

Often used for audit and research to study the trauma outcomes and care, rather than outcome prediction. Many different scoring systems, some physiological and others anatomical. There is no universally accepted scoring system and each system has its own limitations.

Glasgow Coma Score (GCS)

- Quantify the level of consciousness following traumatic brain injury.
- Can be adapted for paediatric patients
- The scale (3-15) is the sum of three parameters:

Eye Opening (E)	Best Verbal Response (V)	Best Motor Response (M)
4 = Spontaneous	5 = normal conversation	6 = normal
3 = to voice	4 = disorientated	5 = localizes to pain
2 = to pain	3 = incoherent words	4 = withdraws to pain
1 = none	2 = incomprehensible	3 = decorticate (flexion)
	1 = none	2 = decerebrate (extension)
		1 = none

Acute Physiology And Chronic Health Evaluation (APACHE II)

- Acute physiology, age and chronic health evaluation
- Most widely used critical care scale - used mainly in ICU, not a trauma score per se.
- Multiple variables

Revised Trauma Score

Total 0-12. Poorly predictive of trauma mortality.

GCS	BPsys	RR	Points
13-15	≥90	10-29	4
9-12	76-89	≥30	3
6-8	50-75	6-9	2
4-5	1-50	1-5	1
3	0	0	0

Injury Severity Score (ISS)

Anatomically based

Based on injuries to 6 body regions

- head/neck, face, chest, abdo/pelvis contents, extremities/pelvic girdle, external

Injury in each region is assigned a severity 1-6

- minor (1), moderate (2), serious (3), severe (4), critical (5), unsurvivable (6)

Score = sum of squares of the 3 worst affected regions. If one region=6 then total score=75

Interpretation

- Minor <9
- Moderate 10-25
- Severe 26-34
- Very severe >35

Limitations

- Does not take into account age or co-morbidities
- Not accurate for grading penetrating trauma
- Retrospective
- Some injury classifications are ?valid and not based on outcome

Usefulness

- Comparison of different hospitals
- Comparison of same hospital over time
- May aid prognosis

New Injury Severity Score (NISS)

As for ISS but Score = sum of squares of the 3 worst injuries regardless of region. Performs slightly better in mortality prediction.

Trauma and injury severity score (TRISS)

Combination scoring system

Probability of trauma survival using anatomical and physiological scores.

A logarithmic regression equation is used:

$$Ps = 1 / (1 + e^{-b}), \text{ where } b = b_0 + b_1(RTS) + b_2(ISS) + b_3(\text{AgeScore})$$

$$RTS = (0.9368 \times GCS) + (0.7326 \times BP_{sys}) + (0.2908 \times RR)$$

ISS calculated as above

AgeScore = 0 if <55y or 1 if ≥55y.

Coefficients b0-b3 depend on type of trauma:

Coefficient	Blunt trauma or age <15 years	Penetrating trauma
b0	-1.247	-0.6029
b1	0.9544	1.1430
b2	-0.0768	-0.1516
b3	-1.9052	-2.6676

Criticised for:

- Only moderately accurate for predicting survival
- Problems already noted with the ISS
- No information is incorporated related to preexisting conditions
- Similar to RTS, it can't include tubed patients as RR & verbal responses not obtainable
- Doesn't account for patient mix (making comparisons between trauma centres difficult).

ASCOT

Similar to TRISS

This time b exponent called k and based on GCS, BP_{sys}, RR, age and anatomical profile, again with coefficients that vary depending on whether blunt or penetrating