

CONGRESSO NAZIONALE IRC 2023

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20 • 21 OTTOBRE

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LA RIVOLUZIONE DEI SISTEMI



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Fare sistema, la eFast e il percorso extra-ospedaliero

Carlo Coniglio, Marco Tartaglione

Dipartimento Emergenza AUSL Bologna – Ospedale Maggiore –

Rianimazione - 118

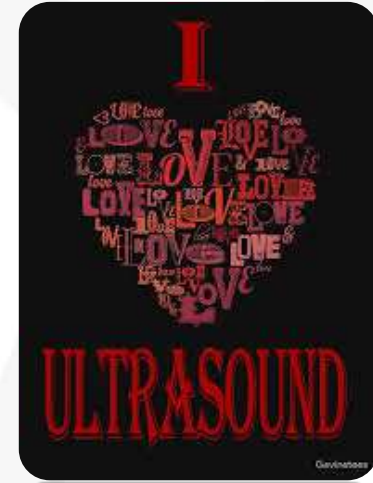
To Probe or not to Probe...



US Lovers

PreH EFAST/US...

- Facile e FAST da fare
- Più informazioni sul paziente
- Aiuta il processo decisionale e terapeutico...
- So farla dentro (inH)... La faccio fuori... (preH)



US Haters



PreH EFAST/US...

- *tempo* sprecato, operatore dipendente, training
- Limiti tecnici: luce del giorno...
- Se il paziente **Stabile**-> non cambia percorso nè attivazione ospedaliera
- Se il paziente è **Instabile** (shock) -> perdo *tempo*, non cambia percorso perchè comunque va in un trauma center dove immediatamente all'arrivo viene eseguita
- *outcome primario mortalità*: molto difficile da dimostrare causa ed effetto

REVIEW

Open Access



The role of point of care ultrasound in prehospital critical care: a systematic review

Morten Thingemann Bøtker^{1,2*} , Lars Jacobsen^{3,4}, Søren Steemann Rudolph^{5,6} and Lars Knudsen²

Abdominal prehospital ultrasound impacts treatment decisions in a Dutch Helicopter Emergency Medical Service

Rein Ketelaars*, Jasper J.M. Holtslag* and Nico Hoogerwerf

ORIGINAL RESEARCH

Open Access



Prehospital point-of-care emergency ultrasound: a cohort study

Maximilian Scharonow and Christian Weilbach*



ELSEVIER

Contents lists available at ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Review

Prehospital ultrasound of the abdomen and thorax changes trauma patient management: A systematic review

D. O'Dochartaigh^{a,*}, M. Douma^b

^aAir Medical Crew, Shock Trauma Air Rescue Society, Suite 100, 1519 35 Ave E, Edmonton Int'l Airport, Alberta T9E 0V6, Canada

^bClinical Nurse Educator, Emergency Services, Royal Alexandra Hospital, 10240 Kingsway Avenue NW, Edmonton, Alberta T5H 3V9, Canada

LG Italiane – 2020-23...



Raccomandazioni 34-35 della Linea Guida per la gestione integrata del trauma maggiore dalla scena dell'evento alla cura definitiva

Publicato agosto 2022 – aggiornato giugno 2023



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Lista delle raccomandazioni formulate

Quesito 17: Qual è l'efficacia clinica e la costo-efficacia di eseguire la E-FAST rispetto all'esame clinico pre-ospedaliero nei bambini, giovani e adulti con sospetto trauma toracico e/o addominale maggiore?

Raccomandazione 34. Nei bambini, giovani e adulti con sospetto trauma toracico e/o addominale maggiore si suggerisce di basarsi sulla valutazione clinica per l'identificazione dello pneumotorace (PNX) iperteso e/o del trauma addominale e per la scelta della destinazione del paziente. [Raccomandazione condizionata contro l'intervento, qualità delle prove molto bassa].

Raccomandazione 35. Nei bambini, giovani e adulti con sospetto trauma toracico e/o addominale maggiore si suggerisce l'utilizzo aggiuntivo dell'E-FAST in fase pre-ospedaliera nell'ambito di protocolli di ricerca per l'identificazione dello pneumotorace (PNX) iperteso e/o del trauma addominale e per la scelta della destinazione del paziente. [Raccomandazione per la ricerca].

LG Italiane – 2020-23



Lista delle raccomandazioni formulate

Quesito 17: Qual è l'efficacia clinica e la costo-efficacia di eseguire la E-FAST in aggiunta all'esame clinico pre-ospedaliero nei bambini, giovani e adulti con sospetto trauma toracico e/o addominale maggiore?

Raccomandazione 34. Nei bambini, giovani e adulti con sospetto trauma toracico e/o addominale maggiore si suggerisce di basarsi sulla valutazione clinica per l'identificazione dello pneumotorace (PNX) iperteso e/o del trauma addominale e utilizzare in aggiunta l'eFAST in presenza delle competenze adeguate e se la procedura non ritarda la destinazione del paziente. [Raccomandazione condizionata di non differenza, qualità delle prove molto bassa].

Raccomandazione 35. Nei bambini, giovani e adulti con sospetto trauma toracico e/o addominale maggiore si raccomanda di valutare il ruolo dell'eFAST preospedaliero nell'ambito di adeguati protocolli di ricerca per l'identificazione dello pneumotorace (PNX) iperteso e/o del trauma addominale e per la scelta della destinazione del paziente. [Raccomandazione per la ricerca].

34: Valutazione Clinica per: pnx iperteso & Trauma addominale + EFAST se:
Competenze e non ritardo in H

35: Valutazione per: Trauma Toracico & Trauma addominale: EFAST come raccomandazione della ricerca

https://www.iss.it/documents/20126/8404212/LGTM_Racc34_35_def_v2.0.pdf/66c1f36f-b2ca-5917-e425-d948e78c33c3?t=1686322229509



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Intra Hospital

Different studies have demonstrated that the results of the FAST exam could significantly modify the diagnostic-therapeutic path of trauma patients [5,6] and its use in the ED is recommended by most trauma guidelines and local protocols [7,8]. Available meta-analyses on ED-performed FAST accuracy for hemoperitoneum showed a moderate sensitivity (70–75%) and an excellent specificity (over 95%) when tested against computed tomography (CT) scan or laparotomy findings [9,10], however, no effects on mortality could be demonstrated [11]. More recently, point-of-care ultrasonography (POCUS) became available in the prehospital environment, potentially allowing earlier recognition of hemoperitoneum and other trauma-related injuries [12].

100%), ruling out intraabdominal fluid (97,1%) were verified at the receiving hospital using ultrasonography, CT scan or x-rays; the prehospital diagnosis was confirmed in 90.8% of cases, the difference between the prehospital and in-hospital findings were not significant (p -values from $p = 0.688$ to $p = 0,99$). Ultrasound-related changes in patient management occurred in 49.5% of patients; in 33.3%, these were transported-related.

component of the trauma ultrasound examination and demonstrated a positive predictive value of 90% and a negative predictive value of 98% for a required intervention due to pneumothorax, a positive predictive value of 50% with a negative predictive value of 96% for a need for laparotomy due to intraabdominal free fluid, but had an insufficient amount of patients to assess the reliability on this part [24]. The latter

How does prehospital ultrasound affect patient management and the patient pathway?

Prehospital POCUS predicts the need for interventions and causes changes in patient management in both trauma, cardiac arrest, and breathing difficulties [18, 21, 24]. But, it is unknown if these changes improve patient outcomes. Since the inclusion period of this review, a secondary analysis of an included study was published

Intra VS PreH



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ORIGINAL ARTICLE



Prehospital FAST reduces time to admission and operative treatment: a prospective, randomized, multicenter trial

Benjamin Lucas¹  · Dorothea Hempel^{2,3,4} · Ronny Otto¹ · Franziska Brenner^{5,6} · Mario Stier⁵ · Ingo Marzi⁵ · Raoul Breitzkreutz⁷ · Felix Walcher^{1,5}

1495 (12.6%) patients. The four main categories of treatment decisions impacted by PHUS were information provided to the destination hospital (45.4%); mode of transportation (23.5%); choice of destination hospital (13.1%); and fluid management (11.6%). The sensitivity of prehospital abdominal US for hemoperitoneum was 91.2%, specificity was 96.7%, and accuracy was 82.2%.

Conclusion Abdominal PHUS in our setting impacted treatment decisions significantly. Therefore

**CLINICA SENZA
VS
CLINICA CON**

Prehospital therapy and management

Patients in the CEX group in whom free fluid was suspected during the prehospital setting experienced changes in the therapy in 63.4%, in the admitting hospital in 68.2%, in communication with the admitting team in 77.3%, and in the management of transfer in 77.3%.

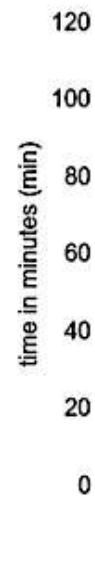
In the CEX-p-FAST group, changes in the therapeutic strategy at the scene were observed in 47.6%, in the choice of the admitting hospital in 71.4%, in communication with the admitting team in 90.5% and in the management of transfer in 85.7% (Fig. 3).

Lucas (RCT, 2021, Germany)

Table 4 Test statistics of the CEX and CEX-p-FAST assuming the computer tomography as the gold standard

	CEX (%)	CEX-p-FAST (%)

time in minutes (min)

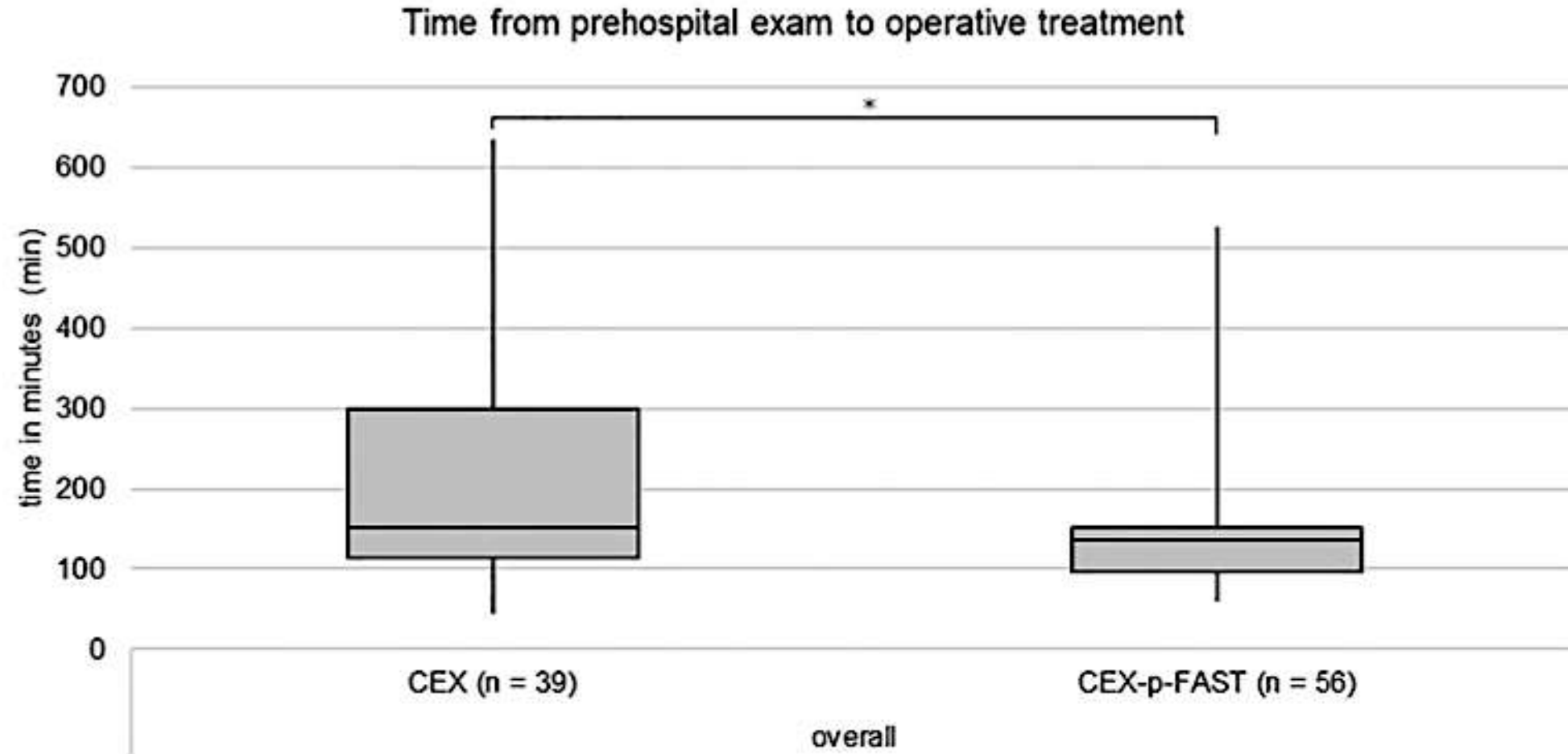


results, we observed an overwhelming acceptance of the p-FAST. However, physicians used the ultrasound even in the CEX group due to patient safety reasons. Therefore, the study had to be interrupted, since the protocol could not be performed as planned. After careful deliberations, the principal investigators decided that patients should not be deprived of receiving the best available tool in diagnostic after blunt trauma, and the study be discontinued due to ethical reasons. Therefore, the explorative data analysis includes

Fig. 2 Time from examination to admission to trauma room. A significant difference in the time from examination to admission to trauma room can be observed between the CEX (median 33 min; IQR 16 min) and CEX-p-FAST (median 30 min; IQR 20 min) groups. However, there is a significant difference

between the two groups. The time from examination to the trauma bay is significantly shorter than the CEX group (median 38 min; IQR 22 min; Mann-Whitney-U-Test $p=0.001$; $**p<0.01$)

Lucas





The role of prehospital ultrasound in reducing time to definitive care in abdominal trauma patients with moderate to severe liver and spleen injuries

Lorenzo Gamberini^a, Marco Tartaglione^{a,*}, Aimone Giugni^a, Carlo Coniglio^a, Cristian Lupi^a, Valentina Chiarini^a, Carlo Elena Heusch-Lazzeri^a, Gregorio Tugnoli^c, Giovanni Gori^a

Table 3

Sensitivity and specificity of prehospital-performed FAST with respect to emergency department-performed FAST.

	PreH FAST -	PreH FAST +
ED FAST -	17	0
ED FAST +	10	17
	95% CI	
Sensitivity: 62.9%	42.4% – 80.6%	
Specificity: 100%	80.5% – 100%	
Positive predictive value: 100%	80.5% – 100%	
Negative predictive value: 63.0%	51.0% – 73.5%	

Abbreviations: PreH – prehospital; ED – emergency department.



Contents lists available at [ScienceDirect](#)

Injury

journal homepage: www.elsevier.com/locate/injury



Review

Diagnostic accuracy for hemoperitoneum, influence on prehospital times and time-to-definitive treatment of prehospital FAST: A systematic review and individual participant data meta-analysis ☆☆☆

Lorenzo Gamberini^a, Tommaso Scquizzato^b, Marco Tartaglione^{a,*}, Valentina Chiarini^a, Carlo Alberto Mazzoli^a, Davide Allegri^c, Cristian Lupi^a, Giovanni Gordini^a, Carlo Coniglio^a, Etrusca Brogi^d

“2,7 min is 27% increase in preH time if preH time is 10 min”

impact regarding decisions in patient management (TABLE 4).

In addition, even in those single cases where an increase in time was reported, the benefit of accelerating the global diagnostic-therapeutic workup accounting also for the intrahospital phase for those patients was perceived as completely balancing the supplemental time needed [30]. We have also to note that the



Diagnostic accuracy for hemoperitoneum, influence on prehospital times and time-to-definitive treatment of prehospital FAST

Conclusions

Prehospital FAST had a low sensitivity but a very high specificity to identify hemoperitoneum and reduced time-to-diagnostics or interventions, without increasing prehospital times, in patients with a high probability of abdominal bleeding. Its effect on mortality is still under-investigated.

Results

5790
adult trauma
patients

21
studies included
(1 RCT)

Diagnostic accuracy for hemoperitoneum

SENSITIVITY
0.63 (95% CI, 0.45 – 0.78)
SPECIFICITY
0.97 (95% CI, 0.96 – 0.98)
+LIKELIHOOD RATIO
20.7 (95% CI, 12.0 – 33.3)
-LIKELIHOOD RATIO
0.38 (95% CI, 0.23 – 0.57)

Time-to-definitive treatment

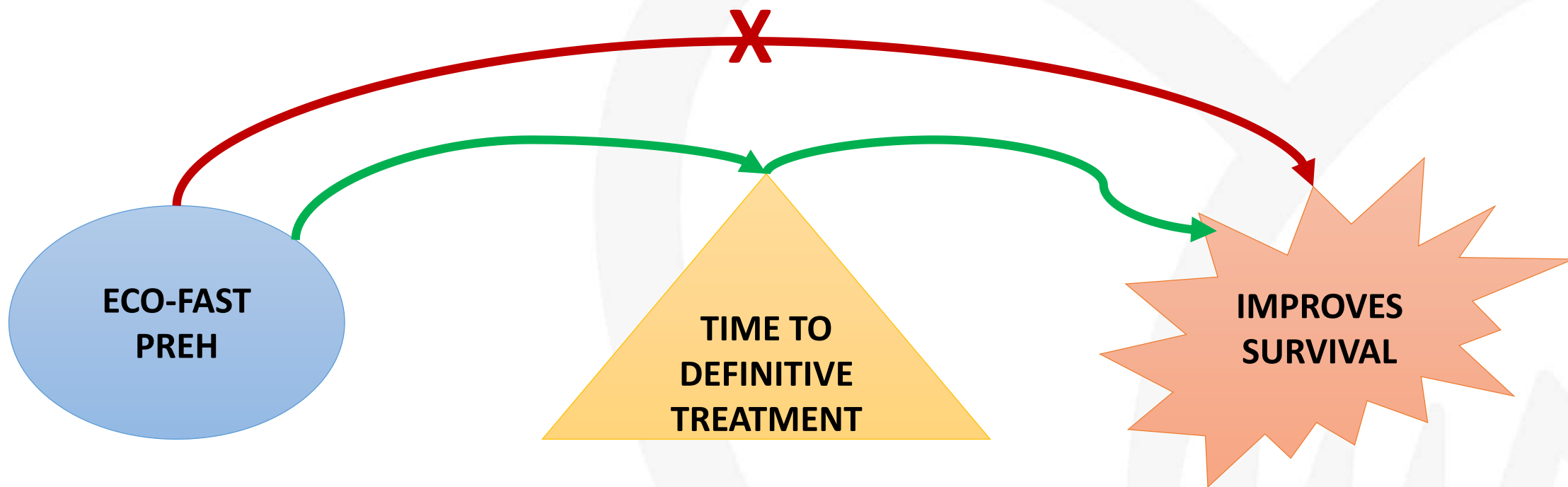
ISS-ADJUSTED POOLED TIME RATIO
for patients with positive FAST vs negative or
not performed FAST
0.63 (95% CI, 0.41 – 0.95)
indicates a more rapid treatment

Influence on prehospital times

PROCEDURAL TIME
2.72 min
(95% CI, 2.12 – 3.31)
PREHOSPITAL TIME
+2.4 min
(95% CI, -3.93 – 8.81)

Prehospital FAST findings changed:

ON-SCENE TRAUMA CARE	ADMITTING HOSPITAL	COMMUNICATION WITH HOSPITAL	TRANSFER MANAGEMENT
12–48%	13–71%	45–52%	52–86%



access more rapid diagnostics and interventions than what was expected based on their ISS. Faster access to definitive treatment is significantly associated with reduced mortality in different studies [3,53,57], especially in patients with traumatic hemoperitoneum [58]. Moreover, modern trauma management has been enriched

The probability of death increased 1% for each 3 minutes in the ED...



Death 1% x 3'



Time to Laparotomy for Intra-abdominal Bleeding from Trauma Does Affect Survival for Delays Up to 90 Minutes

John R. Clarke, MD, Stanley Z. Trooskin, MD, Prashant J. Doshi, MS, Lloyd Greenwald, PhD, and Charles J. Mode, PhD

Objective: We examined the relationship between survival and time in the emergency department (ED) for laparotomy for hypotensive patients from abdominal injuries.

Methods: Patients in the National Trauma Systems Foundation registry with isolated abdominal solid organ, or wall injuries and hypotension were identified. Survival was predicted from the prehospital systolic blood pressure (SBP), pulse, and time in the ED to laparotomy or ED death.

Results: Two-hundred forty-three patients met the criteria. SBP ranged

from 30 to 90 mm Hg. Time to the ED ranged from 7 to 185 minutes. Time in the

... 30' → >10%

60' → > 20%

90 → > 30%

0.55% per minute.

Conclusion: Among patients in a trauma registry who were hypotensive on

arrival in the ED and had major injuries isolated to the abdomen requiring emergency laparotomy, the probability of death showed a relationship to both the extent of hypotension and the length of time in the ED for patients who were in the ED for 90 minutes or less. The probability of death increased approximately 1% for each 3 minutes in the ED.

Key Words: Abdominal injuries, Emergencies, Emergency service, Hemorrhage, Hemorrhagic shock, Hypotension, Laparotomies, Resuscitation, Risk ratio, Survival analysis, Time factors, Trauma centers, Trauma registries.

J Trauma. 2002;52:420-425.

PreH EFAST... Ma la usiamo?

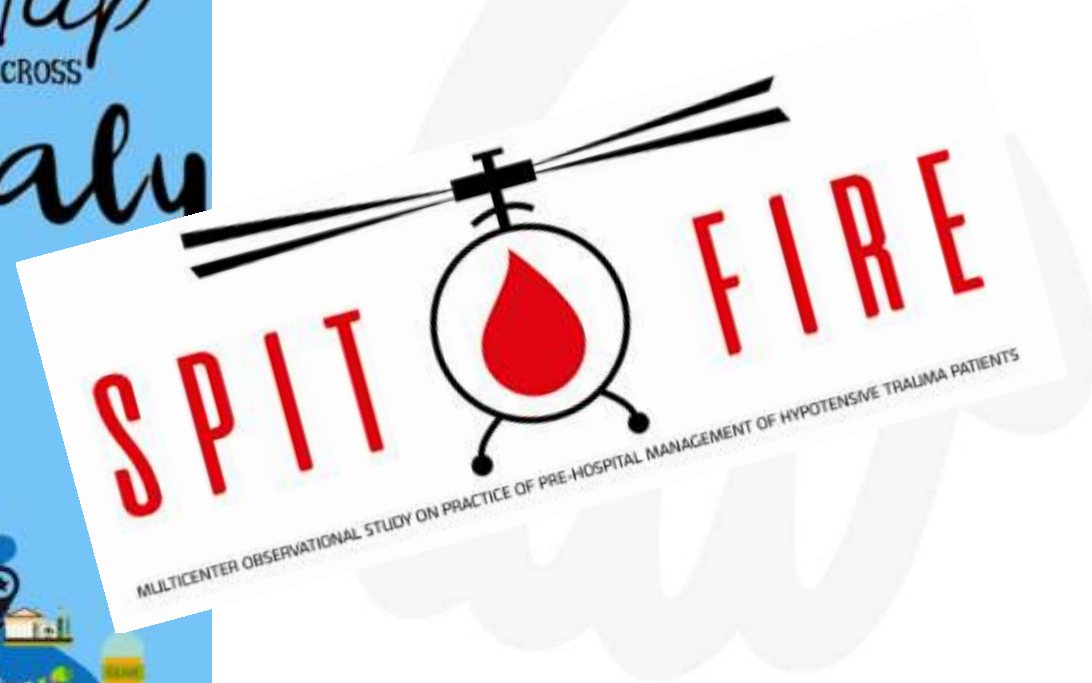


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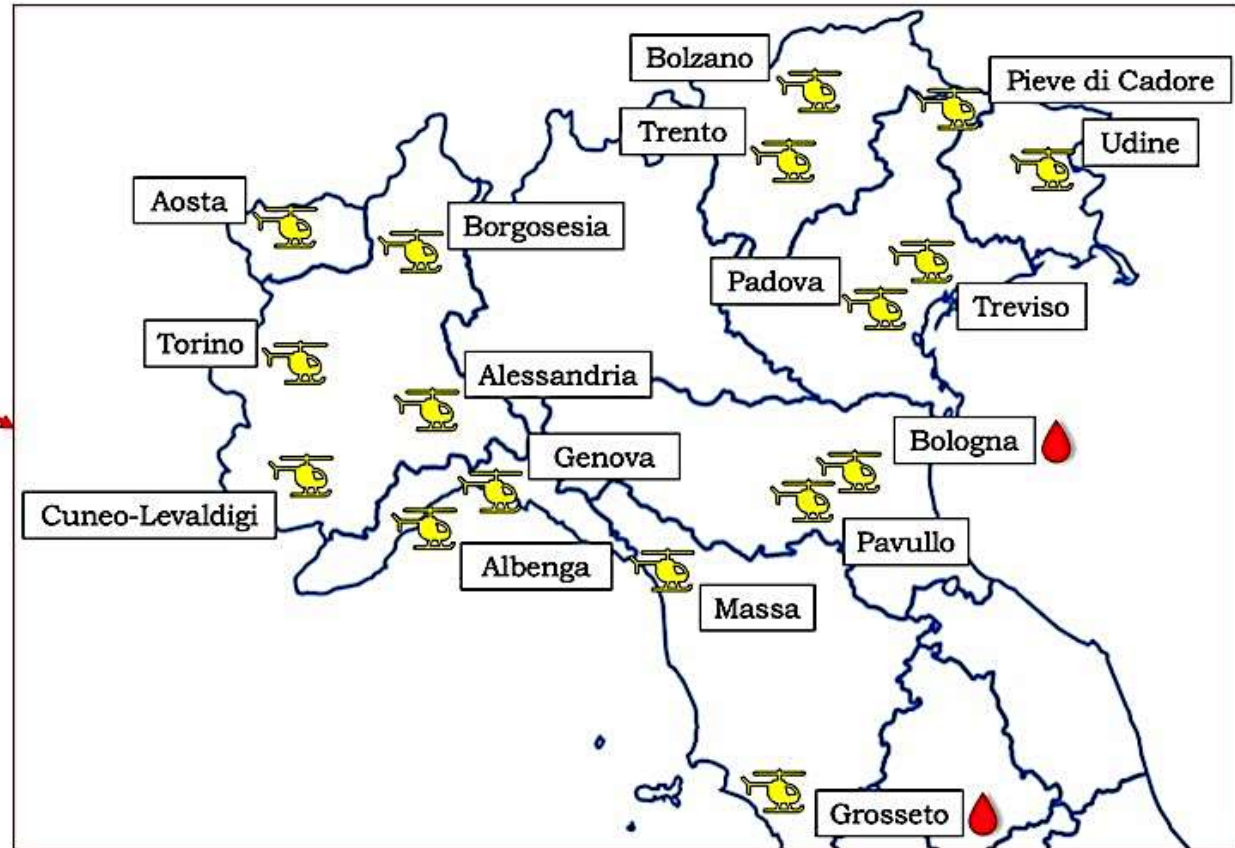
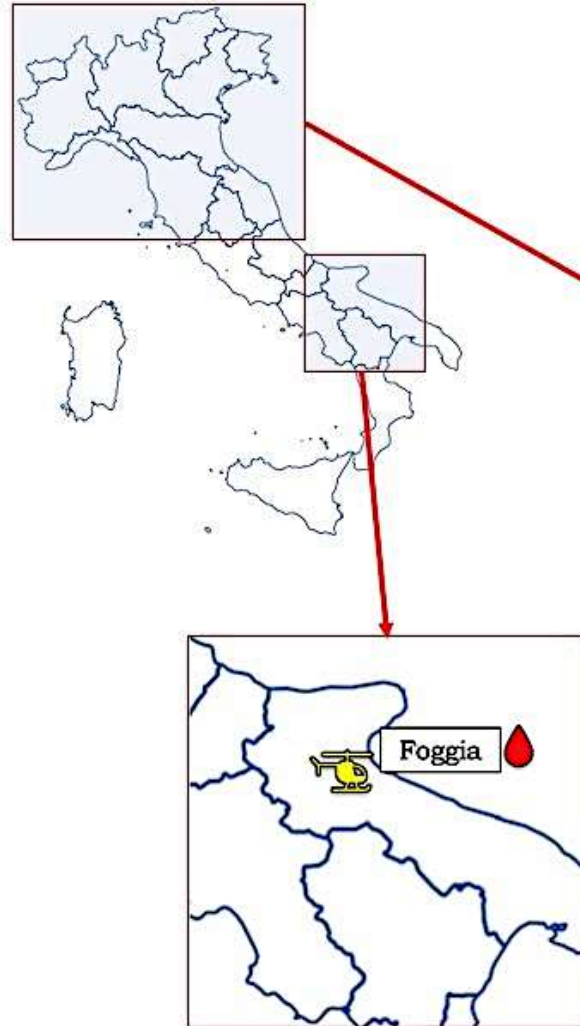


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Come funzionano questi sistemi in Italia?



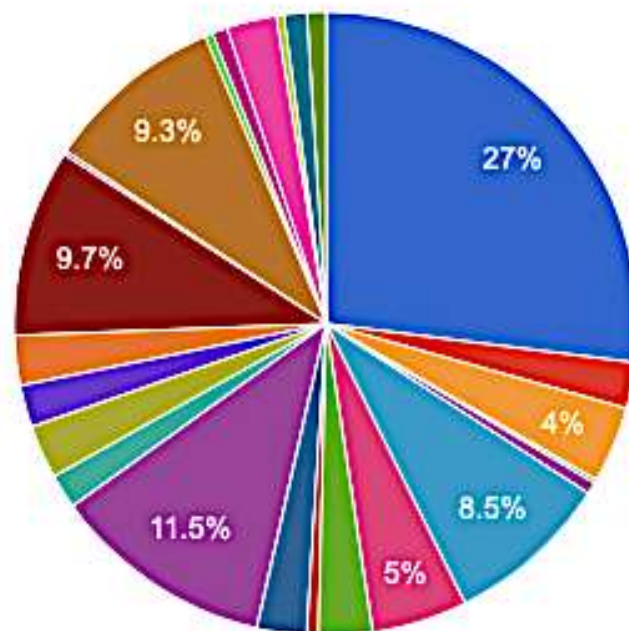
Op
BN

E
MA PATIENTS

Base HEMS - centro reclutante *(base_hems)* [Refresh Plot](#) | [View as Pie Chart](#)

Total Count (N)	Missing*	Unique
504	8 (1,6%)	24

Counts/frequency: Bologna (136, 27,0%), Pavullo (12, 2,4%), Treviso (20, 4,0%), Pieve di Cadore (1, 0,2%), Parma (3, 0,6%), Padova (43, 8,5%), Grosseto (25, 5,0%), Massa (14, 2,8%), Olbia (3, 0,6%), Udine (13, 2,6%), Torino (58, 11,5%), Alessandria (9, 1,8%), Borgo Sesia (14, 2,8%), Cuneo Levaldigi (11, 2,2%), Bolzano (13, 2,6%), Trento (49, 9,7%), Aosta (1, 0,2%), (0, 0,0%), (0, 0,0%), Alghero (0, 0,0%), Cagliari (0, 0,0%), Foggia (47, 9,3%), Albenga (2, 0,4%), Genova (4, 0,8%), Palermo (13, 2,6%), Locri (RC) (0, 0,0%), Caltanissetta (2, 0,4%), Milano (6, 1,2%), Romagna (5, 1,0%)

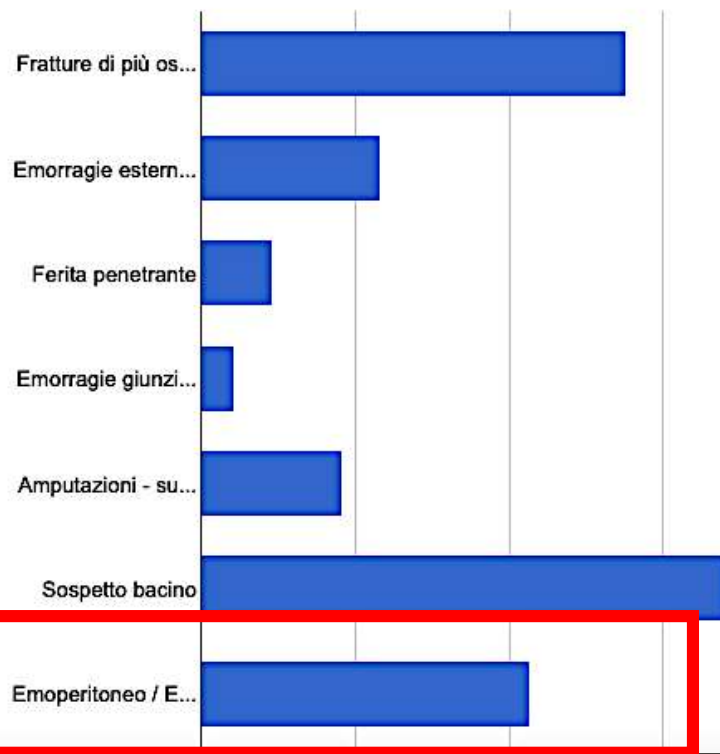


Campione: all (n. 512)

Emorragie in atto (emorragie_in_atto) [Refresh Plot](#)

Total Count (N)	Missing*	Unique
384	128 (25,0%)	9

Counts/frequency: Fratture di più ossa lunghe (138, 35,9%), Emorragie esterne comprimibili (58, 15,1%), Ferita penetrante (23, 6,0%), Emorragie giunzionali (17, 4,4%), Amputazioni - subamputazioni (46, 12,0%), Sospetto bacino (171, 44,5%), Emoperitoneo / Emotorace (107, 27,9%), Emorragie non comprimibili del tronco (18, 4,7%), Emorragie non comprimibili distretto testa-collo (scalpo, MXF, collo) (61, 15,9%)

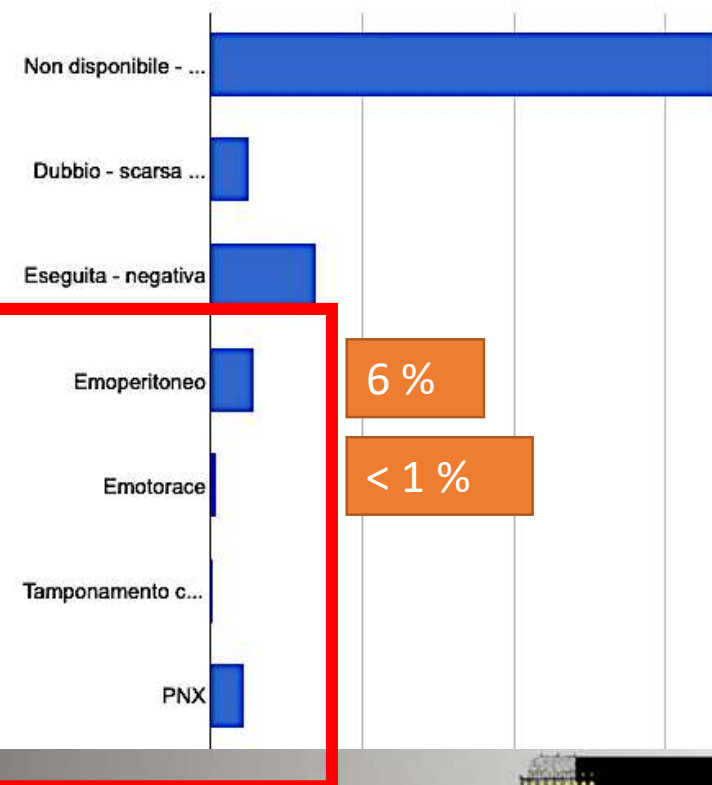


Eco-E_fast (eco_e_fast) [Refresh Plot](#)

Total Count (N)	Missing*	Unique
480	32 (6,3%)	7

ESEGUITA = 30%

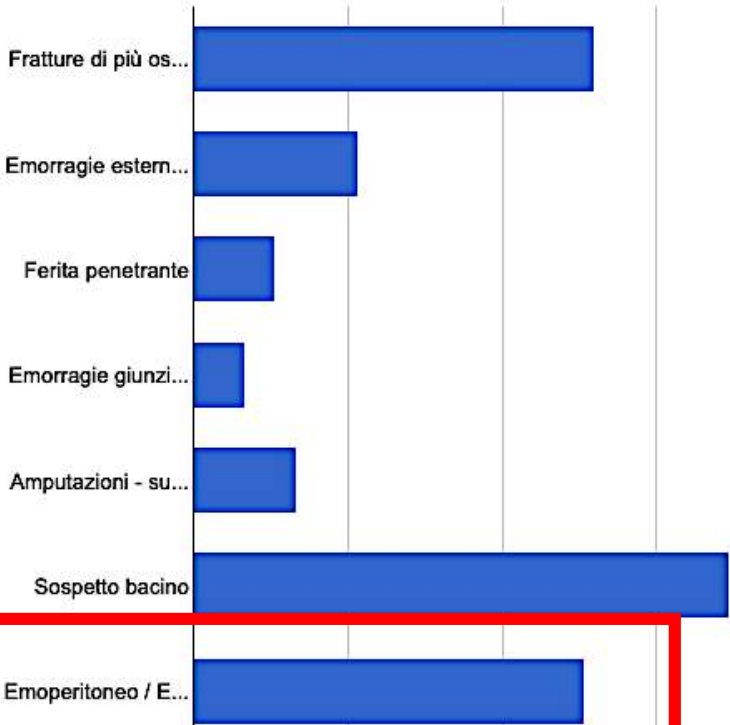
Counts/frequency: Non disponibile - non eseguito (338, 70,4%), Dubbio - scarsa qualità (26, 5,4%), Eseguita - negativa (70, 14,6%), Emoperitoneo (29, 6,0%), Emotorace (4, 0,8%), Tamponamento cardiaco (2, 0,4%), PNK (23, 4,8%)



Emorragie in atto *(emorragie_in_atto)* [Refresh Plot](#)

Total Count (N)	Missing*	Unique
108	11 (9,2%)	9

Counts/frequency: Fratture di più ossa lunghe (39, 36,1%), Emorragie esterne comprimibili (16, 14,8%), Ferita penetrante (8, 7,4%), Emorragie giunzionali (5, 4,6%), Amputazioni - subamputazioni (10, 9,3%), Sospetto bacino (52, 48,1%), Emoperitoneo / Emotorace (38, 35,2%), Emorragie non comprimibili del tronco (2, 1,9%), Emorragie non comprimibili distretto testa-collo (scalpo - MXF collo) (10, 9,3%)

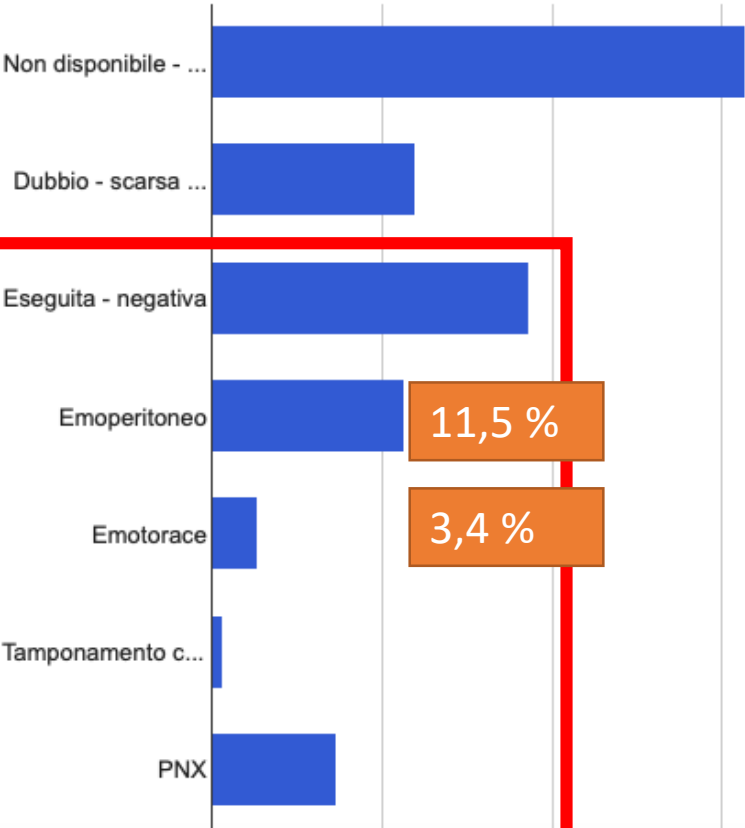


Eco-E_fast *(eco_e_fast)* [Refresh Plot](#)

Total Count (N)	Missing*	Unique
118	1 (0,8%)	7

ESEGUITA = 60% (5 mesi fa era 57!)

Counts/frequency: Non disponibile - non eseguito (47, 39,8%), Dubbio - scarsa qualità (18, 15,3%), Eseguita - negativa (28, 23,7%), Emoperitoneo (17, 14,4%), Emotorace (4, 3,4%), Tamponamento cardiaco (1, 0,8%), PNX (11, 9,3%)





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ABCD... ECO

Andiamo oltre
all'addome...

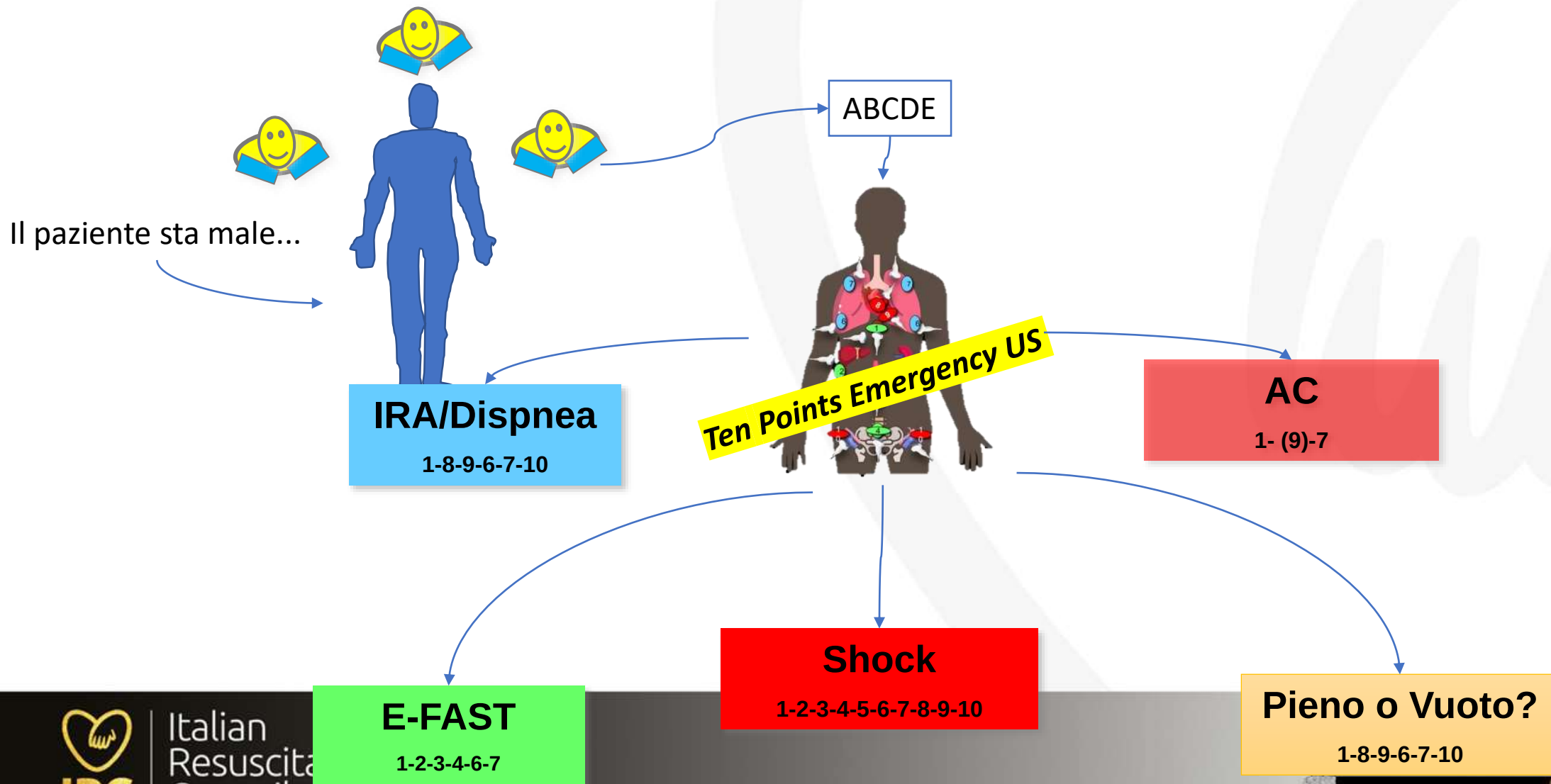


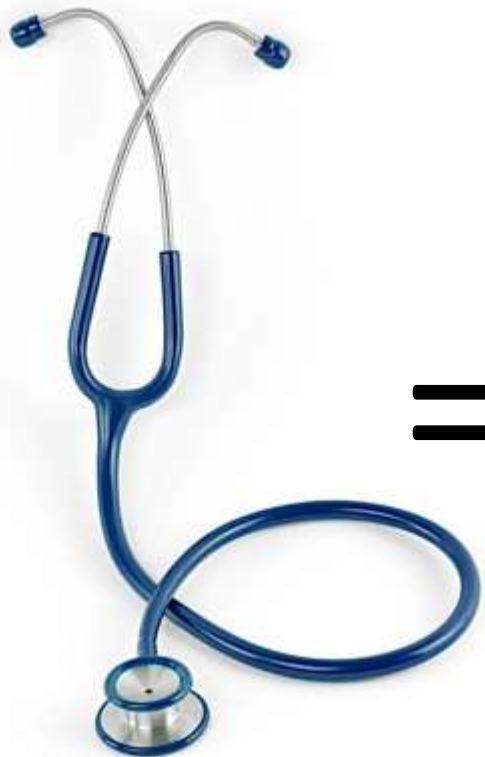
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in

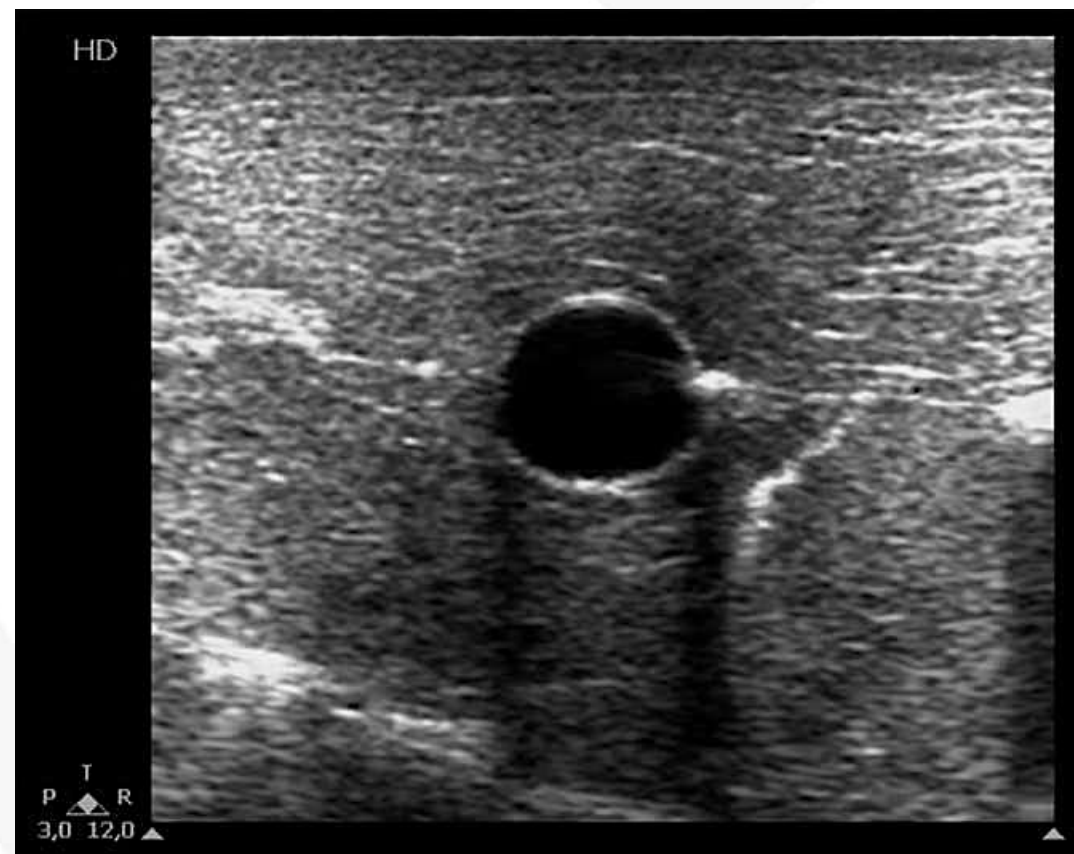


#NonSoloEFAST... POC-US





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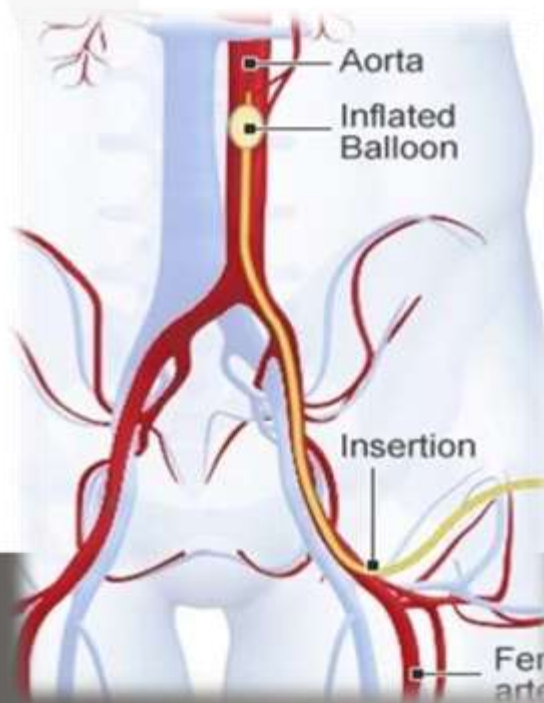
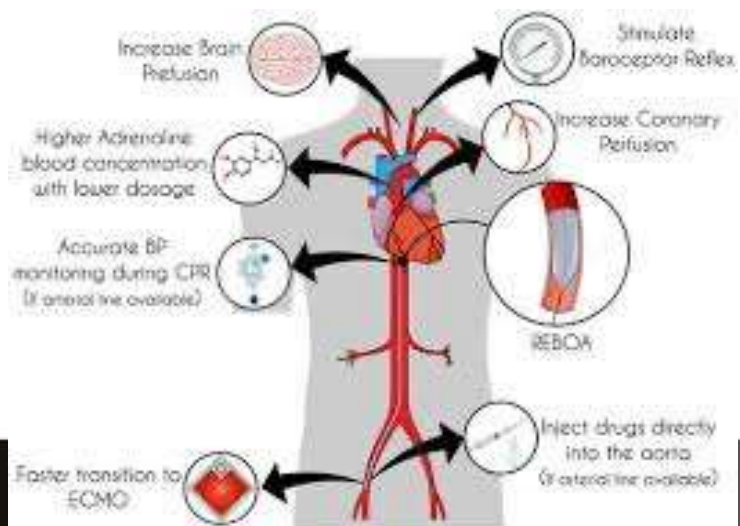
US per procedure preH

Temporize the Bleeding

Stop
The
Bleeding!



REBOA

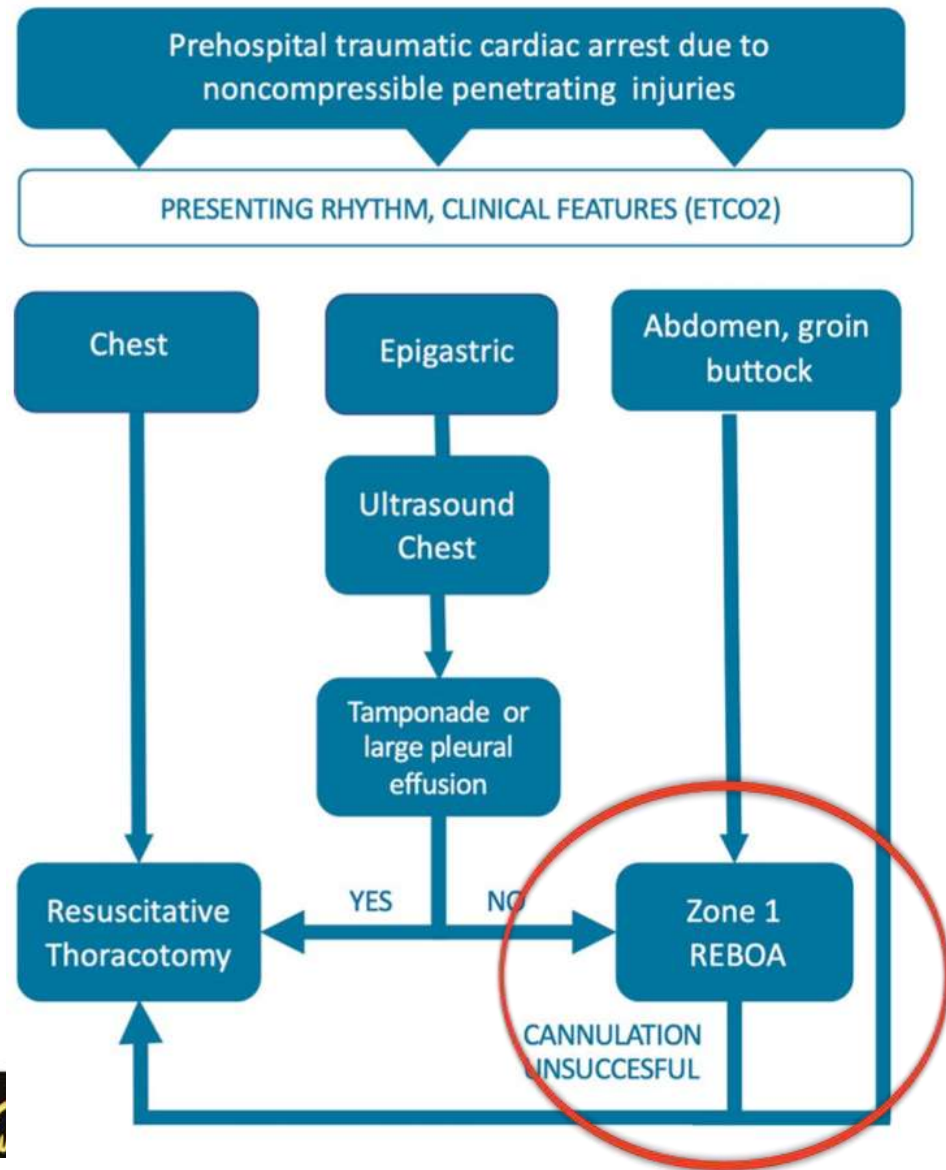


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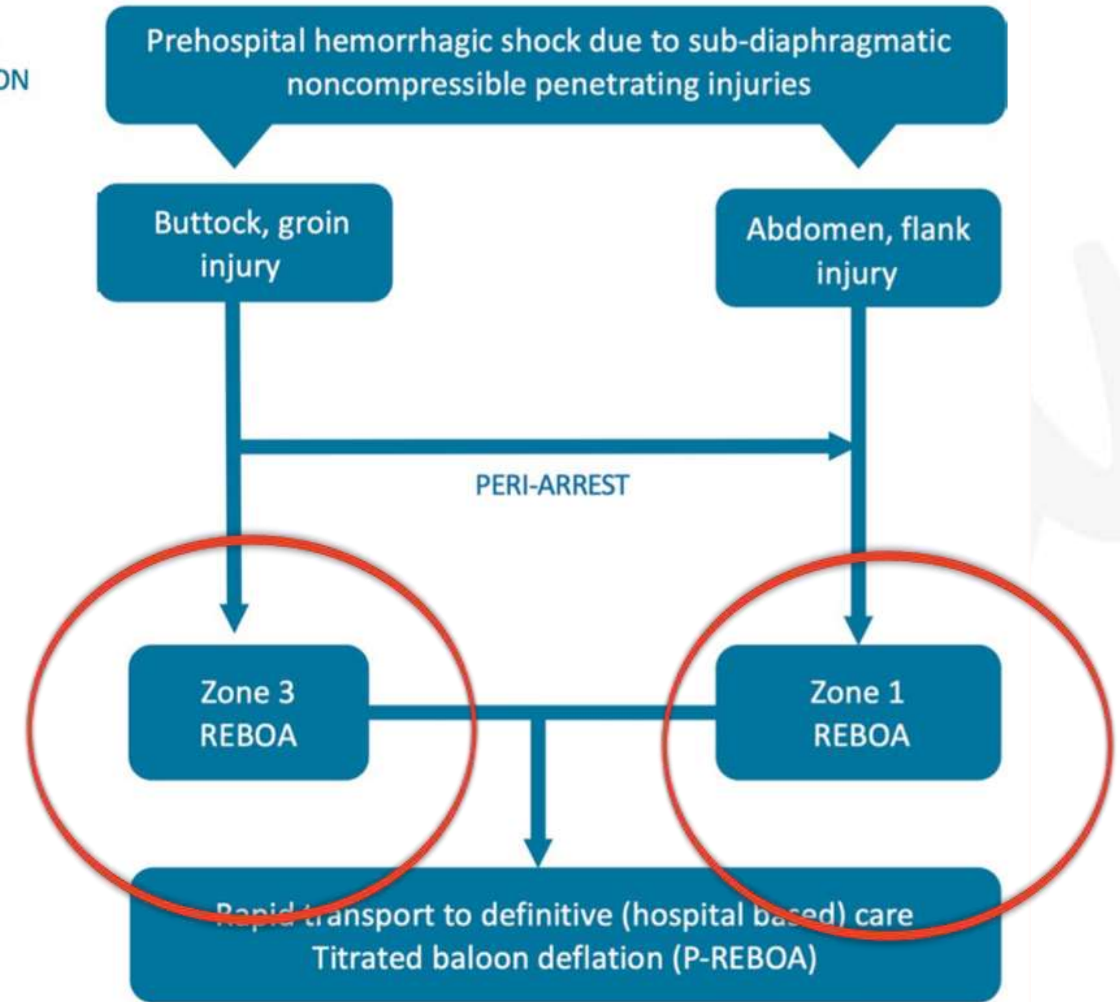
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LA RIVOLUZIONE DEI SISTEMI

Graphical Abstract



VOLUME
RESUSCITATION



preH EFAST (US)... Quando?



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2' esempio: moto sbalzato, trauma di torace, addome e bacino. Ipoteso. Cambia qualcosa sapere se ha sangue in addome?

- binder o REBOA?
- se sanguina dal torace?
- Accesso in PS o dritto in sala?

1' Esempio: moto 2 paz sbalzati

- adulto stabile con dolore add, PAS 105;
- bambino cranico GCS 7, intubato... ne puoi caricare solo uno in elicottero.



preH Triage

Adulto
A, B ok , GCS 15
PAS 80 FC 120



Bambino
A IOT, B ok
PAS 120, FC 100
GCS 10-3 (post IOT)isocorico



40'

20'



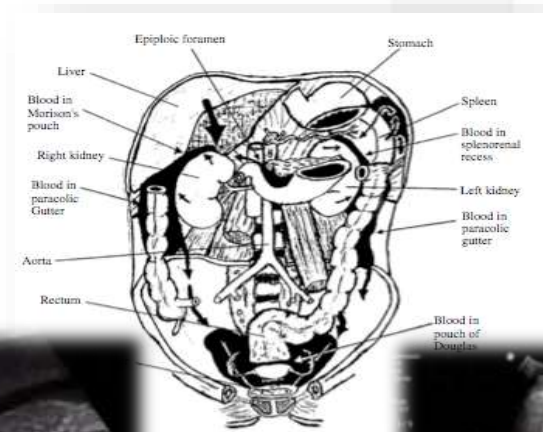
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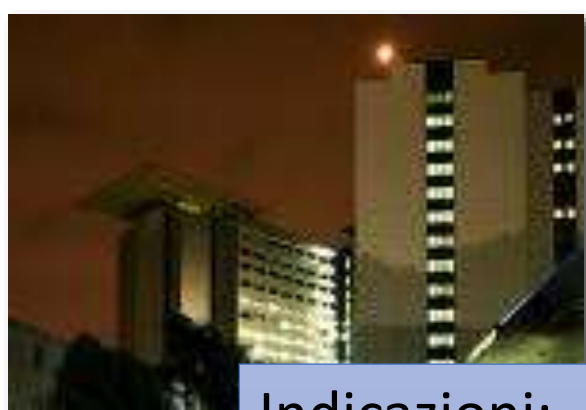
Adulto
 A, B ok , GCS 15
 PAS 80 FC 120
 E:
 Binder /Pelvi –
 Torace neg.
 Addome ++



ER Resus



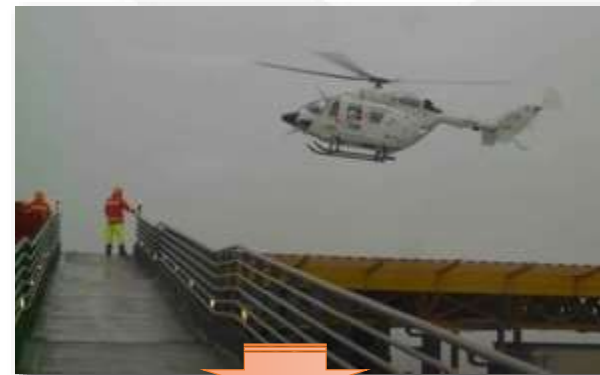
OR Resus



AD/R – Sala Op Ospedale Maggiore BO

Indicazioni:

- Paz. ***emodinamicamente instabili*** (PAS<90 ***persistente*** in preH) con:
 1. Trauma ***penetrante*** Addome/Torace/Collo
 2. Trauma chiusi ***e-FAST preospedaliera positiva*** (++ >1 quadranti)
 3. Trauma con ***emorragia esterna non controllabile*** con tecniche non chirurgiche (compressione diretta, packing esterno, touniquet, REBOA...)



DTOR score

Table 3 – The Direct to Operating Room (DTOR) prediction score (top) and Assessment of Blood Consumption (ABC) prediction score (bottom).

DTOR score	Point value
Penetrating mechanism	2
Positive FAST	2
Systolic blood pressure < 80 mmHg	1
Base excess ≤ -10 mEq/L	1
ABC score	
Penetrating mechanism	1
Positive FAST	1
Systolic blood pressure < 90 mmHg	1
Heart rate > 120 bpm	1

The odds ratio of emergency operation within 30 min of hospital arrival increased by 2.71 (95% confidence interval 2.23-3.29; $P < 0.001$) for every 1-point increase in DTOR score

patients with a **score of 3 or greater** were **14 times more likely** to undergo an emergency **operation** within **30 min** of ED arrival

Chi trasfonderò? Gli SCORE... Dal TASH al BATT?

Massive Transfusion (MT) ? =

- ≥ 10 units of red cells in 24 h after injury or
- ≥ 3 units in the first hour after injury

ABC SCORE

SCORE < 2 SUGGESTS UNLIKELY NEED FOR MASSIVE TRANSFUSION

SBP ≤ 90 +1

HR ≥ 120 +1

+ FAST +1

**PENETRATING
TORSO INJURY** +1

TASH SCORE

TRAUMA ASSOCIATED SEVERE HEMORRHAGE

score < 9
need for MT
 $< 5\%$

Gender
male (+1)

Blood Pressure
SBP < 100 (+4) < 120 (+1)

Hemoglobin
 < 7 (+8) < 9 (+6) < 10 (+4) < 11 (+3) < 12 (+2)

Pulse
 > 120 (+2)

Base Excess
 < -10 (+4) < -6 (+3) < -2 (+1)

FAST
+3 if positive

Unstable Pelvic fx
+6 if present

Open or dislocated femur fx
+3 if present

score > 24
need for MT
 $> 85\%$

RESEARCH

Open Access

Early identification of bleeding in trauma patients: external validation of traumatic bleeding scores in the Swiss Trauma Registry

Alan Costa^{1*}, Pierre-Nicolas Carron¹, Tobias Zingg^{2,4}, Ian Roberts³, François-Xavier Ageron¹ for the Swiss Trauma Registry⁴

Costa et al. *Critical Care* (2022)
26:296

Table 1 BATT score

Age	≥ 65 years old	+ 1
	≥ 75 years old	+ 2
Systolic Blood Pressure	< 60 mmHg	+ 14
	≥ 60 and < 100 mmHg	+ 5
Glasgow Coma Scale	≤ 8	+ 4
	> 8 and ≤ 12	+ 3
Respiratory rate	< 10 or ≥ 30 /min	+ 2
	Alt: Oxygen saturation < 90	+ 2
Heart rate	> 100 /min	+ 1
Penetrating injury	Yes	+ 2
High velocity trauma	Yes	+ 2

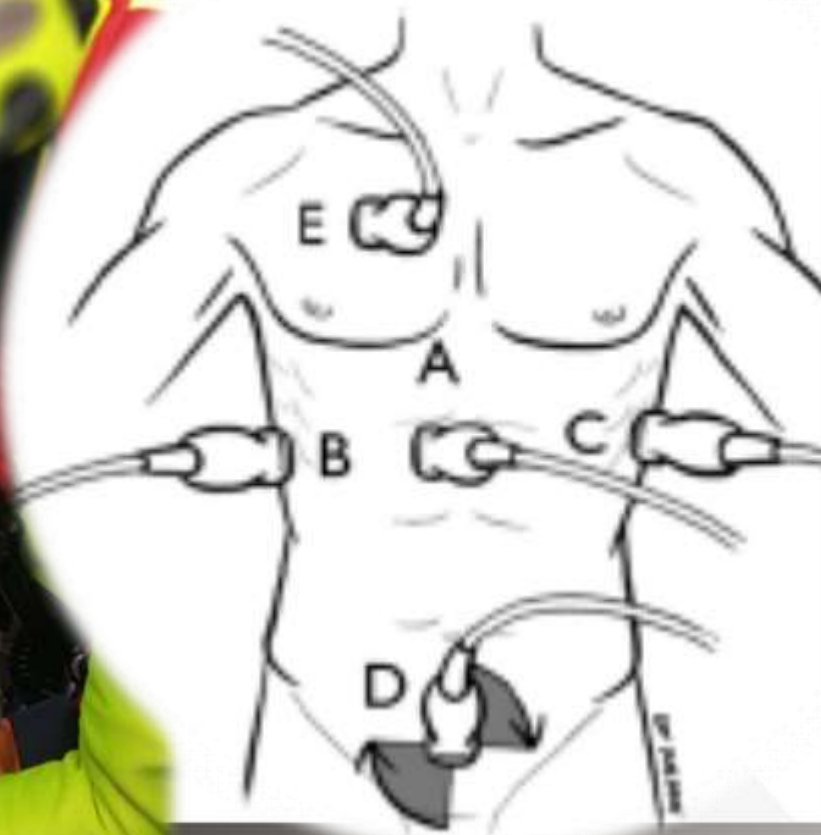
The score is not suitable for isolated limb trauma or isolated neck femoral fracture in people older than 65 years

BATT score
(≥ 8)



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In preH... #NonSoloEFAST...



FAST
Pericardio
PEA Vs Low Output
Ipovolemia
PNX
Prognosi ACR... (es. Asy + no
versemento)

To EFAST... When?... *ongoing EFAST!*

- esame E-FAST aumenta il tempo sulla scena ritardando il trasporto del paziente in ospedale per cui va sempre eseguito dopo la valutazione primaria da parte di personale esperto e possibilmente in itinere, verso l'ospedale di destinazione

TRAUMA - EFAST



Quando?

preH

- Trauma Borderline
 - Per bilancio lesionale
- Trauma Stabile per Triage (es. pazienti multipli)
 - Per centralizzare
- Trauma Instabile
 - Durante il trasporto
 - Per attivare S.op & Chirurgo Traumi
 - InH

InH

- Sempre!!!

... Uno sguardo al futuro? Remote preHUS supervision?

Hermann et al.
Scand J Trauma Resusc Emerg Med (2022) 30:23
<https://doi.org/10.1186/s13049-021-00985-0>

Scandinavian Journal of Trauma,
Resuscitation and Emergency Medicine

ORIGINAL RESEARCH

Open Access

Remote real-time supervision of prehospital point-of-care ultrasound: a feasibility study

Martina Hermann^{1,2}, Christina Hafner^{1,2}, Vincenz Scharner², Mojca Hribersek², Mathias Maleczek^{1,2}, Andreas Schmid¹, Eva Schaden^{1,2}, Harald Willschke^{1,2} and Thomas Hamp^{1*} 

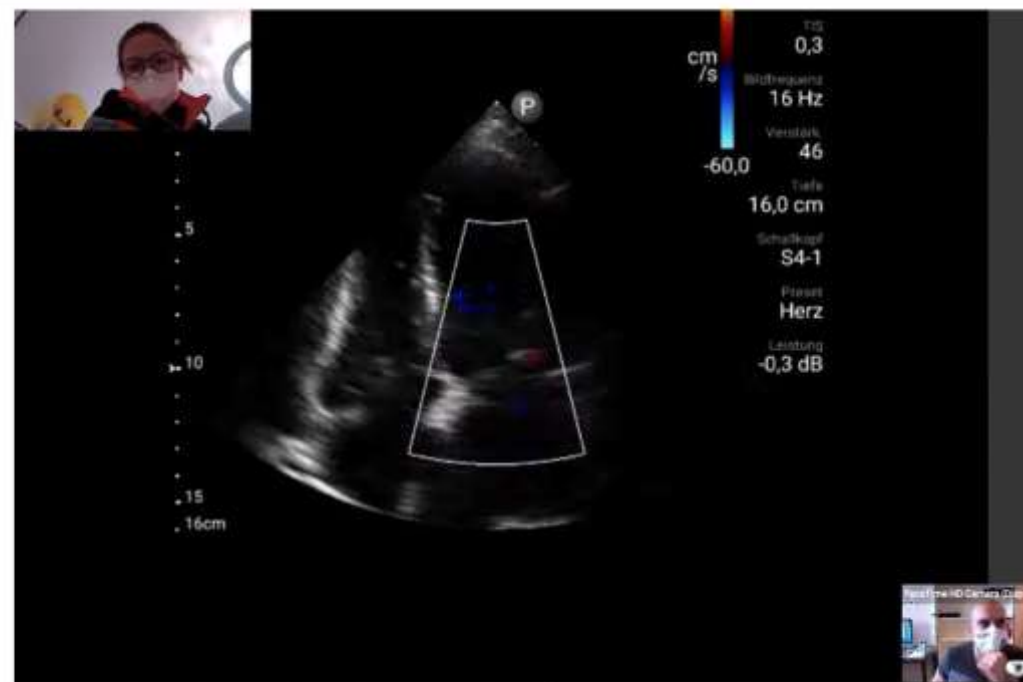
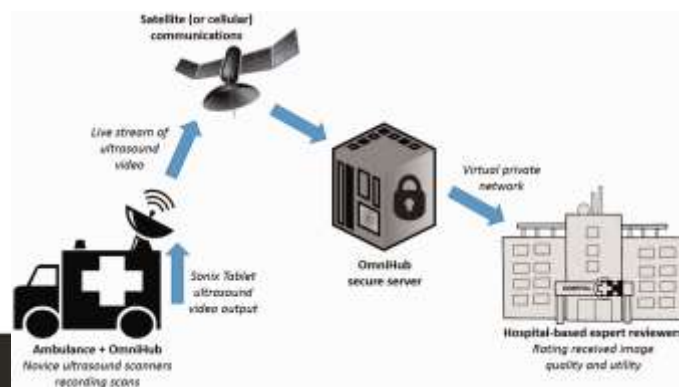


Fig. 1 Supervisor's view: ultrasound image; prehospital emergency doctor left corner, supervisor right corner

Conclusioni... preH US nel Sistema Trauma

Si Se:

- è “**safe**” = non perdiamo tempo utile
- Accuratezza diagnostica (**sensibilità e specificità**)
- Se può modificare il **management** del paziente
 - gestione preH (farmaci, strumenti, tempi, sangue REBOA e altre amenità) >> **ESEMPIO 1'**
 - modalità e mezzo di centralizzazione (HUB vs SPOKE vs **VIE DI MEZZO!**) >> **ESEMPIO 2'**
 - H di destinazione
 - attivazione ospedaliera (trauma team, PTM, sala pronta...)
 - percorso intraH (accesso diretto su sala, angio, trasf. Secondari...)
- Se, in ultimo, modifica la **mortalità** (lo dimostreremo!)





+ Lovers - Haters

Grazie

car.coniglio@gmail.com



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LA RIVOLUZIONE DEI SISTEMI