



The Village University - save lives, save limbs

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Tromsø Mine Victim Resource Center

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Epidemic of Trauma

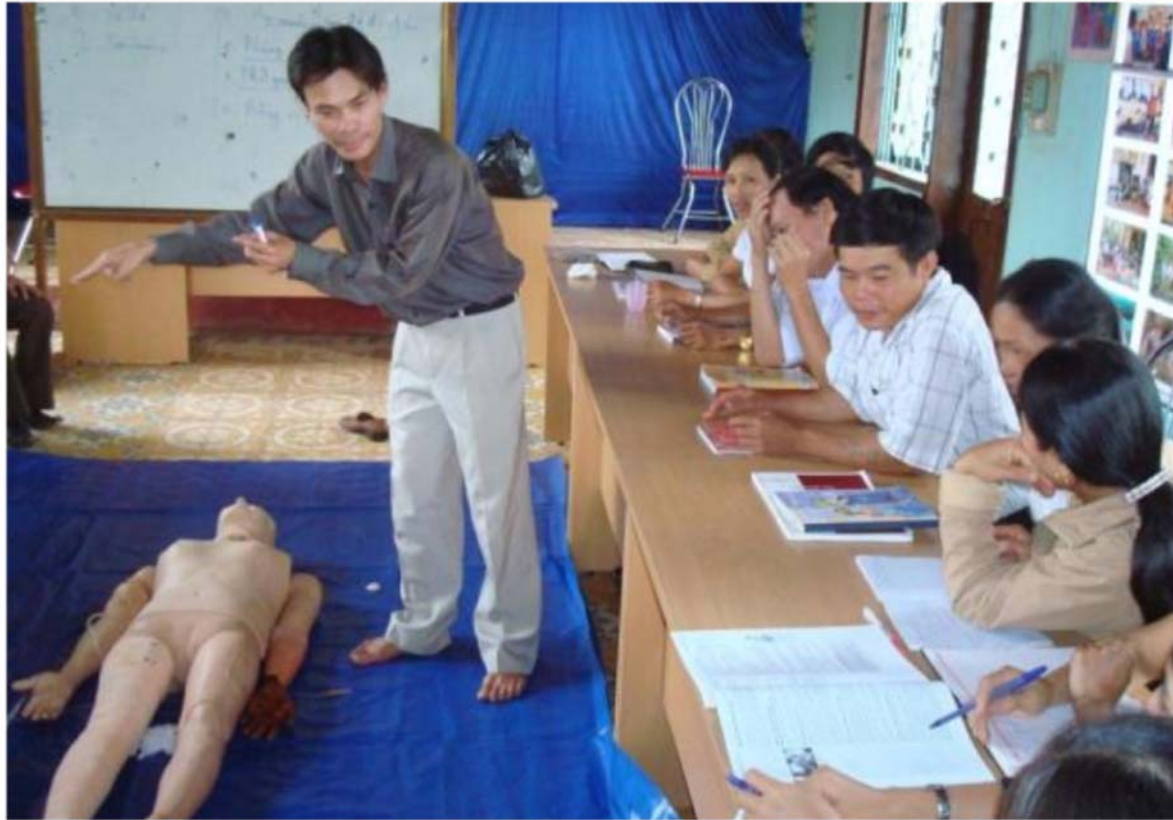
- Every day around the world **16,000 people** die from injuries (1)
- A worldwide epidemic of trauma is on, and it is accelerating. Injury is now the **4th leading cause** of global deaths.
- WHO estimates a **further 40% increase** in global deaths from injury up to year 2030 (2,3)
- According to estimates from the World Health Organization (WHO), almost 90% of deaths due to injuries occur in low/middle-income countries



The war continues

- Every 10 minutes' a person is hit by a land mine or unexploded cluster munitions somewhere in the world.
- Most likely the victim is a poor farmer or one of his family members.
- Out of ten mine victims, four or five will die before reaching a hospital unless somebody is there to provide life support on the way (4,5)

The Village University



Picture from training of Village First Helper in Dong Ha, Vietnam. December 2007.

Principles

- **Confidence:** We all learn better when feeling confident and at home.
- **Troubleshooting:** Identify the problem, and solve it.
- **Learning by doing:** Lectures constitute not more than 25% of the course, and practice should always follow classroom sessions.
- **Local control:** After three years, the students should have the capacity to perform as local instructors.

(6)

Teaching Manual

A handbook for medics and medical teachers

Save Lives Save Limbs

Life support for victims of mines, war, and accidents



Third World Network

Hans Husum

Mads Gilbert
Torben Wisborg

Foreword by
Nobel peace prize laureate
Pau Monchu

Advanced life support



How to place chest tube drain

A minor fragment can injure the chest wall so that blood or air collects inside the chest cavity and makes the lung collapse. When you insert a plastic tube through the chest wall and drain out the blood and the air, the lung expands against the chest wall. This will stop the bleeding.

Reasons to use chest drain

It stops bleeding inside the chest. The bleeding normally comes from rib arteries. When blood and air are drained out by the tube, the collapsed lung will expand if the victim breathes deeply. When the lung is fully expanded and presses against the chest wall, the bleeding points are washed off – and bleeding stops.

It improves the breathing. The lung collapses when blood and air collect inside the chest cavity. The victim is breathing with the other lung only, but the breathing is poor and rapid. It is urgent to inflate the collapsed lung. That can only be done by a chest tube drain. It prevents "tidal flapping". If blood is not drained, it clots and forms scar tissue. Non-elastic scar tissue attached to the lung makes the lung stiff.

It prevents chest infection. All fragment wounds are dirty and full of bacteria – so are chest wounds. Blood collecting inside the chest is excellent food for bacteria. An abscess will form unless the blood is drained.

The examination

Find the wound in the chest wall. Unless the patient completely, wash off blood and dirt. The wound may be tiny – yet it may be life threatening. Also check the victim's back.

Compare breathing sounds

The injured lung is partially collapsed, so the breathing sounds are weaker over this side of the chest. Use a stethoscope or place your ear at the chest wall and compare the breathing sounds over both lungs.

If in doubt: Puncture with needle. Insert a large-bore needle (20 size) through the chest wall in the area where you think there are weak breathing sounds. Let the needle slide through the chest wall at the upper edge of a rib to enter out to hit a rib artery. One of two things may happen: If air releases through the needle when you enter the chest cavity, you probably hit the pneumothorax – insert a chest tube. Or, if you can draw blood through the needle into the syringe, you probably hit the hemothorax: insert a chest tube.

If you are still not sure if there is blood or air inside the chest – but the victim has a chest wound and breathes poorly – or there is a chest wound and signs of blood loss:

Place a chest tube!

See our story p. 122.

Study the anatomy: See p. 211 and 212.

To assess breathing problems: See p. 48.



Are the lungs injured? Cover RR and compare breathing sounds to find out.

Equipment you need

- Soap and clean water.
- Soft plastic tube 10-12 mm wide.
- Kwik.
- 2 pairs of large artery forceps.
- Sutures (large curved) cutting needles) or adhesive tape.
- Suction apparatus or a bottle with soap solution (see p. 92).
- More on medical kits: See p. 161.



THE ANSWER IS ALWAYS THE CHEST TUBE – THE ANSWER IS THE EFFECT!

How to place chest tube drain

Give IV ketamine anesthesia. Cut 1 small side-hole in the tube, and clamp it with an artery forceps 15 cm from the tube end. Wash the chest with soapy water if there is time for it.

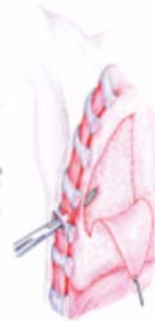
Ketamine: anesthetic. See p. 104.



Make a 3-4 cm skin cut parallel to the ribs at the level of the nipples (pink), over hanging tissue.



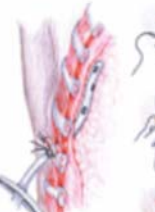
Push the other pair of forceps through the chest wall into the chest cavity. Let the forceps slide over the upper edge of ribs. You hear a snapping sound when you penetrate the pleura. You have to use some force, so support the forceps with one hand against the chest wall, so else you may slip into the lung by mistake.



Open the forceps and withdraw it to make a tunnel. Push your finger through the tunnel and feel inside the chest cavity. This is to make sure that the lung is off the inner chest wall.



Push the tube through the tunnel until 15 cm is inside. Note: The tube is still clamped with the first pair of artery forceps.

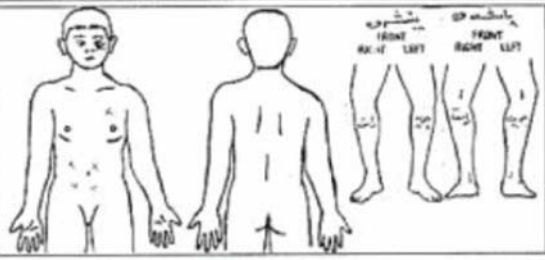


Set two deep skin sutures (size 2-0) in the skin cut, one suture on each side of the tube. Use the sutures to fix the tube. You can also close the skin and fix the tube with adhesive tape.

How to use the chest tubes: See the next page.

Injury Charts

FIELD INJURY CHART No. 100 4960 10.

The patient	Name of individual patient <i>Michael Anaraki</i> home address <i>Tanzania</i>	Sex <input checked="" type="checkbox"/> M <input type="checkbox"/> F	Age <i>2 yr.</i>		
The weapon	Where did it happen <i>Tanzania</i>	When did the injury happen <i>12-9-99</i> <i>4:10 P.M.</i>			
First help	Which type of weapon or other weapon <i>Unknown type of UYO</i>	How far was patient from the explosion source <i>infant's house</i>			
Describe the injury	Name of other patients injured by these accident <i>nil</i>				
Describe the injury	Did first help reach the patient Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> How many first help <i>1</i>	When did first help reach <i>1</i>			
Describe the injury	What kind of first help: open wound <input type="checkbox"/> bone bleeding <input type="checkbox"/> head wound <input type="checkbox"/> infection	Other first help			
Describe the injury	How was the patient transported from the site of accident On foot <input type="checkbox"/> Helicopter <input type="checkbox"/> Airplane <input type="checkbox"/> Taxi <input type="checkbox"/> Ambulance <input type="checkbox"/> Other <input type="checkbox"/>	Where was the patient injured			
Describe the injury	Did the patient come with something on Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> type of something: Rope <input type="checkbox"/> String <input type="checkbox"/> clothes <input type="checkbox"/> Tree bark <input type="checkbox"/> other <input type="checkbox"/>	Describe the main injury <i>injury to left eye - small shell</i> <i>inferior to eye through the lower eyelid</i>			
Describe the injury	Describe the other injuries <i>four shell injury to head</i> <i>one shell to chest</i>				
Describe the injury					
Describe the injury	Breath per Min	4 3 2 1 0	Temp	When was the examination done	
Describe the injury	10-24 Min	25-35 30-60	+35 +50	No breathing No pulse	<i>12-9-99</i>
Describe the injury	Blood pr	50-60 to sound	Only to pain	No response	<i>4:15 P.M.</i>
Describe the injury	Mental res	Normal Semi-conscious	C	Time	

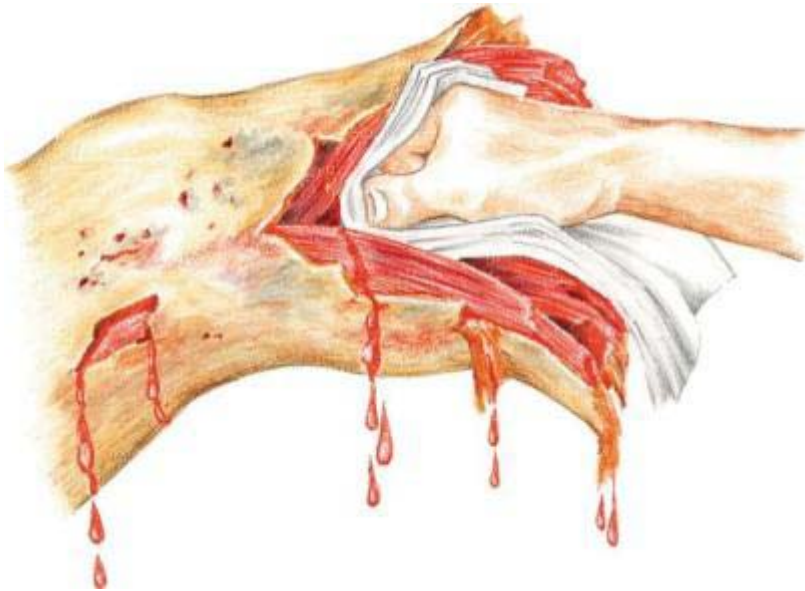
- The learning and training are also supported by the injury chart.
- Injury charts serves as a checklist for examination and also for treatment.
- The paramedics report that injury chart is useful for evaluating their own job.
- It is also used by local supervisors to ensure high quality of care.

About "Save Lives, Save Limbs"

- "Save Lives, Save Limbs" is a manual in basic and advanced trauma care for health workers in countries affected by the mine epidemic and the epidemic of injuries in general.
- Lots of clear drawings help the reader understand procedures, and a large number of photographs of real injuries from the fields makes it practical and useful for health workers, medical and nursing students, medical doctors and lay people.
- "The Village University" teaching model is described in detail.

1/3 OF ALL
MINE DEATHS
ARE DUE TO BLOCKED
AIRWAYS. MOST OF
THESE DEATHS ARE
UNNECESSARY!





The training

1st training course, Basic Life Support, 150 hours

- Understand 'oxygen starvation'
- Clinical examination, BLS and CPR
- Focus on trauma victims with injured limbs

Working period, 4–6 months

- Stabilize and evacuate trauma victims
- Teach Village First Responders

2nd training course, Advanced Trauma Life Support, 150 hours

- Rehearsal of BLS/CPR skills
- Focus on 'the difficult airway'
- Advanced CPR

Working period, 4–6 months

- Stabilize and evacuate trauma victims
- Teach Village First Responders

3rd training course, Advanced Trauma Life Support, 150 hours

- Rehearsal of course 1 and 2
- Focus on chest injured
- Nutrition for trauma victims

Training Village First Helpers

- We encouraged the students to build grassroots networks of first responders in order to
 1. reduce the response time from injury to the first skilled help in-field
 2. anchor knowledge and capability of treatment in the local community, and
 3. give the students practical experience as teachers

Airways



- His fields were too small to feed the family. There was no time to wait for the professional mine learners, so he had to clear new land himself.
- That was when he hit the mine.
- Now he needs someone to keep his airways open.

Breathing



- He was herding cattle with his brother when a mine of unknown type was released and injured both of them.
- A fragment hit his chest and tore up the lung.
- The blood was drained by a chest tube; the medics gave him efficient painkillers so that he could breath well. That's why he survived.

Circulation

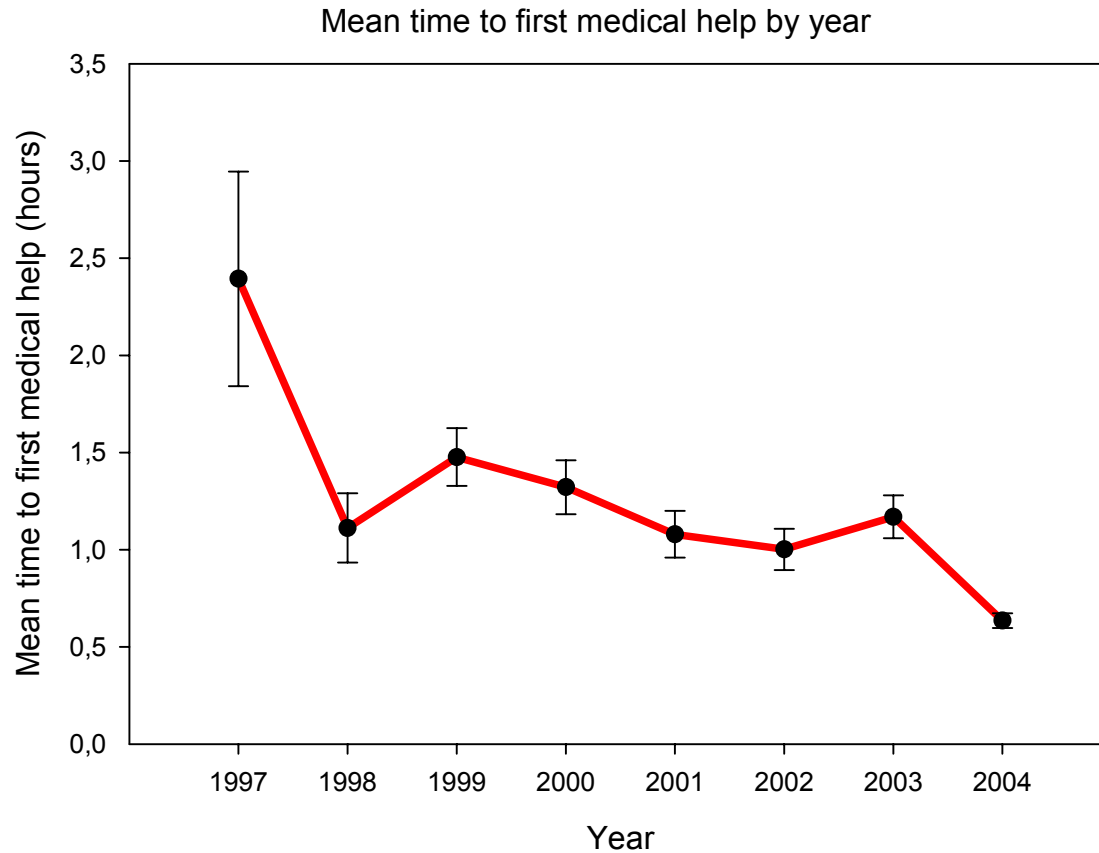


- Trained villagers have packed the amputation wounds with gauze and placed long compressive dressings.
- Not one drop of blood is lost during the transport.

Do they need a doctor?

- Yes!
- But when there is no doctor, they need someone to keep the airway open, support breathing and stop the bleeding, so that they could come alive to the doctor.
- The doctors is too far away.

Time to first medical help

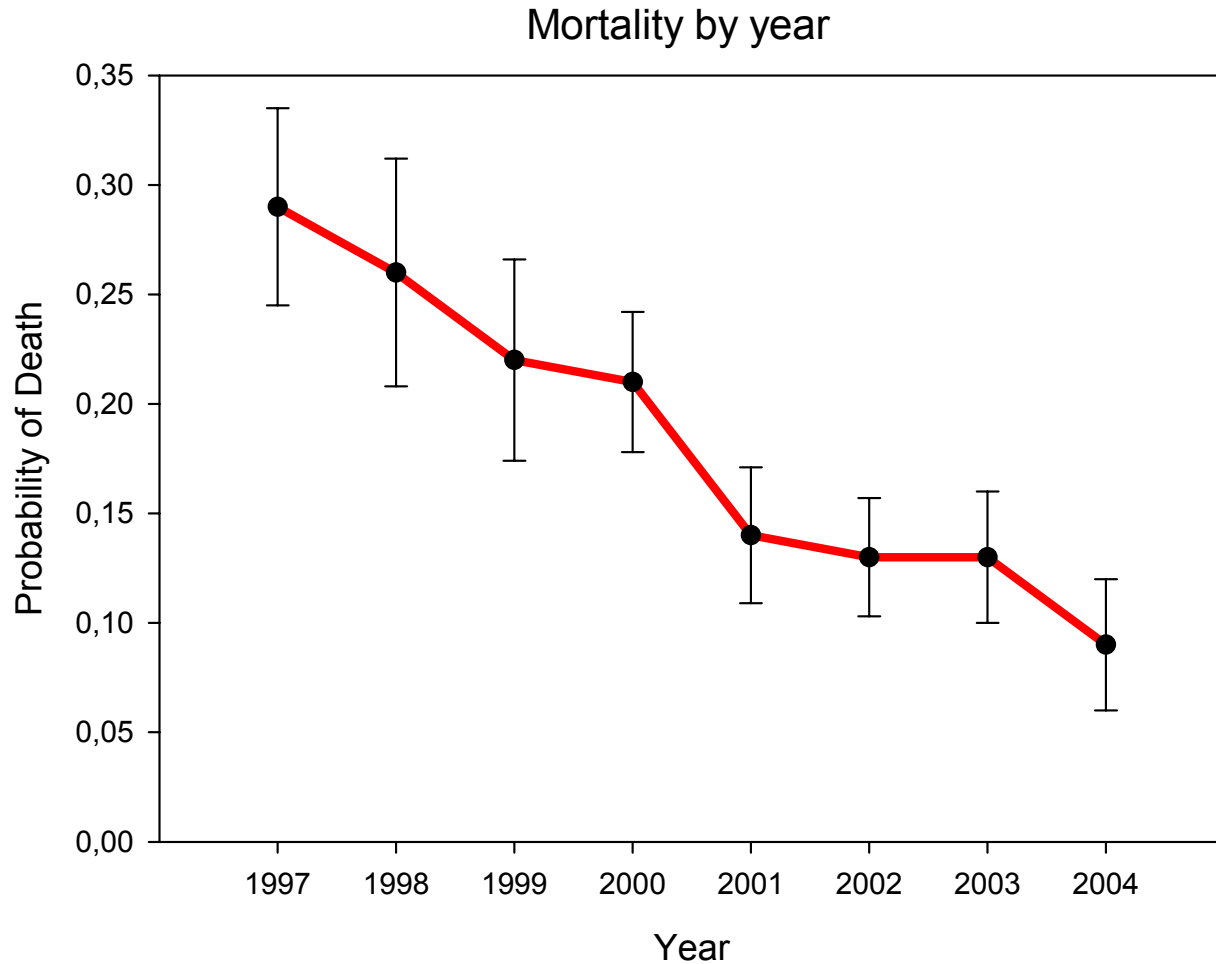


(data from North Iraq 1997-2004)

Results

- After implementation of a rural rescue system, there was a significant reduction in trauma mortality from 26.2% in 1997 to 11.8% in 2001 (7).
- This shows that low-cost prehospital trauma systems improve trauma outcome in land mine victims where prehospital transit times are high.

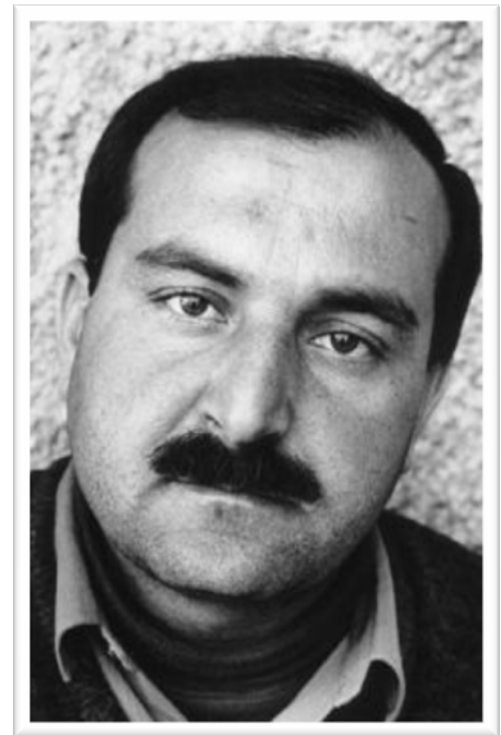
Sustainability



(data from North Iraq 1997-2004 $N=919$)

Paramedic retention

- In North Iraq:
Out of 88 paramedics certified in the years 1996-2004, 63 of them was still present in program in November 2005.



Osman Hama Salah has trained several hundred first helpers during years as a paramedic

Courses in medical research

- The theory of science. Research ethics.
- Study design. Research protocols.
- Controlled clinical trials.
- Basic biostatistics.
- Trauma Registry analysis.
- Quantitative studies: Scientific writing.
- Qualitative methods: Data gathering.
- Qualitative methods: Analysis. Scientific writing

Current research

- **Trauma care as mass mobilization**
 - What makes a survivor?
 - Qualitative and quantitative studies inside the minefields to explore trauma care – not only as medical interventions – but as a structured social response by the affected communities.
 - Self-help groups for long-term post-injury rehabilitation.
- **Delegating life saving skills to staff in District Hospitals**
 - TMC explores the capacity of the local Rural District Hospital, running training programs that delegate life-saving surgical skill to local medical assistants.
- **Early Temporary Walking Aid**
 - Most disabled survivors in the South suffer from incapacitating pain syndromes. Can Early Temporary Walking Aid made of local materials by local technicians prevent chronic pain and promote function?

Current research (2)

- **Post-injury malaria – the Poor Man’s burden**
 - Post-injury malaria is a common complication to primary surgery in malaria endemic areas. Post-injury malaria is a risk factor for wound infection and protracts recovery. We are now exploring measures to prevent the complication, affecting millions living in equatorial areas.
- **Delivery Life Support**
 - The death tolls of mothers and newborn in the rural South exceed by far the numbers being killed by land mines and accidents. TMC upgrades the trauma systems in Cambodia and Afghanistan to also manage deliveries.
- **Rural Blood Banking**
 - Trauma patients and bleeding mothers need blood! We are now exploring local solutions for safe blood transfusion in areas where HIV, hepatitis, and malaria is endemic.

Current research (3)

- **Pain relief**

- Does proper pre-hospital analgesia improve trauma-outcome by improved breathing and circulation in the victim? What is the best drug for pain-relief during the strenuous evacuation to the hospital? Retrospective data analysis and prospective clinical trials ongoing in Cambodia and Vietnam

- **Documentation and systematic data collection**

- Proper documentation in all stages of the chain of survival through ten years provides valuable data for comprehensive research. It is a gold-mine for retrospective and comparative studies to improve understanding of factors promoting survival and better outcome for poor trauma victims.
- New ways of evaluating impact are explored through film and video documentation.

Beyond survival...?



Trauma Care Foundation

- Trauma Care Foundation (TCF) is a movement of professional trauma care providers working in the mine fields and war zones in the rural South. Together with our partners we are operating rural trauma systems in Cambodia, Iraq, Afghanistan, Nepal and Vietnam.
- This movement of 20,000 trauma care providers in the South is coordinated by Tromsø Mine Victim Resource Center (TMC) at the University Hospital of North Norway.

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