MRAD 202 – Patient Care 2

ECG/EKG

Electrocardiograph Monitors

An electrocardiograph (ECG or EKG) is a device that measures the electrical activity of the heart and displays the information graphically in the form of waves on either a paper tracing or a monitor screen. ECGs produce a record of the electrical activity of the heart, displaying waves that are categorized as P, Q, R, S, T and sometimes U.

The graph that is produced is called an **electrocardiogram** (also abbreviated as ECG or EKG). Wave cycles or intervals that are deviations from normal heart activity are automatically recorded and may activate an auditory alarm.

Continuous ECG monitoring is standard practice in most critical care units. Patients may be brought to the Diagnostic Imaging (DI) dept. while being monitored by ECG to detect and record cardiac irregularities. Patients from ER who suffer from various acute medical problems (such as angina or arrhythmia) or patients with traumatic problems may also come to the DI dept. while connected to an ECG monitor.

ECG monitoring may be ordered during **special imaging procedures or treatments** to closely watch the patient's cardiac function.

How it works:

When a patient is being monitored by ECG, electrodes on the patient are attached to cables that connect to an electronic display unit. **ECG electrodes are electrical contacts that can receive tiny electrical signals produced by the patient's heart.** The electrodes are incorporated into disposable

adhesive patches attached to the patient's skin. It is essential that the cables and electrodes patches remain secure.

Note: These patches may be left in place on the patient's chest during DI scans so that the patient can be reconnected easily, but keep in mind these patches will leave small artifacts on a chest x-ray. Also, the cables/wires will leave larger artifacts and need to be placed on top of the patient's shoulders and out of the way.

When a patient moves, an abnormal ECG tracing can result, which may seem to indicate an arrhythmia. If electrodes become loose or detached, a "flat line" tracing can result that seems to indicate asystole (the cessation of cardiac activity). Always check the patient and the electrodes before initiating a code.

Equipment includes:

- Electrodes/leads – most ER patients will have a 3 lead placement but there are also 12 lead placements
- Cables/wires
- Electronic display unit/monitor

Location of leads:

- Two leads are placed on the anterior part of the chest on each side of the sternum at the level of the 2nd intercostal space. These should be on soft tissue, so avoid bone if possible.
- The third lead is attached on the side of the chest at the level of the sixth or seventh intercostal space.
- The white lead goes on the right side, the black lead goes on the left side and the green lead goes on the side of the chest.
- Patient movement causes abnormal tracing so patients must be still when an ECG is being performed.
- If you disconnect a patient from the ECG monitor for the x-ray, ensure you re-attach the patient once you have completed the x-ray.
- If a cable does come loose, an alarm on the monitor will sound indicating what the error is.

Reference

Ehrlich, R. A., & Coakes, D. M. (2016). *Patient care in radiography: With an introduction to medical imaging* (9th ed., p. 205). St. Louis, MO: Mosby Elsevier.