The use of a decision making tool to optimise physiotherapy practice for patients following chest trauma: impact on patient and hospital outcomes

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Introduction

Blunt chest wall trauma is common and associated with significant morbidity and mortality. There is increasing evidence to support standardised care pathways that focus on early referrals and co-ordinated care.

Physiotherapy for patients with chest wall trauma is key to improve respiratory and functional status, but pathways rarely specify expectations or interventions.

We developed the "Blunt Chest Trauma: Physiotherapy Treatment Pathway" to support triage and clinical decision making (Figure 1).

The aim of this study was to explore the demographics and factors associated with patient and hospital related outcomes for a cohort of chest trauma patients.

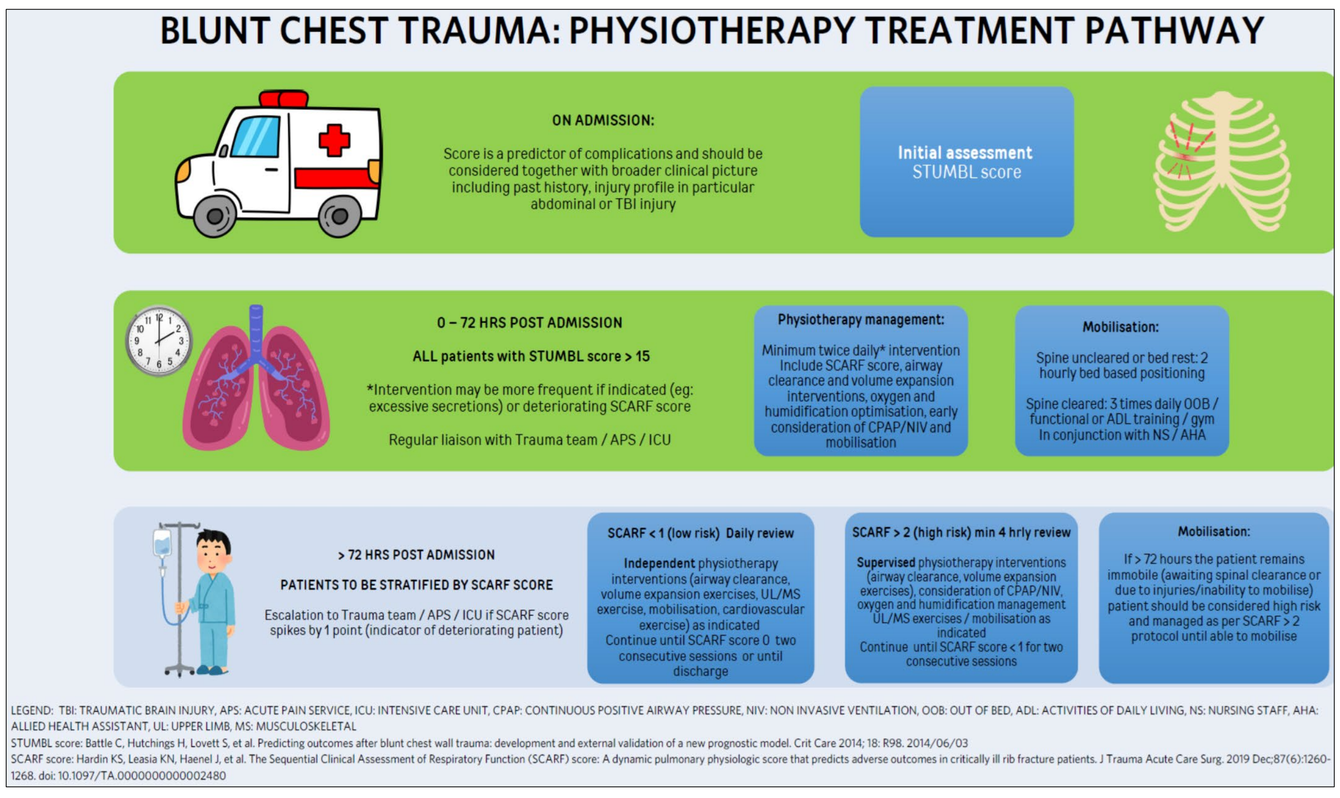

Figure 1: Decision making and triage pathway

Methods

- All patients with chest trauma admitted to the Alfred trauma ward over a 10 month period (2020-21) were triaged using the STUMBL score with high risk patients targeted to receive more intensive physiotherapy (Figure 1)
- Patient demographics were collected (Figure 2), alongside physiotherapy interventions (Table 1), hospital and patient outcome (Table 2)
- Mobility was assessed using the Modified Iowa Level of Assistance Score (mILOA): 6 items scored on the amount of assistance required, distance mobilised and assistive device used (total score from 0= independent to 36)
- Continuous data was compared using Mann Whitney U Tests, whilst categorical data was assessed using Fisher exact and Chi-squared test.

Results

During the 10 month time period there were 1722 patients admitted

539 (31%) had a diagnosis of chest trauma

71% male

62% STUMBL > 15 (deemed high risk - Figure 1)

Figure 2: Demographics high risk group

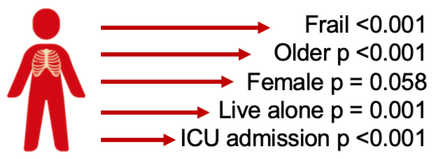

Table 1: Physiotherapy review data

	High Risk Group n=328	Low Risk Group n=193	P value
Occasions of service (median, IQR)	4 (2.5, 8)	3 (1, 6)	<0.001
Clinician Attributable Time (median, IQR in minutes)	142.5 (80, 240)	90 (45, 180)	<0.001

- The high risk group received significantly more physiotherapy occasions of service and clinical attributable time than the low risk group (p value <0.001) (Table 1)
- The median change in mILOA over the admission was ≥7, indicating a clinically significant change in mobility during the patient's hospital stay (Table 2)
- Linear regression analysis showed that being in the high risk group was not associated with total LOS (p=0.45)

Table 2: Hospital and Patient Outcomes Data

Hospital and Patient Outcome	STUMBL score ≤ 15 (low-risk) n= 206	STUMBL score > 15 (high-risk) n= 333	p value
Trauma ward LOS days (IQR)	3.1 (1.5- 6)	5.3 (2.9- 8.1)	<0.001
TotalAlfred LOS days (IQR)	3.8 (2.1- 9)	6.9 (3.8- 11.7)	<0.001
ICU admission	57 (28%)	189 (57%)	<0.001
ICU readmission	3/57 (5.3%)	1/189 (0.5%)	0.01
D/C destination:			
Home	176 (85.5%)	269 (80%)	
Other IP or care facility	29 (14%)	62 (19%)	0.553
Death	1 (0.5%)	2 (1%)	
Initial mILOA (IQR)	8 (0, 20) missing n=13	17 (7, 24) missing n=5	<0.001
D/C mILOA (IQR)	1 (0, 11) missing n=78	5 (0,13) missing n=74	0.053
Readmission within 28 days	16 (8%)	24 (7%)	0.81
Any Hospital Acquired Complication	27 (13%)	72 (21.6%)	0.01
Respiratory	7 (3%)	15 (5%)	0.53
Venous Thromboembolism	9 (4%)	15 (5%)	0.94

Conclusion

Implementation of a physiotherapy decision making algorithm based on risk assessment can triage high-risk chest trauma patients to receive intensive physiotherapy and support appropriate resource utilisation. Regardless of risk status, patients with chest trauma showed clinical improvement in mobility and achieved similar rates of discharge home without an increased in adjusted LOS.