



Introduction to Damage Control Resuscitation



The Damage Control Resuscitation Clinical Practice Guideline was updated based on new evidence and approved by JTS leadership for full implementation in July 2019.

What is a clinical practice guideline (CPG)?

CPGs detail best practices for optimal care obtained from a systematic review of scientific evidence. CPGs are based on the latest clinical research that is vetted by trauma experts from across the military and civilian sectors. CPGs are not a substitute for professional clinical judgment.

What is the Joint Trauma System (JTS)?

The JTS serves as the reference body for all DoD trauma care by the authority of NDAA 2017 Section 707. The JTS is a performance improvement organization that utilizes a systematic approach to determine the acute and long-term outcomes of all casualties, quality of care, improvements in prevention and treatment, and logistical implications.

What is damage control resuscitation (DCR)?

DCR is a complementary strategy to damage control surgery: the goal of DCR is to stabilize a casualty enough for surgery. DCR prioritizes non-surgical interventions to reduce morbidity and mortality from trauma and hemorrhage. The major principles of DCR are to restore homeostasis, prevent or mitigate the development of tissue hypoxia, oxygen debt, and burden of shock, as well as coagulopathy.

What are my specific DCR requirements?

Medics/corpsmen: early, aggressive recognition of the need for DCR, early hemorrhage control, early blood administration, and rapid transport to surgical teams.

Physicians/providers/nurses/paramedics: continued hemorrhage control, early blood administration, and rapid damage control surgery.



Combat Medics & Corpsmen



Triage considerations: Why is early recognition of the need for DCR important for medics/corpsmen?

To initiate early, aggressive hemorrhage control, early blood transfusion, and early administration of calcium and Tranexamic acid (TXA). Prompt recognition and early communication of the need for DCR to health-care facilities shortens the time to blood transfusion and transport to the right surgical resuscitation team.

Calcium administration: What form of calcium is preferred in a pre-hospital environment?

Calcium gluconate is the preferred form for peripheral IV infusion, causing less tissue damage due to extravagation than calcium chloride. Both calcium chloride and calcium gluconate are approved for calcium replacement medications.

What are some pre-hospital TXA implications?

Give TXA only if able to administer within 3 hours of severe hemorrhagic injury. It can cause worsening hemorrhage if given after 3 hours. Administering undiluted TXA by slow IV push (over 1 minute) is acceptable ONLY if supplies or tactical situation prevents providing a diluted infusion with 100ml NS. If TXA is given too rapidly, it can cause hypotension.

Blood administration: What are the preferred pre-hospital fluids to administer for DCR?

Low Titer O Whole Blood (LTOWB) is the FLUID OF CHOICE for DCR. Pre-hospital DCR fluids from most to least preferred:

1. Whole Blood (LTOWB preferred)
2. Plasma, platelets, and red blood cells (RBCs) in a 1:1:1 ratio
3. Plasma and RBCs in a 1:1 ratio
4. Plasma or RBCs alone

What is REBOA and why do I need to know about it?

REBOA (Resuscitative Endovascular Balloon Occlusion of the Aorta) is a balloon that occludes the aorta to stop blood flow to the lower body until the casualty can get into surgery. REBOA should only be used by approved resuscitation teams and is not intended for use by medics/corpsmen.

You should be aware of REBOA so you are able to assist with the procedure if assigned to a REBOA approved resuscitation team, identify REBOA capabilities in your area, and identify the equipment to ensure safe handling/storage.



Physicians, Nurses, & Paramedics



Why is early recognition and communication of the need for DCR important?

To re-evaluate effectiveness of hemorrhage control and promote early blood transfusion. Prompt recognition and early communication of the need for DCR facilitates blood availability at all roles of care, shortens time to transfusion by early mobilization of blood, and supports definitive surgical resuscitation.

Calcium administration: What are some clinical implications of early IV/IO calcium administration?

Calcium gluconate is the preferred form for peripheral IV infusion, causing less tissue damage due to extravagation than calcium chloride.

- Calcium chloride should be administered via central access.
- Calcium chloride should be given with the first unit of blood, then after every four units.
- Early and regular ionized calcium levels should be obtained.

What are some clinical TXA implications?

Give subsequent doses of Tranexamic acid (TXA) only if the first dose was administered within 3 hours of severe hemorrhagic injury. It can cause worsening hemorrhage if given after 3 hours.

Administering undiluted TXA by slow IV push (over 1 minute) is acceptable ONLY if supplies or tactical situation prevents providing a diluted infusion with 100ml NS. If TXA is given too rapidly, it can cause hypotension.

Blood administration: What is the preferred in-hospital fluid to administer for DCR?

In-hospital DCR fluids from most to least preferred:

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| <ol style="list-style-type: none"> 1. Fully TTD tested Whole Blood 2. Blood components at a 1:1:1:1 ratio (plasma:platelets:RBC:CRYO) | <ol style="list-style-type: none"> 3. Whole blood from a recently tested donor 4. RBCs plus plasma=1:1 ratio 5. Plasma with or without RBCs 6. RBCs alone |
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What is REBOA and why do I need to know about it?

REBOA (Resuscitative Endovascular Balloon Occlusion of the Aorta) is a balloon that occludes the aorta to stop blood flow to the lower body until the casualty can get into surgery. REBOA should only be used by approved resuscitation teams. Prompting referral to definitive surgical care is required within 30 minutes of insertion.

You should be aware of REBOA so you are able 1) to administer insertion and manage patients when assigned to a REBOA resuscitation team and 2) identify equipment to ensure safe handling/storage.