Cardiac Monitoring: The Importance of Detecting Heart Rhythm Disorders

Heart rhythm disorders, also called cardiac arrhythmias, occur when there is a malfunction in the heart’s electrical impulses that coordinate how it beats. As a result, the heart can beat too quickly, too slowly or irregularly. In some cases, abnormal heart rhythms are not serious or life threatening and can be addressed with simple lifestyle changes. In other cases – such as when a patient experiences recurrent fainting, palpitations, unexplained stroke or atrial fibrillation – arrhythmias can be serious and potentially life threatening.

Importance of Cardiac Monitoring

- Because abnormal heart rhythms and their accompanying cardiac symptoms often come and go in a transient manner, they may be difficult to detect. Tests such as electrocardiograms only allow a physician to look at the heart’s activity at one point in time, and a patient may be at risk for future symptoms or events that were not detected at the time the test was administered.

- To determine the cause of recurrent fainting, palpitations, unexplained stroke or atrial fibrillation, a patient’s heart must be monitored over time so his or her physician can diagnose the disorder accurately.

Types of Cardiac Monitors

Cardiac monitors are battery-powered devices that record the heart’s electrical activity. There are two categories of cardiac monitors: external cardiac monitors, and implantable or insertable cardiac monitors.

- **External Cardiac Monitors** – Designed for short-term use, traditional external heart monitors (known as Holter or Event Monitors) are the most common monitors for diagnosing heart rhythm disorders that occur on a relatively frequent basis. They are typically attached with wires to the outside of a patient’s body for between 24 hours to 30 days. Other types of external monitors include Mobile Cardiac Telemetry (MCT) or Mobile Cardiac Outpatient Telemetry (MCOT), which also can be worn for up to 30 days. These devices monitor, record and store cardiac data, which can be reviewed and sent to physicians for appropriate follow up.

- **Implantable and Insertable Cardiac Monitors** – Designed for long-term use, implantable and insertable cardiac monitors are devices that help determine the causes of infrequent, unexplained arrhythmias. The small devices are placed just under the skin of the chest during outpatient procedures. The devices detect and record abnormal heart rhythms over long periods of time (up to three years) to help determine whether patients have abnormal heart rhythms.

Key Features of Cardiac Monitoring

- **Continuous Monitoring:**
  
  - Continuously tracking patients' heart rhythms is important because physicians are more likely to discover whether arrhythmias are causing the symptoms. Physicians prefer to use monitors with continuous monitoring to help them make diagnoses or to help manage patients’ conditions.

- **Patient Compliance:**
  
  - Some short-term cardiac monitors, such as the Medtronic SEEQ™ MCT System, are designed for patient comfort and compliance, with a slim profile and without cumbersome wires. Patients can wear the device, which is applied to the chest area like a bandage, discreetly under clothing and does not need to be removed during exercise, showering or sleeping.

  - Long-term insertable cardiac monitors are placed just under the skin. They are very small, and don’t require bulky monitors, recording pads or wires and that are visible under clothing. After the insertion wound has healed, patients with insertable cardiac monitors can continue with normal daily activities – such as swimming, bathing and physician-approved exercise – without the monitor getting in the way or being damaged.

- **Results/Reporting:**
  
  - Short-term monitoring:
    - Holter monitors record all cardiac activity which is interpreted by computer software, typically located at a cardiac clinic, upon completion of the monitoring prescription (24-48 hours)
    - Event recorders can be prescribed for up to 30 days to monitor, capture and record cardiac events. Reports are typically generated at the end of device use
    - Mobile Cardiac Telemetry devices monitor, record and store every heartbeat and can automatically transmit cardiac event data to a monitoring center for review and report generation
• The Medtronic SEEQ MCT System sends cardiac data to a dedicated monitoring center that is continuously staffed by trained cardiographic technicians who review the data transmissions and generate physician reports on a customizable schedule.
  
  o Long-term monitoring:
    ▪ Long-term cardiac monitors are placed just under the skin and continuously monitor a patient’s heart for up to three years.

The Future of Cardiac Monitoring
Cardiac monitors have been used for years to help physicians determine if patients’ symptoms such as recurrent fainting, palpitations, unexplained stroke or atrial fibrillation are caused by irregular heartbeats (or arrhythmias). Over time, these devices have grown smaller – and smarter – and the latest devices are expected to continue to advance the world of cardiac monitoring.

• The SEEQ™ Mobile Cardiac Telemetry (MCT) System is a wire-free, water-resistant, external heart monitor that can be worn for up to 30 days to detect and help diagnose the cause of irregular heartbeats in patients.
  ▪ The System is indicated for patients who experience symptoms that suggest irregular heartbeats such as chest pain, syncope (fainting), lightheadedness, vertigo, palpitations or shortness of breath, and whose symptoms were not detected by 24-hour Holter monitors. The device also allows patients to alert the monitoring center, should they have symptoms.

• The Reveal LINQ™ Insertable Cardiac Monitoring (ICM) System, cleared by the U.S. Food and Drug Administration (FDA) in February 2014, is the smallest ICM available (1.2 cc) that continuously and wirelessly monitors patients’ hearts for up to three years. The LINQ ICM System is especially helpful for patients who experience infrequent cardiac arrhythmias that often are not detectable with short-term monitoring systems.