

## CLINICAL DECISIONS

Section Editor: Colleen Swartz, RN, MSN, CCRN

### Nursing Procedure: Continuous Arteriovenous Rewarming

**Q** Has a trauma center developed a protocol for continuous arteriovenous rewarming (CAVR) and would they be willing to share it with others?

**A** Harborview Medical Center, Seattle, Washington has agreed to provide their nursing procedure for CAVR. It is reprinted with permission in this space. To obtain additional information, contact Chris Martin, Administrative Director, Emergency Services, Harborview Medical Center, Seattle, Washington, or visit <http://www.washington.edu/medical/hmc/index.html>.

#### HARBORVIEW MEDICAL CENTER SEATTLE, WASHINGTON

#### Continuous Arteriovenous Rewarming (CAVR)

**Purpose:** To rapidly and safely rewarm a hypothermic patient.

**Performed by:** Registered nurse in critical care units.

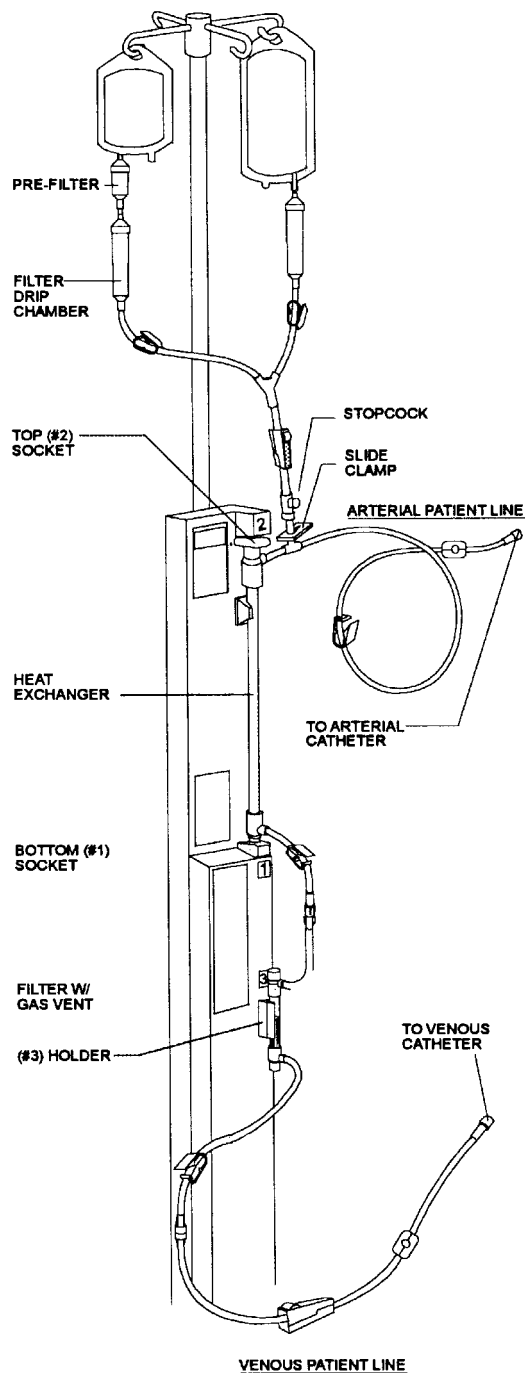
**Equipment:** Level 1 Fluid Warmer (Mod H-500 or H-250) and Level 1 Pressure Infusion System.

Level 1 Arteriovenous (AV) Rewarming Set-Gentilello Technique (includes two large bore catheters with procedural kits).

One intravenous (IV) infusion set.

One disposable Blood Warming Set and Fluid Path-Heparinized bonded tubing.

Normal saline (NS) or Lactated Ringers (LR) IV solution.



(System 1000 SHOWN)

**Figure 1.** CAVR setup. Reproduced with permission from SIMS Level 1 (<http://www.simslevel1.com>)

Colleen Swartz is a trauma coordinator and chief flight nurse in the University of Kentucky Hospital Emergency Department, Lexington.

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Please write [colleen.swartz@mvs.hosp.uky.edu](mailto:colleen.swartz@mvs.hosp.uky.edu) with comments.

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**Table 1.**

Planned actions	Key information
1. Verify physician order for CAVR and obtain Level 1 with pressure chambers and tubing.	1. Obtain disposable A/V Rewarming Set from central supply (CS).
2. Assist physician with placing arterial and venous access (A/V Rewarming set contains two large bore catheters).	2. IV access sites must be large bore. An introducer is acceptable if no catheters (Swan Ganz, CVP, etc) are in line. The white side arm must be removed. Do not use stopcocks or extension tubing in line (they restrict flow).
3. Set up Heat Exchanger and filter chamber. (See diagram.)	3. Refer to Level 1 Fluid Warmer and Rapid Infuser procedure.
4. Do not start procedure until Level 1 temperature reads out greater than 37° C.	
5. Consider withholding procedure if systolic blood pressure (SBP) <60mm Hg.	5. Blood flow will diminish with hypotension and clots may form.
6. Attach IV Infusion set to T-extension set of arterial patient line. Prime with NS or LR.	
7. Connect arterial patient line to arterial catheter. Release clamp.	7. Blood will fill the tubing by blood pressure.
8. Hold air eliminator upside down until full. Return upright air eliminator to holder.	8. Note: <b>Disposal Alarm</b> is active until filter returned to holder.
9. Allow blood to flow completely through disposable tubing (blood warming set fluid path).	9. <b>DO NOT CONTINUE UNTIL VENOUS PATIENT LINE IS COMPLETELY PRIMED.</b>
10. Close venous patient line roller clamp. Attach venous patient line to venous catheter. Open roller clamp.	10. At this point patient rewarming function is active.
11. Tape disposable tubing to patient leg.	11. This prevents the catheters from kinking.
12. May use IV infusion set for IV infusion and blood transfusion during rewarming with these precautions:	12. May need to use pressure chambers to prevent back flow into arterial catheter:
a. Avoid high pressure and flow rates.	a. To prevent flow reversal in rewarming set, arterial line
b. Use sufficient pressure to avoid back flow into the IV infusion set.	c. Observe for infiltration, hematoma, nerve damage, etc.
c. Check pedal pulses, site and color, motor, sensory function (CMS) every 15 minutes, if a femoral site is used.	
13. During emergent transport remove tubing from Level 1 and do not clamp.	
14. Dispose of equipment after use.	14. Rewarming is usually accomplished within 1-2 hours.
15. Medical doctor (MD) is to discontinue arterial and venous catheters.	15. These are not to be kept for intravenous or arterial access.
16. Prevent bleeding at the sites after the catheters are discontinued:	
a. Apply pressure for at least 15-20 minutes after arterial catheter discontinued. Apply pressure for 5-10 minutes after venous catheter discontinued.	
b. Keep the leg/legs straight and the patient on bedrest for six hours.	
c. Raise head of bed (HOB) no higher than 30 degrees.	
d. Check pedal pulses on the arterial access side every 15 minutes x 4, then every 30 minutes x 4, then every hour x 4.	
e. Assess for changes in CMS.	
17. Documentation:	
a. Use of CAVR.	
b. Time CAVR started and finished.	
c. Site of arterial and venous catheter.	
d. Check pedal pulses, site and CMS.	
e. Presence of bleeding at either of these sites.	
f. Temperature before and after the use of CAVR and at least every hour the CAVR was used.	
g. Any complications that develop.	

Approved by: Maryellen Antonelli, Associate Administrator for Patient Care Services  
 Date: 7/2/96  
 jmc7/26/00

**Policies:**

1. Catheters provided in set must be used. Use no stopcocks or extension tubing.
2. These are dedicated catheters.
3. The catheters must be removed upon completion of the procedure, or as soon as possible after correction of coagulopathy.
4. Patient is under continuous assessment and observation by registered nurse (RN).
5. Do not flex or bend patient's legs if a femoral catheter is in-line.

6. Keep the patient on bedrest.
7. No transfers during the procedure.

**Cross References:** Harborview Medical Center (HMC) Nursing Policies: IV Administration, Medication Administration, Transfusing Blood and Blood Products, Central Venous Catheter Insertion, Maintenance and Removal, and Level 1 Fluid Warmer and Rapid Infuser.

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Please send information or requests to:  
Judith Stoner Halpern, RN, MS, CEN, Editor,  
1400 Low Road, Kalamazoo, Michigan, USA 49008  
ijtned@net-link.net  
Fax: (616) 344-0519