

**UAMS MEDICAL CENTER  
TRAUMA SERVICES MANUAL**

**SUBJECT:** Blunt Cardiac Injury Management Guideline

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**UPDATED:** 4/19, 2/23

**EFFECTIVE:** 3/2/2023

**RECOMMENDATION(S):** Dr. Joseph Margolick  
**CONCURRENCE(S):** ALL

**APPROVAL:** 3/2/2023

**PURPOSE:**

Describe initial screening for Blunt Cardiac Injury. Surgical management of cardiac tamponade and penetrating trauma are beyond the scope of this guideline.

**BACKGROUND:**

Blunt chest trauma can lead to a broad range of blunt cardiac injuries (BCI).<sup>1</sup> The most common cause of BCI is motor vehicle accidents (50%), pedestrians struck by vehicle (35%), motorcycle crashes (9%) and falls from significant heights (6%).<sup>2-4</sup> Diagnosing BCI can be challenging due to the polytraumatic nature and multiple injuries incurred in the majority of these patients.

There are six mechanisms that have been suggested to cause BCI: Direct contusions, indirect trauma, bidirectional trauma (compressing the heart between the sternum and the spine), deceleration injuries, blast injuries, concussive or combined. Direct impact to the chest is considered the most common with subsequent cardiac contusions. It is thought that cardiac injury is most likely to occur when the ventricles are maximally filled at the end of diastole.<sup>1</sup> Right ventricular and right atrial injuries are most common whereas left sided heart injury is less common. There have only been a few reported cases of septal, coronary artery or valve injuries.<sup>5</sup> The majority of patients are asymptomatic. Sternal fractures alone are not associated with BCI and do not warrant an echocardiogram in the absence of ECG changes and/or Troponemia.

Manifestations of BCI can be clinically silent, transient arrhythmias and, rarely, lethal cardiac wall ruptures. A high index of suspicion is required for early diagnosis of BCI. Screening for BCI is performed with an ECG and serologic examination of Troponin. Echocardiography is not a useful screening modality and nuclear medicine scans lack sensitivity and specificity to reliably diagnosis BCI.<sup>5</sup> Computed tomography and MRI scans have limited role in the evaluation of BCI.<sup>1-6</sup>

There are no pathognomonic EKG findings for BCI. The most common arrhythmia is sinus tachycardia.<sup>1</sup> However, new onset heart blocks, and ST changes can occur. Previous guidelines stated ECG alone could rule out BCI. However, more recent studies have shown that a subset of patients had BCI and elevated troponin despite an initial normal ECG. For this reason, these guidelines suggest that both a normal ECG and normal Troponin level is required to rule out BCI.

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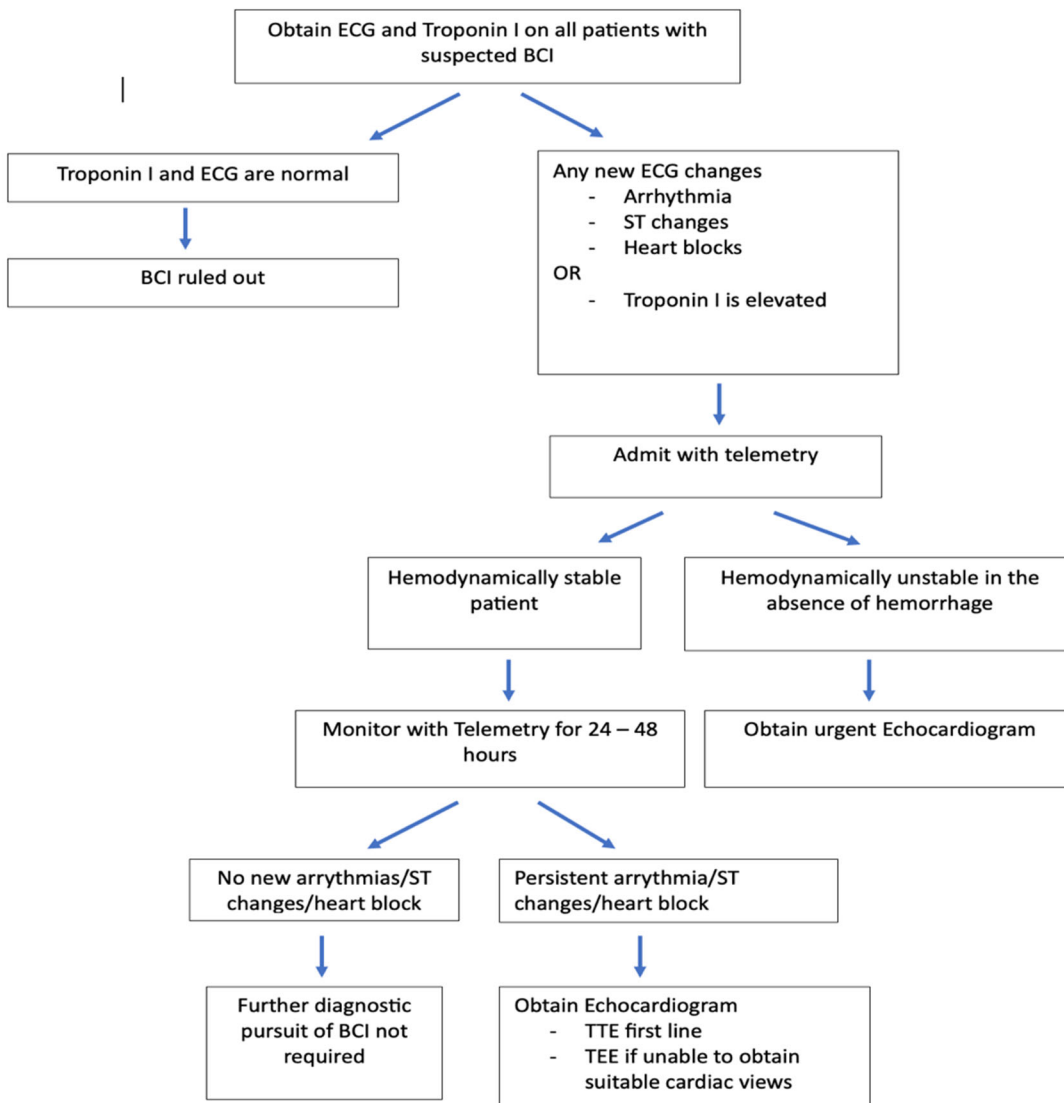
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**GUIDELINE:**

Screen the following patients for BCI:

- **Mechanism:** High speed MVC, pedestrian struck by vehicle, motorcycle accident, Fall from substantial height
- **Evidence of blunt chest trauma:** Rib fractures, pulmonary contusions, pericardial effusions, cardiac wall motion abnormality on FAST, previously undocumented murmurs, sternal fractures, cardiogenic shock
- **Concerns on monitor:** arrhythmias, heart block, ST changes
- **Physician discretion**



These guidelines were prepared by the UAMS Trauma Service. They are intended to serve only as a guideline based on current review of the medical literature and practice. They are neither policies nor protocols. Their use is at the discretion of the managing physician

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