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

Col. Heinz Gerngroß, MD, PhD and
Lt.Col. Wilhelm Kahle, MD, PhD
Military Hospital Ulm
Department of Surgery
Oberer Eselsberg 40
D-89075 Ulm
Germany

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 five 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

**Title:** Six-Hours-Rule A Dogma for Military Surgery?

**Performing Organization:**
Military Hospital Ulm Department of Surgery Oberer Eselsberg 40
D-89075 Ulm Germany

**DISTRIBUTION/AVAILABILITY STATEMENT**
Approved for public release, distribution unlimited

**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 : technologies des traumas et procédures médicales durgence), The original document contains color images.
Six-Hours-Rule – A Dogma for Military Surgery?

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


ILLUSTRATIONS

Penetrating abdominal trauma – Open surgical treatment

Penetrating lung trauma

Mine Injurie

Penetrating extremity trauma
Six-Hours-Rule – A Dogma for Military Surgery?

External fixation – Mine-trauma

Wounded transported to the Kabul Field Hospital

CT-scan - Kabul Field Hospital
Six-Hours-Rule – A Dogma for Military Surgery?

ICU - Kabul Field Hospital

Air transport
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 undone, 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 of the commin g germs will be three to five 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
- **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:**
  - Deleterious, 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