EKG Arrhythmia Recognition: A Third-year Clerkship Teaching Experience

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Background and Objectives: This report describes a curricular experience designed to improve EKG arrhythmia recognition skills in third-year medical students in a required family medicine clerkship. The electrocardiograph (EKG) is an important diagnostic tool for clinicians. Literature cites the lack of ability of primary care physicians to accurately read them. Also of concern is a recent study that revealed that learners do not improve their ability to assess EKG findings simply by completing the clinical work of residency. Little information has been written about educational designs to improve the ability of students to interpret the EKG.

Introduction/Educational Goals

Our experience at the University of South Carolina concurred with the paucity of findings in the literature, in that EKG interpretation was not being integrated into student knowledge in the clinical setting as well as we had hoped. We were surprised to see how poorly students performed on objective EKG tracing recognition testing during the objective structured clinical examination (OSCE) portion of their family medicine clerkship. This report describes the development and integration of an innovative, systematic approach to EKG reading in our third-year family medicine clerkship and our efforts to assess the outcomes of this training.

Description of Intervention

One-hour Interactive Didactic

We developed an interactive learning session on EKG interpretation and added it to the third-year family medicine clerkship during the 2000–2001 academic year. The session includes a review of basic cardiac physiology, the SA node and the generation of the P wave, the PR interval, and the AV node and the generation of the QRS, along with clinical correlations for any abnormalities. We use a teaching file that includes numerous rhythm strip/EKGS for interpretation derived from our own patient cases. Students are then taught to review three questions each time...
they review a rhythm strip, after ventricular rate has been established. (1) Is there only one P wave for every QRS? (atrial abnormalities) (2) Is the PR interval < or = to .20? (blocks) (3) Is the QRS interval < or = to .12? (ventricular abnormalities) If the answer to all three questions is yes, then students know that this is sinus rhythm. If the answer to any question is no, it points them to a category of the abnormality. Then, discussion moves to assessment of the abnormality.

We have found that making the student initially group the arrhythmia as an atrial, ventricular, or block abnormality affords more-accurate interpretation. This also prepares the students to better able to discuss what types of drugs may be used to treat the arrhythmia. Our teaching file includes sinus tachycardia, sinus bradycardia, premature atrial contraction, atrial flutter, atrial fibrillation, supraventricular tachycardia, junctional tachycardia, premature ventricular contraction, ventricular tachycardia, ventricular fibrillation, first-degree block, second-degree block, third-degree block, and bundle branch block.

Evaluation

At the end of each clerkship rotation, each student rotates through a series of OSCE stations. Since 1997, we have routinely tested EKG, CXR, and microscopic skills as part of our practical exam. Student evaluation was accomplished through their interpretation of two EKGs.

Results

The control group included 55 third-year medical students from the academic year 1999–2000; the intervention group included 57 medical students from the subsequent year (2000–2001). Two EKGs, not derived from our teaching files, which have basic rhythm abnormalities, are used for assessment on the OSCE. The overall improvement in scores revealed an improvement in the mean score from .82 to 1.54 questions correct in the intervention group. The frequency of “none correct” decreased from 32.7% (n=18) to 3.5% (n=2). The frequency of only “one correct” decreased from 52.7% (n=29) to 38.6% (n=22). The frequency of “two correct” increased from 14.5% (n=8) to 57.9% (n=33). The intervention group showed a statistically significant improvement in scores throughout the academic year via Pearson chi-square (P<.05).

Conclusions

There is wide agreement in the literature that ability to interpret EKGs/arrhythmias is a skill that is lacking in today’s medical learners. This systematic interactive session offers an improved approach to teaching this skill without significant resource expenditure. Often, EKG training is left to be picked up in the clinical setting, often assumed to be taught in internal medicine or cardiology. Feedback from our students indicates that family medicine is the first rotation where they have understood EKG interpretation, suggesting that this may not be happening elsewhere in the medical education curriculum. We have shown that using this simple systematic approach to teaching EKG interpretation to third-year medical students results in greater understanding and skill and has a positive impact on clinical skill training in third-year medical students.

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References