March, 2010

Surgical response to catastrophe - learning from Canada’s experience abroad

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Surgical response to catastrophe - learning from Canada’s experience abroad

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Global Health

30 March 2010
HIPPOCRATES (ca. 460 BC – ca. 370 BC)
British Museum, second or third century B. C.
Fallen

Comrades
IN HONOUR AND MEMORY OF THOSE WHO SERVED IN THE GREAT WAR
EMBARGOED EMBARGOED 1914 1918
CANADIAN EXPEDITIONARY FORCE
NO 10 STATIONARY HOSPITAL

N. S. M. Wilson
S. A. J. Fox
P. A. Jones
J. H. Hoult
J. W. C. Brown
W. A. W. Hill
J. A. C. G. Macdonald
J. H. Macmillan
R. A. H. Macdonald
A. R. Macdonald
J. A. C. Macdonald
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J. A. C. Macdonal
IN HONOUR AND MEMORY OF THOSE
WHO SERVED IN THE GREAT WAR
EMBARKATION ROLL 1916 UNIVERSITY OF WESTERN ONTARIO
CANADIAN EXPEDITIONARY FORCE
NO. 10 STATIONARY HOSPITAL

1914 1918

N. S. B. M. WILSON  R. E. COUCH  P. T. J. JARROTT
H. J. WOOLSON  A. E. DALLIMORE  P. O. JOHNSTON
H. J. LILLIE  W. DALLIMORE  J. JONES
J. G. H. ROBSON  W. D. DAVIS  A. F. LACY
W. G. B. BAKER  J. W. DAWSON  BO. LAUR
T. E. B. BARTLETT  W. G. D. DUNSTON  E. OC. LAUR
R. H. BARTLETT  D. E. EVERINGHAM  D. A. LUMLEY
S. B. BARTLETT  E. H. EWEN  A. H. MACDONALD
A. F. B. BEGG  H. E. FAIRHALL  M. MALONEY
J. C. B. BOWIE  C. L. FYSH  W. C. MARTIN
R. A. BLACKWELL  A. GATECLIFF  E. C. McCAVE
T. L. GOWIE  S. A. A. GIBBS  R. L. TAYLOR
W. A. BLACKWELL  I. T. W. TAYLOR  L. B. H. THOMAS
F. R. HOWE  D. L. EVANS  E. C. TAYLOR

L. C. E. BRAITHWAITE  SGT. E. GREEN  PT. R. G. MCINTYRE
PT. C. E. BRYANT  J. G. GREEN  SGTL. S. THOMPSON
A. M. ROBERTSON  J. M. McDERMID  CPT. J. A. TOLLA
G. C. MURRAY  J. M. McLAUGHLAN  CPT. G. C. TOLE
A. H. B. R. B. C. CARRUTHERS  J. M. McINNIS  CPT. W. E. WRIGHT
A. R. D. R. C. B. EMERSON  W. G. MOORHEAD  CPT. J. E. WILDE
H. W. B. R. H. BURGESS  R. D. HARDING  SGT. C. A. WILCOX
A. M. C. A. C. T. H. HUBBARD  A. A. H. H. HAMMOND  SGT. C. A. WILSON
A. N. G. A. C. T. J. HUBBARD  A. C. J. HARDY  SGT. A. W. WILSON

* DIED IN SERVICE

CPT. J. T. PATON  SGT. J. H. S. RITCHIE
CPL. J. A. PARK  CLT. C. ROBERTS
CPL. J. A. PATTERSON  CLT. C. ROBERTS
CPL. J. A. PARK  CLT. C. ROBERTS
CPL. J. T. PATON  CLT. C. ROBERTS

* DIED IN SERVICE
Nursing Sisters of No. 10 Canadian General Hospital, RCAMC landing at Arromanches, France, July 23, 1944.

http://archives.cbc.ca/society/religion_spirituality/clips/6023/
Role 3 Multinational Medical Unit, Kandahar Airfield

- 6 general duty physicians or physicians assistants
- 2 surgical teams: 1 general surgeon, 1 orthopaedic surgeon, 1 anaesthetist, 2 nurses, 1 technician
- 1 maxillofacial surgeon
- 1 critical care physician
- 1 psychiatrist
- Radiologist (on-site or teleradiology)
6 year old boy.

High caliber bullet; entry right buttock / exit below right clavicle.

Injuries: right colon (X2); small intestine (X2); liver laceration; right lung laceration.

Initial operations: #1, chest drain; right hemicolecction; segment small bowel resection; pack liver #2, removal of abdominal packs.

Problem: recurrent intra-abdominal hemorrhage.
In-Theater Peritoneal Dialysis for Combat-Related Renal Failure

Joseph S. Pina, MD, Soraya Moghadam, MD, Howard M. Cushner, MD, Greg J. Beilman, MD, and Vivian C. McAlister, MB

Background: Complications of renal failure may prevent timely evacuation of injured soldiers. Conventional renal replacement therapy is not available in forward surgical units.

Methods: Records of in-theater improvised peritoneal dialysis (IPD) in level III hospitals or forward surgical units in Iraq or Afghanistan were reviewed to determine the following: cause of renal failure and associated injuries; type of dialysate, peritoneal access, and exchange technique; and patient outcome. These data were used to propose method for IPD using commonly available materials.

Results: IPD is described in four patients. Abdominal or chest drains were used with either improvised dextrose–electrolyte solution or commercial dialysate. Exchanges were successful, despite fresh surgical wounds including full laparotomy, removed excess fluid and restored acid and electrolyte balance, but did not correct azotemia. Open abdominal packing prevented continuation of IPD after 48 hours. Two patients fully recovered, one died, and one patient with a poor prognosis was lost to follow-up.

Conclusion: IPD can be delivered effectively using readily available materials in forward surgical units and level III combat support hospitals.

Key Words: Combat-related renal failure, Renal replacement therapy, Peritoneal dialysis.

(J Trauma. 2010;XX: 000–000)

assisted of HD or continuous renal replacement therapy (CRRT) and was supplied either on the USNS Comfort or in Landstuhl Regional Medical Center in Germany.4 Despite the paucity of literature on the use of PD in a combat hospital, PD can be provided easily in a deployed setting since the supplies required to perform this procedure are readily available at combat support hospitals and probably available at FST facilities. Other types of renal replacement therapy, such as CRRT and HD require dialysis filters and blood pumps, which are not part of the field hospital inventory and are difficult to supply in a combat zone. Although treatment of renal failure has progressed considerably in the last 50 years, the problem of dealing with acute renal failure (ARF) in a forward surgical setting has not yet been solved. In this article, we report independent attempts to sustain patients with ARF in the Afghanistan and Iraq theaters of Operations Enduring Freedom, Iraqi Freedom, and the International Security Assistant Force.

Levels of care in the combat theater (also known as echelons of care) are generally aligned with the combat unit the healthcare element is intended to support, i.e. battalions
Eye injury
<table>
<thead>
<tr>
<th>R3 MMU Sep 07 – Feb 09</th>
<th>OR log</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civilian</td>
<td>689</td>
</tr>
<tr>
<td>Afghan military</td>
<td>635</td>
</tr>
<tr>
<td>Detainee</td>
<td>48</td>
</tr>
<tr>
<td>Coalition military</td>
<td>303</td>
</tr>
<tr>
<td>Total</td>
<td>1675</td>
</tr>
<tr>
<td>R3 MMU Sep 07 – Feb 09</td>
<td>Mechanism of injury (number of patients)</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Improvised explosive device</td>
<td>190</td>
</tr>
<tr>
<td>Suicide bomb</td>
<td>210</td>
</tr>
<tr>
<td>Rocket propelled grenade</td>
<td>96</td>
</tr>
<tr>
<td>Gunshot</td>
<td>198</td>
</tr>
<tr>
<td>Other</td>
<td>232</td>
</tr>
<tr>
<td>R3 MMU Sep 07 – Feb 09</td>
<td>Procedures</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Wound debridement</td>
<td>555</td>
</tr>
<tr>
<td>Fracture surgery</td>
<td>414</td>
</tr>
<tr>
<td>Laparotomy</td>
<td>176</td>
</tr>
<tr>
<td>Vascular repair</td>
<td>50</td>
</tr>
<tr>
<td>Craniotomy</td>
<td>74</td>
</tr>
<tr>
<td>Maxillo-facial</td>
<td>91</td>
</tr>
<tr>
<td>Eye enucleation</td>
<td>16</td>
</tr>
<tr>
<td>Amputation (leg)</td>
<td>99</td>
</tr>
<tr>
<td>Amputation (arm)</td>
<td>15</td>
</tr>
<tr>
<td>Amputation (hand)</td>
<td>16</td>
</tr>
</tbody>
</table>
Lessons

- Native medical services are usually targeted and destroyed in conflict.
- NGO voluntary medical support is impossible in conflict.
- Military medical services must supply definitive care to the local victims of conflict.
- Military medical services cannot replace local routine medical care.
- Effective reconstruction of native health care, essential for peace, requires the mentorship and support from military medical services.
Lessons

- Native medical services are often destroyed in natural disasters
- NGO voluntary medical support is often already on the ground
- Disaster response medical services must supply definitive care to the local victims of catastrophe
- Patients with medical problems not due to the catastrophe will request care from disaster responders
- Effective reconstruction of native health care requires prolonged mentorship and support