Six-Hours-Rule – A Dogma for Military Surgery?

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Today, the six-hours-rule is a delicate item for military logistics and it is a great challenge for medical services to provide an adequate treatment during the first hours after wounding.

Up to now " Six-hour-rule has never been validated..." (R. Coupland, 1989)

DEFINITION

Six-hour-rule (NATO-ACE-Directive Number 85-8):

A principle of support given by the medical service. Surgical treatment should take place as soon as possible, but at last **six hours** after wounding. This principle directs the location of the first line surgical unit, which can provide **life-saving** and limb-saving surgical procedures. The unit must be reachable within 4 hours after wounding.

HISTORY

The rule is the result of traditional surgical experience. Early wound debridement and open wound treatment led to postprimary, secondary healing without infection. Sepsis and death were mostly caused by un-done, late or wrong wound treatment. The rule respects the intolerance of ischemia of traumatised tissue, especially of the skeletal muscle. In addition, the six-hours-rule considers the physiological pathway of contaminated wounds. Germs penetrate healthy tissue with 1mm per hour. Many studies show that the spreading of infection can be reduced by early infusions of potent antibiotics. In this case the virulence of most the common germs will be three to fife times less.

TREATMENT STANDARDS IN CIVILIAN CASES OF POLYTRAUMA

Investigations in civilian polytrauma cases show death in 50 % during trauma, 30 % within 2 hours and 20 % caused by multi-organ-failure after 10 to 21 days. Mean rescue times of 20 to 40 minutes are usual.

Reduction of rescue time improves the chances to survive.

CONSEQUENCE

Depending on priority (P) of the injury:
P 1 –severe:
life-threatening haemorrhage, occlusion of airways
- 6-hours-rule not useful

Paper presented at the RTO HFM Symposium on "Combat Casualty Care in Ground Based Tactical Situations: Trauma Technology and Emergency Medical Procedures", held in St. Pete Beach, USA, 16-18 August 2004, and published in RTO-MP-HFM-109.

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
01 SEP 2004	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Six-Hours-Rule A Dogma for Military Surgery?	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Military Hospital Ulm Department of Surgery Oberer Eselsberg 40 D-89075 Ulm Germany**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
See also ADM001795, Combat Casualty Care in Ground-Based Tactical Situations: Trauma Technology and Emergency Medical Procedures (Soins aux blessés au combat dans des situations tactiques : echnologies des traumas et procédures médicales durgence)., The original document contains color images.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**UU**	**6**	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18

P 2 - less severe-
fractures of long bones (bullet, shell), severe damage of soft tissue, thoracic/abdominal trauma without life-threat
- 6-hours-rule is restrictedly useful

P 3 -moderate-
Wounding of soft tissue, not-penetrating wounds
- 6-hours-rule is crucial, with a prolongation of the time factor by the additional use of antibiotics

P 4 -lethal-
Deleting, complex injury pattern
- 6-hours-rule is senseless

SITUATION OF THE GERMAN MEDICAL SERVICE

Adequate and best medical treatment of the victims is the political decision: immediately - professional - complete.

".. In case of wounding all German soldiers must be provided with medical procedures which must be comparable with a result provided at home..."(GE surgeon general,1993)

By consequence, treatment according the six-hour-rule is mostly not appropriate - polytraumatised soldiers should reach clinical treatment within "**the golden hour**".

The logistical challenge is to guarantee a modern, up-to-date medical care in field conditions.

LITERATURE

[1] Bunn F., I. Kwan et al., Effectiveness of Pre-Hospital Trauma Care, Cochrane Injuries Group, 2001,http://www.cochrane-injuries.lshtm.ac.uk

[2] Kanz K.-G., J.A. Sturm, W. Mutschler, Algorithmus für die präklinische Versorgung beim Polytrauma, Unfallchirurg 2002,105:1007-1014

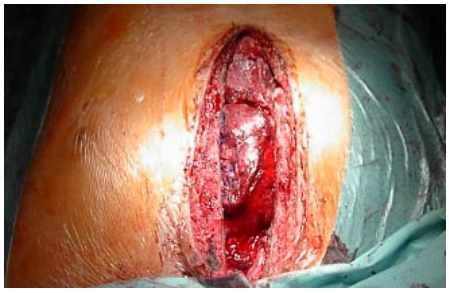
[3] Bowler P. G., B. I. Duerden, and D. G. Armstrong, Wound Microbiology and Associated Approaches to Wound Management, Clinical Microbiology Reviews, 2001, Vol. 14(2):244-269

[4] Schlechtriemen T. et al., Präklinische Versorgung von Traumapatienten in der Luftrettung, Unfallchirurg 2002 ,105: 974 – 985

[5] Osterwalder J.J., Der Einfluß von Rettungs- und Versorgungszeiten auf den klinischen Verlauf und die Ergebnisse beim Polytrauma. Schweiz. Med. Wschr.1992;122:1571-1581

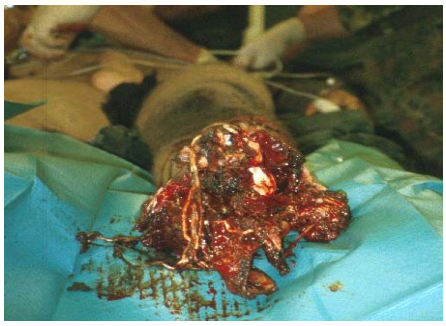
[6] American College of Emergency Physicians, Clinical Policy for the Initial Approach to Patients Presenting With Penetrating Extremity Trauma, Ann Emerg Med.1999;33(5): 612-36

ILLUSTRATIONS



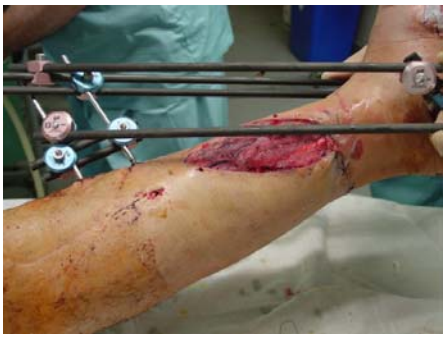
Penetrating abdominal trauma – Open surgical treatment

Penetrating lung trauma



Mine Injurie

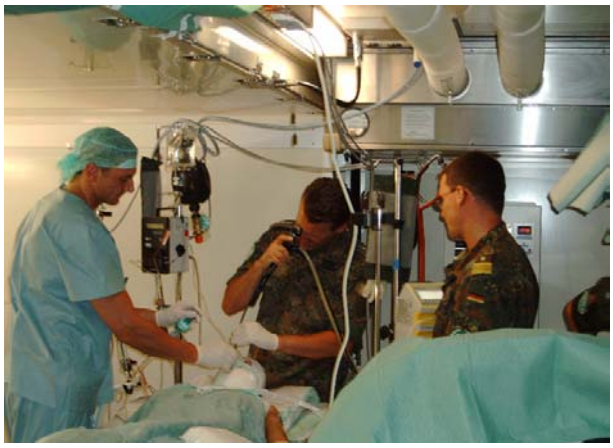
Penetrating extremity trauma



External fixation – Mine-trauma

Wounded transported to the Kabul Field Hospital

CT-scan - Kabul Field Hospital



ICU - Kabul Field Hospital

Air transport

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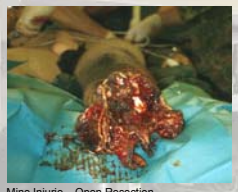
Penetrating abdominal trauma
– Open surgical treatment


Penetrating lung trauma
– lung resection


Mine Injurie – Open Resection


Penetrating extremity trauma
– external fixation


Mine injury, extremity trauma
– external fixation

History:
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CT-scan - Kabul Field Hospital


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