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ONE MINUTE CONSULT
BRIEF ANSWERS TO SPECIFIC CLINICAL QUESTIONS

Q: Do all hospital inpatients need cardiac telemetry?

A: No. Continuous monitoring for changes in heart rhythm with cardiac telemetry is recommended for all patients admitted to an intensive care unit (ICU). But routine telemetry monitoring for patients in non-ICU beds is not recommended, as it leads to unnecessary testing and treatment, increasing the cost of care and hospital length of stay.

RISK STRATIFICATION AND INDICATIONS

Telemetry is generally recommended for patients admitted with any type of heart disease, including:

- Acute myocardial infarction with ST-segment elevation or Q waves on 12-lead electrocardiography (ECG)
- Acute ischemia suggested by ST-segment depression or T-wave inversion on ECG
- Systolic blood pressure less than 100 mm Hg
- Acute decompensated heart failure with bilateral rales above the lung bases
- Chest pain that is worse than or the same as that in prior angina or myocardial infarction.[1,2]

Indications for telemetry are less clear in patients with no history of heart disease. The American Heart Association (AHA)[3] has classified admitted patients based on the presence or absence of heart disease[3]:

- Class I (high risk of arrhythmia): acute coronary syndrome, new arrhythmia (eg, atrial fibrillation or flutter), severe electrolyte imbalance; telemetry is warranted
- Class II (moderate risk): acute decompensated heart failure with stable hemodynamic status, a surgical or medical diagnosis with underlying paced rhythms (ie, with a pacemaker), and chronic arrhythmia (atrial fibrillation or flutter); in these cases, telemetry monitoring may be considered
- Class III (low risk): no history of cardiac disease or arrhythmias, admitted for medical or surgical reasons; in these cases, telemetry is generally not indicated[3]

Telemetry should also be considered in patients admitted with syncope or stroke, critical illness, or palpitations.

Syncope and stroke

Despite the wide use of telemetry for patients admitted with syncope, current evidence does not support this practice. However, the AHA recommends routine telemetry for patients admitted with idiopathic syncope when there is a high level of suspicion for underlying cardiac arrhythmias as a cause of syncope (risk class II-b).[3] In 30% of patients admitted with stroke or transient ischemic attack, the cause is cardioembolic. Therefore, telemetry is indicated to rule out an underlying cardiac cause.[4]

Critical illness

Patients hospitalized with major trauma, acute respiratory failure, sepsis, shock, or acute pulmonary embolism or for major noncardiac surgery (especially elderly patients with coronary artery disease or at high risk of coronary events) require cardiac telemetry (risk class I-b). Patients admitted with kidney failure, significant electrolyte abnormalities, drug or substance toxicity (especially with known arrhythmogenic drugs) also require cardiac telemetry at the time of admission (risk class I-b).

Routine cardiac telemetry is associated with increased hospitalization costs with little benefit

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Recurrent palpitations, arrhythmia

Most patients with palpitations can be evaluated in an outpatient setting.[5] However, patients hospitalized for recurrent palpitations or for suspected underlying cardiac disease require telemetric monitoring (risk class II-b).[3] Patients with high-degree atrioventricular block admitted after percutaneous temporary pacemaker implantation should be monitored, as should patients with a permanent pacemaker for 12 to 24 hours after implantation (risk class I-c). Also, patients hospitalized after implantable cardioverter-defibrillator (ICD) shock need to be monitored.[3,6]

Patients with a paced rhythm who do not meet the above criteria do not require routine telemetric monitoring (risk class III-c).[7]

TELEMETRY IS OVERUSED

Off-site telemetry monitoring can identify significant arrhythmias during hospitalization. It also saves time on nursing staff to focus on bedside patient care. However, its convenience can lower the threshold for ordering it. This can lead to overuse with a major impact on healthcare costs.

Goals: identify patients in true need of a telemetry bed, decrease unneeded testing, reduce costs

Routine use of cardiac telemetry is associated with increased hospitalization costs with little benefit.[8] The use of off-site services for continuous monitoring can activate many alarms throughout the day, triggering unnecessary workups and leading to densensitization to alarms ("alarm fatigue").[9]

Despite the precise indications outlined in the AHA updated practice standards for inpatient electrocardiographic monitoring,[10] telemetry use is expanding to non-ICU units without evidence of benefit,[8] and this overuse can result in harmful clinical outcomes and a financial burden. Telemetry monitoring of low-risk patients can cause delays in emergency department and ICU admissions and transfers[8,11] of patients who may be sicker and need intensive care.

In a prospective observational study,[12] only 11 (6%) of 182 patients admitted to a general medical floor met AHA class I criteria for telemetry; very few patients developed a significant telemetry event such as atrial fibrillation or flutter that necessitated a change in management. Most overprescribers of telemetry monitoring reason that it will catch arrhythmias early.[12] In fact, in a study of patients in a cardiac unit, telemetry detected just 50% of in-house cardiac arrest cases, with a potential survival benefit of only 0.02%.[13]

Another study showed that only 0.01% of all telemetry alarms represented a real emergency. Only 37.2% of emergency alarms were classified as clinically important, and only 48.3% of these led to a change in management within 1 hour.[14]

Moreover, in a report of trauma patients with abnormal results on ECG at the time of admission, telemetry had negligible clinical benefit.[15] And in a study of 414 patients, only 4% of those admitted with chest pain and normal initial ECG had cardiac interventions.[16]

Another study[8] showed that hospital intervention to restrict the use of telemetry guided by AHA recommendations resulted in a 43% reduction in telemetry orders, a 47% reduction in telemetry duration, and a 70% reduction in the mean daily number of patients monitored, with no changes in hospital census or rates of code blue, death, or rapid response team activation.[8]

The financial cost can be seen in the backup of patients in the emergency department. A study showed that 91% of patients being admitted for chest pain were delayed by more than 3 hours while waiting for monitored beds. This translated into an annual cost of $168,300 to the hospital.[17] Adherence to guidelines for appropriate use of telemetry can significantly decrease costs. Applying a simple algorithm for telemetry use was shown[8] to decrease daily non-ICU cardiac telemetry costs from $18,971 to $5,772.

CURRENT GUIDELINES ARE LIMITED

The current American College of Cardiology and AHA guidelines are based mostly on expert opinion rather than randomized clinical trials, while most telemetry trials have been performed on patients with a cardiac or possible cardiac diagnosis.[3] Current guidelines need to be updated, and more studies are needed to specify the optimal duration of cardiac monitoring in indicated cases. Many noncardiac conditions raise a legitimate concern of dysrhythmia, an indication for cardiac

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monitoring, but precise recommendations for telemetry for such conditions are lacking.

RECOMMENDATIONS

Raising awareness of the clinical and financial burdens associated with unwise telemetry utilization is critical. We suggest use of a pop-up notification in the electronic medical record to remind the provider of the existing telemetry order and to specify the duration of telemetry monitoring when placing the initial order. The goal is to identify patients in true need of a telemetry bed, to decrease unnecessary testing, and to reduce hospitalization costs.

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