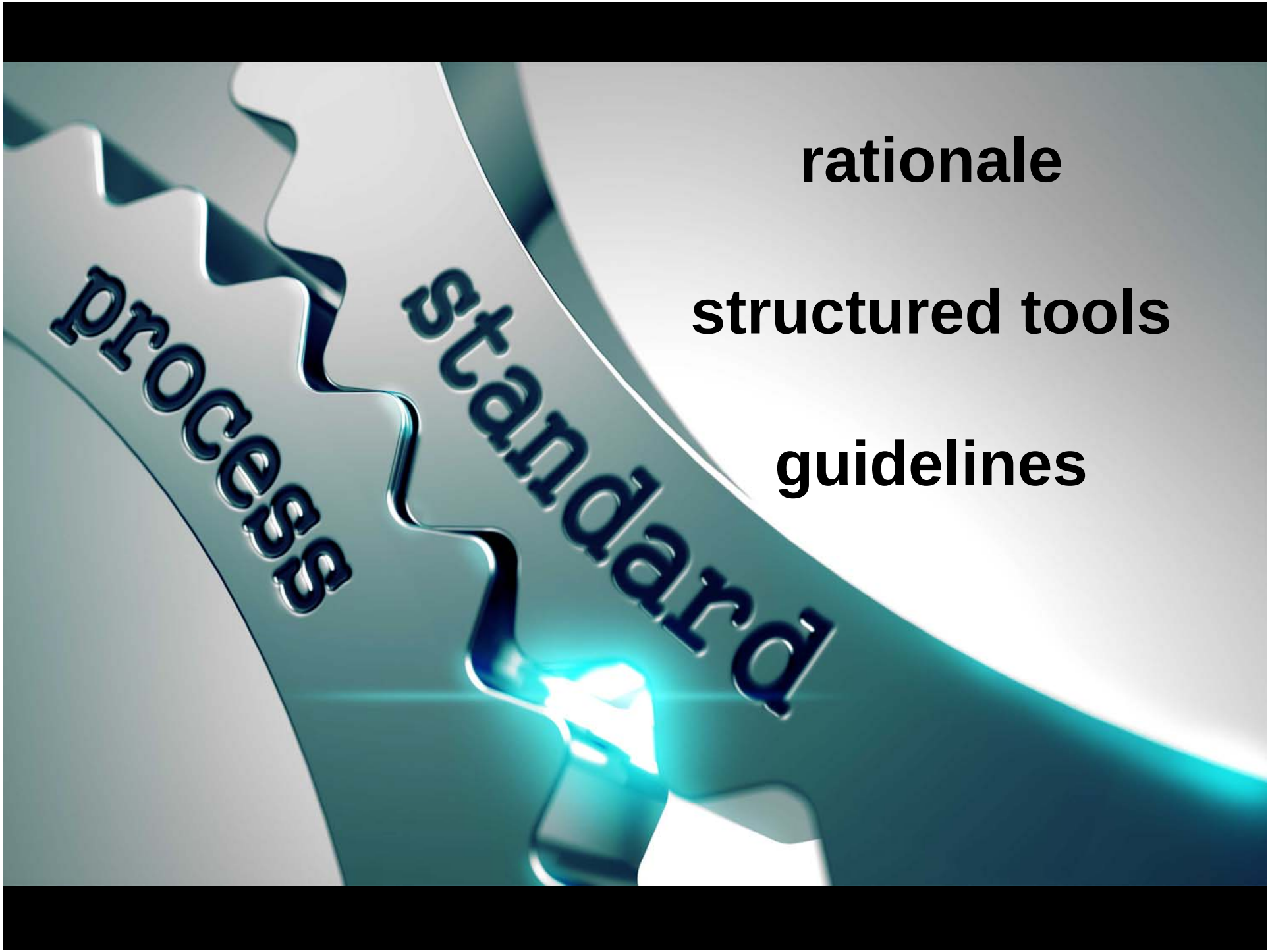
Massive Hemorrhage Protocol:

When is the right time?

FRCPC
Team Leader
St.
Assistant Professor, University of Toronto
Associate Scientist, Li Ka Shing Knowledge Institute
@petros

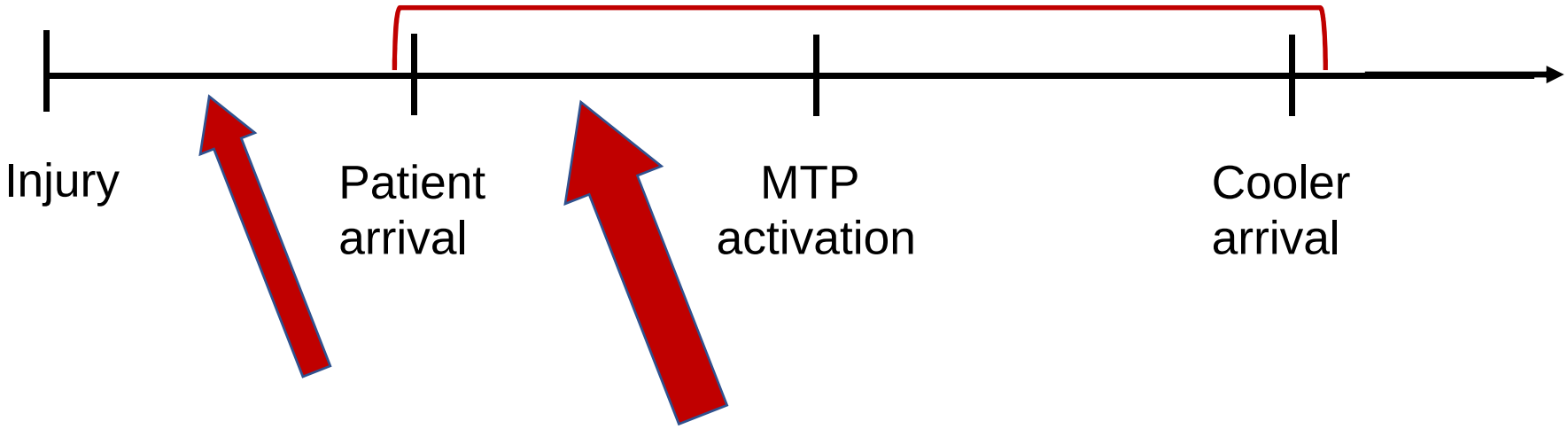
No financial disclosures

Research grants from RCPSC, PSI and St. Michael’s Hospital

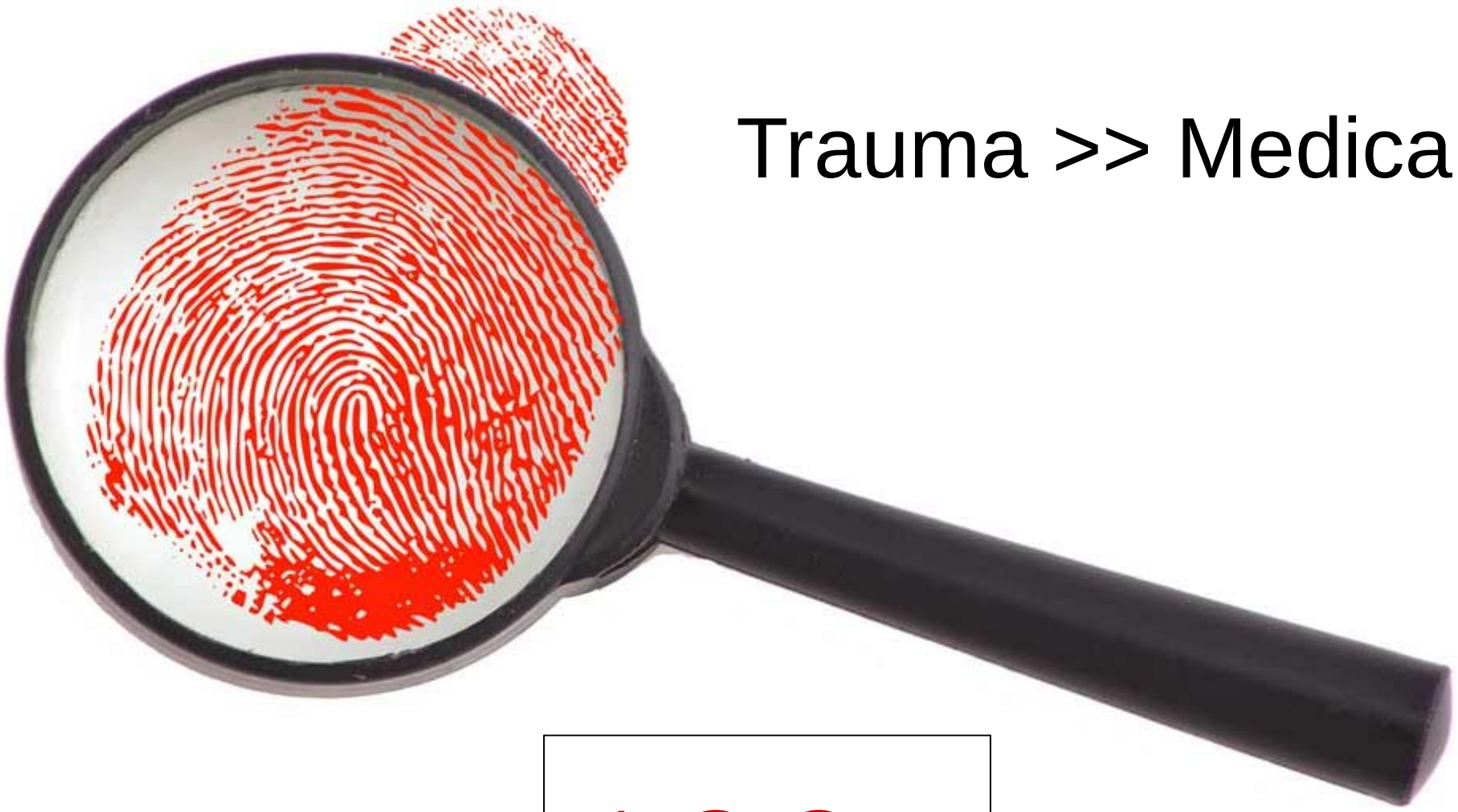

process
standard
rationale
structured tools
guidelines


5% odds
mortality
1 minute
delay
Meyer et al. J Trauma 2017

Door-to-cooler time



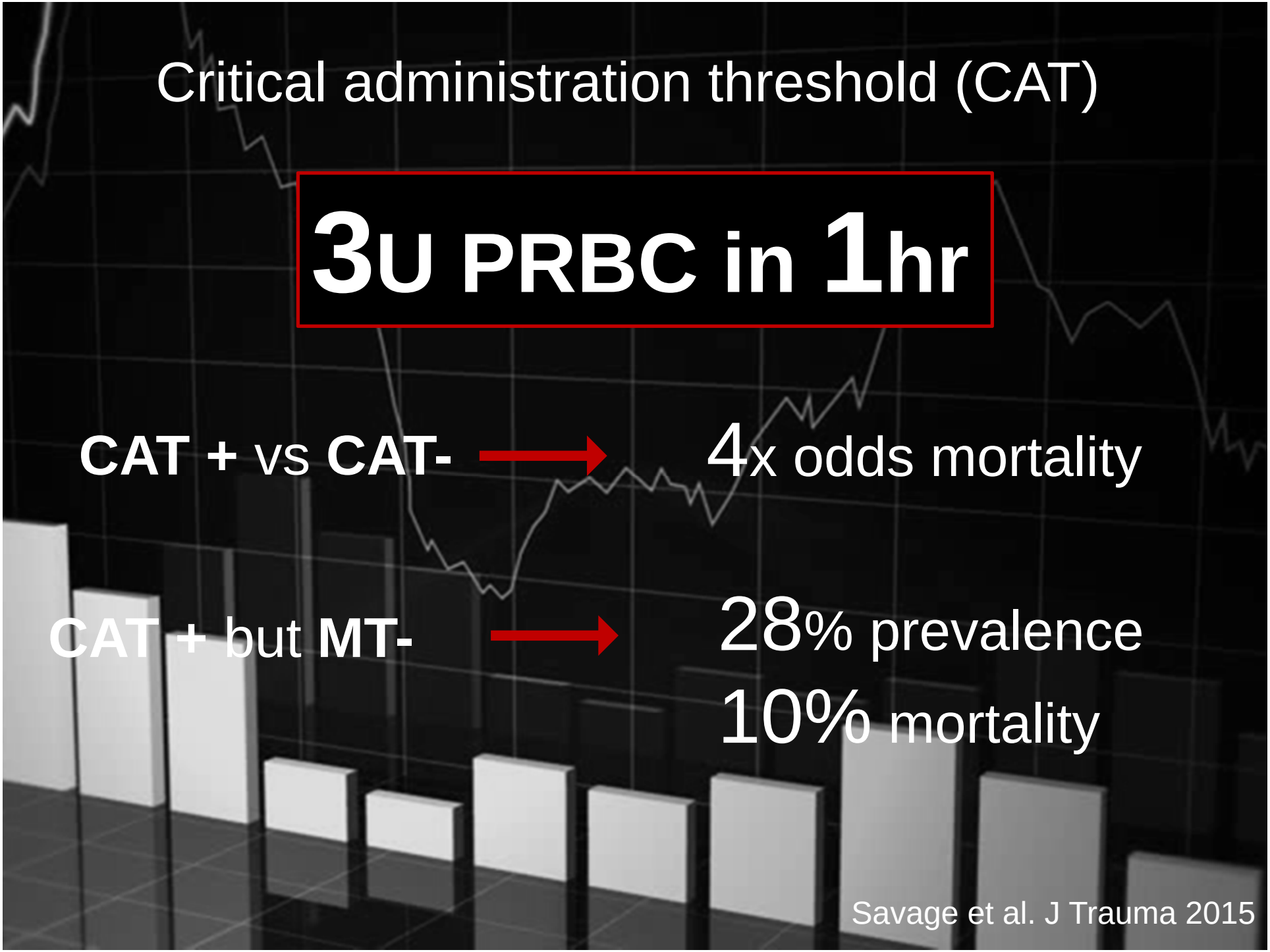
optimize activation



Trauma >> Medical

100x

Retrospective: **10U PRBC in 24hrs**


Critical administration threshold (CAT)
3U PRBC in 1hr
CAT + vs CAT- → 4x odds mortality
CAT + but MT- → 28% prevalence
10% mortality
Savage et al. J Trauma 2015

predicting massive transfusion

trauma surgeons

65% Sn

63% Sp

Pommerening et al. Injury 2015

Scoring tools

Clinical only

vs

Labs required

Penetrating injury

Positive FAST

sBP <**90**

HR >**120**

≥ 2 = MTP

Cotton et al. J Trauma 2010

ABC Score

<6hrs after arrival

87% Sn

82% Sp

* US Trauma centres

Cotton et al. J Trauma 2010

$$\text{Shock Index} = \frac{HR}{sBP}$$

SI > 1.0 predicts MT

Mutschler et al. Crit Care 2013

	Sn	Sp
TASH	31%	93%
PWH	31%	99%
McLaughlin	59%	77%
ETS	97%	68%

M Tonglet, Arch Trauma Res 2016


transient hypotension
anticoagulation
elderly

clinical

mechanism

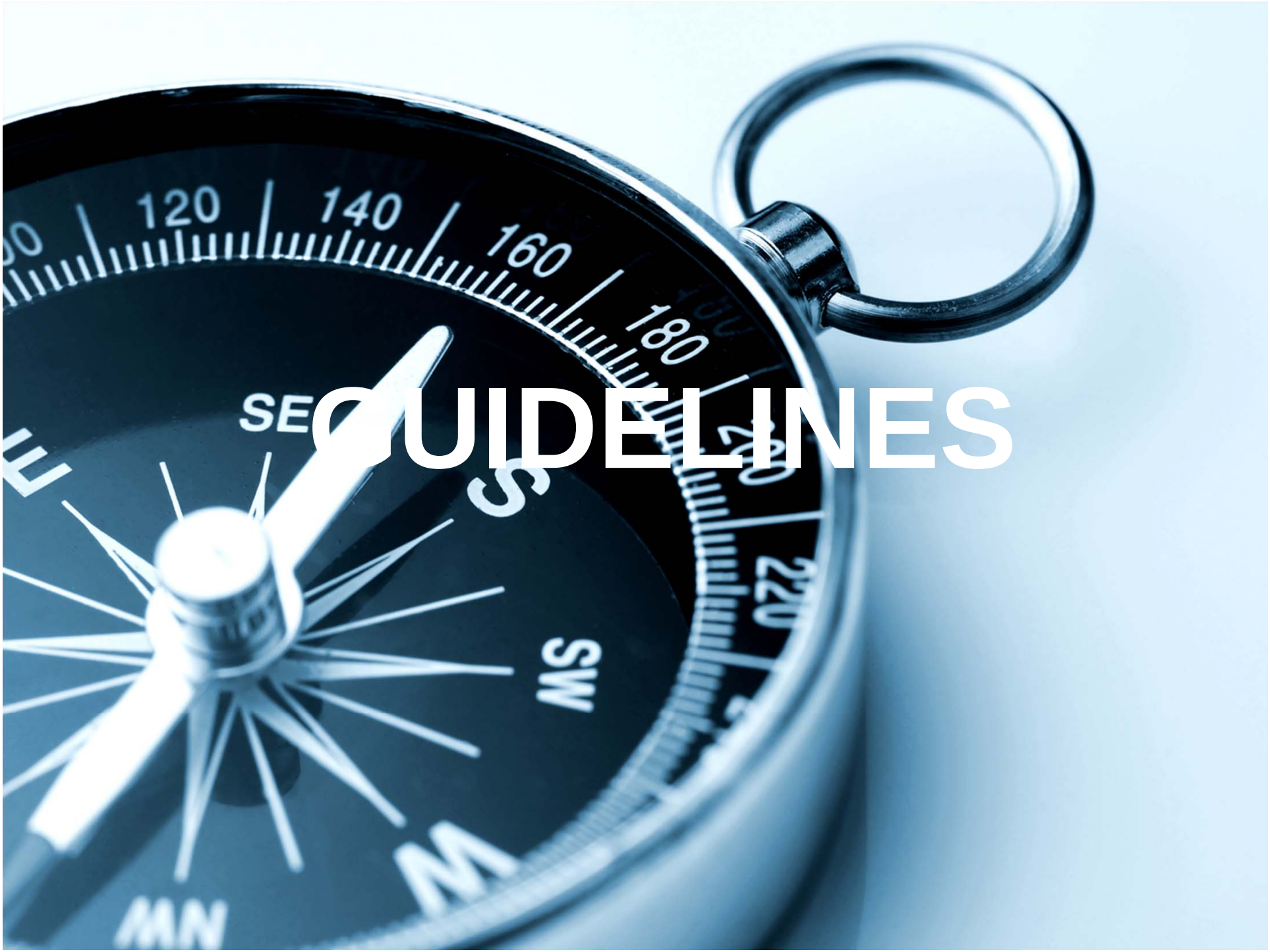
+

pitfall conditions

---

massive transfusion

FLUID = BLOOD = MTP


GUIDELINES

Guidelines: **European**

We recommend that the physician clinically assess the extent of traumatic haemorrhage using a combination of:

patient physiology

anatomical injury pattern

mechanism of injury

patient's response to initial resuscitation. (Grade 1C)

Rossaint et al. Crit Care 2016

Guidelines: **ACS TQIPS**

Criteria to trigger the activation of an MTP should include one or more of the following:

ABC score ≥ 2

Persistent hemodynamic instability

Active bleeding require OR or IR

Blood transfusion in the trauma bay

ACS Best Practice Guideline 2016

Guidelines: **NICE 2016**

*Use **physiologic criteria** that include the **patient's hemodynamic status** and **their response** to immediate volume resuscitation to activate the MHP*

***<u>Do NOT</u>** rely on a haemorrhagic risk tool applied at a **single point** to determine the need for MHP activation*

NICE Guidelines 2016

summary

critical administration threshold

“door to cooler”

epidemiologic considerations

structured approach

clinical assessment/gestalt

thank you

@petrosoniak

EVIDENCE : TRAUMA

balanced ratios ↑

product utilization ↓

wastage ↓

complications ↓

Cantle & Cotton. Crit Care Clin 2017
Foster et al. Anesth Analg 2017

EVIDENCE : Non-TRAUMA

balanced ratios ↑

time to blood delivery ↓

morality benefit

NO EVIDENCE

Foster et al. Anesth Analg 2017


ATLS shock classification
10%
Mutschler et al. Resuscitation 2013