Combat Casualty Care Panel

Lt Col Jennifer Hatzfeld
Combat Casualty Care Research Program
US Army Medical Research and Materiel Command
24 March 2015
Panel Members

- Lt Col Jennifer Hatzfeld – Combat Casualty Care Overview
- Dr. Carmen Hinojosa-Laborde – Point of Injury
- Dr. Robert Christy – Facility Based Treatment
- Ms. Kristy Pottol – Tissue Injury and Regenerative Medicine
- Mr. Daniel Kennedy – Medical Device Advanced Development
- Dr. Victor Macdonald – Blood Product Advanced Development
- Ms. Nita Grimsley – Funding Opportunities

The views expressed in this presentation are those of the author(s) and may not reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government.
Purpose of Panel Discussion

To increase understanding about Combat Casualty Care research focus areas and priorities.

1. Reduce the mortality and morbidity associated with combat-related trauma
   - Continuum of Care
   - Future Operations

2. Identify and develop medical techniques and materiel for early interventions
   - Point of Injury
   - Form/Fit Factor

3. Translate military-relevant basic and preclinical trauma research into clinical practice
   - Facility-Based Treatment
   - Clinical Relevance
Continuity of Care

<table>
<thead>
<tr>
<th>Time</th>
<th>Level of Care (Severity of Injury)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>(Self Care/Buddy Care)</td>
</tr>
<tr>
<td></td>
<td>(Trained Medic/Emergency Management Technician)</td>
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<tr>
<td></td>
<td>(Role 1/2 – Physician/Physician Assistant/Nurse Practitioner/etc)</td>
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<tr>
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<td>(Role 2/3 – Intensive Care)</td>
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Point of Injury
Facility-Based Treatment
Current Operations:
A Seamless Continuum of Care

ROLE 2
(<1 hour)

ROLE 3
(<24 hrs)

ROLE 4
(24-72 hrs)

ROLE 5
(3+ days)

Deployed Hospitals
Role 3
Since Sep 2001 CY 2014*

Total Patients Moved
199,000 6,901

Critical Care (CCATT)
10,200 152

CENTCOM
105,700 1,935

*from AMC/SGK as of 30 Sep 2014
Future Operations

Expect Certain Uncertainty

Note: map is not to scale; for notional purposes only
Point of Injury

Dr. Carmen Hinojosa-Laborde
Tactical Combat Casualty Care Research
US Army Institute for Surgical Research
24 March 2015
• Airway
• Breathing
• Bleeding
• IV access (if needed)
• Fluids/whole blood (keep SBP 80-90 mmHg)
• Prevent hypothermia
• Monitor
• Inspect/dress wounds
• Manage Pain
• Splint Fractures
• Antibiotics
• Document

(from TCCC Guidelines, 2 Jun 2014)

*Additional tasks may be appropriate, depending on the nature of the injury.
Monitoring Capability

• Pulse-oximetry
• Manual blood pressure cuff
• Medic’s assessment skills
  ➢ Level of consciousness
  ➢ Palpated pulse (radial/brachial/inguinal)
  ➢ Active bleeding
Form/Fit Factor

• Incorporate into current practices
  ➢ Easily transportable (i.e., small, lightweight, and durable in extreme environments and handling)
  ➢ Easy to use, low maintenance
  ➢ Does not require refrigeration or other special handling

• Challenges

• Recommendations
Point of Injury: Future Gaps

• Prolonged Field Care
• Provide physiologically-based capability (not time-based)
• Telementoring (reach-back capability)
• Anticipate point of injury needs to meet Army’s “Force 2025 and Beyond”
Facility Based Treatment

Dr. Robert Christy
Extremity Trauma and Burns
US Army Institute for Surgical Research
24 March 2015
• **Forward Care Capability**
  - Advanced emergency medical treatment located as close to the point of injury as possible
  - Focus on stabilizing the patient, providing lifesaving and limb-saving medical treatment.
  - Surgical services: trauma, general, thoracic, and orthopedic surgery capabilities.

• **Theater Hospitalization Capability**
  - Deploy as modules or multiple individual capabilities that provide incrementally increased medical services.
  - Focus on return the patient to duty and/or stabilization to ensure the patient can tolerate evacuation to a definitive care facility.
  - Includes primary inpatient and outpatient care, emergent care, and enhanced medical, surgical, and ancillary capabilities.
  - Can vary according to the regional infrastructure, operational area, and tempo of operation; may include additional surgical capabilities for eye, maxillofacial, and neurosurgery.
Treatment Capabilities

• Intensive Care Unit Capability
  - Continuous stabilization the patient, optimized trauma and burn care
  - Implementation of definitive treatment and monitoring
  - Including continuous monitoring systems and intensive care specialists
  - Provide instrumentation for detection and definitive treatment of organ failure (e.g. lung, kidney) using extracorporeal organ support.
  - Point of care laboratory based results to provide improved diagnosis capabilities
Patient Treatment Gaps

• Equipment, diagnostics and therapies
   Adapt modular equipment to integrate with other monitors/devices/accessories in closed-loop systems
   Point-of-care clinically relevant (trauma) biomarker diagnostics
   Stem cell based acute trauma therapies
   Immunoregulatory treatments to reduce organ damage/failure
   Treatments to reduce pain

• Trauma patient clinical outcomes
   Validated trauma/burn patient clinical trials
   Can be incorporated into clinical practice guidelines
   Allows for cost/benefit analysis
Treatment: Challenges

- Tri-service (Army, Air Force, Navy) solutions
- Anticipate requirements to meet Army’s “Force 2025 and Beyond”
- Providing current hospital based treatments on the battlefield
Treatment: Goal

Show measurable improvement in outcomes

- Mortality and Morbidity
- Reconstruction and Regeneration
- Rehabilitation
- Reintegration

“Until there are ZERO deaths, ZERO pain, and ZERO scars…”
– S.W
Tissue Injury and Regenerative Medicine

Kristy Pottol
Tissue Injury and Regenerative Medicine
Project Management Office
US Army Medical Research and Materiel Command
24 March 2015
To build industrial capacity, reduce barriers to entry, and decrease cost of goods sold for:

- **Vascular defects**
- **Tissue injury wound management**
Key Objectives

1. Enabling technology for vascular injury
   - Tissue preservation
   - Bridging gaps for vascular defects greater than 2.5 centimeters

2. Tissue injury / wound management
   - Optimize tissue healing environment
   - Control or modulate inflammatory response to trauma
   - Simplified solutions for use by untrained operators
Advanced Development

Dan Kennedy
PM Medical Devices
US Army Medical Research and Materiel Command
24 March 2015
Highlights

– Advanced Developer early
– Requirement
– Funding
– IPT/Charter (industry partnership)
– Regulatory
– Contracting
– CRADA (Tech Transfer Laboratory)
Blood Products in Advanced Development
Decreasing Deaths Due to Hemorrhage

Dr. Victor W. Macdonald
Pharmaceutical Systems Project Mgmt. Office, USAMMDA
US Army Medical Research and Materiel Command
24 March 2015
Decrease battlefield hemorrhage deaths by promoting hemostasis with safer, more effective blood products.

- **Risk to Soldiers:**
  - From 2001-11, up to 26% (~1,075 deaths) of total Pre-MTF injury related combat deaths may have been preventable (KIA Level 1)
  - 91% of these deaths were due to hemorrhage (*24% of all total pre-MTF combat deaths*)

- **Requirement:**
  - Army ICD for TC3, Oct 2007: 7.b (3) Blood products: new or improved blood components, new or improved production, preservation and storage of blood components, and/or invention and production of blood component substitutes

- **CONOPS:**
  - Product will be deployed at ROC-3 and ROC-2, with potential for deployment farther forward
1. PLASMA
   - Freeze-Dried Plasma
   - Spray-Dried plasma

2. PLATELETS
   - DMSO Cryopreserved Platelets
   - Freeze-Dried Platelets
   - Refrigerated Platelets

3. RED BLOOD CELLS
   - Extended Shelf-Life Liquid Stored Red Blood Cells

4. WHOLE BLOOD
   - Pathogen Reduction
### CCC Overall Product Context

#### Discovery-Knowledge (6.1/6.2/6.3)
**Topic Areas**
- Coagulopathy of Trauma
- Exploratory animal and in vitro research for Hemostatic, Inflammatory, and Metabolic Modulation

#### Discovery-Product (6.2/6.3)
**Specific Candidate Concepts/Drugs/Devices**
- Improved Blood Products
  - Improved liquid stored platelets (refrigerated & new RT solutions)
- Damage Control Resuscitation
  - Multifunctional Blood Substitute
- Inflammatory Modulation
  - Prioritized list of molecules

#### Late Discovery/Transition (6.3)
**Pre-clinical & Early Clinical Studies on Selected Lead Concept/Drug/Device Expected Transition w/in 2 yrs**
- TRL 3-4
- TRL 4-5
- FTY720
  - C1-inhibitor
  - Ethinyl Estradiol 3-Sulfate
  - Perflourocarbon (Cross-over)
  - Intracavitary Hemostatic (WSS)
  - GroKlot
  - ClotFoam

#### Full (Clinical) Development (6.4/6.5)
**Specific Product**
- TRL 5-9
- Spray-dried SD Plasma Platelet-derived Hemostatic Agent
- Valproic Acid
- Lyophilized Plasma
- Extended-Life Red Cells*
- Cryopreserved Platelets
- Whole Blood Pathogen Reduction Technology (WBPRT)
- Hemostatic Pellets*

#### Knowledge Products To Support Clinical Practice
**Prehospital Use of Plasma for Traumatic Hemorrhage**
- Targeted Studies of Tranexamic Acid
- Transfusion Ratios Study
- Age of Red Cells
- Frozen Red Cells in Trauma

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*Recent FDA approval
Product Development Stages

DoD:
- Research
- Materiel Solution Analysis
- Technology Development
- Engineering & Manufacturing Development
- Production & Deployment
- Operations & Support

Pharmaceutical:
- Discovery
- Preclinical
- Phase I
- Phase II
- Phase III
- File
- Launch
- LCM

Decision Gate Entry Point:
- MDD
- Milestone A: First in Human
- Milestone B: Proof of Concept
- Commit to Phase III
- Milestone C: ND/ABLA Filing
- Approval, Launch
- Post Launch Review

TRL: 1 2 3 4 5 6 7 8 9
Industry Participation

1. WHEN
   - Anytime in the Development Process
   - Product Specific but the Earlier the Better

2. WHY
   - Manufacturing (cGMP) Development & Commercialization
   - Preclinical Testing (cGLP), Clinical Trials (GCP) - Phase 1, 2, 3
   - BLA Submission & FDA Approval

3. HOW
   - Contract
   - Cooperative Research And Development Agreement (CRADA)
   - Information Exchange & Control Thru IPT’s.

4. CONCERNS
   - IP Protection
   - Access to Complete Tech Data Package or Drug Master File
   - Fielding of FDA Approved Products for the Warfighter
Additional Funding Opportunities

Ms. Nita Grimsley
Combat Casualty Care Research Program
US Army Medical Research and Materiel Command
24 March 2015
• Several funding streams programmed through the CCCRP.
• Historically Joint Program Committee (JPC) funding has been programmed solely through targeted solicitations (Program Announcements and Requests for Proposals)
• Recent change in approach has re-opened our use of the Request for Information and the Broad Agency Announcement (BAA)
• Two part application process: Pre-proposal and Full Proposal
  ➢ Pre-proposal process located at the following location in a section titled ‘New for Fiscal Year 2015’: https://www.usamraa.army.mil/pages/Baa_Forms/index.cfm?
  ➢ Pre-proposal submission site has changed. Applications are now submitted through the following link: https://eBRAP.org
Located at: http://www.grants.gov

General Information

- **Funding Opportunity Number:** W81XWH-BAA-15-1
- **Document Type:** Grants Notice
- **Funding Opportunity Title:** DoD USAMRMC FY15 Broad Agency Announcement for Extramural Medical Research
- **Opportunity Category:** Discretionary
- **Funding Instrument Type:** Cooperative Agreement
- **Category of Funding Activity:** Science and Technology and other Research and Development
- **Original Closing Date for Applications:** Sep 30, 2015
- **Current Closing Date for Applications:** Sep 30, 2015
- **Estimated Total Program Funding:**
  - **Award Ceiling:**
  - **Award Floor:**
- **Creation Date:** Sep 30, 2014
- **Posted Date:** Oct 1, 2014
- **Archive Date:** Oct 30, 2015
- **CFDA Number(s):** 12.420 -- Military Medical Research and Development
- **Cost Sharing or Matching Requirement:** No
Areas of research should fall into the following categories as they relate to the immediate care, transport and early definitive care of the injured warfighter:

- Hemorrhage control and fluid resuscitation strategies and products
- First responder care in addition to the control of bleeding
- Traumatic brain injury care for both immediate diagnostics and treatment, and the reduction of long-term complications
- Forward surgical and intensive care techniques, therapeutics and devices
- Enroute care from point of injury to Level II/III and then prolonged transport back to CONUS
- Advanced care throughout the continuum for organ support and treatment, and both hard and soft tissue injuries
• Current RFIs on Fed Biz Opps

- **W81XWH-15-R-PREHOSPITALMORTALITY-0001:** Coordinated, multi-disciplinary, multi-institution, effort to improve the understanding of pre-hospital mortality from severe trauma or injury in the civilian setting (Response Date 13 APR, 2015)

- **W81XWH-15-CLINICALRESEARCHNET-0001:** Multicenter Clinical Research Network dedicated to military-relevant trauma and emergency care research (Response Date 03 APR, 2015)
Questions?

For additional questions after the conclusion of the conference, send an email message to usarmy.detrick.medcom-usamrc.mbx.mmpd@mail.mil