

CORE SKILLS**ELECTROCARDIOGRAM INTERPRETATION****INTRODUCTION**

Cardiorespiratory monitoring is used commonly during hospitalization, and electrocardiograms (ECGs) are often obtained to screen for or diagnose cardiac pathology. Cardiac arrhythmias in the hospital setting can be of clinical significance and may be life-threatening. Early recognition of a clinically significant arrhythmia will result in rapid implementation of appropriate and life-saving interventions. Pediatric hospitalists are often in the best position to recognize, diagnose, and provide the initial treatment for cardiac arrhythmias and other cardiac problems. Pediatric hospitalists should be skilled at obtaining and interpreting ECGs.

KNOWLEDGE

Pediatric hospitalists should be able to:

- Describe the normal electrical cardiac cycle and the corresponding wave forms on an ECG tracing.
- Review the steps in performing an ECG, attending to lead placement and other technical aspects of the procedure.
- Summarize a general approach to the interpretation of pediatric ECGs, attending to evaluation of heart rate, rhythm, QRS axis, wave form durations and intervals, and chamber hypertrophy.
- Compare and contrast the features of the newborn ECG to those of older children and adults.
- Describe the common ECG changes associated with specific electrolyte disturbances.
- List the medications associated with potentially serious arrhythmias (e.g. cisapride and prolonged QT syndrome).
- Describe the appropriate treatment for specific cardiac arrhythmias (e.g. medications, electrical cardioversion, or defibrillation).
- List the ECG findings that should prompt consultation with a cardiologist, including life-threatening or unstable cardiac arrhythmia.

SKILLS

Pediatric hospitalists should be able to:

- Obtain an ECG using the standard number and placement of leads, recording speed, and sensitivity.
- Differentiate between a normal sinus rhythm and other rhythms by evaluating the presence and relationship of the P wave to the QRS complex.
- Determine the heart rate, considering both the atrial and ventricular rates if different.
- Determine the PR and QT intervals, P and QRS durations, and QRS axis.
- Calculate the corrected QT interval (QTc) for the evaluation of prolonged QT syndrome.
- Use the calculated intervals, durations, and amplitudes to evaluate for chamber hypertrophy and to screen for ischemia.
- Recognize patterns that are pathognomonic for certain diagnoses (e.g., delta waves in Wolff-Parkinson-White syndrome).
- Correctly identify abnormal cardiac rhythms and respond with appropriate actions and interventions, including medications, electrical cardioversion, and defibrillation.
- Order appropriate monitoring and correctly interpret monitor data.
- Consult a pediatric cardiologist when indicated.

ATTITUDES

Pediatric hospitalists should be able to:

- Assume responsibility for the need to obtain an ECG and provide an accurate interpretation.
- Communicate effectively with patients, the family/caregivers and other healthcare providers regarding the need to obtain an ECG, findings, and care plan.
- Collaborate with the primary care provider and subspecialists to ensure coordinated longitudinal care for children with cardiac pathology.

SYSTEMS ORGANIZATION AND IMPROVEMENT

In order to improve efficiency and quality within their organizations, Pediatric Hospitalists should:

- Lead, coordinate, or participate in the development and implementation of cost-effective and evidence-based policies regarding the indications for obtaining an ECG.
- Work with pediatric cardiologists, hospital staff, and others to ensure timely, reliable and accurate pediatric ECG interpretation.
- Lead, coordinate, or participate in efforts directed at educating healthcare providers about risk factors for cardiac arrhythmia, early identification of abnormal rhythms, and implementation of appropriate resuscitative efforts.

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