Epidémiologie et bio-mécanismes

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DAR HIA Percy (92)

Murray CJ Lancet 1997;349:1498-504

Alternative projections of mortality and disability by cause 1990–2020: Global Burden of Disease Study

Disorder	Ranking		Change in ranking
	1990	2020 (baseline model)	
Within top 15			
Ischaemic heart disease	1	1	0
Cerebrovascular disease	2	2	0
Lower respiratory infections	3	4	↓1
Diarrhoeal diseases	4	11	↓7
Perinatal disorders	5	16	↓11
Chronic obstructive pulmonary disease	6	3	↑3
Tuberculosis	7	7	0
Measles	8	27	↓19
Road-traffic accidents	9	6	↑3
Trachea, bronchus, and lung cancers	10	5	↓5
Malaria	11	29	↓18
Self-inflicted injuries	12	10	↑2
Cirrhosis of the liver	13	12	↑1
Stomach cancer	14	8	↑6
Diabetes mellitus	15	19	↓4
Outside top 15			
Violence	16	14	↓2
War injuries	20	15	↑5
Liver cancer	21	13	↑8
HIV	30	9	↑21

Research article

Open Access

A review of injury epidemiology in the UK and Europe: some methodological considerations in constructing rates

Roxana Alexandrescu*[1], Sarah J O'Brien[2] and Fiona E Lecky[1]

BioMed Central

2009

Table 1: International comparisons of injury population - based rates of major trauma

Author and date	Population size (million)	Place/time period	Adjust. for age	Inclusion of pre-hospital deaths	Description of the numerator	Rate (100,000 per year)
Welsh et al. 1996 [30]	0.85[1]	Newcastle upon Tyne, UK/1990	N	Y	Injuries ISS>9	408
Petridou et al.2005 [74]	0.001[11]	Helvetikos, Greece/ 1994-1995	N	Y	Injuries ISS>4	6000
Quinlan et al. 1995 [64]	3.3	Mersey Region and North Wales, UK/ 1989-1990	N	N	Blunt injuries ISS>15	19.8
McNicholl & Cooke 1995 [61]	1.5	Northern Ireland/ 1986-1991	N	N	Injuries ISS>15	23.2
Di Bartolomeo et al. 2004 [78]	1.3	Friuli Venezia Giulia, Italy/1998-1999	N	Y	Injuries ISS>15	52.2
Demetriades et al. 1998 [91]	9.4	Los Angeles, USA/ 1996	Y	Y	All trauma cases in the registry	151.8
Petridou et al. 2004 [31]	2.6	San Diego, USA/ 1987-1997	Y	Y	All trauma cases in the registry	195.8
Kumar et al. 2005 [92]	>1[111]	Calgary, Canada/ 1999-2000	N	Y	Injuries ISS>15	71.5
Cameron et al. 1995 [101]	4.2	Victoria, Australia/ 1993-1994	N	N	Injuries ISS>15	25.6

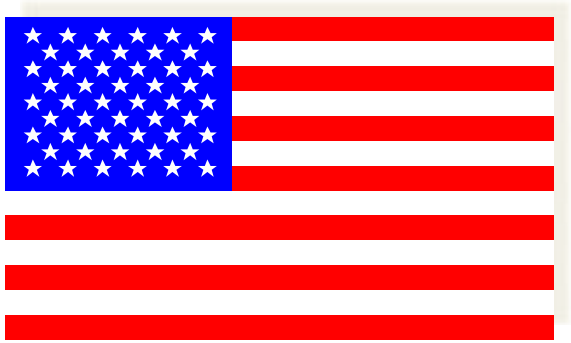
Mortalité en France

INED 2005

Maladies cardiovasculaires	313
Cancer	196
Traumatismes	60
SIDA	5

Pour 100 000 habitants

Traumatologie = 1ère cause mortalité des 15 – 35 ans



Aspects socio-économiques des Traumatismes

Bulger J Trauma 2007

➔ 57 millions de blessés par an
2 millions d'hospitalisations
150 000 décès

➔ Soins aigus : 16 milliards $ (2002)
Soins de suite, handicaps, déficits
150 milliards $ (2002)

→Années de vie perdues

→Années productives gaspillées

Le type de lésions

Base NHDS

2 107 955 patients hospitalisés pour trauma

Dépenses estimées : 11,4 milliards $

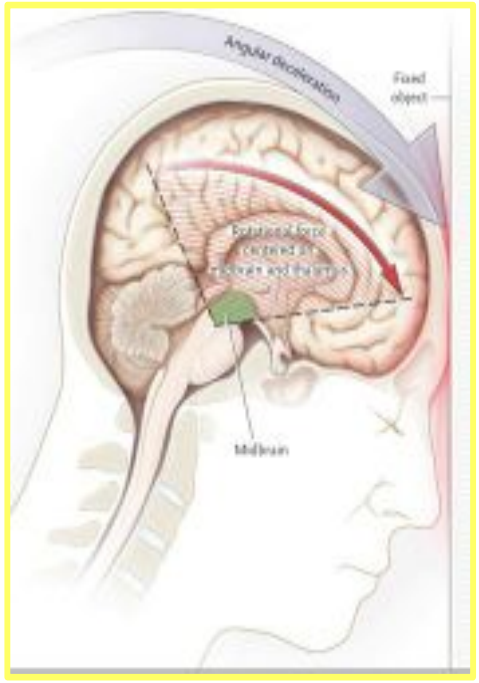
Lésion principale	Volume	Coût relatif
Traumatismes crâniens		
Ensemble des patients	14 %	20 %
Tr. Crâniens AIS ≥ 3	4 %	15 %
Traumatismes rachidiens	1 %	3 %

MacKenzie EJ et al. J Trauma 1990;30:1096-1101

GCS 15 et PCI

Glasgow Coma Scale Score	No. (%) of Patients			Total
	Neg			
13	114			151 (4.7)
14	478			568 (17.9)
15	2277			2462 (77.4)
Total	2869			3181 (100)

Smits M JAMA 2005



TC **PCI** : 45 % séquelles **à 4 mois**

Hoge C NEJM 2008

L’importance de la prévention

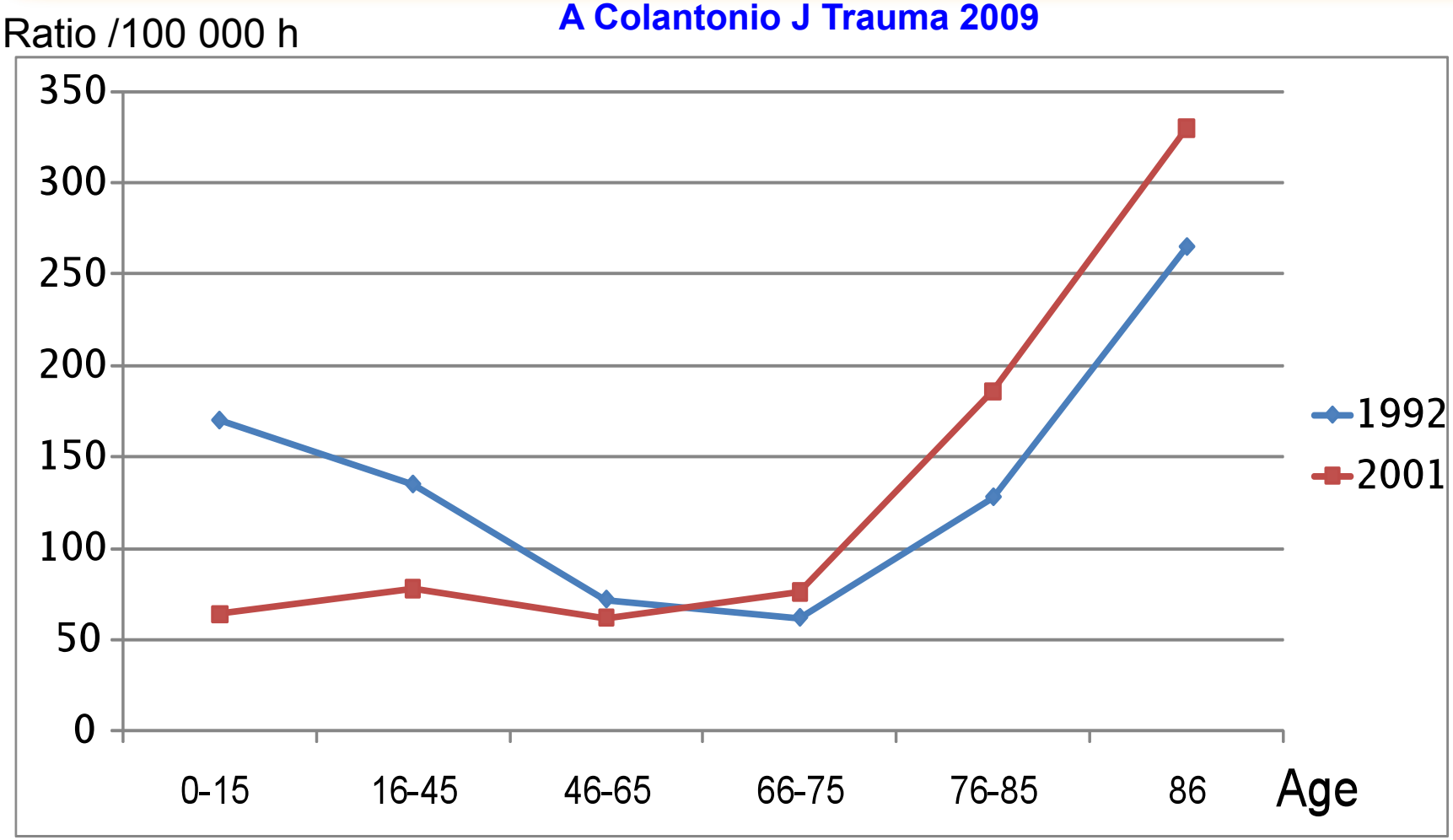
17 TCG/100 000 h (1996) vs 24 /100 000 h (1986)

Masson J Tr

IDF : 3 TCG / 100 000 h (2007)
44 % [15-35] ; 26 % > 55 ans

Epidemiologie des TC avec lésions intracrâniennes en fonction des tranches d'âge
Ontario 1992–2002

A Colantonio J Trauma 2009



The Necessity to Assess Anticoagulation Status in Elderly Injured Patients

Trevor M. Williams, MD, MPH, Javid Sadjadi, MD, Alden H. Harken, MD, and Gregory P. Victorino, MD

J Trauma. 2008;65:772–777.

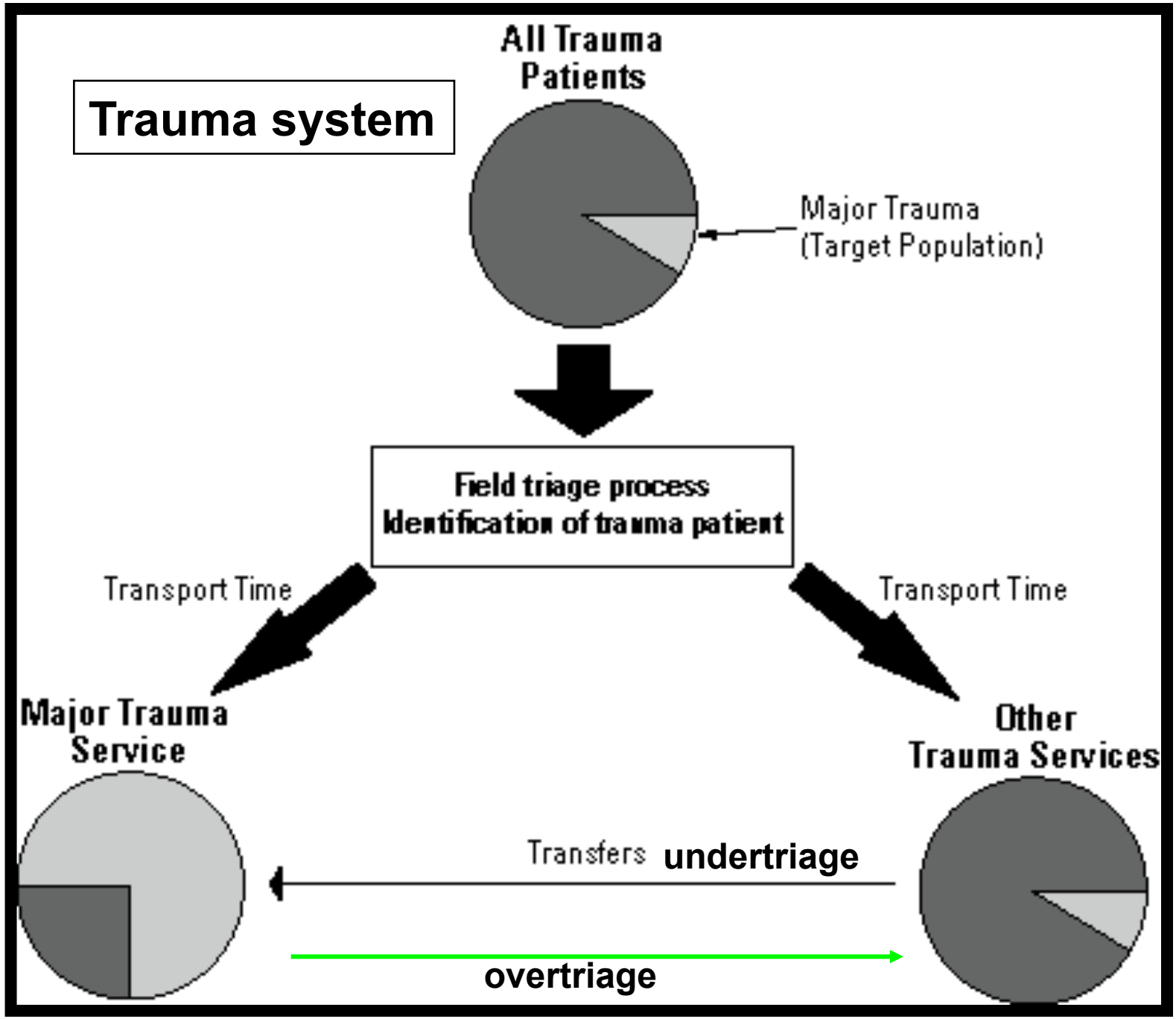
Table 2 Patients 50 Years and Older With Admission INR Assessed

	INR <1.5, n (%)	INR >1.5, n (%)	*p* Value
Total	1,149 (100)	102 (100)	
Male	719 (62.6)	58 (56.9)	0.25*
Median age (range)	66 (50–101)	79 (50–95)	<0.001†
Median ISS (range)	8 (0–66)	9 (0–57)	0.64†
Falls	462 (40)	52 (50)	0.03*
Mortality	94 (8.2)	23 (22.6)	0.0001*
Median INR (range)	1 (0.81–1.5)	2.3 (1.52–18.4)	

Traitement par AVK et survenue d'un traumatisme crânien

Howard J Trauma 2009

	−Warf, n = 2,254 (% Mortality)	+Warf, n = 534 (% Mortality)	OR (95% CI)	*p*
All	129 (5.7)	46 (8.6)	1.54 (1.09–2.19)	0.015
AIS head <4	49 (3.9)	13 (2.4)	1.63 (0.55–4.79)	0.377
AIS head (4 and 5)	80 (16.0)	33 (23.7)	1.63 (1.03–2.58)	0.035
and GCS (14–15)	24 (6.4)	13 (13.5)	2.30 (1.12–4.70)	0.019
and GCS (9–13)	16 (30.2)	7 (38.9)	1.47 (0.48–4.49)	0.496
and GCS (≤8)	38 (65.5)	11 (57.9)	0.72 (0.25–2.09)	0.549
GCS (14–15)	51 (3.3)	22 (5.3)	1.66 (0.99–2.77)	0.050
GCS (9–13)	24 (18.1)	8 (26.7)	1.65 (0.66–4.15)	0.285
GCS (3–8)	41 (52.6)	11 (52.4)	0.99 (0.38–2.61)	0.988


Trauma system
All Trauma Patients
Major Trauma (Target Population)
Field triage process Identification of trauma patient
Transport Time
Transport Time
Major Trauma Service
Other Trauma Services
Transfers undertriage
overtriage

Essential components of trauma systems in USA

Presence of a lead agency with legal authority to designate trauma centres

Use of a formal process for designation of trauma centres

Use of American College of Surgeons' (or similar) standards for verification of trauma centres

Use of an out-of-area survey team for designation of trauma centres

Mechanism to limit the number of designated trauma centres in a community on the basis of community need

Written triage criteria that form the basis for bypassing non-designated centres

Presence of continuous monitoring systems for quality assurance (eg, trauma registry)

Statewide availability of trauma centres

AB Nathens Lancet 2004;363:1794-801

Trauma related by level of trauma care

Nathens AB J Trauma 2004;56:173-78

Level	N	All trauma patients n(%)	Major trauma patients n (%)
1	119	139,740 (27%)	23,235 (41%)
2	167	90,573 (17%)	12,320 (22%)
Non designated center	2031	293,577 (56%)	20,396 (37%)

Evaluation of a Mature Trauma System

Rodney Durham, MD, Etienne Pracht, PhD, Barbara Orban, PhD, Larry Lottenburg, MD, Joseph Tepas, MD, and Lewis Flint, MD

Ann Surg 2006

TABLE 7. Marginal Cost Per Life-Year Saved and #P Value of Life Year Calculations

Mean cost per admission	
A. Designated trauma hospitals	$11,825
B. Non-trauma hospitals	$8,028
C. Additional cost associated with treatment in trauma hospital	$5,797
D. Improvement in odds of survival	0.178
E. Marginal cost per life saved	$32,514
F. Life expectancy for a 31-year-old (all races and sex)*	43.6
G. Marginal cost per life-year saved	$746
Mean charge per admission	
H. Designated trauma hospitals	$57,643
I. Non-trauma hospitals	$35,772
J. Additional charge associated with treatment in trauma hospital	$21,865
K. Improvement in odds of survival	0.178
L. Marginal charge per life saved	$122,758
M. Life expectancy for a 31-year-old (all races and sex)*	43.6
N. Marginal charge per life-year saved	$2,815

Impact of minimal injuries on a level I Trauma Center

344 ISS ≤ 4 / 2927	*Emergency Department*	*Trauma Team*
Nombre de patients	135 (39%)	209 (61%)
Ambulance	135	118
Hélicoptère	0	91
Trauma Score	7 – 12	5 - 12
GCS	11 - 15	11 - 15
Procédures invasives	2.5 (0-10)	4.0 (0-15)
Dms Réanimation	1.2 (0-2)	1.4 (0-12)
Dms Hôpital	2.6 (1-18)	2.8 (1-36)
Coût du séjour ($)	1566	3836

Hoff WS et al. J Trauma 1992

Trauma Team Activation and the Impact on Mortality

Robert A. Cherry, MD, Tonya S. King, PhD, Daniel E. Carney, MD, PhD, Patrick Bryant, MD, and Robert N. Cooney, MD

J Trauma 2007;63:326-30

Table 1 Composition of Trauma Teams by Level of Activation

Level 1 trauma team
- Trauma surgery attending
- Emergency medicine attending
- PGY4 or PGY5 surgical resident
- 1–2 Junior surgical residents
- Anesthesiology attending
- Anesthesiology resident
- PGY3 radiology resident or attending
- 2 Emergency department nurses
- 1 Chaplain
- X-ray personnel
- EMT

Level 2 trauma team
- Emergency medicine attending
- PGY4 or PGY5 surgical resident
- 1–2 Junior surgical residents
- Anesthesiology attending
- Anesthesiology resident
- PGY3 radiology resident or attending
- 2 Emergency department nurses
- 1 Chaplain
- X-ray personnel
- EMT

Level 3 trauma team
- Emergency medicine attending
- Emergency medicine PGY 1 resident
- Emergency medicine PGY 2 resident
- Trauma services PGY4 resident
- 1 Emergency department nurse
- 1 Chaplain
- X-ray personnel
- EMT

Table 5 Age, ISS, Hospital LOS, and Mortality for the 3 Types of Trauma Activations

	Level 1, N = 174	Level 2, N = 287	Level 3, N = 33
Age	41 (25–55)	43 (28–58)	42 (28–57)
ISS*	22 (14–34)	14 (9–21)**	10 (5–17)*
Hospital LOS*	7 (3–18)	4 (2–7)**	3 (2–5)*
Mortality (2 wk)*	17%	3%**	0%
Mortality (4 wk)*	21%	6%**	0%
Mortality (6 wk)	26%	25%	3%

Let the Surgeon Sleep: Trauma Team Activation for Severe Hypotension

Marc J. Shapiro, MS, MD, Jane E. McCormack, RN, BSN, and James Jen, MD

J Trauma 2008

Mécanismes

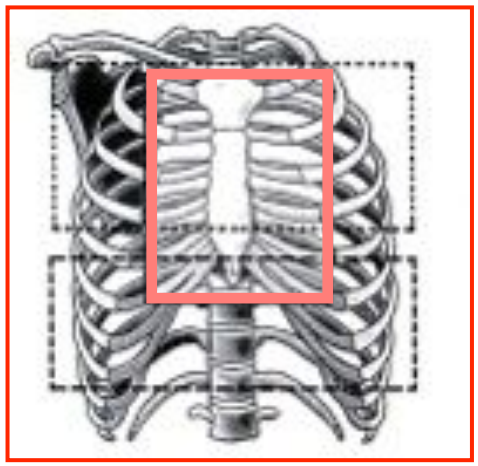
Mobile en mouvement
vs.
Mobile en mouvement

Mobile en mouvement
vs.
Obstacle fixe

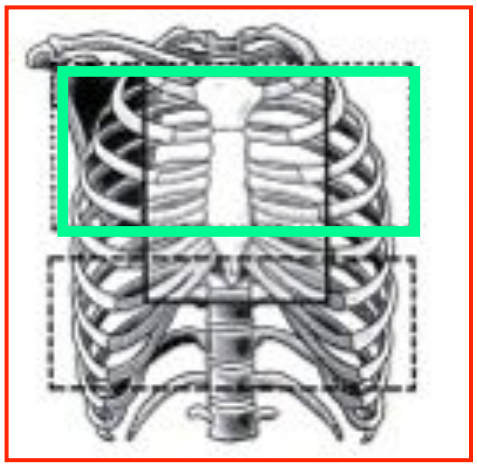
Compression directe
Décélération

Armes blanches

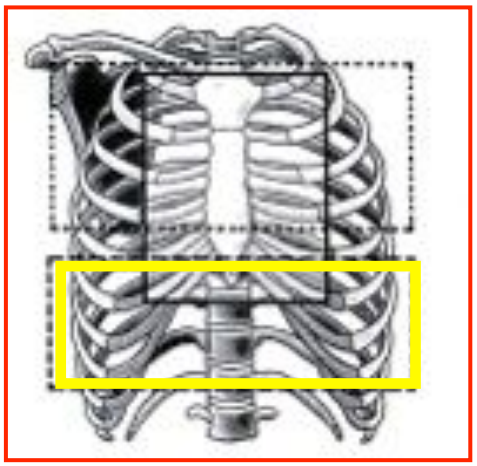
Attention aux structures sous-jacentes



Coeur



Gros vaisseaux



Abdomen

Balistique terminale

- Energie
- Type de projectile (chemisée ou non)
- Distance, position
- Tissus et organes (réplétion..)

Canette vide

Sortie

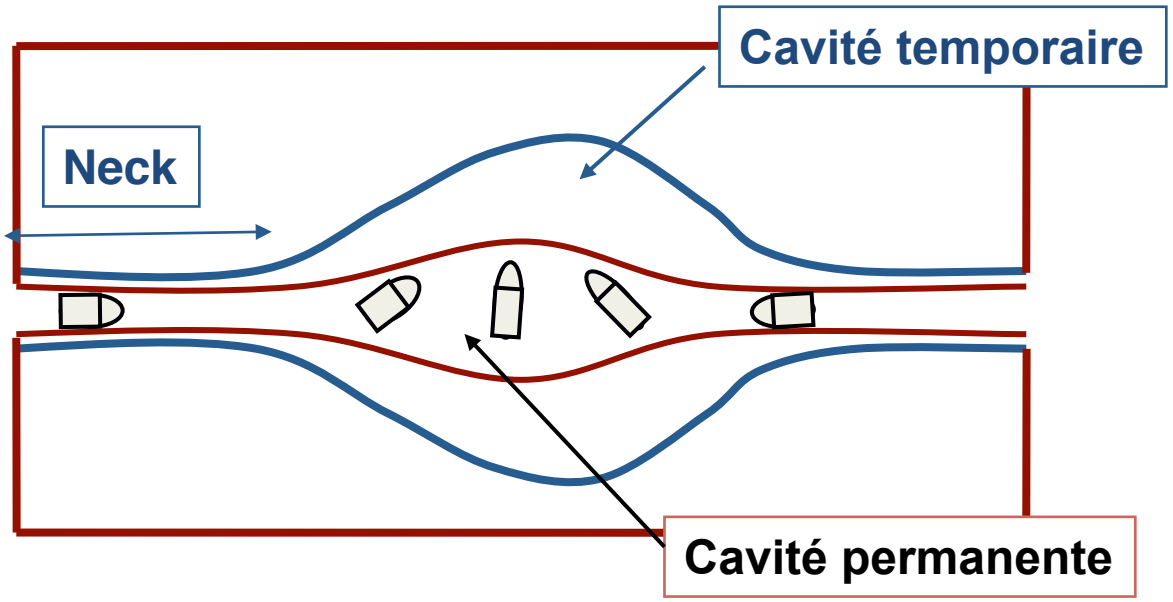
Entrée

Canette pleine

Volgas DA. Injury 2005;36:373-9
Houdelette P. Med Armées 1997;25:155

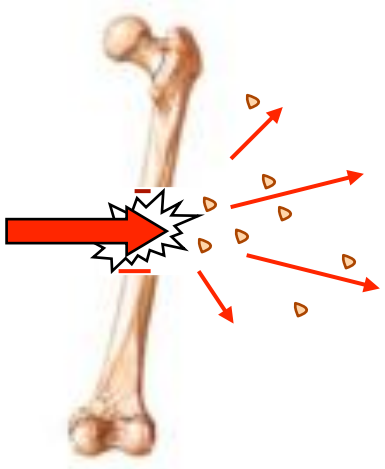
Balistique terminale

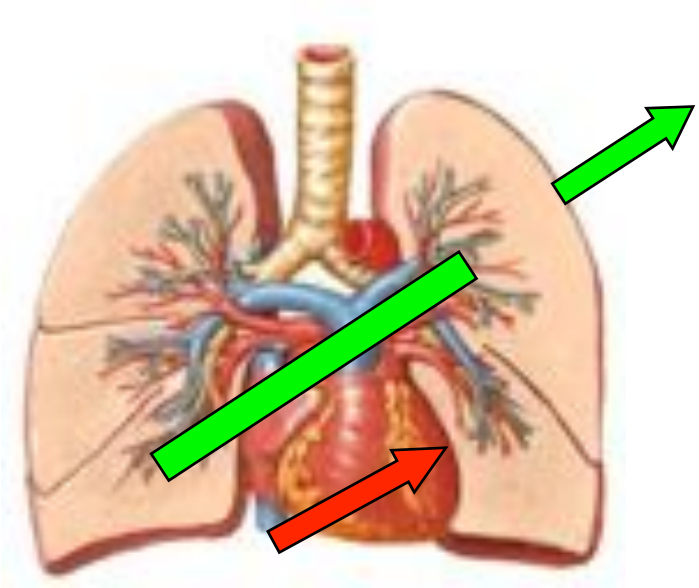
- Tirs sur bloc de gélatine
- Détermination d'un profil lésionnel



Fackler ML. J Trauma 1988;28:S21-9.

Interactions avec les tissus

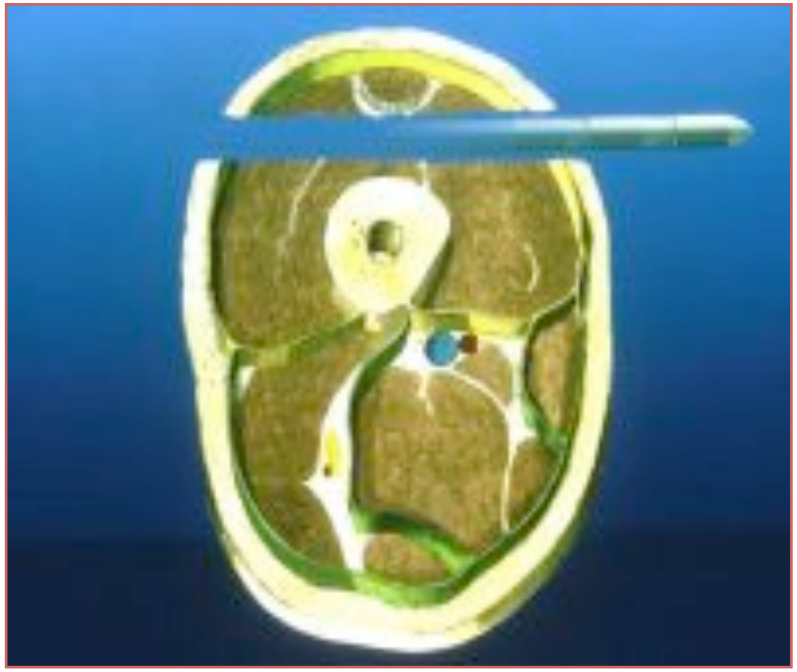


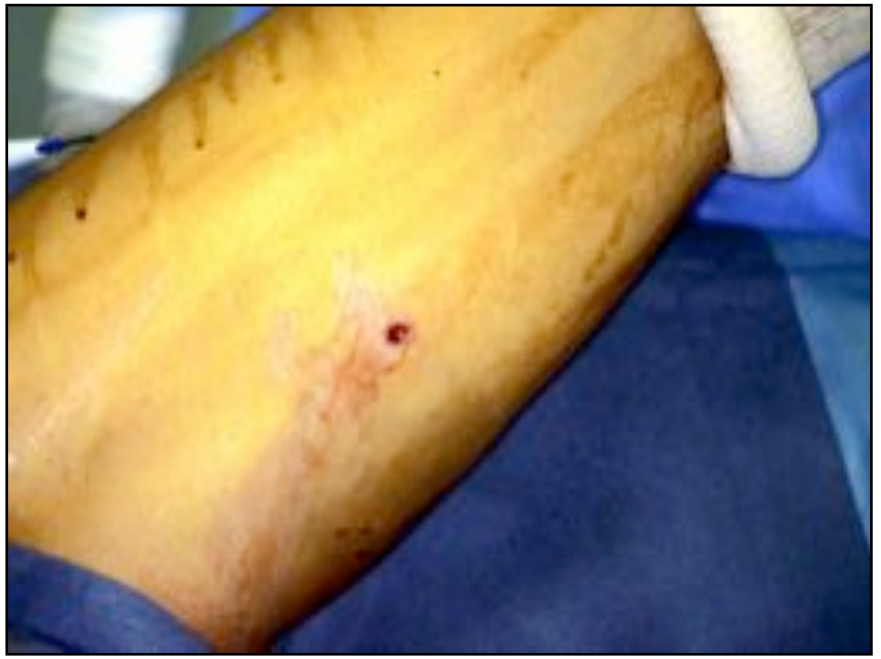


densité élevée, élasticité faible ou nulle

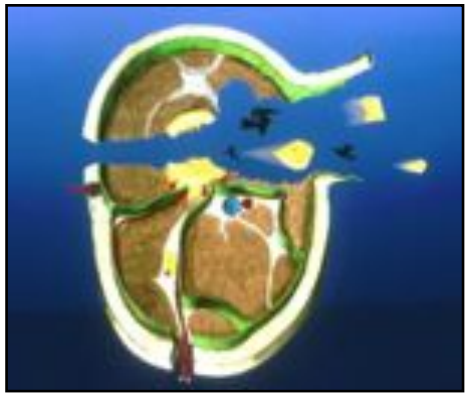
densité faible, élasticité élevée

Trajet court, pas d'obstacle





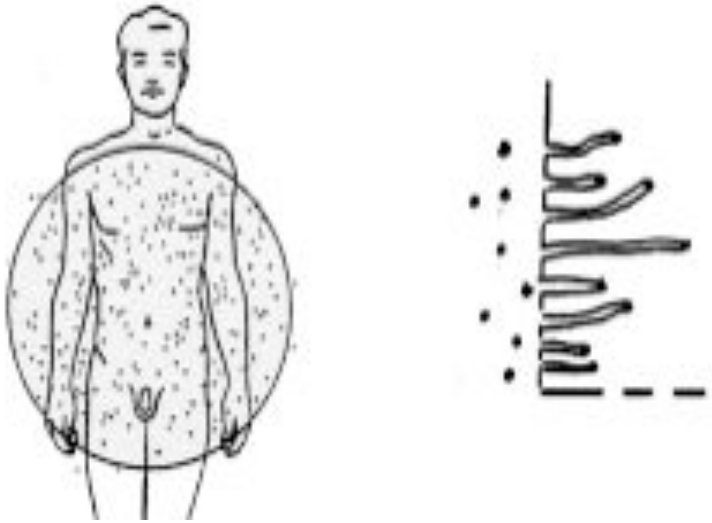
Déviation, fragmentation



Arme de chasse

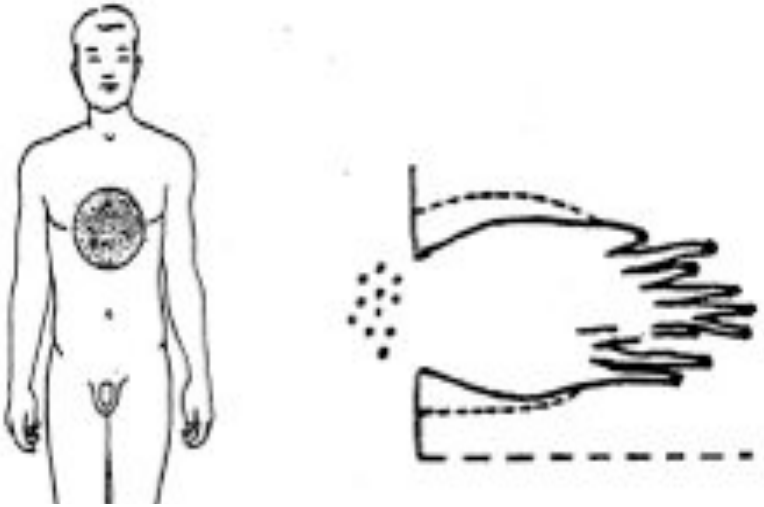
Type 1 : grande distance = polycriblage superficiel

Type 2 (> 3 m)



polycriblage profond

Type 3 (0 à 3m)



effet emporte-pièce