

**25 ANNI DI TRAUMA:
COSA ABBIAMO FATTO
E COSA C'È DA FARE
ANCORA**

Moderatori: Paola PERFETTI,
Tommaso PELLIS

Evoluzione del Trauma Care

Congresso Nazionale IRC

2019

11 • 12 OTTOBRE

Centro Congressi **Veronafiere**



Italian
Resuscitation
Council

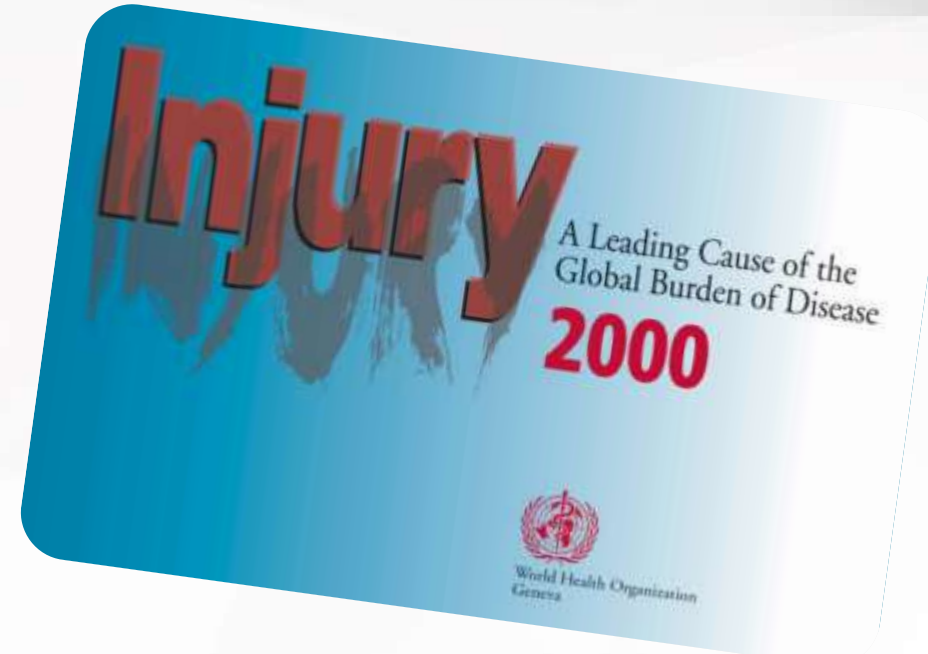
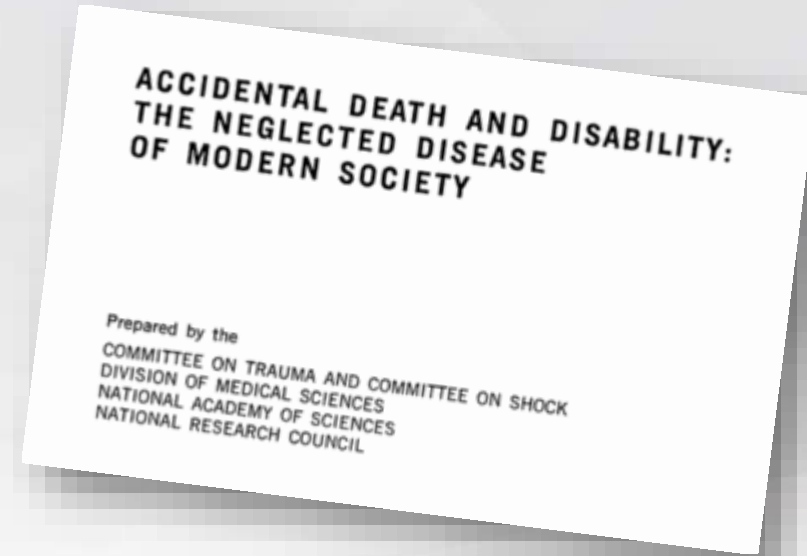
Carlo Coniglio

Rianimazione, 118

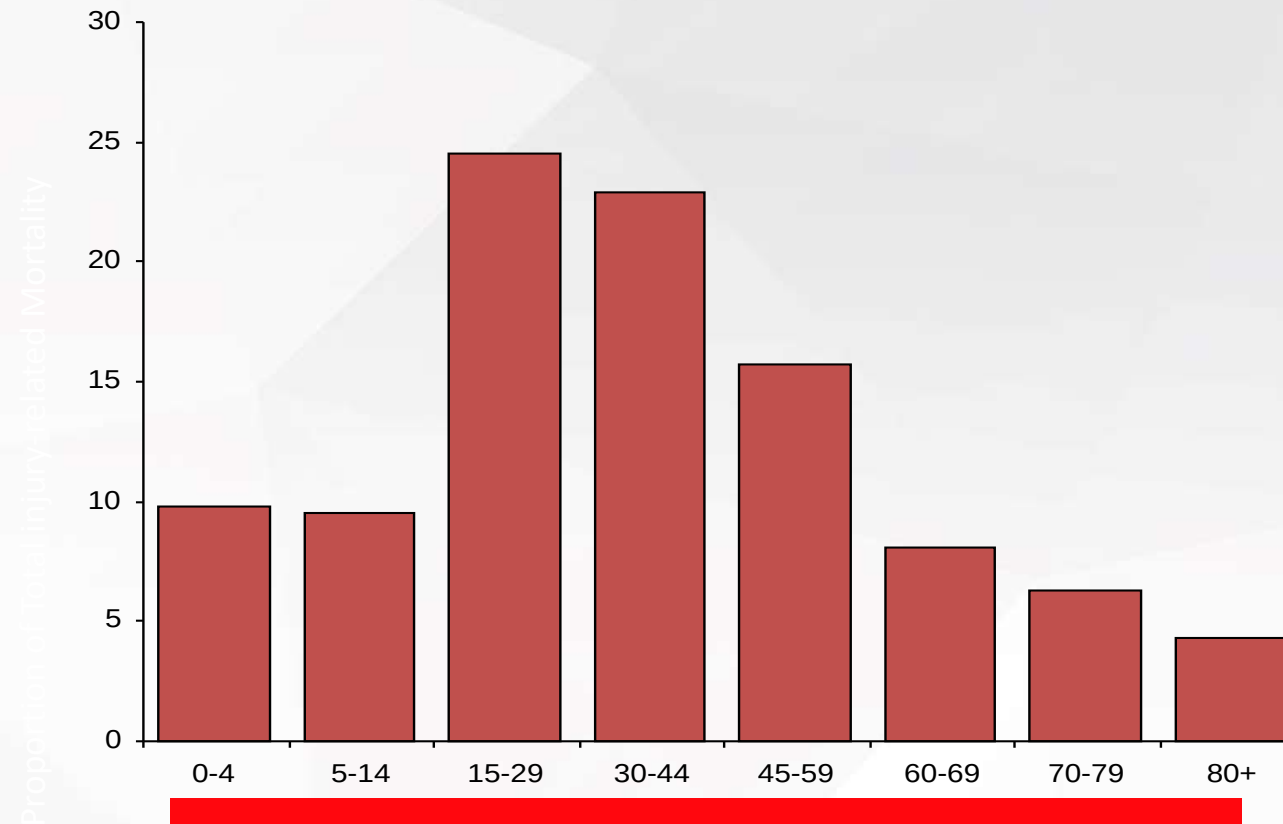
Ospedale Maggiore - Bologna

Trauma una malattia? Più che altro un’ “epidemia”!!

- National Academy of Sciences Trauma: “The Neglected Disease” (1966) – la malattia misconosciuta della società moderna!!!
- WHO (Organizzazione mondiale della Salute) definisce nel 2000 il trauma:
“The Global Burden of Disease”



Mortalità legata a Traumi per gruppi di età; world, 2000



1°

<45anni

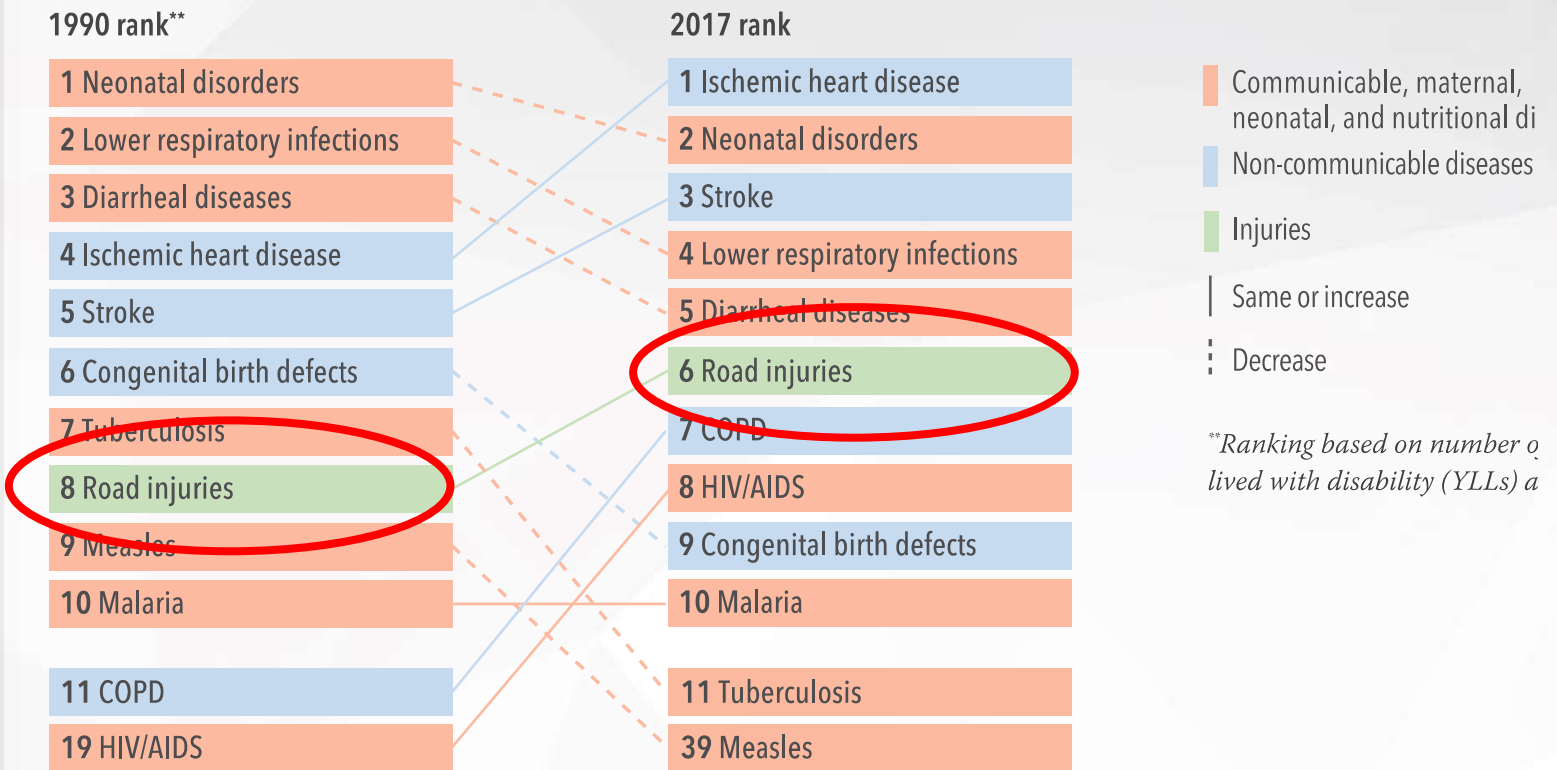
Trauma Maggiore

- Trauma: la prima causa di morte nell'età tra 1-44 aa
- MTV (Major Trauma Victims)
300-400 /1milione persone/ anno

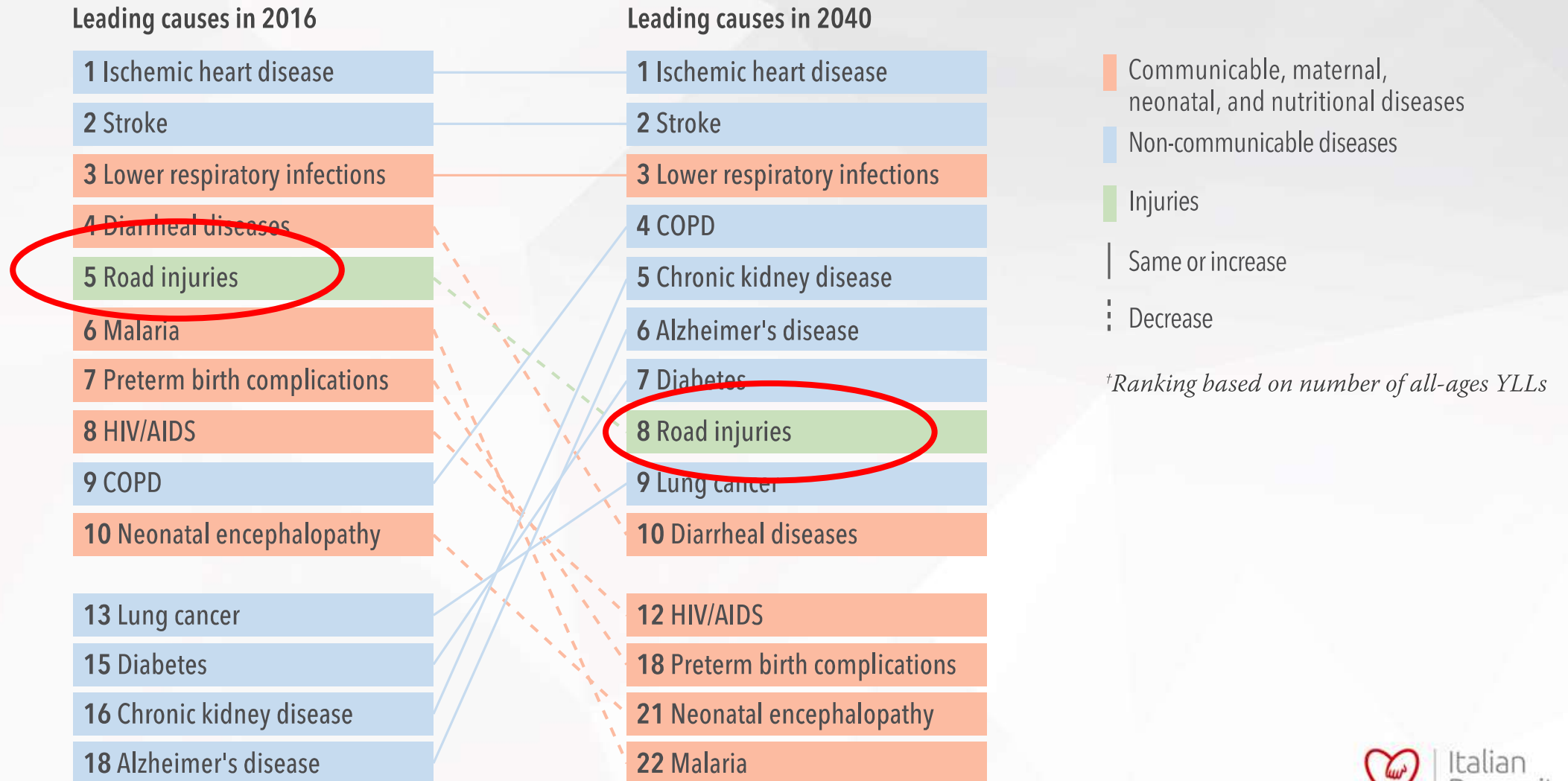
Findings from the Global Burden of Disease Study 2017

Leading causes of early death, 1990 and 2017

Ischemic heart disease, neonatal disorders, stroke, lower respiratory infections, diarrhea, road injuries, and chronic obstructive pulmonary disease (COPD) accounted for more than 1 million deaths each worldwide in 2017.



Leading causes of early death, 2016 and 2040[†]



La “Piramide” del trauma...



Per ogni pz deceduto per trauma:

- 30 pz traumi gravi
- 300 pz les meno gravi

La piramide enfatizza solo punta iceberg: molti episodi di trauma e violenza non sono mai riportati...

Il Modello e le origini...

Accidental Death and Disability:

The Neglected Disease of Modern Society.

Washington, DC: Committee on Trauma and Committee on Shock, Division of Medical Sciences, National Academy of Sciences, National Research Council, **1966**.

- dall'esperienza militare l'esigenza di definire un modello civile di Trauma Care integrato
- 1976 ACS indica criteri di competenza per Trauma Center (Level I, II, III ...)

Punti essenziali:

- Definire gli ospedali in base al livello (I, II, III)
- Implementare protocolli di Triage (preH o intraH) per i quali i pz traumatizzati maggiori vengono indirizzati per il trattamento definitivo ai TrC di livello I

Trauma Care Il Modello e le origini...



Tutto comincia da qui... (o quasi)

Dr. Styner was flying from Los Angeles, California to return home to Lincoln, Nebraska after attending a wedding... His wife, Charlene (32), and four children, Christopher (10), Richard (8), Randal (7), and Kimberly (3), were aboard the aircraft with him...



“...quando è possibile fornire sul campo , con risorse limitate, un trattamento migliore di quello che io ed i miei figli ricevemmo nell’ ospedale di primo soccorso, ciò significa che vi è qualcosa di sbagliato nel sistema e che il sistema deve essere cambiato.”

Styner Febbraio 1976;

da ATLS: Student Course Manual



February 17, 1976



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E in Italia?

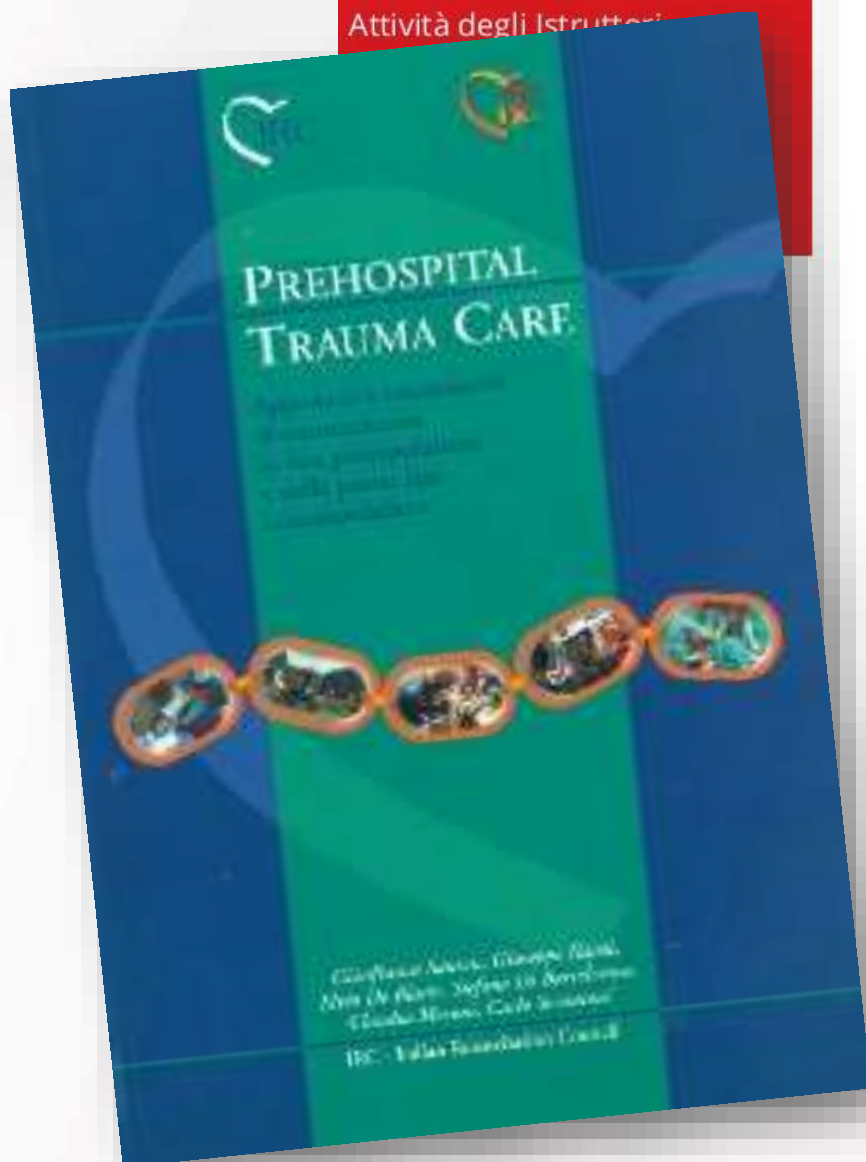


Un po' di storia...

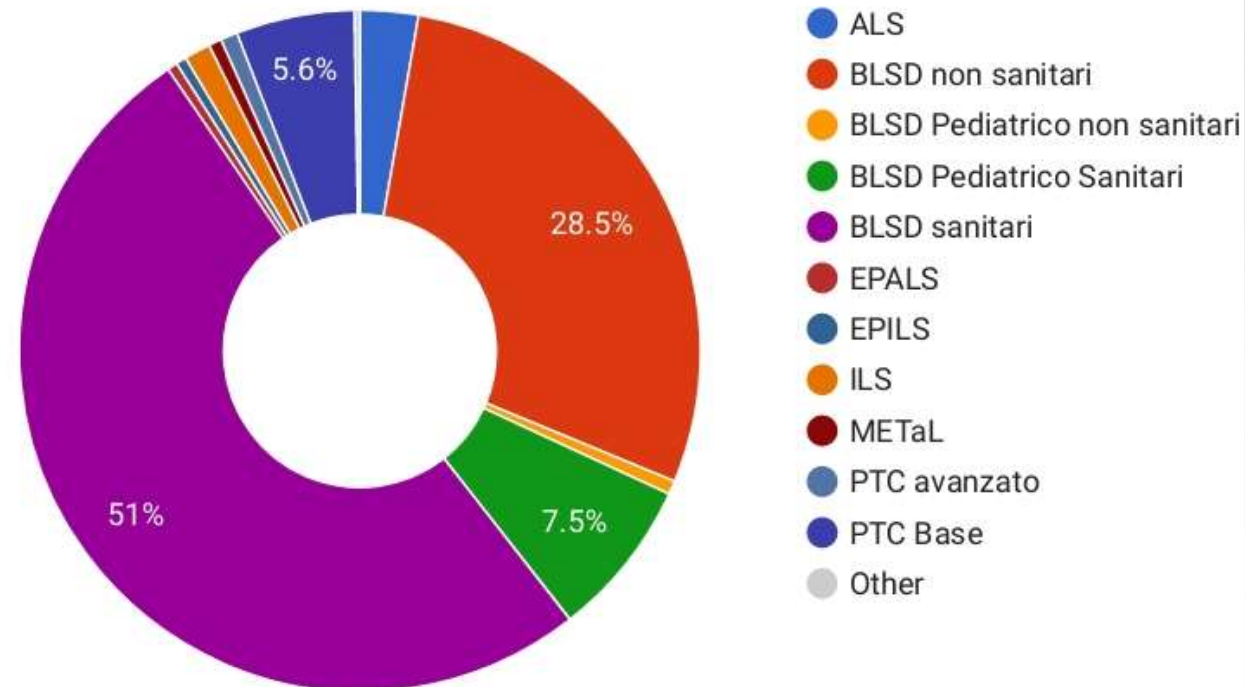
In Italia nel 1997 nasce il PTC



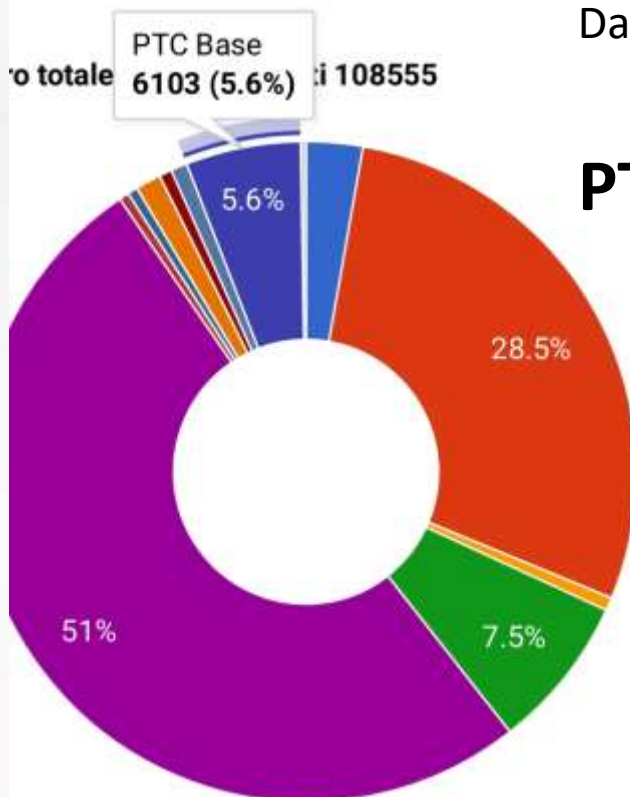
Attività degli Istruttori



Numero totale Corsi approvati 108555

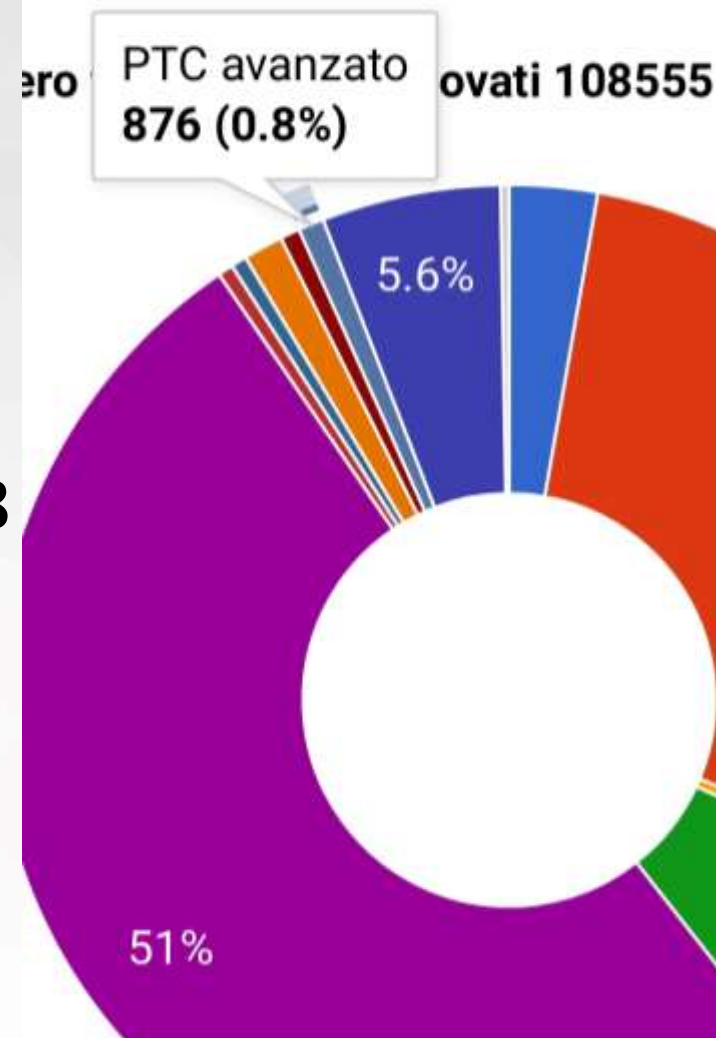


Dal 2007 – Database IRC



PTC base 5871

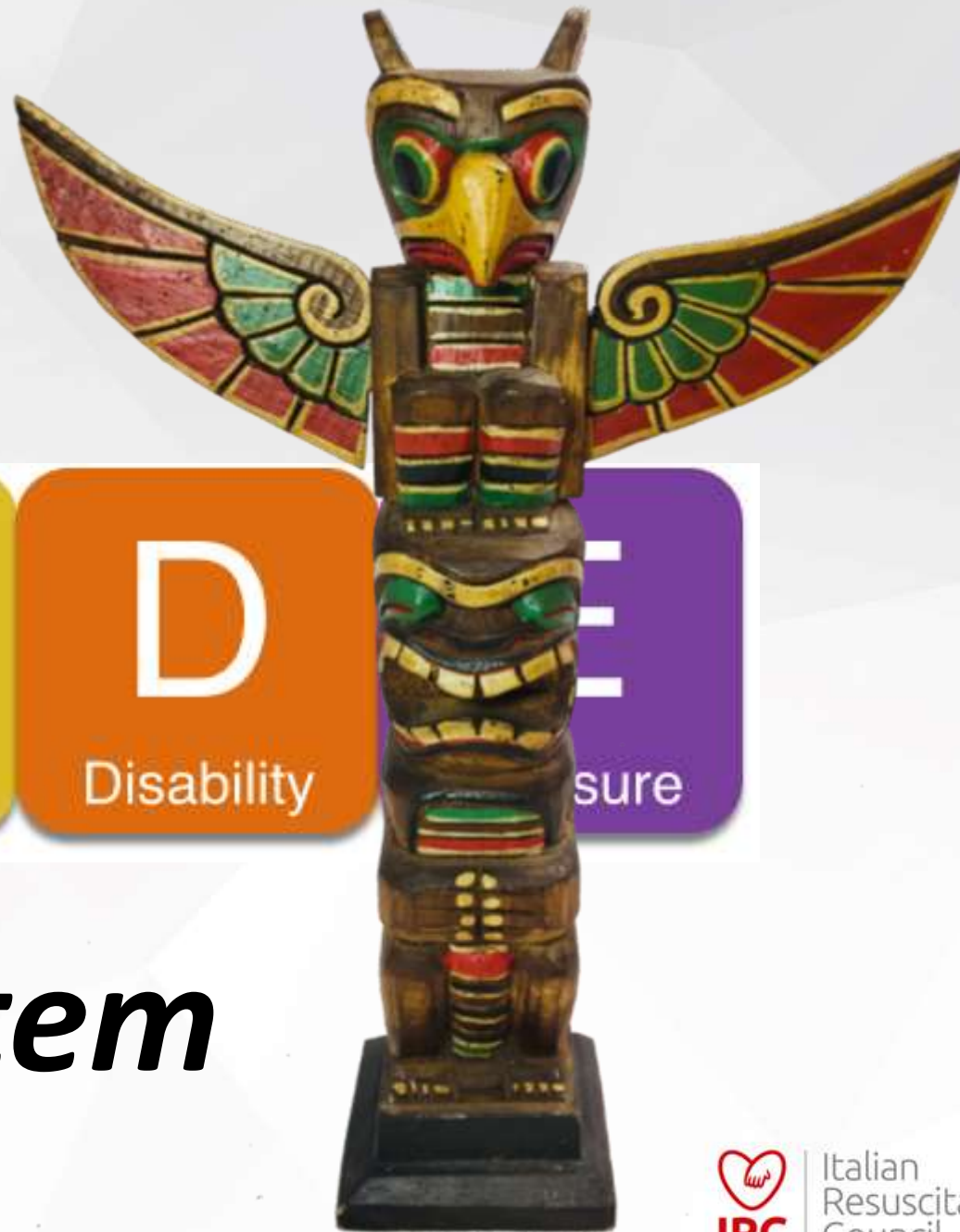
PTC avanzato 818



Trauma Care:...



... Miti e Totem



Airway & C. Spine

- Ostruzione VA
- Ipossiemia grave e refrattaria
- GCS <8

Intra H

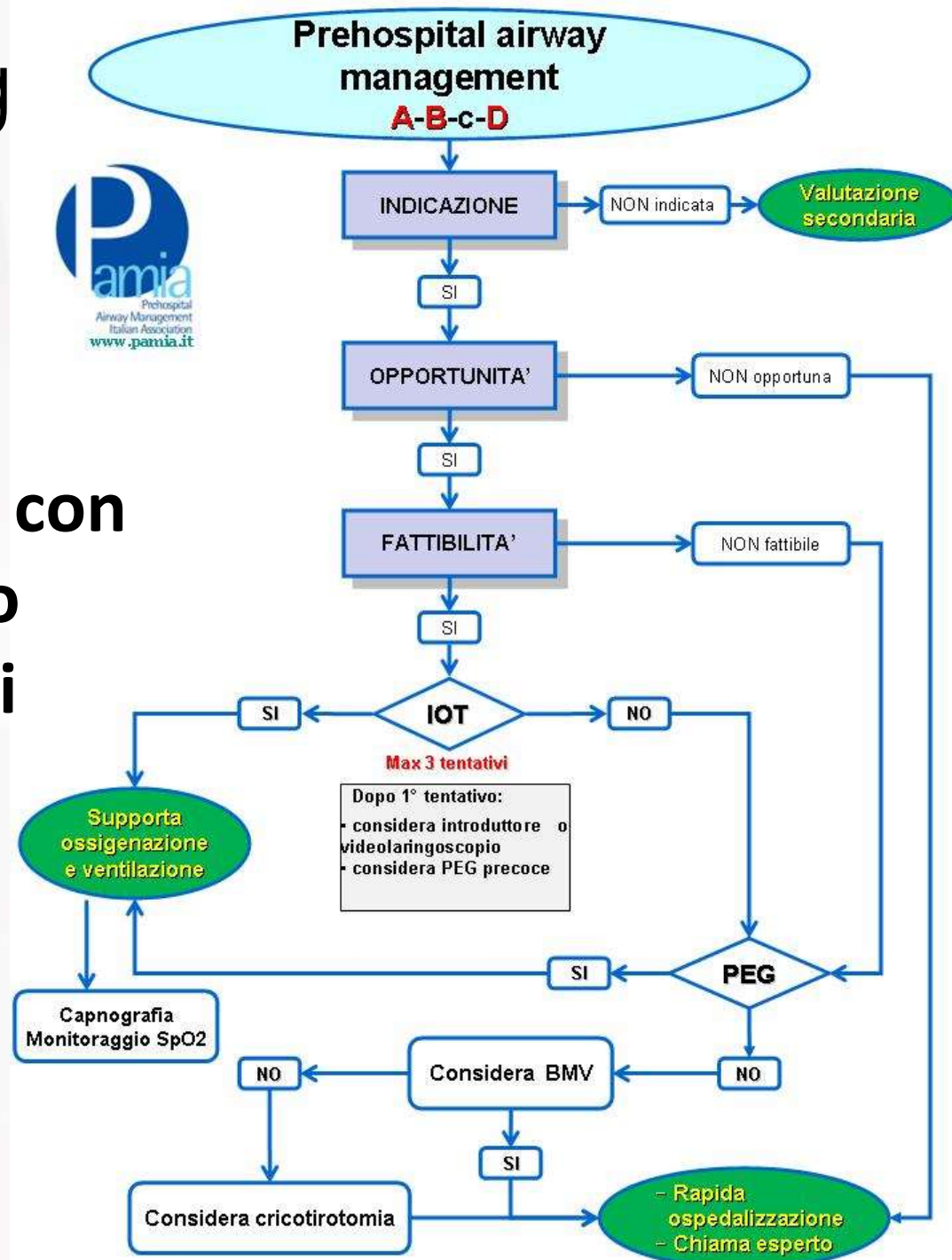
Extra H

Mito: Airway Management nel Trauma



- **Tutti i pazienti con GCS <8 devono essere Intubati**

- **Tutti i pazienti con GCS <8 devono essere Intubati**

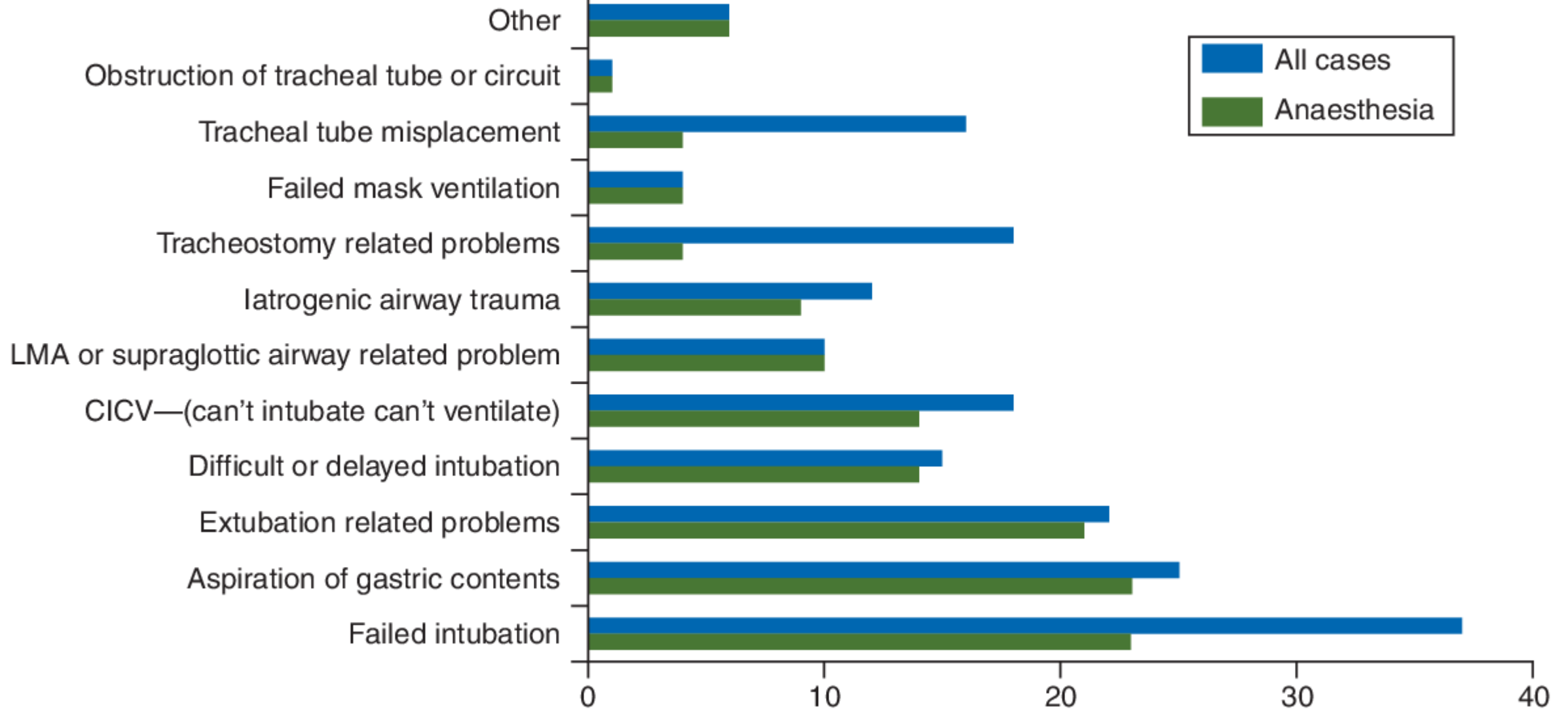


- **Quando?**
- **Tutti in extra?**
- **Da chi?**

Variabili:

- Chi c'è?
 - Skill degli operatori
- Quale paziente?
 - case-mix
- Dov'è il paziente?
 - tempi "Urban Vs Rural"

Airway Management: Damage Control or More Damage?



Skills & Competence

- **Gold:** anestesia-like, elevato volume e skills

- RSI, Drug Assisted Intubation

- **Silver:** meno esperienza

- Presidi alternativi: PEG/SGD

- **Bronze:** gestione occasionale delle vie aeree

- Pallone- Maschera + strumenti di base

Trauma Airway Management within 45 minutes... preferably at the scene

If RSI cannot be performed at the scene

journey time is 60 minutes or less?

y

Trauma Center

n

Local Trauma Unit

transport the patient to a major trauma centre for RSI ***provided the journey time is 60 minutes or less; only divert*** to a trauma unit for RSI before onward transfer if a patent airway cannot be maintained or the journey time to a major trauma centre ***is more than 60 minutes***.

The "Airway Strategy"

PIANO "A"

PIANO "B"

PIANO "C"

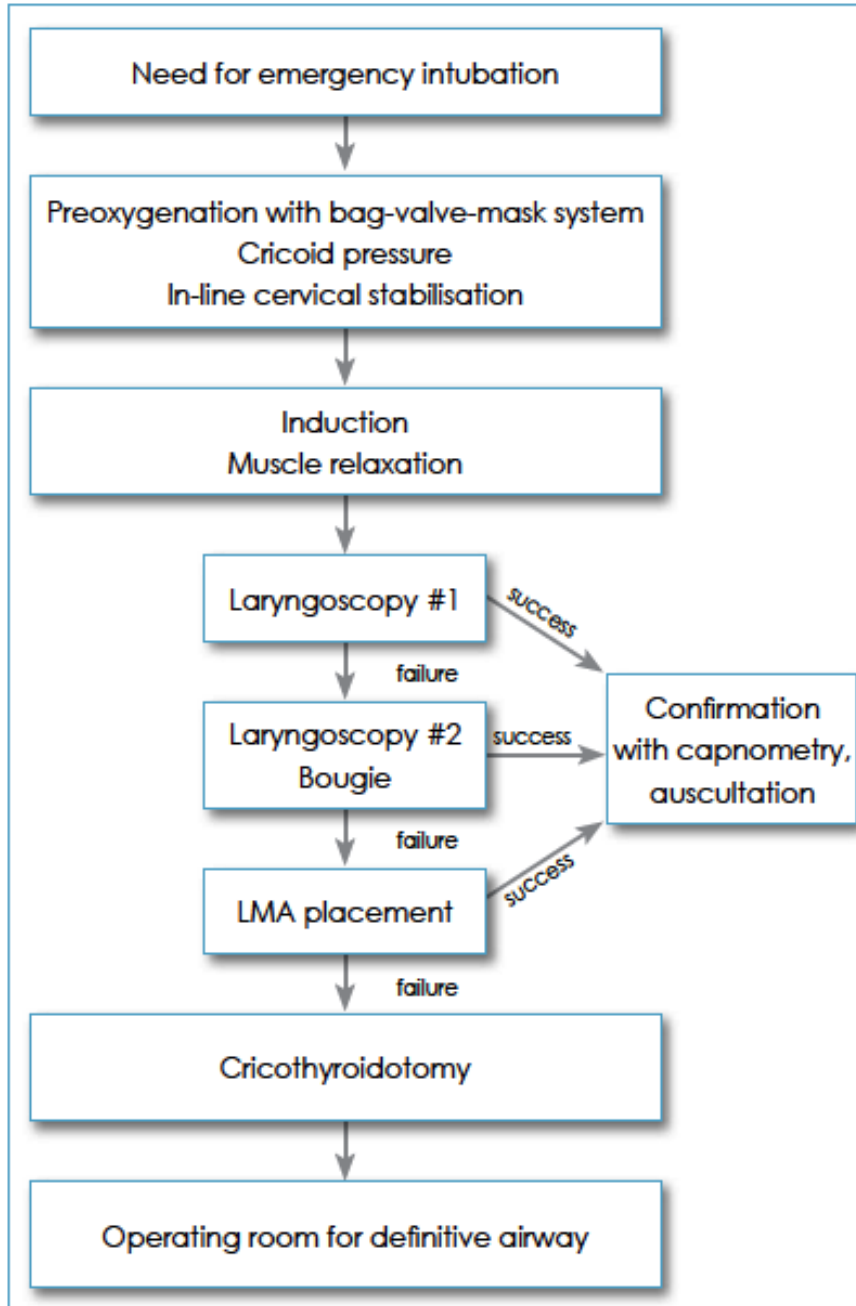


Figure 3: Emergency airway management algorithm used at the R Adam Cowley Shock Trauma Center⁴



Vie Aeree in Emergenza – Piano & Strategia

Piano

A₁



Cerotto/
Fissatubo

Lubrificante

- ✓ Distribuisci i compiti
- ✓ Anticipa le difficoltà
- ✓ Individua/Mark su membrana cricoidea (Us Ecografo)
- ✓ Prepara Carrello Vie Aeree
- ✓ Fai un piano A - B - C
- ✓ Immobilizzazione manuale
- ✓ Prepara Aspiratore
- ✓ Farmaci
- ✓ Guarda il Tempo!
- ✓ Se difficoltà → **Chiama aiuto !**

O₂ →
- Pre-ossigenazione
- Posizione Testa
- Monitor:
Fc, ECG, FR, SpO₂, PA

Farmaci

MDZ 0,1-02 mg/kg
Keta 1-2 mg/kg
Propofol 1-2mg/kg
Fenta 0,1-02 mcg/kg
Sux 1,5-2mg/kg
Rocuronio 1,2 mg/Kg



Piano

A₂

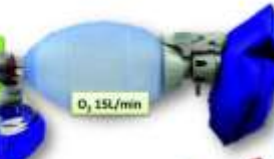
Mandrino Lungo
Bougie

Video Laringoscopio

- ✓ Strategia Alternativa
- ✓ Riposiziona il capo
- ✓ Ventilazione a 2 mani
- ✓ **Mandrino lungo**
- ✓ **Video Laringoscopio**

Piano

B



- ✓ Mantieni Ossigenazione
- ✓ Mantieni Ventilazione

- Ventilazione bimanuale
Pallone
Maschera

- PEG (Presidi Extra Glottici)



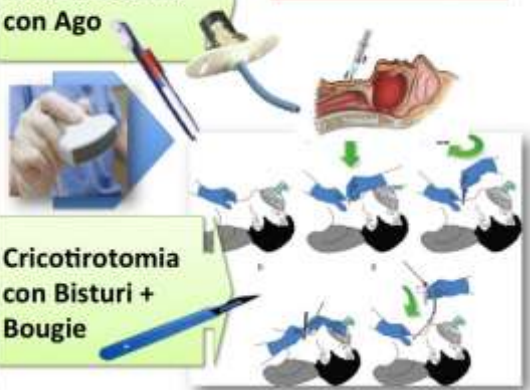
Piano

C

Cricotirotomia con Ago

Cricotirotomia con Bisturi + Bougie

- ✓ Can't Intubate
- ✓ Can't Ventilate



1° Tabù: Prehospital Airway Management

- Personalizzato
- “Permissive Hypoventilation”

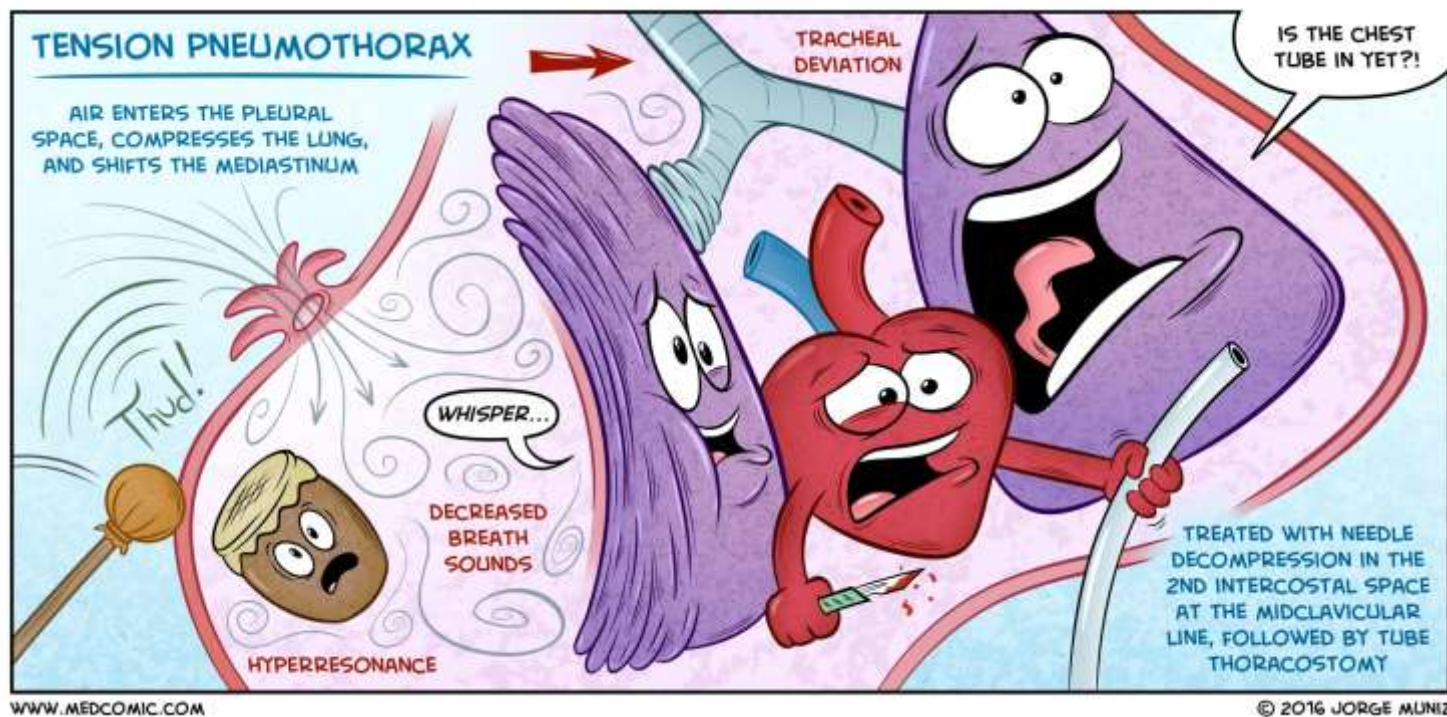


EMS providers should have a clear airway algorithm that takes into account

- injury patterns mechanisms
- transport time to a trauma center
- physiologic consequences of ETI

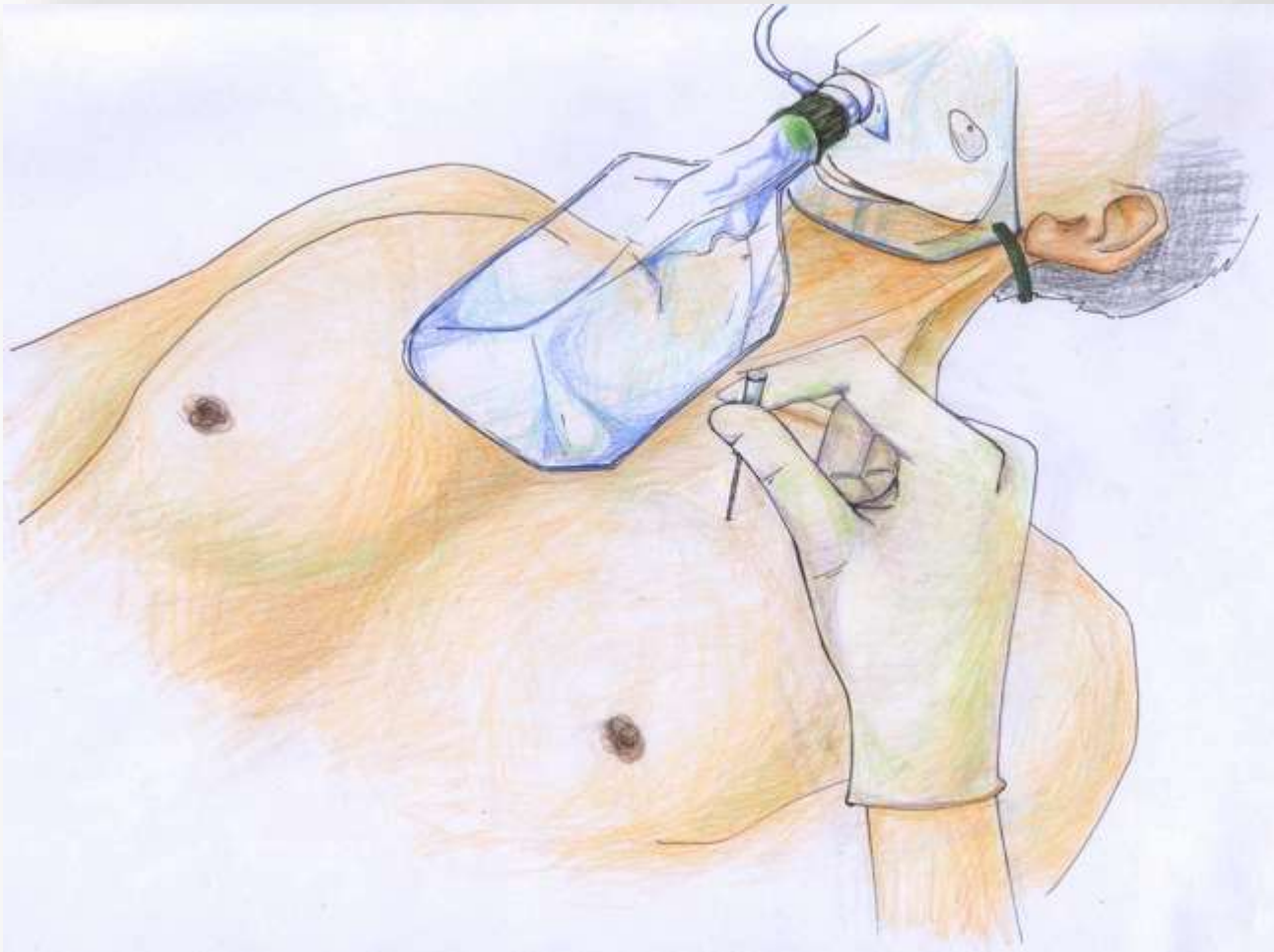
in order to reserve ETI situations where there is a benefit.

Mito: *Tension Pneumothorax* nel Trauma



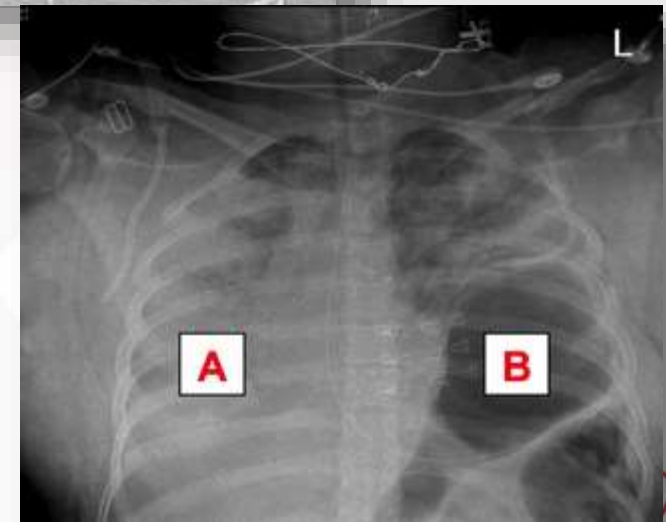
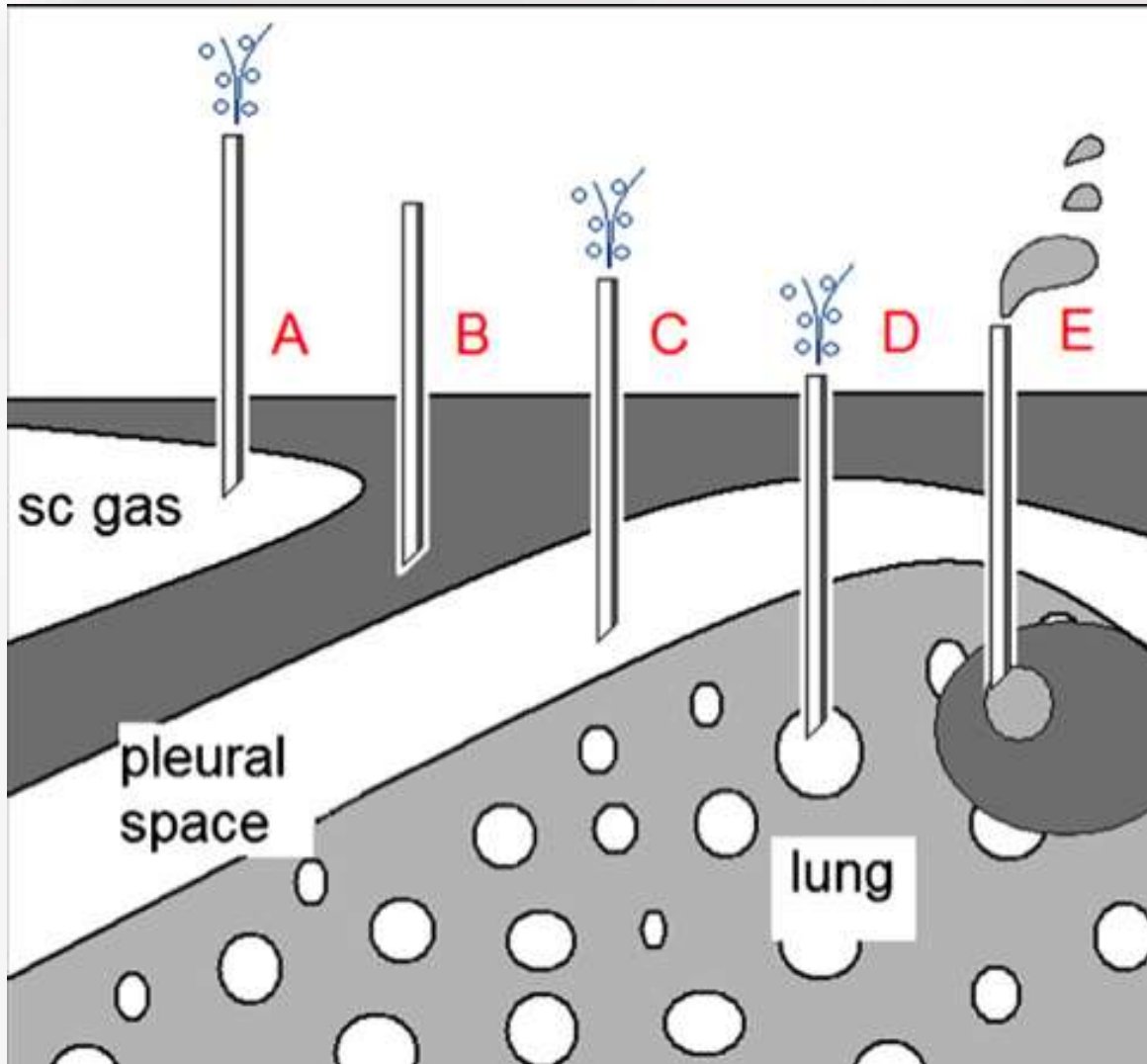
- Killer “sottostimato”

Decompressione con Ago



- Puntura esplorativa
- Decompressione con ago

Decompressione con ago: limiti e “damage”



Pnx in “Respiro Spontaneo”

Arresto respiratorio
in 30 minuti

Features of a tension pneumothorax in a spontaneously breathing or ventilated patient

Tension pneumothorax in spontaneously breathing patient

- Suspect if there is trauma to thorax, neck or upper abdomen
- Universal findings:
 - chest pain
 - initially a breathless patient, not a shocked one
- Common findings:
 - ipsilateral decreased air entry
 - tachycardia and ipsilateral reduced breath sounds occur in 50-75% of cases
- Inconsistent findings:
 - tracheal deviation
 - hypotension
- Decomensation is preceded by:
 - increasing hypoxia
 - respiratory arrest, usually over a period of around 30 minutes
- Cardiac arrest may follow respiratory arrest

Tension pneumothorax in a ventilated patient

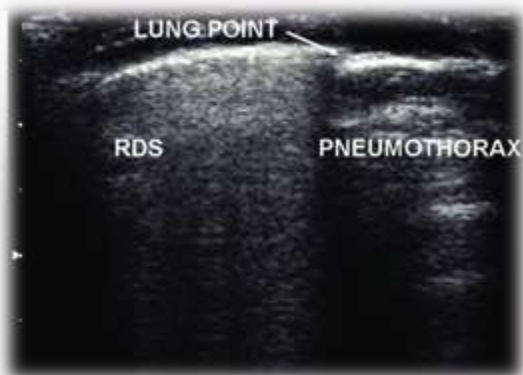
- Suspect if there is trauma to thorax, neck or upper abdomen
- Universal findings:
 - rapid reduction in cardiac output $\pm$ blood pressure
 - rapid and progressive decrease in PaO_2 and SpO_2
- Common findings:
 - ipsilateral chest hyperexpansion
 - ipsilateral reduced movement
 - ipsilateral decreased air entry
 - progressive increase in peak airway pressures
 - tachycardia
 - surgical emphysema
 - venous distension if no co-existing hypovolaemia
- Inconsistent finding:
 - tracheal deviation

Pnx in “Ventiazione a P Positiva

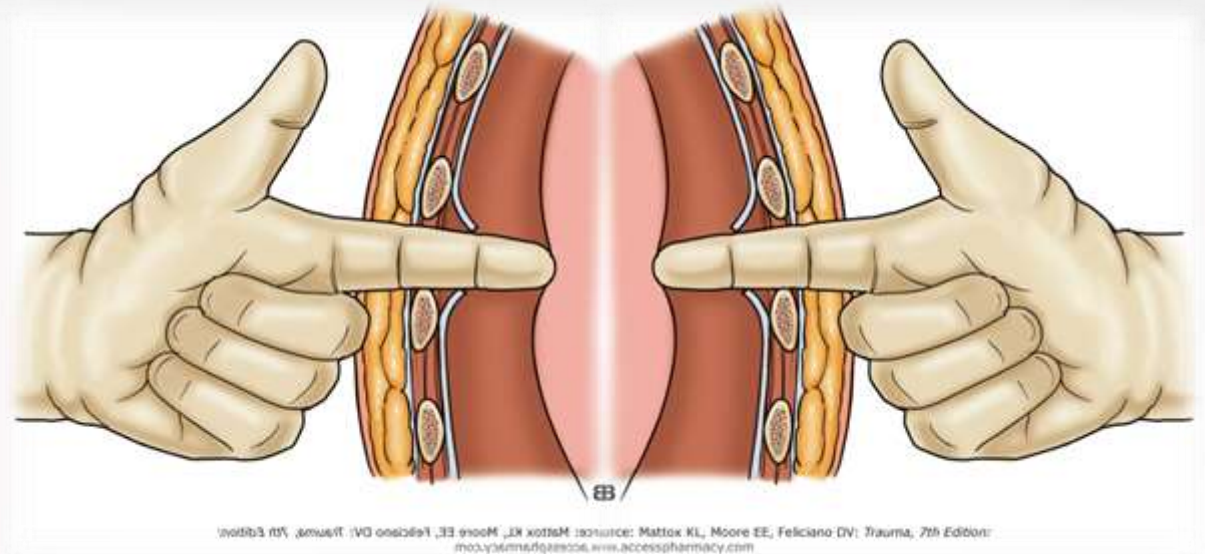
Shock
Ipossia rapidi

Pnx in “Respiro Spontaneo”

- > Tempo x Valutazione Clinica & Management
- ECO, Rx

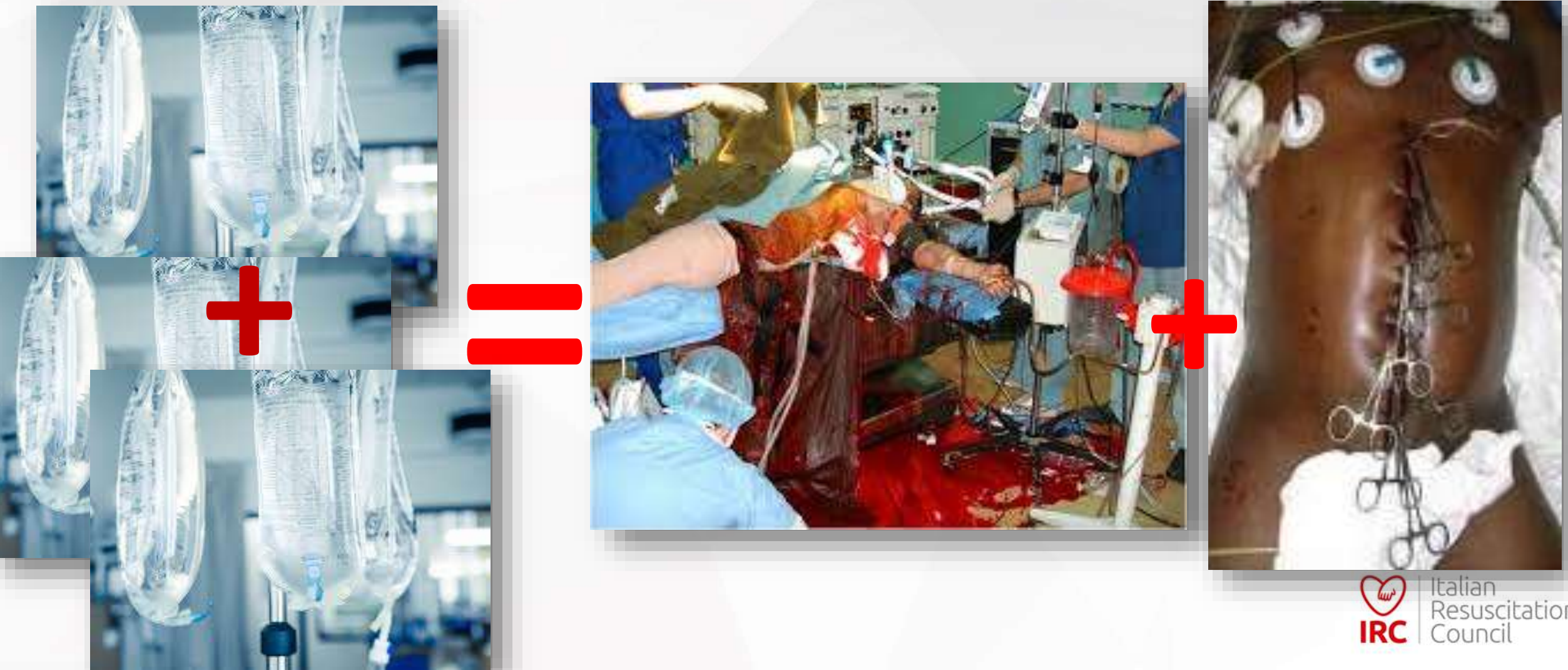


Pnx in
“Ventilazione a P
Positiva



(Mini) Toracostomia
(Bilaterale se necessaria es. ACR)

Mito: Circulation, *Fluidi* nel Trauma



Dall' ABC... al **<CmH>ABCDE**



**Stop The Bleeding
Control Massive Haemorrhage**

CmH → PreH Hemostasis

“Temporary haemorrhage control”

Compressione
diretta & splint arti



Tourniquet



Emostatici Topici

Splint pelvico



Damage Control Resuscitation: parte I



- Stop The Bleeding: temporaneo & Immediato
- Fluid resuscitation “limitata”
- Ipotensione Controllata = Target pressori
 - <100 Trauma penetrante/Chiuso
 - >100 se Trauma Cranico
- Rianimazione Emostatica:
 - Emazie: Plasma = 1: 1
 - Tranex, Fibrinogeno

Scoop & Run



Stay & Play



Fast & Clean

Damage Control Resuscitation: parte II



- Trattamento Acidosi, Ipotermia
- Stop The Bleeding: Definitivo:
- **Damage Control Surgery**
- Radiologia Interventistica
- Correzione Coagulopatia Mirata:
Guidata da Test Viscoelastici
(TEG/ROTEM)

Mito: Spinal Immobilization





Any High Risk Factors?

ANY of the following:

- Age $\geq$ 65 years
- Dangerous Mechanism
- Paresthesias in extremities

Pt has high risk factor?

Well... then you should get...

**Canadian C-Spine Rules
In PreH**

None?

You may proceed...

Any Low Risk Factors?

ANY of the following:

- Simple rear-end MVC
- Sitting position in ED
- Ambulatory at ANY TIME
- Delayed (i.e. not immediate) onset of neck pain
- Absence of midline C-spine tenderness

Not even one?

Then... they aren't low risk!

Radiography

One of the above?

Excellent... proceed with ROM

Able to Rotate Neck actively?

i.e. Rotate neck 45 degrees left & right.

Can't move their neck?

Then... they aren't low risk!

Great!

Based on the CCR...

NO C- Collar



Image by Teresa M. Chan
(@TChanMD)



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Maschmann et al. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*
 (2019) 27:77
<https://doi.org/10.1186/s13049-019-0655-x>

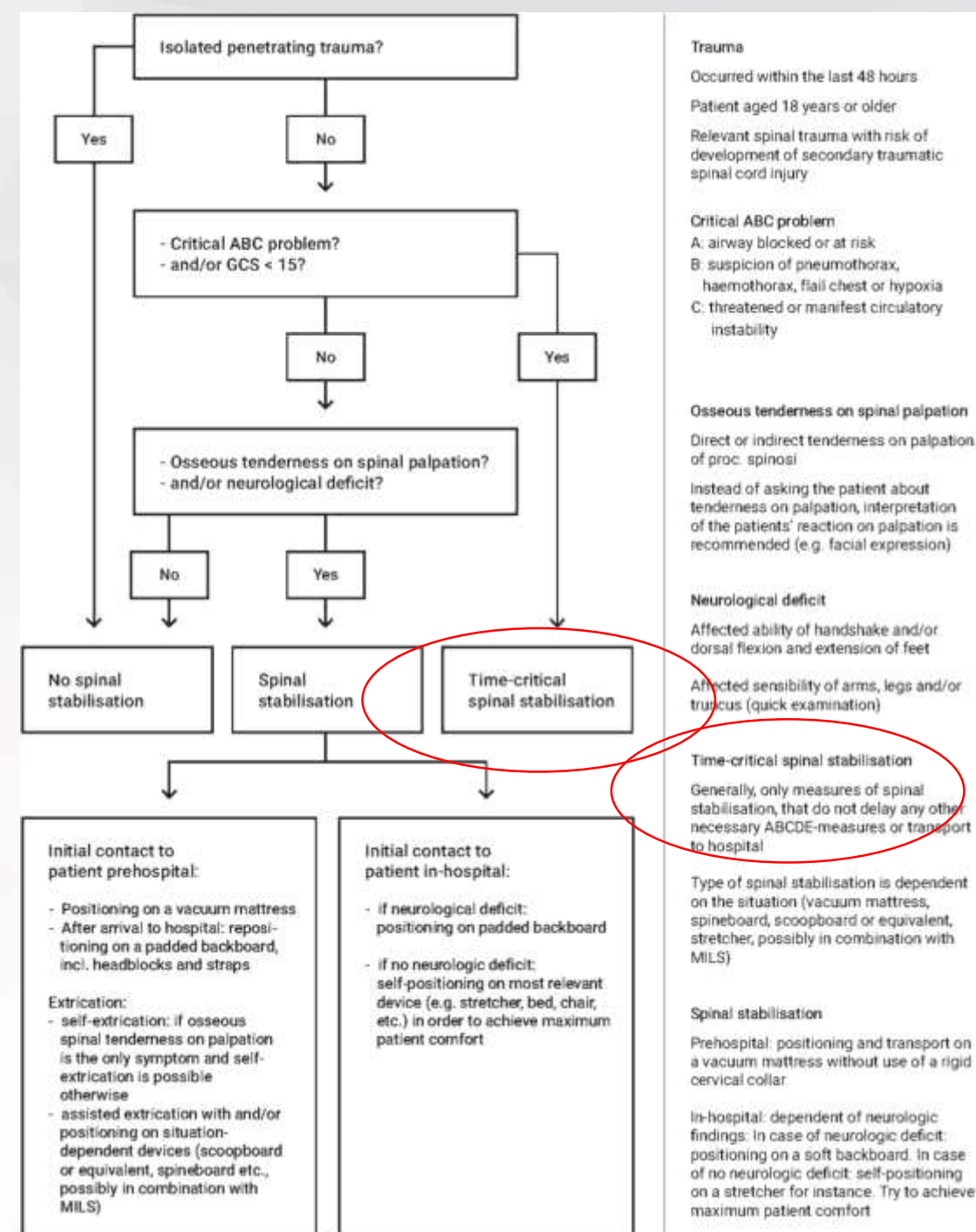
GUIDELINE

Open Access

New clinical guidelines on the spinal stabilisation of adult trauma patients – consensus and evidence based

Christian Maschmann^{1,2,3*} , Elisabeth Jeppesen^{4,5}, Monika Afzali Rubin^{6,7} and Charlotte Barfod³

Scandinavian Journal of Trauma,
 Resuscitation and Emergency Medicine



Self Extrication ?

In assenza di:

- significant distracting injuries
- Sintomi neuro
- spinal pain
- high-risk factors
cervical spine injury
assessed by the
C-spine rule.

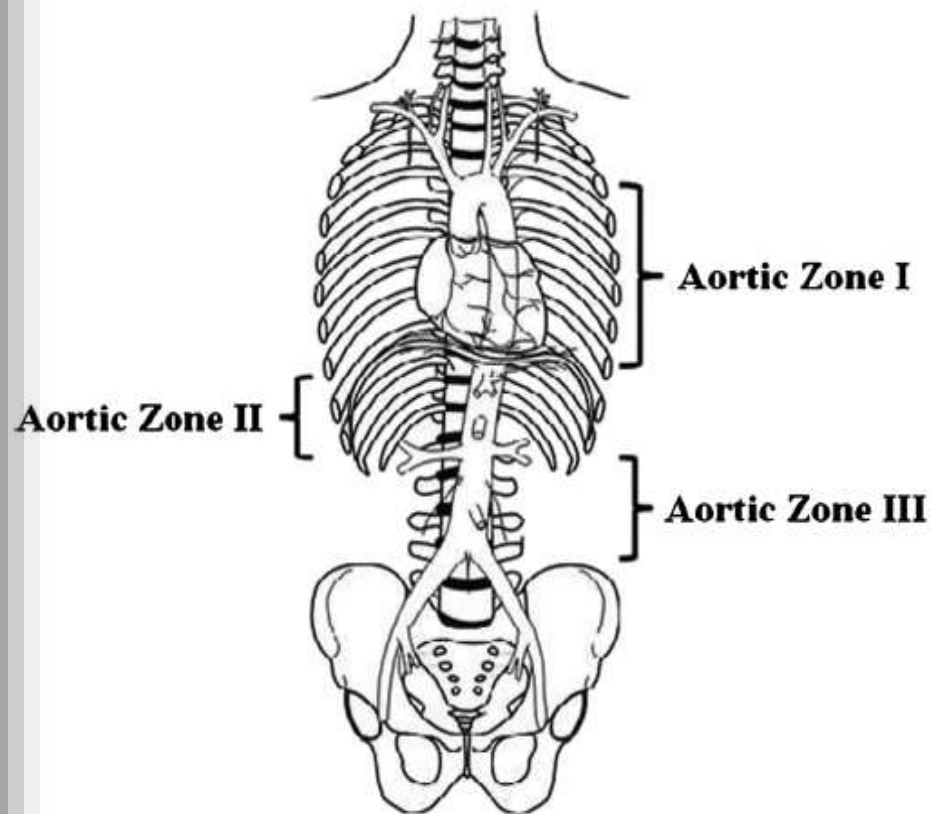
▪ Self Extrication

- Assist the patient as needed to exit the crash setting
- The patient's effort and collar are used for cervical stabilization
- Additional manual stabilization is not needed

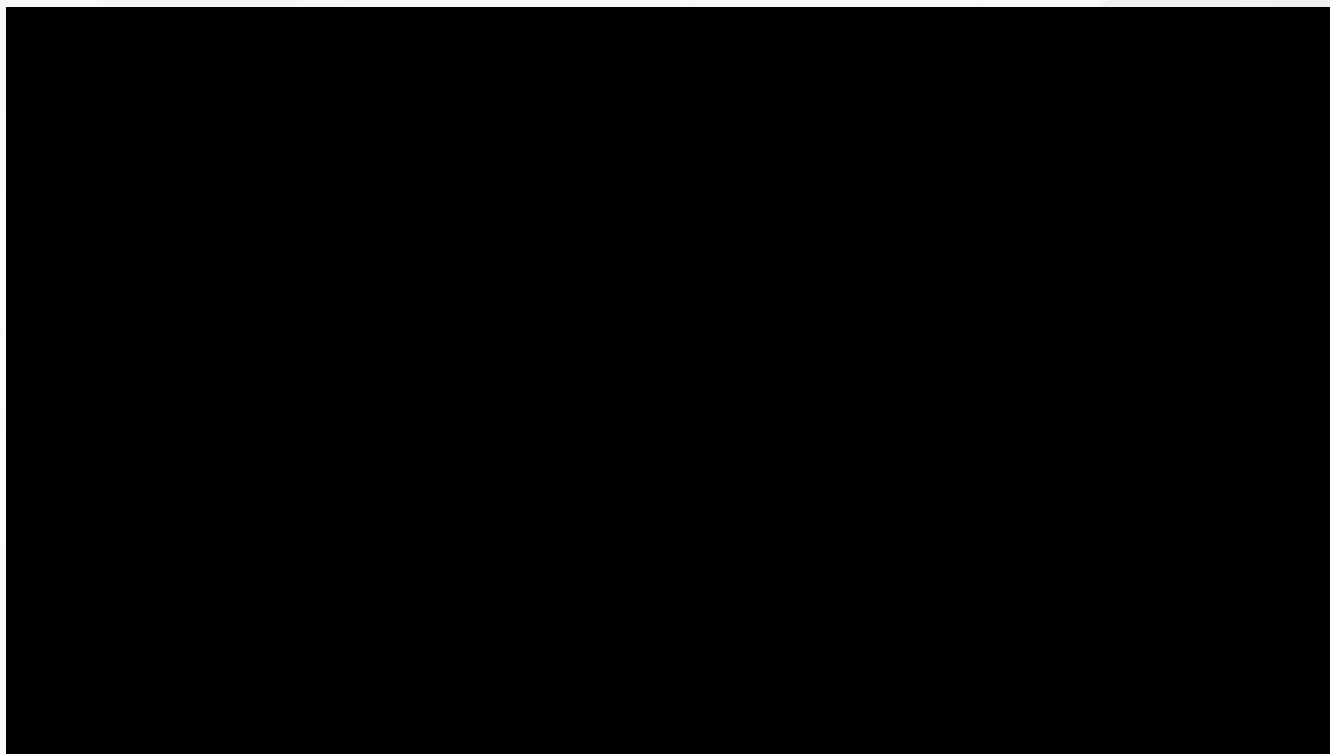


Trauma Care: Scienza in Evoluzione

Stop The Bleeding... si può Temporizzare?



REBOA – Resuscitative Endovascular Balloon Occlusion of the Aorta



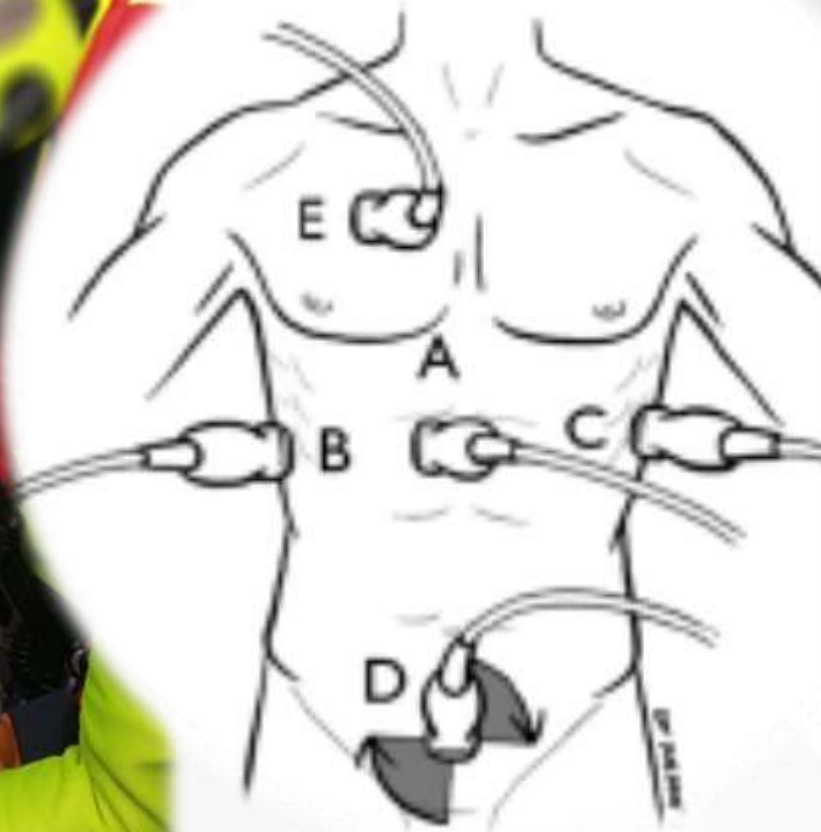


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PreH REBOA



POC US in preH



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



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PreH Emoderivati?



SHOCK, Vol. 46, No. 1, pp. 3–16, 2016

OPEN

Review Article

PREHOSPITAL BLOOD PRODUCT RESUSCITATION FOR TRAUMA: A SYSTEMATIC REVIEW

Iain M. Smith,^{*†‡} Robert H. James,^{§||¶} Janine Dretzke,^{***} and Mark J. Midwinter^{*†}

^{*}NIHR Surgical Reconstruction and Microbiology Research Centre, University of Birmingham; [†]Academic Department of Military Surgery and Trauma, Royal Centre for Defence Medicine, ICT Centre, Edgbaston, Birmingham; [‡]205 (Scottish) Field Hospital, Govan, Glasgow; [§]Academic Department of Military Emergency Medicine, Royal Centre for Defence Medicine, ICT Centre, Edgbaston, Birmingham; ^{||}East Anglian Air Ambulance, Gambling Close, Norwich; [¶]Ministry of Defence Hospital Unit Derriford, Derriford Hospital, Plymouth, United Kingdom; and ^{***}Institute of Applied Health Research, University of Birmingham, Edgbaston, Birmingham, United Kingdom

Received 6 Nov 2015; first review completed 16 Nov 2015; accepted in final form 12 Jan 2016

ABSTRACT—Introduction: Administration of high ratios of plasma to packed red blood cells is a routine practice for in-hospital trauma resuscitation. Military and civilian emergency teams are increasingly carrying prehospital blood products (PBPs) for trauma resuscitation. This study systematically reviewed the clinical literature to determine the extent to which



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Evoluzione del Trauma Care: Trauma is a Team Sport

Injury, Int. J. Care Injured (2007) 38, 5–6



ELSEVIER

EDITORIAL

Trauma care—a team sport in the 21st century

INJURY

INTERNATIONAL JOURNAL OF THE CARE OF THE INJURED

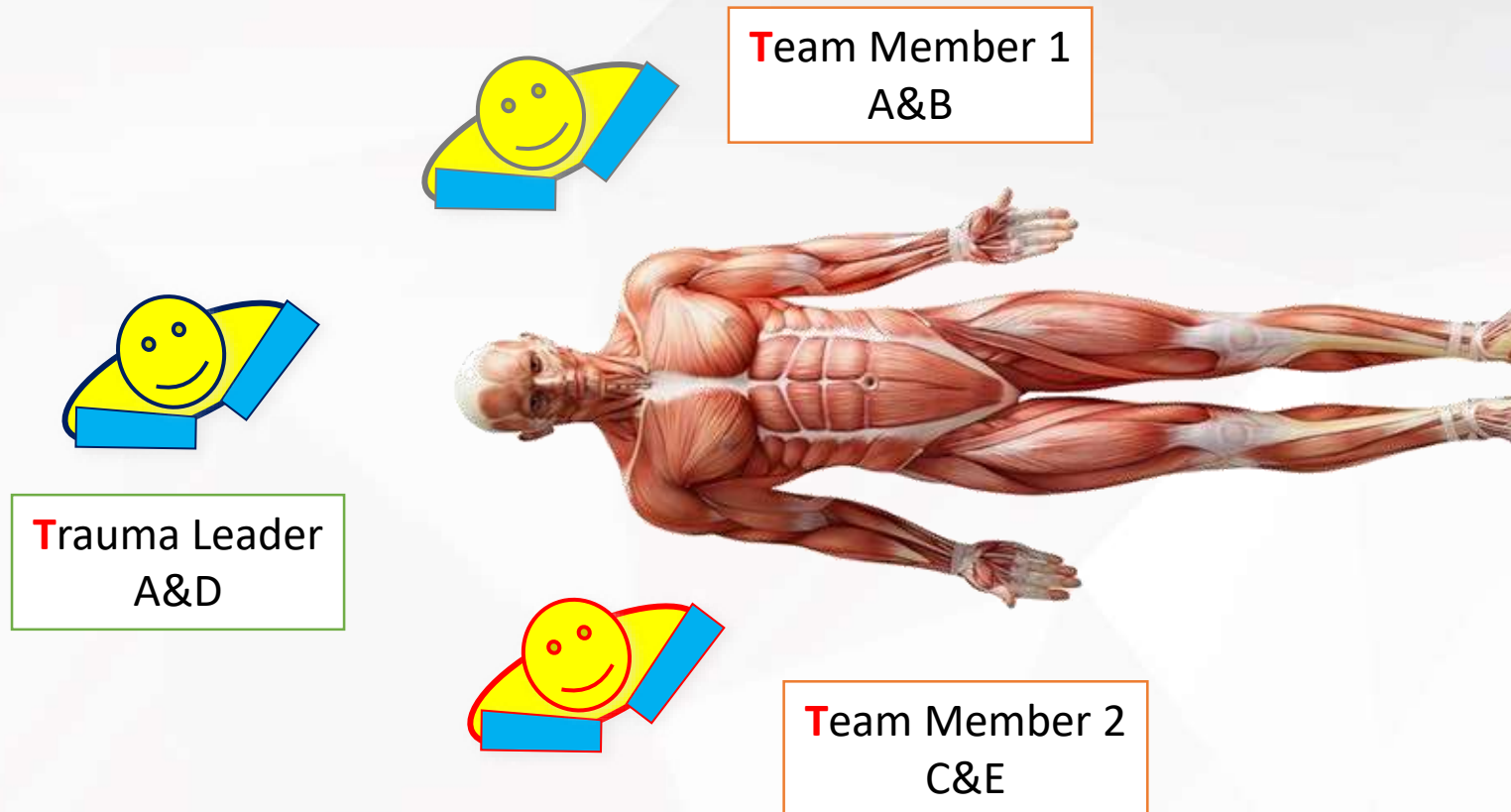
www.elsevier.com/locate/injury



PreH Trauma Team

Trauma is a Team Sport

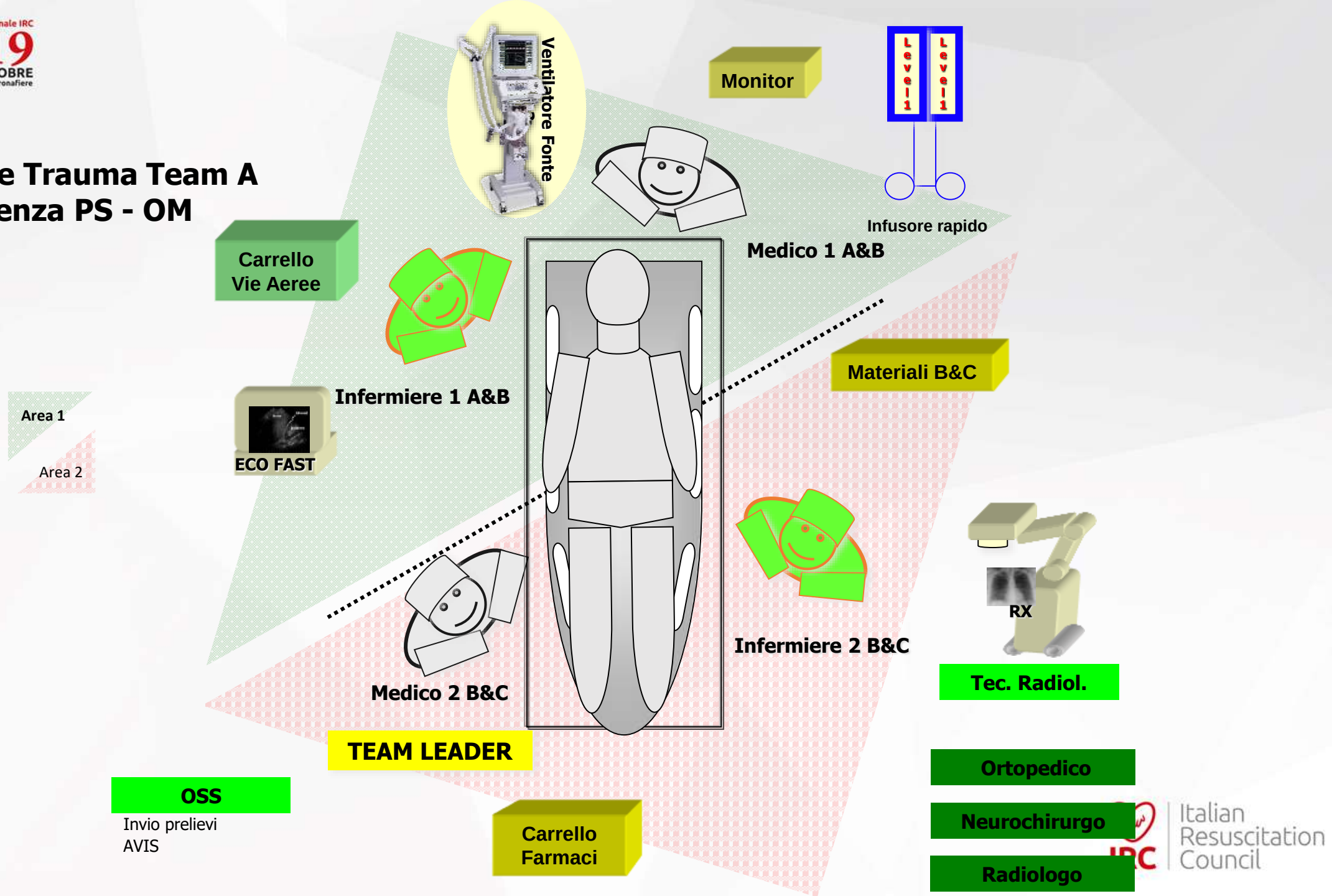
Medical errors most frequently occur as a result of ineffective leadership, poor communication, and lack of situational awareness



Skills Non Tecniche...



Disposizione Trauma Team A Sala Emergenza PS - OM





Formazione

- Metodo ABC



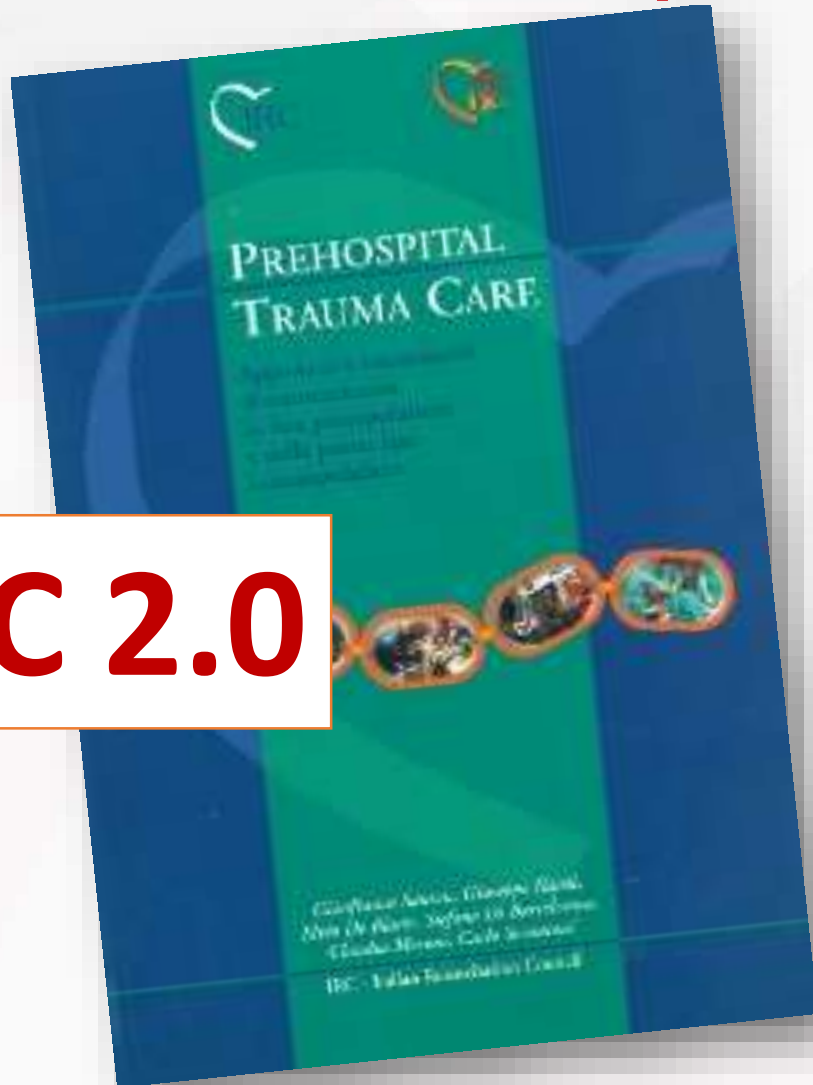
- Team Work & Training

European Trauma Course



Trauma: alcune prossime Sfide

PTC 2.0



> Diffusione

Educare la popolazione

 **viva!** la settimana per la rianimazione cardiopolmonare

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 14-20 Ottobre
2019 Sta per tornare la settimana per la **rianimazione cardiopolmonare**

2 **14** **29** **6**
giorni ore minuti secondi

 **Il progetto**

**For Trauma Education,
Prevention
&
Bleeding Control**

Grazie

car.coniglio@gmail.com