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Moderazione: Mauro Giordano – Simone Vanni

Jacopo Davide Giamello

Lo STUMBL score per la prognosi nel trauma toracico chiuso: uno studio di validazione

XII congresso nazionale
simeu
RICCIONE 13-15 MAGGIO 2022

Lo STUMBL score per la prognosi nel trauma toracico chiuso: uno studio di validazione

Gianpiero Martini, Jacopo Davide Giamello, Davide Prato, Marco Santoro, Letizia Barutta, Alessia Bono, Daniela Caruso, Andrea Pizzuto, Massimo Rega, Gabriele Sobrero, Francesco Tosello, Giuseppe Lauria

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Blunt thoracic trauma

- frequent cause of emergency department (ED) for trauma
- broad severity range
- non-immediate onset complications

→ Identifying patients at high risk of developing complications is critical

Battle *et al. Critical Care* 2014, **18**:R98
http://ccforum.com/content/18/3/R98

CRITICAL CARE

RESEARCH Open Access

Predicting outcomes after blunt chest wall trauma: development and external validation of a new prognostic model

STUMBL

STUdy of the Management of BLunt chest wall trauma

	Patient data	Corresponding risk score
Age	10-19	1
	20-29	2
	30-39	3
	40-49	4
	50-59	5
	60-69	6
	70-79	7
	80-89	8
	90-99	9
	100-109	10
Number of rib fractures	0	0
	1	3
	2	6
	3	9
	4	12
	5	15
	6	18
	7	21
	8	24
	9	27
	10	30

Pre-injury anticoagulants	No	0
	Yes	4
Chronic lung disease	No	0
	Yes	5
Oxygen saturation levels	100-95%	0
	90-94%	2
	85-89%	4
	80-84%	6
	75-79%	8
	70-74%	10

Risk score	Probability of complications
0-10	13%
11-15	29%
16-20	52%
21-25	70%
26-30	80%
31+	88%

Total Score 0-11: Consider discharge home with advice leaflet and analgesia

Total Score 12-26: Consider admission to a ward for observation, analgesia and physiotherapy

Total Score ≥27: Consider ICU management

Retrospective study
ED of Santa Croce e Carle Hospital – Cuneo, Italy
2018-2021

ED diagnosis of blunt thoracic trauma (ICD10)

age < 18 years
presence of an immediately life-threatening lesion
presence of a concurrent lesion in addition to the BTT

composite outcome, at least one among:

- in-hospital mortality;
- any pleuro-pulmonary complications
- need for intensive care unit admission;
- prolonged hospitalisation > 6 days.

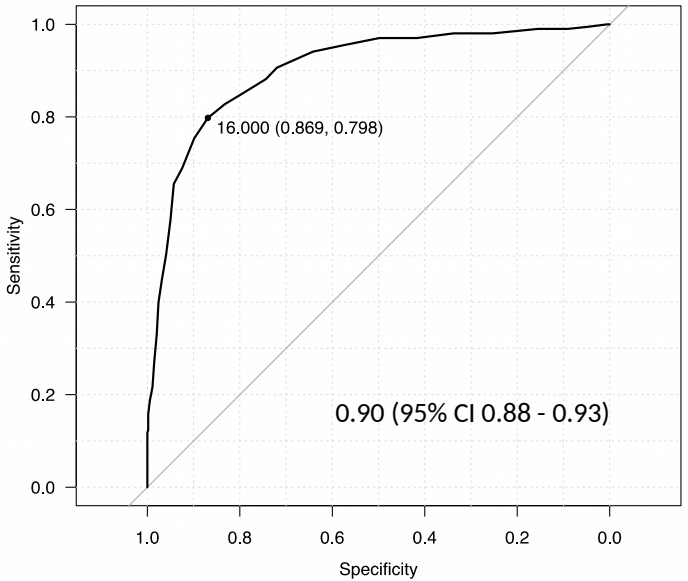
	Sample total (n=745)
Age	64 [50;78]
Female	308 (41.3%)
RR (apm) at presentation	14 [14;16]
SO_2 (%) at presentation	97 [95;99]
Charlson index	2 [1;4]
STUMBL score	11 [6;17]
Chronic lung disease	61 (8.2%)
Pre-injury anticoagulants	59 (7.9%)
Pre-injury antiplatelets	88 (11.8%)
Rib fractures	1 [0;3]
Chest CT in ED	57 (7.6%)
Analgesia in ED	469 (70%)
• Acetaminophen	217 (29.1%)
• NSAIDs	201 (27%)
• Opiates	142 (19.1%)

	No complications (n=542)	Complications (n=203)	P value
Age	60 [47;75]	73 [62;82]	< 0.001
Female	242 (44.6%)	66 (32.5%)	0.003
RR (apm) at presentation	14 [14;16]	15 [14;18]	< 0.001
SO_2 (%) at presentation	98 [96;99]	95 [93;97]	< 0.001
Charlson index	2 [0;4]	4 [2;5]	< 0.001
STUMBL score	9 [5;13]	21 [17;25]	< 0.001
Chronic lung disease	34 (6.3%)	27 (13.3%)	0.002
Pre-injury anticoagulants	30 (5.5%)	29 (14.3%)	< 0.001
Pre-injury antiplatelets	54 (10%)	34 (16.8%)	0.011
Rib fractures	1 [0;2]	4 [3;5]	< 0.001
Chest CT in ED	17 (3.1%)	40 (19.7%)	< 0.001
Analgesia in ED	320 (59%)	149 (74%)	< 0.001
• Acetaminophen	146 (27%)	71 (35%)	< 0.001
• NSAIDs	158 (29.1%)	43 (21.2%)	0.029
• Opiates	71 (13.1%)	71 (35%)	< 0.001

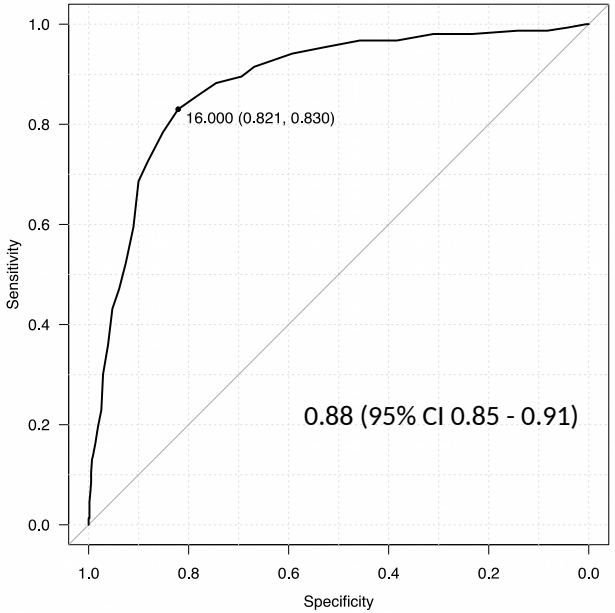
	Sample total (n=745)
discharged home from the ED	65.2%
In-hospital mortality	0.8%
ICU admission	2.1%
Prolonged LOS	19.9%
pleural effusion	11.7%
pneumonia	8.6%
pneumothorax	6.2%
haemothorax	1.9%

discrimination

composite outcome

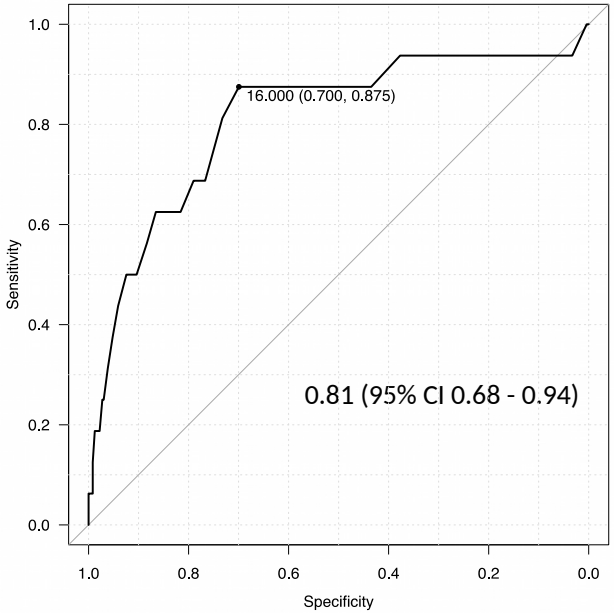


all pulmonary complications

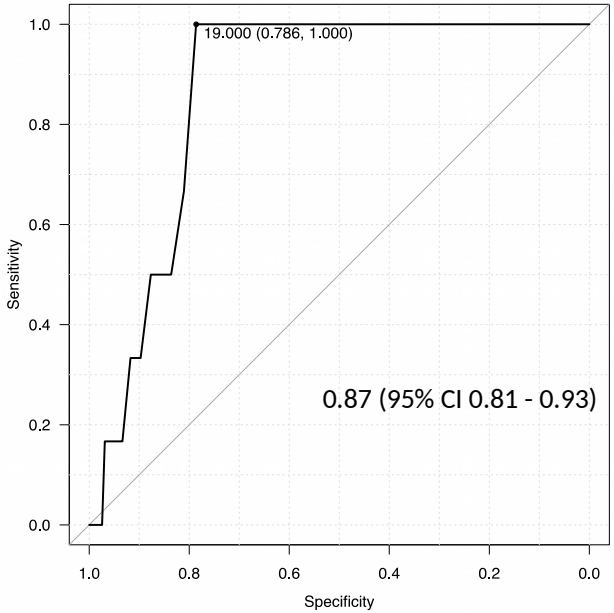


discrimination

ICU admission

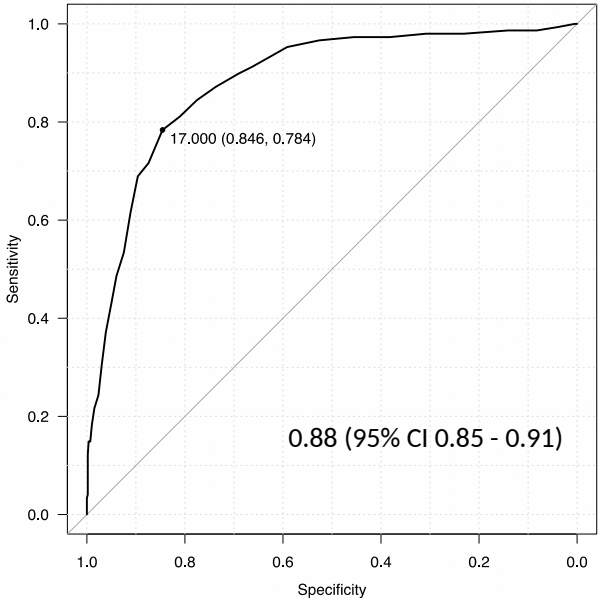


in-hospital mortality

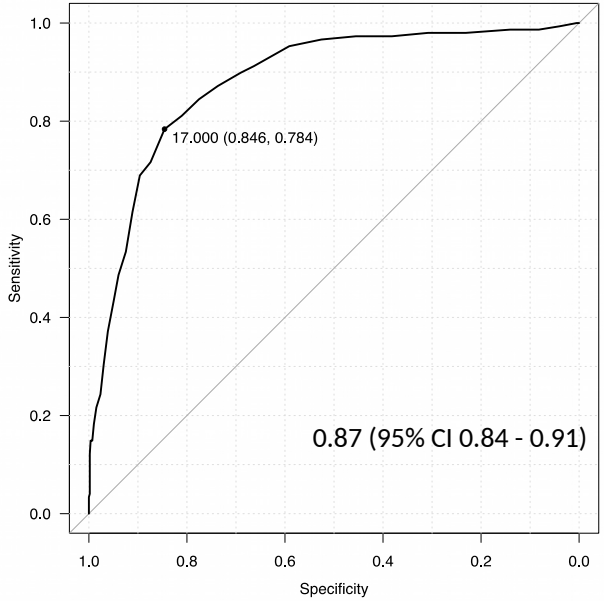


discrimination

prolonged LOS



composite outcome without prolonged LOS

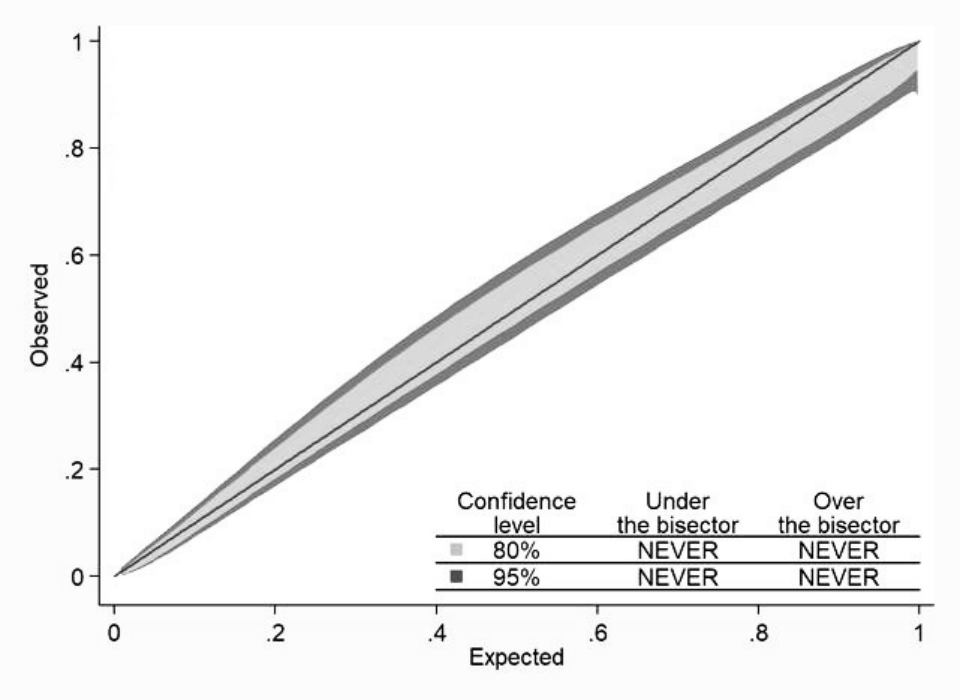


STUMBL = 16

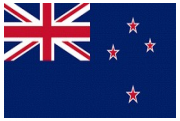
sensitivity	0.8
specificity	0.87
positive predictive value	0.7
negative predictive value	0.97

calibration

Lemeshow test (X-squared = 9.1, p = 0.34)








	Wales derivation	UK validation	New Zealand	Cuneo
patients	274	237	445	745
AUROC	0.80 (95% CI 0.75, 0.85)	0.96 (95%CI 0.93-0.98)	0.73 (95%CI 0.68–0.77)	0.90 (95% CI 0.88-0.93)
Lemeshow test	9.22, p= 0.32	n.a.	n.a.	9.1, p = 0.34
study design	Retrospective, monocentre	Prospective, multicentre	Retrospective, multicentre	Retrospective, monocentric

In this validation study, the STUMBL score demonstrated excellent discrimination and calibration in predicting the outcome of patients referred to the ED for a BTT.

If these data are further supported in extensive prospective studies, the score could become part of clinical practice, ensuring evidence-based ED dispositions for BTT patients.