Dott. **LUPPI FRANCESCO** – Medico specializzando – Medicina d'Emergenza-Urgenza UniMORE

XI congresso nazionale
simeu
ROMA 24-26 MAGGIO 2018

RTS – Revised Trauma Score

Lack of clinical usefulness of RTS during triage in trauma patients

Trauma Score

ISS

Injury Severity Score

NISS

New Injury Severity Score

TRISS

Trauma and Injury Severity Score

RTS

Revised Trauma Score

CRAMS

Circulation Respiration Abdomen Motor Speech

MGAP

Mechanism GCS Age Arterial pressure

The Trauma Score

Champion HR, Sacco WJ, Carnazzo AJ, Copes W, Fouty WJ

Crit Care Med. 1981 Sep;9(9):672-6

Revision of the Trauma Score

Champion HR, Sacco WJ, Copes WS, Gann DS, Gennarelli TA, Flanagan ME

J Trauma. 1989 May;29(5):623-9

RTS

Revised Trauma Score

Punteggio	GCS	SBP (mmHg)	RR (bpm)
4	13-15	> 89	10-29
3	9-12	76-89	>29
2	6-8	50-75	6-9
1	4-5	1-49	1-5
0	3	0	0

RTS

Revised **T**rauma **S**core

RTS PH TRIAGE version

GCS + SBP + RR

Range score 0 - 12

RTS WEIGHTED version

0,9368***GCS** + 0,7326***SBP** + 0,2908***RR**

Range score 0 – 7,84

Is the RTS still useful?

GABBE J, CAMERON PA, FINCH CF
ANZ J Surg 2003;73:944-8

RTS
Review

Study element	Baxt et al.[7]	Emerman et al.[9]	Hill et al.[10]	Roorda et al.[11]	Bouillon et al.[8]
Data collection	Prospective	Prospective	Retrospective	Retrospective	Prospective
Country	USA	USA	Australia	Netherlands	Germany
Years of study	1984–1985	1989–1990	1990–1991	1992	1987
Inclusion criteria	All patients treated at the participating regional trauma centre	All trauma patients transferred by the participating emergency medical service	ISS > 25	Accident victims requiring immediate transport Age > 15 years Not dead on arrival	All patients with a trauma score <16 and a random sample of 10% of patients with a trauma score = 16
Number of patients	2434	1153	40	398	612
Outcome measure	Mortality ISS > 15	Mortality Emergency surgery	Mortality	Major trauma	In-hospital survival
Results and conclusion	The RTS (cut-off not specified) demonstrated a sensitivity and specificity of >84% for mortality but was not as accurate at predicting major injury as defined by an ISS > 15 (sensitivity and specificity <70%)	The RTS (cut-off <12) demonstrated an AUC of 0.99 for mortality, indicating excellent predictive reliability. The AUC for RTS prediction of the need for emergency surgery was 0.90	An RTS < 5 was significantly associated with death ($P < 0.001$)	The RTS (<12) demonstrated sensitivities of 38–76% and a specificity of 94% for identifying major trauma cases The positive predictive value was 25–29% for each outcome at the specified cut-off	The sensitivity and specificity of the RTS at the cut-off of <5.5 was 87% and 90%, respectively, while the AUC was 0.953, indicating good predictive reliability for patients who survived

AUC, area under the receiver operating characteristic curve; ISS, injury severity score. Major trauma is defined as a hospital trauma index derived ISS > 17 or ISS > 19 or one single serious injury/two moderate injuries in different body regions.

Is the RTS still useful?

GABBE J, CAMERON PA, FINCH CF

RTS

Review

Study element	Jones et al.[16]	Luk et al.[13]	Moini et al.[17]	Kuhls et al.[15]	Brennan et al.[18]
Data collection	Retrospective	Retrospective	Prospective	Prospective	Prospective
Country	UK	USA	Iran	USA	Australia
Years of study	1989–1990	1991–1995	1996–1997	1997–1999	1997–2000
Inclusion criteria	Every blunt trauma admission through the emergency department	Level 1 trauma centre admission Trauma score ≤5	Inpatient stay 1 day or more Declared dead in the emergency department	Patients evaluated at Level 1 trauma centre	New injury severity score > 9 Presenting to one of three Level 1 trauma centres
Number of participants	2503	136	2662	7602	8654
Outcome measure	Death within 30 days of admission	Survival to discharge	Mortality	In-hospital mortality	In-hospital mortality
Statistical analyses	Univariate analyses Multivariate logistic regression	Univariate analyses	Univariate analyses Multivariate logistic regression	Univariate analyses Multivariate logistic regression	Univariate analyses Multivariate logistic regression
Results and conclusion	RTS was an independent predictor of mortality ($P < 0.001$)	RTS was not associated with surviving to discharge ($P = 0.43$)	RTS an independent predictor of mortality ($P < 0.05$)	RTS moderate predictor of mortality as shown by an AUC of 0.84	RTS was an independent predictor of mortality (OR 0.46; 95% CI: 0.41– 0.51)

AUC, area under the receiver operating characteristic curve.

1. Buona correlazione con **MORTALITA'**

2. **BASSA SENSIBILITA'** nel predire la gravità del trauma

3. Mai dimostrata la <u>UTILITA' COME STRUMENTO DI TRIAGE</u> intra o extraospedaliero

Quale è il suo comportamento nella nostra popolazione?

CopMAT

Prognostic value of Copeptin in adult patients with major trauma in the ED

OBIETTIVO PRINCIPALE:

Indagare il ruolo prognostico della COPEPTINA nei pazienti traumatizzati confrontando la sua **SPECIFICITA**' con quella dei LATTATI nell'individuare i pazienti deceduti

OBIETTIVI SENCONDARI:

Confrontare la **SENSIBILITA**' a quella dei LATTATI nell'individuare i decessi

Indagare il **POTERE PREDITTIVO** della COPEPTINA nei confronti di queste importanti condizioni:

- *Positività della E-FAST*
- *Presenza di Frattura di bacino*
- *Necessità di Emotrasfusioni*
- *Necessità di Intervento chirurgico in emergenza*
- *Ricovero in ICU*

CopMAT

Prognostic value of Copeptin in adult patients with major trauma in the ED

CRITERI DI INCLUSIONE

- Età > 18 anni
- **Paziente vittima di trauma potenzialmente grave (ISS > 15) secondo giudizio clinico del trauma leader**
- Ottenimento del consenso informato

CRITERI DI ESCLUSIONE

- Trauma cranico isolato
- Pz con diabete insipido o in terapia con vasopressina
- Pazienti già in ACR da trauma all'arrivo in ospedale

CopMAT

La popolazione dello studio

126 pazienti arruolati
- **Età media**: 48 anni
- **Maschi:Femmine** = 84 (67%) : 42 (33%)

ISS
62 con ISS > 15 (49,2%)
64 con *ISS <= 15* (50,8%)
ISS Media: 16,5

Lattati > 18 mg/dL (51,6%)
E-FAST + (16,5%)
Frattura bacino (14,8%)
Necessità di Emotrasfusioni (15,9%)
Intervento chirurgico in emergenza (12,7%)
**Ricovero in ICU** (23,8%)
Mortalità (4,0%)

SENSIBILITY & SPECIFICITY of RTS

RTS

Cut-off: **RTS < 7,84**

■ SENSIBILITY ■ SPECIFICITY
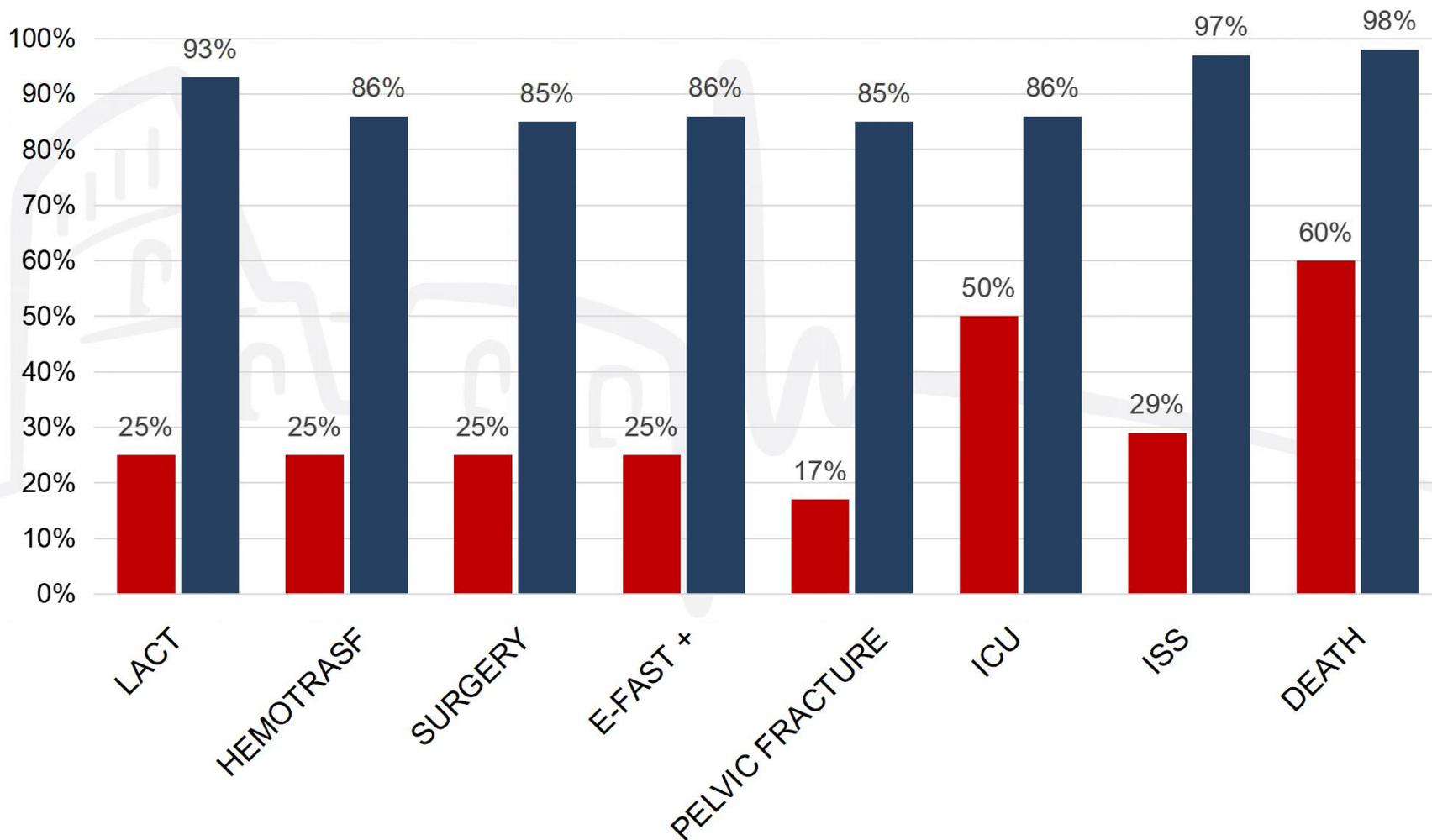
RTS

Lattati >20 mg/dL
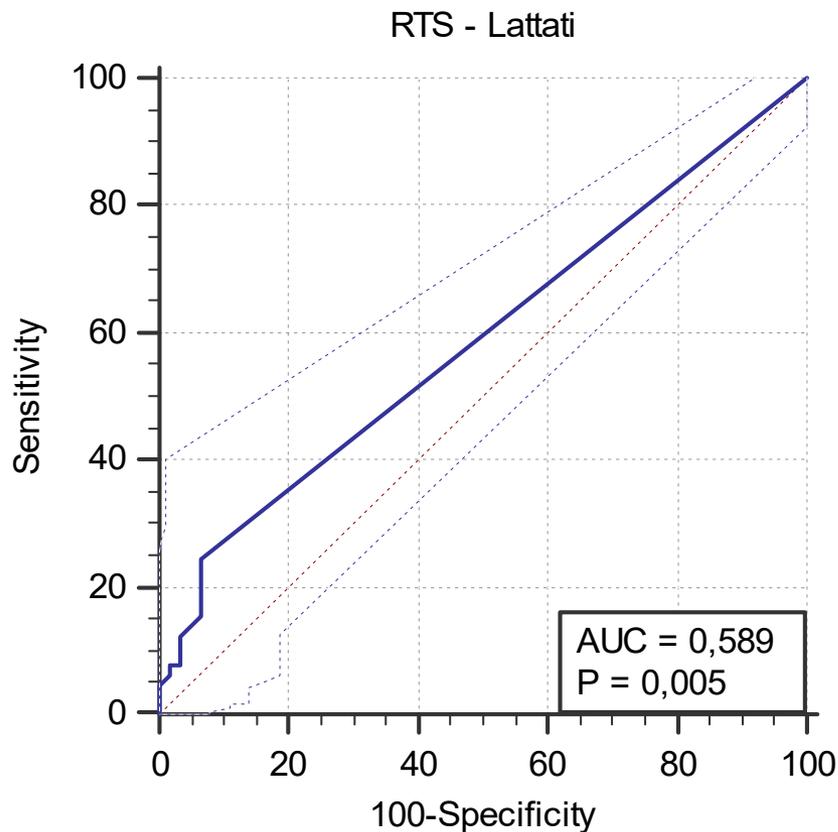
Sensibilità: **25%**

Specificità: **93%**

LR+: **3,5**

LR- : **0,8**

AUC: **0,59**

Jouden's J Index: **0,18**

RTS
E-FAST +

RTS - E-FAST+

AUC = 0,546
P = 0,361
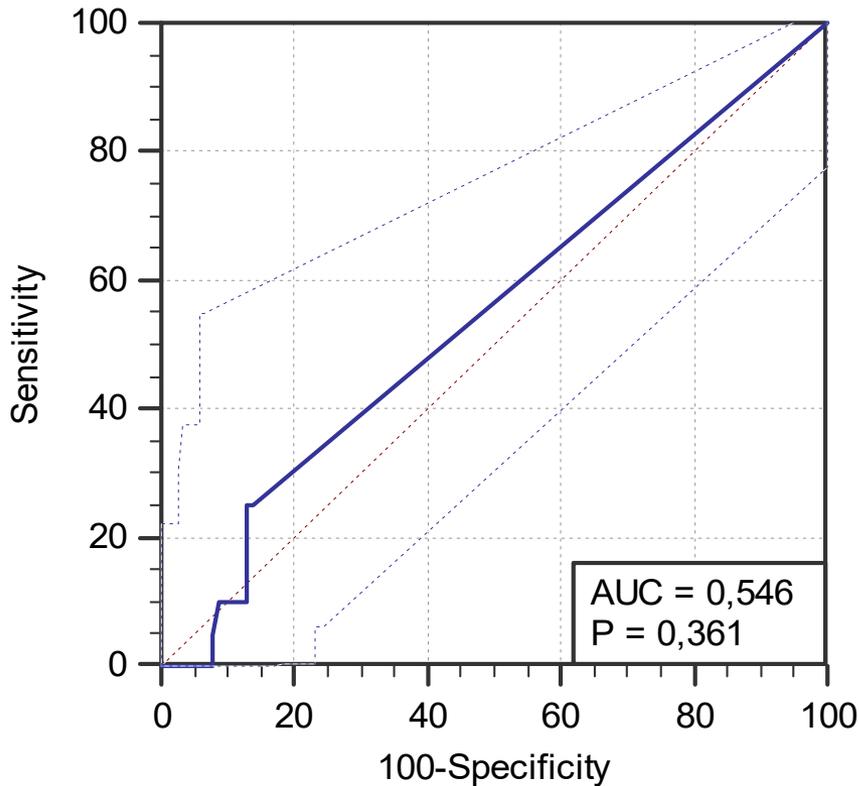
Sensibilità: **25%**
Specificità: **86%**
LR+: **1,7**
LR- : **0,9**
AUC: **0,55**
Jouden's J Index: **0,12**

RTS

Frattura di Bacino

RTS - Frattura di Bacino

AUC = 0,509
P = 0,859
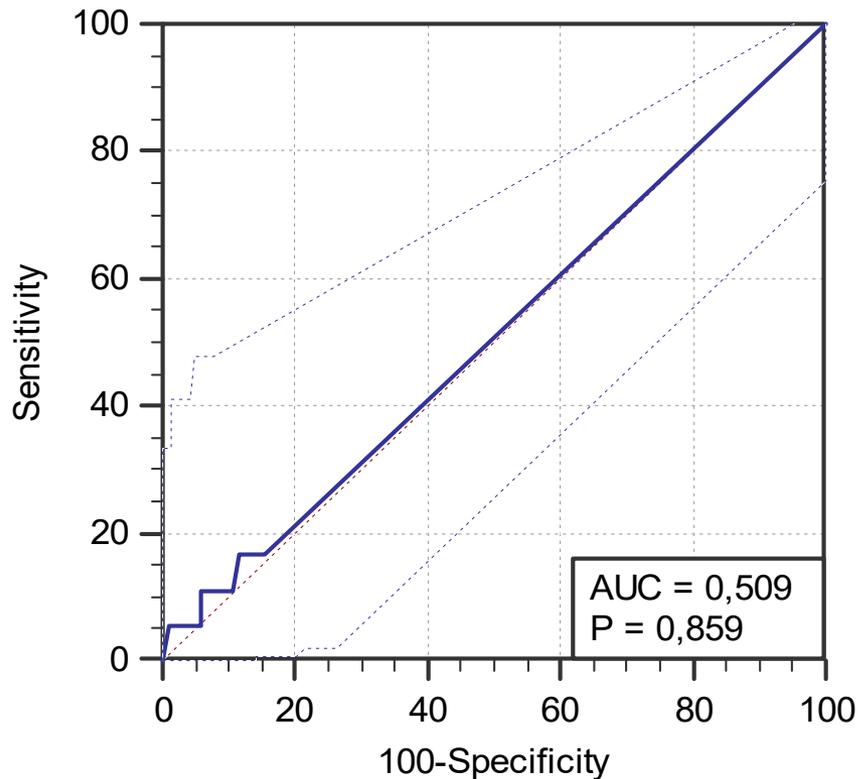
Sensibilità: **17%**
Specificità: **84%**
LR+: **0,9**
LR- : **1,0**
AUC: **0,56**
Jouden's J Index: **0,06**

RTS

Necessità di emotrasfusioni
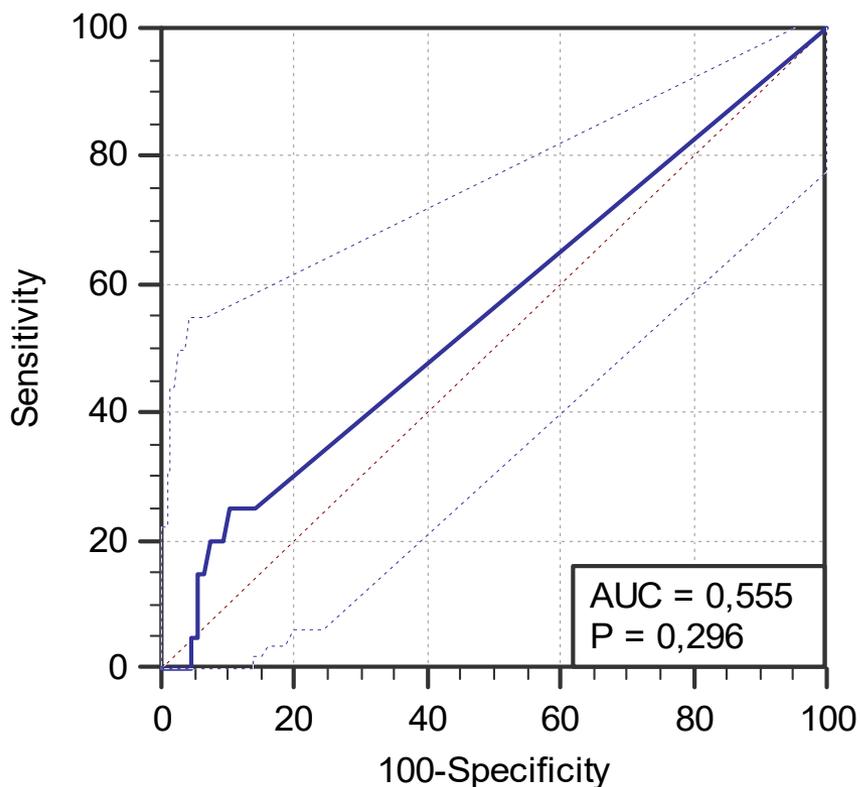
Sensibilità: **25%**

Specificità: **86%**

LR+: **1,7**

LR- : **1,0**

AUC: **0,56**

Jouden's J Index: **0,1**

Necessità di Intervento Chirurgico

RTS
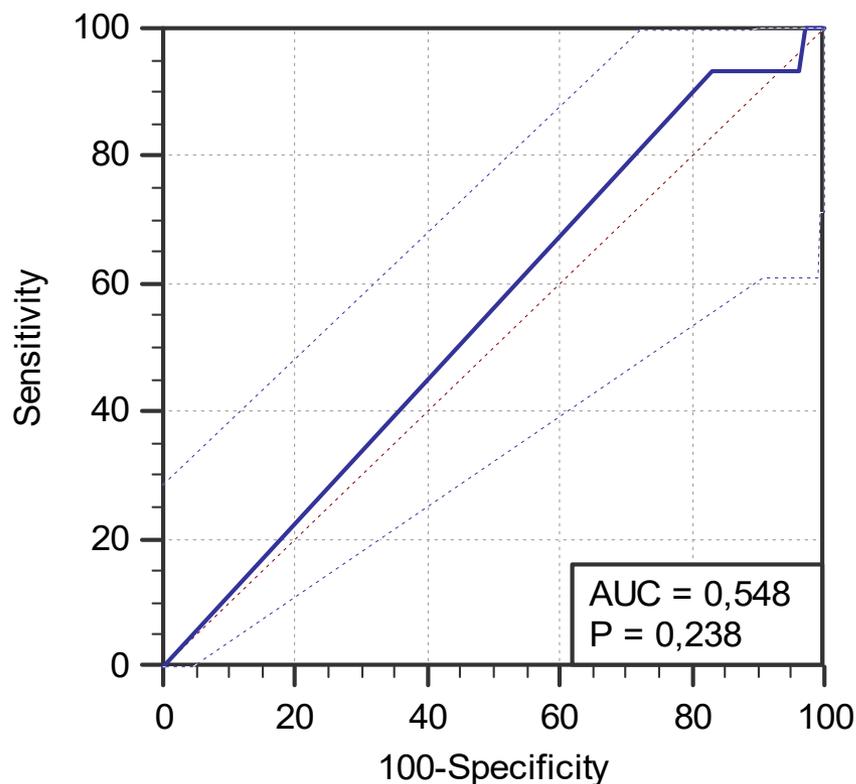
Sensibilità: **25%**
Specificità: **85%**
LR+: **1,6**
LR- : **0,9**
AUC: **0,55**
Jouden's J Index: **0,1**

ISS > 15 – Trauma maggiore
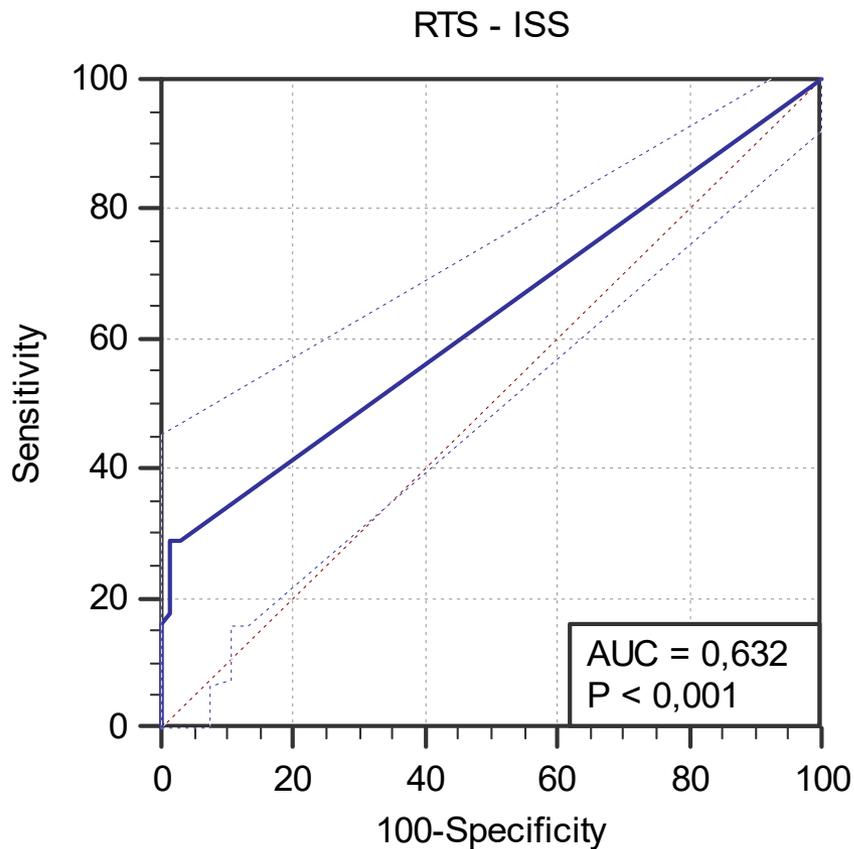

Sensibilità: **29%**

Specificità: **97%**

LR+: **9,6**

LR- : **0,7**

AUC: **0,63**

Jouden's J Index: **0,28**

RTS

Ricovero in ICU

RTS - ICU
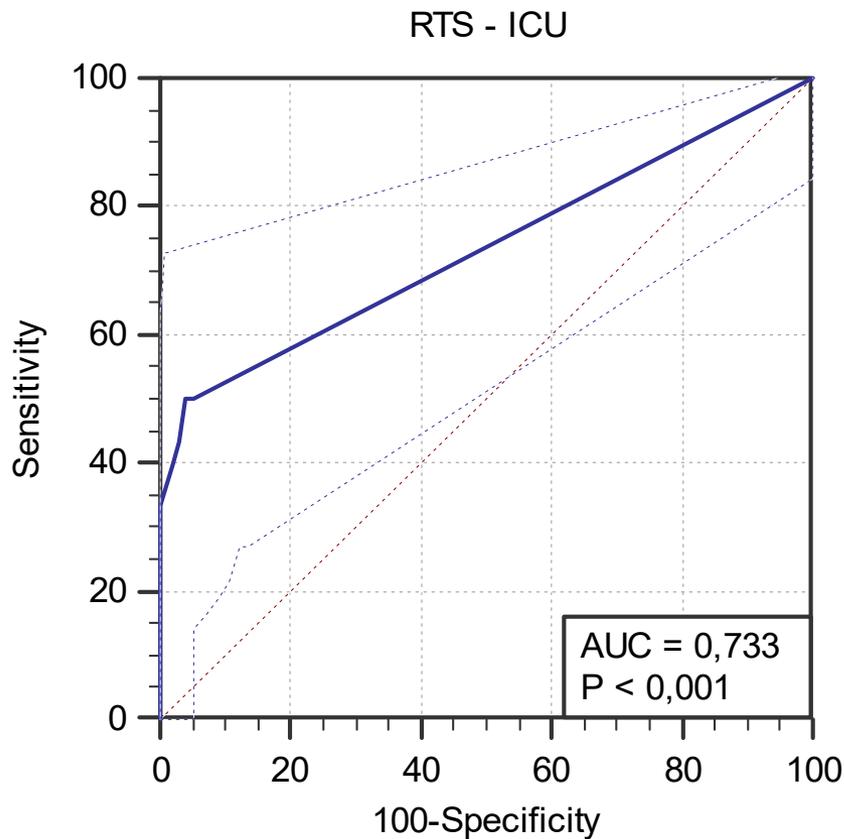
AUC = 0,733
P < 0,001

Sensibilità: **50%**
Specificità: **95%**
LR+: **10,0**
LR- : **0,5**
AUC: **0,73**
Jouden's J Index: **0,46**

RTS
Mortalità

RTS - Mortalità
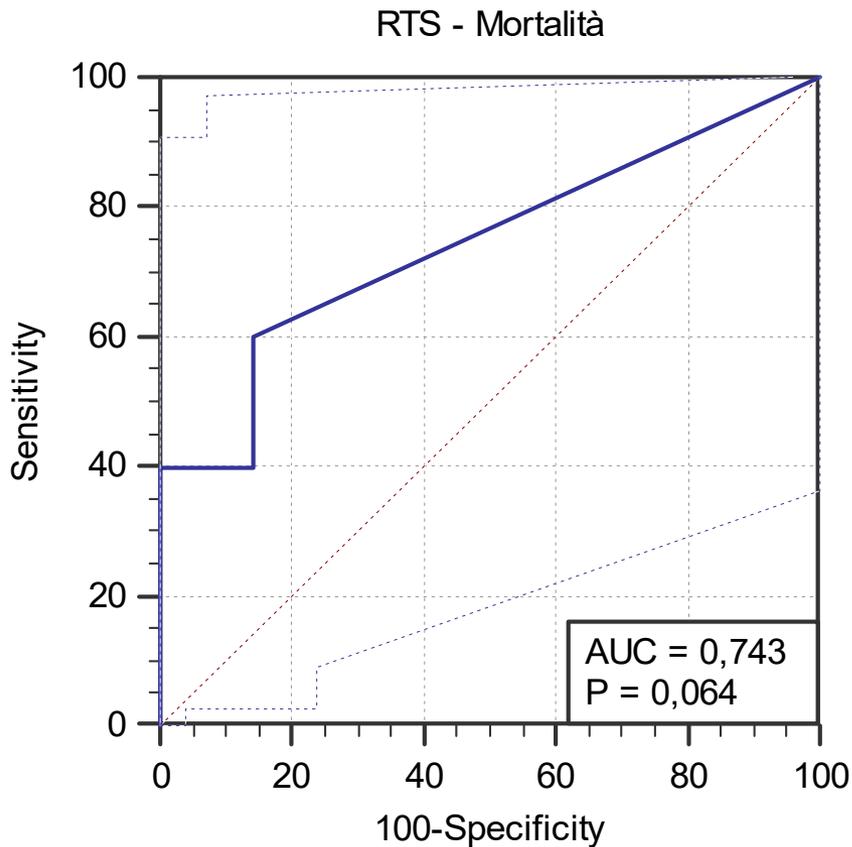
AUC = 0,743
P = 0,064

Sensibilità: **60%**
Specificità: **85%**
LR+: **4,0**
LR- : **0,5**
AUC: **0,74**
Jouden's J Index: **0,46**

CONCLUSIONI

BASSA ATTENDIBILITA' come test
Buone performance solo nell'individuare i pazienti più gravi
(*ICU, DECESSI*) -> quelli con RTS più bassi

ALTO tasso di **UNDER-TRIAGE** nei pazienti potenzialmente
evolutivi (bassa sensibilità generale) -> quelli con RTS normale

SCARSO STRUMENTO DI TRIAGE

Nonostante sia l'unico validato e di facile applicabilità,
soprattutto in prehospital, **siamo sicuri sia UTILE?**

A comparison of EMT judgment and prehospital trauma triage instruments.

Emerman CL, Shade B, Kubincanek J.

<< The EMTs rated the patient's overall severity on a 4-point scale and estimated the probability of patient mortality. We found that the EMT prediction of mortality was as accurate as the various scores. In a subset of patients, we also found that the EMT assessment performed as well as the scoring systems in identifying patients who either died or required emergent operative intervention. *We conclude that EMT judgment is as accurate as these three scoring systems in identifying patients at high risk for death or the need for immediate operative intervention.* >>

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