

An Algorithm to Prevent Missed Bowel Injuries in Blunt and Penetrating Abdominal Trauma Patients

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Background

- Missed diagnoses and delayed treatment of bowel injuries in trauma patients are associated with increased morbidity and mortality.
- Current guidelines for managing patients with a possible bowel injury following abdominal trauma are variable.
- Clinical expertise is limited due to the infrequency of these injuries.

Objective:

To develop a decision-making algorithm for the management of patients with penetrating and blunt abdominal trauma to decrease delayed and missed diagnoses of bowel injuries.

Methods

- Retrospective chart review:
 - 124 abdominal trauma patient charts from July 2012-March 2022 with a resulting bowel injury
 - 16 patients (13.0%) with delayed or missed diagnosis 9 of which suffered complications
 - Average HLOS = 22.3 days (range: 3 - 114 days)

Patient	Blunt Trauma	Penetrating Trauma	Hours to Diagnosis
1	X		151
2	X		41
3	X		187
4	X		11
5		X	18
6	X		96
7		X	16
8	X		13
9		X	4.5
10	X		25
11	X		10
12	X		4
13		X	17
14	X		36
15	X		14
16	X		6

Algorithm

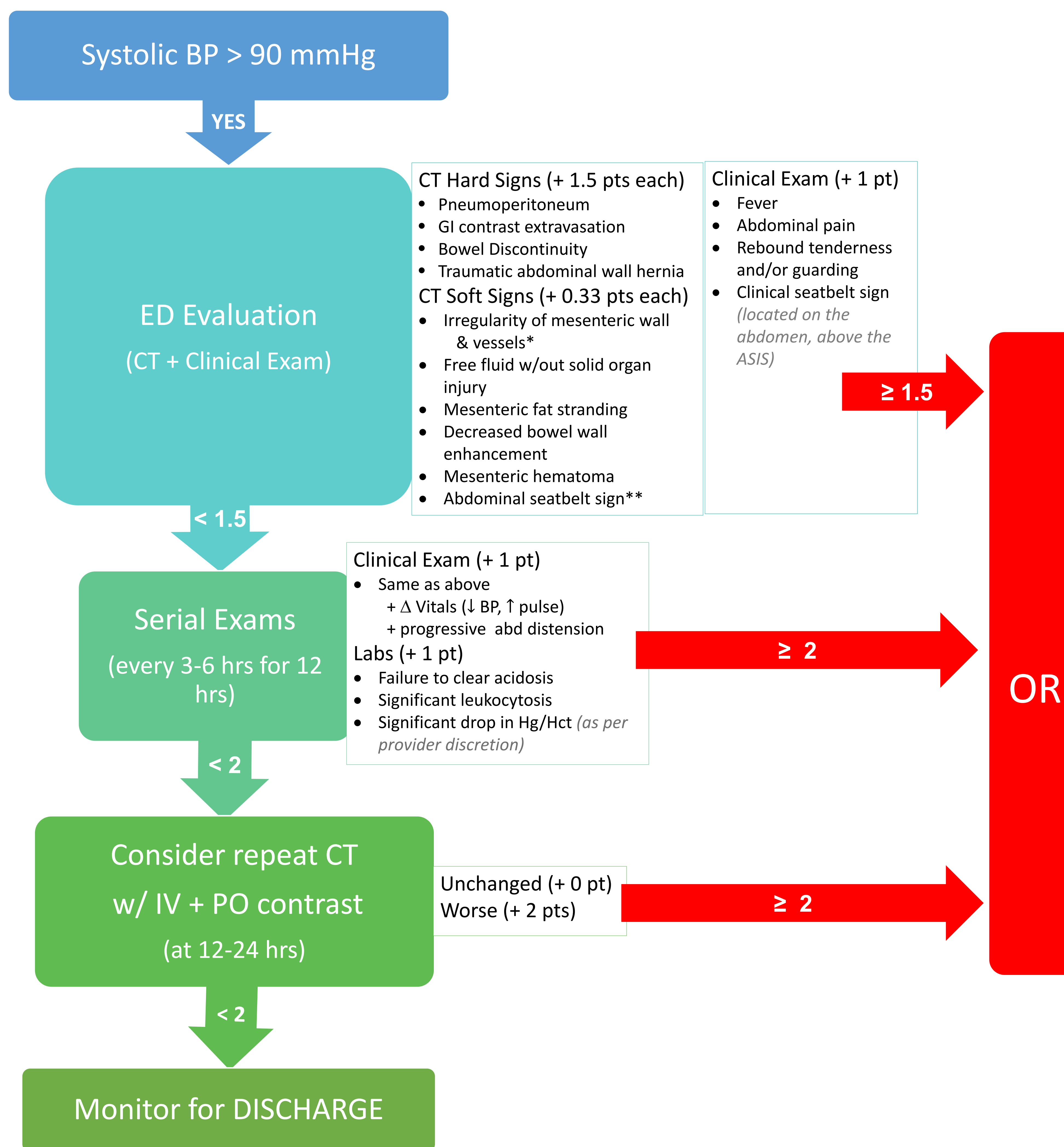
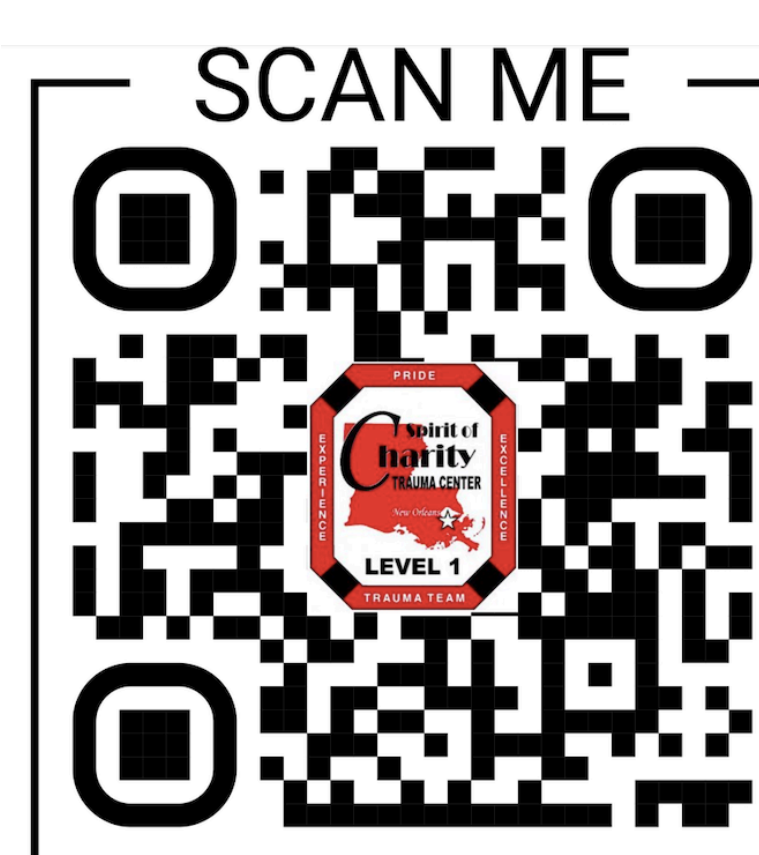


Figure 1, above: Proposed decision-making algorithm for management of blunt abdominal trauma patients.

Figure 2, below: QR code for calculation of algorithm scores for the management of blunt and penetrating abdominal trauma patients.



Results

- An average of two days to surgical management could have been saved with use of the algorithms.

Statistics:

Sensitivity: 86.4%
Specificity: 87.5%
PPV: 90.5%
NPV: 82.4%

- In a retrospective application of the algorithm to 88 patient charts with a negative laparotomy, the sensitivity, specificity, positive predictive value, and negative predictive value were calculated.

Conclusion

- Inadequate decision-making guidelines resulted in missed diagnoses and delayed treatment.
- A standardized approach to the management of patients with a possible bowel injury will decrease delayed and missed diagnoses.
- Retrospective evaluation of the algorithm demonstrated its efficacy in reducing time to bowel injury diagnosis.
- Current studies focus on implementing this algorithm at a Level I trauma center to decrease morbidity and mortality associated with delayed diagnosis and treatment.



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