Training for Damage Control Surgery in Austere Environments

• Introduction to the Research Project and the Human Worn Surgical Trainer
• Ottawa, Ontario
• October 17 2014
Rationale: Prevent Bleeding to death

- leading cause of potentially preventable injury-related death\(^1,\)\(^4\)
- “Bleeding to death” accounts for 80% of early in hospital deaths\(^2\)
- more than 90% of these hemorrhagic deaths being from truncal hemorrhage\(^3,\)\(^5\)

\(^1\) Champion Sem Hematol 2004, \(^2\) Sauaia J Trauma 1995, \(^3\) Hoyt J Trauma 1994, \(^4\) Rhee J Trauma 2003, \(^5\) Bellamy 1984
How do you stop internal bleeding?

- Operative hemorrhage control
- Laparotomy
- Stopping the bleeding with your hands
Damage Control Surgery

- Naval term
  - Emergency procedures to prevent sinking
- Abbreviated and staged surgery
- Aim to preserve physiology not to complete surgery
- Hemorrhage control not definitive surgery \(^1,2,3,4\)
- Placing “packs” and leaving the abdomen “open” are the basic elements

\(^1\) Hirshberg, Surg Clin N Amer 1997;77:813-20.
\(^2\) Holcomb, Milit Med 2001;166:490-3.
\(^3\) Burch, Ann Surg 1992;215:476-83
\(^4\) Sugrue, Injury 2004;35:642-648
Today's Goals

- **High-level**
  - To conduct a Damage control laparotomy on the Cutsuit surgical trainer

- **Specific** – to put packing around the spleen and liver in order to stop the loss of blood
Recruitment Letter

- Over-view and introduction
- General information
Comparison between trained surgeons and mentored non-surgeons

- **Surgeons**
  - In charge of the whole procedure
  - One assistant who will only take directions from the surgeon

- **Non-surgeons (A)**
  - Will do their best with no outside guidance
  - One assistant who will only take directions from the operator

- **Non-surgeons (B)**
  - Will be guided using “just-in-time” guidance from a trained surgeon using tele-mentoring
  - One assistant who will only take directions from both the operator and remote surgeon
Just-in-Time Telementoring

- Remote real-time guidance of a less experienced care provider using simple information technologies to obtain medical data or to perform procedures
Damage Control Laparotomy

- Open the Anterior Abdominal Wall
- Enter the peritoneal cavity
- Identify the bleeding
- Pack the bleeding organs
- Close the skin only
  - Suture
  - iTClamp wound clamps
6 formal phases of a laparotomy

- Incision
- Retraction
- Direction
- Identification
- Hemostasis
- Closure
Incision

- In the midline
- In the fascia
- Between the recti muscles
- From top (xiphoid) to the bottom (symphysis pubis)
- Through the peritoneum
Retraction

- Insertion of the "Balfour" self-retaining surgical retractor
Use of the assistant holding the Richardson abdominal wall retractor

Operator will director the assistant to improve their view of the peritoneal cavity
Identification

- Recognition by the operator of where the bleeding is coming from inside the peritoneal cavity
Control of the identified bleeding through packing of that bleeding with surgical sponges
Closure

- A skin only closure to contain the packed abdominal contents
- Suturing of the Skin
  - Vs
- Application of the ITClamp
Measurements

- **Time**
  - Equates to blood loss
- **Accuracy and task completion**

- **Safety**
  - Safety surgeons
- **Remote Mentors**
- **Physical Assistant**
Informed Consent

- Participation is completely voluntary
- You may withdraw at any time
- Participation or withdrawal will be completely voluntary

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Title of Project:

Sponsor:
The Department of National Defence, the Royal College of Physicians and Surgeons of Canada, and the Canadian Space Agency
Previous Experience Survey

- No right or wrong answers
- Records your ANONYMOUS prior experience with trauma surgery and the Cutsuit

Advanced Surgical Simulation Training with Tele-Mentoring: Training for Damage Control Surgery in Austere Environments

Demographic Survey of Participants and Prior Experience

Dear Participant [Participant Number],

The following anonymous questionnaire is designed to assess your surgical experience and familiarity with surgical simulation and the Cutsuit. There is no right or wrong answer and all data will be analyzed anonymously.

A) General Demographics of Training
1) Are you a Physician or Non-Physician?
2) Are you a Surgeon or Non-Surgeon?
3) Do you possess a valid license to practice surgery (yes/no)?
Questions