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# Q-Tel RMS

## USER GUIDE AND SERVICE MANUAL



Manufactured by Mortara Instrument, Inc., Milwaukee, Wisconsin U.S.A.



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# 1. GENERAL STATEMENTS

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## Technical Support and Service

### Headquarters

**Mortara Instrument, Inc.**

7865 North 86th Street  
Milwaukee, WI 53224  
U.S.A.  
Tel: 414.354.1600  
Tel: 800.231.7437  
Fax: 414.354.4760  
Internet: <http://www.mortara.com>

### European Union Representative

**Mortara Instrument Europe, s.r.l.**

(European Headquarters)  
Via Cimarosa 103/105  
40033 Casalecchio di Reno (BO)  
Italy  
Tel: +39.051.298.7811  
Fax: +39.051.613.3582

### Service/Technical Support Group

**Mortara Instrument, Inc.**

7865 North 86th Street  
Milwaukee, WI 53224  
U.S.A.  
Tel: 414.354.1600  
Service: 888.MORTARA  
(888.667.8272)  
Fax: 414.354.4760  
E-mail: [techsupport@mortara.com](mailto:techsupport@mortara.com)

### Sales Support/ Supplies & Accessories

**Mortara Instrument, Inc.**

7865 North 86th Street  
Milwaukee, WI 53224  
U.S.A.  
Tel: 414.354.1600  
Fax: 414.354.4760

Hospital Customers: [orders.us@mortara.com](mailto:orders.us@mortara.com)  
Physician Practice: [orderspc.us@mortara.com](mailto:orderspc.us@mortara.com)  
U.S. Distribution: [orderspc.us@mortara.com](mailto:orderspc.us@mortara.com)

**Mortara Instrument Germany**

Bonifaciusring 15  
45309 Essen  
Germany  
Tel: +49.201.18 55 69 70  
Fax: +49.201.18 55 69 77

**Mortara Instrument Netherlands**

Postbus 324  
5680 AH Best  
Industrieweg 160b  
5683 CG Best  
Netherlands  
Tel: +31.499.377310  
Fax: +31.499.377908

**Mortara Instrument Australia**

PO Box 7568  
Baulkham Hills NSW 2153  
Unit 28, 9 Hoyle Avenue  
Castle Hill NSW 2154  
Australia  
Tel: +61 2 8070 9303  
Fax: +61 2 9899 9478

**Mortara Dolby UK Ltd.**

Units 11 & 12, Scion House  
Stirling University Innovation Park  
Stirling FK9 4NF  
Scotland  
Tel: +44.1786.444980  
Fax: +44.1786.446630

## 2. NOTICES

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### Manufacturer's Responsibility

Mortara Instrument, Inc. is responsible for the effects on safety and performance only if:

- Assembly operations, extensions, readjustments, modifications, or repairs are carried out only by persons authorized by Mortara Instrument, Inc.
- The device is used in accordance with the instructions for use.

### Responsibility of the Customer

The user of this device is responsible for ensuring the implementation of a satisfactory maintenance schedule. Failure to do so may cause undue failure and possible health hazards.

This manual must be kept in a safe place to prevent its deterioration and/or alteration. The user and Mortara Instrument, Inc. authorized personnel must have access to this manual at any time.

The user of this device must periodically check the accessories, their functionality and integrity.

### Equipment Identification

Mortara Instrument, Inc. equipment is identified by a serial and reference number on the bottom of the device. Care should be taken so that these numbers are not defaced.

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### 3. WARRANTY INFORMATION

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#### Your Mortara Warranty

MORTARA INSTRUMENT, INC. (hereafter referred to as “Mortara”) warrants that components within Mortara products (hereafter referred to as “Product/s”) will be free from defects in workmanship and materials for the number of years specified on documentation accompanying the product, or previously agreed to by the purchaser and Mortara, or if not otherwise noted, for a period of thirteen (13) months from the date of shipment.

Consumable, disposable or single use products such as, but not limited to, PAPER or ELECTRODES are warranted to be free from defects in workmanship and materials for a period of 90 days from the date of shipment or the date of first use, whichever is sooner.

Reusable product such as, but not limited to, BATTERIES, BLOOD PRESSURE CUFFS, BLOOD PRESSURE HOSES, TRANSDUCER CABLES, Y-CABLES, PATIENT CABLES, LEAD WIRES, MAGNETIC STORAGE MEDIUMS, CARRY CASES or MOUNTS, are warranted to be free from defects in workmanship and materials for a period of 90 days. This warranty does not apply to damage to the Product/s caused by any or all of the following circumstances or conditions:

- a) Freight damage;
- b) Supplies, accessories and internal parts NOT approved by Mortara;
- c) Misapplication, misuse, abuse, and/or failure to follow the Product/s instruction sheets and/or information guides;
- d) Accident;
- e) A disaster affecting the Product/s;
- f) Alterations and/or modifications to the Product/s not authorized by Mortara;
- g) Other events outside of Mortara’s reasonable control or not arising under normal operating conditions.

THE REMEDY UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT WITHOUT CHARGE FOR LABOR OR MATERIALS, OR ANY PRODUCT/S FOUND UPON EXAMINATION BY MORTARA TO HAVE BEEN DEFECTIVE. This remedy shall be conditioned upon receipt of notice by Mortara of any alleged defects promptly after discovery thereof within the warranty period. Mortara’s obligations under the foregoing warranty will further be conditioned upon the assumption by the purchaser of the Product/s (i) of all carrier charges with respect to any Product/s returned to Mortara’s principal place or any other place as specifically designated by Mortara or an authorized distributor or representative of Mortara, and (ii) all risk of loss in transit. It is expressly agreed that the liability of Mortara is limited and that Mortara does not function as an insurer. A purchaser of a Product/s, by its acceptance and purchase thereof, acknowledges and agrees that Mortara is not liable for loss, harm, or damage due directly or indirectly to an occurrence or consequence there from relating to the Product/s. If Mortara should be found liable to anyone under any theory (except the expressed warranty set forth herein) for loss, harm, or damage, the liability of Mortara shall be limited to the lesser of the actual loss, harm, or damage, or the original purchase price of the Product/s when sold.

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## 4. USER SAFETY INFORMATION

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**Warning:**

This alert identifies hazards that may cause serious personal injury or death.



**Caution:**

This alert identifies hazards that may cause minor personal injury, product damage, or property damage.

***NOTE:** This manual may contain screen shots and pictures. Any screen shots and pictures are provided for reference only and are not intended to convey actual operating techniques. Consult the actual screen in the host language for specific wording.*



### Warning(s) and Caution(s)

- **WARNING! Restricted use.**The Q-Tel RMS System is intended for use in a hospital or clinical setting by trained and authorized personnel who are acting on the orders or under the supervision of a physician. The system is intended as a complement to, not a substitute for, patient observation by health care professionals. Q-Tel should not be used for unintended activities.
- **WARNING! Use only Quinton approved equipment.**Use of accessories or cables other than those specified, with the exception of accessories or cables sold by Quinton as replacement parts for internal components, may result in increased emissions or decreased immunity of the system. Use only Quinton-approved and specified parts and accessories. Use of other parts can degrade performance and/or safety and may void warranty or contract coverage.
- **WARNING! Restricted use.**The Q-Tel RMS system needs special precautions regarding EMC and needs to be installed and put into service according to the guidelines of the EMC declaration tables.
- **WARNING! Audible alarms.**Do not connect any devices to the Aux input on the speakers as this may mask an audible alarm.
- **WARNING! Audible alarms are not available during a power failure.**During a power outage, the audible alarms may not function; discharge all patients.
- **WARNING! The Lead Off condition disrupts the alarm function.**The arrhythmia alarm detection system must have all leads properly connected to the patient in order to function correctly. If a lead-off condition occurs and the *Lead Off* alarm displays, reattach the lead as soon as possible.
- **WARNING! RF Interference.** Portable and mobile RF communications equipment may affect the Q-Tel RMS system. Observe the recommended separation distances in the EMC declaration tables.
- **WARNING! Improper system performance.** The Q-Tel RMS system should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, observe the Q-Tel RMS system to verify normal operation in the configuration in which it will be used.

- **WARNING! Frequency Interference.** Other wireless devices operate in the same bandwidth as Q-Tel RMS. For example, 900 MHz cordless telephones and other wireless medical devices operate in the same bandwidth as the 900 MHz Q-Tel RMS system. If used within the vicinity of Q-Tel RMS, these devices may interfere with the signal from the transmitter and can affect the alarm detection/ identification capability.
- **WARNING! Frequency Interference.** Microwave ovens operating in the vicinity of a Q-Tel RMS system, particularly the 2.4 GHz system, can interfere with the signal from the transmitter and can affect the alarm detection/ identification capability. Physiotherapy devices that use microwave radiation therapy can cause similar anomalies. Use the Spectrum Analyzer utility to identify interference.
- **WARNING! Spectrum Analyzer.** Use the Spectrum Analyzer utility to verify proper reception on the anticipated frequencies at system installation, and periodically during regular system usage.
- **WARNING! Review default settings.** For optimal patient safety, all operators and clinicians using the system must review the system default settings periodically.
- **WARNING! Explosion hazard.** This instrument is not approved for use and must not be operated in the presence of flammable anesthetics.
- **WARNING! Shock hazard.** Do not place fluids on top of the system. Never spill liquid of any kind on this product. Connectors are not fluid proof. Fluid spilled onto the internal parts of the system can create an electrical hazard. If fluid enters the system, turn off the power immediately and call Technical Support. Do not use until the interior has been cleaned and tested. Water tight boots are commercially available, if needed, for your facility's environment.
- **WARNING! Shock hazard.** Do not use spray on liquid cleaners/aerosol cleaners. Only use damp cloth for cleaning.
- **WARNING! Shock hazard.** Do not use this product near water.
- **WARNING! Possible injury or system damage.** Do not place this product on an unstable cart, stand, or table. This product may fall, causing serious damage to the product or to a person nearby.
- **WARNING! Visual inspection required.** Visually inspect the system periodically to verify functionality. Be aware of and correct any system issues that can affect correct operation and full functionality, such as inoperable hardware, out of adjustment hardware, powered off hardware, or system error messages. Before each use of the equipment, visually check all connector cables and the power receptacle. Make sure all power cables are plugged in securely. Check for worn or damaged plastic coverings, frayed or broken wires, cracked connections, and other signs of damage. Do not operate the equipment if the integrity of these items is in question.
- **WARNING! Monitor system data.** Q-Tel RMS provides ECG monitoring data. The operator must be aware of the meanings of this data and the patient's condition to ensure that the patient is not over-exerted during the rehab session.

- **WARNING! Monitor system data.** Network slowdowns and system failures may delay or disable the display of ECG waveforms and visual alarms on network-connected Q-Tel RMS Workstations. Alarm volumes should be set sufficiently loud on the Q-Tel RMS Tower to be heard adequately over the entire rehab facility. The towers are the primary source of alarm notification. ECG waveforms displayed on the Workstation that are not being updated should not be relied upon for current patient status.
- **Caution: UPS software is not compatible with Q-Tel RMS.** Do not install the UPS software that comes with the UPS device.
- **Caution: Connect only the computer, monitor, and HUB to the UPS.** Do not connect any components, other than the computer, monitor, and HUB into the UPS. See the Q-Tel RMS Main Tower block diagram.
- **Caution: System damage.** Do not obstruct the air holes on the unit. Improper ventilation and air flow could cause the unit to overheat, resulting in automatic shutdown. Slots and openings in the cabinet and the back or bottom are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, do not block or cover these openings. Do not place the product on a rug or similar surface that may block ventilation openings. Never place this product near or over a radiator or heat register. Do not place this product in a built-in installation unless proper ventilation is provided.
- **Caution: Possible interference.** Other electrical devices used on or near patients connected to this device can cause arrhythmia-like artifact on ECG recordings or displays. Those devices, that induce or pass current through the body, can be checked as a possible source of artifact by turning them off while obtaining the diagnostic ECG waveforms on this device.
- **Caution: Network failure.** The Q-Tel RMS system monitors network connections and notifies the user via a message window if a network failure is detected. If a network issue causes a Q-Tel RMS Workstation to be disconnected from the Q-Tel RMS Towers, the Workstation will cease to be functional. Immediately check the system network, and correct any dislodged network plugs, power-down conditions or other failures. Re-establishing the network connection and any needed link within a few minutes of the failure will allow activities in Patient Information and Charting and Editing to continue without shutting down and restarting the Q-Tel RMS Workstation application.



## Electrical Safety

The electrical safety of this product has been considered in its design and production. Quinton medical products are designed to comply with applicable national and international electrical codes.

- **WARNING! Shock hazard.** Do not use spray on liquid cleaners/aerosol cleaners. Only use damp cloth for cleaning.
- **WARNING! Possible injury or system damage.** The product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- **WARNING! Shock hazard.** Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock.
- **WARNING! Electrical hazard.** Do not connect additional multiple portable socket outlets (outlet strips) or extension cords to the Q-Tel RMS system..
- **WARNING! Electrical hazard.** Use only the medical grade power cords supplied with your system. Plug the system only into a grounded power outlet.
- **WARNING! Power cords and system cables.** Do not allow anything to rest on the power cord or cables. Do not locate this product where persons will or can walk or trip on the cord or cables.
- **WARNING! Power cords and system cables.** Do not let the cables get caught in the treadmill or other exercise device mechanism.
- **WARNING! Patient protection.** The Q-Tel RMS equipment was not designed to be used in the environment where the patient is undergoing a medical procedure as defined in IEC 60601-1-1 (1.5 m from the patient). The use of an isolation transformer between mains and Q-Tel RMS is required but is not a sufficient safety measure for use in the patient environment because of data connections (antenna network, data network) that might cause excessive leakage currents in some conditions. Additional separation devices may be required. Any equipment that has a physical connection between Q-Tel RMS and that is in the patient environment (e.g. laser printer and any powered antenna components like LNAs, ANs or DCs) must have additional protection against electrical shock (e.g., an Isolation Transformer and/or a separation device between the equipment and Q-Tel RMS) in order to be in compliance with IEC 60601-1 or equivalent safety standards.
- **WARNING! Possible improper system performance.** Do not connect items that are not specified as part of the Q-Tel RMS system to a Q-Tel RMS Tower or Workstation. Set up the Q-Tel RMS Tower or Workstation as described in the installation instructions and maintain that configuration.
- **WARNING! Electrical hazard.** Always use a DC Block to isolate splitters from ANs.

- **WARNING! Electrical hazard.** Do not install terminators on AN units. DC power is provided through the coax to power other AN units on the network. Installing terminators on the AN units will result in overheating and unit failure. Always use a DC Block to isolate splitters from AN units.
- **Caution: Electrical hazard.** The maximum permitted load for the optional isolation transformer used with the system is 900VA.
- **Caution: Electrical hazard.** The Main Power Source / Isolation Transformer should be plugged into a dedicated power line to ensure that the primary power to the Q-Tel RMS computer is not subject to power sags induced by other devices.



## Improper Software Use

The system must be dedicated to the task of monitoring and recording parameters during rehabilitative sessions. You can compromise the ability of the machine to perform its job by running improper software (for example, games, screensavers, etc.) that is not qualified and tested to run with the Q-Tel RMS software and that uses resources needed for the monitoring and session entry process.

- **WARNING! Requires computer knowledge.** Users must be trained in the use of a PC and capable of recognizing abnormal PC behavior.
- **WARNING! Audible alarms.** Do not use the system to play CDs or DVDs as the sound may mask an audible alarm.

*NOTE: The DVD tray is not meant as coffee cup holder.*

- **WARNING! Patient safety.** Do not alter the software. Do not add or run other software programs on the Q-Tel RMS Tower or Workstation computer (except anti-virus software), especially while monitoring patients. Any unauthorized change or addition may affect patient safety or efficacy. Other software can reduce disk space and available memory; it also can change configuration files. Quinton supports the operation of Q-Tel RMS in its software-only released configuration.
- **WARNING! Possible improper system performance.** Do not load unqualified software on the machine. Unqualified software can compromise the safety of your patient and the accuracy of the tests.
- **Caution: Safeguards for patient information.** The facility is responsible for ensuring appropriate safeguards are put in place to protect patient health information (PHI). This includes a mixture of physical and IT-based mechanisms to secure PHI from unauthorized access. Examples include:
  - Physically securing computers or securing access to them.
  - Ensuring strong passwords are used, especially on mobile equipment.
- **Caution: Computer virus protection.** Do not use removable media that have been used on other PCs. They can introduce computer viruses with destructive effects on the software and data.



## Operator Notes

All screen shots are for reference only. The screen displays differently depending on the system configuration.

At the end of each day, close the Q-Tel RMS application. If you do not close the application at the end of the day, you cannot admit patients to sessions the following day until you close and re-open the Q-Tel RMS application. It is also a good idea to turn off the computer, particularly in areas or times of unstable AC power.

- **WARNING! Read this manual carefully.** The operator must be thoroughly familiar with the information in this manual before using the instrument.
- **WARNING! Review system findings.** Any notification or abnormal indication displayed by this system should be reviewed by skilled staff.
- **WARNING! Audible alarms.** The speakers must remain connected to the system at all times. Disconnecting the speakers can cause a system fault and can prevent you from hearing audible alarms.
- **WARNING! Remote usage.** When working on a Q-Tel RMS system located remotely away from the patient, do not use (exercise related) session management features or discharge a patient.
- **Caution: Powering off.** You must perform standard Windows shutdown procedures when you turn off the computer or the Q-Tel RMS software can become inoperable. See [Powering Off the Computer](#).

***NOTE:** The Q-Tel RMS application requires the user to be a member of the local Power Users or Administrators group to run. Other components of the Q-Tel RMS, including the Backup/Restore, Configuration, Session Recovery, Import/Export and Purge/ Archive utilities, can be used only with users that are members of the local Administrators group.*

## Transmitter Restrictions

Some countries restrict the use of transmitter frequencies. These restrictions are outlined below.

### Channel assignments: 608.48 - 613.52 MHz

In the United States and Canada, use of the Q-Tel RMS transmitter (608 MHz version) is regulated by the Federal Communications Commission (FCC) rules, Part 15 and Industry Canada RSS-210.

- The Q-Tel RMS transmitter must be used solely on the premises of health care facilities (Part 15, section 15.242a). Devices shall not be operated in mobile vehicles including ambulances and other vehicles associated with health care facilities.
- The Q-Tel RMS transmitter must not cause harmful interference to licensed TV broadcast stations or to other authorized services and radio astronomy operation in the 608 - 614 Mhz band. If harmful interference occurs, the interference must either be corrected or the device must immediately cease operation on the occupied frequency (part 15, section 15.242f).
- A health care facility operating the Q-Tel RMS transmitter must coordinate with the directors of existing nearby TV broadcast stations or associated TV booster stations and Radio Astronomy Observatories to ensure compatible use. Minimum separation distances from such facilities may apply. It may be necessary to obtain written authorization from such facilities prior to installation and use of the Q-Tel RMSS transmitter (Part 15, section 15.242d,e). The installer/user shall ensure that the transmitter is at least 80 km from the Penticton radio astronomy station. For medical telemetry systems not meeting this 80 km separation (for example, the Okinagan Valley, British Columbia) the user must coordinate with and obtain the written concurrence of the Director of the Penticton radio astronomy station before the equipment can be installed or operated. The Penticton contact is Tel: 250-493-2277/ fax 250-493-7767.

## Indications for Use

The indications for use of the Q-Tel RMS system is the acquisition and transmission of ECG data by means of a radio-frequency transmitter worn by individual patients in a hospital or clinical setting, to a central monitor where it is received, displayed, stored, and analyzed. The system alerts the user to heart rate and arrhythmia in the patient. The intended populations are ambulatory adults where cardiac monitoring is prescribed while undergoing exercise rehabilitation. Patient demographics, exercise prescription, and collected data can be exported to an outcomes management program.

## Intended Use

- The device is intended to acquire and transmit electrocardiograph (ECG) data by means of a radio-frequency transmitter worn by individual patients in a hospital or clinical setting to a central monitor where it is received, displayed, stored, and analyzed, with alarms for heart rate, arrhythmia, and ST change.
- The device is to be used on ambulatory adult populations where monitoring is prescribed while undergoing exercise rehabilitation.
- Multiple central receivers may be used and connected to a local area network.
- Specified wireless data entry devices may be connected to the system via a wireless access point and be used as a station for entry of patient session data.
- Optional workstation(s) may be connected to the system via a network for entering and viewing patient demographic and rehab session data. The workstation may also be used for tracking patient progress in cardiac rehab and displaying non-real-time waveforms and alarms.
- ECG analysis may include 12-lead EGG interpretation.
- Patient demographics, exercise prescription, scheduling information, and collected data can be ported to an outcomes management program.



## 5. EQUIPMENT SYMBOLS AND MARKINGS

### Symbol Delineation

Quinton products display one or more of these symbols and warning labels for your protection.

 Attention: Consult accompanying documents	 Replace fuse only as marked
 Earth ground (protective)	 Fuse
 Off (power disconnected from mains)	 Mains power
 On (power connected to mains)	 Equipotentiality
 Type B equipment – provides adequate protection against electric shock, particularly regarding allowable leakage current; reliability of the protective earth connection (when present)	 WARNING Ignoring this message can lead to bodily harm
 Type BF equipment – contains an F-type isolated patient applied part providing a high degree of protection against electric shock	 Input/output
 Type BF equipment with defibrillation protection	 Waste Electronic Electrical Equipment (WEEE). Separate collection for waste electrical and electronic equipment
 Type CF equipment – contains an F type isolated patient applied part and provides a degree of protection against electric shock higher than that for type BF equipment regarding allowable leakage currents	Hz      Hertz
 Type CF equipment with defibrillation protection	A      Amperes
 Alternating current	T      Timed fuse (slo-blo)

 High voltage	V Volts
 Earth ground (functional)	VA Volt Amperes

## 6. GENERAL CARE

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Keep system components clean. Perform preventive maintenance as needed and at least semi-annually. For information on cleaning and maintenance of Q-Tel RMS components see [Maintenance](#).



## 7. ELECTROMAGNETIC COMPATABILITY (EMC)

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### Guidance and Manufacturer's Declaration: Electromagnetic Emissions

The equipment is intended for use in the electromagnetic environment specified in the table below. The customer or the user of the equipment should ensure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment: Guidance
RF Emissions CISPR 11	Group 1	The Q-Tel RMS system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.  The Q-Tel RMS system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF Emissions CISPR 11	Class A	
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/ Flicker Emissions IEC 61000-3-3	Complies	

## Guidance and Manufacturer's Declaration: Electromagnetic Immunity

The equipment is intended for use in the electromagnetic environment specified in the table below. The customer or the user of the equipment should ensure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment: Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	+/- 6 kV contact +/- 8 kV air	+/- 6 kV contact +/- 8 kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	+/- 2 kV for power supply lines +/- 1 kV for input/output lines	+/- 2 kV for power supply lines +/- 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	+/- 1 kV differential mode +/- 2 kV common mode	+/- 1 kV differential mode +/- 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% UT (>95% dip in UT) for 0.5 cycles <40% UT (>60% dip in UT) for 5 cycles <70% UT (>30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec	<5% UT (>95% dip in UT) for 0.5 cycles <40% UT (>60% dip in UT) for 5 cycles <70% UT (>30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the equipment requires continued operation during power mains interruptions, it is required that the equipment be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

**NOTE:** *UT is the AC Mains voltage prior to application of the test level.*

## Guidance and Manufacturer's Declaration: Electromagnetic Immunity

The equipment is intended for use in the electromagnetic environment specified in the table below. The customer or the user of the equipment should ensure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment: Guidance
Conducted RF EN 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V <sup>c</sup>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the equipment, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p><b>Recommended separation distance</b></p> <p><math>d = 1.2 \sqrt{P}</math> 150 kHz to 80 MHz</p> <p><math>d = 1.2 \sqrt{P}</math> 80 MHz to 800 MHz</p> <p><math>d = 2.3 \sqrt{P}</math> 800 MHz to 2.5 GHz</p> <p>Where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey<sup>a</sup>, should be less than the compliance level in each frequency range<sup>b</sup>.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V <sup>c</sup>	

**NOTE:** At 80 MHz and 800 MHz, the higher frequency range applies.

**NOTE:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

**NOTE:** Tests were verified with shielded input/output cables only.

- Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radios, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the equipment is used exceeds the applicable RF compliance level above, the equipment should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the equipment.
- Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [3] V/m.
- Amplitude modulated at 80% with a modulation frequency of 10 KHz per En 60601-2-25.

## Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the Equipment

The equipment is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the equipment can help to prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the equipment as recommended in the table below, according to the maximum output power of the communications equipment

Rated Maximum Output Power of Transmitter (W)	Separation Distance According to Frequency of Transmitter (m)		
	150 KHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
	$d = 1.2 \sqrt{P}$	$d = 1.2 \sqrt{P}$	$d = 2.3 \sqrt{P}$
0.01	0.12 m	0.12 m	0.23 m
0.1	0.38 m	0.38 m	0.73 m
1	1.2 m	1.2 m	2.3 m
10	3.8 m	3.8 m	7.3 m
100	12.0 m	12.0 m	23.0 m

For transmitters rated at a maximum output power not listed above, the recommended separation distance  $d$  in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where  $P$  is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

**NOTE:** At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

**NOTE:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

## 8. INTRODUCTION

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This chapter contains introductory information for using the Q-Tel RMS application.

### User Profile

The Q-Tel RMS system is intended for use in a clinical setting by trained personnel who are acting on the orders of a physician. See [User Safety Information](#) for important safety information. The final decision regarding the

treatment of patients is the responsibility of the physician.



#### **Caution: Restricted use.**

Nurses, clinicians, technicians, and other users must be familiar with clinical procedures surrounding ECGs and cardiac rehabilitation and trained in the use of a PC before using the equipment.

Failure to follow the conditions set forth below shall limit, to the extent allowed by law, the responsibility of Quinton for the safety, reliability, and performance of this equipment.

This user manual must be read in full by each operator before using the product for the first time.

Assembly operations, extensions, readjustments, modifications, or repairs must be carried out only by Quinton-trained or Quinton-authorized personnel.

The electrical wiring within the instrument's setting and the electrical installation of the instrument must comply with the applicable local or provincial requirements.

The equipment must be used in accordance with the instructions for use.

### Overview of System

The Q-Tel RMS system is a computer-based cardiac and pulmonary rehabilitation data acquisition and editing system. It provides rehabilitation functionality using telemetry units that transmit patient ECG signals to a PC platform running the Microsoft Windows 7 operating system.

The primary functions of the system are:

- ECG monitoring
- Reporting of data and analysis of results.

The Q-Tel RMS system also maintains a database that contains complete rehabilitation case records.

Q-Tel RMS is scalable from a single tower monitoring (for example) 4 patients (Figure 1) up to a larger network monitoring up to 32 patients (Figure 2).

**Figure 1 Single Tower System**

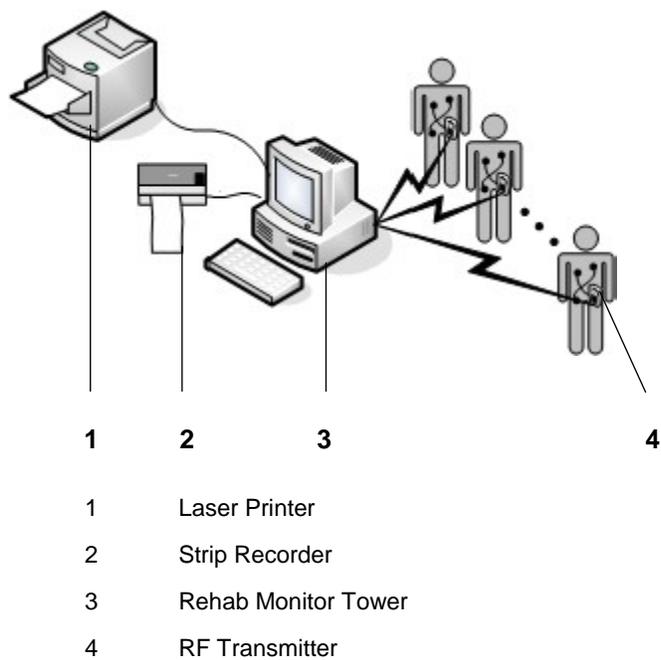
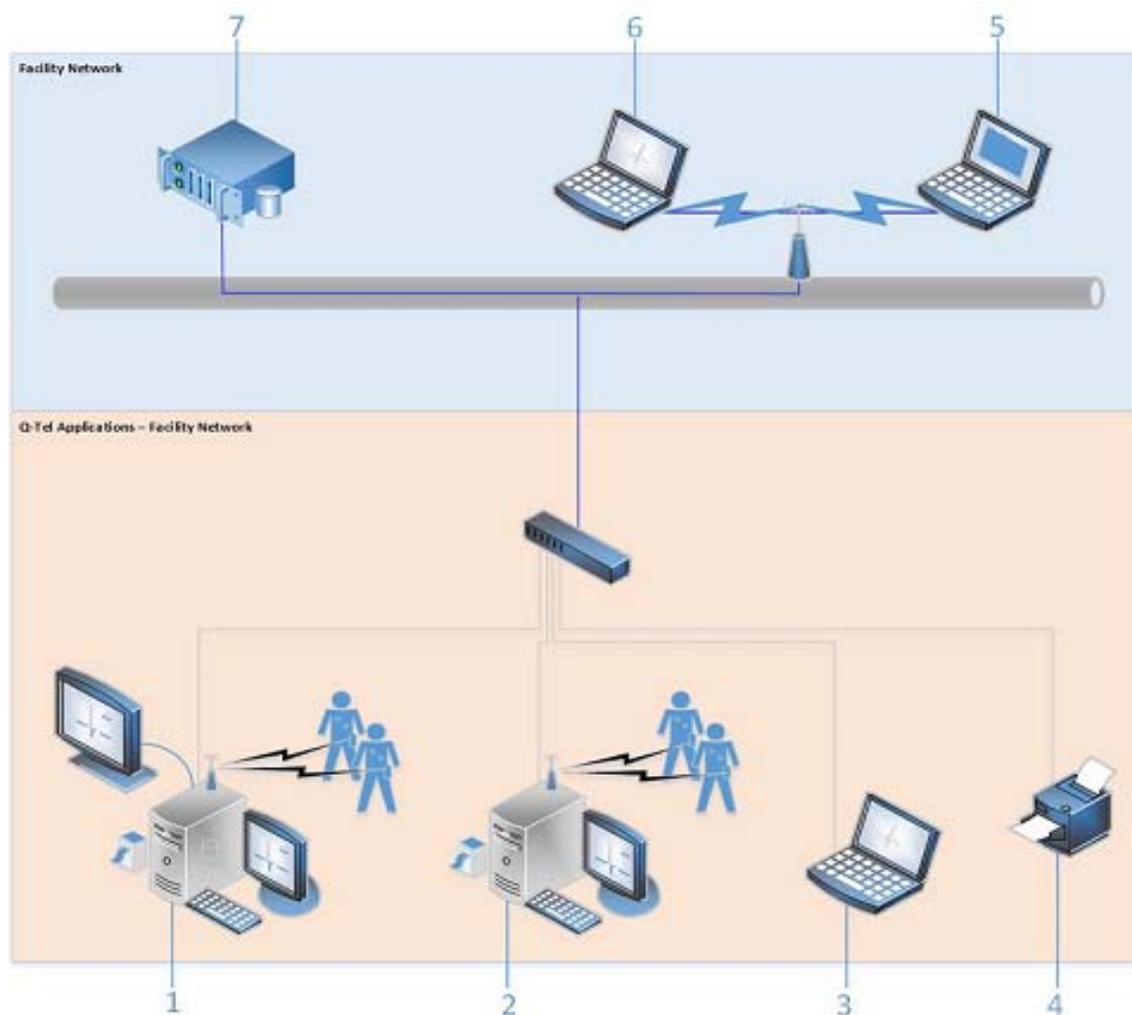


Figure 2 Networked System Concept



- |   |                                  |   |                                |
|---|----------------------------------|---|--------------------------------|
| 1 | Q-Tel RMS Main Tower             | 6 | Q-Tel RMS Software Workstation |
| 2 | Q-Tel RMS Secondary Tower        | 7 | Facility Server                |
| 3 | Q-Tel RMS Turnkey Workstation    |   |                                |
| 4 | Q-Tel RMS Laser Printer          |   |                                |
| 5 | Q-Tel RMS Q-Progress Workstation |   |                                |

## System Configuration and Settings

Windows is configured for optimum performance of Q-Tel RMS. Changing the settings can affect the performance. Q-Tel RMS disables screen-savers.

It is recommended that all Q-Tel RMS systems be periodically updated with Microsoft critical and security updates to protect their system from malware attacks and to fix critical Microsoft software issues. The following guidelines apply for Microsoft updates;

- Customer is responsible for applying Microsoft Updates
- Configure Microsoft updates to be *manually* applied
- Do not install Microsoft updates during use of the product
- After installing updates, verify proper system operation before monitoring patients

Each Q-Tel product release is tested against the cumulative Microsoft updates at the time of product release. There are no known Microsoft update conflicts with the Q-Tel application. Please contact Mortara Technical Support if conflicts are identified.

## Workstation Configurations

This document describes the operation of the Q-Tel RMS software for both the tower and software workstations. However, statements and claims within this document specific to computer software and hardware components apply only to those components purchased from Quinton. If a component has been purchased from a different vendor, consult the vendor documentation for proper operation and use.

If you use the workstation software option, you are responsible for purchasing the hardware that meets the specifications as set by Quinton. See [Workstation Software Specifications](#).

## Function

The Q-Tel RMS system measures the electrical activity of a patient's heart during exercise and transmits it via radio frequency to a central monitoring station. The monitoring station displays the patient's concurrent, real-time ECG waveforms and uses programmable alarms to indicate the presence of arrhythmias. When alerted by the alarm, the clinician can determine whether the event causing the alarm is benign or clinically significant. The Q-Tel RMS system enables the clinician to view, edit, and record ECG strips and print tabular reports.

## Basic Terms and Operations

This section describes basic terms and conventions used in this manual.

### Conventions Used in this Manual

Most actions can be accomplished by using the mouse or by pressing keys on the keyboard.

When directions call for you to click on an item shown on the screen, the item is bold in the text. For example, *Click **Yes** to continue* indicates you should move the mouse cursor over the **Yes** button on the screen and press the left mouse button.

The symbol | between words indicates a sequence of commands. For example, to start the Q-Tel RMS program using the Start menu: **Start | Programs | Quinton | Q-Tel RMS** indicates you click **Start**, in the new window, click **Programs**. Another window displays. Click **Quinton**. When the system displays **Q-Tel RMS** click the icon or select the menu item.

## Product Features

Q-Tel RMS features are:

<b>Feature</b>	<b>Description</b>
Telemetry monitoring	Concurrent monitoring of rehab patients using RF telemetry for ECG transmission
	Concurrent monitoring of rehab patients using RF telemetry for ECG transmission
	Display of real-time ECG signals for up to 8 patients on a single display monitor.
	Support for independent exercise prescriptions for each monitored patient.
	Continuous heart rate measurement and display.
	Continuous arrhythmia analysis with alarms.
ECG	Selectable display lead and gain.
	Sweep speed of 25 mm/sec.
	Optional waveform grid.
Vital Signs	Ability to enter NIBP, SpO2, and other user-defined parameters for each patient.
User Interface	Standard Windows GUI with deviations as required.
	Keyboard, mouse.
Database	Full disclosure of up to 5 leads for each monitored patient for up to four hours, three most recent sessions.
	Backup capabilities for all Q-Tel RMS data, including full disclosure.
	Archive of patient demographic data, session parameters, and associated PDF session reports.
Clocks and Timers	Independent exercise prescription timer for each monitored patient.
Printing and Reporting	Laser printer for printing strips of one or two leads and reports.
	Optional strip recorder for real-time printing of one or two leads ECG strips.
	Vital signs trending (through Q-Progress software).

## Product Components

A Q-Tel RMS system consists of Towers and Workstations, telemetry units, Spectrum Analyzer Tool, and printers.

### Towers and Workstations

A Q-Tel RMS system consists of at least one “Main” Tower, and optional Secondary towers. Towers include receiver cards, and can admit patients for monitoring. The Main tower includes the Q-Tel database. The optional Secondary Towers and Workstations use the database that resides on the Main Tower. Both the Main Tower and the Secondary Towers can serve as rehab monitors and administrative workstations.

Workstations software can be ordered as a Turnkey Workstation with hardware, or be installed on customer-supplied equipment. It includes similar session management capabilities as a Tower.

Review workstation software is supplied without the Session Management license capabilities. It is installed on customer-supplied equipment.

### Workstation Functions

Function	Turnkey	Workstation S/W	Review
Enter rehab patient information	X	X	X
Edit session data in charting and editing	X	X	X
View ECG waveforms in non-real-time	X	X	X
Generate reports in either workstation configuration	X	X	X
Take control of session data for patients admitted to active sessions	X	X	
Edit Session Management information	X	X	

Workstations without session management do not permit control of patients admitted to active sessions and all Session Management functionality is read-only.

A Q-Tel RMS Tower and workstations include:

## Tower and Workstation Components

Function	Q-Tel RMS Tower	Q-Tel RMS Turnkey Workstation	Q-Tel RMS Review Workstation
Proprietary Q-Tel RMS software	X	X	X
A basic computer including the CPU, monitor, mouse, and keyboard	X	X	
Telemetry electronics for the reception of the ECG signals from the patient worn transmitters	X		
Speakers	X	X	

## Telemetry Unit

The telemetry unit consists of lead wires and a transmitter (with a call button as a means to send a remote request to the system). The unit supports the transmission of four and five electrode ECG data with snap-on electrode clips marked with AHA or IEC lead identifiers. It provides ECG data at a rate of 500 samples per second per lead.

The telemetry unit supports transmitter frequency bands within the Industrial-Scientific- Medical (ISM) allocation of 902-928 MHz (Legacy Systems) or 2400-2483 MHz, the Wireless Medical Telemetry Service (WMTS) allocation of 608.48-613.52 MHz, or the 608.48-631.52 MHz frequency band.

## Spectrum Analyzer Tool

The Spectrum Analyzer tool scans the power spectrum of the designated frequencies associated with the telemetry channels. Use this tool to identify channels with low noise for operation of the system and to confirm that transmitter frequencies are properly set.

## Printers

The Q-Tel RMS system supports a laser and strip printer.



### **WARNING! Patient Protection.**

Do not connect the printer directly to the Main tower. Instead, connect the printer via a network connection in order to comply with the IEC60601-1 standard.

## Laser Printer

The laser printer produces full-page reports on 8 ½ by 11 inch paper and supports text, graphics, and waveforms. It prints with a minimum resolution of 600 dpi in both horizontal and vertical directions to support quality ECG data.

The laser printer can also be used to print ECG strips of up to two channels scaled at 25mm/sec.

## Strip Recorder (optional)

The optional strip recorder, connected to a Q-Tel RMS Tower, can begin printing an ECG strip within one second of a print request and can print up to two ECG channels. ECG readings are scaled at 25 mm/sec.

## Uninterruptible Power Supply (UPS)

The Q-Tel RMS system requires a steady supply of power during its operation. If power failures or brownouts are a problem in the area, purchase a line conditioner or use the UPS provided with the tower to ensure optimal operation of the system. The computer, monitor, speakers, and LNA can be plugged into the UPS.



### Caution: Possible improper system performance.

Do not plug the strip recorder or laser printer into the UPS with the other Q-Tel RMS components.

UPS requirements differ based on the AC voltage available with the system.

## Remote Monitor (optional)

A Q-Tel RMS Tower with software v4.0 or higher supports two monitors. A second monitor is connected to the Q-Tel RMS Tower using the dual-head video card. The displayed image is the same on both monitors at all times.

## Starting the Application

Use the instructions in this section to power on the Q-Tel RMS system.



### Caution: Possible improper system performance.

If running a networked Q-Tel RMS system, make sure the Q-Tel RMS Main Tower is powered on and running before starting the Q-Tel RMS application on Secondary Towers or Workstations.

To start the Q-Tel RMS application:



1. Choose a method to start the application:
  - From the desktop of the Q-Tel RMS tower, double-click on the **Q-Tel RMS Tower** icon.
  - From the desktop of the Q-Tel RMS workstation, double-click on the **Q-Tel RMS Workstation** icon.
  - From the Start menu, click on **Start | Programs | Quinton | Q-Tel RMS**.

The logo screen displays:

2. Select the first screen to access.

**NOTE:** You can turn off the selection window and proceed directly to the configured default window on the Main and Secondary Towers only.

On a Q-Tel RMS Tower, the system also displays an Alarm Volume Test dialog box.



**WARNING! Audible alarms.**

The alarm test is included at the start of the Q-Tel RMS program on the Tower to ensure that the audio alarms are properly functioning. The alarms do not function properly if the speakers have been unplugged, if the volume has been turned down on the speakers or in the Windows Control Panel, or if there has been a component failure. It is very important to ensure proper function of the alarms before starting a patient monitoring session.

3. On the Q-Tel RMS Tower, respond to the alarm dialog box:
  - Click **Yes** if you heard the alarm sound.  
The Q-Tel RMS program screen displays.
  - Click **No** if you did not hear the alarm.  
The Q-Tel displays a dialog box. Check the volume control and make sure the speakers are plugged in and functioning.

For more information on alarms, refer to [Alarm Subsystem](#).

4. If there are patient files available for importing, the system prompts you to import the files.
  - Click **Yes** to open the Import files window.
  - Click **No** to import the files later.

For more information on importing files see [Importing Patient Files](#).

## Powering Off the Computer

When you have completed testing for the day, use this procedure to power off the computer.



**Caution: Possible improper system performance.**

If you power down the Q-Tel RMS computer before performing these steps, you can cause the Q-Tel RMS software to become inoperable.

***NOTE:** If running in a networked Q-Tel RMS configuration, you must close the Q-Tel RMS application on all other Q-Tel RMS Towers and Workstations before shutting down the Main Tower.*

***NOTE:** You must discharge all patients before closing the Q-Tel RMS application.*

To power off the system:

1. Choose a method to close the application:
  - Click the **X** in the upper right corner of the screen.
  - Select **File | Exit**.
2. Select **Start | Shut Down** from the Windows task bar. The system displays a confirmation dialog box.
3. Select **Shut down the computer** and then click **Yes**. The system automatically powers off when Windows completes the shutdown process.
4. If the system does not power off after the shutdown is complete, press the power button on the front of the computer. The system powers off.



## 9. SYSTEM SETUP

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This chapter contains the detailed instructions for configuring the Q-Tel RMS transmitters.

### Hardware Setup

Refer to the *Q-Tel RMS Installation and Upgrade Instructions* (9515-193-60), provided with your Q-Tel RMS system for complete instructions on how to set up the system. You will typically have to do this only once.

In addition [Functional Block Diagram](#) provides a functional block diagram for the system depicting the general connectivity of the Q-Tel RMS Tower components.

### Transmitter Setup

The Q-Tel RMS system supports these transmitters:

- X12+ Transmitter

### Configuring the Transmitters

The Q-Tel RMS transmitters are light-weight battery-operated units powered by one 1.5v AA alkaline battery. The units broadcast on user selectable frequency channels within the bands:

- 904.76 to 925.16 MHz
- 608.48 to 631.52 MHz
- 2400.96 to 2482.56 MHz

The patient leads support both 4 and 5 wire configurations and the cable is easily exchanged or replaced.



**X12+ Transmitter**

The following sections describe how to:

- Scan the frequency band within your facility and choose appropriate transmitter channels.
- Set the channel selections on each transmitter.
- Change the batteries.
- Prepare the patient.



**Caution: Frequency interference.**

Observe the same frequency separations in the multiple Q-Tel RMS Tower network configuration as on a Q-Tel RMS Standalone Tower. Use unique, properly spaced frequency settings between the Towers to avoid interference.

## Scanning the Frequency Band



The Q-Tel RMS system includes a Spectrum Analysis tool installed on the system desktop. Scan the radio frequency spectrum to locate suitable channels that are not in use by other equipment near the rehab facility.

The spectrum analysis displays the channel assignment across the bottom of the plot. The units of the channel assignment is hexadecimal (base 16 - counts: 00, 01, 02, ..., 09, 0A, 0B, 0C, ..., 10, 11, 12, ..., 19, 1A, 1B, ... 1F, 20, and so on, to the total number of channels available for the frequency bandwidth). The frequency associated with each channel is listed in [Transmitter Channel Assignments](#).

The last sweep of the band displays in light blue. The maximum detected power from all previous sweeps displays as dark blue.

For example, in Figure 3, Channel 50 (the third power peak extending above -60db) was present for a short period but is not currently broadcasting. The peaks that extend above -80db are from Q-Tel RMS transmitters and typify the signature of the spectral peaks.

The operating range performance of the transmitters is 15 meters with no barriers.

Q-Tel RMS requires that the transmitter frequencies be set a number of channels apart:

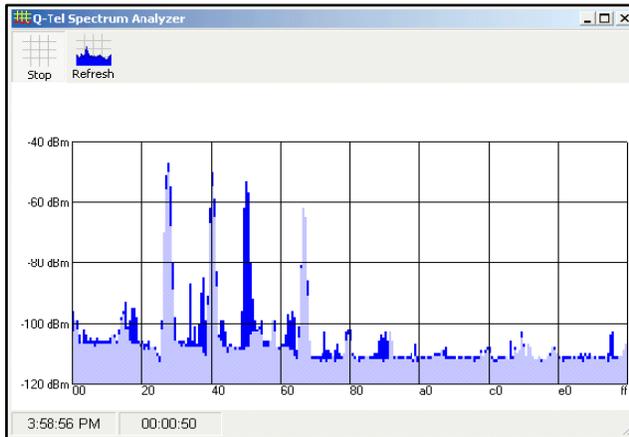
- 915 MHz—the frequencies must be at least 4 channels apart (three unused channels between power peaks).
- 608 MHz—the frequencies must be at least 2 channels apart (one unused channel between power peaks).
- 2.4 GHz (2400 MHz)—the frequencies must be at least 3 channels apart (two unused channel between power peaks).

To scan the frequency band:

1. Choose a method to start the Spectrum Analysis tool:
  - Double-click on the **Q-Tel Spectrum Analyzer** icon
  - Use the **Start** menu and select **Programs | Quinton | Q-Tel Spectrum Analyzer**.

The system displays a spectrum analysis screen.

Figure 3 Example of Spectrum Analysis Screen



2. Click **Start**. The system begins continuously sweeping the frequencies and updating the display with the detected power spectrum. The **Start** icon changes to a **Stop** icon.
3. To clear the spectrum plot and continue frequency scanning, click the **Refresh** icon.
4. To stop the sweep, click the **Stop** icon.

### Transmitter Channel Assignments

The following tables list the transmitter channel assignments for the frequencies:

- 904.76 - 925.16 MHz
- 608.48 - 631.52 MHz
- 2400.96 - 2482.56 MHz

### Transmitter Channel Assignments: 904.76 - 925.16 MHz

CH #	MHz	CH #	MHz	CH #	MHz	CH #	MHz
00	904.76	40	909.88	80	915.00	C0	920.12
01	904.84	41	909.96	81	915.08	C1	920.20
02	904.92	42	910.04	82	915.16	C2	920.28
03	905.92	43	910.12	83	915.24	C3	920.36
04	905.08	44	910.20	84	915.32	C4	920.44
05	905.16	45	910.28	85	915.40	C5	920.52
06	905.24	46	910.36	86	915.48	C6	920.60
07	905.32	47	910.44	87	915.56	C7	920.68
08	905.40	48	910.52	88	915.64	C8	920.76
09	905.48	49	910.60	89	915.72	C9	920.84
0A	905.56	4A	910.68	8A	915.80	CA	920.92
0B	905.64	4B	910.76	8B	915.88	CB	921.00
0C	905.72	4C	910.84	8C	915.96	CC	921.08
0D	905.80	4D	910.92	8D	916.04	CD	921.16
0E	905.88	4E	911.00	8E	916.12	CE	921.24
0F	905.96	4F	911.08	8F	916.20	CF	921.32

CH #	MHz						
10	906.04	50	911.16	90	916.28	D0	921.40
11	906.12	51	911.24	91	916.36	D1	921.48
12	906.20	52	911.32	92	916.44	D2	921.56
13	906.28	53	911.40	93	916.52	D3	921.64
14	906.36	54	911.48	94	916.60	D4	921.72
15	906.44	55	911.56	95	916.68	D5	921.80
16	906.52	56	911.64	96	916.76	D6	921.88
17	906.60	57	911.72	97	916.84	D7	921.96
18	906.68	58	911.80	98	916.92	D8	922.04
19	906.76	59	911.88	99	917.00	D9	922.12
1A	906.84	5A	911.96	9A	917.08	DA	922.20
1B	906.92	5B	912.04	9B	917.16	DB	922.28
1C	907.00	5C	912.12	9C	917.24	DC	922.36
1D	907.08	5D	912.20	9D	917.32	DD	922.44
1E	907.16	5E	912.28	9E	917.40	DE	922.52
1F	907.24	5F	912.36	9F	917.48	DF	922.60
20	907.32	60	912.44	A0	917.56	E0	922.68
21	907.40	61	912.52	A1	917.64	E1	922.76
22	907.48	62	912.60	A2	917.72	E2	922.84
23	907.56	63	912.68	A3	917.80	E3	922.92
24	907.64	64	912.76	A4	917.88	E4	923.00
25	907.72	65	912.84	A5	917.96	E5	923.08
26	907.80	66	912.92	A6	918.04	E6	923.16
27	907.88	67	913.00	A7	918.12	E7	923.24
28	907.96	68	913.08	A8	918.20	E8	923.32
29	908.04	69	913.16	A9	918.28	E9	923.40
2A	908.12	6A	913.24	AA	918.36	EA	923.48
2B	908.20	6B	913.32	AB	918.44	EB	923.56
2C	908.28	6C	913.40	AC	918.52	EC	923.64
2D	908.36	6D	913.48	AD	918.60	ED	923.72
2E	908.44	6E	913.56	AE	918.68	EE	923.80
2F	908.52	6F	913.64	AF	918.76	EF	923.88
30	908.60	70	913.72	B0	918.84	F0	923.96
31	908.68	71	913.80	B1	918.92	F1	924.04
32	908.76	72	913.88	B2	919.00	F2	924.12
33	908.84	73	913.96	B3	919.08	F3	924.20
34	908.92	74	914.04	B4	919.16	F4	924.28
35	909.00	75	914.12	B5	919.24	F5	924.36
36	909.08	76	914.20	B6	919.32	F6	924.44
37	909.16	77	914.28	B7	919.40	F7	924.52
38	909.24	78	914.36	B8	919.48	F8	924.60
39	909.32	79	914.44	B9	919.56	F9	924.68

CH #	MHz						
3A	909.40	7A	914.52	BA	919.64	FA	924.76
3B	909.48	7B	914.60	BB	919.72	FB	924.84
3C	909.56	7C	914.68	BC	919.80	FC	924.92
3D	909.64	7D	914.76	BD	919.88	FD	925.00
3E	909.72	7E	914.84	BE	919.96	FE	925.08
3F	909.80	7F	914.92	BF	920.04	FF	925.16

In the United States and Canada, use of the Q-Tel RMS transmitter (608 MHz version) is regulated by the Federal Communications Commission (FCC) rules and Industry Canada RSS 210. Restrictions may apply. See [Channel assignments: 608.48 - 613.52 MHz](#).

### Transmitter Channel Assignments: 608.18 – 631.52 MHz

CH #	MHz	CH #	MHz	CH #	MHz	CH #	MHz
00	608.48	40	614.48	80	620.48	C0	626.48
01	608.56	41	614.56	81	620.56	C1	626.56
02	608.64	42	614.64	82	620.64	C2	626.64
03	608.72	43	614.72	83	620.72	C3	626.72
04	608.8	44	614.8	84	620.8	C4	626.8
05	608.88	45	614.88	85	620.88	C5	626.88
06	608.96	46	614.96	86	620.96	C6	626.96
07	609.04	47	615.04	87	621.04	C7	627.04
08	609.12	48	615.12	88	621.12	C8	627.12
09	609.2	49	615.2	89	621.2	C9	627.2
0A	609.28	4A	615.28	8A	621.28	CA	627.28
0B	609.36	4B	615.36	8B	621.36	CB	627.36
0C	609.44	4C	615.44	8C	621.44	CC	627.44
0D	609.52	4D	615.52	8D	621.52	CD	627.52
0E	609.6	4E	615.6	8E	621.6	CE	627.6
0F	609.68	4F	615.68	8F	621.68	CF	627.68
10	609.76	50	615.76	90	621.76	D0	627.76
11	609.84	51	615.84	91	621.84	D1	627.84
12	609.92	52	615.92	92	621.92	D2	627.92
13	610	53	616	93	622	D3	628
14	610.08	54	616.08	94	622.08	D4	628.08
15	610.16	55	616.16	95	622.16	D5	628.16
16	610.24	56	616.24	96	622.24	D6	628.24
17	610.32	57	616.32	97	622.32	D7	628.32
18	610.4	58	616.4	98	622.4	D8	628.4
19	610.48	59	616.48	99	622.48	D9	628.48
1A	610.56	5A	616.56	9A	622.56	DA	628.56
1B	610.64	5B	616.64	9B	622.64	DB	628.64

CH #	MHz						
1C	610.72	5C	616.72	9C	622.72	DC	628.72
1D	610.8	5D	616.8	9D	622.8	DD	628.8
1E	610.88	5E	616.88	9E	622.88	DE	628.88
1F	610.96	5F	616.96	9F	622.96	DF	628.96
20	611.04	60	617.04	A0	623.04	E0	629.04
21	611.12	61	617.12	A1	623.12	E1	629.12
22	611.2	62	617.2	A2	623.2	E2	629.2
23	611.28	63	617.28	A3	623.28	E3	629.28
24	611.36	64	617.36	A4	623.36	E4	629.36
25	611.44	65	617.44	A5	623.44	E5	629.44
26	611.52	66	617.52	A6	623.52	E6	629.52
27	611.6	67	617.6	A7	623.6	E7	629.6
28	611.68	68	617.68	A8	623.68	E8	629.68
29	611.76	69	617.76	A9	623.76	E9	629.76
2A	611.84	6A	617.84	AA	623.84	EA	629.84
2B	611.92	6B	617.92	AB	623.92	EB	629.92
2C	612	6C	618	AC	624	EC	630
2D	612.08	6D	618.08	AD	624.08	ED	630.08
2E	612.16	6E	618.16	AE	624.16	EE	630.16
2F	612.24	6F	618.24	AF	624.24	EF	630.24
30	612.32	70	618.32	B0	624.32	F0	630.32
31	612.4	71	618.4	B1	624.4	F1	630.4
32	612.48	72	618.48	B2	624.48	F2	630.48
33	612.56	73	618.56	B3	624.56	F3	630.56
34	612.64	74	618.64	B4	624.64	F4	630.64
35	612.72	75	618.72	B5	624.72	F5	630.72
36	612.8	76	618.8	B6	624.8	F6	630.8
37	612.88	77	618.88	B7	624.88	F7	630.88
38	612.96	78	618.96	B8	624.96	F8	630.96
39	613.04	79	619.04	B9	625.04	F9	631.04
3A	613.12	7A	619.12	BA	625.12	FA	631.12
3B	613.2	7B	619.2	BB	625.2	FB	631.2
3C	613.28	7C	619.28	BC	625.28	FC	631.28
3D	613.36	7D	619.36	BD	625.36	FD	631.36
3E	613.44	7E	619.44	BE	625.44	FE	631.44
3F	613.52	7F	619.52	BF	625.52	FF	631.52

Some countries limit the use of the Q-Tel RMS transmitter (2400 MHz version).

### Transmitter Channel Assignments: 2400.96 – 2482.56 MHz

CH #	MHz	CH #	MHz	CH #	MHz	CH #	MHz
00	2400.96	40	2421.44	80	2441.92	C0	2462.4
01	2401.28	41	2421.76	81	2442.24	C1	2462.72
02	2401.6	42	2422.08	82	2442.56	C2	2463.04
03	2401.92	43	2422.4	83	2442.88	C3	2463.36
04	2402.24	44	2422.72	84	2443.2	C4	2463.68
05	2402.56	45	2423.04	85	2443.52	C5	2464
06	2402.88	46	2423.36	86	2443.84	C6	2464.32
07	2403.2	47	2423.68	87	2444.16	C7	2464.64
08	2403.52	48	2424	88	2444.48	C8	2464.96
09	2403.84	49	2424.32	89	2444.8	C9	2465.28
0A	2404.16	4A	2424.64	8A	2445.12	CA	2465.6
0B	2404.48	4B	2424.96	8B	2445.44	CB	2465.92
0C	2404.8	4C	2425.28	8C	2445.76	CC	2466.24
0D	2405.12	4D	2425.6	8D	2446.08	CD	2466.56
0E	2405.44	4E	2425.92	8E	2446.4	CE	2466.88
0F	2405.76	4F	2426.24	8F	2446.72	CF	2467.2
10	2406.08	50	2426.56	90	2447.04	D0	2467.52
11	2406.4	51	2426.88	91	2447.36	D1	2467.84
12	2406.72	52	2427.2	92	2447.68	D2	2468.16
13	2407.04	53	2427.52	93	2448	D3	2468.48
14	2407.36	54	2427.84	94	2448.32	D4	2468.8
15	2407.68	55	2428.16	95	2448.64	D5	2469.12
16	2408	56	2428.48	96	2448.96	D6	2469.44
17	2408.32	57	2428.8	97	2449.28	D7	2469.76
18	2408.64	58	2429.12	98	2449.6	D8	2470.08
19	2408.96	59	2429.44	99	2449.92	D9	2470.4
1A	2409.28	5A	2429.76	9A	2450.24	DA	2470.72
1B	2409.6	5B	2430.08	9B	2450.56	DB	2471.04
1C	2409.92	5C	2430.4	9C	2450.88	DC	2471.36
1D	2410.24	5D	2430.72	9D	2451.2	DD	2471.68
1E	2410.56	5E	2431.04	9E	2451.52	DE	2472
1F	2410.88	5F	2431.36	9F	2451.84	DF	2472.32
20	2411.2	60	2431.68	A0	2452.16	E0	2472.64
21	2411.52	61	2432	A1	2452.48	E1	2472.96
22	2411.84	62	2432.32	A2	2452.8	E2	2473.28
23	2412.16	63	2432.64	A3	2453.12	E3	2473.6
24	2412.48	64	2432.96	A4	2453.44	E4	2473.92
25	2412.8	65	2433.28	A5	2453.76	E5	2474.24

CH #	MHz						
26	2413.12	66	2433.6	A6	2454.08	E6	2474.56
27	2413.44	67	2433.92	A7	2454.4	E7	2474.88
28	2413.76	68	2434.24	A8	2454.72	E8	2475.2
29	2414.08	69	2434.56	A9	2455.04	E9	2475.52
2A	2414.4	6A	2434.88	AA	2455.36	EA	2475.84
2B	2414.72	6B	2435.2	AB	2455.68	EB	2476.16
2C	2415.04	6C	2435.52	AC	2456	EC	2476.48
2D	2415.36	6D	2435.84	AD	2456.32	ED	2476.8
2E	2415.68	6E	2436.16	AE	2456.64	EE	2477.12
2F	2416	6F	2436.48	AF	2456.96	EF	2477.44
30	2416.32	70	2436.8	B0	2457.28	F0	2477.76
31	2416.64	71	2437.12	B1	2457.6	F1	2478.08
32	2416.96	72	2437.44	B2	2457.92	F2	2478.4
33	2417.28	73	2437.76	B3	2458.24	F3	2478.72
34	2417.6	74	2438.08	B4	2458.56	F4	2479.04
35	2417.92	75	2438.4	B5	2458.88	F5	2479.36
36	2418.24	76	2438.72	B6	2459.2	F6	2479.68
37	2418.56	77	2439.04	B7	2459.52	F7	2480
38	2418.88	78	2439.36	B8	2459.84	F8	2480.32
39	2419.2	79	2439.68	B9	2460.16	F9	2480.64
3A	2419.52	7A	2440	BA	2460.48	FA	2480.96
3B	2419.84	7B	2440.32	BB	2460.8	FB	2481.28
3C	2420.16	7C	2440.64	BC	2461.12	FC	2481.6
3D	2420.48	7D	2440.96	BD	2461.44	FD	2481.92
3E	2420.8	7E	2441.28	BE	2461.76	FE	2482.24
3F	2421.12	7F	2441.6	BF	2462.08	FF	2482.56

### Setting the Transmitter Channels

Once you have profiled the radio frequency spectrum and selected the channels to be used for the transmitters, configure each unit.

Record the channel setting and assign the transmitter a number (see [Telemetry Tab](#) for details on how to enter this information).

It is recommended that you apply a label to the transmitter with the assigned transmitter number.



**WARNING! Use distinct frequencies per transmitter.**

Do not set two transmitters to the same frequency. Use the Spectrum Analyzer tool to select and verify appropriate frequencies.

## X12+ Transmitter

To set the transmitter channel:

1. Press the **Up/Right** key continuously for several seconds. **Lead Check** displays on the screen.
2. Use the **Down** or **Up/Right** keys to highlight **Configure** and then press **Enter**.
3. Use the **Down** or **Up/Right** keys to highlight **Channel** and then press **Enter**. The LCD screen displays a channel number with a highlighted character.
4. To change the channel number:
  - a. Press the **Up/Right** key to highlight the number.
  - b. To increase the number or letter, press the **Down** arrow key.
  - c. At the end of the sequence, it wraps to the beginning of the characters.
  - d. When you have the correct channel code, press the **Enter** key to exit the channel menu.

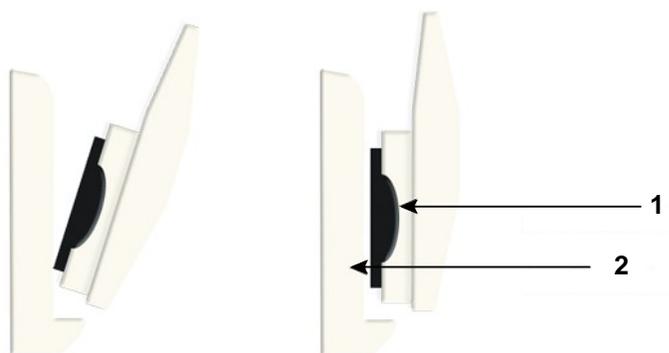
## Attaching the patient cable

The Patient Cable consists of a connector block, main cable and four or five leadwires connected to the main cable. Each leadwire terminates in a snap connector. The leadwires are positioned on the main cable to follow the contour of the torso.

To attach the patient cable:

5. Insert the connector block into the input connector on the side of the transmitter.
6. Insert the connect block parallel to the input connector of the transmitter.

**Figure 4 Example of Patient Cable**



- 1 Connector Block
- 2 Input Connector

## Battery installation and operation

The transmitters are powered by 1.5v AA alkaline batteries. Standard alkaline batteries will power the unit for approximately 20 hours.



**WARNING! Use new alkaline batteries.**

Quinton strongly recommends using only Alkaline batteries. Other battery types, when incorrectly placed in the transmitter, may result in overheating or rupturing. Quinton also recommends Alkaline batteries in order to avoid rapid voltage drops. .



**WARNING! Remove batteries for storage.**

To prevent risk of batteries leaking in the battery compartment, remove the batteries if the transmitter is not going to be used for an extended period of time.



**Caution: Follow manufacturer instructions.**

If using Alkaline rechargeable batteries, follow the manufacturer's instructions for charging, use, and disposal.

To install new batteries and operate the transmitter:

1. Position the X12+ Transmitter with the back visible.
2. Press down on the battery door arrow symbol and slide the battery door away from the transmitter.
3. Insert one AA alkaline battery into the battery compartment. Align the positive (+) and negative (-) indicators of the battery with the designators above the battery compartment.

The X12+ powers on automatically when the battery is inserted.

4. Replace the battery door by placing it back in the same position as step 2 and sliding it until it snaps into place.

## Patient Preparation

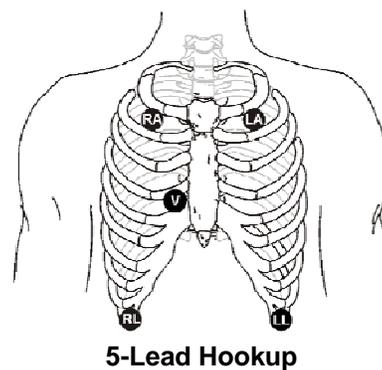
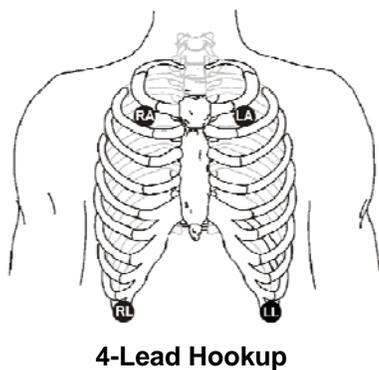
Electrodes must be placed correctly to acquire a successful trace. Although most ECG recordings are successful without special patient preparation, consider performing procedures to remove oils, lotions, and hair from the skin, particularly on obese individuals.

Poor skin-electrode contact can cause noise or artifact that can affect the analysis of the ECG data. Low amplitude signals can also be the result of poor skin-electrode placement.

## Patient Hookup

Figure 5 shows standard hookup for 4- and 5-leads.

### Figure 5 Patient Hookups



**WARNING! Shock hazard.**

To avoid the possibility of serious injury or death during patient defibrillation, do not come into contact with the device or patient cables. Additionally, proper placement of defibrillator paddles in relation to the electrodes is required to minimize harm to the patient.



**WARNING! Explosion hazard.**

A possible explosion hazard exists. Do not use the device in the presence of flammable anesthetics.



**WARNING! Use only Quinton-approved equipment.**

Defibrillation protection is guaranteed only if the Quinton-provided patient cable is used.

## Lead fail

Each transmitter indicates a lead failure according to the type of transmitter:

- X12+ Transmitter

The system displays the lead designator on the LCD display. If the patient cable is not attached, the LCD displays "RL/RA/LA/LL."

## Lead check

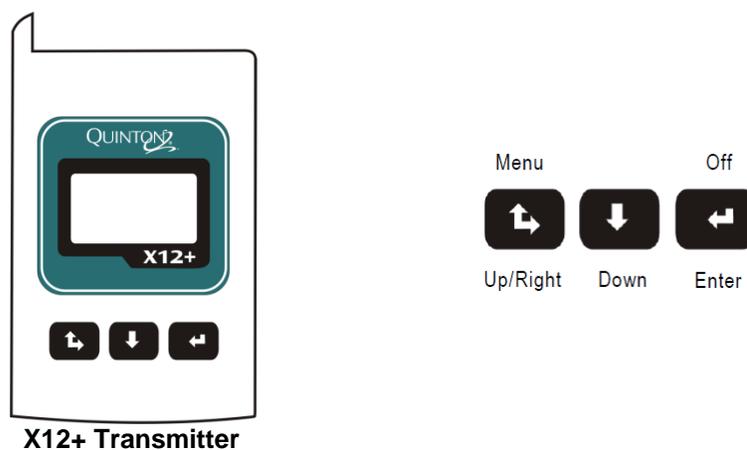
Perform a lead check according to the type of transmitter:

Transmitter Type	Procedure
X12+ Transmitter 	<p>To check the signal quality (impedance check):</p> <ol style="list-style-type: none"> <li>1. Press the <b>Up/Right</b> key continuously for several seconds. <b>Lead Check</b> displays on the screen.</li> <li>2. Press the <b>Enter</b> key. The system displays a bar-graph depicting the signal strength measured (from left to right) at the Right Arm (RA), Left Arm (LA), Left Leg (LL) and V (for 5-lead systems). The higher the bar the better the contact is between the skin and the electrode. For good quality transmissions, the bars reach or exceed the horizontal line on the display.   <i>NOTE: Q-Tel RMS supports four and five lead configurations only.</i>             A full bar means optimal signal strength and good electrode contact (minimum impedance).             A low bar means low signal strength and poor electrode contact (high impedance). Check the skin preparation for improvement and, if necessary, replace the electrode(s).</li> <li>3. Once acceptable signal strength levels are verified, press any of the three keys to return to the <b>Lead Check</b> menu.</li> <li>4. Press the <b>Down</b> key to highlight <b>Done</b>, and then press <b>Enter</b>.</li> </ol>

## X12+ Transmitter Advanced Features

This section explains how to operate advanced features for the X12+ transmitter.

**Figure 6 Example of X12+ Transmitter and Menu Keys**



The keypad is located on the front of the X12+ transmitter. Three keys are available for navigating through the LCD menu screens, for powering the transmitter on and off, and for sending calls during transmission.

## Turning the X12+ Transmitter on and off

The X12+ powers up as soon as an AA battery has been inserted into the battery compartment.

To power on the X12+ transmitter, choose a method:

- Remove and re-insert the AA alkaline battery.
- Press and hold the **Up/Right** arrow key on the front of the X12+ transmitter.

The X12+ powers up and displays the main LCD menu within three seconds.

To power off the X12+ Transmitter, choose a method:

- Remove the battery.
- Press and hold the **Enter** key for three seconds.

The system prompts you to power down.

- Press the **Up/Right** or **Down** key to highlight **Yes**.
- Press the **Enter** key.

If you do nothing, the screen returns to the main menu.

## Call Signal

To send a call signal:

- Press any one of the three keypad keys.

The LCD displays a *CALL* indicator to notify the user that a call signal has been transmitted.

## LCD Display Battery Voltage Indicator

The X12+ requires a minimum of 1.0 volts to operate and is powered by a single AA alkaline battery.

When the battery contains sufficient voltage, the main menu displays an image of a battery in the upper right corner. The current battery voltage displays in increments of 100%, 75%, 50%, and 25%. If the system detects a battery with unknown voltage it does not display the LCD menu; insert a new battery.

### Figure 7 Example of Battery Voltage Displays



When the battery indicator shows a voltage of 25%, discard the battery and insert a new battery into the battery compartment.

If the battery voltage is below 1.0 volts, the X12+ transmitter does not power on. Insert a new AA alkaline battery to continue operation.

## Display Actual Battery Voltage

To display the actual battery voltage:

1. Press the **Up/Right** key continuously for several seconds. **Lead Check** displays on the screen.
2. Use the **Down** or **Up/Right** keys to highlight **Configure** and then press **Enter**.
3. Use the **Down** or **Up/Right** keys to highlight **Battery** and then press **Enter**. The Battery Voltage screen displays with the actual voltage reading.
4. To return to the menu, press **Enter**.
5. Use the **Down** or **Up/Right** keys to highlight **Done** and then press **Enter** to return to the previous menu level.
6. Use the **Down** or **Up/Right** keys to highlight **Done** and then press **Enter** to return to the main menu level.

## Displaying ECG leads

Use the Display ECG to inspect leads I, II, III, and V (for 5-lead systems) before starting a transmission session. Check the signal quality and lead amplitude for each lead.

To check the signal quality and lead amplitude:

1. Press the **Up/Right** key continuously for several seconds. **Lead Check** displays on the screen.
2. Press the **Down** key to highlight **Display ECG** and then press **Enter**. The system displays **Lead I**.
3. Use the **Down** or **Up/Right** key to scroll from lead to lead. After verification of all leads, press the **Enter** key to return to the previous menu.
4. Use the **Down** or **Up/Right** keys to highlight **Done** and then press **Enter** to return to the main menu level.

## Setting the Number of Patient Cable Leadwires

Use the Configure Cable selection to set the number of leadwires for the patient cable. To set the number of patient cables:

1. Press the **Up/Right** key continuously for several seconds. **Lead Check** displays on the screen.
2. Press the **Down** key to highlight **Configure** and then press **Enter**.
3. Use the **Down** or **Up/Right** key to highlight **Cable** and then press **Enter**.
4. Use the **Down** or **Up/Right** key to scroll to the correct leadwire set (4-Leadwire or 5- Leadwire) and then press **Enter**.

*NOTE: Q-Tel RMS does not support the 10-leadwire set.*

5. Use the **Down** or **Up/Right** keys to highlight **Done** and then press **Enter** to return to the previous menu level.
6. Use the **Down** or **Up/Right** keys to highlight **Done** and then press **Enter** to return to the main menu level.

## Setting Language

The X12+ defaults to the English language, which is the only language supported by Q-Tel RMS. The Configure menu should not be used to set the language to any language other than English.

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## Viewing Software Version Number

To view the software version number:

1. Press the **Up/Right** key continuously for several seconds. **Lead Check** displays on the screen.
2. Press the **Down** key to highlight **Configure** and then press **Enter**.
3. Use the **Down** or **Up/Right** key to highlight **Version** and then press **Enter**.
4. The version number displays on the screen.
5. Press **Enter** to return to the previous menu.
6. Use the **Down** or **Up/Right** keys to highlight **Done** and then press **Enter** to return to the previous menu level.
7. Use the **Down** or **Up/Right** keys to highlight **Done** and then press **Enter** to return to the main menu level.



## 10. PATIENT INFORMATION

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The Q-Tel RMS Patient Information component includes:

- Basic patient demographic information such as name and address
- A place to record clinical long-term goals for patient outcomes tracking
- Support to design the best rehab program for the patient's diagnoses and risks

This chapter describes data entry for each Patient Information screen. When you open the Q-Tel RMS program, the Patient Information screen displays.

***NOTE:** If you have a networked Q-Tel RMS, refer to *Network Operation and Workstation Capabilities* for network specific functions related to the Patient Information component.*

***NOTE:** Use the **Close Patient** button to broadcast any changes to the patient record, to other computers. This is especially useful for patient prescriptions.*

### Accessing Patient Information



To access the Patient Information screen:

- Click the **Patient Info** button.

The **Patient Search** screen displays. Tabbed sections contain information specific to the patient and carry through the patient's entire program.

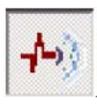
To activate the tabbed sections, select an existing patient or enter a new patient. To enter a new patient see [Adding A New Patient](#).

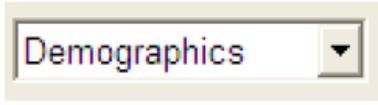
### Patient Information

Use the **Patient Information** screen to view and edit all information that describes the patient or that might be pertinent to the rehabilitation program. Items that are grayed out cannot be used on the current screen.

The main tool bar contains these icons:

#### Patient Information Icons

Icon	Label	Description
	Patient Info	Displays the Patient Information screen.
	Session Management	Displays the Session Management screen.
	Charting and Editing	Displays the Charting and Editing screen.

Icon	Label	Description
	Start Continuous Printing	Begins printing continuous ECG strips.
	Silence Alarm	Turns off the sound for the active alarm. Only active if an alarm is active. Disabled if no alarms are currently sounding.
	Run Report	Prints the report to the selected location. Options are: <ul style="list-style-type: none"> <li>• Printer</li> <li>• Acrobat/PDF</li> </ul>
	Report Type	Selects the report type. Options are: <ul style="list-style-type: none"> <li>• Demographics</li> <li>• Prescription</li> </ul>
	Admin Reports	Prints the Administrative reports.

When the Patient Information screen is enabled, the system displays additional tabs. Each tab uses the conventions listed in the Conventions table.

## Conventions

Convention	Description
Required Fields	Fields that are annotated with a single asterisk (*) are required. The system does not save the data if a required field is blank.
System Required Fields	Fields that are annotated with a double asterisk (**) are required. The system automatically generates a unique entry if the field is blank.
Saving Data	The system automatically saves the patient information when you navigate from one tab to another or from the Patient Information screen to another screen. To cancel changes, re-enter valid data.

## Printing A Demographics Report

Use the report type field to select a report.

**NOTE:** To print a prescription see [Printing A Prescription](#).

To print a demographics report:

1. Select **Demographics** from the report type menu.
2. Select the destination:
  - **Printer**—to send the report to a printer.
  - **PDF**—to store the report in the Adobe PDF format.
3. Click the **Run Report** button to generate the report.
  - On a Standalone Tower, PDF formatted reports are stored in this folder:  
C:\Program Files\Quinton\QTel RMS\Patient\_Reports.
  - For a networked Q-Tel RMS configuration, PDF formatted reports are stored in this folder on a Main Tower:  
C:\QTelDataCenter\Patient\_Reports.

### Patient Query Report

Use the Patient Query report to search for patients based on various session information and create a customized patient demographics report.

To create a list of patients:

1. Click **Admin Reports**.
2. Select **Patient Query** from the list of reports.
3. Enter the patient query information:

Field	To search for...
<b>Active</b>	Patients that are currently active, select <b>Yes</b> . Patients that are not active, select <b>No</b> .
<b>Program</b>	Patients from the selected program.
<b>Gender</b>	Patients of the selected gender.
<b>Monitored</b>	Monitored patients, select <b>Yes</b> . Non-Monitored patients, select <b>No</b> .
<b>Medication Name</b>	Patients using the selected medication.
<b>Enrollment Date</b>	Patients that were enrolled within the selected date range.
<b>Last Session Date</b>	Patients whose last session is within the selected date range.
<b>Program Completion Date</b>	Patients whose program was completed within the selected date range.
<b>Weight</b>	Patients within the entered weight range.
<b>Age</b>	Patients within the entered age range
<b># of Billable Sessions</b>	Patients with the entered range of billable sessions.
<b># of Non-Billable Sessions</b>	Patients with the entered range of non-billable sessions.
<b>Insurance</b>	Patients with the selected Primary and/or Secondary insurance carrier.
<b>Physician</b>	Patients in the care of the selected Primary physician and/or specialist.

Field	To search for...
<b>Diagnoses</b>	Patients with the selected primary and/or secondary diagnosis.
<b>Risk Factors</b>	Patients with the selected combination of risk factors.

4. Click **Query Patients**. The list of patients that match the query criteria display on the right side of the screen.

To	Do this...
Create a new patient query report using different search parameters	Click <b>Change Query Criteria</b> .
Send to a printer	Click <b>Print</b> .
Save as a PDF	Click <b>Save</b> . On a Standalone Tower the system stores PDF files in the folder: C:\Program Files\Quinton\QTel RMS\AdminReports  For a networked Q-Tel RMS configuration, PDF files are stored in this folder on the Main Tower: C:\QTelDataCenter\AdminReports.
Preview the query report	Click <b>Preview</b> . The system displays the report preview screen. For more information see <a href="#">Report Preview</a> .

## Patient Search Tab

Use the patient search functionality to locate a specific patient. The patient search section displays on several screens. The area to the left of the screen displays fields for the selected patient.

### Searching For A Patient

To search for a specific patient:

1. If **Search for Patients** is not visible, select the **Patient Search** tab.

To Search for:	Do this...
All patients (including patients that have completed their rehab program)	<ol style="list-style-type: none"> <li>1. Click List All.</li> <li>2. Uncheck Active Patients Only.</li> <li>3. Click <b>Search</b>.</li> </ol> <p>For information on completed programs, see <a href="#">Program Tab</a>.</p>
All active patients	<ol style="list-style-type: none"> <li>1. Click List All.</li> <li>2. Check Active Patients Only.</li> <li>3. Click <b>Search</b>.</li> </ol>
Patients by last name	<ol style="list-style-type: none"> <li>1. Click List by Last Name.</li> <li>2. Enter at least the first letter of the patient's last name in the text box. To narrow the search, enter more of the last name.</li> <li>3. Click <b>Search</b>.</li> </ol>
Patients by MRN	<ol style="list-style-type: none"> <li>1. Click List by MRN.</li> <li>2. Enter one or more characters of the MRN. To narrow the search, enter more characters.</li> <li>3. Click <b>Search</b>.</li> </ol>

To Search for:	Do this...
All Monitored or All Non-Monitored Patients	<ol style="list-style-type: none"> <li>1. Select the check box for <b>Phase</b>.</li> <li>2. Select a phase condition (monitored or non-monitored) from the Phase menu.</li> <li>3. Click <b>Search</b>.</li> </ol>

The system displays a list of patients matching the search criteria.

2. Scroll down the list to locate the specific patient.

### Editing Existing Patients

Use the **<<Edit Patient** button to change information about the patient.

*NOTE: To open the **Patient Info** tab, double-click anywhere on the patient line, except the **Export** column.*

To edit a patient:

1. Click on the patient to edit. If the patient is not displayed, see [Patient Search Tab](#) to locate the patient.
2. Click on the **Edit Patient** button. All of the patient tabs are available. The **Patient Info** tab opens and information for the current patient displays on the left of the screen.

### Adding A New Patient

Use the **New Patient** button to enter information for a new patient. To enter a new patient into the system:

1. Click the **New Patient** button. The **New Patient** tab displays.
2. Enter the new patient information.

*NOTE: Be sure to select the correct program. Changing the program assignment causes the system to delete session and ECG data for completed sessions.*

3. Select whether the patient is monitored (Phase II) or non-monitored (Phase III) from the **Phase** menu.
4. Select **OK**. All of the patient tabs are available. The **Patient Info** tab opens and information for the current patient displays on the left of the screen.

### Patient Search Fields

Fields	Description
<b>&lt;&lt;Edit Patient</b>	This button displays the Patient Info tab.
<b>New Patient</b>	This button displays the New Patient tab.
<b>Close Patient</b>	This button releases the active patient so another patient can be selected.
<b>Refresh List</b>	This button updates the list with changes. For more information on Refresh, see <a href="#">Additional Features in Patient Information</a> .
<b>Export Data</b>	This button exports the selected patients.
<b>Select All Patients</b>	When checked, all patients are selected for export.
<b>Patient</b>	Displays the patient name. Use the Patient Info tab to edit.

Fields	Description
<b>MRN</b>	Displays the patient MRN.
<b>Completed</b>	The number of sessions completed for the patient.
<b>Approved</b>	The number of sessions the patient's insurance has approved for the patient.
<b>Export</b>	When checked the patient is marked for export.
<b>Search for Patients List All</b>	When selected, the system searches for all patients.
<b>List by Last Name</b>	When selected, the system searches by patient last name. Enter the search criteria in the text box.
<b>List by MRN</b>	When selected, the system searches by the MRN. Enter the search criteria in the text box.
<b>Text Box</b>	Text box for search criteria.
<b>Phase</b>	When selected the system searches only for patients with the selected phase. Select the phase from the drop-down menu. <ul style="list-style-type: none"> <li>• <b>Phase II (Monitored)</b></li> <li>• <b>Phase III (non-Monitored)</b></li> </ul>
<b>Active Patients Only</b>	When selected the system searches only active patients.
<b>Search</b>	This button activates the search based on the selected criteria.

**New Patients Fields**

Fields	Max Length	Description
<b>Last Name*</b>	50	Required field. Patient's last name.
<b>First</b>	50	Patient's first name.
<b>MRN**</b>	25	Required field. The system generates an entry if this field is left blank. MRN (Medical Record Number) uniquely identifies the patient.
<b>Program *</b>		The type of rehabilitation program. Select the program from the drop-down menu. <ul style="list-style-type: none"> <li>• <b>Cardiac</b></li> <li>• <b>Pulmonary</b></li> </ul>
<b>Phase</b>		Indicates the type of patient monitoring. Select the phase from the drop-down menu. <ul style="list-style-type: none"> <li>• <b>Phase II (Monitored)</b></li> <li>• <b>Phase III (non-Monitored)</b></li> </ul>

## Patient Info Tab

Use the Patient Info tab to enter basic patient information.

*NOTE: Some displayed fields may be truncated.*

Fields	Max Length	Description
<b>Last Name*</b>	50	Required field. Patient's last name.
<b>First</b>	50	Patient's first name.
<b>MI</b>	1	Middle initial.
<b>MRN**</b>	25	Required field. The system generates an entry if this field is left blank. MRN (Medical Record Number) uniquely identifies the patient.
<b>SSN</b>	11	Social Security Number. Enter ###-##-#### or any 11 characters.
<b>Date of Birth</b>	--	The system automatically calculates age from date of birth (DOB).
<b>Height</b>	2	Height in inches. (1-99)
<b>Weight</b>	5	Weight in pounds. (0-500.00) This field is linked to the <b>Weight</b> parameter (see <a href="#">System-defined Parameters</a> ). Entering a weight in this field automatically updates all occurrences of the <b>Weight</b> parameter in this patient's prescription. Entering a value for the <b>Weight</b> parameter in the patient's prescription, either on the Patient Information <b>Rx</b> tab or in the activity grid during the patient's session, automatically updates this field.
<b>Gender</b>	--	Drop-down menu for the patient's gender.
<b>Ethnicity</b>	25	Drop-down menu for patient's ethnicity.
<b>Address</b>	50 per line	Two lines are available for the address.
<b>City</b>	50	The patient's city.
<b>State</b>	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit).
<b>Postal Code</b>	10	The patient's zip code.
<b>Country</b>	50	Drop-down menu for the country. (Use the Configuration Utility to edit).
<b>Account Number</b>	40	Account number.
<b>Home Phone</b>	25	Contact information.
<b>Work Phone</b>	25	Contact information.
<b>Cell Phone</b>	25	Contact information.
<b>Pager</b>	25	Contact information.
<b>Fax</b>	25	Contact information.
<b>E-mail</b>	75	Contact information.
<b>Order Number</b>	40	Order number.

## Insurance Tab

Use the Insurance tab to enter the patient’s primary and secondary insurance carriers. The group, contact name and contact phone number are specific to the patient, not the insurance carrier. This accommodates patients with the same insurance carrier but different group IDs, offices or contacts for that carrier through their personal or company insurance plan. The primary and secondary insurance tabs are identical with respect to content and entry.



**Caution: Possible data loss.**

When changing the insurance carrier for a patient, use the **Clear** button to remove the old data and then enter the new data. Do not type over the existing carrier name unless you want to change the name throughout Q-Tel RMS.

The fields for the **Primary** tab and the **Secondary** tab are the same.

Fields	Max Length	Description
Select Carrier	--	Drop-down menu for the insurance carrier.
Clear	--	This button clears the screen. Use <b>Clear</b> to enter a new carrier without editing an existing carrier.
Carrier*	50	The patient’s insurance carrier. Select from the drop-down menu or double-click to add a new entry. Modifying an existing carrier name changes the carrier name for all patients with the existing carrier. For example, selecting Carrier A and then editing it to Carrier B changes all instances of Carrier A to Carrier B.
Group	50	Insurance group number for the patient.
HICN	50	Health Insurance Claim Number for the patient.
Contact Name	50	Insurance contact.
Phone	25	Insurance phone number.

## Billing Tab

Use the **Billing** tab to enter billing information. If the billing address is the same as the patient address on the **Patient Info** tab, the system can automatically copy the information.

To automatically enter patient information from the **Patient Info** tab:

Click **Copy Patient Address**.

Fields	Max Length	Description
Last Name*	50	Required field. Patient's last name.
First	50	Patient's first name.
MI	1	Middle initial.
Relationship	25	Drop-down menu for the relationship to the patient. Select from the drop-down menu or double-click to add a new entry.
Copy Patient Address	--	This button populates the fields using the data from the <b>Patient Info</b> tab.
Phase	--	System-generated.

Fields	Max Length	Description
<b>CPT Billing Code</b>	--	System-generated.
<b>Address</b>	50 per line	Two lines are available for the address.
<b>City</b>	50	The name of the city.
<b>State</b>	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
<b>Postal Code</b>	10	The zip code.
<b>Country</b>	50	Drop-down menu for the country. (Use the Configuration Utility to edit.)
<b>Home Phone</b>	25	Contact information.
<b>Work Phone</b>	25	Contact information.
<b>Cell Phone</b>	25	Contact information.
<b>Pager</b>	25	Contact information.
<b>Fax</b>	25	Contact information.
<b>E-mail</b>	75	Contact information.

## Physician Tab

A rehab patient typically has a specialist (for example, a cardiologist) as well as a primary physician. Use the **Physician** tab to enter information for both doctors.

Changing a physician’s information for one patient, updates all patients with that physician selected.



**Caution: Possible data loss.**

When changing a physician for a patient, use the **Clear** button to remove the old data and then enter the new data. Do not type over the existing physician information unless you want to change the physician’s information throughout Q-Tel RMS.

The fields for the **Primary** tab and the **Specialist** tab are the same.

Fields	Max Length	Description
<b>Select Physician</b>		Drop-down menu for the physician.
<b>Clear</b>		This button clears the screen. Use <b>Clear</b> to enter a new physician without editing an existing physician.
<b>Last Name*</b>	50	Required field. Physicians last name.
<b>First</b>	50	Physician’s first name.
<b>MI</b>	1	Middle initial.
<b>Provider ID</b>	20	Identifier for the physician.
<b>Address</b>	50 per line	Two lines are available for the address.
<b>City</b>	50	The name of the city.
<b>State</b>	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)

Fields	Max Length	Description
Postal Code	10	The zip code.
Country	50	Drop-down menu for the country. (Use the Configuration Utility to edit.)
Home Phone	25	Contact information.
Work Phone	25	Contact information.
Cell Phone	25	Contact information.
Pager	25	Contact information.
Fax	25	Contact information.
E-mail	75	Contact information.

## Emergency Contact Tab

Use the **Emergency Contact** tab to enter contact information in case of a patient emergency. If the emergency information address/phone is the same as that for the patient, copy it by clicking on the **Copy Patient Address** button.

*NOTE: You must enter at least one phone number for an emergency contact.*

Fields	Max Length	Description
Last Name*	50	Required field. Contact's last name.
First	50	Contact's first name.
MI	1	Middle initial.
Relationship	25	Drop-down menu for the relationship to the patient. Select from the drop-down menu or double-click to add a new entry.
Copy Patient Address	--	This button populates the fields using the data from the <b>Patient Info</b> tab.
Address	50 per line	Two lines are available for the address.
City	50	The name of the city.
State	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
Postal Code	10	The zip code.
Country	50	Drop-down menu for the country. (Use the Configuration Utility to edit.)
Home Phone	25	Contact information.
Work Phone	25	Contact information.
Cell Phone	25	Contact information.
Pager	25	Contact information.
Fax	25	Contact information.
E-mail	75	Contact information.

## Diagnoses Tab

Use the **Diagnoses** tab to record information about the patient's previous diagnoses. Enter any previous diagnoses and any secondary diagnoses.

To enter diagnosis data:

1. To enter a date, double-click the **Date** field.
2. The system displays the default date.
3. Edit the date field.
4. Click in the \* **Primary** field to enter a primary diagnosis or double-click to select from the menu.
5. To enter a secondary diagnosis, click in the **Secondary** field or double-click to select from the menu.
6. To add a new line for more diagnosis entries, press **Enter**.

Fields	Max Length	Description
<b>Date</b>		Diagnosis date. The system displays a default date. Double-click to enter the start date.
<b>Primary*</b>	50	Primary diagnosis. Double-click to select from the drop-down menu or click to add a new entry.
<b>Secondary</b>	50	Secondary diagnosis. Double-click to select from the drop-down menu or click to add a new entry.

## Medications Tab

Use the **Medications** tab to list all medications the patient is currently taking, as well as medications a patient has taken in the past.

***NOTE:** If the **Date Stopped** value occurs before the **Date Started** value, the **Date Started** value automatically resets to the same date as the **Date Stopped** value. Set the **Date Started** value to an appropriate value.*

***NOTE:** On Session Reports, the most current information prints for: patient name, MRN, physician and risk level. However, Session Reports show only the medications and diagnoses that were in the patient's saved information the day of the session. Any medications added to the patient's information after the session do not change the medication or diagnoses printed for the completed session, even if the dates overlap with the session date.*

Fields	Max Length	Description
<b>Medication Class</b>	25	Type of medication. Select from the drop-down menu or double-click to add a new entry.
<b>Medication Name*</b>	50	Name of the medication. Select from the drop-down menu or double-click to add a new entry. Medications are sorted alphabetically after each entry.  <b>NOTE:</b> Up to 30 medications can display on the Q-Progress reports.
<b>Dosage</b>	8	Medication dosage.
<b>Units</b>	15	Units for medication dose. Select from the drop-down menu or double-click to add a new entry.

Fields	Max Length	Description
		<b>NOTE:</b> Enter new units in an abbreviated form using four characters or less, for example: enter <i>mg</i> for milligrams.
<b>Frequency</b>	15	How often to administer the medication. Select from the drop-down menu or double-click to add a new entry.
<b>Method</b>	15	How to administer the medication. Select from the drop-down menu or double-click to add a new entry.
<b>Date Started</b>	--	Date the medication was started. Double-click to edit the default date.
<b>Date Stopped</b>	--	Date the medication was stopped. Double-click to edit the default date.

## Risk Factors Tab

The **Risk Factors** tab is divided into sub tabs: History, Family, Lipid Profile, and Allergies.

### History Tab

Use the **History** tab to record:

- Smoking—information about the patient's smoking habits and history, including whether or not the patient lives with a smoker.
- Alcohol—information about the patient's drinking habits, including frequency and type of alcohol consumption.
- Exercise—describes a patient's exercise activity type and frequency.
- Drug Abuse—information about patient's use of controlled substances.
- Other—data helpful to the rehabilitative care giver and crucial to prescribing treatment and recording progress.

Fields	Description
<b>Smoking</b>	
<b>Lives With Smokers</b>	If checked, indicates the patient lives with a smoker.
<b>Smoking History</b>	If checked, the fields in the smoking section are enabled.
<b>Packs/Day</b>	The number of cigarette packs smoked per day. <b>(0-10.00)</b>
<b>Years</b>	Number of years patient smoked (if patient no longer smokes) or has smoked (if patient continues to smoke). <b>(0-99)</b>
<b>Date Stopped</b>	If patient has stopped smoking, click the small checkbox in front of the date to edit the default date.
<b>Alcohol</b>	
<b>Days/Week</b>	The number of days per week the patient has an alcoholic drink. Use the arrows to select the number of days per week to enable this section. <b>(0-7)</b>
<b>Drinks/Day</b>	How many alcoholic drinks the patient has per day. <b>(0-99)</b>
<b>Type of Alcohol</b>	Select the type of alcohol the patient drinks.
<b>Liquor Wine Beer</b>	
<b>Exercise</b>	
<b>Days/Week</b>	The number of days per week the patient exercises. Use the arrows to select the

Fields	Description
	number of days per week to enable this section. <b>(0-7)</b>
<b>Activity Type</b>	Type of exercise. Select from the drop-down menu or click to add a new entry.
<b>Intensity</b>	Select the intensity of the patient's workout.
<b>Light</b> <b>Moderate</b> <b>Heavy</b>	
<b>Minutes/Day</b>	
<b>0-15</b> <b>16-30</b> <b>31-45</b> <b>46-60</b> <b>&gt;60</b>	
<b>Other</b>	Select the risk factors that are applicable.
<b>Depression</b> <b>Diabetes</b> <b>Pacemaker</b> <b>Hypertension</b> <b>Family History</b> <b>Hyperlipidemia</b> <b>Sedentary Life Style</b> <b>Obesity</b> <b>Stress</b> <b>AICD</b>	
<b>Drug Abuse</b>	This tab contains a text box for describing nature of the drug abuse.

***NOTE:** If the patient has a pacemaker, you must check the **Pacemaker** check box before admitting the patient. Otherwise, pacer spikes are not detected correctly. Q-Tel RMS displays pacer spikes for informational purposes only and provides no analysis information for these spikes.*

***NOTE:** Turn off the Muscle Artifact filter to see the pacer spikes in the waveform data. See Configuring the ECG display.*

### Family History Tab

Use the **Family** tab to record all notes regarding family support and family history.

Fields	Max Length	Description
<b>Support</b>	1000	The amount and type of support the patient has.
<b>History</b>	1000	Patient's history.

## Lipid Profile Tab

Use the **Lipid Profile** tab to record lipid draws and their associated levels. Enter any number of lipid profiles. To add a new line, press **Enter**.

Fields	Description
<b>Draw Date*</b>	Required field. Double-click to edit the default date.
<b>Chol</b>	Cholesterol. Double-click to enter a value or use the scroll arrows to adjust the level.
<b>LDL</b>	Low-density Lipoproteins. Double-click to enter a value or use the scroll arrows to adjust the level.
<b>HDL</b>	High-density Lipoproteins. Double-click to enter a value or use the scroll arrows to adjust the level.
<b>Trig</b>	Triglycerides. Double-click to enter a value or use the scroll arrows to adjust the level.
<b>Tc/HDL</b>	Total Cholesterol/High-density Lipoproteins. Double-click to enter a value or use the scroll arrows to adjust the level.
<b>Lp(a)</b>	Lipoprotein (a). Double-click to enter a value or use the scroll arrows to adjust the level.

## Allergies Tab

Use the **Allergies** tab to record patient allergies. Enter any number of allergies. To add a new line, press **Enter**.

Fields	Max Length	Description
<b>Allergy</b>	100	Enter the patient's allergy.
<b>Medication Allergy</b>	100	Enter any allergies to medications.
<b>Allergy Comment</b>	1000	Enter any comments regarding the allergies.

## Program Tab

When you enter a new patient in the Q-Tel RMS system, that person is enrolled into a general program. Use the **Program** tab, to enter information specific to the patient's program to ensure the most beneficial result. Changes to the Program when a patient is admitted to a session do not take effect until the next session

*NOTE: For more information on creating and editing the general programs refer to [Programs Tab](#).*

Fields	Description
<b>Program</b>	The system displays the selected program.
<b>Enrollment Date</b>	The system displays the date the patient record was created. Click in the field to edit the date.
<b>Lead Set</b>	
<b>Overall Risk Level</b>	Select the appropriate risk level.
<b>No Risk</b>	

Fields	Description
Low Moderate High	
Sessions	
Planned	The default number of sessions for the program as configured in the Configuration Utility. <b>(0-99)</b>
Approved	The number of sessions for which insurance approval has been obtained. Default is zero. <b>(0-99)</b>
Don't Remind Sessions	Turns off the alert function when the patient exceeds the number of approved sessions. When this box is checked the system does not remind you to obtain approval for additional sessions.
Completed Program	Indicates the patient has completed the program. Use this check box to indicate the patient has completed a program, or to discharge the patient and enroll the patient in a different program. Once you mark a patient as complete, you cannot admit the patient to sessions. To allow the patient to be admitted again: <ul style="list-style-type: none"> <li>• Uncheck the <b>Completed Program</b>. Unchecking the <b>Completed Program</b> checkbox does not reverse the abridgement of the full disclosure data.</li> </ul>
Abridge all Session Data	When this check box is checked, the system abridges the all session data, including the last three sessions, saving only the stored strips. Use this option to save space when the patient has completed the program.
Admit to New Program	This button opens the New Patient tab to enroll this patient in a new program if the <b>Completed Program</b> check box is checked. To enroll the patient in a new program: <ol style="list-style-type: none"> <li>1. Select Admit to New Program. The system displays the New Patient tab with only the <b>Program</b> field enabled.</li> <li>2. Select the new program from the drop-down menu. Changing a patient's program resets the values on the <b>Program</b>, <b>Rx</b>, and <b>Alarms</b> tabs to the system defaults. The patient goals, comments, and previous session data is also reset, use the Q-Progress application to view this data.</li> </ol>
Patient Goals	Lists the goals for the patient. Enter goals for the patient to achieve during the program. To create a new line, press <b>Enter</b> . Patient goals are listed in the order you enter them. Up to 10 patient goals can display in the Q-Progress reports
Comments	A text entry field for comments.

When you admit a patient to a session and the session number is higher than the number of approved sessions, the system displays a warning, unless **Don't Remind Sessions** is checked for the patient. The system does not prevent you from admitting the patient, but it does remind you to seek approval for more sessions if necessary.



**Caution: Data delay.**

A large number of patients and sessions in your Q-Tel RMS database can cause a system delay of up to 15 seconds when ending a patient's program and enrolling the patient in another program. Changing a patient's program should not be done when monitoring patients.

If you mark a patient's program as complete, a message displays prompting you to confirm abridgement of the patient's full disclosure ECG data. Abridging the full disclosure data saves only the stored strips. If you select **OK**, the full disclosure data for the last three monitored sessions is abridged and no longer available for review and edit; the Session and Session Summary reports continue to print with saved strips as before the abridgement.

## Prescription (Rx) Tab

The **Rx** tab initially contains the default prescription from the Program assigned to the current patient. Use the **Rx** tab to tailor the prescription to fit the patient. For more information on setting up a prescription, see [Prescription](#).

The prescription on the **Rx** tab is associated with the specific patient and follows the patient through the entire rehab program and is updated as progress or setbacks dictate. The prescription shows in the patient's individual session tab after you admit the patient to a session. You can edit the prescription:

- At any time during a session.
- If the edits are made after the patient is admitted to a session, then the prescription changes take effect for the next session.
- In Patient Information.
- In Charting and Editing while viewing a completed exercise session summary for guidance on patient performance.

## Printing A Prescription

Use the report type field to select a report.

*NOTE: To print a Demographics report, see [Printing a Demographics Report](#).*

To print a prescription:

Use the report type field to select a report.

*NOTE: To print a Demographics report, see [Printing a Demographics Report](#).*

To print a prescription:

1. Select **Prescription** from the report type menu at the top of the Q-Tel RMS display.
2. Select the destination:
  - **Printer**—to send the report to a printer.
  - **PDF**—to store the report as in the Adobe PDF format.
3. Click on the **Run Report** button to generate the report.
  - PDF formatted reports are stored in this folder on a Standalone Tower:  
C:\Program Files\Quinton\QTel RMS\Patient\_Reports.
  - For a networked Q-Tel RMS configuration, PDF formatted reports are stored in this folder on a Main Tower:  
C:\QTelDataCenter\Patient\_Reports.

## Modifying A Prescription

To modify a prescription from the **Rx** tab:

To	Do this...
 Add a modality	<ol style="list-style-type: none"> <li>1. Click the <b>Add New</b> icon. The system inserts a blank line above the highlighted modality.</li> <li>2. Double click in the <b>Modality</b> field and select an exercise from the drop down menu. The exercise prescription supports up to 12 exercise activities and exercises can be repeated.</li> <li>3. Edit the setting for the prescription fields.</li> </ol>
Change a modality	Double click the <b>Modality</b> field and select an exercise from the drop-down menu.
 Change the order of the modalities	Select the modality and then click the <b>Move Up</b> or <b>Move Down</b> arrows. <b>NOTE:</b> Rest must be the first activity in the prescription list, and Recovery must be the last activity in the list.
 Delete a modality	To remove an exercise modality, select the modality and the click Delete Line. <b>NOTE:</b> Rest and Recovery cannot be deleted from the prescription.
Modify the prescribed exercise duration	Double-click <b>Duration</b> to activate the scroll arrow keys or enter the duration.
Select a timed option	Double-click <b>Timed</b> to add or remove the check mark. The default is on (a check mark in the checkbox). <b>NOTE:</b> The use of timers depends on the type of exercise modality used. You can designate your preference in the prescription for each modality and also choose the exercise time allotted.
Enter workload parameters	Double-click <b>Workload</b> field or enter the value for the first parameter. The field changes automatically to display the available parameters. Enter values for the workload parameter to identify the workload for a selected exercise device (see <a href="#">Workload Parameters</a> ). If a METS equation is defined for the selected device, the system computes the METS for the workload values.
Modify selections for storing a strip and printing a strip	Double-click <b>Store Strip</b> or <b>Record Strip</b> , and select an option from the drop-down menu:

## Prescription (Rx) Fields

Fields	Description
	The system displays a green arrow to indicate the selected Modality.
<b>Modality</b>	The exercise modality. Double-click to select from the drop-down menu or click to enter a new activity.
<b>Duration</b>	The duration of the modality. Enter a value or double-click to use the scroll arrows.
<b>Timed</b>	A checkmark indicates the modality is timed.
<b>Workload</b>	Enter the values for the parameters required for the METS equation.
<b>METS</b>	The calculated basal metabolic rate.

Fields	Description
<b>Store Strip</b>	<p>Select the condition that initiates the saved strip. Options are:</p> <ul style="list-style-type: none"> <li>• <b>No</b>—Do not save or print</li> <li>• <b>Midpoint</b>—Save or print at the mid-point of the exercise modality</li> <li>• <b>Max heart rate</b>—Save or print at the maximum heart rate</li> <li>• <b>Min heart rate</b>—Save or print at the minimum heart rate</li> <li>• <b>At Start</b>—Save or print at the beginning of the modality</li> <li>• <b>End-30</b>—Save or print 30 seconds before the exercise modality completes</li> <li>• <b>End-60</b>—Save or print 60 seconds before the exercise modality completes</li> <li>• <b>Custom...</b>—Specify a time from the beginning or the end of the exercise. Enter a positive number (for example, 60) to specify a time from the beginning of the exercise. Enter a negative number (for example, -60) to specify a time before the end of the exercise.</li> </ul> <p>When you add an exercise activity to the prescription, the <b>Save Strip</b> setting always defaults to <b>Max Heart Rate</b> and the <b>Print Strip</b> setting always defaults to <b>No</b>.</p>
<b>Record Strip</b>	Select the condition that initiates the printed strip. (See <b>Store Strip</b> options above.)

## Alarms Tab

Use the **Alarms** tab to configure alarms specifically for this patient. The initial alarms are default alarms as configured by the configuration utility (see

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*Alarms Tab*). You can set patient-specific limits for those alarms that have limits, as well as attributes for priority, persistence, recording and storing.

- The priority settings for Asystole, Ventricular Fibrillation, and Ventricular Tachycardia are set to High. They cannot be modified.

*NOTE: The system cannot detect alarms when there is a lead-off condition, therefore, the Lead Off alarm priority is set to High.*

- Setting the priority of an alarm to **Off** disables the **Record Strip** and **Store Strip** selections. The system does not record or store alarm units for alarms set to **Off**. However, the system annotates the alarm conditions in the Full Disclosure data for the patient.
- If your system does not include the Advanced Arrhythmia option, then you can select and configure the Asystole, Ventricular Fibrillation, Ventricular Tachycardia, High Heart Rate and Low Heart Rate alarms only.
- If the edits are made when the patient is admitted to a session, then the changes take effect for the next session.

Fields	Description
<b>Alarm type</b>	The type of alarm.
<b>Limit</b>	Alarm threshold. Some alarms use a threshold setting to initiate the alarm. Enter the threshold limit or double-click to use the scroll arrows.
<b>Persistence</b>	A drop down menu to select the way the system represents the alarm. Options are: <ul style="list-style-type: none"> <li>• Audio and Visual</li> <li>• Visual</li> <li>• Off</li> </ul>
<b>Priority</b>	A drop-down menu to select the priority of the alarm. Options are: <ul style="list-style-type: none"> <li>• Low</li> <li>• Medium</li> <li>• Off</li> </ul>
<b>Record</b>	A checkmark indicates the system will record the alarm.
<b>Store</b>	A checkmark indicated the system will store the alarm.
<b>Test Alarms</b>	Sounds the alarm to test the volume.

## Assessment Tab

Use the **Assessment** tab to configure details for the Patient Intake Assessment report. The Assessment tab is organized into these tabs:

- Clinical Assessment
- Behavioral Assessment
- Health Assessment
- Services Assessment
- Comments

### Clinical Assessment

Use the clinical assessment to record clinical observations including:

- Obesity/Dyslipidemia
- Diabetes/Hypertension/Heart Rate
- Functional Assessment
- Pulmonary

## Obesity/Dyslipidemia

Use this tab to record the progress in the patient's weight and lipid levels at the time of the assessment.

Fields	Description
<b>Obesity</b>	
<b>Weight</b>	The weight of the patient. The system displays the weight entered in the Patient Information tab.
<b>Height</b>	The height of the patient. The system displays the height entered in the Patient Information tab.
<b>BMI</b>	The body mass index of the patient. Enter the BMI or use the arrows to adjust the value.
<b>Dyslipidemia</b>	
<b>LDL</b>	The LDL level of the patient. Enter the LDL level or use the arrows to adjust the value.
<b>HDL</b>	The HDL level of the patient. Enter the HDL level or use the arrows to adjust the value.
<b>Triglycerides</b>	The level of triglycerides for the patient. Enter the triglycerides level or use the arrows to adjust the value.
<b>Other</b>	
<b>Metabolic Syndrome</b>	Indicates whether or not the patient has Metabolic Syndrome. Select: <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• (blank)</li> </ul>
<b>Depression</b>	Whether the patient reports depression. Select: <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• (blank)</li> </ul>
<b>Pain Scale</b>	The level of pain reported by the patient. Valid values are: <ul style="list-style-type: none"> <li>• 0 through 10</li> </ul>
<b>Description</b>	A text field to describe the pain experienced by the patient.

## Diabetes/Hypertension/Heart Rate

Use this tab to record the patient's Diabetes, Hypertension, and Heart Rate function.

Fields	Description
<b>Diabetes</b>	
<b>HbA<sub>1c</sub></b>	The glycated hemoglobin of the patient. Enter the HbA <sub>1c</sub> or use the arrows to adjust the value.
<b>Fasting Glucose</b>	The fasting glucose of the patient. Enter the fasting glucose level or use the arrows to adjust the value.
<b>Hypertension</b>	
<b>Resting BP</b>	The resting blood pressure of the patient. Enter the blood pressure or use the arrows to adjust the value. (Maximum values are 400/399.)
<b>Exercise BP</b>	The exercising blood pressure of the patient. Enter the blood pressure or use the arrows to adjust the value. (Maximum values are 400/399.)
<b>Heart Rate</b>	
<b>Rest</b>	The resting heart rate of the patient. Enter the heart rate or use the arrows to adjust the value.
<b>Target</b>	The target heart rate of the patient. Enter the heart rate or use the arrows to adjust the value.
<b>12 Lead ECG</b>	Indicates whether a 12 lead ECG is available. Select: <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• (blank)</li> </ul>
<b>Date</b>	Indicates the date of the ECG. Edit the default date.
<b>Result</b>	A text field to describe the result of the ECG.

## Functional Assessment

Use this tab to record the patient's functionality through the exercise modalities.

Fields	Description
<b>Assessment Exercise</b>	The exercise used for the functional assessment. (Default is 6 minute walk.)
<b>RPE</b>	The rate of perceived exertion of the patient during the exercise (Peak modality). Enter the value or use the arrows to adjust the value.
<b>METS</b>	The calculated basal metabolic rate (Peak modality). Enter the value or use the arrows to adjust the value
<b>Distance</b>	In the <b>Peak</b> modality enter the distance covered during the exercise or use the arrows to adjust the value.
<b>HR</b>	The patient's heart rate during the exercise. For each modality: Rest, Peak, and Recovery, enter the heart rate or use the arrows to adjust the values.
<b>BP</b>	The patient's blood pressure during the exercise. For each modality: Rest, Peak, and Recovery, enter the blood pressure. (Maximum values are 400/399.)
<b>SpO2</b>	The oxygen saturation levels during the exercise. For each modality: Rest, Peak, and Recovery, enter the SpO2 value or use the arrows to adjust the values.
<b>Comments</b>	A text entry field for comments.

## Pulmonary

Use this tab to record the patient's pulmonary function.

Fields	Description
<b>Lung Sounds</b>	A text field for describing the sounds of the patient's lung.
<b>SpO2</b>	The oxygen saturation levels during the exercise. Enter the SpO2 value or use the arrows to adjust the values.
<b>Resp. Rate</b>	The patient's respiration rate during the exercise. Enter the rate or use the arrows to adjust the values.
<b>O2 Flow</b>	The patient's oxygen flow. Enter the value or use the arrows to adjust the values. (Maximum value is 100.)
<b>Room Air</b>	Whether the patient was breathing room air. Select <b>Yes</b> or <b>No</b> .

## Behavioral Assessment

Use the clinical assessment to record behavioral observations including:

- Nutrition
- Social Environment

## Nutrition

Use this tab to record the progress in the patient's nutritional behaviors.

Fields	Selection	Description
<b>Patient follows prescribed diet</b>	%	Indicates how closely the patient follows a prescribed diet. Enter the rating (as a percentage) or use the arrows to adjust the value.
<b>Significant weight change in the last 12 months</b>	<ul style="list-style-type: none"> <li>• <b>Gain</b></li> <li>• <b>Loss</b></li> </ul>	Records patient's weight gain or loss. 1. In Change, enter the amount of change (in lbs) or use the arrows to adjust a value. 2. Select Gain or Loss.
<b>Appetite</b>	<ul style="list-style-type: none"> <li>• <b>Good</b></li> <li>• <b>Fair</b></li> <li>• <b>Poor</b></li> </ul>	Indicates the patient's appetite.
<b>Vitamin Supplements</b>	<ul style="list-style-type: none"> <li>• <b>Yes</b></li> <li>• <b>No</b></li> </ul>	Select whether or not the patient takes vitamin supplements.
<b>Dietary Restrictions</b>	<ul style="list-style-type: none"> <li>• <b>Low Salt</b></li> <li>• <b>Diabetic</b></li> <li>• <b>Ulcer</b></li> <li>• <b>Hiatal Hernia</b></li> <li>• <b>Low Fat/Chol</b></li> <li>• <b>Other</b></li> </ul>	Indicates any diet restrictions for the patient.
<b>Patient has problems with</b>	<ul style="list-style-type: none"> <li>• <b>Chewing</b></li> <li>• <b>Digesting</b></li> <li>• <b>SOB after meals</b></li> <li>• <b>Swallowing</b></li> <li>• <b>Nausea</b></li> <li>• <b>Bloating</b></li> <li>• <b>Dental</b></li> <li>• <b>Other</b></li> </ul>	Indicates any problems the patient has with eating or nutrition.
<b>Food Allergies</b>	--	A text box to enter any food allergies the patient has.
<b>Dietary Counseling Indicated</b>	--	Indicates the patient should be referred to dietary counseling.
<b>Date</b>	--	Indicates the date the form was completed. Edit the default date.

## Social/Environment

Use this tab to record information about the patient’s environment.

Fields		Description
<b>Housing</b>	<b>Apartment</b> <b>House</b> <b>Assisted Living</b>	Indicates the type of housing where the patient resides and any assistance available.
	<b>Has help w/yard work</b>	Indicates the patient has help with yard work.
	<b>Stairs to climb</b>	Indicates the patient’s residence has stairs to climb.
<b>Lives with</b>	<b>Spouse</b> <b>Alone</b> <b>Friend</b> <b>Partner</b>	Indicates the living situation for the patient.
	<b>Other Family</b>	Indicates the patient also lives with other family members.
	<b>Pets</b>	Indicates the patient also lives with pets.
<b>Assistive Devices</b>	<b>Walker</b> <b>Cane</b> <b>Wheelchair</b> <b>Oxygen</b> <b>CPAP</b>	Indicates the type of assistance a patient uses. Select any devices the patient uses.
<b>Transportation</b>	<b>Self</b> <b>Public</b> <b>Friend/Family</b> <b>None</b>	Indicates the type of transportation used by the patient.
<b>Occupation</b>		A text field. Enter the patient’s job.
<b>Retired</b>		Indicates that the patient is retired from the listed occupation.

## Health Assessment

Use the health assessment to enter patient comments.

*NOTE:* To enter comments in the Comment Library, see [Health Assessment Comments](#).



Choose a method to enter comments:

- Enter a comment in the comment field.
- Select a comment from the comment library and click the **Paste** button.

## Health Assessment Tab Fields

Fields	Description
<b>Comment Library</b>	A menu of pre-defined comments. Select a comment from the comment library.
<b>Comment</b>	A text entry field for comments. (Maximum of 1,000 characters).

## Services Assessment

Use this tab to record the progress in the patient's required medical services.

Fields	Description
<b># ER Visits</b>	The number of emergency room visits. Enter the number of visits or use the arrows to adjust the value.
<b># Hospital Visits</b>	The number of hospital visits. Enter the number of visits or use the arrows to adjust the value.
<b>Satisfaction Survey</b>	Indicates how satisfied the patient is. Enter the rating or use the arrows to adjust the value.
<b># Dr. Visits</b>	The number of doctor visits. Enter the number of visits or use the arrows to adjust the value.
<b># Medication Rx</b>	The number of medications. Enter the number of medications or use the arrows to adjust the value.

## Comments

Use this tab to record comments regarding the patient health and/or progress.

Fields	Description
<b>Comments</b>	A text entry field for comments.

## PCP (Patient Care Plan) Tab

Use the **PCP** tab to configure details for the Patient Care Plan report. The Patient Care plan is organized into these tabs:

- Exercise Plan
- Nutrition Plan
- Education Plan
- Psycho-Social Plan
- Expected Outcomes

### Exercise Plan

Use this tab to record progress with the patient’s exercise plans:

Fields	Description
<b>*Exercise Goals</b>	Lists the exercise goals. Select a pre-defined goal, or enter text. For each goal you can select: <ul style="list-style-type: none"> <li>• <b>Met</b></li> <li>• <b>Not Met</b></li> <li>• <b>In Pro.</b> (In Process)</li> </ul>
<b>Comments</b>	A text field to enter comments for the selected goal.
<b>Intervention</b>	A text field to describe interventions.
<b>Date field</b>	Select the date of the entry.

### Nutrition Plan

Use this tab to record the patient’s nutrition progress:

Fields	Description
<b>*Nutrition Goals</b>	Lists the nutrition goals. For each goal you can select: <ul style="list-style-type: none"> <li>• <b>Met</b></li> <li>• <b>Not Met</b></li> <li>• <b>In Pro.</b> (In Process)</li> </ul>
<b>Comments</b>	A text field to enter comments for the selected goal.
<b>Intervention</b>	A text field to describe interventions.
<b>Date field</b>	Select the date of the entry.

### Education Plan

Fields	Description
<b>*Education Class Description</b>	Lists the education classes. Select a class or enter the class name.
<b>Date Complete</b>	The date the patient completed the class. Enter the date.
<b>Understands</b>	Describes how well the patient understands the class material.
<b>Met</b>	Indicates the class goal was met.
<b>Not Met</b>	Indicates if the class goal was not met.
<b>In Pro.</b>	Indicates patient is currently enrolled in the class.
<b>Comments</b>	A text field to enter comments.

## Psycho-Social Plan

Use this tab to record the patients psychological and social support plans. To complete the psycho-social plan:

1. Select the appropriate **Symptom**.
2. Enter the **Nursing Intervention**.
3. Select whether the intervention has been **Met, Not Met**, or is **In Pro.** (in process).
4. Enter any comments in the **Comments** field.

Fields	Description
<b>Symptoms</b>	Lists the patient's symptoms. Options are: <ul style="list-style-type: none"> <li>• <b>Stress</b></li> <li>• <b>Depression</b></li> <li>• <b>Anger/Hostility</b></li> <li>• <b>Grief</b></li> <li>• <b>Job</b></li> <li>• <b>Family</b></li> <li>• <b>Other</b></li> </ul>
<b>Nursing Interventions</b>	A text field to enter the interventions used to address the symptoms. For each intervention, indicate: <ul style="list-style-type: none"> <li>• <b>Met</b></li> <li>• <b>Not Met</b></li> <li>• <b>In Pro.</b> (In Process)</li> </ul>
<b>Comments</b>	A text field to enter comments.

## Expected Outcomes

Fields	Description
<b>Exercise</b>	Enables the available outcomes for exercise. Enter: <ul style="list-style-type: none"> <li>• <b>METS</b>—enter the goal basal metabolic rate for the patient.</li> <li>• <b>Per Week</b>—enter the number of times the patient will exercise each week.</li> </ul>
<b>Weight MGMT</b>	Enables the available outcomes for weight management. Enter: <ul style="list-style-type: none"> <li>• <b>Target WT</b>—enter the patient's goal weight. (Maximum 999.99)</li> </ul>
<b>Diabetes MGMT</b>	Enables the available outcomes for diabetes management. Enter: <ul style="list-style-type: none"> <li>• <b>Hb1Ac</b>—enter the patient's goal for glycosylated hemoglobin.</li> </ul>
<b>Smoking</b>	Enables the available outcomes for smokers. Select: <ul style="list-style-type: none"> <li>• <b>Quit</b></li> <li>• <b>Reduce</b></li> </ul>
<b>Cholesterol</b>	Enables the available targets for cholesterol. Enter: <ul style="list-style-type: none"> <li>• <b>LDL</b>— enter the patient's goal   Low-density Lipoproteins level.</li> <li>• <b>HDL</b>— enter the patient's goal   High-density Lipoproteins level.</li> <li>• <b>TRI</b>—Triglycerides. Enter the patient's goal triglycerides level.</li> </ul>
<b>Other</b>	When checked the associated text field prints on the report. If Other is not checked the text field displays in the tab, but is not printed.
<b>Text field</b>	A text field for any additional goals or expected outcomes and the measurement criteria.

## 11. SESSION MANAGEMENT

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Use the Session Management component of Q-Tel RMS to admit patients into monitored or non-monitored sessions and to record session information for each patient. Use the Session Management screen to view the status of all patients at a glance or one at a time. The Session Management component includes:

- Session activities grid (Admit tab)
- Full Disclosure Viewer
- Comments
- Discharge Options
- Session Reports

**NOTE:** For Session Management information specific to a networked Q-Tel RMS, refer to [Network Operation and Workstation Capabilities](#).

### Accessing Session Management



To access the Session Management screen:

1. Click the Session Management icon.
2. To select a patient choose a method:
  - Select an existing patient. For instructions on searching for a specific patient, see [Patient Information](#).
  - Add a new patient. Click **Add New Patient** and follow the instructions for [Adding A New Patient](#).

### Admit Tab

You can admit patients to an active session either as monitored or non-monitored. The number of simultaneously monitored patients you admit must be less than or equal to the number of receivers you purchased with your tower, typically 4 or 8. The number of non-monitored patients that can run at the same time is limited to 16.

The system displays a warning dialog box if a Phase II (Monitored) patient is admitted to a non-monitored session or if a Phase III (non-Monitored) patient is admitted to a monitored session.



**WARNING! Obscuring data.**

While patients are admitted to monitored sessions, promptly attend to and dismiss Q-Tel RMS application and computer operating system messages (such as out of paper). Do not allow these messages to obscure the ECG monitoring data on the display.



**WARNING! Alarm notification.**

Be aware of and immediately correct any system issues that can affect notification of alarms, such as a poorly adjusted monitor or an alarm component error message.



**WARNING! Signal range.**

Ensure that monitored patients know the allowable range of movement within your facility. The patient's ECG signal is lost if the patient goes out of range.

**NOTE:** Refer to [Patient Preparation](#) for information on electrode placement, impedance check, and other aspects of preparing the patient for monitoring.

To	Do this...
Admit a patient to a new session	<ol style="list-style-type: none"> <li>1. Select a patient.</li> <li>2. Click <b>Admit</b> or double-click the patient. The system displays an admit dialog box.</li> <li>3. Select the lead set corresponding to the method used to prepare the patient from the drop-down menu.</li> <li>4. Select options for a prescription worksheet, and session monitoring.</li> <li>5. Select the number corresponding to the patient's transmitter (monitored session) or click <b>Non-Monitored</b> (non-monitored session).</li> </ol> <p>When a patient is admitted, the system increments the patient's session number only if the previous session was billable. The system does not include non-billable sessions in the number of completed sessions.</p> <p><b>NOTE:</b> When you admit a patient to a session and the session number is higher than the number of <b>Approved</b> sessions, the system displays a warning. The system does not prevent you from admitting the patient, but it does remind you to seek approval for more sessions if necessary</p>
Print a tabular Prescription Worksheet for the patient	<ul style="list-style-type: none"> <li>• Click in the check box for <b>Print prescription</b> in the admit dialog box. The Prescription Worksheet prints to the laser printer and includes: <ul style="list-style-type: none"> <li>• Patient's name and MRN.</li> <li>• Patient's program name and the current session number.</li> <li>• Prescribed modalities, exercise times and workloads.</li> <li>• Headings for the parameters associated with the patient's program.</li> </ul> </li> </ul> <p>The printed page is suitable for use on a clipboard. Use the report to record actual exercise and vital sign information during the rehab session for later entry into Q-Tel RMS.</p>
Select a Monitored or Non-Monitored session for the patient	<ul style="list-style-type: none"> <li>• For a monitored session, click on the number corresponding to the transmitter number assigned to the patient.</li> </ul> <p><b>NOTE:</b> When the patient is out of Standby mode, ask the patient to press the <b>CALL</b> button on the transmitter. Verify that the patient is assigned to the correct transmitter.</p> <ul style="list-style-type: none"> <li>• For a non-monitored session, click <b>Non-Monitored</b>.</li> </ul> <p><b>NOTE:</b> Non-monitored patients do not have a corresponding ECG display tile. You can enter exercise accomplishments and vital signs.</p>
View or edit patient information	<ol style="list-style-type: none"> <li>1. Select a patient. Select any patient, including patients admitted to a session.</li> <li>2. Click <b>Show Patient Info</b>. The system displays the Patient information screen.</li> <li>3. To return to the <b>Session Management</b> Screen, click the <b>Session Management</b> icon.</li> </ol>
Add a new patient (Quick Admit)	<p>Select Add A New Patient. Add a new patient using the instructions for <a href="#">Adding A New Patient</a>. If the patient is added on a different station than the one you are currently working on, you may need to click the <b>Refresh List</b> button to make the new patient display on your list</p>

## Admit Tab Fields

Fields	Description
<b>Monitored</b>	Lists the patients that have been admitted to a monitored session.
<b>Non-Monitored</b>	Lists the patients that have been admitted to a non-monitored session.
<b>&lt;&lt;Admit</b>	This button admits patients to a session.
<b>Show Patient Info</b>	This button displays the <b>Patient Info</b> tab on the <b>Patient Information</b> screen.
<b>Add New Patient</b>	This button displays the <b>New Patient</b> entry screen.
<b>Refresh List</b>	This button updates the list with changes. For more information on Refresh, see <a href="#">Additional Features in Patient Information</a> .
<b>Patient</b>	Displays the name of the patient.
<b>MRN</b>	Displays the MRN for the patient
<b>Completed</b>	Indicates the number of sessions the patient has completed.
<b>Approved</b>	Indicates the number of sessions approved for this patient.

## ECG Monitoring Tile

After the patient is admitted as a monitored patient, the system starts an ECG monitoring tile for that patient. The ECG monitoring tile displays the real-time ECG waveform data and provides user feedback and control of key activities.

If the patient transmitter is properly connected, the ECG monitoring tile will display the patient's ECG. If an error message appears (e.g. "out of sync") or the wave form is flat, verify that the transmitter is turned on, properly configured and operating as expected.

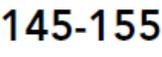
The name of the currently selected patient displays at the top of the screen as selected patient. The left side of the tile for selected patient, displays in a lavender color. To switch focus to a different patient, click on another tile or click on the patient name in the name list in the upper left portion of the screen.



### **WARNING! Alarm conditions in Standby mode.**

Alarm conditions excluding Low Battery will not be indicated in Standby Mode.

Icon	Label	Description
	<b>Store Strip</b>	Manually saves the ECG strip when a clinically significant event occurs. The number of strips stored for the patient's session is displayed below the <b>Store Strip</b> button. These strips are in addition to the strips automatically stored for alarms and modalities.
	<b>Record Strip</b>	Prints the ECG on the thermal strip printer. The number of pending strips displays below the <b>Record Strip</b> button.
	<b>Configure ECG</b>	Change the ECG display. See <i>Configuring the ECG display</i> .

Icon	Label	Description
	<b>Toggle Standby Mode</b>	Toggles between Normal and Standby modes to control ECG arrhythmia recognition.
	<b>Mode/Alarm Indicator</b>	Displays the current ECG analysis mode ( <b>Standby</b> , <b>Learn</b> or Normal - <blank>) or the active or persisted alarm.
	<b>Audible Alarm Indicator</b>	Illuminates for the patient whose alarm is generating the audio alarm sound.
	<b>Blood Pressure</b>	Displays the blood pressure reading entered for the current modality. When a new modality is started, the Blood Pressure field is blank until a new blood pressure reading is entered for that modality.
	<b>% of Target HR</b>	Displays the target heart rate range and color codes the graphic to represent the percent of target heart rate achieved. Yellow—below the range Green—within the range Red—above the range
	<b>Current Heart Rate</b>	Displays the current calculated heart rate for the patient.
	<b>Activity Timer</b>	Displays the remaining exercise time on a modality (timers).

## Printing the Current ECG

You can select strips to be printed or select continuous printing for a thermal printer.

The printed strips are the primary and secondary leads displayed on the ECG tile at the time the strip was generated. The number of leads printed is set in the Q-Tel RMS Configuration Utility (see [Storing or Recording Strips](#)).



To print ECG strips on a thermal strip recorder or a laser printer:

- Click the **Record Strip** button.

The number of strips waiting to be printed (pending) displays below the Record Strip button.

The system limits the number of pending strips to 50. If you exceed this limit, you can later print the strips from Full Disclosure.



To continue strip printing:

- Click the **Continuous Print** icon in the upper left of the screen.

If the thermal print is active, then the system overrides the strip length setting and the ECG continues to print until you click the icon again.

**NOTE:** *The Continuous Print function is not available if the laser printer is configured for printing strips.*

## Configuring the ECG Display

To configure the ECG Display:

1. Click the **Configure ECG** button. The system displays the ECG configuration dialog box. The selected patient's name displays at the top of the dialog box.

To	Do this...
Change the displayed gain	<ul style="list-style-type: none"> <li>• Click on the <b>Gain</b> setting.</li> </ul>
Toggle the display of the ECG grid on the monitoring tile.	<ul style="list-style-type: none"> <li>• Check <b>Show Grid</b> to display the grid.</li> <li>• Uncheck <b>Show Grid</b> to hide the grid.</li> </ul>
Display two ECG channels (when space is available given the number of monitored patients.)	<ul style="list-style-type: none"> <li>• Check <b>Show Secondary Trace</b> to display two ECG channels, uncheck to display only one ECG channel.</li> </ul>
Activate the Muscle Artifact filter	<ul style="list-style-type: none"> <li>• Check Apply Muscle Artifact Filter to select the filter, uncheck to disable the filter. The filter reduces motion induced noise.</li> </ul>
Change the displayed leads	<ol style="list-style-type: none"> <li>1. Highlight the lead in the <b>Leads</b> scroll box.</li> <li>2. Use the scroll arrows to move the lead to the first (primary lead) or second (secondary) position in the list.</li> </ol>

2. Click **OK** to save the changes. The system updates the ECG display.

## Real-time ECG Display

The ECG display displays 3.9 or more seconds of the patient's live ECG and one to two channels of ECG data. The number of channels displayed depends on the default trace selections (see *Trace Setup Tab*), the number of patients admitted, and the selected ECG Configuration setting for that patient.

**Figure 8 Example of a Real-time ECG**



- |   |                        |
|---|------------------------|
| 1 | Patient Name           |
| 2 | Active Modality        |
| 3 | Transmitter Number     |
| 4 | Current Trace Gain     |
| 5 | Medical Records Number |

## Session Tab

The session view contains the sub-tabs:

- **Group view**—Displays a summary view of all patients
- **Individual view**—Displays a detail view for the selected patient. The system changes the Individual tab title to reflect the currently selected patient.

### Group View

Use the **Group** tab to view all monitored and non-monitored patients. All activity for a specific patient displays on a single line.

### Changing the Activity for the Selected Patient

To change the activity for a patient in the group view:

1. Double-click the **Modality** column for the patient.
2. Select a different modality from the drop-down menu.

### Changing the Selected Patient

Choose a method to change the selected patient:

- Click on a different patient in the group view grid.  
The green arrow moves to that patient, the tile for that patient highlights in the color lavender, and the patient's name displays as the selected patient at the top of the screen.
- Double-click on a patient cell in the Group view.  
The system displays the Individual view for the patient and the patient becomes the selected patient.

### Individual View

Use the Individual view tab to view the selected patient and all the session activities associated with that patient for the current session.

### Activity Management

The Activity management tools function the same in both the Group and the Individual views.

- In the Group view, the Activity Management tools apply to the patient indicated by the green arrow in the first column. In the Individual view, the Activity Management tools apply to the modality indicated by the green arrow in the first column. To change the position of the green arrow, click another patient in the Group view or another modality in the Individual view.
- When a button is greyed out, it is not available.

Icon	Activity Management Tool	Description
	<b>Start/Resume</b>	Starts a modality that is currently pending or resumes a modality that is currently paused. When a modality is in progress, the modality active icon displays in the status column of the activity grid. When an exercise modality is paused, the system changes the label of the button to <b>Resume</b> . When you select <b>Resume</b> , the system copies that modality, leaving the previous portion of the activity marked as done. The system resumes running again and the modality active icon displays in the status column of the activity grid.
	<b>Pause</b>	Temporarily stops the modality. An exercise modality that is paused is marked with a yellow exclamation point (!) in the status column of the session activity grid.  <b>NOTE:</b> You cannot pause the <b>Rest</b> and <b>Recovery</b> modalities.
	<b>Done</b>	Ends the modality. <ul style="list-style-type: none"> <li>Timed modalities—<b>Done</b> applies to timed modalities that are running or paused only. When a timed modality is marked <b>Done</b>, the system automatically displays the elapsed time in the Time column and annotates the modality with a checkmark in the status column of the session activity grid.</li> </ul> <b>NOTE:</b> You cannot mark the Recovery modality as <b>Done</b> . To stop the Recovery modality, discharge the patient. <ul style="list-style-type: none"> <li>Non-timed modalities—<b>Done</b> applies to non-timed modalities that are running, paused or pending. When a non-timed modality is marked <b>Done</b>, the system automatically displays the duration in the <b>Time</b> column and annotates the modality with a checkmark in the second column of the session activity grid.</li> </ul>
	<b>Add New</b>	Adds a new modality to the patient's current session. To add a new modality: <ol style="list-style-type: none"> <li>Select a modality. The system inserts the modality in the row above the selected modality.</li> <li>Click <b>Add New</b>.</li> <li>Double-click on the new modality field.</li> <li>Select an exercise device.</li> <li>Enter the duration, and click the timer check box to set on or off.</li> <li>Select <b>Record Strip</b> and <b>Store Strip</b> settings.</li> </ol>
	<b>Reset</b>	Returns the exercise modality to a pending state. Resetting an exercise modality clears the <b>Time</b> and <b>HR</b> columns and any calculated heart rate parameters, such as <b>%THR</b> and <b>Avg HR</b> . Other parameters, such as BP and RDE, are not reset. The system does not remove sorted strips from Full Disclosure data, but they are not annotated with the modality.  <b>NOTE:</b> You cannot reset the <b>Rest</b> modality.
	<b>Delete</b>	Deletes the modality from the session and allows you to change the prescription to reflect the session.  <b>NOTE:</b> You cannot delete Rest, Recovery, or the active modality.  To delete a modality: <ol style="list-style-type: none"> <li>Select the modality and click <b>Delete</b>.</li> <li>To save the modified session as the new prescription, select <b>Save Rx</b>.</li> </ol>
	<b>Save Rx</b>	Saves any changes made to a patient's prescription during the session. When you select <b>Save Rx</b> , the system displays a confirmation message. Select <b>Yes</b> to apply the

Icon	Activity Management Tool	Description
		changes to future sessions.  <b>NOTE:</b> In a networked Q-Tel RMS configuration, if another station has the same patient open in <b>Patient Information</b> and the <b>Rx</b> tab displayed, you can make changes to the prescription for the current session but you cannot save those changes until the other station closes the patient or moves to a different tab in <b>Patient Information</b> .
	<b>Unlock</b>	Releases a patient record for another user to access.

## Patient Session Data Tabs

Use the **Patient Session Data** tab to enter session data, and rapidly change exercise plans to meet patient needs. The Patient Session data displays an activity grid.

Column	Description
 Selection (Column 1)	The system displays a green arrow that points to the selected modality. To change the status of the modality, use the Activity Management tools. To select a modality, click on another line.
Status (Column 2)	The system displays the status of the exercise prescription. Modalities that are complete display a checkmark. <ul style="list-style-type: none"> <li>A modality currently in progress is marked with the modality active icon.</li> <li>A modality that is cancelled (Disabled) is marked with an <b>X</b>.</li> <li>A modality that is Paused is marked with an exclamation point (!).</li> </ul> Pending modalities do not have any status markings.
<b>Modality</b>	Lists the prescribed modalities, starting with Rest and ending with Recovery.  <b>NOTE:</b> If you start the wrong modality, you can change the modality while the exercise is in progress or after it has been marked done. The ECG data collected during the modality is annotated with the new (correct) modality name.  To change any exercise modality: Double-click on the exercise device name and select a different modality from the drop-down menu.
<b>Timed/Not Timed</b>	Modalities that are checked start the timer for the prescribed duration. Modalities that are not checked are run without the timer. To select or un-select the check box: <ul style="list-style-type: none"> <li>Double-click on the check box.</li> </ul> Once the modality is started, you cannot change the <b>Timed</b> check box.
<b>Time</b>	The system supports timed and non-timed modalities. <ul style="list-style-type: none"> <li>For timed modalities—The <b>Time</b> field shows the count-down of the prescribed time. When the task is completed (marked as <b>Done</b> or the countdown time reaches zero), the <b>Time</b> field shows the actual exercise time.</li> <li>For non-timed events—The <b>Time</b> field remains blank until the modality is marked as <b>Done</b>. The <b>Time</b> field then displays the prescribed exercise duration.</li> </ul> When the system starts a timed activity, the <b>Time</b> column displays a timer that counts down the time remaining based on the prescribed duration. If a patient is monitored, then the status of the timer displays on the patient tile as well. Once

Column	Description
	<p>the timer counts down to 0, the system automatically marks the activity as done. The exception is the Recovery modality, which continues to mark time until the patient is discharged.</p> <p><b>NOTE:</b> You can edit the value in the <b>Time</b> field of a completed modality as necessary.</p>
<b>Duration</b>	View and change the prescribed exercise time. You can change this field both before a modality is started and while the modality is in progress. Updating the prescribed time updates the timer.
<b>Store</b>	<p>Access the rule for saving an ECG strip for the modality. To save the ECG strip:</p> <ul style="list-style-type: none"> <li>• Double-click on the disk icon.</li> </ul> <p>The system displays a menu for changing the store condition. You cannot change the rule while a modality is in progress or after the modality has been marked done. The default condition for exercise modalities is to save a strip at the maximum heart rate. After a modality has been marked done, the system updates the <b>Store</b> column with the number of strips saved for that modality.</p>
<b>Record</b>	<p>Access the rule for printing an ECG strip for the modality. To print the ECG strip:</p> <ul style="list-style-type: none"> <li>• Double-click on the icon.</li> </ul> <p>The system displays a menu for changing the record condition. You cannot change the rule while a modality is in progress or after the modality has been marked done. The default condition does not record any strips.</p>
<b>Workload and METS</b>	<p>A multi-functional field. Use this field to rapidly enter data for several conditions.</p> <ul style="list-style-type: none"> <li>• If the modality does not have an associated METS equation, such as for exercising with Bands or Weights, enter in any text string.</li> <li>• If the modality has an associated METS equation, the field dynamically changes for input of the associated parameters. Either double-click on the field, or start typing the value of the first parameter and the field automatically expands for data input.</li> </ul> <p>For example, the AirDyne modality requires the input of <b>Level</b> and <b>Weight</b>. Start typing the Level (for example, "3"). Tab to the next field and enter the <b>Weight</b>.</p> <ul style="list-style-type: none"> <li>• If the modality has multiple METS equations, select a METS equation to change. Tabbing out of the <b>Workload</b> field changes the input area to a simple field with the entered workload data. The adjacent <b>METS</b> column automatically displays the computed METS value.</li> </ul> <p>To override a METS value calculated by Q-Tel RMS:</p> <ul style="list-style-type: none"> <li>• Press the <b>CTRL</b> key and double-click on the <b>METS</b> cell for the patient and then enter the METS value. <ul style="list-style-type: none"> <li>• If the modality does not have workload parameters or a METS equation, click in the field.</li> </ul> </li> </ul> <p>If you manually change a METS value and then change a workload parameter for that modality, the system automatically calculates a new METS value. Re-enter your manual METS value.</p>
<b>HR (Heart Rate)</b>	<p>For monitored patients, the system automatically enters the heart rate when the modality is completed.</p> <ul style="list-style-type: none"> <li>• For Rest and Recovery modalities, the default heart rate is determined by the lowest heart rate from the strips stored during the modality; if no strips were stored, the system displays the lowest heart rate detected during the modality.</li> <li>• For exercise modalities the default heart rate is determined by the maximum heart</li> </ul>

Column	Description
	<p>rate from the strips manually stored during the modality.</p> <ul style="list-style-type: none"> <li>If no strips were stored manually, the system displays the maximum heart rate of strips automatically stored during the modality.</li> <li>If no strips were stored, the system displays the highest heart rate detected during the modality.</li> </ul> <p>To manually enter a heart rate for monitored and non-monitored patients:</p> <ul style="list-style-type: none"> <li>Double-click on the <b>HR</b> cell for the patient and then type in the heart rate.</li> </ul> <p><b>NOTE:</b> For monitored patients, if you manually enter the heart rate prior to completion of the modality, it is retained on completion of the modality; the manually entered heart rate is not overwritten by the system heart rate.</p> <p><b>NOTE:</b> The %tHR parameter is calculated based on the heart rate displayed in the <b>HR</b> field. The <b>Min. HR</b> and <b>Max. HR</b> parameters do not update for changes to the <b>HR</b> field.</p>
<b>BP</b> (Blood pressure)	For manual entry of blood pressure. Type blood pressure in the standard format, for example 120/80 (including the "/"). You can also press <b>Tab</b> to move from the first to the second value.
<b>RPE</b>	Rate of perceived exertion.
<b>SpO2</b>	Oxygen saturation levels.
<b>Parameters</b>	<p>Captures custom parameter information for the patient. Double-click on the <b>Parameters</b> cell and the system displays a list of parameters selected for that modality. Note the modality and patient's name display above the list.</p> <p>To add new parameter:</p> <ul style="list-style-type: none"> <li>Click <b>New Parameter</b> and select the parameter from the list. <ul style="list-style-type: none"> <li>For Rest and Recovery, the system displays parameter data from the previous billable session for reference.</li> <li>If you add a parameter to an exercise modality, it is added to all exercise modalities for that patient. In addition, all added parameters persist for future sessions for that patient.</li> </ul> </li> </ul> <p>To delete a parameter, select the parameter and press the <b>Delete</b> key.</p>

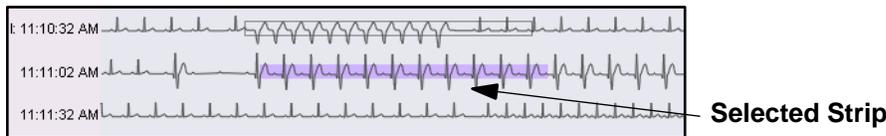
## Full Disclosure Tab

Use the **Full Disclosure** tab to view the selected patient's complete ECG waveforms. The view initially shows 2.5 minutes of ECG waveform data, 30 seconds per line.

Full View Display		2.5 Minute Display
10 Minute Display		Zoom and Center Selected Strip
Show List of Stored Strips		Show List of Alarms
Record Selected Strip		Print Full Disclosure Report
Add a New Strip		Display Settings
Delete Selected Strip		Restore Deleted Strip

Any strips that were saved, whether automatically or manually, are shown in the full disclosure as rectangles surrounding the waveforms included in the strip. You can select a strip by clicking on it. The selected strip is highlighted in a cyan color.

**Figure 9 Example of the Full Disclosure Tab**



To	Do this...
Select a view	<ul style="list-style-type: none"> <li>To view ten minutes of ECG waveforms, one minute per line, click the <b>10</b> button from the icon bar.</li> <li>To view eight seconds of ECG waveforms, select the <b>Full</b> button.</li> </ul>
Select a different strip	<ol style="list-style-type: none"> <li>Click on the <b>Show List of Stored Strips</b> button. The system displays a drop-down menu of all strips that have been saved, the time they occurred and the median heart rate.</li> <li>Select a strip from the list. The system changes the view to center on that strip.</li> </ol>
Navigate between strips	<ul style="list-style-type: none"> <li>Click either the <b>Forward Strip</b> button (on the right) or the <b>Back Strip</b> button (on the left) at the bottom of the Full Disclosure display.</li> </ul>
Print a selected strip	<ul style="list-style-type: none"> <li>Click the <b>Record Selected Strip</b> button. The system prints the strip to the thermal strip recorder or to the laser printer, depending on the configuration.</li> </ul> <p><b>NOTE:</b> The strip length on a laser printer is 8 seconds. For a 16- second strip, two 8-second strips print. The two 8-second strips show start times and other labels according to data recorded during two consecutive 8-second time spans. Laser printer strip labels reflect changes in modality, Muscle Artifact filter setting, and other measurements between the two 8- second strips.</p> <p>For a 20-second strip, two 8-second strips and a 4-second strip print. Similar to the two 8-second substrips for a 16- second strip, each of the three sub-strips for a 20-second strip shows labels according to data recorded during its time span.</p>
Return to the Full View	<ul style="list-style-type: none"> <li>Click the <b>Zoom and Center Selected Strip</b> button. The heart rate displayed in the lower right corner of a zoomed and centered strip is the average median heart rate of the strip.</li> </ul>
Add a strip	<ul style="list-style-type: none"> <li>Click the <b>Add a New Strip</b> button.</li> </ul>
Delete a strip	<ul style="list-style-type: none"> <li>Click the <b>Delete Selected Strip</b> button.</li> </ul>
Restore the last deleted strip	<ul style="list-style-type: none"> <li>Click the <b>Restore Deleted Strip</b> button.</li> </ul>
Display a list of medical alarm conditions detected during the monitoring period	<ul style="list-style-type: none"> <li>Click on the <b>Show List of Alarms</b> button. The system displays a drop-down menu that includes alarms raised during the session, as well as, alarms with the priority set to <b>OFF</b>.</li> </ul> <p>The menu shows the type of alarm, the time the alarm occurred, and the average heart rate. To include technical alarms in the list, click on the Display Settings button and select List Technical Alarms.</p> <p><b>NOTE:</b> Only those alarms enabled for the system are detected. Refer to <a href="#">Alarm Subsystem</a>.</p>

To	Do this...
Change the lead displayed in Full Disclosure Viewer	<ul style="list-style-type: none"> <li>Click the <b>Display Settings</b> button and select the lead. The system saves the full disclosure data from the three most recent sessions per patient only. All prior sessions are abridged to save only the strips that are printed on session reports.</li> </ul> <p>The <b>Print Full Disclosure Report</b> selection is not available during session monitoring. Print the Full Disclosure Report when discharging the patient or after discharge from <b>Charting and Editing</b>.</p>

## Comments Tab

Use the **Comments** tab to enter comments at any time during the session. Enter comments in these categories:

- Critical comments
- Clinical comments
- Patient comments

The comments tab is divided into prior session (upper portion) and current comments (lower half).

Use the vertical scroll bar at the right of the session reminder dialog to view all of the comments when they exceed the amount of space in the dialog.

## Entering Comments

You can incorporate prior comment, add new comments, edit comments, or select comments from a pre-defined list.

To	Do this...
Incorporate existing comments	<ul style="list-style-type: none"> <li>For each comment type, click on the <b>Copy</b> button between the top and bottom text areas.</li> </ul>
Enter pre-defined comments	<ul style="list-style-type: none"> <li>Select a comment from the drop-down menu and click the <b>Paste</b> icon. You can enter multiple pre-defined comments, each comment is appended to the existing text.</li> </ul>
Enter new comments or edit comments	<ul style="list-style-type: none"> <li>Click in the comments field and enter or edit comments.</li> </ul>

## Comment Tab Fields

Column	Description
<b>Prior Session's Critical Comments</b>	System-generated field. Contains the comments from the previous session.
<b>Copy</b>	This button copies the text from the prior session comments to the current session comments.
<b>Critical Comments</b>	Enter new comments or use the <b>Copy</b> button to enter the previous comments and edit the previous comments.
<b>Prior Session's Clinical Comments</b>	System-generated field. Contains the comments from the previous session.
<b>Clinical Comments</b>	Enter new comments or use the <b>Copy</b> button to enter the previous comments and edit the previous comments.

Column	Description
<b>Prior Sessions's Patient Comments</b>	System-generated field. Contains the comments from the previous session.
<b>Patient Comments</b>	Enter new comments or use the <b>Copy</b> button to enter the previous comments and edit the previous comments.
<b>Set Reminder</b>	Select this check box to display the comment the next time the patient is admitted to a session. Acknowledge the comment to admit the patient.

## Discharge Tab

Use the **Discharge** tab to discharge the currently selected patient. The selections on the **Discharge** tab can be made at any time during the session. You can select patients for discharge individually or select them sequentially based on the position of the patient in the ECG tile monitoring area. When you are ready to discharge the patient, click the **Discharge** button.

If your system has a software license for Q-Exchange, you can select the session data for export from the **Discharge** tab.

### Discharging a Patient

To discharge a patient:

1. Select a check box from the **Reason for Discharge**, or choose **Other** and then enter a reason in the **Comment** box.



**Caution: Possible data loss.**

If you select **Cancelled Session** as the reason for discharge, the system does not save the session data. The system prompts you to confirm this selection.

2. If the session is not billable, click the **Billable** check box to clear the checkmark.
3. To add the patient to the charting and editing list when discharged, click **Queue for Charting and Editing**. See [Charting and Editing](#).
4. For each report click one or more check boxes to select an output:
  - Send to PDF file. PDF files are stored in this folder on Standalone Towers:  
C:\Program Files\Quinton\QTel RMS\Patient\_Reports  
If generated on a networked Q-Tel RMS, PDF files are stored in this folder on the Main Tower:  
C:\QTelDataCenter\Patient\_Reports
  - Print report. Each report includes basic patient demographic header information (name, medical record number, medications, etc.). Sample printouts of each report are provided at the end of this chapter.
5. If you are using Q-Exchange, select the export options.
6. To discharge the patient, click the **Discharge** button. If the patient that you have selected to discharge is not in Recovery when you click **Discharge**, the system displays a confirmation dialog box.

## Discharge Tab Fields

Fields	Description
<b>Reasons for discharge</b> <b>End of Session</b> <b>Medical Conditions</b> <b>Cancelled Session</b> <b>Other</b>	Select the appropriate check box to identify the reason for discharge.
<b>Comment</b>	Enter a reason for discharge.
<b>Discharge</b>	This button discharges the patient.
<b>Discharge Action</b>  <b>Billable</b>  <b>Queue for charting and editing</b>	<p>A checkmark indicates the session is billable (system default).</p> <p>A checkmark indicates the patient will be added to the charting and editing list when the patient is discharged.</p>
<b>Print Reports</b>	For each report type: <ol style="list-style-type: none"> <li>1. Select the check box for the printer icon, to send the report to the printer.</li> <li>2. Select the check box for the PDF icon to save the report as a PDF.</li> </ol>
<b>Session Summary</b>	A summary of the recorded Rest and Recovery parameter data and the minimum, maximum and average of the recorded Exercise parameter data. The report also includes three ECG strips (if stored), one each from Rest, Exercise, and Recovery. The Rest and Recovery strips are the stored strips with the lowest heart rate for the modality, and the Exercise strip is the stored strip with the highest heart rate for all exercise modalities.
<b>Session Report</b>	The Session Report is a multi-page report with all completed modalities and associated parameter data recorded during the session, including all ECG strips.
<b>Full Disclosure</b>	The Full Disclosure report is a compressed plot of the full disclosure data for one lead. The report compresses 60 seconds of data per line and annotates each line with the relative time of the recording and the calculated heart rate. Alarm conditions and stored strips are not annotated on the Full Disclosure Report.
<b>QExchange</b>  <b>Export Session Data</b>	A checkmark indicates the system will export session data plus basic demographics data for this patient.
<b>Session Summary PDF</b>	A checkmark indicates the system also exports a session summary PDF file for this patient.
<b>Session Report PDF</b>	A checkmark indicates the system also exports a session report PDF file for this patient.
<b>Full Disclosure PDF</b>	A checkmark indicates the system also exports the Full Disclosure data for this patient.
<b>Full Demographics</b>	A checkmark indicates the system exports full demographics data rather than basic demographics data for this patient.

## Sample Reports

This section contains samples of the session management reports.

Figure 10 Example of the Session Summary Report

Summary Outcomes Report				General Hospital					
Gerlock, Robin J		DOB: 2-Mar-81		MRN: 094054					
Primary Diagnosis: MVR, TVR, AVR		Age: 27		Primary Physician: Zelenak, Dennis					
Family Medical Hx: Pts. father died of pericardial cancer - age 52. Chronic hypertension and high cholesterol in both mother and father. 3 siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 55).		ICD-9-CM: I10, I25.51		Specialist Physician: Wilson, Susan					
Enrollment Date: 1-Jun-07		Program: Cardiac (Clarke)		Risk Class: Moderate					
Discharge Date: 10-Aug-07		Gender: Male		NCC: <input type="checkbox"/> Pcc: <input type="checkbox"/>					
Sessions Comp: 30									
<b>Medications:</b>									
Name	Dosage/Unit	Frequency	Method	Start Date	Stop Date				
Amlodipine	10mg	Daily	Oral	03/18/2004	06/19/2007				
Aspirin	81mg	Daily	Oral	03/18/2006					
Calcium	600mg	Po QD	Oral	06/05/2007					
Clopi	500mg	3x Daily	Oral	06/12/2007	08/02/2007				
Cholestyram	20mg	Daily	Oral	03/05/2006					
Comp	25mg	BID	Oral	06/04/2007					
Digitek	25mg	DAILY	Oral	07/11/2007					
Etiar XR	150mg	Daily	Oral	06/15/2005	06/19/2007				
Fluoxetine	20mg	Daily	Oral	06/15/2005	03/12/2006				
Folic Acid	1mg	Daily	Oral	06/18/2007					
Hydrochlorothiazide	25mg	Daily	Oral	03/18/2006					
Hydrochloroquin	200mg	Daily	Oral	03/18/2006					
Ibuprofen	30mg	Daily	Oral	06/15/2007	06/19/2007				
Lisin	20mg	BID	Oral	03/05/2006					
Lisinopril	10mg	Daily	Oral	06/05/2005					
Nitroglycerin	650mg	BID 2x	Oral	06/05/2006					
Metoprol	25mg	DAILY	Oral	05/23/2007					
Metoprolol	100mg	Daily	Oral	03/18/2006					
Nitroglycerin	500mg	Daily	Oral	03/15/2007					
Nitroglycerin	0.4mg	PRN	Sublingual	11/01/2005					
Occulta Prevention	1ea	Daily	Oral	07/11/2007					
Omega 3	1000mg	DAILY	Oral	06/15/2007					
Omeprol	20mg	Daily	Oral	06/21/2007					
Piave	75mg	Daily	Oral	06/21/2006					
Vitamin D	1000IU	DAILY	Oral	06/12/2007					
<b>Report Range:</b>									
Session: 1		Session: 18		Session: 30					
1-Jun-07		2-Jul-07		10-Aug-07					
<b>Resting Data</b>									
Session	HR	Weight	HR	HR/100	HR/100	HR/100	HR/100	HR/100	HR/100
1	77	210		145	88	95			
18	50	190		142	78	99			
30	76	182		120	69	98			
Percent	-1%	-13%		-13%	-22%	3%			
<b>Exercise Data</b>									
Session	Time	HR	HR/100	HR/100	% HR	HR/100	HR/100	HR/100	HR/100
1	03:00	80	3.8	12		145	85	92	
18	05:18	100	7.1	12		122	78	95	
30	1:05:00	142	7.5	13		122	71	99	
Percent	82%	81%	100%	8%		-9%	-20%	8%	
<b>Recovery</b>									
Session	Time	HR	% HR	HR/100	HR/100	HR/100			
1	02:00	80		150	92				
18	01:42:05	80		130	75				
30	01:45:05	76		127	85				
Percent	-30%	-11%		-15%	-25%				
<b>Quality of Life Surveys</b>									
Session	Date	HR/100	HR/100	HR/100					
1	06/18	8.0	21						
18	06/20	7.6	20						
30	06/21	8.3	21						
Percent		89%	95%	-43%					
<b>Comments</b>									
Pt. seems motivated to achieve all stated goals and is willing to attend recommended education classes as well as do the exercise activities.									
Case Manager: _____ Date: August 20, 2008									

Figure 11 Example of the Full Disclosure Report

General Hospital

## Full Disclosure Report on Lead II -- Session 13 (5/21/2007 11:11:18 AM)

**Name:** Rubin J Gerlack      **MRN:** 894854      **Gender:** Male      **Age:** 67      **Enrolled:** 4/9/2007  
**Program:** Cardiac      **Risk:** Moderate      **Phase:** Phase II (Monitored)      **Date of Birth:** 3/2/1941  
**Specialist:** Susan L Wilson      512-826-7452      **Physician:** Dennis I Zelewski      251-254-8874  
**Goals:** Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500); Lose weight (25 pounds); Quit smoking;

## Diagnoses:

Date	Primary	Secondary
4/2/2007	MVR,TVR,AVR	CABG 1983
5/15/2007	HYPERTENSION	STABLE ANGINA

## Medications:

Medication Name	Dosage	Frequency	Method	Date Started	Date Stopped
Amlodipine	10 mg	Daily	Oral	3/19/2004	9/15/2007
Aspirin	81 mg	Daily	Oral	7/8/2006	
Calcium	600 mg	PoBID	Oral	8/5/2007	
Cipro	500 mg	3 x Daily	Oral	8/12/2007	8/22/2007
Citalopram	20 mg	Daily	Oral	12/5/2006	
Coreg	25 mg	BID	Oral	5/4/2007	
Digitek	25 mg	DAILY	Oral	7/11/2007	
Effexor XR	150 mg	Daily	Oral	7/1/2005	9/15/2007
Fluoxetine	20 mg	Daily	Oral	9/1/2005	3/12/2008
Folic Acid	1 mg	Daily	Oral	6/18/2007	
Hydrochlorothiazide	25 mg	Daily	Oral	5/18/2006	
Hydroxychloroquin	200 mg	Daily	Oral	3/18/2008	
Isosorbide	30 mg	Daily	Oral	5/15/2007	8/15/2007
Lipitor	20 mg	HS	Oral	12/3/2006	
Lisinopril	10 mg	Daily	Oral	8/8/2005	
Metformin	850 mg	BID 2x	Oral	8/8/2006	
Metoprol	25 mg	DAILY	Oral	5/22/2007	
Metoprolol	100 mg	Daily	Oral	3/18/2006	
Nebumetone	500 mg	Daily	Oral	3/15/2007	
Nitroglycerin	0.4 mg	PRN	Sublingual	11/1/2005	
Occuvite Preservision	1 ea	Daily	Oral	7/11/2007	
Omega 3	1000 mg	DAILY	Oral	6/15/2007	
Omeprazol	20 mg	Daily	Oral	4/21/2007	
Plavix	75 mg	Daily	Oral	9/21/2006	
Vitamin D	1000 IU	DAILY	Oral	8/12/2007	

## Discharge as: End of Session

Time HR

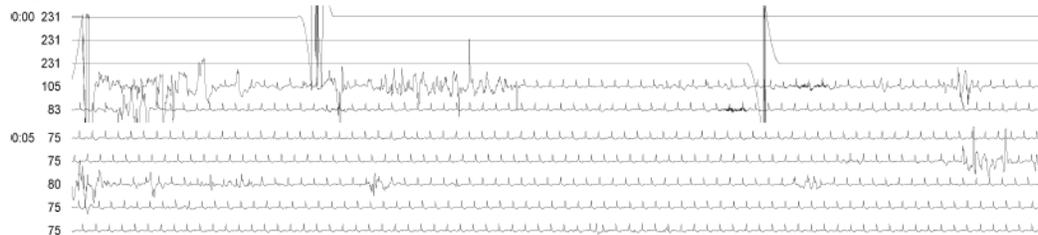


Figure 12 Example of the Session Report

General Hospital

## Session Report -- Session 13 5/21/2007 11:11:18 AM

**Name:** Rubin J Gerlack      **MRN:** 894854      **Gender:** Male      **Age:** 67      **Enrolled:** 4/9/2007  
**Program:** Cardiac      **Risk:** Moderate      **Phase:** Phase II (Monitored)      **Date of Birth:** 3/2/1941  
**Specialist:** Susan L Wilson      512- 826-7452      **Physician:** Dennis I Zelewski      251-254-8874  
**Goals:** Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500); Lose weight (25 pounds); Quit smoking;

**Diagnoses:**

Date	Primary	Secondary
4/2/2007	MVR,TVR,AVR	CABG 1983
5/15/2007	HYPERTENSION	STABLE ANGINA

**Medications:**

Medication Name	Dosage	Frequency	Method	Date Started	Date Stopped
Amlodipine	10 mg	Daily	Oral	3/19/2004	9/15/2007
Aspirin	81 mg	Daily	Oral	7/8/2006	
Calcium	600 mg	PoBID	Oral	8/5/2007	
Cipro	500 mg	3 x Daily	Oral	8/12/2007	8/22/2007
Citalopram	20 mg	Daily	Oral	12/5/2006	
Coreg	25 mg	BID	Oral	5/4/2007	
Digitek	25 mg	DAILY	Oral	7/11/2007	
Effexor XR	150 mg	Daily	Oral	7/1/2005	9/15/2007
Fluoxetine	20 mg	Daily	Oral	9/1/2005	3/12/2008
Folic Acid	1 mg	Daily	Oral	6/18/2007	
Hydrochlorothiazide	25 mg	Daily	Oral	5/18/2006	
Hydroxychloroquin	200 mg	Daily	Oral	3/18/2008	
Isosorbide	30 mg	Daily	Oral	5/15/2007	8/15/2007
Lipitor	20 mg	HS	Oral	12/3/2006	
Lisinopril	10 mg	Daily	Oral	8/8/2005	
Metformin	850 mg	BID 2x	Oral	8/8/2006	
Metoprol	25 mg	DAILY	Oral	5/22/2007	
Metoprolol	100 mg	Daily	Oral	3/18/2006	
Nebumetone	500 mg	Daily	Oral	3/15/2007	
Nitroglycerin	0.4 mg	PRN	Sublingual	11/1/2005	
Occuvite Preservision	1 ea	Daily	Oral	7/11/2007	
Omega 3	1000 mg	DAILY	Oral	6/15/2007	
Omeprazol	20 mg	Daily	Oral	4/21/2007	
Plavix	75 mg	Daily	Oral	9/21/2006	
Vitamin D	1000 IU	DAILY	Oral	8/12/2007	

**Resting Data:**

Time	Workload	HR	BP	RPE	SpO2	tHR	Wt
10:00		75	101/63				200

**Exercise Data:**

Modality	Time	Workload	METS	HR	BP	RPE	SpO2	% THR
Warmup	05:00			75				
Arm Ergometer	20:00	Watts 100,Wt 200.00	6.6	90		12		
Nu-Step	29:21	Watts 60,Wt 200.00,<115	2.6	75	124/60	12		

**Exercise Summary:**

Tot.Time	METS	HR	BP	RPE	SpO2	% THR
54:21	Minimum 2.6	75	124/60	12		
	Average 4.6	80	124/60	12		
	Maximum 6.6	90	124/60	12		

**Recovery Data:**

Figure 13 Example of the Patient Demographics Report

General Hospital

**Patient Demographics Report**

<b>Last Name:</b> Gerlack		<b>Address:</b> 310 Half Way Rd	<b>Home Phone:</b> (319) 235-8473
<b>First Name:</b> Rubin	<b>MI:</b> J		<b>Work Phone:</b>
<b>MRN:</b> 894854		<b>City:</b> Sheldonville	<b>Cell Phone:</b>
<b>SSN:</b> 324-03-185		<b>State:</b> Nebraska	<b>Pager:</b>
<b>Date of Birth:</b> 3/2/1941	<b>Age:</b> 67	<b>Postal Code:</b> 48958	<b>Fax:</b>
<b>Height:</b> 71	<b>Weight:</b> 194.00	<b>Country:</b> United States	<b>Email:</b>
<b>Gender:</b> Male	<b>Ethnicity:</b> Caucasian		
<b>Account:</b> C5215-5421		<b>Order Num:</b>	

<b>Emergency Contact</b>			
<b>Last Name:</b> Gerlack		<b>Address:</b> 310 Half Way Rd	<b>Home Phone:</b> 319- 235-8473
<b>First Name:</b> Sally	<b>MI:</b> P		<b>Work Phone:</b>
<b>Relationship:</b> Wife		<b>City:</b> Sheldonville	<b>Cell Phone:</b>
		<b>State:</b> Nebraska	<b>Pager:</b>
		<b>Postal Code:</b> 48958	<b>Fax:</b>
		<b>Country:</b> United States	<b>Email:</b>

<b>Billing</b>			
<b>Last Name:</b> Gerlack		<b>Address:</b> 310 Half Way Rd	<b>Home Phone:</b> (319) 235-8473
<b>First Name:</b> Rubin	<b>MI:</b> Z		<b>Work Phone:</b>
<b>Relationship:</b> Self		<b>City:</b> Sheldonville	<b>Cell Phone:</b> 319-254-2214
		<b>State:</b> Nebraska	<b>Pager:</b>
		<b>Postal Code:</b> 48958	<b>Fax:</b>
		<b>Country:</b> United States	<b>Email:</b>

<b>Specialist</b>			
<b>Last Name:</b> Wilson		<b>Address:</b> 104196 Highlands Parkway SW	<b>Home Phone:</b>
<b>First Name:</b> Susan	<b>MI:</b> L		<b>Work Phone:</b> 512- 826-7452
<b>Provider ID:</b> 2823475		<b>City:</b> Carlton	<b>Cell Phone:</b>
		<b>State:</b> South Carolina	<b>Pager:</b>
		<b>Postal Code:</b> 35327	<b>Fax:</b> 512-444-6408
		<b>Country:</b> United States	<b>Email:</b>

<b>Primary Physician</b>			
<b>Last Name:</b> Zelewski		<b>Address:</b> 9273 Boswell Way	<b>Home Phone:</b>
<b>First Name:</b> Dennis	<b>MI:</b> I		<b>Work Phone:</b> 251-254-8874
<b>Provider ID:</b> 4968		<b>City:</b> Omaha	<b>Cell Phone:</b>
		<b>State:</b> Nebraska	<b>Pager:</b>
		<b>Postal Code:</b> 72893	<b>Fax:</b>
		<b>Country:</b> United States	<b>Email:</b> DZelewski@NPG.org

**Insurance Carrier**

Carrier	Group	HICN	Contact Name	Phone
Alliant Health Systems	536444		Jane McIntyre	251-254-3352
Blue Cross	B5928		Paul Thomas	251-548-6654

**Diagnoses:**

Date	Primary	Secondary
4/2/2007	MVR,TVR,AVR	CABG 1983
5/15/2007	HYPERTENSION	STABLE ANGINA

**Medications:**

Medication Name	Dosage	Frequency	Method	Date Started	Date Stopped
Amlodipine	10 mg	Daily	Oral	3/19/2004	9/15/2007
Aspirin	81 mg	Daily	Oral	7/8/2006	
Calcium	600 mg	PoBID	Oral	8/5/2007	

## 12. CHARTING AND EDITING

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Use the Q-Tel RMS Charting and Editing function to:

- Review and edit a patient's session data for a completed session.
- Alter the prescription for the upcoming session.
- Change the billable status of a prior session.
- Print patient reports.

***NOTE:** If you have a networked Q-Tel RMS, refer to [Network Operation and Workstation Capabilities](#) for network specific functions related to the Charting and Editing component.*

### Accessing Charting and Editing



To begin Charting and Editing:

1. Click the **Charting and Editing** icon.
2. Select a patient.

For instructions on searching for a specific patient, see [Patient Search Tab](#).

### Patient Queue

The Patient Queue is a list of patient files that the user has selected for reviewing and editing. Putting patients into the queue makes their sessions available for editing.

The Patient Queue displays in the grid on the left side of the screen. The check box in the first column signifies that you are finished editing this patient. When you switch to another component, such as Patient Information or Session Management, the patient is removed from the queue.

***NOTE:** When you close Q-Tel RMS, the system detects patients in the Patient Queue who have not been marked as finished, and displays a dialog box indicating that there are patients in the Charting and Editing queue and confirming that you want to exit the application.*

Icon	Label	Description
	Check Box	A checkmark indicates the charting and editing for the patient is complete.
	Select	A green arrow displays next to the name of the patient currently selected for editing.
	Clipboard Icon	Indicates how many sessions the patient has completed.
	Handshake	Indicates the number of approved sessions for the patient.

### Add to Queue Tab

You can also place patients in the Patient Queue by selecting **Queue for charting and editing** when discharging a patient from an active session.

You can also double-click on the patient name in the Search results list. This places the patient in the queue and makes the patient the active patient for editing.

To place a patient in the Charting and Editing Patient Queue:

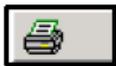
1. Click the Charting and Editing icon.
2. Select a patient. For instructions on searching for a specific patient, see [Patient Search Tab](#).
3. Double-click the patient name or click **<<Add to Queue** and then click on the name in the patient queue. The patient is placed in the Patient Queue and is ready to edit.

Fields	Description
<b>&lt;&lt;Add to Queue</b>	Adds the selected patient to the Patient Queue.
<b>Remove from Queue</b>	Removes the checked patients from the Patient Queue.
<b>Refresh List</b>	This button updates the list with changes. For more information on Refresh, see <a href="#">Additional Features in Patient Information</a> .
<b>Patient</b>	Displays the name of the patient.
<b>MRN</b>	Displays the MRN for the patient.
<b>Completed</b>	Indicates the number of sessions the patient has completed.
<b>Approved</b>	Indicates the number of sessions approved for this patient.

## Session History Tab

The **Session History** tab is specific to the selected patient. The **Session History** tab displays a grid that shows all of the patient's completed sessions, starting with the most recent session. The grid indicates whether the patient was monitored in that session and whether the session was billable.

To the right of the session history grid is a report drop-down menu and a destination drop-down menu.



To print reports for a selected session:

1. Click on the session in the grid.
2. Select the report type you want to print from the drop-down menu. Selecting another type of report automatically updates the **Session** tab in Charting and Editing.

***NOTE:** The default report type is the Patient Session report; changing the report type changes the default report type on this machine.*

3. Select the destination:
  - **Printer**—to send the report to a printer.
  - **PDF**—to store the report as in the Adobe PDF format.
4. Click on the **Run Report** icon. The Full Disclosure Report is not available for sessions with abridged full disclosure data and for non-monitored sessions.

To view the data for a particular session, double-click on the session that you would like to view/edit. This takes you to the **Session** tab with the data from the selected session in view.

Fields	Description
<b>Session</b>	System-generated. The system displays the number of sessions for the patient.
<b>Date</b>	System-generated. The system displays the dated of the session.
<b>Monitored</b>	System-generated. The system indicates whether the session is monitored or non-monitored.
<b>Billed</b>	System-generated. The system indicates whether the session has been marked as billable.
<b>Export</b>	Select this field to export this patient. To export all patients, click the <b>Select All Sessions</b> button.  <b>NOTE:</b> The <b>Select All Sessions</b> button displays only if the system is equipped with the Q-Exchange option.
<b>Select Report</b>	A drop-down menu of all the available reports. Selecting another type of report changes the default report type and automatically updates the <b>Session</b> tab in Charting and Editing.
<b>Printer Acrobat PDF</b>	A drop-down menu next to the <b>Run Report</b> icon displays the print type options for the report.
<b>QExchange Export Data</b>	Exports data for all patients with a checkmark in the <b>Export</b> field.
<b>Select All Sessions</b>	Selects all sessions for export. All sessions display a checkmark in the <b>Export</b> field.
<b>Session Summary PDF</b>	Select the check box to include this report as part of the exported data.
<b>Session Report PDF</b>	Select the check box to include this report as part of the exported data.
<b>Full Disclosure PDF</b>	Select the check box to include this report as part of the exported data.
<b>Export Data into One File</b>	Select this check box to export data to one file. If the check box is not selected, each report exports as a separate file.
<b>Full Demographics</b>	Select this check box to export all demographics.

## Session Tab

The **Session** tab is labeled with the number of the patient's session currently available for editing. Use the **Session** tab to:

- Edit past session data.
- Edit the patient's prescription that will be used in future sessions.

## Editing Past Information

The **Session** tab shows the session as it was actually run. Change the session data to ensure the results correctly represents the patient's session. For more information on changing a Modality see [Prescription \(Rx\) Tab](#).



### Caution: Cannot cancel changes.

Changes to session parameter data in Charting and Editing cannot be cancelled. Make sure you edit only the data intended to be changed.

To	Do this...
Select the session	Use the <b>Session</b> spin control at the top left of the tab. The time and date of the session displays beside the spin control, and the data on the screen updates to that session.
Change the billable status of the session	Click <b>Billable</b> or double-click the patient. A checkmark indicates the session is billable.
Change the reason for discharge	Select from the <b>Reason for discharge</b> menu.
Add comments	Enter comments in the <b>Comments</b> field.
Select and print a report	<ol style="list-style-type: none"> <li>1. Select a report from the report type drop-down menu.</li> <li>2. Select the report format (print or PDF) from the report format drop-down menu. Selecting another type of report automatically updates the <b>Session History</b> tab in Charting and Editing.</li> </ol> <p><b>NOTE:</b> The default report type is the Patient Session report; changing the report type changes the default report type on this machine.</p>
 Add a modality	<ol style="list-style-type: none"> <li>1. Click the <b>Add New</b> icon. The system inserts a blank line above the highlighted modality.</li> <li>2. Double-click in the <b>Modality</b> field and select an exercise from the drop-down menu. The exercise prescription supports up to 12 exercise activities and exercises can be repeated.</li> <li>3. Edit the settings for the prescription fields.</li> </ol>
Change a modality	<ol style="list-style-type: none"> <li>1. Double-click the <b>Modality</b> field and select an exercise from the drop-down menu.</li> </ol>
 Delete a modality	Select the modality and click the delete button.
 Change the order of the modalities	<ul style="list-style-type: none"> <li>• Select the modality and then click the <b>Move Up</b> or <b>Move Down</b> arrows.</li> </ul> <p><b>NOTE:</b> Rest must be the first activity in the prescription list, and Recovery must be the last activity in the list.</p>
Add or change session parameter data	Double-click on the field and enter the new value.
Manually change a METS value	<ol style="list-style-type: none"> <li>1. If the METS value was automatically calculated by the system, hold down the <b>Ctrl</b> key and double-click in the <b>METS</b> field, and then enter the new data.</li> <li>2. If the modality does not have workload parameters or a METS equation, click in the METS field and type in the data.</li> </ol> <p><b>NOTE:</b> If you manually change a METS value and then change a workload parameter for that modality, the system automatically calculates a new METS value. Enter the manual METS value again.</p>

## Editing the Prescription



Selecting the **Prescription** button changes the view to include the patient's future prescription. The session activity grid is truncated

On the right is the prescription for the next time the patient is admitted to an active session. The prescription portion of the screen displays its own editing tools. For information on editing the prescription, see [Prescription \(Rx\) Tab](#). for instructions on editing the prescription



Use the **Copy** button and the **Find** button to edit the prescription.

To	Do this...
Copy an activity line from the session activity grid to the prescription grid.	<ul style="list-style-type: none"> <li>Position the cursor on the session activity line and then click the <b>Copy</b> button.</li> </ul>
Find the first occurrence of the modality in the prescription grid that matches the selected modality in the session activity grid.	<ul style="list-style-type: none"> <li>Position the cursor on the session activity line and then click the <b>Find</b> button. The system indicates the first occurrence of the selected session activity on the prescription grid.</li> </ul>

## Full Disclosure Tab

The **Full Disclosure** tab in Charting and Editing is specific to the selected session. In Charting and Editing, you can print the Full Disclosure report from the controls, otherwise, the behavior is the same as in the Session Management component. For more information on the Full Disclosure, see [Full Disclosure Tab](#).

If the selected session is not one of the most recent three monitored sessions, the **Full Disclosure** tab is not available for selection because the data has been abridged to just the saved ECG strips. In this case, the **Full Disclosure** tab is greyed out and labeled **Abridged**. For non-monitored patients, the **Full Disclosure** tab is labeled **Non-Monitored**.

***NOTE:** The Full Disclosure data is not available for viewing until the ECG data is copied from the Secondary Tower to the Main Tower. Selecting the **Full Disclosure** tab before the ECG data file is copied from a Secondary Tower (immediately after discharging the patient), then the **Full Disclosure** tab is greyed-out and labeled **FD Copying**.*

***NOTE:** If Q-Tel RMS detects an error in the ECG data file, the **Full Disclosure** tab is greyed-out and labeled **FD Suspect**. The Full Disclosure data is not available for viewing.*

## Comments Tab

The **Comments** tab in Charting and Editing is similar to the **Comments** tab in the Session Management component, although any reminders that are set here appear only if you are editing the last session completed. For more information on Comments, see [Comments Tab](#).



## 13. Q-EXCHANGE

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Use Q-Exchange<sup>®</sup> to import patient information from another system or to export information to another system. Once data is imported to the Q-Tel RMS system, it is available for editing. Imported data overwrites all existing data.

***NOTE:** The MRN is a unique identifier for the patient and is not available for editing.*

The Q-Tel RMS system can import:

- Patient demographics

The Q-Tel RMS system can export:

- Patient demographics
- Session data for Charting and Editing
- Session data from Session Management

### Q-Exchange Import/Export Folders

The Q-Exchange import and export data folders are located on the Main Tower. The import folder contains patient demographic data. The default location is: C:\QTelDataCenter\ImportPatients

The export folder location is: C:\QTelDataCenter\QTelExchangeData

You can configure a different folder to hold the export data. The folder can be on a remote computer on the hospital domain. To configure the export folder on a computer other than the Main Tower:

1. Create a folder for the export data.
2. Open **Computer** from the windows tool bar to start **Windows Explorer**.
3. Navigate to the folder you want to share and then select the folder one level up (for example, if using C:\Program Files\Quinton\Qtel RMS\QTelExchangeData, select C:\Program Files\Quinton\Qtel RMS).
4. Right-click on the selected folder and select **Share with** and then **Advanced sharing...** from the menu. **The Properties dialog box will display with multiple tabs.**
5. Select **Advanced Sharing** from the **Sharing** tab displayed.
6. Check **Share this folder** and accept the shared name as displayed.
7. Click the **Permissions** button. The **Share Permissions Dialog** box displays. In the **Permissions for Everyone** section make sure **Full Control**, **Change**, and **Read** is checked for the **Allow** box.
8. Click **OK** on both confirmation dialog boxes.
9. Click **Close** on the Properties dialog box.
10. On the Main Tower, map the export data folder as a local drive.
11. Configure the export data folder through the Q-Tel RMS Configuration utility:
  - a. Open the Q-Tel RMS Configuration utility.
  - b. Click the **Exchange** tab.
  - c. Click the **Browse** button and locate the export data folder.
  - d. Click **Save**.
  - e. Close the Q-Tel RMS Configuration utility.

### Import Schema

The system defines a schema that determines the content, order, and size of each field. The data to import must match the schema for imported data.

The import schema is defined on the Q-Tel RMS application CD. The schema defines the data fields, including size and content for the patient data files.

## Data Field Mapping

The schema contains four user-configurable fields:

- **Primary Physician**
- **Specialist Physician**
- **Primary Insurance**
- **Secondary Insurance**

These fields are defined in the schema, but may not match the imported data. You can select the mapping for these fields based on the input data.

For example, if imported data uses *Consulting Physician* rather than *Specialist Physician*, use the Q-Tel RMS Configuration Utility to map the term *Specialist Physician* to *Consulting Physician* so the imported data will display properly on the Q-Tel RMS system.

To configure mapping:

1. Click on the **Q-Tel RMS Configuration** icon.
2. Select the **Exchange** tab. The system displays the export and import settings.
3. In the **Import Data Field Mapping** section, enter the **Import** fields that correspond to the existing fields.
4. Click **Save**.
5. Close the Configuration window.

## Modifying Billing Codes

You can modify the CPT Billing Codes. To define the CPT Billing Codes:

1. Click on the **Q-Tel RMS Configuration** icon.
2. Select the **CPT Billing Code** tab. The system displays the CPT billing codes. The default billing codes are:
  - 93798—Phase II
  - 93797—Phase III
3. To change the billing code, select the billing code and enter the modification.  
.To change the descriptions, select the description and enter the modification.
4. Click **Save**.

## Import Window

The function of the import window is to import patient demographics. The data to import must match the schema for imported data. Connect to the system that contains the patient files and then select the data to import.

Use the Import window to edit before importing the data. This does not change the original import file.

When the system starts, it checks for files in the Import directory. If the system detects files in the Import directory, it prompts for file import.

The imported record, including the changes you have added, over-write the existing information.

The Import window has these tabs:

- **Patient Info**—Similar to the **Patient Info** tab on the **Patient Information** screen.
- **Physician**—Similar to the **Physician** tab on the **Patient Information** screen.
- **Insurance Provider**—Similar to the **Insurance** tab on the **Patient Information** screen.
- **Warning**—Displays any warnings or mis-matches of import data. Check this tab to ensure the system imports all data correctly.

The Import window tabs displays fields for the import record and if a record exists for the patient in Q-Tel RMS, the Import window can display this record as well. Each tab has identical sections:

- **Import Record**—Displays the fields from the Import record.
- **Existing Record**—Displays the fields from the existing record on Q-Tel RMS. The existing record fields are for information only and will be overwritten by the import record fields

The left side of the import window displays the import list and displays the same information for all tabs.

*NOTE: Some displayed fields may be truncated.*

Field	Max Length	Description
Import List window	--	Displays the list of patients available for import. Files that display in red have an existing entry in Q-Tel RMS. Importing these files overwrites any existing entry. To select a patient for import, select the check box next to each name. To remove a patient from the import group, clear the checkmark next to the name.
<b>Import Now</b>	--	Starts the import of patient demographic data for all patients selected in the <b>Import List</b> .
<b>Import Later</b>	--	Postpones the import of patient demographic data. 1. To return to the import screen, select <b>File   Import</b> patients from the menu bar.
<b>View Invalid Files</b>	--	Opens a dialog box to view and delete the invalid files. Invalid files are files that the system cannot import.
<b>Patient Info Tab</b>		Similar to the <b>Patient Info</b> tab on the <b>Patient Information</b> Screen.
<b>Last Name</b>	50	Patient's last name.
<b>First</b>	50	Patient's first name.
<b>MI</b>	1	Middle initial.
<b>MRN</b>	25	System-generated number. MRN (Medical Record Number) uniquely identifies the patient.
<b>SSN</b>	11	Social Security Number.
<b>Account</b>	40	Account number.
<b>Billing Code</b>	40	Billing code.
<b>Order Number</b>	40	Order number.
<b>Address</b>	50 per line	Two lines are available for the address.
<b>City</b>	50	The name of the city.

Field	Max Length	Description
<b>State</b>	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
<b>Postal Code</b>	10	The patient's zip code.
<b>Country</b>	50	Drop-down menu for the country. (Use the Configuration Utility to edit.)
<b>Date of Birth</b>	--	The system automatically calculates age from Date of Birth (DOB).
<b>Gender</b>	--	Drop-down menu for patient's gender.
<b>Home Phone</b>	25	Contact information. <b>Work</b>
<b>Phone</b>	25	Contact information. <b>Cell</b>
<b>Phone</b>	25	Contact information.
<b>Pager</b>	25	Contact information.
<b>Fax</b>	25	Contact information.
<b>E-mail</b>	75	Contact information.
<b>Ethnicity</b>	25	Drop-down menu for patient's ethnicity.
<b>Physician Tab</b>		Similar to the <b>Physician</b> tab on the <b>Patient Information</b> screen. There are separate tabs for: <ol style="list-style-type: none"> <li>1. <b>Specialist</b></li> <li>2. <b>Primary Physician</b></li> </ol> These tabs are identical.
<b>Last Name</b>	50	Physician's last name.
<b>First</b>	50	Physician's first name.
<b>MI</b>	1	Middle initial.
<b>Provider ID</b>	20	Identification code for the provider.
<b>Address</b>	50 per line	Two lines are available for the address.
<b>City</b>	50	The name of the city.
<b>State</b>	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
<b>Postal Code</b>	10	The zip code.
<b>Country</b>	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
<b>Home Phone</b>	25	Contact information. <b>Work</b>
<b>Phone</b>	25	Contact information. <b>Cell</b>
<b>Phone</b>	25	Contact information.
<b>Pager</b>	25	Contact information.

Field	Max Length	Description
<b>Fax</b>	25	Contact information.
<b>E-mail</b>	75	Contact information.
<b>Insurance Tab</b>		Similar to the <b>Insurance</b> tab on the <b>Patient Information</b> screen. There are separate tabs for: 1. <b>Primary</b> 2. <b>Secondary</b> These tabs are identical.
<b>Carrier</b>	50	The patient's insurance carrier.
<b>Group</b>	50	Insurance group name.
<b>HICN</b>	50	Health Insurance Claim Number for the patient.
<b>Contact Name</b>	50	Insurance contact.
<b>Phone</b>	25	Insurance phone number.
<b>Warning Tab</b>		The <b>Warning</b> tab displays a system generated list of any discrepancies found in the import file. Use the <b>Admin Configuration</b> screen to correct discrepancies. The system will not import the portions of the record that contain discrepancies.

## Importing Patient Files

When the system starts, it checks for files in the Import directory. If the system detects files in the Import directory, it displays a dialog box.

To import files when files exist in the Import directory:

1. Choose a method to begin the import process:
  - If the application is not started: start the system, a dialog box prompts you to import the files, click **Yes**.
  - If the application is running: select **File | Import Patients** from the menu bar.

If the system detects invalid files, a dialog box lists the location of the invalid files. For more information on invalid files see [Invalid Imported Files](#). Note the location of the invalid files and select **OK** to dismiss the dialog box. The system displays the **Import** window.

2. For each patient to import:
  - a. Click the check box next to the patient name on the left of the screen.
  - b. Click on the **Patient Info**, **Physician**, and **Insurance Provider** tabs and review the information to import. If necessary, edit the information to import.
  - c. View the **Warning** tab.

If the system displays a warning, the system may not import the data correctly. Choose a method to proceed:

- Select **Import Later**, fix the import files, and restart the import process.
- Click in the check box to remove the checkmark for the affected patient file, import the other files, fix the import files with the error, and then restart the import process.
- Select **Import Now** and manually correct the data once it is loaded in Q-Tel RMS.

3. To import the selected patient files, click **Import Now**. When the import is complete, the system displays a dialog box. Patients that were successfully imported display in the **Imported Patients** section. Patients that were selected for import, but not imported display in the **Patients Not Imported** section. The system displays the **Import Results** dialog box.
4. If there were no invalid files, click **Done**. To view the log file for the Patients not imported:
  - a. Click on the patient in the list.
  - b. View the invalid files to determine the error.
  - c. If you are unable to determine the error, you can save the files for technical support
  - d. To print a copy of the import log file, select **Print Import Log File**.
  - e. To close the dialog box, click **Done**.

### Q-Exchange Import Folders

The Q-Exchange import data folders containing patient demographic data are located on the Main Tower. The default location is: C:\QTelDataCenter\ImportPatients

### Invalid Imported Files

The system cannot import invalid files. Invalid files include files that contain incorrect schema, duplicate data, corrupted information, or an XML error. The system detects invalid patient files and removes them from the import process. You can view the system error message and the contents of the file using the Invalid Import File List. When the system detects an invalid file, the **View Invalid File** button displays on the Import window.

To view invalid files:

1. Start the import process. (See *Importing Patient Files*.) If the system detects invalid files, a dialog box displays listing the location of the invalid files. Note the location of the invalid files and select **OK** to dismiss the dialog box. The system displays the Import window.
2. Select **View Invalid Files**. The system displays the Invalid Import File dialog box. A list of invalid files displays at the top. Error messages, indicating the reason the file is invalid, display in the center. A representation of the file contents displays at the bottom.
3. For each invalid file:
  - a. Click on the invalid file. Technical Support or your IT department can use this information to determine if the problem can be corrected.
  - b. To delete the file without correction, select the **Delete** check box for the file.
4. To delete all the marked files click the **Delete** button.
5. To close the dialog box click **Cancel**.

### Exporting Patient Data

You can export:

- Patient Demographics
- Session Data for Charting and Editing
- Session data from Session Management

## Exporting Patient Demographics

To select data for export:

1. Select the **Patient Information** button to preview the patient data available for export.
2. Select the patient data to export by selecting the **Export** check box on the patient list.
3. To select all displayed patients, click **Select all Patients**.
4. Select **Export Data**.

## Exporting Session Data From Session Management

To select data for export at the completion of a session:

1. Select the **Discharge** tab.
2. Select **Export Session Data** from the **QExchange** section.
3. Select the type of data to export:
  - To export a summary of the session in PDF format, select **Session Summary PDF**.
  - To export a session report in PDF format, select **Session Report PDF**.
  - To export the full disclosure strips in PDF format, select **Full Disclosure PDF**.
  - To export patient demographics, select **Full Demographics**.
4. Select **Discharge**.

For more information on discharging a patient, see [Discharge Tab](#). The system exports the files to the export location.

## Exporting Session Data From Charting and Editing

To select data for export from Charting and Editing:

1. Add the patients to the queue. For more information on using charting and editing, see [Charting and Editing](#).
2. Select the Session History tab.
3. Choose a method to select patients:
  - To export all sessions, click the **Select All Sessions** button.
  - To select an individual session, select the **Export** check box. The **Export Data** button and the export options are available.
4. Select the type of data to export:
  - To export a summary of the session in PDF format, select **Session Summary PDF**.
  - To export a session report in PDF format, select **Session Report PDF**.
  - To export the full disclosure strips in PDF format, select **Full Disclosure PDF**.
  - To export patient demographics, select **Full Demographics**.
  - To export all sessions in one file, select **Export Data Into One File**.
5. Select Export Data. The system exports the files to the export location. To change the export location see [Exchange Tab](#).

## Q-Exchange Viewer

The Q-Tel RMS Exchange Viewer program provides end users a way to view the patient demographics and session data exported by the Q-Exchange export function. The Exchange Viewer uses Acrobat Reader to display report PDF files and ensures the file is well-formed and complies with the Q-Exchange XML schema before displaying the file.

To view the export data:

1. Double-click the Q-Tel RMS Exchange icon or select **Start | Programs | Quinton | Q- Tel RMS Exchange Viewer | QExchangeViewer.exe**. Exchange Viewer launches Acrobat reader and automatically finds and expands the Q- Exchange data folder, if it exists. If the XML schema is invalid, Exchange Viewer displays an error dialog box.
2. To view newly exported data, double click on the root export folder and then expand the folder which holds the patient's data file.

### Q-Exchange Export Folders

The Q-Exchange export data folders are located on the Main Tower. The default export folder location is:

C:\QTelDataCenter\QTelExchangeData.

You can configure a different folder to hold the export data. The folder can be on remote computer on the hospital domain. Each user maps to the network drive and configures the export data folder.

To configure the export folder on a computer other than the Main Tower:

1. Create a folder for the export data.
2. Open **Computer**.
3. Navigate to the folder you want to share and then select the folder one level up (for example, if using C:\Program Files\Quinton\Qtel RMS\QTelExchangeData, select C:\Program Files\Quinton\Qtel RMS).
4. Right-click on the selected folder and select **Sharing and Security** from the menu.
5. Check **Share this folder** and accept the shared name as displayed.
6. Click the **Permissions** button. The **Share Permissions Dialog** box displays. In the **Permissions for Everyone** section make sure **Full Control**, **Change**, and **Read** is checked for the **Allow** box.
7. Click **OK** on both confirmation dialog boxes.
8. For each user: on the Main Tower, map the export data folder as a local drive, and check **Reconnect at logon**.
9. For each user: configure the export data folder through the Q-Tel RMS Configuration utility:
  - a. Open the Q-Tel RMS Configuration utility.
  - b. Click the **Exchange** tab.
  - c. Click the **Browse** button and locate the export data folder.
  - d. Click **Save**.
  - e. Close the Q-Tel RMS Configuration utility.

***NOTE:** If the remote shared folder needs to be re-mapped due to a network connection issue, the user needs to reboot the machine after remapping the folder.*

## 14. ADMINISTRATIVE REPORTS

Use the Administrative reports to view billing, insurance, patients, and physicians.

### Generating Administrative Reports

To run the Administrative Reports, click on the report icon at the top right of the Q-Tel RMS screen.

**NOTE:** Administrative Reports cannot be generated when patients are admitted in Session Management.

To generate an Administrative report:



1. Click the report icon at the top right of the Q-Tel RMS screen.
2. Select the report name. The system highlights the report. If the report has associated date criteria, the system displays date selections, use the calendar or enter the date(s). Do not enter future dates.
3. To locate a specific patient, use the selections in **Search For Patients**. For more information on searching for patients, see [Searching For A Patient](#).
4. Select the features based on the report.

For these reports	Do this...
Daily Billing Insurance List Patient List Patient for Dates Physician List	<ol style="list-style-type: none"> <li>1. Select the destination: <ul style="list-style-type: none"> <li>• <b>Printer</b>—to send the report to a printer.</li> <li>• <b>PDF</b>—to store the report as in the Adobe PDF format.</li> </ul> </li> <li>2. Click on the <b>Send to Printer</b> icon to generate the report.</li> </ol> <p>For a networked Q-Tel RMS configuration, PDF files are stored on the Main Tower: C:\QTelDataCenter\AdminReports.</p>
Patient Intake Assessment Patient Care Plan	<ol style="list-style-type: none"> <li>1. To send to a printer, click <b>Send to Printer</b>.</li> <li>2. To create a PDF, click <b>Send to Acrobat/PDF</b>. <ul style="list-style-type: none"> <li>• PDF files are stored on the Main Tower: C:\QTelDataCenter\AdminReports.</li> </ul> </li> <li>3. To preview the report: <ol style="list-style-type: none"> <li>a. Select the patient.</li> </ol> </li> </ol> <p>Click <b>Report Preview</b>. The system displays the report preview screen. For more information see <a href="#">Report Preview</a>.</p>
Patient Query	<ol style="list-style-type: none"> <li>1. Create the patient query list. See <a href="#">Patient Query Report</a>.</li> <li>2. To send to a printer, click <b>Print</b>.</li> <li>3. To create a PDF, click <b>Save</b>.</li> </ol> <p>For a networked Q-Tel RMS configuration, PDF files are stored on the Main Tower: C:\QTelDataCenter\AdminReports.</p> <p>To preview the report, click Preview. The system displays the report preview screen. For more information see <a href="#">Report Preview</a>.</p>

## Report Preview

Some reports have the report preview feature. Use report preview to view the report prior to printing or saving.

To...	Do this...
Print from print preview	Click Print.
Save as a PDF from print preview	<ol style="list-style-type: none"> <li>Click <b>Save</b>. The system displays a confirmation dialog box indicating the location of the PDF. <ul style="list-style-type: none"> <li>For a networked Q-Tel RMS configuration, PDF files are stored on the Main Tower: C:\QTelDataCenter\AdminReports.</li> </ul> </li> <li>Click OK.</li> </ol>
Change the magnification of the displayed report	Select the size from Zoom. Options are: <ul style="list-style-type: none"> <li>125</li> <li>100</li> <li>75</li> <li>50</li> </ul>
Page through the report	Click the forward and back scroll arrows.
Go to a specific page	Enter the page number in the <b>Page</b> field and then click <b>Go</b> .
Exit print preview	Click <b>Close Preview</b> .

## Administrative Reports

The reports in this section are available through Administrative Reports.

### Daily Billing

The Daily Billing report lists all billable sessions that occurred for the selected date.

**Figure 14 Example of the Daily Billing Report**

General Hospital						8/14/2008 4:14:12 PM
<b>Daily Billing 4/23/2007</b>						
<b>Cardiac [Cardiac] - Monitored</b>						
Patient Name	MRN	Birth Date	Session	Sessions	Physician(s)	
Bowden, Charles Q	2938	7/8/1942	9:58AM	3/12	Chesterton, Barry O (Specialist) Chesterton, Barry O (Primary Physician)	
Gerlack, Rubin J	894854	3/2/1941	9:30AM	4/36	Wilson, Susan L (Specialist) Zelewski, Dennis I (Primary Physician)	
Jacobsen, Harold H	692847	3/2/1975	10:33AM	1/37	Yetsin, Andrew J (Primary Physician)	

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Insurance List

This report prints a list of insurance carriers and the active patients associated with each carrier.

Figure 15 Example of Insurance List Report

General Hospital		8/14/2008 4:14:03 PM					
<b>Insurance List</b>							
<b>Advanced Health</b>							
Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Bowden, Charles Q	Cardiac [Cardiac]	Secondary	22988	2938	7/8/1942	66	Male
Ingras, Robert B	Cardiac [Cardiac]	Secondary	93848	9285	10/15/1977	30	Male
Insurance Contact:							
<b>Aetna</b>							
Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Edgerton, Larry C	Cardiac [Cardiac]	Secondary		4945	3/17/1942	66	Male
Gundersen, Clyde J	Cardiac [Cardiac]	Primary		84723	1/6/1938	70	Male
Howard, Lynn J	Cardiac [Cardiac]	Primary	9837	8923	11/6/1976	31	Male
Insurance Contact:							
<b>Alliant Health Systems</b>							
Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Alderton, Robert M	Cardiac [Cardiac]	Secondary		293884	11/14/1936	71	Male
Andrews, Harriet K	Cardiac [Cardiac]	Primary		3985	5/8/1952	56	Female
Bennett, Alan T	Cardiac [Cardiac]	Primary	2938	43098	2/22/1965	43	Male
Gerlach, Rubin J	Cardiac [Cardiac]	Primary	536444	894854	3/2/1941	67	Male
Gladstone, Terrance H	Cardiac [Cardiac]	Secondary		28823	3/10/1963	45	Male
Hamburg, Dierdra K	Cardiac [Cardiac]	Primary		39486	8/12/1947	61	Female
Insurance Contact: Jane McIntyre251-254-3352							
<b>Blue Cross</b>							
Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Bennett, Alan T	Cardiac [Cardiac]	Secondary	92339	43098	2/22/1965	43	Male
Bowden, Charles Q	Cardiac [Cardiac]	Primary	938	2938	7/8/1942	66	Male
Gerlach, Rubin J	Cardiac [Cardiac]	Secondary	85928	894854	3/2/1941	67	Male
Howard, Lynn J	Cardiac [Cardiac]	Secondary		8923	11/6/1976	31	Male
Insurance Contact: Paul Thomas251-548-6654							
<b>Equity Insurance</b>							
Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Andrews, Harriet K	Cardiac [Cardiac]	Secondary		3985	5/8/1952	56	Female
Gundersen, Clyde J	Cardiac [Cardiac]	Secondary		84723	1/6/1938	70	Male
Hamburg, Dierdra K	Cardiac [Cardiac]	Secondary	1946	39486	8/12/1947	61	Female
Insurance Contact:							
<b>Group Health</b>							
Page:1							

Patient List

The Patient List report lists all active patients with physician and emergency contact information.

Figure 16 Example of the Patient List Report

General Hospital		Patient List				8/14/2008 4:13:19 PM
Patient Name	Program	MRN	Birth Date	Physician(s) Emergency Contact	Telephone	
Alderton, Robert M	Cardiac [Cardiac]	293384	11/14/1936	Chesterton, Barry O (Primary Physician) Farrington, Darryl A (Specialist) Alderton, Susan J (Contact)	(155) 247-9339 (278) 243-1756 (155) 247-9339	
Andrews, Harriett K	Cardiac [Cardiac]	3985	5/8/1952	Chesterton, Barry O (Specialist) Jalorowski, David I (Primary Physician) Andrews, Harry I (Contact)	(155) 247-9339 (232) 149-2564	
Bennett, Allan T	Cardiac [Cardiac]	43098	2/22/1965	Eddington, Sam Z (Specialist) Isaacson, Henry E (Primary Physician) Bennett, June (Contact)	(528) 034-5389 (393) 293-2938	
Bowden, Charles Q	Cardiac [Cardiac]	2938	7/8/1942	Chesterton, Barry O (Specialist) Gibbons, Yves L (Primary Physician) Bowden, Orsen M (Contact)	(155) 247-9339 (013) 483-8341 (558) 829-9708	
Edgerton, Larry C	Cardiac [Cardiac]	4945	3/17/1942	Andrews, Patricia S (Specialist) Saunders, Elizabeth M (Primary Physician) Edgerton, Louise Y (Contact)	(476) 236-9229 (273) 034-1722	
Gerlach, Rubin J	Cardiac [Cardiac]	894854	3/2/1941	Wilson, Susan L (Specialist) Zelowski, Dennis I (Primary Physician) Gerlach, Sally P (Contact)	512-826-7452 251-254-8874 319-235-8473	
Gladstone, Terrance H	Cardiac [Cardiac]	289823	3/10/1963	Isaacson, Henry E (Primary Physician) Nicholas, Jake M (Specialist) Labilimum, Vuobepdthiqwx K (Contact)	(528) 034-5389 (476) 236-9229 (273) 034-1722	
Gunderson, Clyde J	Cardiac [Cardiac]	84723	1/6/1938	Isaacson, Henry E (Primary Physician) Yelzin, Andrew J (Specialist) Haverson, Susan P (Contact)	(528) 034-5389 (670) 126-1740 (319) 939-5598	
Hamburg, Dierdra K	Cardiac [Cardiac]	39486	8/12/1947	Chapman, Lawrence F (Primary Physician) Welby, Marcus Z (Specialist) Hamburg, Horst F (Contact)	(006) 856-5296 (020) 812-4218	
Howard, Lynn J	Cardiac [Cardiac]	8923	11/6/1976	Anderson, Peter L (Specialist) Chesterton, Barry O (Primary Physician) Cronkite, Walter Q (Contact)	(302) 860-5199 (155) 247-9339 (743) 486-0672	
Ingress, Robert B	Cardiac [Cardiac]	9285	10/15/1977	Comstock, Nelson P (Primary Physician) Xavier, Jesus A (Specialist) Ingress, Margaret K (Contact)	(326) 822-8528 (180) 238-9830	
Jacobsen, Harold H	Cardiac [Cardiac]	692847	3/2/1975	Alverson, Trevor Q (Specialist) Yelzin, Andrew J (Primary Physician) Jacobsen, Harriett I (Contact)	(500) 766-0260 (702) 716-4448	

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Patients for Dates

This report lists all patient who were admitted to sessions in the date range specified.

Figure 17 Example of a Patient List Report for a Selected Date Range

General Hospital		Patient List 4/1/2007 to 4/30/2007				8/14/2008 4:13:50 PM
Patient Name	Program	MRN	Birth Date	Physician(s)	Telephone	
Bowden, Charles Q	Cardiac [Cardiac]	2938	7/8/1942	<b>Emergency Contact</b>		
				Chesteron, Barry O (Specialist)	(155) 247-9339	
Edgerton, Larry C	Cardiac [Cardiac]	4945	3/17/1942	Gibbons, Yves L (Primary Physician)	(013) 483-8341	
				Bowden, Oraen M (Contact)	(558) 829-9708	
Gerfack, Rubin J	Cardiac [Cardiac]	894854	3/2/1941	Andrews, Patricia S (Specialist)		
				Saunders, Elizabeth M (Primary Physician)		
Gladstone, Terrance H	Cardiac [Cardiac]	289823	3/10/1963	Edgertob, Louise Y (Contact)	(064) 417-7767	
				Wilson, Susan L (Specialist)	512-826-7452	
Hamburg, Dierdra K	Cardiac [Cardiac]	39486	8/12/1947	Zolewski, Dennis I (Primary Physician)	251-254-8874	
				Gerfack, Sally P (Contact)	319-235-8473	
Howard, Lynn J	Cardiac [Cardiac]	8923	11/6/1976	Isaacson, Henry E (Primary Physician)	(528) 034-5389	
				Nicholas, Jake M (Specialist)	(476) 236-9229	
Ingress, Robert B	Cardiac [Cardiac]	9285	10/15/1977	Labibilmum, Vuobepdthiqwex K (Contact)	(273) 034-1722	
				Chapman, Lawrence F (Primary Physician)	(319) 939-5598	
Jacobsen, Harold H	Cardiac [Cardiac]	692847	3/2/1975	Welby, Marcus Z (Specialist)	(006) 856-5296	
				Hamburg, Horst F (Contact)	(020) 812-4218	
				Anderson, Peter L (Specialist)	(302) 860-5199	
				Chesteron, Barry O (Primary Physician)	(155) 247-9339	
				Cronkite, Walter Q (Contact)	(743) 486-0672	
				Comstock, Nelson P (Primary Physician)		
				Xavier, Jesus A (Specialist)	(326) 822-8528	
				Ingress, Margaret K (Contact)	(180) 238-9830	
				Averson, Trevor Q (Specialist)	(500) 766-0260	
				Yelstin, Andrew J (Primary Physician)		
				Jacobsen, Harri ett I (Contact)	(702) 716-4448	

## Physician List

This report shows all physicians in the Q-Tel RMS system and lists their active patients.

Figure 18 Example of the Physician List Report

General Hospital		8/14/2008 4:13:56 PM		
<b>Physician List</b>				
<b>Physician Name:</b> Alverson, Trevor Q				
<b>Office:</b> (500) 766-0260		<b>Pager:</b>		<b>Cell:</b>
Patient Name	Birth Date	Age	Emergency Contact	Phone
Jacobsen, Harold H	3/2/1975	33	Jacobsen, Harriett	(702) 716-4448
<b>Physician Name:</b> Anderson, Peter L				
<b>Office:</b> (302) 860-5199		<b>Pager:</b>		<b>Cell:</b>
Patient Name	Birth Date	Age	Emergency Contact	Phone
Howard, Lynn J	11/6/1976	31	Cronkite, Walter	(743) 486-0672
<b>Physician Name:</b> Andrews, Patricia S				
<b>Office:</b>		<b>Pager:</b>		<b>Cell:</b>
Patient Name	Birth Date	Age	Emergency Contact	Phone
Edgerton, Larry C	3/17/1942	66	Edgerton, Louise	(064) 417-7767
<b>Physician Name:</b> Chapman, Lawrence F				
<b>Office:</b> (319) 939-5598		<b>Pager:</b>		<b>Cell:</b>
Patient Name	Birth Date	Age	Emergency Contact	Phone
Hamburg, Dierdra K	8/12/1947	61	Hamburg, Horst	(020) 812-4218
<b>Physician Name:</b> Chesterton, Barry O				
<b>Office:</b> (155) 247-9339		<b>Pager:</b> (945) 740-1757		<b>Cell:</b>
Patient Name	Birth Date	Age	Emergency Contact	Phone
Alderton, Robert M	11/14/1936	71	Alderton, Susan	(278) 243-1756
Andrews, Harriett K	5/8/1952	56	Andrews, Harry	(232) 149-2564
Bowden, Charles Q	7/8/1942	66	Bowden, Orsen	(558) 829-8708
Howard, Lynn J	11/6/1976	31	Cronkite, Walter	(743) 486-0672
<b>Physician Name:</b> Comstock, Nelson P				
<b>Office:</b>		<b>Pager:</b>		<b>Cell:</b>
Patient Name	Birth Date	Age	Emergency Contact	Phone
Ingress, Robert B	10/15/1977	30	Ingress, Margaret	(180) 238-8830
<b>Physician Name:</b> Eddington, Sam Z				
<b>Office:</b>		<b>Pager:</b>		<b>Cell:</b>
Patient Name	Birth Date	Age	Emergency Contact	Phone
Bennett, Alan T	2/22/1965	43	Bennett, June	(393) 293-2938
<b>Physician Name:</b> Farrington, Darryl A				
<b>Office:</b>		<b>Pager:</b>		<b>Cell:</b>
Page: 1				

Patient Intake Assessment

This report is a detailed patient assessment.

Figure 19 Example of Patient Intake Assessment Report (page 1)

<b>Patient Assessment Report</b>		Pt: Gerlack , Rubin				
8/20/2008 3:34:49 PM		MRN: 894854				
Page:1 of 4		DOB: 03/02/1941				
<b>Demographics</b>						
Pt Name: Gerlack , Rubin	DOB: 03/02/1941	Age: 66				
Address 1: 310 Half Way Rd	Program: Cardiac	Primary Physician: Zelewski , Dennis				
Address 2:	Phase: Phase II (Monitored)	Secondary Physician: Wilson , Susan				
City: Sheldonville	Enroll Date: 04/09/2007					
State: Nebraska	Postcode: 48958	Sessions Approved: 36				
Phone 1: (319) 235-8473	Sessions Completed: 13	Primary Insurance: Alliant Health Systems				
Phone 2:		Secondary Insurance: Blue Cross				
Emergency Contact: Gerlack , Sally	Relationship: Wife	Phone: 319- 235-8473				
<b>Diagnoses</b>						
<b>Date</b>	<b>Primary</b>	<b>Secondary</b>				
04/02/2007	MVR,TVR,AVR	CABG 1983				
05/15/2007	HYPERTENSION	STABLE ANGINA				
<b>Medications</b>						
<b>Name</b>	<b>Dosage</b>	<b>Unit</b>	<b>Frequency</b>	<b>Method</b>	<b>Start</b>	<b>Stop</b>
Ambidipine	10	mg	Daily	Oral	03/19/2004	09/15/2007
Aspirin	81	mg	Daily	Oral	07/08/2006	
Calcium	600	mg	POBID	Oral	08/05/2007	
Cipro	500	mg	3 x Daily	Oral	08/12/2007	08/22/2007
Citalopram	20	mg	Daily	Oral	12/05/2006	
Coreg	25	mg	BID	Oral	05/04/2007	
Digitek	25	mg	DAILY	Oral	07/11/2007	
Effexor XR	150	mg	Daily	Oral	07/01/2005	09/15/2007
Fluoxetine	20	mg	Daily	Oral	09/01/2005	03/12/2008
Folic Acid	1	mg	Daily	Oral	06/18/2007	
Hydrochlorothiazide	25	mg	Daily	Oral	05/18/2006	
Hydroxychloroquin	200	mg	Daily	Oral	03/18/2008	
Isosorbide	30	mg	Daily	Oral	05/15/2007	08/15/2007
Lipitor	20	mg	HS	Oral	12/03/2006	
Lisinopril	10	mg	Daily	Oral	08/08/2005	
Metformin	850	mg	BID 2x	Oral	08/08/2006	
Metoprol	25	mg	DAILY	Oral	05/22/2007	
Metoprolol	100	mg	Daily	Oral	03/18/2006	
Nebumetone	500	mg	Daily	Oral	03/15/2007	
Nitroglycerin	0.4	mg	PRN	Sublingual	11/01/2005	
Occuvite Preservision	1	ea	Daily	Oral	07/11/2007	
Omega 3	1000	mg	DAILY	Oral	06/15/2007	
Omeprazol	20	mg	Daily	Oral	04/21/2007	
Plavix	75	mg	Daily	Oral	09/21/2006	
Vitamin D	1000	IU	DAILY	Oral	08/12/2007	
<b>Medical History</b>						
<b>Family Support</b>		<b>Family History</b>				
Pt. lives with his wife who provides good psychological support and encouragement for the program. She is in good health and assists Rubin with some daily living tasks he cannot easily perform himself. Their children live nearby and assist with yardwork and heavy housework.		Pts. father died of pancreatic cancer - age 52. Chronic hypertension and high chibesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).				

Figure 20 Example of Patient Intake Assessment Report (page 2)

	<b>Patient Assessment Report</b>  8/20/2008 3:34:49 PM  Page:2 of 4	Pt: Gerlack , Rubin  MRN: 894854  DOB: 03/02/1941																												
<b>Clinical Assessment</b>																														
<b>Obesity</b> Weight 210 Height 71 BMI 29.5  <b>Dyslipidemia</b> LDL 189 HDL 60 Triglycerides 162  <b>Diabetes</b> HbA1c 5.5 Fasting Glucose 78  <b>Hypertension</b> Resting BP 145/88 Exercise BP 145/94  <b>Heart Rate</b> Rest 74 Target 135	Metabolic Syndrome Y Depression N Pain Scale (0-10) 4  Description: Minor arthritis in shoulders, somewhat restricts range of movement. Does not prevent exercise activity.	12 Lead ECG <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Date: 7/13/2007 Result: NSR with a 1st degree AVB. Q waves in leads V2-V4																												
<b>Functional Assessment</b>																														
<b>Pulmonary Assessment</b>  Lung Sounds: Occasional rales in left lung. Rt. lung is clear. Pt. reports dyspnea with moderate exertion.  SpO2: 94 Resp. Rate: 78 O2 Flow: 1.5 Room Air: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">6 Minute Walk</th> <th style="text-align: center;">Rest</th> <th style="text-align: center;">Peak</th> <th style="text-align: center;">Recovery</th> </tr> </thead> <tbody> <tr> <td>Distance</td> <td></td> <td style="text-align: center;">1380</td> <td></td> </tr> <tr> <td>METS</td> <td></td> <td></td> <td></td> </tr> <tr> <td>HR</td> <td style="text-align: center;">67</td> <td style="text-align: center;">102</td> <td style="text-align: center;">69</td> </tr> <tr> <td>BP</td> <td style="text-align: center;">135/88</td> <td style="text-align: center;">155/90</td> <td style="text-align: center;">137/83</td> </tr> <tr> <td>SpO2</td> <td style="text-align: center;">95</td> <td style="text-align: center;">92</td> <td style="text-align: center;">96</td> </tr> <tr> <td>RPE</td> <td></td> <td style="text-align: center;">15</td> <td></td> </tr> </tbody> </table> Comments: Pt achieved moderate intensity workload on 6 minute walk test. Pt. is sufficiently ambulatory to proceed with the program.		6 Minute Walk	Rest	Peak	Recovery	Distance		1380		METS				HR	67	102	69	BP	135/88	155/90	137/83	SpO2	95	92	96	RPE		15	
6 Minute Walk	Rest	Peak	Recovery																											
Distance		1380																												
METS																														
HR	67	102	69																											
BP	135/88	155/90	137/83																											
SpO2	95	92	96																											
RPE		15																												

Figure 21 Example of Patient Intake Assessment Report (page 3)

	<p><b>Patient Assessment Report</b></p> <p>8/20/2008 3:34:49 PM</p> <p>Page:3 of 4</p>	<p>Pt: Gerlack , Rubin</p> <p>MRN: 894854</p> <p>DOB: 03/02/1941</p>
<b>Behavioral Assessment</b>		
<b>Nutrition</b>		
Patient follows prescribed diet: 75 %		
Significant weight change in the last 12 months		Dietary restrictions:
Change: 25	<input checked="" type="checkbox"/> Gain <input type="checkbox"/> Loss	<input checked="" type="checkbox"/> Low salt <input type="checkbox"/> Diabetic <input checked="" type="checkbox"/> Low Fat/Chol
Appetite: <input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor		<input checked="" type="checkbox"/> Hiatal Hernia <input type="checkbox"/> Ulcer
Vitamin supplements: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Other: Lactose intolerant. No Dairy.
Food Allergies: Wheat, Lactose, Peanuts		Patient has problems with:
<input checked="" type="checkbox"/> Dietary Counseling Indicated	Date: 7/13/2007	<input type="checkbox"/> Chewing <input type="checkbox"/> Swallowing <input checked="" type="checkbox"/> Digesting
		<input checked="" type="checkbox"/> Bloating <input type="checkbox"/> Nausea <input checked="" type="checkbox"/> Dental <input checked="" type="checkbox"/> SOB after meals
		<input checked="" type="checkbox"/> Other: Bridgwork is not secure. Pt suffers from TMJ.
<b>Social/Environment</b>		
Housing: <input type="checkbox"/> Apartment <input checked="" type="checkbox"/> House <input type="checkbox"/> Assisted Living	<input checked="" type="checkbox"/> Has help w/ yardwork	<input type="checkbox"/> Stairs to climb
Lives with: <input checked="" type="checkbox"/> Spouse <input type="checkbox"/> Alone <input type="checkbox"/> Friend	<input type="checkbox"/> Other family	<input type="checkbox"/> Partner <input checked="" type="checkbox"/> Pets
Assistive Devices: <input type="checkbox"/> Walker <input checked="" type="checkbox"/> Cane <input type="checkbox"/> Wheel Chair	<input checked="" type="checkbox"/> Oxygen	<input checked="" type="checkbox"/> CPAP
Transportation: <input checked="" type="checkbox"/> Self <input type="checkbox"/> Public <input type="checkbox"/> Friend/Family	<input type="checkbox"/> None	
Occupation: City bus driver	<input checked="" type="checkbox"/> Retired	
<b>Risk Factors</b>		
Smoking	Alcohol	Exercise
<input type="checkbox"/> Lives With Smoker	Days/Week: 7	Days/Week: 2
<input checked="" type="checkbox"/> Smoking History	Drinks/Day: 1	Activity Type: Walks dogs
Packs/Day: 2.500	Type of Alcohol:	Intensity: Light
Years: 35	<input type="checkbox"/> Liquor	Minutes/Day: 16 - 30
Date Stopped:	<input checked="" type="checkbox"/> Wine	
	<input type="checkbox"/> Beer	
<input type="checkbox"/> Depression	<input type="checkbox"/> Diabetes	<input type="checkbox"/> Pacemaker
<input checked="" type="checkbox"/> Sedentary Life Style	<input checked="" type="checkbox"/> Obesity	<input type="checkbox"/> Stress
<input checked="" type="checkbox"/> Drug Abuse	Note: Note reported or observed.	<input checked="" type="checkbox"/> Hypertension <input checked="" type="checkbox"/> Family History
		<input type="checkbox"/> AICD <input checked="" type="checkbox"/> Hyperlipidemia
<b>Health Assessment</b>		
Comments:		
Results of SF36 Scoring: PCS: 37.6 MCS: 39.3 Duke Activity Survey Index (DASI):26.8		
<b>Services Assessment</b>		
#ER Visits	2	#Dr Visits 36
#Hospital Visits	2	#Medication Rx 18
Satisfaction Survey		
<b>Comments</b>		
Pt. displays generally positive attitude about the program. He presents indications of mild depression. Family support network seems good. Diet and smoking habits need improvement (nutritional counseling and smoking cessation education are recommended).		

Figure 22 Example of Patient Intake Assessment Report (page 4)

	<p style="text-align: center;"><b>Patient Assessment Report</b></p> <p style="text-align: center;">8/20/2008 3:34:49 PM</p> <p style="text-align: center;">Page: 4 of 4</p>	<p>Pt: Gerlack , Rubin</p> <p>MRN: 894854</p> <p>DOB: 03/02/1941</p>	
<b>Sign Off</b>			
	Typed Name	Signature	Date
Prepared By:	_____	_____	_____
Reviewed By	_____	_____	_____
Physician:	_____	_____	_____

Patient Care Plan

The Patient Care Plan prints patient goals and outcomes.

Figure 23 Example of the Patient Care Plan Report (page 1)

<b>Patient Care Plan AND Expected Outcomes</b>		Pt: Gerlack, Rubin																													
Page:1 of 2		MRN: 894854																													
		DOB: 03/02/1941																													
<b>Risk Factors</b> Overall Risk Level: <input type="checkbox"/> No Risk <input type="checkbox"/> Low <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> High  Smoking: <input type="checkbox"/> Lives With Smoker <input checked="" type="checkbox"/> Smoking History Packs/Day: 2.500 Years: 35 Date Stopped:  Alcohol: Days/Week: 7 Drinks/Day: 1 Type of Alcohol: <input type="checkbox"/> Liquor <input checked="" type="checkbox"/> Wine <input type="checkbox"/> Beer  Exercise: Days/Week: 2 Activity Type: Walks dogs Intensity: Light Minutes/Day: 16 - 30  <input type="checkbox"/> Depression <input type="checkbox"/> Diabetes <input type="checkbox"/> Pacemaker <input checked="" type="checkbox"/> Hypertension <input checked="" type="checkbox"/> Family History <input checked="" type="checkbox"/> Sedentary Life Style <input checked="" type="checkbox"/> Obesity <input type="checkbox"/> Stress <input checked="" type="checkbox"/> Hyperlipidemia <input type="checkbox"/> AICD <input checked="" type="checkbox"/> Drug Abuse Note: Note reported or observed.		<b>Expected Outcomes</b> <input checked="" type="checkbox"/> Exercise 5 METS 4 Per Week <input checked="" type="checkbox"/> Weight MGMT 185 Target WT. <input type="checkbox"/> Diabetes MGMT Hb1Ac (<= 7%) <input checked="" type="checkbox"/> Smoking <input checked="" type="checkbox"/> Quit <input type="checkbox"/> Reduce <input checked="" type="checkbox"/> Cholesterol 140 LDL 50 HDL 150 TRI <input checked="" type="checkbox"/> Other Maintain A1c below 6.0.																													
<b>Patient Goals</b> Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500) Lose weight (25 pounds) Quit smoking																															
<b>Exercise Plan</b> <table border="1" style="width: 100%;"> <thead> <tr> <th>Goals</th> <th>Met</th> <th>Not Met</th> <th>In Process</th> </tr> </thead> <tbody> <tr> <td>Achieve 5.0 METS during exercise</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Achieve target weight of: 185 pounds, loss / gain of 23 lbs.</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Exercise a minimum of 45 minutes of moderate or better exercise during rehab sessions.</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Maintain moderate or better exercise at least 4x per week for 45 minutes at home.</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>				Goals	Met	Not Met	In Process	Achieve 5.0 METS during exercise	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Achieve target weight of: 185 pounds, loss / gain of 23 lbs.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exercise a minimum of 45 minutes of moderate or better exercise during rehab sessions.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Maintain moderate or better exercise at least 4x per week for 45 minutes at home.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>								
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<b>Comments</b> Making good progress on exercise goals. Weight is down to 195.		<b>Intervention</b> Recommend exercise training class.																													
		Date: 8/7/2007																													
<b>Nutrition Plan</b> <table border="1" style="width: 100%;"> <thead> <tr> <th>Goals</th> <th>Met</th> <th>Not Met</th> <th>In Process</th> </tr> </thead> <tbody> <tr> <td>Complete and turn in a food log daily.</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Develop an overall meal plan including at-home and restaurant choices.</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Increase fiber in diet to 9 grams daily.</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Increase fruits and vegetables in diet to at least 2 full servings of each daily.</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Meet with dietician for nutrition counseling once per week during rehab.</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Reduce dietary fat intake to less than 30% of daily caloric intake.</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </tbody> </table>				Goals	Met	Not Met	In Process	Complete and turn in a food log daily.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Develop an overall meal plan including at-home and restaurant choices.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Increase fiber in diet to 9 grams daily.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Increase fruits and vegetables in diet to at least 2 full servings of each daily.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Meet with dietician for nutrition counseling once per week during rehab.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Reduce dietary fat intake to less than 30% of daily caloric intake.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Reduce dietary fat intake to less than 30% of daily caloric intake.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																												
<b>Comments</b> Pt. has made significant changes to eating habits; reducing fat intake and increasing fiber, fruits, and vegetables.		<b>Intervention</b> Recommend nutritional counseling and education.																													
		Date: 7/2/2007																													
<b>Education Plan</b> <table border="1" style="width: 100%;"> <thead> <tr> <th>Class Description</th> <th>Date Complete</th> <th>Patient Understands</th> <th>Met</th> <th>Not Met</th> <th>In Process</th> </tr> </thead> <tbody> <tr> <td>Balanced Nutrition: General group session on nutrition, meal planning, and making healthy food choices at home and in restaurants. Includes informational pamphlets, meal planners, and food logs.</td> <td>5/18/2007</td> <td>5</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Exercise Your Way to a Healthy Heart: Group training session on exercise and it's benefits. How to incorporate exercise into daily living.</td> <td>5/23/2007</td> <td>4</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>				Class Description	Date Complete	Patient Understands	Met	Not Met	In Process	Balanced Nutrition: General group session on nutrition, meal planning, and making healthy food choices at home and in restaurants. Includes informational pamphlets, meal planners, and food logs.	5/18/2007	5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exercise Your Way to a Healthy Heart: Group training session on exercise and it's benefits. How to incorporate exercise into daily living.	5/23/2007	4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
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Exercise Your Way to a Healthy Heart: Group training session on exercise and it's benefits. How to incorporate exercise into daily living.	5/23/2007	4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																										

Figure 24 Example of the Patient Care Plan Report (page 2)

	<p><b>Patient Care Plan</b></p> <p>AND</p> <p><b>Expected Outcomes</b></p> <p>Page: 2 of 2</p>	<p>Pt: Gerlack , Rubin</p> <p>MRN: 894854</p> <p>DOB: 03/02/1941</p>			
<b>Education Plan</b>					
<b>Class Description</b>	<b>Date Complete</b>	<b>Patient Understands</b>	<b>Met</b>	<b>Not Met</b>	<b>In Process</b>
Managing Your Medications: Individual education session including a comprehensive review and reconciliation of current medications, their purpose, and the importance of taking all meds as prescribed.	5/10/2007	5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoking Cessation: Group training session with individual consultation on effects of smoking and ways to help quit. Includes multiple followup sessions throughout the rehab program.	5/29/2007	3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The Live Longer Lifestyle: Group training session focused on making healthy choices in daily living, including diet, exercise, smoking, weight management, and stress reduction.			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Understanding Cardiac Risk Factors: Group education session covering the most common risk factors for coronary disease, how they affect longevity, and ways to reduce or eliminate the risk.			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Comments</b>					
Pt has attended all required classes, except on. This class is scheduled for a later date.					
<b>Psycho-Social Plan</b>					
<b>Symptoms</b>	<b>Nursing Interventions</b>		<b>Met</b>	<b>Not Met</b>	<b>In Process</b>
<input type="checkbox"/> Stress			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Depression	Referral to therapist for evaluation.		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Anger/Hostility			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Grief	Referred to social worker for counseling and education.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Job			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Family			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other :			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments</b>					
Pt is retired. Upon D/C from program, he will be encouraged to participate in recreational activities such as golf, walking, yard work, on a regular basis.					
<b>Sign Off</b>					
	Name	Signature	Date		
Prepared By:	_____	_____	_____		
Reviewed By:	_____	_____	_____		
Physician:	_____	_____	_____		

**Patient Query**

The patient query report prints a list of patients based on the search criteria. The search criteria displays at the top of each page.

**Figure 25 Example of the Patient Query Report**

<b>Query Criteria</b>			
Active:	Program:	Monitored:	Gender:
Medication:			
Enrollment Date:		Last Session Date:	
Number of Completed Sessions:		Program Complete Date:	
Weight: 1 <= Value <= 250	Age: 1 <= Value <= 75	# of Billable Sessions: 1 <= Value <= 10	
Primary Insurance:		Secondary Insurance:	
Primary Physician:		Specialist:	
Primary Diagnosis:		Secondary Diagnosis:	
Risk Factors: <input type="checkbox"/> Lives with Smoker <input type="checkbox"/> Smoking <input type="checkbox"/> Drink Alcohol <input type="checkbox"/> Exercise			
<input type="checkbox"/> Depression	<input type="checkbox"/> Diabetes	<input type="checkbox"/> Family History	<input type="checkbox"/> Hyperlipidemia <input type="checkbox"/> Sedentary Life Style <input type="checkbox"/> Hypertension
<input type="checkbox"/> Obesity	<input type="checkbox"/> Stress	<input type="checkbox"/> AICD	<input type="checkbox"/> Pacemaker
Total Patients Found: 10		Page: 1 of 1	

Patient Name	Patient MRN
Alderton, Robert M	293384
Andrews, Harriett K	3985
Bennett, Allan T	43098
Bowden, Charles Q	2938
Edgerton, Larry C	4945
Gladstone, Terrance H	289823
Gundersen, Clyde J	84723
Hamburg, Dierdra K	39486
Howard, Lynn J	8923
Jacobsen, Harrold H	692847

## 15. Q-PROGRESS

---

This chapter provides instructions for using the Quinton Q-Progress program.



**WARNING! Possible misdiagnosis.**

Q-Progress provides a reporting capability for the Q-Tel RMS systems. Q-Progress, however, is not a medical device. Diagnosis should be performed only with Q-Tel RMS data.



**WARNING! Unintended impact to patient data.**

The template has built in functions and macros to ensure proper operation. Functions can be found from the Microsoft Excel formula bar. Individual cells which are populated through Q-Tel will show a formula in the entry field. Overwriting a cell's formula will cause it to no longer import its value from Q-Tel. After making any changes to the template, please verify spreadsheet operation and accuracy.



**WARNING! Unintended impact to patient data.**

Entering data in the wrong cells, changing or deleting any pre-programmed formulas could result in delayed or mis-treatment. Please refer to the Q-Tel user manual for proper use and additional cautions and warnings regarding the Q-Tel RMS System and Q-Progress reporting tool.

The Q-Progress program is installed on your Q-Tel RMS system. Q-Progress can also be installed and run from a desktop computer that meets the minimum system requirements and is connected to the same network as your Q-Tel RMS system. A Q-Progress program installed on a computer without the Q-Tel RMS system is referred to in this manual as a Q-Progress workstation system.

Use the Q-Progress program to track and report outcome data over time for individual patients. Q-Progress provides reporting capabilities for Q-Tel RMS systems, using Microsoft Excel-based reports, charts, and graphs.

Q-Progress automatically generates pre-formatted reports and summaries for your Q-Tel RMS patient data.

***NOTE:** The AACVPR Registry worksheets require an AACVPR Registry ID and Password, and a Quinton Authentication Code in order to send data to the AACVPR Cardiac Outcomes Registry. Please contact AACVPR to obtain your AACVPR Registry credentials. Once you have your AACVPR Registry credentials, you may obtain a Quinton Authentication code by contacting Quinton technical support and providing the last 6 digits of your AACVPR Registry. You may reach technical support by phone at 1.888.667.8272 (+1.414.354.1600), or email at TechSupport@mortara.com.*

### Using Q-Progress

Q-Progress provides several functions for outcomes-based reporting. Weekly Reports, Summary Reports, HCFA 700 and 701 Reimbursement forms, Duke and Dartmouth Quality of Life Surveys, Individual Treatment Plans (ITPs), and Discharge Reports are all created using an Excel workbook that can be customized. Q-Progress also provides capabilities to transmit data to AACVPR Registry. Menus and toolbar buttons provide easy access to the functionality of the application.

## Using the Application

To begin using Q-Progress choose a method:

1. Open the **Start Menu**, and choose **Programs | Quinton | Q-Progress**.
2. Double-click on the desktop icon.

## Patient Selection Criteria Area

You can display ALL patients in the database and manually scroll through the list, marking patients to select for action or for a longer list, use the search selections to select patients.

To select all patients:

1. Click on the **Show All** box in the **Patient Selection Criteria** work area.
2. Click **Yes** to dismiss the warning dialog box.
3. Click **Search Patients**. Search for specific patients.

To Search by	Do this...
Patient name	<ol style="list-style-type: none"> <li>1. Enter the patient's last name (<b>Lname</b>).</li> <li>2. Click <b>Search Patients</b>. The system displays all patients with the associated string. For example, if you enter the letter "S" and click <b>Search Patients</b>, the system displays a list of all patients in the database whose last name begins with an S.</li> </ol>
Patient MRN	<ul style="list-style-type: none"> <li>• Enter the patient's medical record number (MRN) and then click <b>Search Patients</b>. The search returns all patients with the associated MRN.</li> <li>• To search for a specific patient, combine the last name and MRN fields.</li> </ul>
Completed program and time range	<ol style="list-style-type: none"> <li>1. Specify a date range.</li> <li>2. Click <b>Search Patients</b>.</li> </ol> <p>For example, to display patient information on a quarterly basis, specify a date range, such as 1 Jan. 2007 to 31 March 2007. The system displays all patients that completed their program in this period.</p>
Inactive patients (Not returning to the program)	<ol style="list-style-type: none"> <li>1. Specify a date range several months previous.</li> <li>2. Select all patients who had their last session within this range.</li> </ol>
Date range: Inclusive or Exclusive	<ol style="list-style-type: none"> <li>1. To exclude the date range criteria as part of the search, click the <b>Ignore</b> check box until it displays with a check mark.</li> <li>2. To include the date range criteria, click the <b>Ignore</b> check box until it displays without the check mark.</li> </ol> <p>Unchecking the <b>Ignore</b> check boxes or doing a search with the <b>Show All</b> button checked increases the patient search time significantly.</p>

## Menu Options

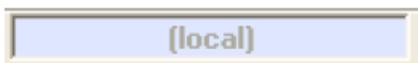
Q-Progress features a series of top-level menus, each containing related menus below them.

Menu	Sub Menu	Description
<b>File</b>		Application Level options.
	<b>Close</b>	Closes the Q-Progress application.
<b>Patients</b>		Patient-related functionality options.
	<b>Generate Report</b>	Generates a summary report for the currently selected patient. (See <a href="#">Q-Progress Reports</a> for detailed information).
	<b>Weekly Summaries</b>	Generates printed weekly summary reports for checked patients (See <a href="#">Weekly Summary Report</a> for detailed information).
	<b>Update Excel Files</b>	Automatically updates with the most recent data available, the Excel files for all checked patients.  <b>NOTE:</b> Before updating the Excel files, close all Q-Progress files on each Q-Tel RMS computer on the network.  <b>NOTE:</b> Selecting a large number of patients, can cause the update to take several hours. To reduce system conflicts, perform the update during off-hours, such as at night or over the weekend.
	<b>Find</b>	Locates a specific patient in the displayed patient list. Enter a patient name (full or partial) in the dialog box. The patient index highlights the first patient it finds that matches.
	<b>Check All</b>	Checks all displayed patients.
	<b>Uncheck All</b>	Unchecks all displayed patients.
<b>View</b>		Configuration and display options.
	<b>Options</b>	Displays the <b>Options</b> dialog box for Q-Progress. The options are: <ul style="list-style-type: none"> <li>• <b>Storage Directory</b>—specifies the location for storing the Microsoft Excel files that are generated by Q-Progress. If the Storage Directory is not found, the application creates a <i>Storage</i> sub-folder beneath the application install path. If you are running Q-Progress from multiple workstations, set the storage directory on all Q-Progress PCs to a shared network drive. See <a href="#">Configuring the Storage Directory</a>.</li> <li>• <b>Name Format</b>—specifies the layout of the patient names in the patient index. Click the down arrow to specify a different format.</li> </ul>
<b>Tools</b>		The wizard for data export.
	<b>Export Wizard</b>	Performs batch exports of data from Q-Progress for use with a third party application. See <a href="#">Q-Progress Export Wizard</a> for more details.
<b>Help</b>		Online documentation and application information.
	<b>Contents</b>	Displays the contents of the online documentation.
	<b>Technical Support</b>	Displays the contact information for Technical Support.
	<b>About</b>	Displays the <b>About</b> dialog box with information about the application.
<b>Q-Tel Machine Name</b>		For Q-Progress workstations only. Sets the Q-Tel RMS system that a <i>remote</i> Q-Progress workstation is linked to. See <a href="#">Changing the Current Q-Tel RMS Database</a> .

## Toolbar Options

Q-Progress provides a toolbar for quick access to commonly used functionality.

The toolbar, as shown in the illustration below, features many of the same features as the application's menus.

Icon	Description
	Generate Patient Report
	Generate Weekly Summaries
	Update Patient Excel Files
	Find Patient
	Quick Find Input Box
	Display Options
	Display Help Contents
	Set Q-Tel Machine Name (Remote Q-Progress only)
	Current Q-Tel Database Machine Name

## Changing the Current Q-Tel RMS Database

Q-Progress must know the location of the Q-Tel RMS system that is being accessed to retrieve patient data. If Q-Progress is running on the Q-Tel RMS system, the database is on the same machine, and it is designated as (local). However, if the Q-Tel RMS system is on the network, remote from the user's workstation, then you must specify the machine name of the Q-Tel RMS system.

***NOTE:** For installations with multiple Q-Tel RMS systems you can access patient data on any Q-Tel RMS system from your Q-Progress workstation by changing the machine name that is used by Q-Progress.*

To change the connection to the Q-Tel RMS database:

1. Select **Q-Tel Machine Name** from the menu bar or click on the **Set Q-Tel Machine Name** icon on the toolbar. The **Q-Tel machine name** dialog box displays.
2. Enter the machine name of the Q-Tel RMS system and click **OK**.

## Running Q-Progress on a Remote Workstation

After changing the machine name you can run Q-Progress on your PC workstation over the network, even though the data resides on the Q-Tel RMS system. Please observe the following caution.



### Caution: Possible improper system performance.

No more than two (2) concurrent users should use Q-Progress while patients are being actively monitored on the Q-Tel RMS system. A heavier user load can impact the ECG trace display performance of the Q-Tel RMS system. DO NOT use Q-Progress if the Q-Tel RMS system is being backed-up or if the database is being restored.

## Configuring the Storage Directory

Q-Progress creates patient reports using Microsoft Excel. The Excel workbooks are approximately 4 MB in size. The default storage location is the C: drive.

To change the location of the storage directory:

1. Double-click on the **Q-Progress** desktop icon, or choose **Programs | Quinton | Q-Progress** from the **Start** menu.
2. Select **View | Options** from the Q-Progress menu bar. The Options dialog box displays.
3. Click the ... (ellipses) button  at the right of the directory window to browse to the new location. When you have made the change click **OK**. Store Q-Progress reports to a folder, not the top level drive.



### Caution: Possible missing data.

Q-Progress reports are included in the Q-Tel RMS backup only if they are stored to the default locations on the Q-Tel RMS system.

## Shared Network Drive

If you are running Q-Progress from multiple workstations, set the storage directory on all Q-Progress workstations to a shared network drive. This ensures that all Q-Progress users access the same Q-Progress report.

To set a shared network drive:

1. Map a network drive to a drive or folder one level above the folder where you want to store the Q-Progress Excel files.
2. In Q-Progress select the network folder where you want to store your Q-Progress Excel files (see [Configuring the Storage Directory](#)).

## Q-Progress Reports

Q-Progress automatically generates pre-formatted reports and summaries of your Q-Tel RMS patient data.

Q-Progress provides a variety of patient-specific reports. All reports use a Microsoft Excel template.

- Q-Progress calculates some parameters, such as percent target heart rate, rather than using the Q-Tel RMS value. In these cases, due to rounding, the parameter value displayed in Q-Progress may differ from that in Q-Tel RMS. This difference will be no more than one unit.
- Do not mark the program as **Complete** until you have generated the necessary Q-Progress reports. Q-Progress does not update a patient's reports if the patient's program is marked **Complete** in Q-Tel RMS.
- Q-Progress updates session information for the first 36 sessions of the patient's program.

## Before You Begin

Each patient report is an individual tab within a Microsoft Excel workbook. The cells on each tab contain formulas that refer to the data stored in a hidden tab of the workbook.



**Caution: Possible improper system performance.**

Do not type data into a cell or otherwise manually change the contents of a cell unless you want to permanently override the displayed data on that particular patient's report. Over-typing will erase the formulas that the cells contain.

Changing the contents of cells that contain formulas removes the built-in formulas. For example, if you display data for a user-selected session (for example, Discharge Summary Report or Patient Summary Report) and you overwrite the cell formula in a cell that pertains to the session information, that change is permanent and the cell contents no longer update based on changing the user-selected session cells. To restore the file, delete the patient Excel file and regenerate it using Q-Progress. By running the report from Q-Progress, you will rebuild the report from the Excel template, and it will regenerate the report formulas, as well as the patient data.

## Displaying Patient Reports

To display a patient report:

1. From the main Q-Progress screen, click on the patient name. The system displays the list of programs for that patient.
2. Double-click on the program to open the Q-Progress report.



**Caution: Possible improper system performance.**

You must allow the report to fully generate before you click a cell on a report page, switch report pages, or select a different patient. If the report generation is interrupted, the report will not generate correctly.



**Caution: Possible improper system performance.**

Close any open Q-Progress report before generating another Q-Progress report. Only one Q-Progress report should be open at a time.

The Q-Progress Report includes:

- Cover Page
- HCFA 700 and 701 Reimbursement Forms
- Cardiac ITP
- Pulmonary ITP
- 36 Visit Report
- Blood Pressure Report
- Med Rec Report
- Discharge Summary with Graphical Trend Charts
- Patient Summary Report
- Critical Comments Report
- Session Data
- Duke Activity Status Index
- Dartmouth Quality of Life Index
- AACVPR Registry Data (Intake, Discharge and Follow-Up)

### Q-Progress “Cover” Worksheet

The Cover worksheet allows the user to select which Q-Progress worksheets to display. Changes made will be used as the default setting for each new patient report created. You may revisit this cover page and amend your choices for individual patient records at any time. For example, if your site typically runs Cardiac patients, you can uncheck the “Pulmonary ITP” checkbox.

### HCFA 700 and 701 Reports

The Q-Progress program assists you with the completion of the HCFA forms for reimbursement. These forms come pre-loaded with typical field entries. To remove this pre-loaded data, see [\*Updating the Template\*](#).

Figure 26 Sample HCFA-700

PLAN OF TREATMENT FOR OUTPATIENT REHABILITATION				(COMPLETE FOR INITIAL CLAIMS ONLY)	
1. PATIENT'S LAST NAME Gerlack		FIRST NAME Rubin	MI J	2. PROVIDER NO. 29352976	
3. HICN		4. PROVIDER NAME General Hospital 170185 Wallingford Way NE		5. MEDICAL RECORD NO. 894854	6. ONSET DATE
7. SOC. DATE 060107		8. TYPE: <input type="checkbox"/> PT <input type="checkbox"/> OT <input type="checkbox"/> SLP <input checked="" type="checkbox"/> CR <input type="checkbox"/> RT <input type="checkbox"/> PS <input type="checkbox"/> SN <input type="checkbox"/> SW	9. PRIMARY DIAGNOSIS	10. TREATMENT DIAGNOSIS	11. VISITS FROM SOC.
12. PLAN OF TREATMENT FUNCTIONAL GOALS GOALS (Short Term) Achieve ___ min. of exercise at an average MET level of			PLAN Increase workload as tolerated.		
OUTCOME (Long Term) Achieve ___ min. of exercise at an average MET level of Develop risk modification plan of regular exercise.			Provide education on		
13. SIGNATURE (Professional establishing POC including prof. designation)			14. FREQ/ DURATION (e.g.: 3/wk x 4 wk.) 3/wk x ___ wk.		
I CERTIFY THE NEED FOR THESE SERVICES FURNISHED UNDER THIS PLAN OF TREATMENT AND WHILE UNDER MY CARE. <input type="checkbox"/> N/A			17. CERTIFICATION <input type="checkbox"/> N/A FROM: THROUGH:		
15. PHYSICIAN'S SIGNATURE		16. DATE	18. ON FILE (Print / type physician's name) <input type="checkbox"/>		
20. INITIAL ASSESSMENT (History, medical complications, level of function at start of care. Reason for referral.) Patient History:  Reason for Referral: To increase strength and endurance, and promote reduction of cardiac risk factors of  Initial Level of Function:			19. PRIOR HOSPITALIZATION <input type="checkbox"/> N/A FROM: TO:		
21. FUNCTIONAL LEVEL. (End of billing period) PROGRESS REPORT Current level of function:			<input type="checkbox"/> CONTINUE SERVICES OR <input type="checkbox"/> DC SERVICES		
			22. SERVICE DATES FROM: THROUGH:		

FORM HCFA-700 (11-91)

Figure 27 Sample HCFA-701

UPDATED PLAN OF PROGRESS FOR OUTPATIENT REHABILITATION (Complete for Interim to Discharge Claims)				
1. PATIENT'S LAST NAME Gerlack	FIRST NAME Rubin	MI J	2. PROVIDER NO. 29352976	3. HICN
4. PROVIDER NAME General Hospital 170185 Wallingford Way NE	5. MEDICAL RECORD NO. 894854	6. ONSET DATE	7. SOC. DATE 060107	
8. TYPE: <input type="checkbox"/> PT <input type="checkbox"/> OT <input type="checkbox"/> SLP <input checked="" type="checkbox"/> CR <input type="checkbox"/> RT <input type="checkbox"/> PS <input type="checkbox"/> SN <input type="checkbox"/> SW	9. PRIMARY DIAGNOSIS	10. TREATMENT DIAGNOSIS	11. VISITS FROM SOC.	
13. CURRENT PLAN UPDATE, FUNCTIONAL GOALS GOALS (Short Term) Achieve _ min. of exercise at an average MET level of		12. FREQ / DURATION (e.g.: 3/wk x 4 wk.): 3/wk x _ wk.		
OUTCOME (Long Term) Achieve _ min. of exercise at an average MET level of Develop risk modification plan of regular exercise		PLAN Increase workload as tolerated.  Provide education on		
I HAVE REVIEWED THIS PLAN OF TREATMENT AND RECERTIFY A CONTINUING NEED FOR SERVICES <input type="checkbox"/> N/A <input type="checkbox"/> DC		14. RECERTIFICATION FROM: THROUGH: <input type="checkbox"/> N/A		
15. PHYSICIAN'S SIGNATURE	16. DATE	17. ON FILE (Print / type physician's name) <input type="checkbox"/>		
18. REASON(S) FOR CONTINUING TREATMENT THIS BILLING PERIOD (clarify goals and necessity for continued skilled care Continue to monitor heart rate, blood pressure and weight.  Written, verbal and video information provided on				
19. SIGNATURE (or name of professional, including professional designation)		20. DATE	21 <input type="checkbox"/> CONTINUE SERVICES OR <input type="checkbox"/> DC SERVICES	
22. FUNCTIONAL LEVEL. (End of billing period) PROGRESS REPORT Current Level of Function:  Received information and questions were answered on				
23. SERVICE DATES FROM: THROUGH:				

FORM HCFA-701 (11-91)

## Q-Progress ITP Forms

The Q-Progress reporting application provides the user with customizable Cardiac and Pulmonary Individualized Treatment Plan (ITP) reports, which are now required by The Centers for Medicare and Medicaid Services (CMS) 42 CFR 410.49 - Medicare provision for Cardiac Rehab, 42 CFR 410.47 - Medicare provision for Pulmonary Rehab and AAVCPR for program reporting. The purpose of this document is to provide physician involvement in the patient's plan of care to be reviewed every 30 days until discharge from the rehabilitation program. The default Q-Progress ITP reports provide 6 tabs for both cardiac and pulmonary patients, satisfying the basic minimum requirements to be completed by the rehab staff. Each ITP tab covers a 30 day assessment period to include the following for both Cardiac and Pulmonary Rehabilitation patient populations:

### CARDIAC ITP Components

- **Exercise Assessment**
- **Exercise Plan**
  - Goals
  - Interventions
    - Exercise Prescription, Including Mode, Frequency, Duration, Intensity, Progression
  - Education
- **Exercise Reassessment**
- **Exercise Discharge/Follow-up**
- **Nutrition Assessment**
- **Nutrition Plan**
  - Goals
  - Interventions
  - Education
- **Nutrition Reassessment**
- **Nutrition Discharge/Follow-up**
- **Psychosocial Assessment**
- **Psychosocial Plan**
  - Goals
  - Interventions
  - Education
- **Psychosocial Reassessment**
- **Psychosocial Discharge/Follow-up**
- **Other Core Components as appropriate** (Tobacco cessation, Medications, Diabetes, Prevention/Management of CHF Exacerbations, etc.)
- **Assessment**
- **Plan**
  - Goals
  - Interventions
  - Education
- **Reassessment**
- **Discharge/Follow-up**

### PULMONARY ITP COMPONENTS

- **Oxygen Assessment**
  - **Oxygen Use and Titration Plan**
    - Goals
    - Interventions
    - Education
- **Oxygen Reassessment**
- **Oxygen Discharge/Follow-up**
- **Exercise Assessment**
- **Exercise Plan**
  - Goals
  - Interventions
    - Exercise Prescription, Including Mode, Frequency, Duration, Intensity, Progression
  - Education
- **Exercise Reassessment**
- **Exercise Discharge/Follow-up**
- **Nutrition Assessment**
- **Nutrition Plan**
  - Goals
  - Interventions
  - Education
- **Nutrition Reassessment**
- **Nutrition Discharge/Follow-up**
- **Psychosocial Assessment**
- **Psychosocial Plan**
  - Goals
  - Interventions
  - Education
- **Psychosocial Reassessment**
- **Psychosocial Discharge/Follow-up**
- **Other Core Components as appropriate** (Tobacco cessation, Medications [in particular inhaler medications], Prevention/Management of Exacerbations, etc.)
- **Assessment**
- **Plan**
  - Goals
  - Interventions
  - Education
- **Reassessment**

## Discharge/Follow-up

It is recommended that the user be familiar with the minimum AACVPR requirements prior to making any customizations to prevent any degradation of the validity of the document.

Each of the 3 domains is required to be assessed every 30 days. To accommodate this, the ITP provides the following pages:

- Initial Assessment – This page is to be filled out when a patient starts the program and is intended to report the initial assessment values. This worksheet includes a signature line for hospital/institutional approval.
- Re-Assessment 1 – This page is a 30 day follow up to the initial assessment. This worksheet includes a signature line for hospital/institutional approval.
- Re-Assessment 2 – This page is a 60 day follow up to the 30 day assessment. This worksheet includes a signature line for hospital/institutional approval.
- Re-Assessment 3 – This page is a 90 day follow up to the 60 day assessment. This worksheet includes a signature line for hospital/institutional approval.
- Re-Assessment 4 – This page is a 120 day follow up to the 90 day assessment. This worksheet includes a signature line for hospital/institutional approval.
- Discharge – This page is a final follow up to the previous assessments. This worksheet includes a signature line for hospital/institutional approval.
- Follow-up – This page is a final follow up to the previous discharge assessment. This worksheet includes a signature line for hospital/institutional approval.

The worksheets include:

- |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Cardiac – Initial</li> <li>• Cardiac – Reassessment 1</li> <li>• Cardiac – Reassessment 2</li> <li>• Cardiac – Reassessment 3</li> <li>• Cardiac – Reassessment 4</li> <li>• Cardiac – Discharge</li> <li>• Cardiac – Follow-up</li> </ul> | <ul style="list-style-type: none"> <li>• Pulmonary – Initial</li> <li>• Pulmonary – Reassessment 1</li> <li>• Pulmonary – Reassessment 2</li> <li>• Pulmonary – Reassessment 3</li> <li>• Pulmonary – Reassessment 4</li> <li>• Pulmonary – Discharge</li> <li>• Pulmonary – Follow-up</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**NOTE:** The Risk Factor checkboxes on the Discharge tab always reflect the values in Q-Tel. Changes to these values must be entered in Q-Tel. Manual changes to those checkboxes in the worksheets will be overridden the next time Q-Progress is run.

## Discharge Summary Report

The Discharge Summary Report features key patient session data including:

- Patient demographics
- Risk factors
- Up to 30 Medications (as listed in the user interface)
- Education classes attended
- Session summary information
- Up to 10 patient goals (as listed in the user interface)
- Comments
- Discharge plan

This report also includes key trending graphs for tracking patient improvement over the course of the sessions.

Figure 28 Sample Discharge Summary Report (page 1)

Discharge Summary Report		General Hospital	
Gerlack, Rubin J DOB: 3/2/1941	MRN: 894854 Age: 67	Primary Physician: Zelewski, Dennis Specialist Physician: Wilson, Susan	
Primary Diagnosis: MVR,TVR,AVR		HYPERTENSION	
Family Medical Hx: Pts. father died of pancreatic cancer - age 52. Chronic hypertension and high cholesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).			
Enrollment Date: 6/1/2007 Discharge Date: 8/10/2007 Sessions Comp: 36		Program: Cardiac [Cardiac] Risk Class: Moderate Gender: Male Return to work: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
AICD: <input type="checkbox"/> Pacer: <input type="checkbox"/>			
<b>Medications:</b>			
<b>Name</b>	<b>Dosage&amp;Unit</b>	<b>Frequency</b>	<b>Method</b>
Amlodipine	10mg	Daily	Oral
Aspirin	81mg	Daily	Oral
Calcium	600mg	PoBID	Oral
Cipro	500mg	3 x Daily	Oral
Citalopram	20mg	Daily	Oral
Coreg	25mg	BID	Oral
Digitek	25mg	DAILY	Oral
Effexor XR	150mg	Daily	Oral
Fluoxetine	20mg	Daily	Oral
Folic Acid	1mg	Daily	Oral
Hydrochlorothiazide	25mg	Daily	Oral
Hydroxychloroquin	200mg	Daily	Oral
Iscorbide	30mg	Daily	Oral
Lipitor	20mg	HS	Oral
Lisinopril	10mg	Daily	Oral
Metformin	850mg	BID 2x	Oral
Metoprol	25mg	DAILY	Oral
Metoprolol	100mg	Daily	Oral
Nebumetone	500mg	Daily	Oral
Nitroglycerin	0.4mg	PRN	Sublingual
Occuvite Preservision	1ea	Daily	Oral
Omega 3	1000mg	DAILY	Oral
Omeprazol	20mg	Daily	Oral
Plavix	75mg	Daily	Oral
Vitamin D	1000IU	DAILY	Oral
<b>Risk Factors:</b>			
<input checked="" type="checkbox"/> Tobacco Use	<input checked="" type="checkbox"/> Hyperlipidemia	<input checked="" type="checkbox"/> Hypertension	<input checked="" type="checkbox"/> Sedentary Life Style
<input type="checkbox"/> Diabetes	<input checked="" type="checkbox"/> Obesity	<input type="checkbox"/> Stress	<input checked="" type="checkbox"/> Family History
<input type="checkbox"/> Alcohol Use <input type="checkbox"/> Depression <input type="checkbox"/> Other			
Drug Abuse: None reported or observed.			
Comments:			
<b>Allergies:</b>			
Dust	Pollen	Mold	
Dander (Cat)	Latex		
<b>Med Allergies:</b>			
Penicillin	Sulfa Drugs	Codeine	
Latex			
<b>Education Classes Attended:</b>			
<input checked="" type="checkbox"/> Risk Factors	<input checked="" type="checkbox"/> Nutrition	<input checked="" type="checkbox"/> Exercise	<input type="checkbox"/> Other
<input type="checkbox"/> Stress Mgmt	<input type="checkbox"/> Medications	<input type="checkbox"/> Making Lifestyle Changes	<input type="checkbox"/> Emotional Aspects of Heart Disease
		<input type="checkbox"/> Meditation	<input checked="" type="checkbox"/> Anatomy and Function of the Heart

Figure 29 Sample Discharge Summary Report (page 2)

Discharge Summary Report			General Hospital		
Gerlack, Rubin J			MRN: 894854		Primary Physician: Zelewski, Dennis
Session Summary: 1 36			ECG (from Rhythm Strips): <input type="checkbox"/> Normal Sinus Rhythm		
Date:	1-Jun-07	10-Aug-07	<input type="checkbox"/> No Change	<input type="checkbox"/> Conduction Delay	<input type="checkbox"/> ST/T Wave Changes
Weight:	210.0	182.0	<input type="checkbox"/> Ectopy	<input type="checkbox"/> Dysrhythmia	<input type="checkbox"/> Other
Height:	71		Comments		
BMI:	29.4	25.4	Symptoms: <input type="checkbox"/> None <input type="checkbox"/> Angina <input type="checkbox"/> SOB <input type="checkbox"/> Dizziness <input type="checkbox"/> Other		
Resting HR:	77	76	Comments		
Resting BP:	145/88	126/69			
Exercise HR:	85	142			
Exercise BP:	145/89	132/71			
Max METS:	3.6	7.5			
Patient Goals:					
Met	Not Met	In Progress			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500)		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lose weight (25 pounds)		
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Quit smoking		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Summary Notes:					
Discharge Plan:					
Case Manager: _____			Date: _____		

## Discharge Summary Report - Trending

The Discharge Summary Report features trends in key patient parameters.

## Customizing the Discharge Graphs

You can customize the graphs in the discharge summary report by selecting parameters to compare with each other or across modalities. Access and print the Discharge Summary report as for all other reports.

**NOTE:** In order to see the Discharge Summary trending graphs; you must open the Discharge Summary report through Q-Progress. The trending graphs use macros. If you open the report using Excel, you must enable macros.

These reports compare two parameters across each modality:

- **Rest** graph—compares parameters across the Rest modality
- **Exercise** graph—compares parameters across the Exercise modality. These reports compare one parameter across multiple modalities.
- **Rest and Exercise** graph—compares one parameter across the Rest and the Exercise modalities
- **Configurable** graph—compares one parameter across the Rest, Exercise, and Recovery modalities

To customize the reports from Q-Progress:

- Select a patient and then select the **Discharge** tab. To the right of the graph are the selection boxes for the parameters.
  - For the **Rest** graph and the **Exercise** graph, select each parameter to compare. The name of the graph changes to include the selected parameters. If the scales are different, the scale for the first parameter displays on the left of the graph and the scale for the second parameter displays to the right of the graph. The key for the parameters displays with the settings at the bottom of the graph.
  - For the **Rest and Exercise** graph and the Configurable graph, select the parameter to compare.

The name of the graph changes to include the selected parameter. The key for the modalities displays with the settings for the parameter at the bottom of the graph.

*NOTE: If there is no data for the selected parameter, the graph does not display a marker or data for that parameter.*

Figure 30 Sample Discharge Summary Report – Trending (page 1)

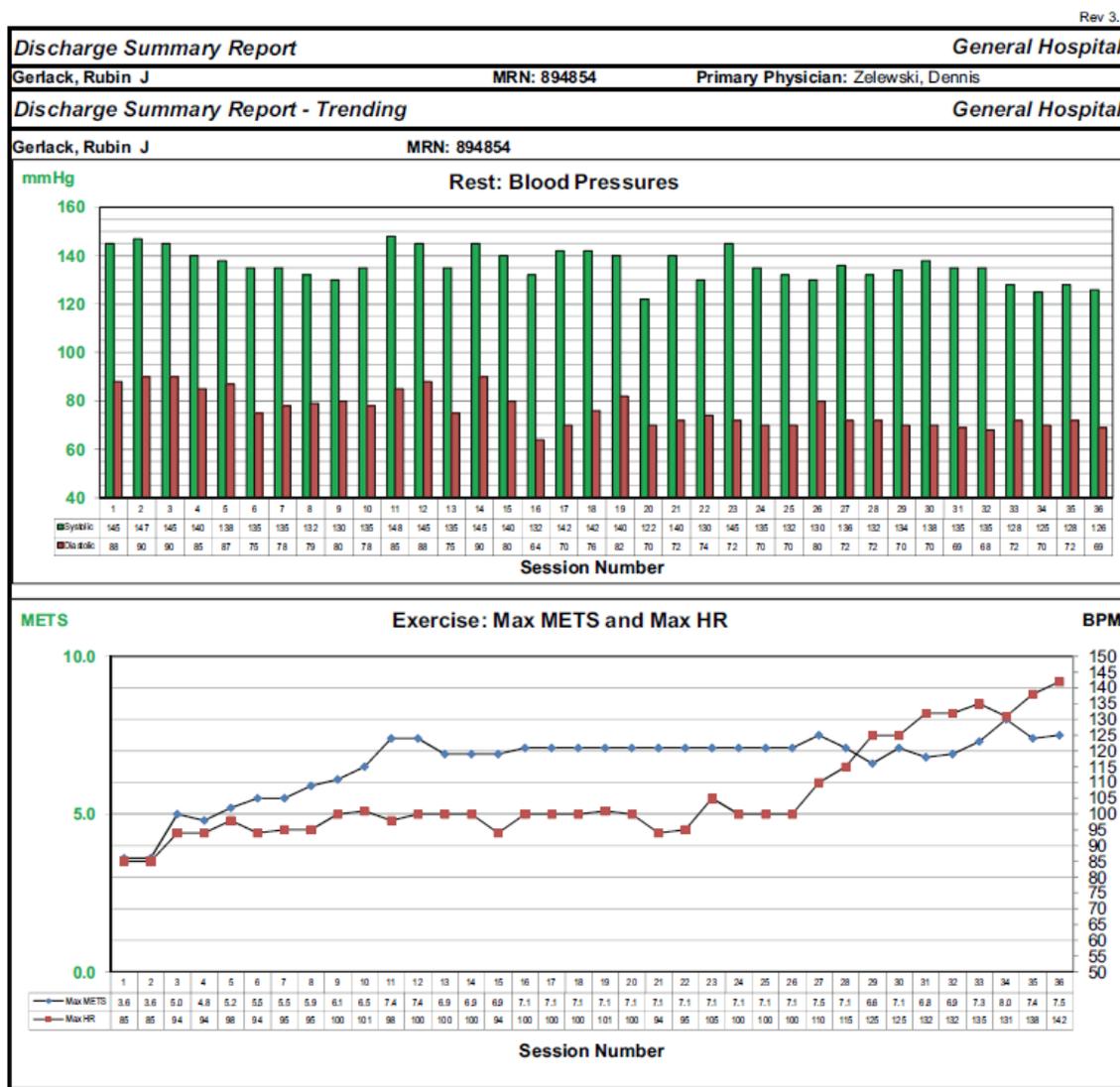


Figure 31 Sample Discharge Summary Report – Trending (page 2)

Rev 3.1

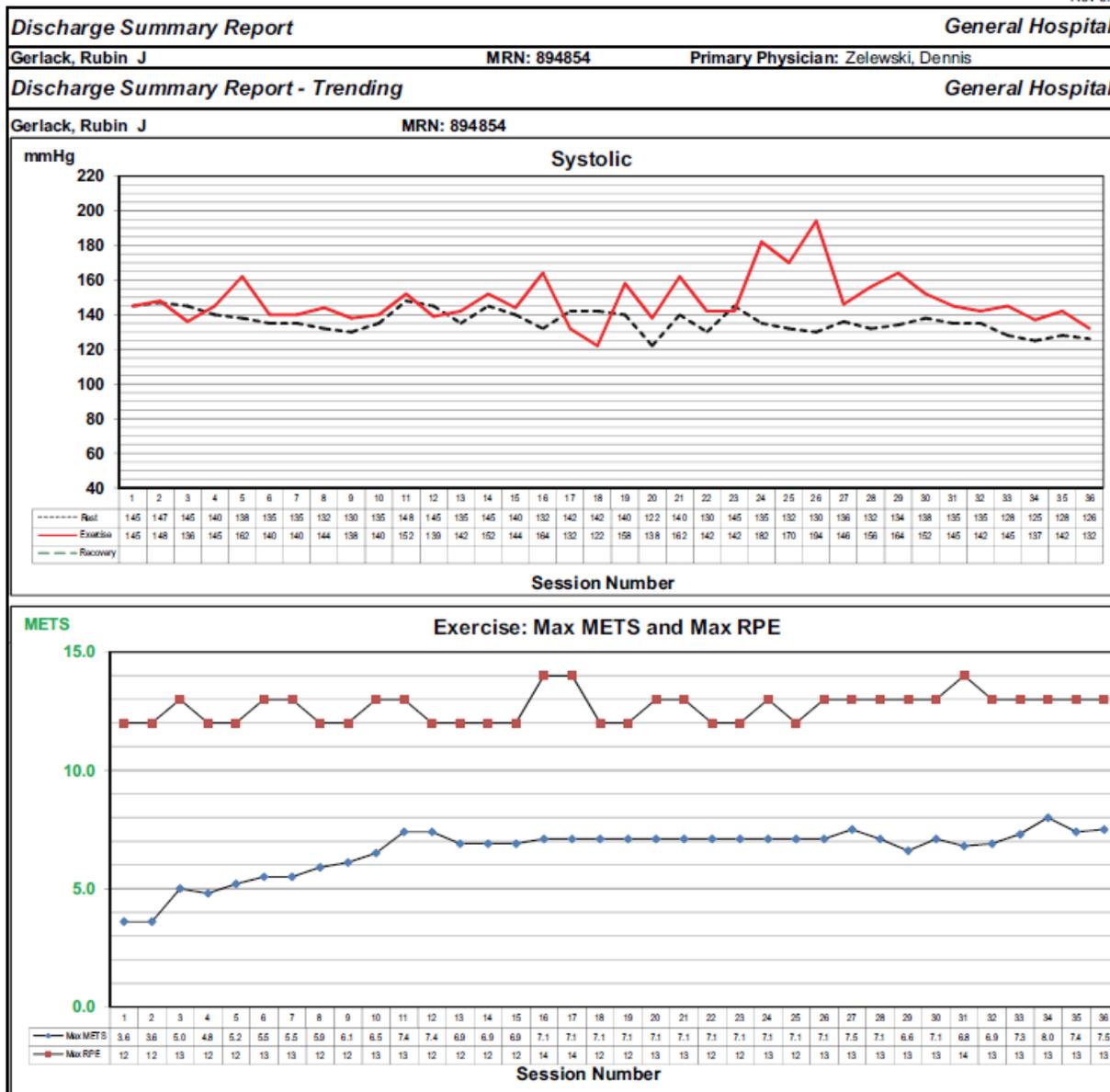
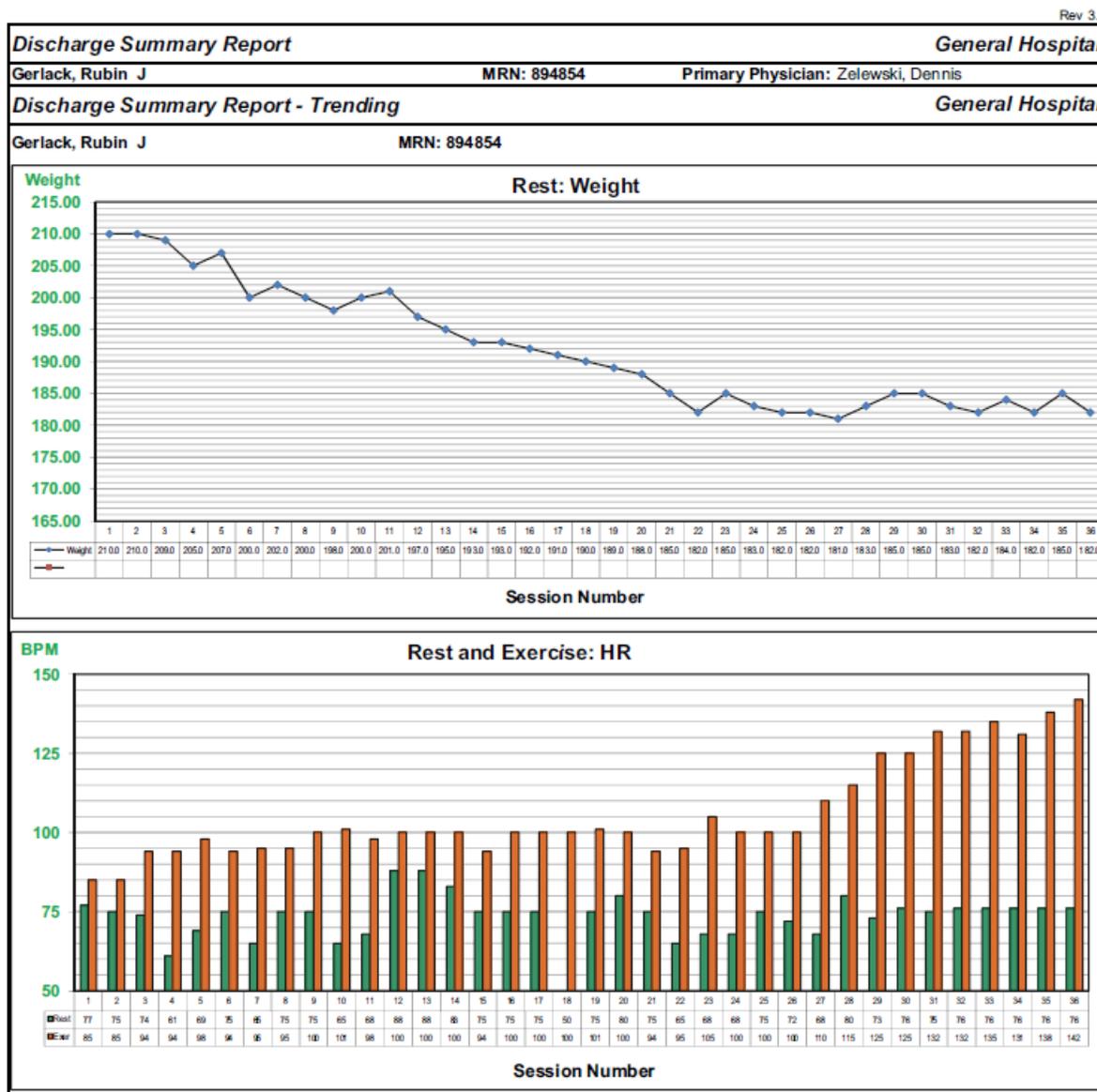


Figure 32 Sample Discharge Summary Report – Trending (page 3)



**Q-Progress 36 Visit Report (36 Visit Report)**

The Q-Progress reporting application provides the user with a comprehensive report of all sessions completed up to a total of 36. This report is auto populated with clinical data from the Q-Tel application. The clinical data that auto populates is as follows:

- Resting Heart Rate
- Resting Blood Pressure
- Maximum Exercise Heart Rate
- Maximum Exercise Blood Pressure
- Average Exercise SpO2
- Recovery Heart Rate
- Recovery Blood Pressure

The bottom part of the report provides an area for additional comments.

### Q-Progress Medication Reconciliation Report (Med Rec)

The Q-Progress reporting application provides the user with a comprehensive report of all medications, up to a total of 30. The medication data that auto populates is as follows:

- Medication Name
- Medication Dosage and Unit
- Medication Frequency
- Method of Administration
- Medication Start Date (Reconciliation Date)
- Medication Stop Date

The bottom part of the report provides an area for additional comments.

***NOTE:** for the medication listings, if the Reconciled (or Start) date is missing, the “Stopped” date will look like the initial date.*

### Q-Progress Blood Pressure Report (BP Report)

The Q-Progress reporting application provides the user with a graphic trending report of blood pressures recorded for each session, up to a total of 36. The clinical data that auto populates is as follows:

- Resting Blood Pressure
- Maximum Exercise Blood Pressure
- Recovery Blood Pressure

### Summary Outcomes Report

The Q-Progress program automatically generates the Patient Summary Report with Session Data for Sessions 1, 18, and 36 displayed by default.

***NOTE:** The Patient Summary report displays according to how the Q-Tel RMS headings have been customized.*

The first section of the Patient Summary report displays a header containing:

- Patient demographics
- Up to 30 Medications (as listed in the user interface)
- Program information

The second section displays the report range information.

The Report Range information indicates the displayed data in the rest of the Summary Outcomes Report.

By changing the first session, mid session, and last session numbers in the report cells, you can display different sessions. For example, to see patient outcomes data for the first week of sessions, and enter 1 for the First Session, 2 for the mid session, and 3 for the Last Session.

***NOTE:** The Report Range selections do not persist when you close the Q-Progress report, so the next time you open the report, the default values of 1, 18, and 36 display. Any edited session data, will persist. It is strongly recommended that you edit patient data in Q-Tel RMS and allow Q-Progress to automatically generate the report with that data.*

---

The remaining sections of the Summary Report display the patient session data for the specified sessions and the Quality of Life Surveys data for sessions 1, 18, and 36.

**NOTE:** The Quality of Life Surveys section does not automatically update to the specified sessions. However, you can manually change the session number identifiers.

The patient session data displays under the headers: Resting Data, Exercise Data, and Recovery Data. In addition 'Open' fields correspond to the parameters defined in Q-Tel RMS, and reflect the Q-Tel RMS data you entered. The report format provides for four additional parameters in Rest and three additional parameters in Exercise.

**NOTE:** New parameters defined in Q-Tel RMS for Recovery do not display or print on the report.

Figure 33 Example of the Summary Outcomes Report

Summary Outcomes Report		General Hospital							
Getack, Rubin J		MRN: 894854	Primary Physician: Zekowski, Dennis						
DOB: 2-Mar-41	Age: 67	Specialist Physician: Wilson, Susan							
Primary Diagnosis: MVR, TVR, AVR		HYPERTENSION							
Family Medical Hx: Pts. father died of pancreatic cancer - age 52. Chronic hypertension and high cholesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).									
Enrollment Date: 1-Jun-07		Program: Cardiac (Cardiac)							
Discharge Date: 10-Aug-07		Risk Class: Moderate							
Sessions Comp: 36		Gender: Male							
		AED: <input type="checkbox"/>	Pacer: <input type="checkbox"/>						
<b>Medications:</b>									
Name	Dose/Unit	Frequency	Method	Start Date	Stop Date				
Amlodipine	10mg	Daily	Oral	03/19/2004	09/15/2007				
Aspirin	81mg	Daily	Oral	07/08/2006					
Calcium	600mg	PoBID	Oral	08/05/2007					
Cipro	500mg	3 x Daily	Oral	08/12/2007	08/22/2007				
Clonidine	20mg	Daily	Oral	1/20/2006					
Coniq	25mg	BID	Oral	05/04/2007					
Digitek	25mg	DAILY	Oral	07/11/2007					
Eliquis XR	150mg	Daily	Oral	07/01/2006	09/15/2007				
Furosilene	20mg	Daily	Oral	08/01/2005	03/12/2008				
Folic Acid	1mg	Daily	Oral	08/18/2007					
Hydrochlorothiazide	25mg	Daily	Oral	05/18/2006					
Hydrochloroquin	200mg	Daily	Oral	03/18/2006					
Isosorbide	30mg	Daily	Oral	05/15/2007	08/15/2007				
Lipitor	20mg	HS	Oral	1/20/2006					
Lisinopril	10mg	Daily	Oral	08/08/2005					
Metformin	850mg	BID 2x	Oral	08/08/2006					
Metoprol	25mg	DAILY	Oral	05/22/2007					
Metoprolol	100mg	Daily	Oral	03/18/2006					
Nebumstone	500mg	Daily	Oral	03/15/2007					
Nitroglycerin	0.4mg	PRN	Sublingual	1/10/2005					
Cozaart Provention	1ea	Daily	Oral	07/11/2007					
Omega 3	1000mg	DAILY	Oral	08/15/2007					
Omeprazol	20mg	Daily	Oral	04/21/2007					
Plavix	75mg	Daily	Oral	08/21/2006					
Vitamin D	1000IU	DAILY	Oral	08/12/2007					
<b>Report Range:</b>									
Sessions:	1	Sessions:	18						
1-Jun-07		5-Jul-07							
Sessions:	36	10-Aug-07							
<b>Resting Data</b>									
Session	HR	Weight	HR	Systolic	Diastolic	Glucose	SpO2		
1	77	210		145	88		95		
18	50	190		142	76		99		
36	76	182		126	89		98		
Percent	-7%	-13%		-13%	-22%		3%		
<b>Exercise Data</b>									
Session	Time	HR	METS	RPE	% THR	Systolic	Diastolic	SpO2	
1	0:34:00	85	3.8	12		146	89	92	
18	0:55:18	100	7.1	12		122	78	95	
36	1:09:03	142	7.5	13		130	71	99	
Percent	82%	87%	108%	8%		-9%	-20%	8%	
<b>Recovery</b>									
Session	Time	HR	%THR	Systolic	Diastolic	SpO2			
1	0:20:00	80		150	92				
18	0:14:25	88		130	75				
36	0:14:05	71		127	85				
Percent		-30%		-15%	-20%				
<b>Quality of Life Surveys</b>									
Session	Duke	Functional METS	Dartmouth						
1	26.8	6.0	37						
18	39.2	7.8	28						
36	45.2	8.3	21						
Percent	85%	38%	-43%						
<b>Comments</b>									
Pt. seems motivated to achieve all stated goals and is willing to attend recommended education classes as well as do the exercise activities.									
Case Manager: _____ Date: August 20, 2008 _____									

### Critical Comments Summary

The Critical Comments report reflects all the critical comments recorded in the Q-Tel RMS during the program.

The first section of the Critical Comments report displays a header containing:

- Patient demographics
- Up to 30 Medications (as listed in the user interface)
- Up to 10 Patient Goals (as listed in the user interface). The next section lists the comments.

Figure 34 Example of the Critical Comments Summary

Critical Comments Summary		General Hospital			
Gerlack, Rubin J		Risk Class: Moderate	MRN: 894854		
Gender: Male	Entry Weight: 210.0	Primary Physician: Zelewski, Dennis			
DOB: 3/2/41	Age: 67	Specialist Physician: Wilson, Susan			
Enrollment Date: 6/11/07	Height: 71	AICD: <input type="checkbox"/>	Pacer: <input type="checkbox"/>		
Discharge Date: 8/10/07	Program: Cardiac [Cardiac]	Sessions Approved: 36	Sessions Finished: 36		
<b>Medications:</b>					
Name	Dosage&Unit	Frequency	Method	Start Date	Stop Date
Amlodipine	10mg	Daily	Oral	03/19/2004	09/15/2007
Aspirin	81mg	Daily	Oral	07/08/2006	
Calcium	600mg	PoBID	Oral	08/05/2007	
Cipro	500mg	3 x Daily	Oral	08/12/2007	08/22/2007
Citalopram	20mg	Daily	Oral	12/05/2006	
Coreg	25mg	BID	Oral	05/04/2007	
Digitek	25mg	DAILY	Oral	07/11/2007	
Effacor XR	150mg	Daily	Oral	07/01/2005	09/15/2007
Fluoxetine	20mg	Daily	Oral	09/01/2005	03/12/2008
Folic Acid	1mg	Daily	Oral	06/18/2007	
Hydrochlorothiazide	25mg	Daily	Oral	05/18/2006	
Hydroxychloroquin	200mg	Daily	Oral	03/18/2008	
Isosorbide	30mg	Daily	Oral	05/15/2007	08/15/2007
Lipitor	20mg	HS	Oral	12/03/2006	
Lisinopril	10mg	Daily	Oral	08/08/2005	
Metformin	850mg	BID 2x	Oral	08/08/2006	
Metoprol	25mg	DAILY	Oral	05/22/2007	
Metoprolol	100mg	Daily	Oral	03/18/2006	
Nebumetone	500mg	Daily	Oral	03/15/2007	
Nitroglycerin	0.4mg	PRN	Sublingual	11/01/2005	
Occuvite Preservision	1ea	Daily	Oral	07/11/2007	
Omega 3	1000mg	DAILY	Oral	08/15/2007	
Omeprozol	20mg	Daily	Oral	04/21/2007	
Plavix	75mg	Daily	Oral	09/21/2006	
Vitamin D	1000IU	DAILY	Oral	08/12/2007	
<b>Primary Diagnosis:</b> MVR,TVR,AVR		HYPERTENSION			
<b>Family Medical Hx:</b> Pts. father died of pancreatic cancer - age 52. Chronic hypertension and high cholesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).					
<b>Patient Goals:</b> Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500) Lose weight (25 pounds) Quit smoking					
<b>Comment #</b>					
1	Session: 1	Date: 6/1/07	SR NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.		
2	Session: 2	Date: 6/3/07	SR NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.		
3	Session: 3	Date: 6/5/07	SR W INFERIOR T WAVE INVERSION. NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.		
4	Session: 4	Date: 6/7/07	SR W INFERIOR T WAVE INVERSION. NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.		
5	Session: 5	Date: 6/9/07	SR W INFERIOR T WAVE INVERSION. NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.		
6	Session: 6	Date: 6/11/07	SR W INFERIOR T WAVE INVERSION. NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.		
7	Session: 7	Date: 6/13/07			

## Patient Session Summary

The Session Data (Patient Session Summary) features data for all available sessions (up to 36 sessions).

The first section of the Patient Session Summary report displays a header containing:

- Patient demographics
- Up to 30 medications (as listed in the user interface)
- Up to 10 patient goals (as listed in the user interface)

Subsequent pages display with an abbreviated header. For example, Figure 35 displays the header and Figure 36 displays an example of the session data.

**Figure 35 Example of the Patient Session Summary (page 1)**

Patient Session Summary		General Hospital			
Gerlack, Rubin J		Risk Class: Moderate			
MRN: 894854		Primary Physician: Zelewski, Dennis			
Gender: Male		Specialist Physician: Wilson, Susan			
DOB: 3/2/41		AICD: <input type="checkbox"/> Pacer: <input type="checkbox"/>			
Enrollment Date: 6/1/07		Sessions Approved: 36			
Discharge Date: 8/10/07		Sessions Finished: 36			
Entry Weight: 210.0		Program: Cardiac [Cardiac]			
Age: 67					
Height: 71					
<b>Medications:</b>					
Name	Dosage&Unit	Frequency	Method	Start Date	Stop Date
Amlodipine	10mg	Daily	Oral	03/19/2004	09/15/2007
Aspirin	81mg	Daily	Oral	07/08/2006	
Calcium	600mg	PoBID	Oral	08/05/2007	
Cipro	500mg	3 x Daily	Oral	08/12/2007	08/22/2007
Citalopram	20mg	Daily	Oral	12/05/2006	
Coreg	25mg	BID	Oral	05/04/2007	
Digitex	25mg	DAILY	Oral	07/11/2007	
Eflexor XR	150mg	Daily	Oral	07/01/2005	09/15/2007
Fluoxetine	20mg	Daily	Oral	09/01/2005	03/12/2008
Folic Acid	1mg	Daily	Oral	06/18/2007	
Hydrochlorothiazide	25mg	Daily	Oral	05/18/2006	
Hydroxychloroquin	200mg	Daily	Oral	03/18/2008	
Isosorbide	30mg	Daily	Oral	05/15/2007	08/15/2007
Lipitor	20mg	HS	Oral	12/03/2006	
Lisinopril	10mg	Daily	Oral	08/08/2005	
Metformin	850mg	BID 2x	Oral	08/08/2006	
Metoprol	25mg	DAILY	Oral	05/22/2007	
Metoprolol	100mg	Daily	Oral	03/18/2006	
Nebumelone	500mg	Daily	Oral	03/15/2007	
Nitroglycerin	0.4mg	PRN	Sublingual	11/01/2005	
Occuvite Preservision	1ea	Daily	Oral	07/11/2007	
Omega 3	1000mg	DAILY	Oral	06/15/2007	
Omeprazol	20mg	Daily	Oral	04/21/2007	
Plavix	75mg	Daily	Oral	09/21/2006	
Vitamin D	1000IU	DAILY	Oral	08/12/2007	
<b>Primary Diagnosis:</b> MVR,TVR,AVR		HYPERTENSION			
<b>Family Medical Hx:</b> Pts. father died of pancreatic cancer - age 52. Chronic hypertension and high cholesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).					
<b>Patient Goals:</b> Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500) Lose weight (25 pounds) Quit smoking					

Figure 36 Example of the Patient Session Summary (page 2)

Patient Session Summary										General Hospital				
Gerlack, Rubin J					Risk Class: Moderate					MRN: 894854				
Gender: Male			Entry Weight: 210.0			Primary Physician: Zelewski, Dennis								
DOB: 3/2/41			Age: 67			Specialist Physician: Wilson, Susan								
Enrollment Date: 6/1/07			Height: 71			AICD: <input type="checkbox"/>			Pacer: <input type="checkbox"/>					
Discharge Date: 8/10/07			Program: Cardiac [Cardiac]			Sessions Approved: 36			Sessions Finished: 36					
Session: 1										Date: 6/1/2007				
Resting Data:										Monitored				
HR	Weight	tHR	Systolic	Diastolic	Glucose	SpO2								
77	210		145	88		95								
Patient Comment:		PATIENT VERBALIZES AN UNDERSTANDING OF HOME EXERCISE AND THE EXPECTATION OF REGULAR EXERCISE OUTSIDE OF CLASS.												
Exercise Data:														
Activity	Time	Workload	HR	METS	RPE	% THR	Systolic	Diastolic	SpO2					
Warm up	5:00		75											
Treadmill	18:00	Speed 3.0, Grade 0.0,	85	3.3	12		145	89						
REC BIKE 7	15:00	LEVEL 4	85	3.6	12				92					
Recovery	20:00		80				150	92						
Comment:	CONSENTS SIGNED, CLASS SEQUENCE AND SCHEDULE EXPLAINED. PATIENT VERBALIZES AN UNDERSTANDING OF THE RISKS AND BENEFITS OF OUT PATIENT CARDIAC REHAB.													
Session: 2										Date: 6/3/2007				
Resting Data:										Monitored				
HR	Weight	tHR	Systolic	Diastolic	Glucose	SpO2								
75	210		147	90		96								
Patient Comment:		20 MIN WALK AT HOME												
Exercise Data:														
Activity	Time	Workload	HR	METS	RPE	% THR	Systolic	Diastolic	SpO2					
Warm up	5:00		75											
Treadmill	20:00	Speed 3.0, Grade 0.0,	85	3.3	12		148	91						
REC BIKE 7	20:52	LEVEL 4	85	3.6	12				96					
Recovery	20:27		100				150	93						
Comment:	WILL BRING IN DHS AND MEDS NEXT CLASS--CHEST AND LEFT LEG INCISIONS HEALING WELL WITH GOOD O2 SATS--LUNG FIELDS CLEAR													

Although you can correct Q-Tel RMS data entry errors by editing the values on this sheet, the changes made in Q-Progress do not update data used by Q-Tel RMS, therefore Quinton strongly recommends correcting the errors using the Charting and Editing tools within Q-Tel RMS.

The Q-Progress report does not display:

- Text data entered in the Rest workload field in Q-Tel RMS
- An RPE value entered for Recovery in Q-Tel RMS
- New parameters defined in Q-Tel RMS for Recovery

The report displays up to ten exercise modalities. If there are more than ten, only the first ten display on the report.

## Duke Activity Status Index

Use the Duke Activity Status Index (DASI) to track activity. Q-Progress automatically scores the test, and displays the results on the Summary Report.

Figure 37 Example of the Duke Activity Status Index

Gerlack, Rubin J		MRN: 894854		
<i>Duke Activity Status Index</i>				
Can you ... (Check <input checked="" type="checkbox"/> each box to indicate YES)		Session Number		
		1	18	36
1	Take care of yourself, that is, eating, dressing or using the toilet?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	Walk indoors, such as around your house?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	Walk a block or 2 on level ground?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	Climb a flight of stairs or walk up a hill?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Run a short distance?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	Do light work around the house like dusting or washing the dishes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	Do moderate work around the house like vacuuming, sweeping floors, or carrying in groceries?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	Do heavy work around the house like scrubbing floors, or lifting or moving heavy furniture?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9	Do yardwork like raking leaves, weeding, or pushing the lawn mower?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10	Have sexual relations?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
11	Participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12	Participate in strenuous sports like swimming, singles tennis, football, basketball or skiing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Score:		26.8	39.2	45.2
Functional Capacity in METS:		6.03	7.56	8.3

## Dartmouth Quality of Life Index

The Dartmouth Quality of Life Index provides functionality similar to the Duke Index sheet.

## Feelings

During the past 4 weeks how much have you been bothered by emotional problems such as feeling anxious, depressed, irritable or downhearted and blue?

Feelings	Session Number		
	1	18	36
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slightly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moderately	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quite a bit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extremely	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Physical Fitness

During the past 4 weeks what was the hardest physical activity you could do for at least 2 minutes?

Physical Fitness	Session Number		
	1	18	36
Very Heavy Run Fast; Carry Heavy Loads Uphill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heavy Jog; Climb Stairs or Hill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moderate Walk Medium; Carry Light Loads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Light Walk Medium; Carry Light Loads	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very Light Walk Slow; Wash Dishes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Social Support

During the past 4 weeks was someone available to help you if you needed and wanted help? For example, if you:

- Felt very nervous, lonely, or blue
- Got sick and had to stay in bed
- Needed someone to talk to
- Needed help with daily chores
- Needed help just taking care of yourself

Social Support	Session Number		
	1	18	36
Yes, as much as I wanted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yes quite a bit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yes, some	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yes, a little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No, not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Daily Activities

During the past 4 weeks how much difficulty have you had doing your usual activities or tasks, both inside and outside the house because of your physical and emotional health?

Daily Activities	Session Number		
	1	18	36
No difficulty at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A little bit of difficulty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some difficulty	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Much difficulty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Could not do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Social Activities

During the past 4 weeks has your physical and emotional health limited your social activities with family, friends, neighbors or groups?

Social Activities	Session Number		
	1	18	36
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slightly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moderately	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quite a bit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extremely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Pain

During the past 4 weeks how much bodily pain have you generally had?

Pain	Session Number		
	1	18	36
No pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very mild pain	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mild pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moderate pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Severe pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Overall Health

During the past 4 weeks how would you rate your health in general?

Overall Health	Session Number		
	1	18	36
Excellent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fair	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Quality of Life

How have things been going for you during the past 4 weeks?

Overall Health	Session Number		
	1	18	36
Very well - Could hardly be better	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pretty good	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good & bad parts about equal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pretty bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very bad - Could hardly be worse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Change in Health

How would you rate your overall health now compared to 4 weeks ago?

Change in Health	Session Number		
	1	18	36
Much better	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A little better	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
About the same	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
A little worse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Much worse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Summary

The summary for the index.

Summary	Session Number		
	1	18	36
<b>Score:</b>	29	0	0

## Weekly Summary Report

The Weekly Summary Report is formatted the same as the Summary Report described in the previous section. It provides a mechanism for specifying a range of sessions to report on and automatically prints those reports for the selected patients on a single page. The reports for patients who have no data within the specified session ranges will have blank spaces in the report for those sessions.

The Weekly Summary Report is valid only for patients with 36 sessions or less. To generate the weekly summary report:

1. Check the boxes corresponding to patients you want to include in the report.
2. Select the **Weekly Summary Report** menu or toolbar option.

The system displays a dialog box that allows you to select the sessions and the patients you want to include in the report.

Field	Description
<b>Specify Sessions</b>	<ul style="list-style-type: none"> <li><b>Default</b> - Prints the three most recent sessions for selected patients.</li> </ul> <p>For example, if a patient has completed 7 sessions, this option generates the Patient Summary Report with sessions 5, 6, and 7 as the displayed defaults.</p> <p>Use this option to print Weekly Summary Reports for selected patients.</p> <ul style="list-style-type: none"> <li><b>Custom</b> - Specify the three sessions you would like to report on.</li> </ul> <p>You must provide a Beginning, Middle, and Ending session. For example, you may choose to view a range of sessions such as Sessions 10, 15, and 20.</p> <p>Patients who have not completed the selected sessions are not printed.</p>
<b>Select Patients</b>	<p>To select Patients for a Weekly Summary Report choose a method:</p> <ul style="list-style-type: none"> <li>Click on the box next to the patient to display a check mark.</li> <li>Press the <b>TAB</b> key to navigate to the Patient list, use the <b>UP</b> and <b>DOWN</b> arrow keys to select a patient and then press the <b>SPACEBAR</b> to display or remove the checkmark.</li> </ul>

## AACVPR Registry Worksheets

The Q-Progress AACVPR Registry worksheets gather some information from the Q-Tel RMS application and also allow manual entry of all fields tracked via the AACVPR Cardiac Outcomes Registry. The data collected on this worksheet can be sent directly to the AACVPR Registry from both the AACVPR Discharge and the AACVPR Follow-up worksheets. To enable (display) the worksheets you will need:

- Your AACVPR Registry ID & password. These credentials are provided by AACVPR.
- Your Quinton authentication code. This can be obtained by contacting Quinton Technical Support and providing them with the last 6 digits of your registry ID.

Population of data via Q-Tel RMS: Some of the data in the AACVPR Registry worksheets is populated from Q-Tel RMS via Q-Progress and some fields can be populated using data from Q-Exchange (optional). Please see the list at the end of this section of fields auto-populated. In order for data to be populated from Q-Exchange, the appropriate fields must be filled out in Q-Tel and the Q-Exchange data needs to be exported. Please consult the Q-Tel RMS User's Manual for details on exporting Q-Exchange data.

## Using the AACVPR Registry Worksheets

The AACVPR Registry worksheets consist of the following:

**AACVPR Intake:** Use this sheet to fill in the fields that describe the patient when they started their rehabilitation. Some of the data will be populated from data in the Q-Tel RMS program. If this data is incorrect, it is best to update the appropriate fields in Q-Tel RMS so the worksheets will be consistent with Q-Tel RMS. Some data, such as patient name and MRN can only be entered/edited on the Intake sheet. The same applies to units of measurement for anthropometric data, lipids/glucose and functional assessments. Please make sure the data you are entering corresponds with the units shown.

**AACVPR Discharge:** Use this sheet to fill in the fields that describe the patient upon discharge from the program. Similar to the intake worksheet, some of the data will be populated from data in Q-Tel RMS.

**AACVPR Follow-up:** Use this sheet to fill in the fields that indicate the patient's condition during a follow-up visit. The data on this page is not populated with data because Q-Tel RMS does not track follow-up visits.

This AACVPR Discharge and AACVPR Follow-up worksheets include a button to send the data directly to the registry. In order for this action to be successful, the computer needs to be connected to the Internet, and the AACVPR credentials must be correct. Update your AACVPR credentials on the "Cover" worksheet. Information should only be transmitted to the Registry at Discharge, and then again at Follow-Up. Any transmission to the registry includes all information contained in the AACVPR tabs. (So if you don't send it at Discharge, you can complete all three tabs at Follow-Up, and then send the data once.) After you press the "Send" button, the system displays progress and the success of the transmission.

***NOTE:** Demographic data on the AACVPR Discharge and AACVPR Follow-up worksheets for the patient will reflect the data on the AACVPR Intake worksheet and can only be updated on the AACVPR Intake worksheet.*

## List of Auto-Populated AACVPR Fields

The following tables list fields that automatically populate from Q-Progress or Q-Exchange.

### AACVPR Programs Intake

<b>Demographics</b>	
Patient Last Name	Q-Progress
DOB	Q-Progress
Gender	Q-Progress
Zip Code	Q-Exchange
Primary Physician	Q-Progress
MRN	Q-Progress
Race	Q-Exchange
Specialist Physician	Q-Progress
Primary Insurance	Q-Exchange
Secondary Insurance	Q-Exchange
<b>Medical History</b>	
Hyperlipidemia	Q-Progress
Hypertension	Q-Progress
Diabetes	Q-Progress
<b>Program Intake</b>	
Enrollment Date	Q-Progress
Prescribed Sessions	Q-Progress
AACVPR Risk Category	Q-Progress
<b>Clinical Outcomes</b>	
Lipids Date	Q-Exchange
Total	Q-Exchange
TG	Q-Exchange
HDL	Q-Exchange
LDL	Q-Exchange
FBG	Q-Progress
A1C	Q-Exchange
Systolic	Q-Progress
Diastolic	Q-Progress
Weight	Q-Progress
Height	Q-Progress
<b>Tobacco Use Status</b>	
Use	Q-Exchange
Quit Date	Q-Exchange
Average Packs Per Day	Q-Exchange
Years	Q-Exchange
Exercise Minutes/Day	Q-Exchange
Exercise Days/Week	Q-Exchange

### AACVPR Programs Discharge

<b>Program Discharge</b>	
Sessions Completed	Q-Progress
ECG Monitored Sessions	Q-Progress
<b>Clinical Outcomes</b>	
Lipids Date	Q-Exchange
Total	Q-Exchange
TG	Q-Exchange
HDL	Q-Exchange
LDL	Q-Exchange
Systolic	Q-Progress
Diastolic	Q-Progress
Weight	Q-Progress
Height	Intake

## Printing Q-Progress Worksheets

Each individual worksheet can be printed using Excel's print functions. Excel includes a "print preview" feature to help you gauge how the printed worksheets appear when printed. Please be sure to install the appropriate print drivers and print a few initial reports to ensure that the reports print as intended. Prior to printing, we recommend saving the worksheet. Only one worksheet should be printed at a time.

## Troubleshooting

This section describes resolutions to common issues.

Problems	Possible Solution/Explanation
A "Compatibility Checker" popup is seen when opening the Q-Progress worksheets.	Depending on the version of Excel used, some compatibility notices may appear when saving the template or patient report. Provided you continue using the same (or a newer) version of Excel, you can disable Compatibility Checker.
User is prompted with, "Do you want to replace the contents of the destination cells?" message.	While updating a report from the Q-Progress utility, this message may appear. Answer Yes to ensure the latest patient information is included in the Excel report.
Error message received when attempting to send data to the registry.	Check internet connection is available and AACVPR Registry credentials are correct.
Data in worksheet is not being updated with current Q-Tel information.	Check that the cell where the data is expected to be updated contains a formula and that the formula was not overwritten.
Risk Factors checkboxes overwrite user selections when re-opened the Q-Progress worksheet.	The Risk Factors checkboxes will always update to reflect the data in the Q-Tel RMS application. Make changes to these values in Q-Tel RMS.

## Q-Progress and Microsoft Excel

Q-Progress uses Microsoft Excel for report generation. All report formats and computations are controlled using a single Excel template file that consolidates all of the reports into one workbook. This section provides tips and suggestions on how to get the most out of the capabilities of Q-Progress and Excel.

### Q-Progress integration with Excel

When Q-Progress generates the reports for a patient, it first looks to see if it has previously created the Excel file for the patient. If so, it opens the existing Excel file and updates the Patient.csvtab of the workbook with the current Q-Tel RMS data for all sessions.

Any session data edits you make in Q-Tel RMS Charting and Editing are reflected in the updated data exported into the Excel workbook for the patient. Quinton strongly recommends that edits to session data occur in Q-Tel RMS and not in the Excel Session Report.

If Q-Progress doesn't find the Excel file for the patient in the Storage Directory (see [Configuring the Storage Directory](#)) it uses the template file to create an Excel file for this patient and loads the Q-Tel RMS data into the Patient.csv tab of the workbook. This ensures that the data not otherwise managed by Q-Tel RMS (for example, information you enter onto the HCFA forms, educational classes attended, any customized data fields added by your organization, etc.) is saved and available on subsequent access to the reports.

Patient reports are saved as Excel files that are named using the patient's MRN followed by a random number.

## Updating the Template

On each PC where it runs, Q-Progress stores the Excel workbook template file in C:\Program Files\Quinton\Qtel RMS\QProgress.xlt.

Before you edit and create a new template file, rename the default factory shipped version (for example, QProgress-Factory.xlt) so that you always have a reference that is known to function properly. The updated template must be saved in the QtelRMS directory as shown above on every PC running Q-Progress. Be sure to save the template as an .xlt file (Excel tries to change the file extension to .xls).

When you replace the factory shipped template with your customized template, Q-Progress immediately starts using the new template with NEW PATIENTS. Patients already viewed in Q-Progress have an existing Excel file that continues to use the older template.

To upgrade all patients to the new template, you must delete all patient Excel files in the Storage Directory (See [Configuring the Storage Directory](#) for current location of the storage directory). Q-Progress then creates new Excel files for each patient at the time of viewing. If you have not made significant edits and data entries in the previous patient reports, deleting the old and starting fresh is the best path. If you have entered significant data into reports for previous patients, it is best to phase in the new report templates with the new patients (versus re-entering the data). In either case, you should review the factory reports and customize as necessary as part of your initial start-up activities.

### Important: When editing the template:

- Do not change the Patient.csv tab.
- Do not delete a row that contains a formula.
- Do not delete a row that contains a title.

## Printer and Font Differences

The template includes margins and sizing appropriate for a standard laser printer. However, some printers may render the reports in slightly different dimensions. Acceptable reports can usually be created by adjusting the margins and print size of the individual reports within the template.

## Saving Your Work

If you are using the Excel report workbooks only for viewing and printing reports then you can simply exit Excel, or close the workbook, when finished with the patient's data.



### Caution: Possible data loss.

If you are making entries and changes in the workbook, click **Save** before you close the report or the changes are lost.

## Excel Display Notes

This section describes features of Excel that affect Q-Progress.

If the network connection fails, an export failure occurs and a network error message appears.

## Display Area

A display cell within an Excel spreadsheet has a dedicated and finite amount of space for displaying the contents of the cell. Although this ensures that a report remains properly formatted, data elements that are longer than expected will be truncated. For numbers that are larger than the allocated display space a display error is indicated by ####. Text fields (for example, a patient last name longer than 13 characters) are truncated to the characters that fit within the allocated space. Depending upon the formatting of the text cell (left, center or right justified), either or both ends of the long text field may be truncated. The field sizes set in the template have been used with numerous patients and provide a good balance between format and length needs. Should you encounter a case where data is truncated within a cell, increase the column width within Excel to correct the issue (see **Change Column Width** in Excel Help) or decrease the font size.

## Patient Goals

The Session Data, Discharge, and Critical Comments reports allocate a limited number of lines text for patient goals. Q-Tel RMS allows for an unlimited number of goals and organizes the goals according to the order they were entered in Q-Tel RMS.

An experienced Excel user can edit the template to increase the number of goals reported on the Session Data, Discharge, and Critical Comments reports.

## Session Activities

The Session Data Report displays up to ten exercise modalities and the Recovery activity for each session. If there are more than ten exercise modalities for a session, only the first ten modalities are presented in the report.

## Workbook Tabs

Each report is located on a dedicated tab displayed at the bottom of the Excel screen.

The tabs may be scrolled off the screen. If so, use the arrow keys at the left to scroll the tabs left and right. The left and right most icons scroll the tabs to the extreme left and right respectively. The center icons scroll the tabs one tab at a time.

## Q-Progress Export Wizard

The Q-Progress Export Wizard performs batch exports of data from Q-Progress for use with a third party application.

To export from Q-Progress:

1. Check the boxes corresponding to the patients to be exported.
2. Select **Export Wizard** from the **Tools** menu. The system displays the **Export Wizard** dialog box.
3. Click **Next**. The system displays a list of the checked patients in the main display. These are the patients you will export.

To	Do this...
Remove a patient from the export group	Choose a method: <ul style="list-style-type: none"> <li>• Clear the check box in front of the patient's name.</li> <li>• Select multiple patients, and then click the <b>Clear All</b> button.</li> </ul>

To	Do this...
Select all patients	Click the <b>Select All</b> button.
Return to the previous screen	Choose a method: 1. Click the <b>Back</b> button. 2. Click the <b>Cancel</b> button.
Search for inactive patients (Not returning to the program)	Specify a date range from some months ago and select all patients who had their last session within this range.
Continue with the export	Click the <b>Next</b> button.

4. For each patient, specify the Pre and Post Program data to export. Patients with 0 sessions available are not displayed in this screen, even if they were selected in the previous screen.
  - a. Select the patient.
  - b. Select the program, click in the box and then select the program from the drop- down menu.

Some patients will have completed more than one rehab program (see [Patient Information](#) for details on returning patients that start a new program). Q-Progress allows you to select which program to export for that patient. The default is the patient's current program. The patient program must have either **Cardiac** or **Pulmonary** in the name to be exported.

- c. Select the **Preprogram**, click in the box and then select the session from the drop- down menu. The Preprogram session defaults to the first session
  - d. Select the **Postprogram**, click in the box and then select the session from the drop- down menu. The Post Program session defaults to the most recently completed session for the patient.
  - e. Click **Next** to continue, **Back** to return to the previous screen or **Cancel** to exit this function.
5. To export the patient data, click **Finish**. Status indicators keep you informed of the overall export progress for the batch. The **Export now** exports the data to one XML file.

### Q-Progress Data Exported

These tables list the parameters that are actually exported. If a parameter is not listed, it is not exported.

Q-Tel Data	XML Tag Name
Patient GUID:	Patient ID
program type	type
Patient Last Name	Last_Name
Patient First Name	First_Name
Smoking Quit Date	smoking_quit_date
Insurance Coverage	insurance_Coverage
Patient MRN	identifier
inactive	inactive
Smoker	smoker
Sex	Sex
race	race

<b>Q-Tel Data</b>	<b>XML Tag Name</b>
risk level	Risk_Stratification
primary diagnosis	primary_diagnosis
secondary diagnosis	secondary_diagnosis
home phone	phone_number
work phone	work_phone
specialist	referring_physician
middle initial	middle_name
address	address
city	city
state	state
zip code	zip_code
birth date	BirthDate
sessions completed	Sessions_Completed
Session Date Time	Evaluation TestingDate
Session	Phase
Resting HR	HR_Rest
Resting DBP	DBP_Rest
Resting SBP	SBP_Rest
Max HR	HR_Peak
Max DBP	DBP_Peak
Max SBP	SBP_Peak
Max Met Level	maximum_met_level
recovery HR	HR_recovery
recovery DBP	DBP_Recovery
recovery SBP	SBP_Recovery
Perceived Exertion	Perceived_Exertion
Max Treadmill DBP	DBP_Peak_Treadmill
Max Treadmill SBP	SBP_Peak_Treadmill
Perceived Exertion Treadmill	Perceived_Exertion_Treadmill
Peak Treadmill HR	hr_Peak_Treadmill
Low Density Lipo	low_density_lipo
High Density Lipo	high_density_lipo

<b>Q-Tel Data</b>	<b>XML Tag Name</b>
weight	weight
height	height
number of medications	number_of_medications

## 16. BACKUP/RESTORE UTILITY

---

The Q-Tel RMS system includes a Backup/Restore utility. Use the Backup/Restore utility to back up your system and restore the patient rehab data in the event of a catastrophic hardware failure (for example, a hard disk crash). Q-Tel RMS data included in the backup is stored in three areas:

Data	Source
Patient demographic and session data	Microsoft SQL database
Full Disclosure ECG data and ECG strips	Direct access binary files
Q-Progress patient reports	Individual Microsoft Excel workbooks

The backup does not include PDF reports generated by Q-Tel RMS.

The Backup/Restore utility copies data from all three sources to your selected backup media; network drive or external hard drive for backup storage. **Note:** The Backup/Restore utility saves the rehab data located on the Q-Tel RMS computer ONLY. If you have set up the Q-Progress directory for storage of the Excel workbooks (see [Configuring the Storage Directory](#)) to a folder other than the default (C:\Program Files\Quinton\QTel RMS\QProgressCSVData) on the Q-Tel RMS system then these files are not saved with the backup. You should ensure that your system administrator is properly backing up these files, along with any other data critical to your operation on a regular basis.

Backup media should be stored in a secure location physically separate from the Q-Tel RMS system to mitigate loss due to fire or flood. Ensure environmental conditions specified for the backup media are maintained. If backing up to a network drive, ensure appropriate safeguards are in place.

### Backup

This section describes how to back up data on the Q-Tel RMS system.

#### Backup Frequency

The frequency of your system backups should be based on the effort required to do the backups versus the effort to recover from the loss of data. Whether you back up to external hard drive or to a network drive, it is recommended that you perform a backup of your Q-Tel RMS system daily. The backup process can run unattended.

1. Perform the backup process described in the next section.
2. Leave for the day.
3. The next morning close the Backup/Restore utility.

#### Backing up Q-Tel RMS

You cannot use the Q-Tel RMS system while a backup is in process.

The backup can take several hours depending on how much rehab data is on your system. It is best to begin the backup before leaving for the day.

**NOTE:** You must be logged into the system using an account with administrator privileges in order to run the Backup/Restore Utility.

To back up the Q-Tel RMS system:

1. Close all applications.
2. Double-click on the **Q-Tel Backup Restore** icon on the Q-Tel RMS system desktop. The system displays the **Backup/Restore Utility** screen.
3. Select the backup location in the **Data Destination** section. If you are backing up to tape, insert a tape.
4. Click on Start Backup.
  - If you selected **Hard Drive** as your data destination, the system displays the **Select Backup Folder** screen.
  - To back up to a networked drive, your Q-Tel RMS computer must be mapped to that drive:
    - a. Click the down arrow on the **Select Backup Folder**.
    - b. Select the drive for the backup files.
    - c. Select a folder and the path for the backup files.
    - d. Click **OK**.
5. The Backup/Restore utility checks to make sure there is enough space for the backup.



**Caution: Possible improper system performance.**

Backup does not overwrite the previous backup. Periodically you must delete old backups in order to ensure there is room on the drive for new backups.

The directories are listed in the **Backup** tab as they are backed up. When the backup is complete, the system displays a message indicating that the backup was successful.

6. Click **OK**.
7. Close the Backup/Restore utility.

## Restore

The Restore function writes all of the data from the backup media to the Q-Tel RMS system, completely restoring the Q-Tel RMS SQL database, the associated ECG files, and any Q-Progress files stored in the C:\ProgramFiles\Quinton\QTel RMS\QProgressCSVDatafolder.

You cannot use the Q-Tel RMS system while Restore is active.

The Restore process can take several hours depending on how much rehab data was backed up.



**Caution: Possible data loss.**

Restoring an old backup file will overwrite any existing data, including the Q-Tel RMS database, ECG files, and Q-Progress files. Do not perform a restore if you require any of the data on the system hard drive.

To restore data from a backup:

1. Close all applications.
2. Double-click on the **Backup Restore** icon on the Q-Tel RMS system desktop. You must have administrative privileges to run the Restore function.
3. Click the **Restore** tab.
4. Verify the correct backup media is selected.
5. Click **Start Restore**. The system displays a message warning that all rehab data on the Q-Tel RMS system will be overwritten with the contents of the backup.
6. Select **Yes** to proceed with the Restore or select **No** to cancel the Restore.

7. For a restore from the hard drive, select the location of the backup you want to use for the restore process; click on the backup name, then click **OK**. The system restores the selected backup. When the restore is complete, the system displays a message indicating that the Restore was successful.
8. Click **OK**.
9. Close the Backup/Restore utility.

## Messages

The Backup/Restore utility detects the following conditions and displays a dialog box:

Error Condition	Description
Incompatible data	The backup media and the Q-Tel RMS system contain different software versions.
Missing data	The backup files are not in the specified folder.



## 17. ALARM SUBSYSTEM

Q-Tel RMS includes several tools to help the clinical user rapidly identify medical or technical problems that can impact the health or safety of the rehab patients. Medical alarms include both common and life threatening conditions, such as premature ventricular contractions (PVCs) or ventricular fibrillation. The technical alarms include common issues, such as lead-off conditions and low battery, as well as other important warnings such as when a patient is nearing the four hour limit for full disclosure storage. The clinical user can control which alarms are presented through visual and audio signals, and if the alarms remain presented even if the underlying alarm condition has terminated. This chapter highlights each of these areas and concludes with some example cases that illustrate the behaviors.

For more information on alarms and their causes, refer to [Physician's Guide to Signal Analysis](#).

### Alarm Types

The Q-Tel RMS alarm configurations are:

- Basic medical alarms (Standard)—asystole, ventricular fibrillation, ventricular tachycardia, high heart rate and low heart rate - and technical alarms.
- The Advanced Arrhythmia option—the five basic medical alarms, the technical alarms, and the medical alarms: bigeminy, couplet, high PVC, missing QRS, trigeminy, ventricular multifocal PVCs, ventricular rhythm, and ventricular run.



**WARNING! Audible alarm.**

Q-Tel RMS detects and displays only those alarms enabled for your system configuration.



**WARNING! The Lead Off condition disrupts the alarm function.**

The arrhythmia alarm detection system must have all leads properly connected to the patient in order to function correctly. If a lead-off condition occurs and the Lead Off alarm displays, reattach the lead as soon as possible.



**WARNING! Selectable Alarm Presets.**

Using different alarm presets for the same or similar equipment on a patient could result in a potential hazard. Ensure that the alarm presets are appropriate for the patient before monitoring.

These tables describe the medical and technical alarms and factory default settings.

#### Medical Alarms

Basic/Advanced Alarm Type	Medical Alarms	Description	Default Priority	Default Persistence
Basic and Advanced	Asystole	Absence of a QRS complex for four or more seconds.	High	Visual
Basic and Advanced	Ventricular Fibrillation	Irregular ECG signal with no recognizable QRS complex.	High	Visual
Basic and Advanced	Ventricular Tachycardia	6 or more PVCs at a rate greater than 130 bpm.	High	Visual
Basic and	High Heart Rate	Heart rate is exceeds the value set as the	Off	Off

Basic/Advanced Alarm Type	Medical Alarms	Description	Default Priority	Default Persistence
Advanced		High HR limit.		
Basic and Advanced	Low Heart Rate	Heart rate is below the value set as the Low HR.	Off	Off
Advanced	Bigeminy	Sequence of alternating PVC and normal cardiac cycles.	Off	Off
Advanced	Couplet	Two consecutive PVCs.	Off	Off
Advanced	High PVC	Rate of PVC exceeds the value set for High PVC.	Off	Off
Advanced	Missing QRS	Missing/skipped beat.	Off	Off
Advanced	Trigeminy	Sequence of PVC after every two normal cardiac cycles.	Off	Off
Advanced	Ventricular Multifocal PVCs	PVCs originating from multiple focal points within the ventricles.	Off	Off
Advanced	Ventricular Rhythm	Occurrence of 4 or more PVCs at a rate of less than 100 bpm.	Off	Off
Advanced	Ventricular Run	Occurrence of 6 or more PVCs at a rate less than 130 bpm.	Off	Off

### Technical Alarms

Technical Alarms	Description	Default Priority	Default Persistence
Out of Sync	Data transmission error	Low	Off
RF Interference	The telemetry channel has noise from another source such that ECG reliability and quality can be degraded.	Low	Off
Lead Off -- RA, LL,	One or more electrodes are disconnected—one alarm per lead.	High	Off
Lead Off -- LA, V1	One or more electrodes are disconnected—one alarm per lead.	Medium	Off
Low Battery	The transmitter battery voltage is low (for example, less than two hours available).	Low	Visual
Almost End of Full Disclosure	The system has logged data to the point that 10 min. or less recording time is available.	High	Audio and Visual
End of Full Disclosure	The system has been logging ECG data to the point that the FD storage file will no longer be able to retain additional trace data. The system will automatically discharge the patient.	High	Audio and Visual

**Medical Alarm Abbreviations**

<b>Medical Alarms</b>	<b>Abbreviation</b>
Asystole	Asystole
Bigeminy	Bigeminy
Couplet	Couplet
High Heart Rate	High HR
High PVC	High PVC
Low Heart Rate	Low HR
Missing QRS (Pause)	No QRS
Trigeminy	Trigeminy
Ventricular Fibrillation	V Fib
Ventricular Multifocal PVCs	MF PVC
Ventricular Rhythm	V Rhythm
Ventricular Run	V Run
Ventricular Tachycardia	V Tach

**Technical Alarm Abbreviations**

<b>Technical Alarms</b>	<b>Abbreviation</b>
Almost End of Full Disclosure	Almost EOFD
End of Full Disclosure	End of FD
Attention (Patient Call)	Attention
Battery Low	Low Bat
Lead Off - LL	LL Fail
Lead Off - LA	LA Fail
Lead Off - RA	RA Fail
Lead Off - V1	V1 Fail
Out of Sync	Out of Sync
RF Interference	RF Interfer

## Priority

Each alarm has a priority that determines its precedence relative to other alarms. The highest priority alarm for a given monitored patient is indicated on the corresponding patient tile; the highest priority alarm of all monitored patients sounds audibly through the speakers.

In most cases an alarm's priority can be set to **Medium**, **Low**, or **Off**, though there are several exceptions. A priority of **Off** means that the system does not indicate the alarm condition, either visually or audibly, and does not store or print a strip when the condition occurs (except for Patient Call, see [Record and Store](#)). The condition is detected when not in Standby or Learn modes, and can be seen in the Full Disclosure viewer.

A few special cases limit user control over alarm priority. These medical alarms are considered life-threatening and have a fixed priority of **High**.

- Asystole
- Ventricular Fibrillation
- Ventricular Tachycardia

These alarms also have special ordering rules: Asystole always has visual precedence over Ventricular Fibrillation, which always has visual precedence over Ventricular Tachycardia, which always has visual precedence over other high priority alarms. The audio indications for these conditions and other high priority alarms are identical, with no special ordering among them.

The other special cases that limit priority are these technical alarms:

- Lead Off - LL and RA
- Almost End of Full Disclosure
- End of Full Disclosure
- Battery Low

Lead Off for LL (left leg) and RA (right arm) are fixed **High** priority because this condition can mask the life-threatening medical alarms. Almost End of Full Disclosure, which signals that only a few minutes of full disclosure storage remain for the patient, can be set to either **Medium** or **High** priority. End of Full Disclosure is fixed at **High** priority. Battery Low can only be set to **Low** or **Medium** priority (it cannot be **Off**).

The life-threatening alarms; Asystole, Ventricular Fibrillation, and Ventricular Tachycardia, are high priority alarms that cannot be changed. To change the priority setting for the remaining medical and technical alarms, see [Alarms tab](#). The ordering from highest to lowest priority is:

- Asystole
- Ventricular Fibrillation
- Ventricular Tachycardia
- High Priority
- Medium Priority
- Low Priority

When a session has more than one alarm of the same priority, secondary sorting rules are applied.

- An alarm with an active triggering condition displays before a persisted alarm of equal priority with a triggering condition that has cleared.
- If all conditions are equal, alarms are presented in the order in which they occurred.

## Limits

You can adjust the alarm conditions based upon heart rate for each patient. The limits establish the trigger threshold for the alarms High Heart Rate, High PVC, and Low Heart Rate. These limits are not applicable to other alarms.

The High PVC alarm is triggered when the average number of premature ventricular contractions per minute exceeds the defined limit. The accepted range limit for High PVC is 2-70.

A median heart rate exceeding the limit for High Heart Rate triggers the High Heart Rate alarm; a heart rate below the Low Heart Rate limit causes a Low Heart Rate alarm. The accepted limit range for High Heart Rate is 100-250. For Low Heart Rate the range is 30- 100.

The heart rate must exceed the High Heart Rate limit continuously for at least six seconds to trigger the High Heart Rate alarm.

## Record and Store

You can configure any medical alarm or Patient Call to automatically record a strip on the strip recorder and/or store a strip in Full Disclosure when the alarm becomes active. Except in the case of Patient Call, alarm-generated strips are recorded or stored only when the alarm priority is other than **Off**. Strips are recorded and stored for Patient Call when those options are selected in the Configuration Utility, even when the priority is **Off** (in this case no visual or audio attention alarm is indicated).

If an alarm is configured to record and/or store a strip, the system generates the strip when the alarm condition is triggered, regardless of its priority relative to other alarms. An alarm does not have to be indicated before its strip is stored in Full Disclosure or queued for printing on the strip recorder.

## Alarm Notification

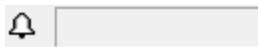
The technical and medical alarm conditions use both visual and audio signals to attract the clinical user's attention.

Notification of alarm will occur within five seconds of the triggering event with the exception of the following alarms:

- Ventricular Fibrillation can take from 5 to 10 seconds to detect.
- Low Heart Rate will be detected after four beats for heart rates less than or equal to 48BPS and after 16 beats for heart rates greater than 48BPS. This results in an alarm notification time of less than 10 seconds for Low Heart Rate.
- High Heart Rate will be detected after 16 beats. This results in an alarm notification time of less than 10 seconds for High Heart Rate.

### Visual

Each monitored patient has an associated "tile" that includes a multifunction alarm indicator and user control. The alarm indicator visually communicates the state of the alarm system specific to a patient's session.



When there is no alarm for a patient, the alarm indicator displays the current mode of the session. Standby and Learn modes are represented by the words *Standby* and *Learn*. Normal mode displays with no text and with the background fill the same as the tile.

A bell icon is located next to the visual alarm indicator. This bell icon indicates if audio alarming is currently active but not sounding, sounding due to an alarm or silenced for a given alarm. The bell icon indicates the specific audio state of alarms for the given session and can be used to identify which session is causing the current audio alarm.

Bell Icon	Indication
	Not Sounding - Audio alarming is active but not sounding for this session.
	Sounding - Audio alarming is sounding due to a current alarm.
	Silenced - Audio is temporarily silenced for the current active alarms.

Alarm Priority	Visual Alarm Indicators
High	Rapidly blinking red background
Medium Priority	Slowly blinking yellow background
Low Priority	Non-blinking (static) yellow background

The alarm that has the highest priority (see [Priority](#)) displays on the visual alarm indicator on the patient tile.

A persisted alarm that has cleared is represented by a green border around the visual alarm indicator. When the green border is present the alarm can be manually dismissed by clicking on the indicator.

## Audio

The purpose of the audio alarms is to draw the attention of the user back to the system. When multiple patients are concurrently monitored, it isn't possible to provide useful and distinct sounds for each combination of patient and alarm priority. The visual alarm indicators are designed to communicate the critical information detailing the patient and the alarm condition. The audio indicator communicates an alarm's priority (High, Medium, or Low). When multiple alarms are active, only the sound for the highest priority alarm is sounded. Although each monitored patient has his own visual alarm indicator, the audio alarm indicator is shared by all.

When more than one alarm of the same priority is active, the alarm that triggered first is the one that is sounded. All the High priority alarms, including life threatening alarms Asystole, Ventricular Fibrillation, and Ventricular Tachycardia, share the same sound and thus the same priority within the audio subsystem.



**WARNING! Audible alarms.**

Do not rely on audio cues alone to gauge the number of patients that require attention. Alarms of equal or lower priority associated with other patients will not be heard while a current audio alarm is active.

Each alarm priority has a distinct sound associated with it.

Alarm Priority	Audible Alarm Indicators
High	Five rapid high-pitched pulses, sounded twice
Medium Priority	Three low pulses, repeated every 25 seconds
Low Priority	Two consecutive tones, repeated every 60 seconds

The **Alarms** tab in the Configuration Utility and the Patient Information screen contain a **Test Alarm** button. Use the **Test Alarm** button to listen to the alarm sounds and to set the speaker volume. The **Test Alarm** button is not available if an audio alarm is active for a patient that is currently monitored.



**WARNING! Audible alarms.**

Adjust audio volume so that it can be heard over normal background noise and at the distance typical in use.

We recommend maintaining a minimum 30% separation between alarm priorities.

## Arrhythmia Detection Modes

The system detects and reports alarms appropriate to the monitoring mode.

### Standby

When a patient is first admitted to a monitored session, the patient is in Standby. The session remains in Standby until commanded to enter Learn mode. In Standby, the system does not detect or indicate alarm conditions except for:



**WARNING! Alarms.** In Standby, the system does not detect or indicate alarm conditions except for:

- Low Battery
- Almost End of Full Disclosure
- End of Full Disclosure

When the patient enters Standby from Learn or Normal modes, all alarms except these three are automatically cleared.

For example, if the Lead Off - LA alarm is active while in Normal mode and the user places the session in Standby, the alarm indication immediately ceases (regardless of its persistence setting). If while in Standby, the system detects a low battery condition in the transmitter, the Battery Low alarm is indicated until the batteries are replaced or the patient is discharged.

Use the **Toggle Standby** button to enter and leave Standby mode. The **Toggle Standby** button is adjacent to the mode indicator. The patient is in Standby mode when the button is selected.

Figure 38 Example of Toggle Standby Button



Active



Standby

**WARNING! Audible alarms.**

All medical alarms are disabled when the system is in Standby. Do not toggle to Standby to silence a medical alarm. Use the **Silence Alarm** function (see [Silencing Alarms](#)).

**Learn**

When the patient is in Standby, click the **Toggle Standby** button to initiate an approximately 20-second period of learning the patient's ECG characteristics. For example, the system takes about 20 seconds to learn normal rhythm at a rate of 60 bpm or 10 seconds to learn normal rhythm at a rate of 120 bpm.

**WARNING! Possible improper system performance.**

Do not select Learn mode if the transmitter has a low battery warning or the patient's waveform is noisy or suspect.

The system identifies the dominant characteristic beat during the Learn mode and uses those characteristics for identifying anomalous beats. The Learn mode is most effective when the patient's ECG is showing mostly normal sinus rhythm.

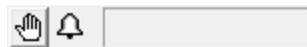
**WARNING! Possible improper system performance.**

If the dominant beat during the Learn period is not the dominant characteristic beat, then the system will not be as effective in identification of some arrhythmias.

For instance, if the Learn period is dominated by PVCs, the system is not as effective in identification of alarm conditions involving PVCs. Should you start Learn mode and the patient is presenting a significant run of ectopic beats, toggle back to Standby mode and re-enter Learn mode once the run has subsided.

**Normal**

After the system has learned the ECG characteristics the system removes the Learn indicator and is in active analysis of the ECG. The blank window signifies that the system is actively looking for arrhythmias.



This is the usual mode of a monitored session in which all alarm conditions are detected and indicated according to their priority. The session automatically transitions to Normal mode following Learn mode, and remains in this state until you click the **Toggle Standby** button.



**WARNING! RF Interference.**

Lead off conditions, ECG noise associated with exercise activities, radio frequency interference or loss of signal and other unusual mechanical or physiological conditions can degrade the detection of some arrhythmias. Clinical staff should always be present and actively monitoring the health and performance of patients currently monitored with Q-Tel RMS. The arrhythmia detection algorithms and associated alarms should not be the sole mechanism for determining the patient's cardiac condition.

## Alarm Persistence

Some alarm conditions do not last for a very long time. For instance, a short run of SVT would trigger the High Heart Rate alarm. Because the condition is of such short duration, if you are away from the monitor and the condition clears before you return, the ECG may have scrolled off the screen. There would be no indication that an alarm has occurred. The system allows you to designate that alarms of interest persist. They remain active until you acknowledge and dismiss the alarm. See [Alarms Tab](#) and [Silencing Alarms](#) for discussions and directions on how to turn on/off alarm persistence.

An alarm's persistence setting determines its behavior after its triggering condition has passed.

- **Off**—the alarm indication immediately ceases once the alarm condition passes (that is, the alarm does not persist after the condition clears).
- **Visual persistence**—the visual alarm indication on the patient tile continues after the alarm condition passes, until dismissed.
- **Audio and Visual persistence**—both visual and audio alarm indications continue until the alarm is manually dismissed.

***NOTE:** Because the Patient Call alarm is only active while the transmitter call button is pressed, it should always be configured for Audio and Visual persistence. Otherwise, the alarm is too brief to be heard or seen.*

A persisted visual alarm whose triggering condition has cleared is shown with a green border around the visual indicator. To dismiss the alarm, click within the area surrounded by the border. When the green border is not present (the alarm is still active), clicking within the visual indicator has no effect, since only alarms whose triggering condition has cleared can be dismissed.

During the course of detecting a medical condition, sometimes a chain of two or more related medical alarms are triggered. For example, Ventricular Tachycardia is often preceded by the High Heart Rate alarm. When the highest medical alarm clears, other cleared, persisted alarms of lower priority that are masked by it can also clear. To reduce the effort of dismissing a chain of related alarms, when a medical alarm is manually dismissed, other cleared, persisted medical alarms of lower priority are also automatically dismissed. Technical alarms are not automatically dismissed.

For example, when a Bigeminy condition is active, the high priority of this alarm could mask lower priority alarms such as High PVC and Patient Call (Attention). The following table illustrates the alarm queue.

Bigeminy
High PVC
Attention

When the Bigeminy condition clears, a green border is displayed around the visual indicator. When the user clicks on the indicator both the Bigeminy and High PVC alarms are dismissed and removed from the queue; Because High PVC is a medical alarm and in this example its triggering condition has cleared, it is dismissed. Patient Call remains persisted even though its condition has cleared because it is a technical alarm. Clicking on the indicator again will dismiss it.

In the special case when an active alarm that has been manually silenced (using the **Silence Alarm** button) becomes clear, the alarm indication automatically becomes blank, as though the alarm's persistence were set to **Off**. By silencing the alarm the technician has acknowledged it, and therefore is not required to manually dismiss it when the alarm condition clears. This behavior only applies to alarms that are currently silenced (except the Patient Call alarm where persistence is other than off); if an active alarm is silenced and becomes clear after the silence interval has passed, the alarm indication continues according to its persistence setting as described above.

Here are some additional examples of persistence behavior. The assumptions are: only one alarm is active at a time, and all have a priority set to Medium or Low, the technical alarm Lead Off - LA has persistence **Off**, medical alarm Bigeminy has **Visual persistence** only, and technical alarm Patient Call has **Audio and Visual persistence**.

- If the Left Arm electrode becomes detached, the patient tile indicates a Lead Off - LA alarm and the speakers play the alarm tone. After the lead is reattached, all alarm indications immediately clear without user action since the alarm has no persistence.
- When the arrhythmia analysis algorithms detect a Bigeminy condition, the patient tile indicates the Bigeminy alarm and the speakers play the alarm tone. When the condition clears, the audio indication stops but the alarm is still visible with a green border on the patient tile. To clear the visual indication, click on the tile alarm indicator.
- When the patient presses the transmitter **CALL** button, Patient Call (Attention) is activated. Because its persistence is Audio and Visual, the tile continues to indicate the alarm and the alarm is heard through the speakers until the user dismisses the alarm.



#### **WARNING! Low battery.**

When a technical alarm for Low Battery condition occurs and the Low Battery alarm indicator is active, any medical alarm of the same priority as the Low Battery alarm will not take visual precedence over the Low Battery alarm. It is strongly recommended that you replace the batteries as soon as possible.

## Silencing Alarms



When the audio alarm indicator is active, the Silence Alarm button is enabled, and the speaker icon on the associated patient tile is illuminated.



Clicking the Silence Alarm button temporarily silences the current audio alarm until the interval set within the Q-Tel RMS Configuration Utility (from 30 seconds to three minutes) expires. If other monitored sessions are indicating alarms, then one of these becomes audible according to the priorities. Therefore, if several patients are triggering active alarms then Silence Alarm will have to be pressed multiple times, once for each patient. Once the silence period has expired the alarm will again sound.

For patients with active alarms, selecting the bell icon indicating the current audio state will toggle between Silence Alarm and the alarm audio active state for that patient.

This section describes different alarm scenarios.

### Example: Single Session

In this example, the medical alarms Bigeminy and High PVC have settings of Medium priority and Visual persistence and the Bigeminy condition becomes active the Bigeminy alarm is seen in the alarm indicator and a Medium priority audio alarm is heard through the speakers. (See Figure 39.)

**Figure 39 Example of Active Bigeminy Alarm**



If the High PVC condition becomes active, the Bigeminy alarm remains on the indicator, because Bigeminy is still active and both alarms have the same priority (Medium).

If the Bigeminy condition clears while the High PVC condition remains active, the High PVC alarm is indicated, because active alarms take precedence over equal priority persisted alarms whose conditions have cleared. (See Figure 40.)

**Figure 40 Example of High PVC Alarm (Bigeminy Condition Has Cleared)**



When the High PVC condition clears, both alarms are cleared and have the same priority. Since Bigeminy came first, it is once again shown in the visual indicator, now with a green border surrounding it to show that the alarm is clear and can be dismissed by clicking on the alarm. Because the persistence is Visual rather than Audio and Visual, no audio alarm is heard. (See Figure 41.)

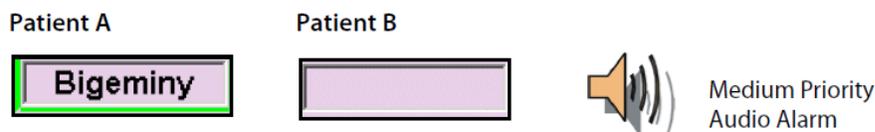
**Figure 41 Example of Cleared Condition with Visual Persistence**



Click the visual indicator to dismiss both Bigeminy and High PVC alarms as described in section [Alarm Persistence](#).

### Example: Dual Session

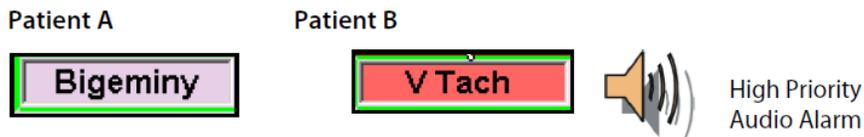
In this example, Bigeminy and High Heart Rate are set to Medium priority for both patients A and B. If Patient A triggers a Bigeminy alarm, the alarm is displayed and heard on the visual and audio indicators.



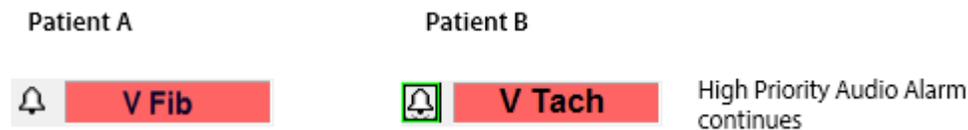
If Patient B's heart rate exceeds the configured limit, it triggers a High Heart Rate alarm. Because both alarms have the same priority and Patient A's alarm came first, no change is heard through the speakers. The previous medium priority audio alarm continues uninterrupted, repeating every 25 seconds.



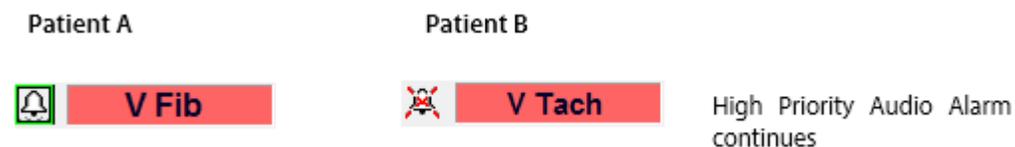
If Patient B progresses into Ventricular Tachycardia, which is a high priority alarm, the medium priority audio alarm associated with Patient A is preempted, and the system alarms with the high priority audio and visual alarm condition.



If Patient A now triggers a Ventricular Fibrillation, the system continues the audio alarm because Ventricular Fibrillation and Ventricular Tachycardia have the same priority, however Ventricular Fibrillation has a higher visual priority than Bigeminy.



Clicking the **Silence Alarm** button, temporarily silences the high priority alarm associated with Patient B, and the high priority alarm associated with Patient A is audible (both have the same sound; what will be heard is an interruption in the normal ten second repetition cycle as the audio alarm associated with Patient A is started from the beginning). After the temporary silence interval expires, the audio alarm is associated with Patient A.



## 18. SESSION RECOVERY

---

The Q-Tel RMS system includes a Session Recovery feature which recovers usable system data following a PC failure.

The Session Recovery feature restores the data up to the point of the system failure. The system may be able to recover:

- An entire session
- A partial session

Some sessions cannot be recovered, for example, if ECG integrity is not intact, the system was down for a long period of time, or the session did not have enough data to recover.

### Session Recovery Screen

Use the Session Recovery screen to continue, discharge, or discard sessions affected by the system failure.

When the system recovers from a system failure, it detects partial systems that are available for recovery. A session is available for recovery if:

- There is enough session data.
- The recovery is started within the necessary time frame for a monitored patient. (Data that is out of date cannot be recovered for a monitored patient.)
- The ECG data integrity for monitored patients, is intact. The Session Recovery screen contains:
- The list of recovered sessions
- Session data for the selected patient

Field	Description
<b>Patient</b>	The list of patients that have recovered sessions.
<b>MRN</b>	The MRN (Medical Record Number) uniquely identifies the patient.
<b>Session No.</b>	Number of recovered sessions.
<b>Date</b>	Date and time the session began.
<b>Monitored</b>	Indicates whether or not the session was monitored. <ul style="list-style-type: none"><li>• <b>Yes</b>—Monitored</li><li>• <b>No</b>—Non-Monitored</li></ul>
<b>Recovery Option</b>	Indicates how to handle the session. The system defaults to <b>Continue</b> if the session can be continued and to <b>Discard</b> if the session had been suspended for too long. <ul style="list-style-type: none"><li>• <b>Continue</b>—Continue the session from where it left off.</li><li>• <b>Discharge</b>—End the session and discharge the patient.</li><li>• <b>Discard</b>—Delete the partial session.</li></ul>
<b>Channel</b>	The channel assigned to the patient when the system failed.
<b>Session Management Fields</b>	See <a href="#">Patient Session Data Tabs</a> . All fields are system-generated and cannot be edited.
<b>Critical Comment Tab Clinical Comment Tab Patient Comment Tab</b>	See <a href="#">Comments Tab</a> .
<b>Reason for Discharge Discharge Action</b>	See <a href="#">Discharge Tab</a> .

Field	Description
<b>Print Reports Q-Exchange</b>	
<b>Full Disclosure Strips</b>	See <a href="#">Full Disclosure Tab</a> .
<b>Start Session Recovery</b>	Starts the session recovery by continuing, discharging, discarding the sessions as designated by the selection in <b>Recovery Option</b> .
<b>Exit Application</b>	Exits the recovery screen.

## Recovering a Session

If the PC running the Q-Tel RMS system experiences a system failure due to a power outage, hardware failure, or other problem, the Q-Tel RMS system may be able to continue some of the incomplete sessions.

When the PC is functional, you must determine the status of the existing sessions before starting another session.

To recover a session from the same tower:

1. Restart the system. The system prompts for restoring an incomplete sessions. You cannot start a new session until the incomplete sessions have been recovered or discharged.
2. Click **OK**. The system displays the **Session Recovery** screen.
3. For each patient:
  - a. Select a patient in the Patient List. The system displays the session in the **Session Management** and **Full Disclosure** fields.
  - b. Use the **Session Management** fields and **Full Disclosure** fields to determine if the session should be recovered. If the patient displays in the color red, the patient is locked on another system. You must discard the patient or discharge them from the session on the other system.
  - c. Add comments to the session.
  - d. Select **Continue**, **Discharge**, or **Discard** from the **Recovery Option** field.
  - e. If the patient is to be discharged, make selections for:
    - **Reason for Discharge**
    - **Discharge Action**
    - **Print Reports**
    - **Q-Exchange**
4. Click Start Session Recovery. The session executes the recovery of all patients as a group.
  - If any patients are marked for **Discard**—the system displays a confirmation dialog box.
  - If any patients are marked for **Discharge**—the modality shows as complete and the interruption does not display on the full disclosure strips.
  - If any patients are marked for **Continue**—the time gap displays as a yellow line on the full disclosure strips.

The sessions will re-number according to whether a new session is started on a different tower.

To recover a session from another tower:

1. From the **Session Management** screen, select the patient for a session. The system displays a dialog box indicating the patient has an incomplete session on another tower. Starting a new session without recovering the existing session prevents the recovery of the incomplete session.
2. Click **OK** to begin a new session, or **Cancel** to recover the session on the other tower.

## 19. CONFIGURATION UTILITY

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The Q-Tel RMS Configuration Utility defines and configures system settings to control the overall behavior and capability of the Q-Tel RMS monitoring application. This includes defining exercise devices and patient parameters for monitoring, configuring clinical and technical alarm conditions and selecting default ECG lead configurations.

- You cannot run the Configuration Utility while the Q-Tel RMS application is open.
- In a networked Q-Tel RMS configuration, the Configuration Utility can run on only one tower at a time.

You must be logged into the system using an account with administrator privileges in order to run the Configuration Utility. If your login account does not have administrator privileges, you cannot open the utility.

### Accessing the Configuration Utility



To access the Configuration Utility screen:

1. Double-click the **Q-Tel RMS Configuration** icon on the desktop. The configuration utility displays.
2. Click on the tab you want to access.

The Configuration Utility tabs contain buttons that are common on many of the tabs. These buttons are described in the following table.

Button	Description
<b>Save</b>	Saves the changes. Click <b>Save</b> before exiting the tab to save changes.
<b>Cancel Changes</b>	Discards the changes to the tab. If you inadvertently make a change or delete an item, select <b>Cancel Changes</b> before switching tabs or clicking on <b>Save</b> . This restores the changed or deleted field(s).
<b>Add New</b>	Opens a new line for adding a new selection.
<b>Delete</b>	Removes the selected custom selection.

### Parameters Tab

Parameters represent the data that is measured or quantified during a patient session. Examples of parameters are patient heart rate, blood pressure, target heart rate, RPE and METS. Use parameters to:

- Capture patient data, such as heart rate, blood pressure and RPE, during rest, exercise and recovery.
- Record data about the exercise device (or modality), such as speed and grade for a treadmill.
- Capture data that will be used to calculate METS.

You can define the minimum and maximum values that will be allowed for each Parameter.

The Q-Tel RMS program is pre-loaded with a list of commonly used parameters. You can add other parameters as needed.

## Parameter Definitions

The **Parameters** tab contains the parameter definitions.

Field	Max Length	Description
<b>*Name</b>	50	Required field. A unique name for the parameter. Use this name to describe the parameter.
<b>*Label</b>	8	Required field. A short unique name for the parameter. This label displays in grids and selection controls across the system.
<b>*Units Category</b>	--	Required field. A drop-down menu to select the label of the units for a particular parameter.  The category you choose has no effect on calculations or display in the system. Choose <b>No Units</b> when the parameter does not have units. For example, an RPE rating is simply a number and has no units.
<b>Type</b>	--	Drop-down menu for the type of field. Options are: <b>Number</b> <b>Text</b>
<b>MIN</b>	--	The meaning of MIN depends on the selected type. If <b>Type</b> is set to <b>Text</b> — <b>MIN</b> is the minimum number of characters allowed for the parameter. If <b>Type</b> is set to <b>Number</b> — <b>MIN</b> is the smallest allowable value for the parameter.
<b>MAX</b>		The meaning of MAX depends on the selected type. If <b>Type</b> is set to <b>Text</b> — <b>MAX</b> is the maximum number of characters allowed for the parameter. If <b>Type</b> is set to <b>Number</b> — <b>MAX</b> is the largest allowable value for the parameter.
<b>Precision</b>	--	The meaning of Precision depends on the selected type. If <b>Type</b> is set to <b>Text</b> — <b>Precision</b> is not used (the field is blank). If <b>Type</b> is set to <b>Number</b> — <b>Precision</b> is the number of decimal places (up to two) to display and record.
<b>Description</b>	80	Record notations about the parameter or its use within the system.

## System-defined Parameters

System-defined parameters are supplied by the system. They cannot be deleted. You can edit the label and the description.

Name	Label	Type	Min Val	Max Val	Prec	Units	Description
Average Heart Rate	AvgHR	Number	0	300	0	Bpm	
BMI Rating	BMI	Number	0	60	0	No Units	Body Mass Index - measure of obesity (expects Weight in pounds and Height in inches).
Diastolic BP	diaBP	Number	1	399	0	mm-Hg	XXX/YY - the YY in blood pressure.

Name	Label	Type	Min Val	Max Val	Prec	Units	Description
Distance	Dist	Number	0	1000	0	Ft	Distance walked in 6 or 12 minutes.
Ectopic rate	ER	Number	0	300	0	Bpm	Number of ectopic beats per minute.
Glucose	Glucose	Number	0	500	0.0	mg/dL	Blood Sugar
Grade	Grade	Number	-30	30	0.0	%	Treadmill grade (slope).
Heart Rate	HR	Number	0	300	0	Bpm	Number of beats per minute.
Level	Level	Number	0	5	0.0	No Units	Airdyne Level
Max Heart Rate	MaxHR	Number	0	300	0	Bpm	The maximum heart rate detected during a time interval.
Max predicted HR	MaxPHR	Number	0	300	0	Bpm	HR predicted from age.
METS	METS	Number	1	30	0.0	No Units	Metabolic output - related to Workload.
Min Heart Rate	MinHR	Number	0	300	0	Bpm	Minimum Heart Rate.
Oxygen Sat.	SpO2	Number	50	100	0.0	%	Oxygen saturation in blood.
O2 Flow	O2Flow	Number	0	20	0	l/min	Measurement of oxygen flow given to pulmonary patients.
Percent Target HR	% THR	Number	0	500	0	%	Percent of Target Heart Rate (actual HR/tHR).
Rate	Rate	Number	0	250	0	Per Min	Steps per minute.
Rate of Perceived Dyspnea	RPD	Number	0	20	0	No Units	Scale for rate of perceived dyspnea.
RPE	RPE	Number	0	20	0	No Units	Rate of perceived exertion.
Speed	Speed	Number	0	15	0.0	MPH	Treadmill speed.
Step Height	Step Ht	Number	0	30	0	Inches	Exercise device step height in inches.
Systolic BP	sysBP	Number	1	400	0	mm-Hg	XXX/YY - the XXX in blood pressure
Target Heart Rate Range	tHR	Number	0	300	0	BPM	Number or range (for example: 110-120).
Target Heart Rate	tHR Calc	Number	0	300	0	BPM	Heart rate goal.
Watts	Watts	Number	0	1000	0	Watts	Power measure for some exercise device.
Weight	Wt	Number	0	500	0.00	Lbs	Patient weight

Name	Label	Type	Min Val	Max Val	Prec	Units	Description
Workload	Workload	Text	0	0		No Units	Device specific metrics for patient workload.

## Defining Custom Parameters

Use the **Parameters** tab to define custom parameters.

### Adding a New Parameter

To add a new parameter:

1. Click **Add New**. An additional line displays at the bottom of the table.
2. Double-click in the **Name** field and enter the parameter name. When you move from the Name field to a different field, the system automatically moves the parameter into its alphabetical position in the list.
3. Click in the **Label** field and enter the label for the parameter.
4. Select a units category from the drop-down menu. The **Units Category** field is required. If the parameter does not have units, double-click on the field and select **No Units** from the drop-down menu.
5. To change type, double-click in the **Type** field and select an option from the drop-down menu.
6. To set parameter values, double-click and use the scroll arrows in the **MIN**, **MAX**, and **Precision** fields.
7. To enter a description of the parameter, click in the **Description** field and enter the information.

### Changing a Parameter

To change a parameter:

1. Click on the cell in the grid you want to change.
2. Enter your change. You cannot change the Type field once the parameter is saved.

### Deleting a Parameter

You can delete a custom parameter. System-defined parameters cannot be deleted. To delete a custom parameter:

1. Click on the name of the parameter you want to delete.
2. Click **Delete**.
3. Deleting a parameter does not affect modalities or prescriptions that already use this parameter. The parameter continues to be available in those cases.

## Modalities Tab

The **Modalities** tab describes each modality.

The standard rehab facility uses a set of exercise devices in the programs they administer. The Q-Tel RMS application refers to these as Modalities. Definitions of the most common modalities in rehabilitation are pre-loaded on your Q-Tel RMS system. Included in the definition of each device is the standard equation(s) that convert exercise data into METS.

All preconfigured device information can be updated as needed. The preconfigured system Modalities list includes these devices:

- AirDyne
- Arm Ergometer
- Bands
- Step Machine
- Leg Ergometer
- Nu-Step and Nu-Step Q
- Treadmill
- Weights

You can define additional exercise devices to meet the needs of your facility. You can define as many devices as you need.

Field	Max Length	Description
<b>*Modality</b>	16	Required field. A unique name for the Modality. Use this name to describe the modality.
<b>Wkld Parm 1</b>	--	Required field. A drop-down menu for the workload name to describe the modality.
<b>Units Category</b>	--	System generated field. (From the <b>Parameters</b> window.)
<b>Wkld Parm 2</b>	--	An optional workload parameter to use for the METS equation.
<b>METS label</b>	9	Identifies the METS equation.
<b>Abbr</b>	5	A short identification for the METS equation.
<b>*METS Equation (use P1 and P2 to enter parameters)</b>	50	The mathematical expression of the METS equation. Enter P1 and P2 for Wkld Parm 1 and Wkld Parm 2 when you enter the equation. The system automatically replaces the placeholders with the label in the field.
<b>Remove Modality</b>	--	Removes a custom modality.
<b>Add METS</b>	--	Adds a METS equation
<b>Delete METS</b>	--	Deletes a METS equation
<b>Default METS</b>	--	Return to Default METS equation.

### Workload Parameters

One or two parameters can be selected for inclusion in the METS equation for each modality. These are referred to as *Workload* parameters. For example, Speed and Grade are commonly used as workload parameters in the METS equation for a treadmill. When a patient prescription is defined, the values for the workload parameters can be entered to show the METS value you want the patient to achieve.

Only parameters defined as a number type can be used in a METS equation.

## METS Equations

The METS equation(s) for a modality can be any mathematical expression using addition, subtraction, multiplication or division.

**NOTE:** For non-parameter workload, such as Bands, the workload does not display properly if you enter a backslash character (\) in the input text.

You can define more than one METS equation for an exercise device. In some cases there are different equations depending upon the mode of use. For example, the METS produced on a treadmill is higher when running than when walking, even if the speed and grade are the same. Q-Tel RMS supports up to three different METS equations per modality.

If no METS equation is defined, you can enter text in the workload field when the modality is included in a prescription.

## Defining a Modality

The parameters used in the equation, must be listed in the Parameter list. For instance, if the exercise device reports *Calories* then be sure to first add a parameter into the system named *Calories*.

## Adding a Modality

To add a new exercise modality into the system.

1. Click **Add New** on the **Modalities** tab.
2. Enter the name of the device in the **Modalities** field. The name of the Modality must be unique and can have up to 16 characters. When you tab from the Modality field the system moves the device listing into its alphabetical position in the list.
3. Double-click on the **Wkld Parm P1** field and select the first parameter to be used in the METS equation from the drop-down menu. The system automatically fills in the Units field.
4. If the equation requires a second parameter, use the second **Wkld Parm P2** field and select the parameter from the drop-down menu.
5. To identify the METS equation:
  - a. Click on the **METS Label** field and enter the name for the METS equation.
  - b. Click on the **Abbr** field and enter an abbreviation of the METS Label.

If the exercise device has only one mode, the **METS Label** and **Abbr fields** are optional. If there are two METS equations, the METS Label and Abbr fields are optional. The METS Label is used in a drop-down menu for equation selection when entering patient workloads and the corresponding abbreviation is displayed in the Workload field for the modality when used in a prescription.

METS Labels and abbreviations are linked. If you select a label that already exists, the Abbr field is automatically filled with the abbreviation for that METS Label. If you change an abbreviation for a label, all exercise modalities that use the label are automatically updated with the new abbreviation.

6. In the \* **METS equation** field, double-click to enter the equation using *P1* and *P2* to represent the parameters in the equation. For example, if the METS equation is:
 
$$1 + 0.25 * \text{Watts} + 0.023 * \text{Watts} * \text{Watts} / \text{Weight}$$

Where the first parameter is Watts and the second parameter is patient Weight, enter the equation as:

$$1 + 0.25 * P1 + .0023 * P1 * P1 / P2$$

Use standard math symbols for addition (+), subtraction (-), multiplication (\*), and division (/). If necessary, use parenthesis to define the order of the operations. Q-Tel RMS uses standard math order of operations, multiplication and division operations are performed before addition and subtraction operations unless specified by parenthesis.

7. To enter a second equation for METS:

- a. Select the modality.
- b. Click Add METS.

The system adds a second row below the modality. Enter the corresponding parameters and equation. Be sure to include the label and abbreviation information

## Setting the Default METS Equation

The first equation in the list for the specific exercise device is the default selection for entry of patient workloads during a session.

Make the most common mode the default to minimize typing during an active session. For example, since most rehab patients walk on the treadmills, the Walk equation is the default.

To change the default METS equation:

1. Click on the equation you want to be the default.
2. Click **Default METS**.

The selected equation will change position to become the first METS equation line for the exercise modality.

## Editing or Deleting Modalities

To change a modality or METS equation:

1. Click on the cell in the grid you want to change.
2. Enter your change.

If you edit a METS equation, the previous equation continues to be used for any patients or program with that METS equation selected in the prescription. The new equation can be selected from the METS equation pull-down list in the prescription for the patient or program. The METS label for the previous equation is distinguished with a “~”.

To delete a modality from the system:

1. Click on the modality name.
2. Click **Remove Modality**.
3. To remove a METS equation for a modality with multiple METS equations, click on the METS equation and then click Delete METS.

If you delete a METS equation or an exercise modality, that equation or modality continues to be used for any patient who had it selected in the prescription. Once removed from the prescription, it will not be selectable.

## System-defined Modalities

The system-defined modalities and METS are preconfigured in the Q-Tel RMS.

Modality	Wkld Parm P1	Wkld Parm P2	METS Label	Abbr.	METS Equation
AirDyne	Level	Weight			$1 + 377 * \text{Level}/\text{Weight}$
Arm Ergometer	Watts	Weight			$1 + 11.3 * \text{Watts}/\text{Weight}$
Bands					
Leg Ergometer	Watts	Weight			$1 + 7.54 * \text{Watts}/\text{Weight}$
Nu-Step	Watts	Weight	<115 Watts	<115	$(-108. + 1.89 * \text{Weight} + 4.23 * \text{Watts})/\text{Weight}$
			>=115 Watts	>115	$(-5.45 + 2.22 * \text{Weight} + 0.024 * \text{Watts} * \text{Watts})/\text{Weight}$
Nu-Step Q	Watts	Weight			$1.73 + 0.85 * \text{Watts}/\text{Weight} + 0.0223 * \text{Watts} * \text{Watts}/\text{Weight}$
Step Machine	Rate (steps/min.)	Step Ht			$0.1 * \text{Rate} + 0.0174 * \text{Rate} * \text{Step Ht}$
Treadmill	Speed (miles/hr.)	Grade (5% grade entered as "5")	Walking	W	$1 + 0.766 * \text{Speed} + 0.138 * \text{Speed} * \text{Grade}$
			Running	R	$1 + 1.53 * \text{Speed} + 0.0676 * \text{Speed} * \text{Grade}$
Weights					

**NOTE:** Patient weight (**Weight**) and Step Height are entered in pounds and inches respectively.

The METS equations the above table are from these sources:

- American College of Sports Medicine Guidelines for Exercise Testing and Prescription, Fifth Edition, Williams and Wilkins, 1995.
- Nu-Step - Evaluation of MET Values on Recumbent Nu-Step 4000, Chad Rateike, University of Wisconsin-LaCrosse, June 2000. This work has defined two equations, each valid for a range of workloads (less than 115 Watts and greater than or equal to 115 Watts).
- Nu-Step Q - Derived from Rateike's work by Quinton to provide a simplified form for input. The standard deviation of this equation, relative to Rateike's, for the range of use in rehab, is about 0.25 METS. The derivation has been done to simplify input during a session, as the user does not have to notice if the Watts is greater or less than 115 and choose the correct corresponding equation.



**Caution: Units for weight.**

Those equations that require input of patient weight have been converted to use weight measured in pounds.

## METS Unit of Measure

The units of measurement for weight and height in the system are optional. However, the units of measurement in the METS equations that ship with the system are in pounds and inches. When you configure the parameters in your system you can choose to change these. For your convenience, provided below are the equivalent METS equations for modalities involving weight, converted to use kilograms instead of pounds.

Name	Wkld Parm 1	Wkld Parm 2	METS Equation
AirDyne	Level	Weight	$1 + 171 * \text{Level}/\text{Weight}$
Arm Ergometer	Watts	Weight	$1 + 5.14 * \text{Watts}/\text{Weight}$
Leg Ergometer	Watts	Weight	$1 + 3.43 * \text{Watts}/\text{Weight}$
Nu-Step	Watts	Weight	< 115 Watts: $(-49.1. + 1.89 * \text{Weight} + 1.92 * \text{Watts})/\text{Weight}$
			>= 115 Watts: $(-2.48 + 2.22 * \text{Weight} + 0.011 * \text{Watts} * \text{Watts})/\text{Weight}$
Nu-Step Q	Watts	Weight	$1.73 + 0.39 * \text{Watts}/\text{Weight} + 0.01 * \text{Watts} * \text{Watts}/\text{Weight}$

Refer to [Defining a Modality](#) for specific instructions.

## Programs Tab

The Program is a plan for a course of rehabilitative treatment. Programs vary depending upon the type of patient or rehab strategy. The two programs included with Q-Tel RMS are Cardiac and Pulmonary.

Within a particular patient population there can be subgroups for which your facility would like to tailor a rehabilitation program. For example, you can design a program specifically for diabetic patients within the Cardiac group. In this Cardiac/Diabetic program, you can include glucose measurements that otherwise would not be necessary.

Q-Tel RMS allows you to define and customize up to 32 Programs.

Define the new program using an existing program. The system creates the new program with the attributes of the existing program. Edit the new program. Programs can be edited or deleted at any time.

Patients are enrolled in a program either when they are registered or when they are admitted to a session for the first time. Changes to a program affect new patients, not patients already partially through an existing program.

The procedures in this section describe how to customize a program.

### Defining a Program

To define a program:

1. Click on **Add New**. The system displays the **Add new program** dialog box.
2. To use an existing program as a template, click the radio button for **Use existing program as a template** and then select the program from the drop-down menu. The system automatically fills the **Type** and **Sub Type** fields with the entries from the selected Program template.
3. To create a new program without reference to an existing program, click the radio button for **Create new program**.

4. Enter the name in the **Program Name** box. Select from the drop-down menus or enter in the **Program Type** and a **Sub Type** (if there is one). If you enter a new name, it is automatically added to the drop-down menu in its category.
5. Click **Save** to save your new type or click on **Cancel Changes** to return to the Programs menu without saving changes.

## Parameters

For a particular program you can customize the parameters that you want to track during the rest, exercise and recovery phases of a session. These will serve as a basis for the patient's program, but can be modified for a particular patient. Some of the parameters are always enabled and cannot be deleted.

To select parameters to track:

1. Click on the **Parameters** Tab (under the **Program** tab).
2. Check any parameters you want to record during rest, exercise or recovery for this program. Use the scroll bar on the right to access the complete list of parameters.

The following table displays default program parameters that are automatically selected for a program. Those marked as "P" cannot be deleted from a program.

**%tHR** and **Weight** are automatically selected as noted below. However, they can be removed from a program by unchecking the corresponding box.

Parameter	Cardiac			Pulmonary				
	Rest		Exercise	Recovery	Rest		Exercise	Recovery
%tHR			✓				✓	
Dia BP & Sys BP	P		P	P	P		P	P
HR	P		P	P	P		P	P
METS	P		P	P	N/A		P	N/A
RPE	P		P	P	P		P	P
SPO2	P		P	P	P		P	P
tHR	✓						✓	
Weight	✓						✓	
Workload	P		P	P	P		P	P
O2 Flow					✓		✓	✓
RPD					✓		✓	✓

## Phases of a Prescription

The first phase of the prescription is Rest. During this time, the patient's resting parameters are taken. The Rest phase must always be first, and can never be omitted.

The Rest phase is followed by zero or more exercise activities. Select an exercise device from your pre-defined list of exercise modalities (for example: Bike), add the desired values into the workload parameters, if any (for example 10 Watts) and a duration (such as 5 minutes).

The last phase of the prescription is Recovery, where the patient is monitored while the heart rate and blood pressure return to near resting levels. Unless discharged or cancelled early, Recovery is always the last phase.

For each Program, define a starting prescription. Use the Patient Information screen Prescription tab to make changes for each patient. The default prescription contains a list of exercise devices (the Modalities), the prescribed exercise duration, and expected Workload (for example, the expected speed and grade for the treadmill). The prescription can also control when ECG strips are stored and recorded.

To add a new exercise device into the prescription:



1. Click the **Add New** icon. The system displays a blank line.
2. Double-click in the **Modality** field and select an exercise device. Any exercise device can be represented in a prescription more than once. The exercise prescription will support up to 12 exercise activities.
3. Tab to **Duration** and double-click on that field to activate the up and down arrow keys. (You can also enter the duration time.)
4. Tab to **Timed** and click in the check box to change the default. Depending on the type of modality, you may or may not want to use timers. You can designate your preference in the prescription for each modality and also choose the exercise duration allotted.
5. Tab to **Workload** and enter the values. You can identify the workload for a selected device by entering values for the associated workload parameters (see [Workload Parameters](#)). The system computes the METS for the entered workload values as long as a METS equation has been defined for the selected device. You can leave this field blank.
6. Tab to **Store Strip** and double-click in the field to select the **Store Strip** option.
7. Tab to **Record Strip** and double-click in the field to select when you want to print a strip.

## Storing or Recording Strips

For any exercise activity in the prescription, specify whether a strip is to be stored, recorded or both stored and recorded during any exercise modality. The options are as follows:

- Midpoint between the starting and completion of the exercise on the device.
- At the time of maximum heart rate.
- At the time of the minimum heart rate.
- 30 seconds before the modality was terminated.
- 60 seconds before the modality was terminated.
- Start of the modality.
- In seconds after the beginning or n seconds before the termination of the modality (Custom).
- No (no strips desired).

Strips are centered on the criteria selected.

## Programs Tab Fields

Field	Max Length	Description
<b>Program</b>	20	Enter the name of the program. You can base the new program on an existing program. The new program retains the attributes of the parent program. You can then modify the attributes of the new program. Programs can be edited or deleted at any time.  Patients are enrolled in a program either when they are registered or when they are admitted to a session for the first time. Changes to a program affect new patients, not patients already partially through an existing program.
<b>Program Name</b>		Name of the program. Uniquely identifies a particular program. Once a program is named, you can edit the name. Patients already enrolled in the program retain the original name.
<b>System default Make system default</b>	--	<ul style="list-style-type: none"> <li>If the program is the system default, then System default displays.</li> <li>If the program is not the system default, then Make system default displays. To make the program the system default, click in the check box.</li> </ul> <p>You cannot delete the default program.</p>
<b>Program Type</b>	--	Programs are divided into type categories. You can define your own types. The system defaults are: Cardiac Pulmonary
<b>Sub Type</b>		A smaller category within the program. For example, a cardiac patient could be diabetic and you want to define a Diabetic Sub Type.
<b>Parameters tab</b>		
<b>Rest</b>		A checkmark indicates the parameter is included to track the parameter in the rest phase. To remove or add a checkmark, click the check box. Some parameters cannot be deleted.
<b>Exercise</b>		A checkmark indicates the parameter is included to track the parameter in the exercise phase. To remove or add a checkmark, click the check box. Some parameters cannot be deleted.
<b>Recovery</b>		A checkmark indicates the parameter is included to track the parameter in the recovery phase.  To remove or add a checkmark, click the check box. Some parameters cannot be deleted.
<b>Session Configuration tab</b>		
<b>Default Number of sessions</b>		Define the expected number of sessions for a patient enrolled in this program. When you enroll a patient, you can specify the number of sessions that are authorized for reimbursement.  To increase or decrease the number of sessions, use the scroll arrows or enter the number of sessions.
<b>Prescription</b>		A rehab prescription is your particular protocol for guiding a patient through a rehab session to achieve cardiovascular goals. The prescription fields can be changed according to the instructions for changing the prescription in the <b>Patient Information</b> screen. See <a href="#">Prescription (Rx) Tab</a> .

## Alarms Tab

Use the **Alarms** tab to change default settings for the alarms.

Q-Tel RMS notifies the user when certain patient medical or technical conditions arise. Use the Configuration Utility to set the standard baseline response to alarms. Alarms fall into these categories:

- **Medical Alarms**—Alarms corresponding to the patients' medical condition. Specific alarm availability is dependent on your system configuration.
- **Technical Alarms**—Alarms corresponding to the system or technical conditions.

For each type of alarm, the system allows you to configure several attributes. More information on alarms is available in [Alarm Subsystem](#).

### Alarm Sound

The system issues a different sound for each alarm priority. The sound is set by the system and cannot be changed. The sound will repeat at different intervals depending on the priority of the alarm.

### Main Volume

Since different hardware and speakers can have varying volumes, the **Volume Adjust** control allows you to set the alarm volume based on your needs. The **Volume Adjust** setting is stored on the machine where it is set; therefore, in a multi-tower configuration, it must be set on each tower.

To change the volume:

1. Select the **Alarms** tab in the Q-Tel RMS Configuration Utility.
2. For each alarm priority in the Priority/Volume table.
  - a. Select the alarm priority. The name of the alarm test button changes to indicate the selected alarm priority.
  - b. Click the test alarms button. The system sounds the alarm.
  - c. To make the volume louder, increase the **Volume Adjust** number (which is a percentage of maximum volume).

When using external stereo speakers, we recommend maintaining a minimum 30% separation between alarm priorities.

### Medical Alarms

The following table shows the medical alarms supported by Q-Tel RMS and the values associated with their priority and persistence as set by the system. You cannot change the priority of those alarms predefined with a High priority, but you can change the priority of all other medical alarms.

You can select and configure only those medical alarms enabled for your system configuration. Reference [Alarm Subsystem](#).

Alarm	Description	Default Priority	Default Persistence
Asystole	Absence of a QRS complex for four or more seconds.	High	Visual
Ventricular Fibrillation	Irregular ECG signal with no recognizable QRS complex.	High	Visual
Ventricular Tachycardia	6 or more PVCs at a rate greater than 130 bpm.	High	Visual

Alarm	Description	Default Priority	Default Persistence
Bigeminy	Sequence of alternating PVC and normal cardiac cycles.	Off	Off
Couplet	Two consecutive PVCs	Off	Off
High Heart Rate	Heart rate exceeds the value set as the High HR limit.	Off	Off
High PVC	Rate of PVC exceeds the value set for High PVC.	Off	Off
Low Heart Rate	Heart rate is below the value set as the Low HR.	Off	Off
Missing QRS	Missing/skipped beat.	Off	Off
Trigeminy	Sequence of PVC after every two normal cardiac cycles.	Off	Off
Ventricular Multifocal PVCs	PVCs originating from multiple focal points within the ventricles.	Off	Off
Ventricular Rhythm	Occurrence of 4 or more PVCs at a rate of less than 100 bpm.	Off	Off
Ventricular Run	Occurrence of 6 or more PVCs at a rate less than 130 bpm.	Off	Off

These life threatening conditions have high priority alarms that cannot be changed.

- Asystole
- Ventricular Fibrillation
- Ventricular Tachycardia

The following table shows the lower and upper limits between which the alarm rate value can be set for particular types of alarms.

Alarm Type	Lower Limit	Upper Limit	Default Value
High HR	100	250	150
Low HR	30	100	50
High PVC	2	70	10

Only the Medical alarms that you specify for a patient in the Patient Information component are triggered for that patient. The alarm setting (priority, persistence, limits, store, and record) are initially set to the values configured in the Configuration Utility and can be customized for each patient.

### Technical Alarms

The following table shows the technical alarms supported by the Q-Tel RMS and the values associated with their priority and persistence as set by the system. You can change the priority and persistence of these alarms as necessary, except those that have a High priority.

Alarm	Description	Default Priority	Default Persistence
Out of Sync	Data transmission error.	Low	Off
RF Interference	The telemetry channel has noise from another transmitter such that ECG reliability and quality can be degraded.	Low	Off

Alarm	Description	Default Priority	Default Persistence
Lead Off – LL, RA	One or more electrodes are disconnected – one alarm per lead.	High	Off
Lead Off – LA, V1	One or more electrodes are disconnected – one alarm per lead.	High	Off
Low Battery	The transmitter battery voltage is low (for example, less than two hours available).	Low	Visual
Almost End of Full Disclosure	The system has logged data to the point that 10 minutes or less recording time is available.	High	Audio and Visual
End of Full Disclosure	The system has been logging ECG data to the point that the FD storage file will no longer be able to retain additional trace data.	High	Visual (see Note below)

**NOTE:** The ECG full disclosure capacity is approximately four hours. When the Full Disclosure file has reached capacity, the patient will be automatically discharged. The **Almost End of Full Disclosure** alarm will activate, even if the system is in Standby mode. The alarm will activate at each of these times before the end of ECG recording occurs:

- 10 Minutes
- 7 Minutes
- 3 Minutes

**NOTE:** The default persistence for **Almost End of Full Disclosure** cannot be changed. At the End of Full Disclosure the patient will be discharged, the alarms will be cleared and the ECG display removed—Alarm persistence has no meaning when the ECG display is removed.

The low battery alarm also activates even when the system is in standby.

Field	Description
<b>Alarm Silence duration (Secs)</b>	When an alarm occurs during a session you can silence it for a period from 30 seconds to 3 minutes. After it is silenced, the alarm continues to show visually. At the end of the silent period, the alarm sounds again, unless the alarm condition has ended. Any other alarm conditions that occur will sound. Silencing an alarm only silences the current alarm condition.
<b>Test High Alarms Test Medium Alarms Test Low Alarms</b>	To test the volume and make sure it is set at the correct level: <ul style="list-style-type: none"> <li>• Click the <b>Test Alarm</b> button.</li> <li>• Increase or decrease the <b>Volume Adjust</b> until the volume level is appropriate.</li> </ul>
<b>Volume Adjust</b>	Sets the default volume level. The system allows you to adjust the volume for each priority level. A test function is provided on the <b>Alarms</b> tab so that you hear the sound and volume of each alarm as you configure it.
<b>Priority</b>	The system changes the <b>Test Alarm</b> button to reflect the selected alarm priority. Use <b>Volume</b> to set the <b>Alarm</b> volume.
<b>Volume</b>	To change the volume on an alarm priority: <ol style="list-style-type: none"> <li>1. Double-click in the <b>volume</b> field.</li> <li>2. Select the volume percent from the drop-down menu. The High priority must be louder than the Medium and Low priorities. The Medium priority must be louder than the low priority.</li> <li>3. Click <b>Save</b> to save your changes.</li> </ol>

Field	Description
<b>Patient Call</b>	The system response that occurs when the call button on a transmitter is pressed.
<b>Priority</b>	Each alarm has a priority that determines its precedence relative to other alarms. Select: <b>Off</b> , <b>Low</b> , or <b>Medium</b> .
<b>Persistence</b>	An alarm's persistence setting determines its behavior after its triggering condition has passed. For patient call select: <b>Audio and Visual</b> —both visual and audio alarm indications continue until the alarm is manually dismissed.  Because the Patient Call alarm is only active while the transmitter call button is pressed, it should always be configured for Audio and Visual persistence. Otherwise, the alarm can be too brief to be heard or seen.
<b>Store</b>	Saves an ECG strip. The event is centered as in the <b>Record</b> option below. You can select <b>Store</b> and <b>Record</b> for the Patient Call alarm even when priority and persistence are set to <b>Off</b> .
<b>Record</b>	The ECG is printed on the chart recorder or laser printer, depending on your system hardware and configuration settings. The length of the strip is defined by the default setting as configured in <b>Trace Setup</b> under the System Setup tab in the Configuration Utility. The event is centered. This means that if the default recorder setting is 20 seconds, 10 seconds of the recording are prior to the call event, and 10 seconds are after the call event.
<b>Medical alarms and Technical alarms</b>	Type of alarm.
<b>Limit</b> (Medical alarms only)	Set the threshold for the alarm condition based upon heart rate for each patient. Establish limits for the alarms: <b>High Heart Rate</b> , <b>High PVC</b> , and <b>Low Heart Rate</b> . These limits are not applicable to other alarms
<b>Persistence</b>	Determines the alarm's behavior after its triggering condition has passed. <ul style="list-style-type: none"> <li>• <b>Off</b>—the alarm indication immediately ceases once the alarm condition passes (the alarm does not persist after the condition clears).</li> <li>• <b>Visual</b>—the visual alarm indication on the patient tile continues after the alarm condition passes, until the alarm is manually dismissed.</li> <li>• <b>Audio and Visual</b>—both visual and audio alarm indications continue until the alarm is manually dismissed.</li> </ul> Because the Patient Call alarm is only active while the transmitter call button is pressed, always configure Patient Call for Audio and Visual persistence. Otherwise, the alarm can be too brief to be heard or seen.
<b>Priority</b>	A drop-down menu to assign the importance of the medical or technical condition relative to other medical or technical conditions. Options are: <ul style="list-style-type: none"> <li>• <b>Off</b></li> <li>• <b>Low</b></li> <li>• <b>Medium</b></li> <li>• <b>High</b> (selected alarms only)</li> </ul> The priority of alarms for life-threatening conditions is permanently set to High. The priority of most other alarms can be set to Medium, Low, or Off. Medical alarm settings can also be customized for each patient. See <a href="#">Alarms Tab</a> .
<b>Record</b> (Medical alarms only)	Automatically record a strip on the strip recorder
<b>Store</b> (Medical alarms only)	Store a strip in Full Disclosure when the alarm becomes active

## List Maintenance Tab

Use the **List Maintenance** tab to enter, edit, or delete items for lists. You can maintain these lists:

- Country
- Exercise Activity Type
- Med Dosage Units
- Medication
- Medication Class
- Medication Delivery Method
- Medication Frequency
- Modality Equation Type
- Race Ethnicity
- Rehab Program Subtype
- Relationship
- SCP Diagnosis
- SCP Secondary Diagnosis
- State Province

Changing a list item affects only new patients or programs. Patients or programs with that item already selected continue to use the original entry.

To maintain a list:

1. Click on the down arrow by the list field. The system displays a menu with all the lists.
2. Highlight the list you want to change. The system displays the items currently on the list.
3. To add a new item:
  - a. Click **Add New** to add a new item. The system displays a new line.
  - b. Type in the name of the new item and the press **ENTER**. The system automatically alphabetizes the item.
4. To make changes to an existing item:
  - a. Double-click on the item. The cursor changes to an I-bar.
  - b. Use the backspace key or the arrow keys to navigate. You can also highlight the entire line and type in a new item.
5. To delete an item on a list, click anywhere on the line and then click **Delete**. The system removes the item from the list.
6. Click **Save** to save the list or **Cancel Changes** to return to the original list.

The following table describes each field.

***NOTE:** Some displayed fields may be truncated.*

Field	Description
<b>List</b>	Displays the available lists in a drop-down menu.
<b>Items</b>	Displays the items in the selected list.

## System Setup Tab

System Setup has these tabs:

- Telemetry
- Trace Setup
- Facility Information
- Auditing Schedule
- Startup Settings tab

### Telemetry Tab

Use the **Telemetry** subtab to set the transmitter frequencies on the system so that the receivers can work properly. The channel numbers defined in this tab display as selectable channels for admission in the Session Management component of Q-Tel RMS. Before using the Q-Tel RMS system to monitor sessions, configure all of the transmitters to work within your environment.

Each transmitter works on a different assigned frequency within the Industrial-Scientific- Medical (ISM) allocated bands of 902-928 MHz, 614-632 MHz, or 2400-2483 MHz, or the Wireless Medical Telemetry Service (WMTS) allocated band of 608-614 MHz. To set the frequency for each transmitter see [System Setup](#). Do not set transmitters to adjacent channels. Transmitters on adjacent channels can cause interference between patient signals. To minimize interference between patients, allow these channel spaces between every channel:

- Three channel spaces for 900 MHz systems.
- Two channel spaces for 2400 MHz systems.
- One channel space for 608 MHz systems.

256 channels are available for 900 MHz systems and 64 channels are available for 2400 MHz and 608 MHz systems, providing room to tune around other noise sources and spreading the channels for the number of transmitters available.

The **Telemetry** subtab, displays the number of receivers installed on your system. Depending on the system, there are 4 or 8 receivers. You can configure less than or up to the number of receivers. To assign a channel and a frequency for each configured transmitter, click in the **Frequency** field and enter the frequency number.

A multiple Q-Tel RMS Tower network configuration requires the same frequency separations as a Standalone Tower. Create frequency settings for the transmitters that are unique and properly spaced.

It is recommended that you apply a label to the transmitter with the assigned transmitter number.



**WARNING! Invalid patient data.**

Be careful to accurately read the numbers from the transmitter and enter them correctly into the Q-Tel RMS program. Incorrect entry of the transmitter channel number will result in a failure to detect and record valid patient data.

The system does not allow you to enter a frequency that is not separated by the minimum channel spacing for the frequency configuration. If the frequencies are not far enough apart, a dialog box displays asking you to change the value.

## Copying Telemetry Configuration

To configure a replacement tower using the telemetry configuration from the previous tower:

1. Press **Ctrl+Shift+M**. The system displays a menu of all other towers on your network.
2. Click the arrow next to the field listing the towers.
3. Click on the tower with the configuration you need.
4. Click **Replace** to copy the telemetry configuration to this current tower.

## Telemetry Tab Fields

To change the receiver type:

1. Press **Ctrl+Shift+R**. The system displays a menu of receivers.
2. Select the receiver.

Field	Description
<b>Tower</b>	Displays the configured name of the tower.
<b>Receiver Type</b>	Displays the configured receiver type.
<b>Number of Licensed Receivers</b>	Displays the number of receiver licenses purchased.
<b>Number of Licensed Transmitters</b>	Enter the actual number of transmitters for this system. Must not exceed the Number of Licenses Receivers.
<b>Transmitter ID</b>	Identifies the transmitter.
<b>Frequency</b>	Displays the frequency assigned to the transmitter.

## Trace Setup Tab

Use this section to set up lead sets and the default strip recording device.

Field	Description
<b>Lead Sets</b>	
<b>Lead Set</b>	Lists the available lead sets and the priorities of the displayed leads. The system supports these ECG lead sets: <b>4 wire</b> —Modified Chest Lead (MCL) or Standard Limb sets <b>5 wire</b> —four limb leads plus one V lead (limb + C)
<b>Priority</b>	The system displays up to two traces for the selected lead set. Options are: <b>1</b> —Always display the traces from this lead <b>2</b> —Display the traces from this lead if space is sufficient
<b>Lead</b>	The name of the lead.

Field	Description
<b>Defaults</b>	
<b>Lead Set</b>	Selects the default lead set to display on the strip. You can change the lead set on a patient by patient basis, you cannot change the lead set once a patient session has begun. The gain and grid display selections can be changed during the session. To change the displayed leads, see Configuring the ECG display. When the default lead set is changed, the lead set for all patients, including those already registered in the system, are changed to the new default.
<b>Gain</b>	Sets the default gain.
<b>Display Grid</b>	The system displays the grid when there is a checkmark in the check box.
<b>Filter Type</b>	Select the AC line filter type appropriate to your environment: <ul style="list-style-type: none"> <li>• <b>60 Hz</b></li> <li>• <b>50 Hz</b></li> <li>• <b>Off</b></li> </ul>
<b>Chart Recorder Setup</b>	
<b>Recording Length</b>	The length (in seconds) of the strip printed on the strip recorder. This setting does not affect the length of the saved strip, which is always 8 seconds. <ul style="list-style-type: none"> <li>• <b>7</b></li> <li>• <b>8</b></li> <li>• <b>16</b></li> <li>• <b>20</b></li> </ul>
<b>Number of Leads to Print</b>	Select the number of leads to print: <ul style="list-style-type: none"> <li>• <b>1</b></li> <li>• <b>2</b></li> </ul>
<b>Paper Type</b>	Sets the type of paper in the printer. <ul style="list-style-type: none"> <li>• <b>Computer Printed Grid</b> (system default)</li> <li>• <b>Preprinted Grid</b>—select this option to avoid printing a grid on top of a preprinted grid</li> </ul>
<b>Tower</b>	Lists each Q-Tel RMS Tower in your Q-Tel RMS network. Use Print Strips to set the printing device for the strips. If you have a standalone Q-Tel RMS Tower you will see only one entry.
<b>Print Strips To</b>	Sets the device where the strips are printed: <ul style="list-style-type: none"> <li>• <b>Chart Recorder</b>—prints to the chart recorder attached to the system.</li> <li>• <b>Default Printer</b>—prints to the default printer attached to the system.</li> <li>• <b>Auto Detect</b>—the strips are printed to the default printer, unless a chart recorder is attached to the Q-Tel RMS Tower.</li> </ul> <p>Thermal printers can only be connected to Q-Tel RMS Towers, and strips can only be printed on the thermal printer for patients that were admitted to that tower. Patient strips from other towers cannot be printed on a different tower's thermal printer.</p>
<b>Session Management</b>	
<b>Automatically Save Prescription on Discharge</b>	A checkmark indicates the prescription is saved with the patient on discharge.

## Facility Information Tab

Q-Tel RMS provides a number of reports and integrates with Q-Progress (Progress Tracking Assistant) and Outcomes reporting. The information entered in the Facility tab is used to provide the facility data required in some of these forms. The facility name is also printed at the top of Q-Tel RMS reports.

Field	Max Length	Description
<b>Facility Name *</b>	50	The name of the facility.
<b>Address *</b>	50 each line	The address of the facility.
<b>City</b>	50	The city where the facility is located.
<b>State</b>	--	A drop-down menu for the state or province.
<b>Postal Code</b>	10	The zip code of the facility.
<b>Country</b>	--	A drop-down menu for the country.
<b>HCFA/CMS No.</b>	50	Health Care Financing Administration/Center for Medicare and Medicaid Services medical claims processing number.
<b>Phone</b>	25	The telephone number of the facility.
<b>Fax</b>	25	The fax number of the facility.

## Auditing Schedule Tab

Use the **Auditing Schedule** tab to manage audit tracking files.

Field	Description
<b>Tower List</b>	Lists each Q-Tel RMS Tower in your Q-Tel RMS network. Select the tower to expand the list of audit files.
<b>Days to keep the audit files</b>	A drop-down menu for the number of days to keep audit files.
<b>AppNam</b>	Displays the name of the Q-Tel RMS application.
<b>AppVersion</b>	Displays the software version of the application.
<b>AppStatus</b>	Displays logged activity.
<b>Audtingtime</b>	Displays the time of the activity.
<b>LogUser</b>	Displays the user name.
<b>MachineName</b>	Displays the name of the tower or workstation.
<b>MachineType</b>	Displays the type of the tower.
<b>Clean Audit Files</b>	Deletes the audit files older than the setting for Days to keep the audit files.

## Startup Settings Tab

Use the **Startup Settings** tab to configure start-up preference for the Main and Secondary Towers

Field	Description
<b>Show Startup Screen</b>	Selects whether or not to display the selection screen upon startup. Options are: <ul style="list-style-type: none"> <li>• <b>Yes</b>—display the selection screen</li> <li>• <b>No</b>—display the default window</li> </ul>
<b>Default Window</b>	Selects the default window, if the selection screen does not display at startup. Options are: <ul style="list-style-type: none"> <li>• <b>Patient Information</b></li> <li>• <b>Session Management</b></li> <li>• <b>Charting and Editing</b></li> <li>• <b>Admin Reports</b></li> </ul>

## Exchange Tab

The **Exchange** tab defines the settings for the Q-Exchange Export and Import settings. Use the Export Setting to set the default settings when exporting data.

Use the **Import Data Mapping Fields** to modify the Import schema for selected fields.

The following table describes each field:

*NOTE: Some displayed fields may be truncated.*

Field	Max Length	Description
<b>Export Settings</b>		
<b>Session Summary PDF</b>	--	A checkmark indicates the system exports a Session Summary by default.
<b>Session Report PDF</b>	--	A checkmark indicates the system exports a Session Report by default.
<b>Full Disclosure PDF</b>	--	A checkmark indicates the system exports Full Disclosure information by default.
<b>Auto Export Session Data at Discharge</b>	--	A checkmark indicates the system exports session data by default.
<b>Combine Session Data into One File</b>		A checkmark indicates the system consolidates the session data into one file.
<b>Full Version of Patient Demographic Cata</b>		A checkmark indicates the system exports the full version of patient demographic data.
<b>Q-Exchange Export Folder</b>		Select the folder where the system exports the changes.
<b>Browse</b>		Use the <b>Browse</b> button to open the Windows navigation window to locate the folder.
<b>Import Data Field Mapping</b>		
<b>**** Existing Fields</b>		Lists the fields expected by the Q-Tel RMS system.

Field	Max Length	Description
*****		
***** <b>Import Fields</b> *****	40 each field	Enter the name of the field in the import file that maps to the <b>Existing Field</b> selection.

## Comments Library Tab

Use the **Comments Library** tab to create custom comments that can be added to the comments in the Patient Information and Session Management screens. There are sub- tabs for:

- Session Comments
- Health Assessment Comments
- Exercise Goals
- Nutrition Goals
- Education Classes

### Session Comments

Use session comments to create comments for use during Session Management.

Field	Max Length	Description
<b>Session Comment Type</b>	--	Displays the menu of comment types.
<b>Session Comment Names</b>	30	The title of the comment.
<b>Comment Name</b>	1000	The text of the comment.

### Health Assessment Comments

Use the health assessment comments to create comments for the Assessment tab.

Field	Max Length	Description
<b>Health Assessment Comment Type</b>	--	Displays the drop-down menu of comment types.
<b>Health Assessment Comment Names</b>	50	The title of the comment.
<b>Comment Name</b>	1000	The text of the comment.

## Exercise Goals

Use the exercise goals to create goals for the patient care plan.

Field	Max Length	Description
<b>Exercise Goal Names</b>	50	Displays the menu of comment types.
<b>Goal Names</b>	500	A text field to describe the goal.

## Nutrition Goals

Use the exercise goals to create goals for the patient care plan.

Field	Max Length	Description
<b>Nutrition Goal Names</b>	50	Displays the drop-down menu of comment types.
<b>Goal Names</b>	500	A text field to describe the goal.

## Education Classes

Use the exercise goals to create goals for the patient care plan.

Field	Max Length	Description
<b>Education Class Names</b>	50	Displays the drop-down menu of comment types.
<b>Class Names</b>	500	A text field to describe the class.

## Resource Tab

Use the **Resource** tab to maintain the lists for:

- Providers
- Insurance Carriers

If a provider or insurance carrier is assigned to a patient, the system prompts you to re-assign the patient to another provider or insurance carrier.

Field	Max Length	Description
<b>Provider</b>	--	Select this radio button to display the physician fields.
<b>Provider</b>	--	The name of the physician.
<b>Provider ID</b>	--	The unique identification of the physician.
<b>Delete</b>	--	Marks the provider for deletion.
<b>Insurance Carrier</b>	--	Select this radio button to display the insurance carrier fields.
<b>Insurance Carrier</b>	--	The name of the insurance carrier.
<b>Delete</b>	--	Marks the provider for deletion.

To delete a resource:

1. Select the radio button for **Provider** or **Insurance Carrier** to display the appropriate resource.
2. Double-click in the **Delete** check box for the resource. If the resource is associated with a patient, the system prompts you to assign a new resource to the affected patients:
  - a. Double-click in the **Provider** or the **Insurance Carrier** field and select an option from the drop-down menu.
  - b. To apply the selections, press **Enter** and then **Apply All**.
  - c. Click **Save**. The system re-assigns the patient and returns to the **Resource** tab.
3. Click **Save** to delete the resource.

## CPT Billing Code Tab

Use the **CPT Billing Code** tab to maintain CPT Billing Codes.

Field	Description
<b>CPT Billing Code</b>	The CPT Billing code.
<b>Phase</b>	The phase where the billing code is used.
<b>CPT Billing Code Description</b>	The description of the CPT Billing code.



## 20. PURGE AND ARCHIVE

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This chapter describes the Purge and Archive Utility, the Archive Viewer Utility, and user controls. It describes how to purge patient data and program data for patients. It also details the difference between purging and archiving patient data.

### Purge and Archive Utility

Over time your Q-Tel RMS system database and associated disk space will fill with patient data. To maintain system performance and allow for the continued storage of new patients and their session data, you must periodically purge older data from the system. You can archive this data for clinical review at a later date. The Q-Tel RMS Purge and Archive utility retains just the data you need on the system and purges older data that is not in current use. It can also archive data.



#### **WARNING! Possible data loss.**

Purging data removes information permanently. Do not purge data unless you also perform an archive, have a backup of data, or are absolutely certain you will not want the data back.

Be aware that the archive and purge operations may take a considerable amount of time, depending on the number of patients and programs you select. You cannot use the Q-Tel RMS system (either towers or workstations) while the archive and purge operations are in process.

The Q-Tel RMS Purge and Archive utility provides support for these key functions:

- Removing all records for one or more patients from the system, including their demographic profiles, all of their session parameter data, and all ECG waveform data.
- Removing all session and waveform data for one or more patients, leaving their demographic profiles on the system for possible re-use on subsequent admission.
- Purging older program data for a patient who re-entered Rehab for an additional suite of sessions. The Q-Tel RMS system retains the current in-progress session data and demographic data.
- Archiving selected data that you want to purge from the system. You can archive the data to the CD-RW or to a network location. The archive includes patient demographic data, all session parameters and all PDF session reports.
  - ECG strips are NOT archived.
  - If only the patient program, and not the patient demographic information, is selected for archive, you will get a modified header with First Name, Last Name and MRN and then the Session information. The viewer will substitute the modified header information and the full session information.
- Query the database to find out when a patient was archived and the name of the archive.

*NOTE: The Purge and Archive utility resides only on the Main Tower.*

### Starting the Purge and Archive Utility

To start the Q-Tel RMS Purge and Archive utility, choose a method:

*NOTE: You must be logged into the system using an account with administrator privileges in order to run the Purge and Archive Utility. If your login account does not have administrator privileges, a message dialog will be displayed and the utility will not open.*



- Double-click the **Q-Tel RMS Purge and Archive Utility** icon on the desktop.
- Click on **Start | Programs | Quinton | Q-Tel Purge Archive Utility**.

## Select Patient Information for Purge and Archive

The Q-Tel RMS Purge and Archive functionality has these tabs:

- **Patient List**—Select patient information from the pool of all patient data on the system based on the Patient Search Criteria.
- **Final Purge/Archive Patient List**—Verify that you have selected the correct list of patients for action (Purge and Archive) and to carry out the selected actions.
- **Error Information List**—Manages any error conditions that might arise over the course of the actions (error recovery).

Use the Patient Search Criteria to select patients for purge and archive. The search is based on the patient's MRN and last name. To select all of the patients you want to archive, you may need to define two or more distinct search criteria. For example, first select all patients whose program was completed last quarter and then select all patients who have not formally completed their program but have not shown-up in the past six months. Each time you specify a new criteria and search, the **Patient List** field is populated with patients meeting the criteria.

***NOTE:** Patients with un-recovered sessions will not be included in the results of your search and cannot be purged or archived until the incomplete session is recovered or cancelled. See [Session Recovery](#) for information on recovering incomplete sessions.*

To Search for	Do this...
All patients (including patients that have completed their rehab program).	<ol style="list-style-type: none"> <li>1. Click the check box to select <b>All</b>.</li> <li>2. Click <b>Search Patients</b>.</li> </ol>
Patients by last name	<ol style="list-style-type: none"> <li>1. Enter at least the first letter of the patient's last name in <b>LName</b>.</li> <li>2. Click <b>Search Patients</b>.</li> </ol> <p>The search returns all patients with the associated string. For example, if you enter the letter "S", the system displays a list of all patients in the directory whose last name begins with an S.</p> <p>The system recognizes the wildcard characters. Enter "*" to match any number of characters or "?" to match any single character. For example: S??th returns Smith, Smyth, South, and any name beginning with S, ending with th and having two characters in between. S*th returns all the examples above and any name that starts with S and ends with th, with any number of characters in between.</p> <p>To narrow the search, enter more of the last name.</p>
Patients by MRN	<ol style="list-style-type: none"> <li>1. Enter at least the first character of the MRN in <b>MRN</b>. To narrow the search, enter more characters. <ul style="list-style-type: none"> <li>• The system recognizes the wildcard characters. Enter "*" to match any number of characters or "?" to match any single character. For example: S??th returns Smith, Smyth, South, and any name beginning with S, ending with th and having two characters in between. S*th returns all the examples above and any name that starts with S and ends with th, with any number of characters in between.</li> </ul> </li> <li>2. Click <b>Search Patients</b>.</li> </ol>
Select all patients within a specified time range, for example all patients for last quarter.	<ol style="list-style-type: none"> <li>1. To select all patients that have completed their programs enter the date range in the <b>Completion Date</b> field.</li> <li>2. To select all sessions within the date range, enter the date range in the <b>Last Session Date</b> field.</li> </ol>
Select inactive patients (patients that will not return)	<ol style="list-style-type: none"> <li>1. Specify a date range and select all patients who had their last session several months ago.</li> </ol>

To Search for	Do this...
	<ul style="list-style-type: none"> <li>Note: Use the <b>Ignore</b> check boxes to include or exclude date range criteria as part of the search.</li> </ul>

## Patient List

Use the **Patient List** to select a list of prospective patients for your review and selection. To expand or collapse the display for each patient, click on the [+] or [-] box to the left of the patient's name.

## Select Patients and Programs to Purge and Archive

You can move all of the patients in the list to the Final Purge and Archive list or selectively mark patients in the list for inclusion in the final list. Continue searching for patients and moving them into the Final List until you have identified all patients for purge and archive.

To help you efficiently mark patients for purge and archive activities, use the buttons on the **Patient List** tab.

You can also manually select or de-select individual patients and specific program session data by checking or unchecking the associated box on the tree-view of all selected patients.

For patients that have completed two or more programs, you can define selection criteria that select a subset of all of the complete programs for that patient. The system prevents you from deleting the patient and the associated demographic data, leaving behind an “orphaned” program - you can only delete a patient from the system once all of the associated patient's programs have also been purged. In this scenario, if you click on the box next to a patient's name, attempting to mark the patient for deletion, but not all of the programs for that patient are complete and selectable for deletion, the system displays a warning dialog box, and prevents you from deleting the patient. The patients with both completed and active programs display with a shaded background.

***NOTE:** This dialog box is not displayed when you select the **Select All Patient Program** button. It is not efficient to show this message for all patients.*

Select all of the program nodes for a patient, and then select the patient to purge.

If a patient is in the system then the system expects a program to be associated with the patient. When you purge all program data for a patient but leave behind the patient demographic information for possible future use, the system enrolls the patient in the default Program as defined in the Q-Tel RMS Configuration Utility. If you select the patient's final program for deletion the application displays a warning dialog box indicating that the patient will be enrolled in the default program.

## Final Purge/Archive Patient List

Use the Final Purge/Archive Patient List to verify all patients to remove. You can select whether the items are purged or archived and purged.

You can archive the database information and manage the associated PDF files. You can also remove any patient or patient program that, on review, should not have been added to the processing list.

After selecting a list of patients for Purge and Archive processing, select the processing option.



**WARNING! Possible data loss.**

Purge and Archive processing will **ALWAYS** remove the selected patients and program data from the Q-Tel RMS database and delete the associated ECG waveform files.

The Archive created by the system has a standard Windows directory structure. A folder is created for each patient and the archived session and demographic data and any available PDF files are copied into each patient's folder. The archived session and patient demographic data is stored in an industry standard XML format for use by other applications, including the Q-Tel RMS Archive Viewer.

The archive created during the processing may be written to any location on the network or on the Q-Tel RMS Tower, including to a CD if available. If archiving to a CD, the CD must be blank. When a non-CD-RW drive is selected (local or network drive), click the **Open Folder** button to navigate to the folder you want to use:

When you click the **Archive** button, the program makes these validations:

- Checks the archive destination media to ensure there is enough space to hold the patients and Program data.
  - If sufficient space is available, the system displays a confirmation dialog box.
  - If sufficient disk space is not available, the system displays a warning dialog box.
- If the destination is CD-RW, the system checks if the drive has a CD in it.
- If the destination is a network drive, the system checks that the user has "Write" permission on the drive.

If any of these validations are not successful, the system does not archive the data. The system does not purge data if the associated archive is not successful.

Before starting the Archive and Purge process, designate a label name for the archive. The name should be something meaningful to the facility (for example, "Jan-March.") The system adds a prefix of either Purge or Archive followed by mmddyyyyhhmmss.

If archiving to CD, label the CD with the name.

To cancel the purge or archive process, click the **Cancel** button.

On completion of the Archive or Purge operation, the system prompts to tune the database. Tuning the database removes overhead associated with now empty storage locations. This optimizes the Q-Tel RMS database performance. The database tuning process is very quick and is recommended.

## Purging Data

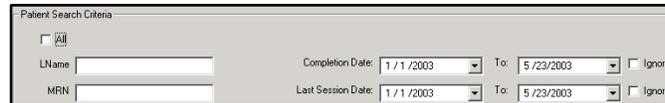
To permanently remove patients from the Q-Tel RMS system:

***NOTE:** The purge process can take up to 2 minutes per patient. Do not purge more than 10 patients at one time*



1. Double-click the **Purge/Archive Utility** icon on the desktop.
2. Select the **Purge** option.
3. Select the files you want to purge. Generate a list of patients by clicking the **All** check box and then **Search Patients** to list all patients on the system.

You can also list specific patients by MRN, last name, completion date, or last session date. Enter the conditions and click **Search Patients**. A list of patients that meet your criteria displays.



The dialog box titled "Patient Search Criteria" contains the following fields and controls:

- All
- LName: [text input field]
- Completion Date: [dropdown menu with 1/1/2003 selected]
- To: [dropdown menu with 5/23/2003 selected]
- Ignore
- MRN: [text input field]
- Last Session Date: [dropdown menu with 1/1/2003 selected]
- To: [dropdown menu with 5/23/2003 selected]
- Ignore

4. Click the check box for each patient and/or program you want to purge or click the **Select All** box to select all patients in the list.
5. Click the Add to Final Purge/Archive List button.



The system displays the selected patients. Review the list to ensure that only those patients to be removed from the system are listed.

6. Click **Purge**. A message confirmation dialog box displays.
7. Click **Yes** to continue or **No** to cancel. The system prompts for a batch name for this purge.
8. Click **OK** to use the default name. When the process is complete, the system prompts you to tune the database.
9. Click **Yes**. When the hourglass displays as the regular cursor tuning is complete.

## Archiving Data

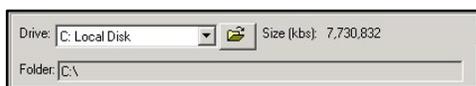
To archive patients (and permanently remove them from the Q-Tel RMS database):

***NOTE:** The archive process can take up to 2 minutes per patient. Do not archive more than 10 patients at one time.*

1. Click the **Purge/Archive Utility** icon on the desktop.
2. Click **Archive** under Data Processing Options.

***NOTE:** Selected patients are purged after archiving.*

3. Select the files you want to archive. Generate a list of patients by clicking the **All** check box and then **Search Patients** to list all patients on the system. Alternatively, specify patients by MRN, last name, completion date, or last session date. Enter the conditions and click **Search Patients**. A list of patients that meet your criteria display.
4. Click the check box in front of each patient and/or program you want to archive or click the **Select All** box to select the entire list.
5. **Click** Add to Final Purge/Archive List. The system displays the selected patients. Review the list to ensure that only those patients to be removed from the system are listed.
6. Click the down arrow by the drive selection. A list of available drives displays. Click on the drive where you want to archive the files.



The dialog box shows the following information:

- Drive: C: Local Disk
- Size (kbs): 7,730,832
- Folder: C:\

7. Click **Archive**. A confirmation dialog box indicates these files will be deleted from the server.
8. Click **Yes** to proceed or **No** to cancel. A dialog box displays indicating the archive may result in a long wait time.
9. Click **Yes** to proceed or **No** to cancel. A dialog box displays indicating the estimated number of MB needed to write the archive.
10. Click **OK** to proceed with the archive.

11. The system prompts for the archive name, click **OK** to use the default name. When the archive completes, the system prompts you to tune the database.
12. Click **Yes**. When the tuning is complete, the hourglass displays as the regular cursor.

**NOTE:** Although you can view archived patient data with the Q-Tel RMS Archive Viewer, you cannot restore a patient from archive back to the Q-Tel RMS system.

### Error Information List Tab

Use the **Error Information List** tab to retry the processing of Archive and Purge data. If an error occurred during the archive or purge process, the application lists the patients and/or patient programs on the **Error Information List** tab.

Patient data is not purged from the system if an error occurs during processing.

If you highlight either the patient or patient program node, the error message text displays in the bottom left of the form.

To resolve an error:

- To re-try the failed records, click the **ReTry All Checked** button, or click the **Cancel** button to ignore the failure on the records and finish the batch purge and archive processing. Before clicking **ReTry All Checked**, you can ignore individual patients or programs by unchecking those items.
- If an error occurs during the purge or archive process, click the **Cancel** button to rollback the archived data file in the error list.

Field	Max Length	Description
<b>Patient Search Criteria</b>		
<b>All</b>	--	A checkmark indicates that all patients are listed for purge and archive.
<b>LName</b>	50	A portion of the patient's last name. The system uses this information to search for the patient. The system recognizes the wildcard characters. Enter "*" to match any number of characters or "?" to match any single character. For example: S*?th returns Smith, Smyth, South, and any name beginning with S, ending with th and having two characters in between. S*th returns all the examples above and any name that starts with S and ends with th, with any number of characters in between.
<b>MRN</b>	40	A portion of the patient's MRN. The system searches for patients with an MRN that begins with the entered characters. The search returns all patients with the associated string.
<b>Completion Date</b>	--	A drop-down menu displays a calendar for selecting the date range.
<b>Last Session Date</b>	--	A drop-down menu displays a calendar for selecting the date range.
<b>Data Processing</b>		
<b>Options Archive</b>	--	Directs the system to write the patient's demographic and session data to the archive file. The archive file includes all previously created PDF files for the patient. On completion of the Archive operation, the system automatically performs the Purge operation on the selected patient data. Click on the radio button to select the <b>Archive</b> option.
<b>Purge</b>	--	Deletes all selected patient data <i>without</i> saving or archiving.

Field	Max Length	Description
<b>Remove PDF Files</b>	--	<p>Deletes the associated patient report PDF files from the Q-Tel RMS system. When you choose the <b>Remove PDF Files</b> option during a Purge or Archive, all PDF files associated with the selected patients are deleted regardless of the programs selected for the operation. Do not select the <b>Remove PDF Files</b> option unless you are selecting the patient, not just the program(s), for Purge or Archive.</p> <p>The session PDF files support viewing of ECG strips, as well as the session data (see <a href="#">Session Management</a> for more discussion on the session PDF capabilities). ECG strips for the selected patients being Purged are viewable ONLY via the PDF files. If future viewing of the ECG strips is important then it is recommended that PDF session reports routinely be generated for each patient and the Archive function always be selected during Purge/Archive operations.</p>
<b>Search Patients</b>		Creates a patient list of all patients meeting the search criteria.
<b>Drive</b>	--	A drop-down menu displays the network locations for Archive storage.
<b>Folder</b>	--	Displays the folder location for Archive storage.
 <b>Open Folder</b>	--	Displays a dialog box to navigate to the Archive folder. Displays the size of the folder in kbs.
<b>Patient List Tab</b>		
<b>Select All</b>	--	Selects all demographic and session data for the patient.
<b>Select All Patient Programs</b>	--	Selects all patient programs (all session data) but does not select patient demographic data.
<b>Select Completed Patient Programs</b>		Selects only those patient programs that have been completed and leaves patient demographic and active patient program session data.
<b>Clear All</b>	--	Removes all patients and their associated patient program nodes from the patient list.
<b>Patient Name</b>	--	Name of the patient.
<b>MRN</b>	--	Patient's MRN>
<b>Complete Date</b>	--	The date the session was complete.
<b>Session Date</b>	--	The date of the last session.
<b>Number of Sessions</b>	--	The number of sessions completed for this patient.
<b>&gt;&gt;</b>	--	Adds the selected programs and patients to the <b>Final Purge/Archive Patient List</b> . You can switch back to the <b>Patient List</b> tab to select more patients or patient programs and add them to the <b>Final Purge/Archive Patient List</b> as many times as necessary.
<b>Final Purge and Archive Patient List Tab</b>		
<b>Remove Unchecked Patients</b>	--	Removes all patients that you have unchecked from the <b>Final Purge/Archive Patient List</b> .
<b>Remove All</b>	--	Removes all patients and patient programs from the <b>Final Purge/Archive Patient List</b> .

Field	Max Length	Description
<b>Estimate Space Required</b>	--	Perform an analysis of the space required to archive the selected items. The system displays a dialog box with the information.
<b>Archive Purge</b>	--	The system labels the button according to the Data Processing Option selected. Clicking the button begins the purge or archive process.
<b>Error Information List Tab</b>		
<b>Select All</b>	--	Check all items.
<b>Select Patient Programs</b>	--	Check all patient programs.
<b>Retry All Checked</b>	--	Resubmit the checked items for purge or archive.
<b>Cancel</b>	--	Cancels the purge or archive for these items.

## Purge and Archive Utility Tools

Purge and Archive provides tools that can be run either from the Toolbar button or by selecting them from the **Tools** menu:

- Purge/Archive Batch List
- Tune Database

You can run both utilities functions at any time without purging or archiving data.

### Purge/Archive Batch List

The Purge/Archive Batch List function queries the Q-Tel RMS database to determine how many archives have been performed and lists them to past Purge or Archive activities. The archive label name is displayed for each previous archive. Click on an archive to expand the list and display the list of all patients associated with the selected archive. If you are writing the archive to a CD, this utility can help you find the right CD to load for viewing the patient of interest.

### Tune Database

After purging data from the database the system may have needless overhead associated with now empty storage locations. The Tune Database function optimizes the database for performance. To run the performance tuning just select the option from the Tools menu or click on the icon at the top left of the screen.

## Archive Viewer Utility

The Q-Tel RMS Archive Viewer supports retrieving, viewing, saving as PDF files, and printing of patient demographic and session information previously archived using the Q-Tel RMS Purge and Archive utility. The Archive Viewer supports archive data stored on the local hard drive, a CD-ROM, external USB hard drive, a USB portable flash memory disk, or a hard drive on a remote system.

**NOTE:** You can use the Archive Viewer from the Main Tower, Secondary Tower or Workstation, as long as the storage location is accessible. If the archive folder is on a remote machine, ensure the archive folder is shared and assigned access privileges to the user account for the other Q-Tel RMS machines; and create a map from the other Q-Tel RMS machines to the shared folder.

## Starting the Archive Viewer



To start the Q-Tel RMS Purge and Archive utility, choose a method:

- Double-click the **Q-Tel Archive Viewer** icon on the desktop.
- **Click on Start | Programs | Quinton | Q-Tel Archive Viewer.**

## Search Archive Batch Info

To retrieve and view archived patient information identify the archive and select the patient.

To identify the archive and select the patient:

1. Start the Archive Viewer.
2. Click the **Search Archive Batch Info** tab on the Archive Viewer, to navigate to the correct archive and patient.
3. Click the **Select Archive Folder** button to find the archive. The Select Archive Folder window displays. The **OK** button is grayed-out (disabled) until you double-click on a folder that contains archive data files.
4. Select the drive (local, network or CD) and select folder that contain archive data. If the folder contains Q-Tel RMS archive data, the **OK** button becomes active. To locate a particular archive, view the Purge/Archive Batch List in the Q-Tel RMS Purge and Archive utility to see which patient was archived to which archive directory or CD.
5. Click **OK** to load the names of the patients, and their archived programs, into the **Search Archive Batch Info** screen.

## Selecting Patient Data to Display

Expand the **Search Archive Batch Info** screen display to display the Program(s) associated with each patient. For example, one patient may have returned to Rehab for a second Phase II Program, or may have both Phase II and Phase III programs stored in the archive. You can expand or collapse the display for each patient by clicking on the [+] or [-] box to the left of the patient's name.

For large archives use the **Find Patients** button to find a patient in the archive list. To find a patient:

1. Enter either the patient's last name (or any portion) or an MRN in the text box to the right of the **Find Patients** button.
2. Select either **By Lname** or **By MRN** as appropriate for your search. The program moves the cursor to the first patient record that satisfies the search requirements.

## Display Archive Data

Only one of the archived patient demographics and session information files can be viewed at a time. To view the data, select one of these options:

- Double-click the name of the selected patient—the patient and the first program for that patient displays.
- Click on the patient name (highlights), then click on the **Show Patient and Session Data** tab—the patient and the first program is displays.
- Click the patient node (expands list to see all programs associated with this patient), then select a program other than that patient's first one. Click the **Show Patient and Session Data** tab—the patient and the selected program displays.
- Click the patient node (expands list to see all programs associated with this patient), then double-click the program of interest—the patient and the selected program displays.

## Show Patient and Session Data

The **Show Patient and Session Data** tab displays the patient demographic and session information associated with the selections made above

## User Controls

Function	Definition
<b>Scrolling</b>	Use the scroll bar at the right to scroll the window up and down through the current page.
<b>Paging</b>	To see a specific page of the display, click the Left or the Right arrow button or type the page number in <b>Page</b> box and click the <b>Go</b> button.
<b>Zoom</b>	Use the <b>Zoom</b> menu to expand or contract the display.
<b>Print</b>	Click the <b>Print</b> button to print the entire archived report
<b>Save</b>	Click the <b>Save</b> button to save the display as a PDF file. You may save the file in any network location or local folder. Saving the patient information as a PDF file is an easy way to create an electronic document that you can attach to an e-mail.

## 21. NETWORK OPERATION AND WORKSTATION CAPABILITIES

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This chapter describes configuring the workstation for the network option.

**NOTE:** *Wireless devices, by nature, cannot guarantee uninterrupted connectivity due to unforeseen and unpredictable interference from other radio frequency sources. The Q-Tel RMS system uses a variety of methods to mitigate outside interference and accommodate co-existence with other wireless systems. User is responsible to identify potential nearby sources of radio frequency interference and take appropriate measures to minimize interference.*

### Network Operation

Q-Tel's Network capabilities leverage a common database of patient information across multiple networked Q-Tel RMS Towers and Workstations. This supports many functions important for efficient operation of a large rehab center allowing you to:

- Access and update Patient Information, Session Data and Administrative Reports from multiple locations, including your office workstation.
- Admit patients to sessions from any tower.
- Selectively monitor patients, manage sessions and enter data from multiple workstations located around the facility.

A Q-Tel RMS Tower is a computer system that includes telemetry electronics for the reception of the ECG signals from the transmitters worn by the patients. Patients must be admitted to sessions on towers. A Q-Tel RMS Workstation is a computer that does not include the telemetry electronics. You can connect any combination of up to four tower and workstations on your network.



**WARNING! Possible improper system behavior.**

Exceeding the four node/machine limit on your Q-Tel RMS network system can cause unpredictable and unstable behavior.



**WARNING! Possible Improper Use.**

Workstations are not intended for monitoring alarms.

### Anti-Virus Software

The use of anti-virus (AV) software is recommended for the computers hosting the Q-Tel applications. The following guidelines apply in the use of AV software;

- Customer is responsible for installation and maintenance of AV software
- AV software updates (software and definition files) should not be applied during active use of the Q-Tel application
- AV software must be configured to exclude files/folders as defined in the Q-Tel Installation Manual
- Active scanning is allowed during operation of the Q-Tel application

Please refer to the instructions included with your anti-virus software for complete configuration instructions.



**WARNING! Computer virus protection.**

- If you allow active scanning during the operation of the Q-Tel application and exclusions are not configured per instructions in the Q-Tel Installation Manual; you may notice performance degradation during operation of the product.
- If you have a technical support issue on your Q-Tel RMS system, you may be asked to remove any virus scanning software from the device in order to investigate the issue.

## Accessing Patient Data on the Network (Locking)

On a Q-Tel Network, multiple concurrent Q-Tel RMS Tower and Workstation users can access and update potentially the same patient information at the same time. This could lead to confusion and uncertainty as the system attempts to reconcile which changes should be kept and which overwritten.

### Locking a Record

To prevent confusion, Q-Tel RMS controls or *Locks* a record when it is in use and notifies users of the status if they attempt to access and change the same information. A view-only capability ensures key information is always available to every user (for example: emergency contact information), even when the record is locked by another user.

To minimize the likelihood that a user will encounter a locked record, the patient data is divided into workflow areas:

Icon	Definition
	Patient Info
	Session Management
	Charting and Editing

For example, one user may be in an office updating the Patient Information for a patient, that patient can also be participating in an active session in the Rehab area and currently monitored by a technician using the Session Management Section, at the same time, another colleague using a different workstation might be updating past session information in Charting and Editing. The following sections discuss more of the details regarding network use of Q-Tel RMS and lock management.

### Locking with the Rx Feature

The Q-Tel RMS Network prevents multiple users from changing the exercise prescription for the same patient. For example, if a workstation user accesses the **Rx** tab in Patient Information, then other users cannot edit or change the Rx for the same patient using the Rx tools in Session Management or Charting and Editing.

With either the Q-Tel RMS Tower or Workstation you can always make changes to the current prescription in Session Management for the current session. You cannot save that prescription for future sessions unless you have control (system focus). When the **Save Rx** button is enabled you have control. When the **Save Rx** button is not enabled (grayed out), you do not have control.

## Additional Features in Patient Information

### Refresh List

When any user enters a patient into the database, other users can access that patient.

To access a new patient:

- From the **Patient Search** tab, click the **Refresh List** button. If the **Refresh List** button is enabled (not grayed-out), then there are new patients entered that are not on your current list. The system updates your list adding the newly entered patients.
  - When you enter a new patient on your own computer, the **Refresh List** button is not enabled because the patient is available on your list immediately.
  - The **Refresh List** button is on the **Patient Search** tab in **Patient Information**, **Admit** tab in **Session Management**, and the **Add to Queue** Tab in **Charting and Editing**.
  - The **Refresh List** button can create a slight delay on the modality clock in Session Management. Click **Refresh List** only after all patients are dismissed from active sessions.

### Patient Locking

In Patient Information, if you attempt to open a Patient Information record for a patient who is already opened in Patient Information on another station, a dialog box indicates the Patient Information is available as read only and indicates the workstation or tower where the record is open.

When you have completed making your additions and edits in Patient Information for a specific patient it is courteous to other users to release the record so that others can access and update the same record as necessary.

To release a record, choose a method:

- Select the next patient in your work list.
- Select **Close Patient** on the **Patient Search** tab.
- Double-click on another patient in the **Patient Search** screen.

For more information on patient locking see [Accessing Patient Data on the Network \(Locking\)](#).

## Workstations

This section describes the network considerations for a Workstation. Workstation software can be installed on customer supplied hardware, or come pre-configured from Quinton as a Turnkey Workstation.



**WARNING! Alarms not real time.**

Waveforms and alarms on the Workstation are near real-time but are NOT real-time.



**WARNING! Alarm volumes.**

Network system failures may disable the display of ECG waveforms and visual alarms on network connected Workstations. Alarm volumes should be set sufficiently loud on the Q-Tel RMS Tower to be heard adequately over the entire rehab facility. ECG waveforms displayed on the Workstation that are not being updated should not be relied upon for current patient status.



**Caution: Network failure.**

The Q-Tel RMS system monitors network connections and notifies the user via a message window if a network failure is detected. Workstations connected to Q-Tel RMS Towers via the failed network are not functional. The system network should be checked and any dislodged network plugs, power-down conditions or other failures corrected. Reestablishment of the network connection within a few minutes of the failure will allow activities in Patient Info and Charting and Editing to continue without shutting down and restarting the Q-Tel RMS software on the Workstation.

## Workstation Capabilities

Q-Tel RMS Workstations function the same as a Q-Tel RMS Tower except:

- Workstations do not show ECG trace data in true real-time. The display may be slightly delayed by network traffic. Workstation users can request that an ECG strip be recorded and printed. These requests are executed on the associated Q-Tel RMS Tower that was used to admit the patient. The strip is positioned in the same manner as an ECG strip requested from a Q-Tel RMS Tower. However, it can be slightly delayed from when the user clicked the **Save** or **Print** buttons on this workstation because of the delays associated with network traffic.
- You cannot access or change the ECG arrhythmia detection controls (for example, put a patient in Standby, or enter Learn). You must access these activities on the tower that admitted the patient.
- You cannot change the ECG waveform display parameters. These must be accessed and changed on the Q-Tel RMS Tower that admitted the patient.
- You cannot admit a patient to a new session on a Workstation. You can, however, take control of the session after the patient is admitted on a Tower.
- You cannot view Full Disclosure data for monitoring sessions that are in progress.

## Review Workstations

Review Workstations are Workstations without the Session Management license. On Review Workstations, Session Management functionality is read-only. You can view ECG waveforms in non-real-time as well as all session information, but you cannot edit any information in Session Management. This limitation is useful for Workstations installed outside the rehab center where clinicians can't physically see the patients they are editing.

You can display selected patient ECG waveforms on remote workstations (as well as on the admitting tower) and enter session data at the most convenient computer - either tower or Workstation. This leads to an environment where it is common for multiple users to be concurrently accessing and updating session data for the same patient at multiple locations in the facility. To prevent confusion it is important to maintain the concept of locking a patient record during edits. But, it is also important to quickly release the lock so that other users can also access and update the same patient session data. Provided no one else is currently accessing the same patient, you will automatically be given a lock on a patient session record when you double-click the patient's ECG tile.

You can also acquire a lock (take control of the patient data) on a tower by clicking the **Unlock** button  at the bottom left of the session data grid and on Workstations by clicking the **Take Control** button. When you quit entering information the lock automatically expires in 15 seconds and any other user can then access and edit the same patient session data. This 15-second delay allows you sufficient time to review your edits and continue making changes and updates without losing control to another user, but short enough so that other users will rarely encounter a locked record. You don't need to do anything to create the lock — it happens automatically for you when you double-click on the tile. Should you attempt to access session data for a patient that is being updated by another user the locked dialog box displays.

You can always print and save strips even if the session data is locked and being edited by someone else.

## Connecting to the Q-Tel Network

Q-Tel RMS Workstation Software can connect directly on the Q-Tel RMS network, or via the hospital network allowing you access to all data and sessions.

It is recommended to disable screen savers prior to using the Q-Tel RMS Workstation application.

If you install the Workstation software on a domain member machine, you may need to configure the machine as described in the Q-Tel RMS System Installation Guide.

## Patient Selection

Patient selection on the Workstation is similar to that on the Tower, but has some very important distinctions. Patients can only be admitted on a Q-Tel RMS Tower that has the necessary telemetry electronics for receiving and processing the ECG data. The Workstation patient session list shows all patients (monitored and non-monitored) admitted to a session on all Towers connected to the network. The Workstations are provided with information on all patients currently admitted on all Towers. You can select from this list the patients to be accessed and displayed on the Workstation. The displayed patient list provides you with current information about each patient, including the current exercise modality, heart rate and blood pressure.

If the **Refresh List** button is active, click on it to add patients to the list who have been admitted since you last refreshed the list.

Each workstation can display up to 18 ECG tiles.

The patient queue on the workstation is the same as that on a tower except for the last four columns.



All patients are initially displayed in gray. The following table shows how to activate the patient (the patient information turns black).

Definition	Workstation	Review Workstation
Double-click on the patient name and go to the session tab.	X	X
Double-click on the ECG column for that patient.	X	X
Double-click on the Take Control column for that patient.	X	

**Take Control** is not selectable with a Review Stations as all Session Management functionality is read-only.

Icon	Label	Definition
	<b>View ECG</b>	Check this column to view near real-time ECGs for the patient during an exercise session.
	<b>Take Control</b> (Turnkey Workstation only)	Check this column to take control (lock) of a patient currently admitted to a session on one of the other towers (clicking on <b>Take Control</b> also activates <b>View ECG</b> ). Once an ECG tile displays, you can also take control of a patient by double-clicking on the patient ECG tile.
	<b>Monitored Non-Monitored</b>	Patients who are admitted to a session as non-monitored will not have a computer icon showing in this column.
	<b>Discharged Not Active</b>	If a patient has been discharged or is no longer in an active session, this column is checked.

All information added to a patient's active session is reflected on the other station(s) that are viewing the tab that is being updated. For example, if the Turnkey Workstation has control of the patient's active session and the technician adds blood pressure information, the data displays on the admitting Tower. If the patient alarms with VTACH, this alarm shows on all stations where this patient is currently listed.

## Remove a Patient from the Patient Session List

When a patient is discharged from the controlling station, that patient is also discharged from any other station list.

To remove a patient from the Workstation, choose a method:

- Click the **Refresh List** button when a checkmark displays in the **Discharge/Not Active** column.
- Double-click the red checkmark in the **Discharged/Not Active** column.

## Discharge from the Workstation

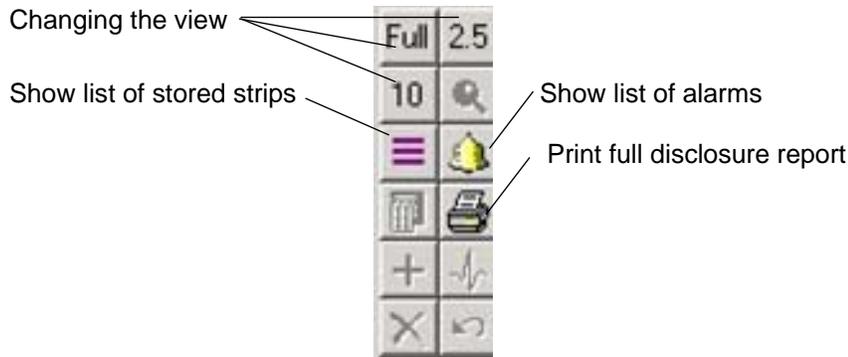
If you have taken control of a patient and discharge that patient from a Workstation, you have one more option on the **Discharge** tab.

Under the **Queue for charting and editing**, another selection displays: **Queue to this machine**. If you check only the **Queue for charting and editing**, the patient is queued to the admitting Tower. If you check both boxes, the patient is queued for charting and editing to this Workstation.

## Additional Features in Charting and Editing

The locking in Charting and Editing is the same as for the **Patient Information** tab. See [Accessing Patient Data on the Network \(Locking\)](#) for further information.

If another user is updating a patient's session data in **Charting and Editing** you can still view, but not edit, the same patient's past session data. In the **Full Disclosure** tab you can access these functions.



These functions in the full disclosure tab are disabled when the patient is read-only.

- Zoom/Center selected strip
- Record selected strip
- Add new strip
- Display setting
- Restore deleted strips
- Delete selected strips

To remove a patient from the Charting and Editing queue:

- Click on the box in front of the patient name and click the **Remove from Queue** button on the Add Queue tab.

## Network Errors

This section describes how network failures affect the networked Q-Tel RMS system.



### **WARNING! Monitor network status.**

Users should monitor network status, and take immediate corrective action when the Network Down notification window appears. Please review details in the rest of this section for troubleshooting network issues. If network connectivity is not restored within 5 minutes, data loss may occur. Please refer to the section on Session Recovery to attempt recovery of data lost during network issues.

### Q-Tel RMS Workstation Network Issue

To troubleshoot Workstation network issues:

- When you click to initiate an action on the Q-Tel RMS Workstation application and the system has a network issue, the system displays a warning dialog box. If you click **Retry** and your Q-Tel RMS network connection is successfully re-established the system displays a restart message. After network connectivity has been restored, you will have full functionality in Patient Information and Charting and Editing, but in order to regain functionality in Session Management you must restart the Workstation. If you click **Cancel**, the Q-Tel RMS Workstation application closes.
- If you do not click or take action and your Q-Tel RMS Workstation has a network issue, it will detect the issue within 10 seconds and display a restart message. After network connectivity has been restored, you will have full functionality in Patient Information and Charting and Editing, but in order to regain functionality in Session Management you must restart the workstation.
- If your Workstation experiences a network issue and you have not taken action or are unable to correct the Q-Tel RMS network issue within 5 minutes the system displays a warning dialog box.

## Q-Tel RMS Secondary Tower Network

### Issue To troubleshoot Secondary Tower

- If you have a network issue, the system displays a warning dialog box when you click to initiate an action on the Q-Tel RMS Secondary Tower application. If you click **Retry** and your Q-Tel RMS network connection is successfully re-established you can continue as normal and have full functionality in Patient Information, Charting and Editing and Session Management. You will lose Session Management functionality on your Q-Tel RMS Workstations until you shut down and restart your Q-Tel RMS Secondary Tower(s) and then restart your Q-Tel RMS Workstation(s).
- If your Q-Tel RMS Secondary Tower experiences a network issue and you have not taken action or are unable to correct the Q-Tel RMS network issue within 5 minutes the Q-Tel RMS Secondary Tower displays a warning dialog box. If you click **Cancel**, the Q-Tel RMS Tower application closes.

### Q-Tel RMS Main Tower Network Issue

If you experience a network issue, your Q-Tel RMS Main Tower functions normally in all areas, including Patient information, Charting and Editing, and Session Management. However Q-Tel RMS Secondary Towers and Q-Tel RMS Workstations will lose connectivity to the Q-Tel RMS database on the Main Tower and will not be able to execute any functions until the Q-Tel RMS network issue is corrected.

You must correct the Q-Tel RMS Network RMS issue within 5 minutes in order to re-establish functionality for your Q-Tel RMS Secondary Towers or Q-Tel RMS Workstations. If you do not correct the Q-Tel RMS network issue within 5 minutes your Q-Tel RMS Secondary Towers and Q-Tel RMS Workstations need to be closed down. After you correct your Q-Tel RMS network issue, restart your Q-Tel RMS Secondary Towers and Q-Tel RMS Workstations. They will have full functionality again.

## 22. TROUBLESHOOTING

This chapter describes how to troubleshoot or resolve software and hardware issues that may affect the Q-Tel RMS.



### **WARNING! Contact Technical Support.**

If at any time you suspect your Q-Tel RMS system is not working properly, immediately contact Technical Support. See [Contact information](#).

### Software: Diagnostic/Service Programs and Procedures

View the log file using a text editor such as Microsoft Notepad. At the beginning of the log file is a line of information about the log itself.

```
<QuintonErrorLog Version="1.1" StartTime="12/27/01 08:23:41">
```

The following table describes the standard log entries. Not all contents indicate error. Some messages contain informational data.

Sample Log Entry	Explanation
<QuintonEvent>	Begin logged event.
<QuintonEvent version="1.0" Forwarded="n" Count="1" RawTime="1009470402" Type="11" Severity="105" ContextID="1200" hResult="800A0BCD">	Information about the version, number of times the event was detected, type, severity and context of the event.
<Date>Thu Dec 27 08:26:42 2001</Date>	Date and time in human format.
<Guid>{5CFF4640-ACC6- 11D3-8F63- 0000C0282FFD}</Guid>	ID of the object (if any).
<MachineName>Q-Tel</ MachineName>	Machine where the log file is written.
<Message>Test started</ Message>	Message text for the log entry.
<Location>CBOBase::GetV al(Long)</Location>	Code module and function where the error occurred.
<LineNumber>1394</ LineNumber>	Line number in that module/function.
<UserName>Administrator </UserName>	Logged-in user.
<Data>0</Data>	Any data associated with the event.
</QuintonEvent>	End of event.

## Strip Recorder

Use the following table to troubleshoot the strip recorder. The serial number is located on the rear of the unit. Please be ready to indicate the serial number for the strip recorder if you call technical support.

Symptom	Possible Cause	Resolution
No power in unit	Power cord is not plugged into the power strip.	Verify power cord is firmly plugged into power strip.
	Power cord is not plugged into recorder power entry module.	Verify power cord is securely connected to the recorder power entry module.
	Power switch is in the OFF position.	Verify the switch is in the correct position.
	Power strip is not providing power.	Plug another device into the power strip outlet to check for power.
	Power cord is defective.	Plug another device onto power cord to check for power.
No recorder output	Power switch is off.	Turn on power.
	Paper is out.	Reload paper.
	Paper is jammed.	Clear the paper jam.
	Interface cable is unplugged.	Check the interface cable is securely attached at both ends
	Interface cable is defective.	Replace the cable.
No data printed on strip	Paper is inserted on the non-thermal side.	Remove paper and insert correctly.
Cannot load paper	Paper is not inserted far enough into recorder.	Open door and pull more paper out of printer.

## Laser Printer

Use this section to troubleshoot the laser printer.

### Troubleshooting

In the event of a printer problem, consult the user guide that came with the printer.

## Speakers

Use the following table to troubleshoot the Q-Tel RMS speakers.

Symptom	Possible Cause	Resolution
No Alarm Sound	Power cord is not plugged into the power strip.	Verify power cord is firmly plugged into power strip.
	The Speaker cord is not plugged into the PC.	Verify that the speaker cord is firmly plugged into the PC.
	Volume on the speaker is turned down.	Check that the speaker volume is at the correct level.
	Windows volume is turned down.	Check the sound volume in the Windows control panel.

## Transmitter Troubleshooting



**WARNING! Contact Technical Support.**

If at any time you suspect your Q-Tel RMS system is not working properly, immediately contact Technical Support. See [Contact information](#).

Symptom	Possible Cause	Resolution
No or noisy waveform	Mismatched frequency setting.	Ensure frequency channel setting in Q-Tel is the same as the Transmitter settings – see Configuration Utility.
	Frequency channel selected has interference.	Select a different frequency.
	Bent pins on patient cable interface connector.	Contact Technical Support. See <a href="#">Contact information</a> .
	Poor signal from electrode.	<ol style="list-style-type: none"> <li>1. Verify good prep before placing electrodes on patient.</li> <li>2. Verify electrodes are good (not beyond expiration date).</li> <li>3. Perform lead check test.</li> </ol>
Blinking lead on torso	Cable is not attached.	Check cable to ensure it is connected to the Transmitter and patient electrodes.
	Poor lead placement or attachment.	<ol style="list-style-type: none"> <li>1. Verify good prep before placing electrodes on patient.</li> <li>2. Verify electrodes are good (not beyond expiration date).</li> </ol>
Display does not show ON	Transmitter not turned on.	Press and hold the Up/Right arrow key on the front of the X12+ transmitter.
	Dead batteries.	Install new batteries.
	No batteries.	Install new batteries.
	Battery cover is not fully closed.	Close battery cover.
Display shows <b>Lb</b>	Low battery.	Replace batteries with new batteries.

## Error Messages

The errors in the following table refer to messages generated by the Q-Tel RMS application rather than those that are generated by the Microsoft operating system. If the given remedies for these errors are ineffective, contact Technical Support. See [Contact information](#).

#	Error Message	Resolution
411	Warning, an unexpected error has occurred while saving data. Continuing to run the application in this state can result in unexpected behavior and/or loss of data. Click OK to continue without saving or Cancel to attempt to resolve the problem.	Select <b>OK</b> to discard your input. Select <b>Cancel</b> to return to the data fields to change your input. If you continue to receive this message, restart the Q-Tel RMS application.
465	There is a problem with alarm manager.	Call Technical Support.
466	We are unable to create all our components.	Call Technical Support.
467	The transmitter setup has a problem.	Use the Configuration utility to view your transmitter setup. Check that frequencies are assigned correctly and that the correct number of transmitters for your system are configured.
468	The default alarm setup has a problem.	Use the Configuration utility to view the default alarm setup. Verify all alarm settings.
469	Event Manager was unable to start.	Reboot the computer.
470	Report Manager could not start. You will not be able to run reports.	Call Technical Support.
471	Chart Manager could not start. You will not be able to print chart strips.	Call Technical Support.
727	You must discharge your patients before closing.	The Q-Tel RMS application cannot be closed if patients are being monitored. Discharge the patients and then close the application.
906	Audible Alarm Error. An error occurred that prevented an audible alarm from sounding.	Call Technical Support.
908	Strip Recorder Door Open. The strip recorder door is open. Strip recording cannot continue until the door is closed.	Close Strip Recorder door.
910	Out of Paper. The strip recorder is out of paper. Strip recording will resume after the paper is replaced.	Load paper. This message displays only when starting the Q-Tel RMS application and does not affect the system's ability to monitor patients.
912	Alarm Error. An error occurred that can result in unreliable alarm indications.	Call Technical Support.
914	Strip Recorder Offline. The strip recorder is offline. Please check that the power is on and that the serial cable is connected.	Perform troubleshooting as described in <a href="#">Strip Recorder</a> .
1016	Q-Tel RMS requires a minimum screen resolution of [1280 x 1024]. The current screen resolution is [#### x ####].	Go to the Windows <b>Control Panel</b> and under <b>Display Settings</b> , set the <b>Screen Resolution</b> to a resolution equal to or higher than <b>1280 x 1024</b> .
1460	You may need to adjust the alarm volume. Select OK to retest the alarm volume or Cancel to run Q-Tel RMS with Session Management disabled.	If you responded <b>No</b> to the alarm volume test dialog when you started the Q-Tel RMS application, this error message displays. Check the speaker connector and volume.
1550	The SQL Server Service is not running.	Be sure that you are logged in as a user with administrative or power user privileges. Use the <b>Control Panel</b> to start the SQL Server services.

#	Error Message	Resolution
1551	The SQL DTC (Distributed Transaction Coordinator) service is not running.	Call Technical Support.
1552	There is not enough file space available.	Your system is running low on disk space. Delete temp files and defrag the hard disk as described in <a href="#">Q-Tel RMS Tower Hard Drive Space Maintenance</a> .
1553	There is not enough file space available to admit any more patients.	Your system is running on disk space. Delete temp files and defrag the hard disk as described in <a href="#">Q-Tel RMS Tower Hard Drive Space Maintenance</a> .
1554	The Q-Tel RMS database is ##% full and is almost out of space.	Perform the Purge/Archive function to free up space in your database.
1555	The Q-Tel RMS database is ##% full and is almost out of space.	Perform the Purge/Archive function to free up space in your database.
1556	The Q-Tel RMS is in an unknown state and cannot run. Please call Technical Support for assistance.	Call Technical Support.
1557	There is only enough file space available to run fewer than one hundred one-hour sessions.	Your system is running low on disk space. Delete temp files and defrag the hard disk as described in <a href="#">Q-Tel RMS Tower Hard Drive Space Maintenance</a> .
1558	The system has detected that you started the Q-Tel RMS application yesterday. Before you can admit another patient you must shut down and restart the application.	Exit the Q-Tel RMS application and then restart it.

**Configuration Errors**

#	Error Message	Resolution
800	Warning - [Application you are trying to start] and [application already running] cannot be run at the same time. Please shut down [application already running] before running [Application you are trying to start].	Q-Tel applications (Q-Tel RMS, Configuration, Backup Restore, Q-Progress and Spectrum Analyzer) cannot be run concurrently. To switch to another Q-Tel application, close the current application before trying to open another.
	DICOM Service was disabled and is enabled on this computer now. The application will terminate. Please reboot the machine to take effect of the set.	The Q-Tel applications require DCOM to be enabled. If DCOM is disabled, the system enables detects the error and enables DCOM. You must reboot the system for the change to take effect.

## Network Errors

#	Error Message	Resolution
1909 1910	Network connection to Q-Tel RMS Server is down.	<p>Click <b>Cancel</b> to shut down the application. Click <b>Retry</b> to continue after you have corrected your Q-Tel RMS network issue.</p> <p>Make sure that all of your Q-Tel RMS Systems Network cables are plugged in securely to the Q-Tel RMS Machines and switch. Check your machines System log and verify that you have no entries related to your network card.</p>
1910 1911 1912	Session Management function is not available due to network connection problem. You need to restart RMS application on Secondary Tower(s).	Make sure that all of your Q-Tel RMS Systems Network cables are plugged in securely to the Q-Tel RMS machines and switch. In order to regain full functionality of your Q-Tel RMSS System after correcting the network issue, restart your Q-Tel RMS Secondary Tower(s) and Q-Tel RMS Workstation(s).
1903 1908	Session Management function is not available due to network connection problem. You need to restart your Q-Tel RMS Workstation.	Make sure that all of your Q-Tel RMS Systems Network cables are securely plugged into the Q-Tel RMS machines and switch. In order to regain full functionality of your Q-Tel RMS System after correcting the network issue restart your Q-Tel RMS Workstation(s).
1905	This computer has lost the connection to the network for more than 5 minutes. You cannot run the Q-Tel RMS application on this computer until the network connection has been re-established and the application has been restarted. The Q-Tel RMS application will exit when you click the Close button	Make sure that all of your Q-Tel RMS Systems Network cables are securely plugged into the Q-Tel RMS machines and switch. Click the <b>Close</b> button to shut down the application. Correct the Q-Tel RMS Network issues then restart your Q-Tel RMS Secondary Tower(s) and Q-Tel RMS Workstation(s).

## 23. MAINTENANCE

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Keep system components clean. Perform preventive maintenance as needed and at least semi-annually.

### Care and Cleaning

This section describes the procedures for cleaning and care of the Q-Tel RMS system.



**WARNING! Risk of electric shock.**

Dangerous voltages are present in the power supplies and around the power connections when the Q-Tel RMS system is powered up. Verify that all power cords are disconnected from the wall outlet before performing the maintenance procedures.

### Cleaning Q-Tel RMS Components

Clean and disinfect the external housing of system components as required and at least semi-annually.

- Turn off the power to each component before cleaning.
- Clean external surfaces with a damp cloth moistened with mild soap solution; wipe dry with a clean cloth.



**Caution: Possible equipment damage.** Do not leave excess cleaning fluid on the unit.

- Disinfect components using a gauze moistened with isopropyl alcohol, ammonia, chlorine bleach (1:10 concentration with water), or hexachlorophene (PHisoHex). Wipe dry with a clean, damp cloth.
- This information is provided for your convenience only. Always follow your institution's standard procedures for disinfection and sterilization.

Component	Action	Schedule
Monitor glass	Clean with glass cleaner.	As needed
Keyboard	Clean with damp cloth and mild detergent.	As needed
Fan filters	Clean with soap and water.	At least every 6 months (more often in a dusty environment)
External surfaces (all modules)	Clean with damp cloth and mild detergent (do NOT use solvents on plastic cases). You can also apply a dust removal spray to a cloth and wipe the external surfaces.	As needed

### Cleaning Transmitter ECG Cables

Use any of these materials to clean and disinfect the trunk cable and patient leadwires:

- Green soap, green soap tincture (U.S. Pharmacopoeia), or alcohol-free hand soap.
- 2% glutaraldehyde solution (such as Cidex).
- sodium hypochlorite (bleach) solution 10% in water.

**Caution: Do not immerse patient leadwires.**

Do not immerse the patient leadwires in water or the cleaning solution. Make sure cables are dry before using on a patient.

## Transmitter Cleaning and Maintenance

Check the transmitter and patient cable every day to be sure they are not damaged or broken.

To clean and disinfect the transmitter:

1. Turn off the transmitter.
2. Clean the outside with a damp cloth. (The cloth can be moistened with alcohol).
3. Dry the equipment completely before use.

**WARNING! The transmitter is not waterproof.**

Prevent liquid from penetrating the transmitter case. Avoid submerging the transmitter in any liquid. Sterilization is not allowed.

**Caution: Possible keypad damage.**

To prevent possible damage to the keypad, do not use sharp or hard objects to press keys, only use fingertips.

**Caution: Do not immerse.**

Do not attempt to clean the device or patient cables by submersing into a liquid, autoclaving, or steam cleaning. Wipe the exterior surface of the device and patient cables with a sterilizing disinfectant, then dry with a clean cloth.

**Caution: Risk of electrical shock.**

Conductive parts of the patient cable, electrodes and associated Type CF connections, including the neutral conductor of the patient cable and electrode, should not come into contact with other conductive parts, including earth ground.

**Caution: Clean transmitter and patient cables.**

The transmitter and patient cable should be cleaned between each use.

**Caution: Possible equipment damage.**

Do not pull or stretch patient cables as this could result in mechanical and/or electrical failures. Patient cables should be stored after forming them into a loose loop.

**Caution: No user serviceable parts are inside.**

Any modification of this device may alter defibrillator protection. Any modification to any part of this device is to be performed by qualified service personnel only.



**Caution: Possible RF interference.**

The following equipment may cause interference with the RF channel: microwave ovens, diathermy units with LANs (spread spectrum), portable telephones, amateur radios and government radar.

## Disposal of Waste Materials

Dispose of alkaline batteries from the transmitters and disposable monitoring electrodes in accordance with these guidelines:

Waste Material	Disposal Guidelines
Batteries	Site Procedure
Electrodes	Normal Waste

## Inspection

After maintenance on a Q-Tel RMS system, inspect cables and wire harnesses for frayed insulation, excessive bends or crimps, burned terminals, and other signs of wear.

## Q-Tel RMS Tower Hard Drive Space Maintenance

As you use your Q-Tel RMS system, temporary files are created on the hard drive in the system temp folder. These temporary files can use excessive amounts of hard drive space. Delete these files and improve system performance.

### Delete Temp Files

To delete temporary files:

1. Make sure all applications are closed.
2. Log into the system with any account.
3. Click the Start button.
4. In the Search field type **%temp%**.
5. Double-click the folder named **QTel User** or the user account you normally are logged in with when using your Q-Tel RMS system. Click the **Temp** folder at the top of the results window.
6. Hold the **Ctrl** key and press **A** to select all files.
7. Hit the Delete key on your keyboard.
8. Select **Yes** at the Delete Multiple Items confirmation window.
9. Choose **Skip** for any items that you are alerted cannot be deleted at this time.
10. Close the Temp folder window.
11. If needed, repeat steps 2 – 10 using a different account.

### Defragment Hard Disk

Over time performance on the hard drives degrades because of file fragmentation. This is a normal process on machines that run the Microsoft Windows operating system and can be avoided by periodically performing the disk defragmentation function. On Q-Tel RMS machines, it is recommended to perform disk defragmentation at least once a month for each installed hard drive.

To defragment a hard drive on your computer:

1. Double-click **Computer** from the desktop.
2. Right-click on the drive you want to defrag.
3. Select **Properties** from the drop-down menu.
4. Select the **Tools** tab from the **Properties** page.
5. Click **Defragment Now...** to open the Disk Defragmenter application.
6. Select the drive you want to defragment and then click **Defragment**. The application will notify you when the disk defragmentation is complete.

## Assembly/Disassembly Procedures

System components are listed in *Accessories and Options (70-00131-xx)*. In most cases, replace system components as a unit. The only disassembly instructions are to mark and disconnect any necessary cables.

The software version of the tower or workstation being replaced must be supplied with the order request.

**NOTE:** *These instructions are for advisory purposes only.*

### Replacing Computer Boards

The Q-Tel RMS system is shipped from the factory with an x86 based computer.



**Caution: Risk of electrostatic discharge.**

Always follow standard electrostatic discharge safeguard procedures when handling PCB assemblies.

1. Disconnect the computer from the Q-Tel RMS system.
  - a. Turn off the computer power switch.
  - b. Mark where the cables connect to the computer, then disconnect them.



**Caution: Risk of electrostatic discharge.**

The AC power must be removed from the computer to make sure there is no power to the internal assemblies even when the power switch is in the off position.

- c. Looking at the back of the computer remove the three screws on the right back cover of the computer, pull the latch on the right side panel, and then slide the right side cover towards the back of the computer to remove it.
  - d. Mark all cable locations/connections.
  - e. Disconnect cables as necessary.
2. To remove a card, press downward on the tops of the green plastic cover locks at either end of the expansion slot cover rail, lift the cover rail backwards, then pull the card straight up, out of its socket.

### Installing a New Card

To install a new card:

1. Align the new PCBA with the correct slot.
2. Push down on the PCBA evenly, both front and back, until it is seated firmly in the slot. Lower the expansion slot cover rail and ensure that both green cover locks click into place.
3. Reconnect any cables previously removed.
4. Replace the side cover.
5. Reconnect the external cables and then the AC power cord.

## Checkout Procedure

The following procedure can be used after updating the system to confirm basic functionality. If Secondary or Workstation computers referenced aren't used in your installation, perform the steps on the Main Tower instead.

1. Start the Main Tower, Secondary Tower(s) and Workstation(s).
2. Admit a new (demo) patient to the Secondary, and start monitoring.
3. From the transmitter, confirm that the Call alarm appears on the monitoring tower.
4. Take control of the patient from another Workstation, and discharge the patient.
5. Send a report for the patient to the printer and confirm it prints.



## 24. SPECIFICATIONS

This appendix lists specifications for the Q-Tel RMS and its components.

### Q-Tel RMS

#### Overall System

	Specification
Performance	AAMI Standard EC:11:1991 for diagnostic ECG*
Display and Analysis Filters	Baseline wander, muscle artifact, 50/60 Hz line filters
Gain	2.5, 5, 10, 20, 40 mm/mV
Lead Groups	4 and 5 wire lead sets, supporting the standard Limb set, Limb plus one chest lead, and the Modified Chest Lead
Power	100-120 VAC 50/60 Hz 2.5A nominal 200-240 VAC 50/60 Hz 1.3A nominal

*\*NOTE: Q-Tel does not offer a calibration pulse, and prints exclusively at 25mm/s.*

#### Software

	Specification
Off the Shelf	Windows 7 Professional SP1 (32-bit), Microsoft Office Standard 2010, Microsoft SQL 2008, Adobe Acrobat Reader 9.0
Quinton	Q-Tel RMS software, Q-Progress software

#### PC Hardware

	Tower Specifications	Turnkey Workstation Specifications
CPU	Intel compatible P4, 3.2 GHz	Intel compatible P4, 3.4 GHz
RAM	4 GB	2 GB (Min)
Hard drive	500 GB	20 GB (min)
DVD	8x DVD-RW	16X/40X DVD-ROM

#### Chart Recorder (Optional Strip Recorder)

	Specification
Type	One and two channel ECG waveforms and alphanumeric printing
Recording Techniques	High-resolution thermal dot array, temperature controlled thermal print head
Speed	25 mm/sec
Paper	Blank or pre-printed ECG grid, 2 in. wide rolls thermal
Feed	Continuous form roll

**Laser Printers**

	Specification
Type	Multiple format ECG waveform and alphanumeric printing
Paper	Weight: 50 lb.-65 lb. Size: A, 8.5 x 11 in.
Resolution	600 DPI minimum

**Back-up External Hard Drive**

	Specification
Type	USB
Capacity	500 GB or greater

**Monitor Display**

	Specification
Content	4 and 8 channel ECG display and alphanumeric data I/O
Size	24" color LCD, 1920 x 1080
ECG Display (Tower)	3.5 – 8 seconds, depending upon number of channels
Displayed Data	ECG traces, heart rate, target heart rate, blood pressure, patient demographics and risk profiles, workload, METS, RPE, patient weight, and other user selectable parameters

**Report Capabilities**

	Specification
Session Reports	Succinct and complete session reports, full disclosure reports
Administrative Reports	Billable patient sessions, patient demographics, patient prescription, and lists for patients, insurance providers, physicians

**ECG Analysis**

	Specification
Heart Rate	Moving median estimate based upon R-R intervals
Arrhythmia Analysis	Mortara ECG algorithms

**Receiver**

	Specification
Receiver sensitivity	The receiver sensitivity is -100 dBm. The receiver system features a full diversity antenna system. Two separate receiver antennae are simultaneously operated and the power is monitored at each antenna. The system automatically switches to the antenna with the higher signal strength. This unique system design significantly reduces visible errors in the transmitted data. Open field range for the system is not less than 100 meters. This large open field range eliminates the need for extensive antenna networks for wide open areas commonly required with VHF telemetry systems.
Channels	There are 256 channels per receiver for 915 MHz systems and 64 channels per receiver for 608 MHz and 2400 MHz systems. The receiver board can accommodate up to 8 independent receivers (modular RF cans) and each receiver is capable of receiving up to 12-lead of diagnostic ECG data.
Bandwidth	The ECG bandwidth is determined by the transmitter and is diagnostic according to AAMI-EC 11-1991. Minimum is 0.5- 40Hz.
Pacemaker spike detection	Pacemaker detection is performed at 10,000 samples/second/channel at the transmitter. Detected pacemaker spikes are transmitted as part of the encoded data stream and are detected in all acquired leads.
Form factor	The receiver board is a full-size PCI board.

**Q-Tel RMS X12+ Transmitter**

	Specification	Transmitter Notes
Size	Maximum dimensions 2.5 x 3.5 x .98 in.	The X12+ transmitter measures approximately 2.5 x 3.5 x .98 in. (6.4 x 9.1 x 2.5 cm).
Weight	<5 oz.	With battery: 4.8 ounces, (126 grams) Without battery: 4.0 ounces, (114 grams).
Channels		Easily select the channel by using the function keys.
	64 channels	608 MHz and 2400 MHz systems.
Display	LCD	The 1.25 x 0.62 in. (3.2 x 1.6 cm) LCD display shows leads fail, lead quality, power ON/OFF, low battery.
Frequency range	608 MHz	Frequency range is 608.48 to 632.52 MHz.
	2400 MHz	Frequency range is 2400.96 to 2482.56 MHz.
Patient Isolation	Positive defibrillation protection	The X12+ transmitter is in compliance with AAMI standards and IEC 601-2-25.
Batteries	AA alkaline	One AA alkaline battery is required.
Battery life	Minimum 20 hours	The battery life achieved with the Q-Tel RMS transmitter is typically 30 hours.
Environmental	Standard medical device, water resistant	The Q-Tel RMS transmitter is classified according to IEC-601-1 and IEC-601-2-25 as ordinary equipment. This classification does not require passage of a spill test.
Leads connector		Single-block, 4 or 5 lead.

	Specification	Transmitter Notes
Function keys	Three	<b>Up/Right, Down</b> and <b>Enter</b> keys for ON, menu navigation and CALL.
Data stream content	Encoded lead potentials; battery voltage; lead potency or impedance	The data stream includes up to 8 leads of encoded potentials, battery status, pacemaker detection, patient call event and lead fault indication. Electrode impedance is measured by the transmitter and indicated by a series of horizontal bars on the LCD display.
Sample rate	500 samples/second/channel	The front-end acquisition is run at 10,000 samples/second/channel for pacemaker spike detection. Detected pacemaker spikes are flagged as part of the transmitted data stream. The sample rate of the transmitted data is 500 samples/second/channel to provide diagnostic quality ECG signals in accordance with the AAMI standard EC-11-1991 for diagnosis ECG.
Accessories	Patient call button	The Q-Tel RMS transmitter incorporates patient call capability on the transmitter. Pressing any button while monitoring inserts the signal into the transmitted data stream.

### Environmental Conditions

	Specification
Temperature	Operating: 59° to 90° F (15° to 32° C) Storage: 32° to 113° F (0° to 45° C)
Relative Humidity	Operating: 30 to 80% non-condensing Storage: 20-90% with condensation

### Workstation Software Specifications

This section contains the computer and accessory system requirements to operate the Q- Tel RMS Workstation on a computer other than one purchased from Quinton

Quinton strongly recommends that the user purchase hardware listed on the Windows Hardware Compatibility List. A regularly updated list can be found on the Internet at [http:// www.microsoft.com/whdc/hcl](http://www.microsoft.com/whdc/hcl).

Upon customer request, Quinton will install the workstation software on customer-provided hardware. Contact your local representative or Quinton Sales Support for more information on availability and applicable fees.

Quinton will not install or support Q-Tel software if any component of the customer-provided hardware or accessories does not meet the requirements listed in this document. Customer-provided hardware must be completely assembled and software installed per Quinton installation instructions prior to commencement of applications training. The integrity of any non-Quinton software other than the operating system cannot be guaranteed after installation of Quinton software.

Workstation software requires some specific network settings in order to function properly. Contact your local representative for more details on the network requirements.

**Computer**

	Specification
Processor	Intel Pentium 4; clock speed 2.4 GHz or faster
System Memory	1 GB minimum
USB Ports	One (1) for optional USB peripherals
CD or DVD Drive	8X or faster
Hard Drive	20 GB minimum
Video	1280 x 1024 resolution

**Other**

	Specification
Operating System	Windows 7 Professional, SP1 (32-bit)
Network	100 Mbps (minimum) NIC Card or 802.11G (minimum) wireless card

**Ventilation Clearances**

Allow at least 6 inches behind each Q-Tel RMS computer for ventilation. There are no side clearance requirements except for the laser printer, which requires about 3 inches minimum on each side.

**Fuse Replacement**

Blown fuses are to be replaced by a Quinton field service representative or qualified technician only.

**BTU Output**

The estimated heat output from each system can be computed using this formula: Maximum amperage x 120 V x 3.41 = BTU/hr



## 25. ANTENNA DESIGN

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This section provides an overview for a successful build of your antenna networks spanning the needs from compact rehabilitation clinics to large scale environments with multiple exercise rooms and walkways.

An antenna network system cannot be constructed by simple splicing of wires. The Radio Frequency (RF) signals are carried over coax cables and special electronics are required to merge or split signals. The two key components that support the construction of the Q-Tel RMS network are discussed in this chapter.



**Caution: Use only Quinton-approved components.**

Only Quinton-approved components should be used to configure the antenna network. Use of unapproved parts may damage other components or result in unreliable operation.

### Amplifiers

The 915 MHz and 608 MHz systems use a Low Noise Amplifier (LNA). The 2400 MHz system uses a Down Converting Antenna Amplifier. For simplicity “LNA” is used through this section to refer to both amplifiers.

The LNA provides necessary signal amplification to boost the signal strength to the level expected by the receiver card(s) mounted within the PC. Only one LNA is used for a network and it is always connected directly to the receiver card(s). The LNA requires DC power. An external 12 volt power supply is provided with the unit. When used with a single receiver card the two unused output ports should be terminated with 50 ohm terminators. The input ports to the LNA can be connected directly to two antennas or connected to an AN unit.

### Antenna Network

Depending on your Q-Tel RMS configuration, your antenna network unit could be a model AN-915, AN-611, or AN-2500. All three antenna network units will be referred to in the following section as the AN unit.

The AN unit supports the merging of two signals, from both whip antennas and other AN units in the network. The AN unit is the basic building block for developing complex networks. It provides RF gain for two independent antenna inputs and combines them with the output of the next distal AN unit down the network.

When radio signals propagate down the coax cable a measurable part of the signal is lost. The longer the cable, the greater the loss. The AN units have 10dB of gain to counter this loss. To maintain good operating range anywhere along an antenna network it is advisable to offset the cable loss with the gain of the AN unit - See [RF Cable Requirements](#). Too much loss will degrade operating range, while too much gain could cause the system to overload with strong signals.

An anticipated cause of a network failure is a bad cable or cable connection. The AN unit has a built-in cable test feature. Since DC power is carried on the RF cables, that power is used to illuminate an LED. The AN unit has a green LED for each channel providing a quick visual indication of network integrity.

### Power Supply Requirements

The AN unit can be powered by either an external DC power supply or by a DC voltage on the RF cables. An external supply connected to the Auxiliary DC input applies power to both sides of the unit. From the connector the DC power passes through the protection diodes and connects power to the RF signal traces through the inductors. The inductors couple the DC power but do not load the RF transmission line. Both LEDs are illuminated when power is applied to the Auxiliary DC Input.

When the AN unit receives power from the RF cables, the power is isolated between the two sides. The power in the cable attached to the Network A side illuminates the *cable ready* LED on the right and activates the amplifiers on the right. Only when a powered cable is attached to the Network B side are the LED and amplifiers on the left activated.

When very long chains of amplifiers are constructed, multiple supplies are required. This presents two problems. The first, and most obvious, is the capability to supply the required current, typically, 150 mA per unit. The second and less obvious is the voltage drop down the network. This drop is estimated by the following equation where N is the number of units.

$$V(\text{drop}) = .075 * N * (N+1)$$

For example, a series chain of 5 units will see a voltage drop of 2.25 V. A chain of 10 units will see a 8.25V drop in power supply voltage at the last unit. A 15 unit chain will see an 18V drop! This assumes an ideal supply under load with no “sag” with the ever increasing load.

A general rule is to add an additional power supply every 5 units when using a 15V supply or every 10 units with a 20V supply. Since the auxiliary supply inputs are diode blocked there is no concern that mismatched supplies will cause excess current flow. If possible, measure the DC voltage on the BNC inputs of the last unit in the chain to confirm that an adequate voltage exists.

### AN Unit Specifications

	Specification
Supply Current @20 VDC	150 mA (typ)
Minimum Operating Voltage	10 Volt
Maximum Operating Voltage	30 Volt
Voltage Drop of a 10 Unit Chain	Approximately 8 Volt
Operating Frequency	904-926 MHz, 608-632 MHz, 2400-2483 MHz
RF gain	10 dB nominal
Recommended Cable	Belden 8259
Max Recommended Separation	15 meters
RF Cable Connector	BNC Male
Power Source Connector	Female 5.5 mm OD, 2.1 mm ID, Inside Positive, Outside Ground

### Antennas

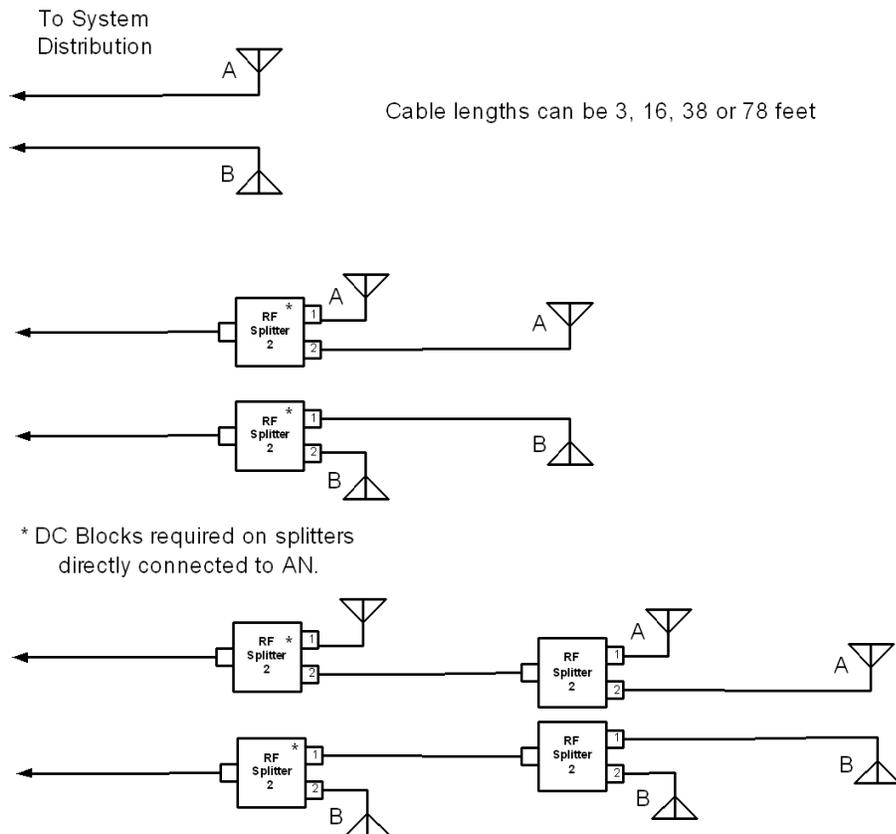
The antennas are standard flexible and adjustable antennas that can be rotated and adjusted for optimal performance. To minimize the effects of location dependent drop-outs or dead spots the system employs a diversity antenna scheme. This is accomplished using two antennas connected to two electrically (but not physically) distinct receivers. To avoid drop-outs the antenna network must deploy antennas in pairs, rather than just a single antenna at each node of the network.

The tips of the antennas at the LNA or ANA should be 8 to 10 inches apart.

## Antenna Configurations

For smaller facilities it may be desirable to use a passive antenna network where signal amplification from an AN or LNA is not required. Three possible configurations are shown in figure 42.

**Figure 42 Cable Configuration Options**



The first option extends the antenna position away from the back of the PC using coax cabling. It is advisable to move the antenna away from the electrical noise associated with the PC and above desks and exercise equipment, thus improving the line of sight between the antennas and the patients. The second example uses 2-way splitters to add an additional antenna at a more distal location. The third example continues using splitters to service a third antenna location. Each splitter introduces an additional 4 db of attenuation, thus reducing the spatial coverage of the antenna elements distal to the splitter(s). Although additional splitters could be added beyond the third option, the associated splitter attenuation lowers the signal to levels below the range of the receiver cards. For most passive cases, the first or second example will provide the best results. In most cases, the first example will provide acceptable coverage for a transmitter-antenna distance of about 25 feet. When the antennas are placed in the center of the room an area of about 50'x50' should be adequately covered. The second configuration can be used for longer and narrower room settings; coverage of an area of about 30'x65' should be adequately covered. Structural elements of the room, such as pillars, and placement of equipment can affect radio wave scattering and transmission effectiveness. Following installation of the antenna system it is always advisable to move a monitored transmitter throughout the facility and ensure that adequate coverage is actually achieved in all required areas.

These design elements can also be integrated into an active array using ANs and LNAs. However, the splitters have near zero impedance at DC and the AN units provide DC power on the coax. It is extremely important to isolate splitters from AN units using a DC Block.



**WARNING! Electrical hazard.**

Always use a DC Block to isolate splitters from ANs.

## RF Cable Requirements

For optimum performance of the antenna network, a balance of gain and losses must be maintained in the system. Each AN unit provides 10 dB gain to offset cable loss. It is important to use a cable between units that has about 10 dB of loss. The type of cable and the length are the key factors in determining the amount of loss. Severe bends or pinches in the cable can cause increased loss and should be avoided.

RG-58 type cable is recommended due to its flexibility, diameter, and low cost. The 4.9 mm diameter mates with many BNC connector housings. RG-58 comes in many styles however and strict attention to its signal loss must be made. Two types of RG-58 are shown in the table below.

### Cable Loss vs. Cable Type

Type	Length	Frequency	Loss
Belden 8259	15 Meters	915 MHz, 608 MHz, 2400 MHz	10 dB
Belden 9310	15 Meters	915 MHz, 608 MHz, 2400 MHz	6.5 dB
Belden 9310	23 Meters	915 MHz, 608 MHz, 2400 MHz	10 dB

## Network Configurations

This section illustrates the combinations of components that build simple to complex networks.

### Single and Multi-tower Systems

The basic configuration connects the antenna components (see above) with either an LNA or an AN with DC blocks. The output ports from Network A and B are connected to the receiver(s) card located in the PC. For single receiver board systems (4 or 8 receivers) the unused output ports of the LNA should be terminated with 50 Ohm terminators.

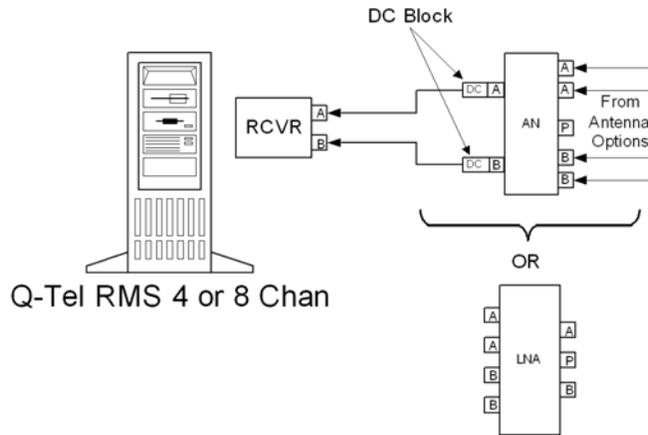


**WARNING! Do not install terminators on AN units.**

DC power is provided through the coax to power other AN units on the network. Installing terminators on the AN units will result in overheating and unit failure. Always use a DC Block to isolate splitters from AN units.

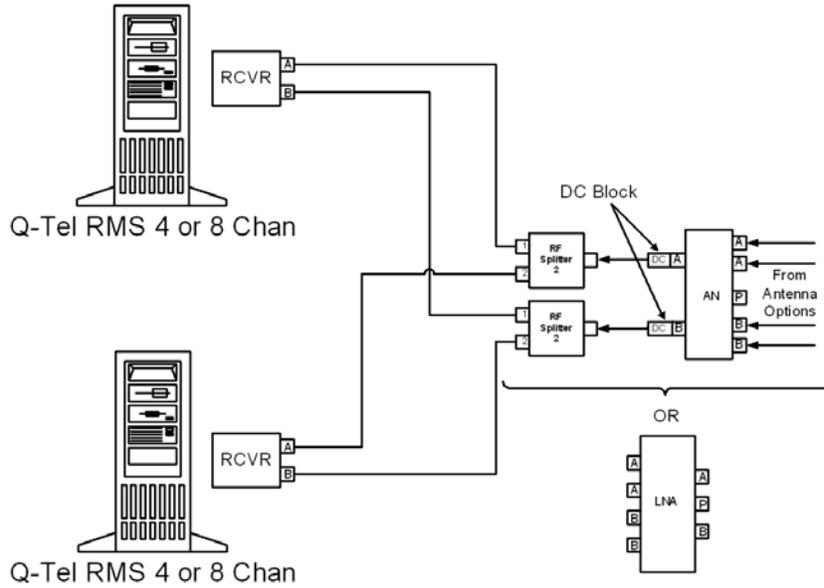
Figure 43 shows a typical 4 or 8 channel, single receiver board configuration.

**Figure 43 Single Receiver Board (4 to 8 channels)**



For larger facilities it is possible to use a combination of components to support multiple towers from one antenna system. Following is a simple example for two 8 channel towers. Additional splitters can be used to drive additional boards, or additional towers. Note that each 2-way splitter introduces 4 db of signal loss. For larger installations it may be desirable to use a 4-way splitter (-8 db) to minimize signal loss that would result from using three 2-way splitters ( $3 \times 4 = 12$  db loss).

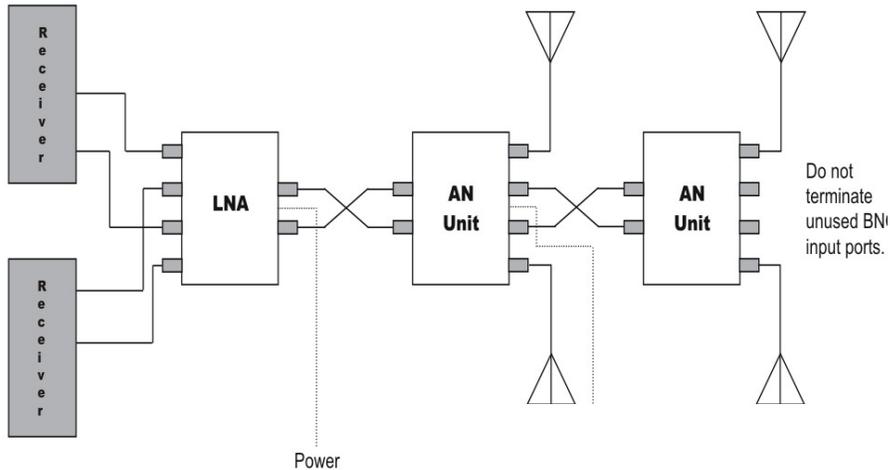
Figure 45 Combining Receiver Boards (two 8-channel towers)



Extended Series Networks

For environments where broader coverage is required, a series of AN units may be chained together in order to achieve extended coverage. The AN units are designed to be separated by 15-20 meters when using the recommended coax cable. The last unit in the chain (most distal from the PC) does not require any connection on the unused ports. See figure 46.

Figure 46 Example of Extended Series Network



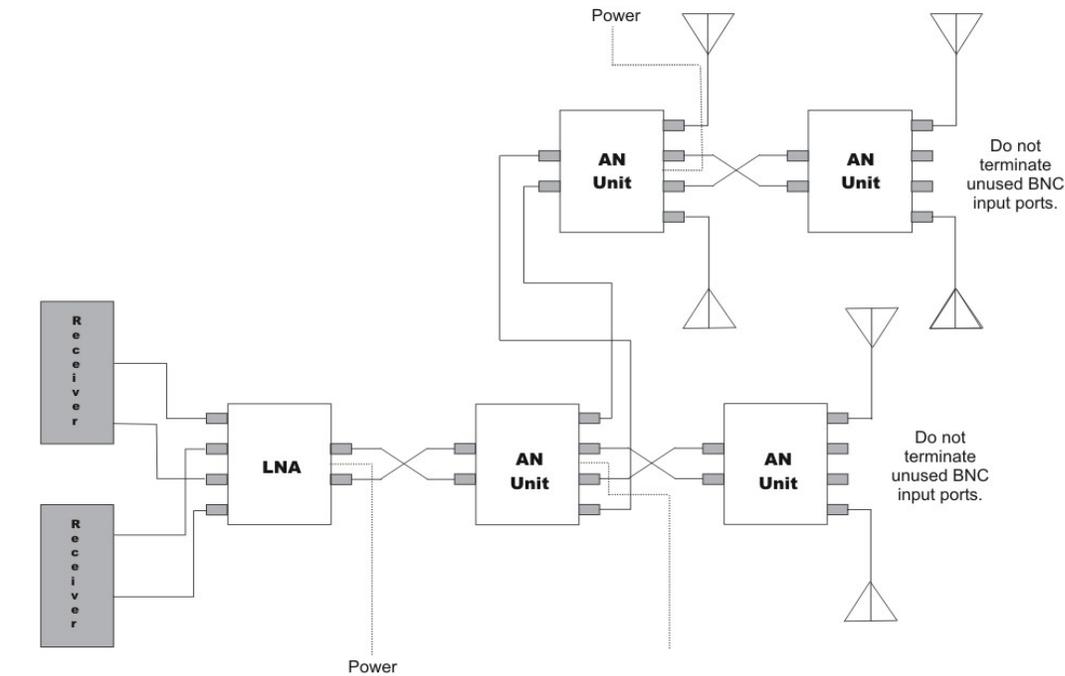
For single board systems terminate the unused output ports on the LNA with 50 Ohm terminators.

in the network. Each unit does not require its own power supply.

### Branched Networks

Some environments will require a branched network system to efficiently cover the entire space. The AN units can be used for branching networks as illustrated below. The AN units with antennas should be spaced at 15-20 meter intervals along each branch of the network. An AN unit used to merge branches has no antennas and must not be considered when setting the distance between AN units. However, to prevent excess RF gain, standard cable lengths should be used to connect both to and from "Branch Combiner" AN units. See Figure 47.

**Figure 47 Example of Branched Network**



For single board systems terminate the unused output ports on the LNA with 50 Ohm terminators.

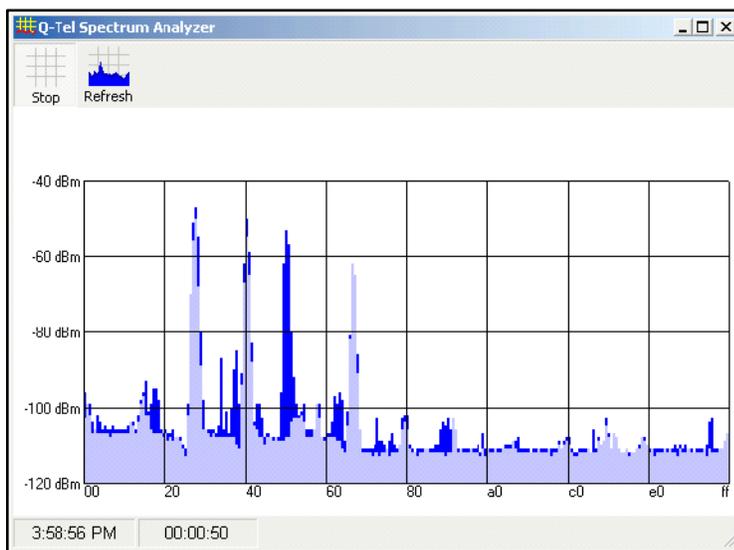
## Design Considerations

This section describe the antenna design configurations.

### Signal Strength

Systems should be designed so that the transmitter signal is at least 20 dB stronger than the background noise. Use the Spectral Analyzer utility loaded on every Q-Tel RMS Tower system to measure both the background noise and the transmitter signal strengths for the selected channels. Figure 48 shows an example spectrum with background noise and a transmitter peak associated with channel 34.

**Figure 48 Example of Spectrum with Background Noise**



As an approximate rule of thumb, the transmitter spectral peak decreases in amplitude about one (1) dB per meter of increasing distance from the antenna. A 20 meter increase in distance will decrease the signal strength by about 20 dB. When possible, the antennas should be deployed in as central a location as possible to minimize distance to all areas of intended coverage.

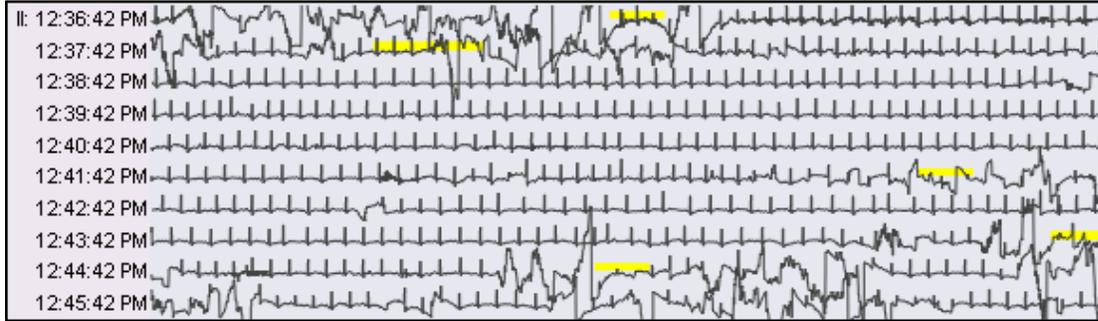
### PC and Monitor Noise

The PC and monitor are a source of background noise that may degrade the transmitter signal to noise ratio. Fortunately, the PC-generated noise rapidly attenuates with distance. It is recommended that the antennas be placed at least 2-3 meters away from the PC equipment.

### Solving Noise Problems

If the signal strength compared to background noise is marginal the recorded ECG may have disruptions associated with occasional lost signal. The typical ECG signature in such situations looks like the screen shot in Figure 49 (only the left portion of the screen is showing).

**Figure 49 Example of ECG Signature**



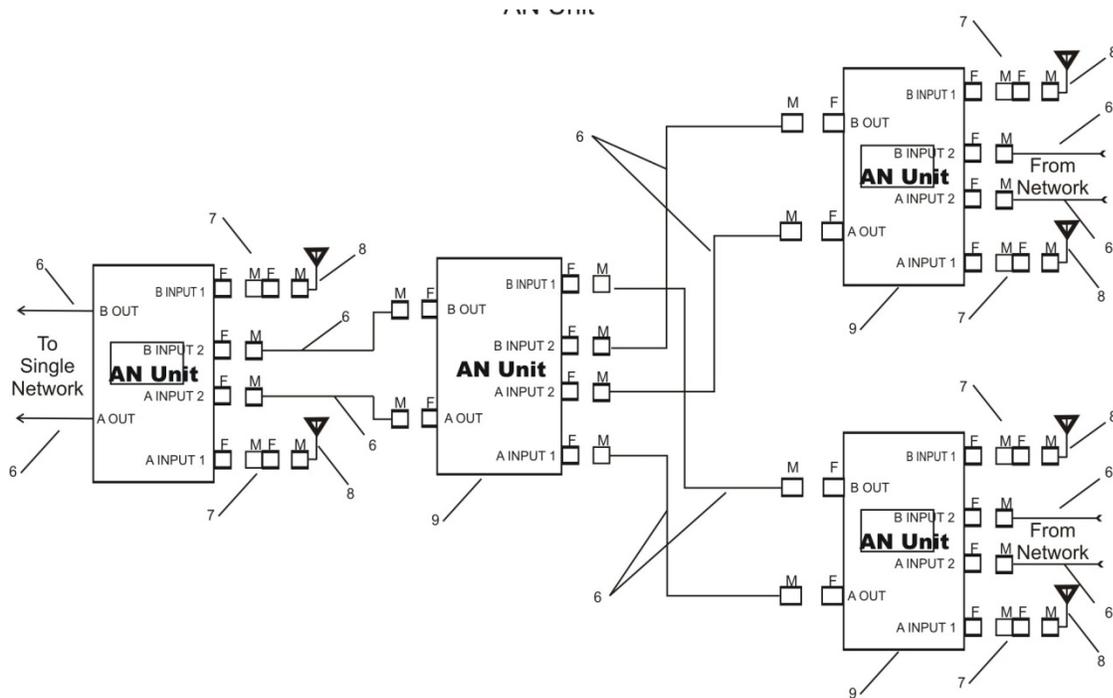
The first step in resolving the problem is to examine the signal strength for the problem transmitter/receiver channel and determine if there is a new source of noise that has degraded reception of the transmitted signal. It may be possible to resolve the problem by changing the transmitter frequency to a different channel with lower or different noise characteristics. If the problem is associated with particular areas within the facility then it is likely that the antenna will need to be re-located, or additional AN units added to increase total and uniform coverage.

**Coax cabling**

A more consistent and balanced performance between Network A and B side can be achieved by crossing the cables at every AN unit. This will tend to balance gain differences between the two networks.

For example, if a .3 dB variance at the low end of the band is consistently in the Network A side, chaining 10 units will result in a 3 dB gain difference between A and B. However, if the cables are crossed at every unit forming a chain of ABABAB etc., there will be no imbalance. See Figure 50.

**Figure 50 Standard Branched Network AN Unit**



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1	8 Way 915 MHz Power Splitter with BNC Connectors	8	608 MHz, 915 MHz, or 2400 MHz Antenna with TNC Male Connector
2	DC Block with BNC Connectors	9	AN (Antenna Network) Unit
4	BNC Male 50 OHM Termination	10	DC Power Source (9-12 Volt)
5	3 Meter BNC Cable	M	Male Connector
6	15 Meter BNC Cable	F	Female Connector
7	BNC Male to TNC Female Adapter		

## 26. PHYSICIAN'S GUIDE TO SIGNAL ANALYSIS

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This section is a guide to signal conditioning and ECG analysis in the Q-Tel RMS System. It explains how the ECG signal is acquired and filtered for display. This section also discusses the method and accuracy of the computed ECG heart rate and arrhythmia analysis, with notes on special points of interest. The overall goal of signal analysis is to produce useful ECG recordings from the frequently noisy signals associated with active patients exercising during rehab. Noise (artifact) comes from lead motion, electrode motion and muscle artifact, and AC power line. Proper electrode placement, skin preparation and patient instruction are important in collecting high quality ECG records.

### Data Acquisition

The transmitter worn by the patient digitizes the ECG signal at a sampling rate of 10,000 samples per second per lead. The data is filtered and transmitted to Q-Tel RMS at a sampling rate of 500 samples per second per trace, with a resolution of 2.5 microvolts per LSB. The frequency bandwidth of the transmitted signal meets AAMI standard EC11:1991 for diagnostic quality ECG data.

### Filters

The Q-Tel RMS system uses filters to improve the signal and reduce artifacts.

#### Baseline Wander Removal

To lower the ECG noise associated with body motion during exercise, the transmitted signal is first filtered with a baseline wander filter. This filter is characterized as a High Pass filter with the corner frequency at 0.5 Hz (i.e.: ECG frequencies higher than 0.5 Hz are passed without amplitude reduction). Frequencies lower than 0.5 Hz are attenuated, helping to hold the ECG baseline more constant. The baseline wander filter is always applied to the transmitted ECG signal.

#### 50/60 Hz Line Filter

AC Power line noise is a typical artifact problem in ECG monitoring. It is caused by power line radiation that is picked up in the patient lead wires associated with the transmitter. This noise is minimized by the input amplifier design that has high common mode rejection (i.e., the rejection of signals that are the same on all electrodes). Under some conditions however, it cannot be eliminated completely by common mode rejection, so various signal processing techniques have been developed to further reduce power line noise on the ECG signals. The simplest approach is to provide a narrow stop band (or “notch”) filter that is centered on the line frequency, either 50 or 60 Hz. This type of filter selectively removes only the chosen frequency, plus or minus a narrow range of frequencies. The assumptions underlying the use of this type of filter is that there is very little energy in the ECG (particularly, the QRS) in the chosen frequency band, and that the power line noise is stable enough to fall within the range of filtered frequencies. If the energy in the QRS at the chosen frequency is relatively low, there will be no distortion of the QRS. However, the amount of energy in the QRS complex at power line frequencies varies significantly with subtle differences in QRS waveform shape, some QRS shapes having no significant energy, while others can have a peak. If there is significant energy in the QRS at the line frequency, and it is filtered out along with the power line noise, two things happen: the shape of the QRS is altered, and there is a brief ringing at the power line frequency following the QRS in the ST segment, even for an ECG signal that has no power line noise.

To avoid the drawbacks of notch filters, Quinton uses a digital signal processing technique to implement an adaptive power line noise-canceling algorithm. This algorithm is adaptive in that it uses an error minimizing technique to estimate the amplitude and phase of the power line induced noise. The estimate is subtracted from the original signal to remove the interference. This approach does not introduce ringing associated with high frequency QRS signals, and is very effective in removing the line noise.

The Line Filter can be turned on or off in the Configuration Utility. If the filter is enabled it is applied to all real time ECG data for all monitored patients.

## Muscle Artifact and Pacer Spikes

The conventional approach to reducing muscle artifact and other high frequency noise in the live ECG has been to employ low pass filtering. Low pass filters (also called high cutoff filters) tend to smooth the data, much in the same way a human observer might imagine a smooth line to be drawn through the data. The disadvantage of this technique is that the filtering is applied to the whole ECG, so that high frequency information in the QRS complex can be lost. While conventional low pass filters can effectively smooth the baseline and the ST, T and P-wave segments of the ECG, they can also reduce R-wave amplitude, smooth over notches like Bundle Branch Block and slurs in the QRS complex, and can eliminate small, narrow Q or S waves.

Because of the importance of recording an accurate ECG during exercise, particularly in Stress Testing, Quinton has taken a new approach to the implementation of muscle artifact filters. Through a combination of filtering techniques, Quinton has produced a time-varying filter capable of dynamically adjusting its cutoff frequency. For muscle artifact filtering the filter cutoff is varied dynamically so that the QRS complex is passed through the filter with full diagnostic bandwidth, but the region outside of the QRS is filtered more strongly. This technique effectively eliminates the distortion of the QRS complex while maintaining effective smoothing of muscle artifact in the rest of the ECG.

To control the bandwidth of the muscle artifact filter so that QRS complexes can be passed unfiltered, it is necessary to have an indication of the locations of the QRS complexes (on- set and off-set locations) so that the filter coefficients can be adjusted. Classical QRS detection algorithms usually have significant delays associated with them, so are inappropriate for this application. Instead two mathematical operators called erosion (choosing the minimum value from a set of numbers) and dilation (choosing the maximum value from a set of numbers) are used to obtain a function that has a high value for waveform shapes that approximate a typical QRS complex (in terms of duration and magnitude of signal slopes), and a low value all other times. The coefficients of a low pass filter are adjusted so that signals which have a high value of the QRS indicator function are not filtered, while signals with the lowest values are maximally filtered (approximately 20 Hz low pass cutoff). Muscle noise does not typically fit the QRS indicator function profile, and is therefore maximally filtered. This strategy for eliminating muscle artifact is very effective at providing smoothed ST segments, T-waves and P-waves without slurring the QRS onset or offset. However it does sometimes produce waveforms that are at first sight puzzling. For some QRS shapes, and with significant high frequency muscle artifact amplitude, it is possible to see a short burst of artifact just before and just after the QRS (the artifact looks like short spikes close together). This effect results from the change in filter bandwidth, which is timed to occur just before and just after the QRS complex, so that Q-waves and S-waves are not filtered. The artifact nature of this signal is usually readily apparent by examining several QRS complexes in sequence. The other, seemingly paradoxical effect is that occasionally, with large bursts of artifact (due to muscle potentials or lead motion) the filter bandwidth opens-up, passing the artifact unfiltered. This effect is a "fail-safe" design, indicating that it is not possible for the filter to clearly distinguish between artifact and real QRS complexes. In cases like these, even low pass filtered data is very irregular, making reading the ECG difficult. If this effect occurs, it is usually a good indicator that an electrode is loose or needs to be moved to a location with less underlying muscle mass.

### Pacer Spikes

The Muscle Artifact filter is designed to suppress high frequency noise and spikes that are not associated with a QRS shaped complex. Clearly Pacer Spikes fall into this category; the display of pacer spikes on the ECG will be attenuated by the filtering associated with the Muscle Artifact filter.

The Muscle Artifact filter can be turned on or off on a patient by patient basis.

***NOTE:** While the system provides information about the presence of pacemaker spikes, it is not intended for use in the diagnosis of pacemaker efficacy.*

## Beat Identification Accuracy

The algorithms used for beat identification and classification have been tested using records obtained from the MIT-BIH database. The records are typically about 30 minutes in duration and cover a wide range of cardiac conditions. The MIT records have been analyzed by a cardiologist and every beat identified and classified as either Normal Sinus or Ventricular. The records were analyzed using the Q-Tel algorithms and the results compared with the known classifications.

**Heart Rate.** There are about 59,000 beats in the analyzed records; the median accuracy for beat identification was 99.95 percent, with the range extending from a minimum accuracy of 98.9% to many records classified with 100% accuracy. An estimate of the heart rate is computed every 2 seconds in Q-Tel, using the algorithm determined timing of detected beats - missed beats should be a rare occurrence. The heart rate algorithm uses a median estimate based upon the R-R interval time of the preceding beats. Only the last 8 seconds of data are considered, but no more than 6 beats are included in the median estimate. For instance, at a heart rate of 80 beats per second the 6 beat limit would occur in about 4.5 seconds, i.e.: the heart rate would reflect the rate determined from the last 4.5 seconds of data. The median estimate provides a robust estimate of heart rate - occasional errors in beat identification do not degrade the estimate as would occur with an average estimate.

## Normal Sinus Rhythm

On average, the Q-Tel algorithm correctly identifies a beat as Normal Sinus Rhythm 99.7% of the time, with a computed standard deviation of 0.48%. The data volume contained about 52,000 NSR beats; Only 174 were incorrectly identified as Ventricular, for a gross measurement of error of about 0.3 percent.

## Ventricular Beats

On average, the algorithm correctly identifies a beat as Ventricular 96.7% of the time, with a computed standard deviation of 7% - slightly worse than the accuracy rate for NSR. The data volume contained about 7100 Ventricular beats; Only 187 were incorrectly identified as NSR, for a gross measurement of error of about 2.6% (accuracy of 97.4%), in reasonably good agreement with the record based analysis of 96.7%.

## Algorithm Notes

The above discussed beat detection and classification algorithms are the foundation for subsequent ECG alarm detection and reporting. The accurate detection of beats is critical for the accurate computation of heart rate, as well as for alarms for high and low heart rate, missing QRS, ventricular fibrillation, and asystole. The differentiation of normal sinus rhythm beats versus ventricular beats is critical to the identification of ventricular tachycardia, bigeminy, couplets, high PVC rates, trigeminy and ventricular rhythms and runs.

The following notes discuss a few important aspects of the alarm behavior.

### Ventricular Fibrillation

The VFIB alarm remains active after the visual termination of ventricular fibrillation and does not terminate the reporting of VFIB until heart beats have been detected for at least 15 seconds. At the onset of VFIB the system will continue to report a heart rate, but that rate will quickly trend to zero. The heart rate will remain zero after the return of NSR for about 20 seconds as the algorithm re-learns the pattern of the rhythm and re-starts beat identification.

### Missing QRS

Regularly missing QRS (for example, every fifth beat is followed by a long pause) will initially be reported as a Missing QRS alarm. After 3-5 cycles of this pattern the algorithm will determine that the ECG reflects an irregular rhythm and stop reporting the condition as a Missing QRS alarm. A return to NSR for a minute or more will re-start the detection of missing QRS.



# 27. FUNCTIONAL BLOCK DIAGRAM

This appendix shows the functional block diagram for the Q-Tel RMS Main Tower in detail.

Figure 51 Q-Tel Main Tower Functional Block Diagram (120V)

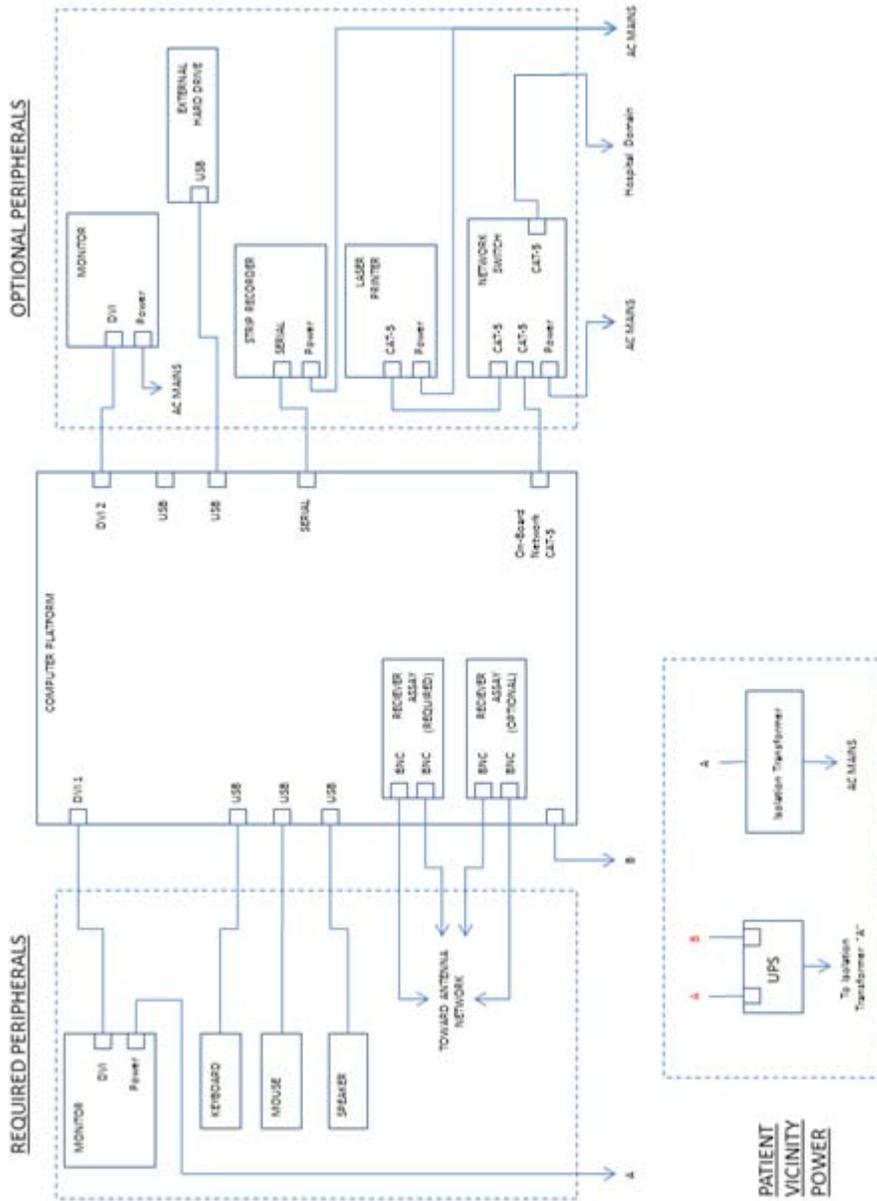


Figure 52 Q-Tel Main Tower Functional Block Diagram (240V)

