

ml of fluid at 39.7° C then was bolused through 50 cm tubing at 300 ml/hour.

Results: Initial and mean fluid temperature (C) versus distance during one-hour infusions.

| rate (ml/hr) | Initial Bag | Mean Bag | 100 cm | 180 cm | 230 cm | 280 cm |
|--------------|-------------|----------|--------|--------|--------|--------|
| 1000 | 60.3 | 53.8 | 42.3 | 38.8 | 37.5 | 36.1 |
| 800 | 60.7 | 52.0 | 41.3 | 36.4 | 35.8 | 34.5 |
| 600 | 59.8 | 51.8 | 39.2 | 34.8 | 33.4 | 31.8 |
| 400 | 59.8 | 51.6 | 35.6 | 30.4 | 29.1 | 27.9 |
| 200 | 75.0 | 65.2 | 34.9 | 27.2 | 26.5 | 25.1 |
| 1000 | 39.3 | 36.1 | 31.7 | 30.0 | 29.6 | 28.9 |

Sixty ml of saline at 39.7° C run through 50 cm of tubing (300 ml/hr) was 37.6° C at delivery.

Conclusions: Warmed fluids cannot be delivered at therapeutic temperatures under current recommendations (37°–42° C). Emergency departments should store fluid at 60° C and physicians should consider both tubing length and flow rates when ordering warmed lavage and intravenous fluids, even when using fluid warmers. For hypothermia, intermittent boluses could deliver the same fluid volumes at higher temperatures than continuous drips and should be used when permitted.

071.

International Relief as a Model for Disaster Response Training

Lynn Amowitz, MD, Liese Schwarz, MD, Bruce M. Becker, MD
Brown University/Rhode Island Hospital,
Providence, Rhode Island USA

The Emergency Medicine Residency Training Curriculum encourages resident education in Disaster Response. The paucity of large-scale disasters in the United States makes such practical experience difficult to obtain. An elective created at an Emergency Medicine Residency Program offered a four-week experience at a field hospital in an African war zone. Between August and December 1994, AmeriCares, a non-government relief agency, operated a medical facility in a remote area of Rwanda along the refugee route linking Goma, Zaire, and Kigali. Review of the facility's epidemiologic log revealed that physicians evaluated and treated between 1,859 and 5,054 patients a week. Medical cases included tropical diseases such as malaria and filariasis, as well as entities commonly seen in the United States. Surgical cases ranged from burns and abscesses to traumatic injuries sustained in the war. Residents participated in triage, clinical evaluation and treatment, packaging and transport of patients and public-health planning decisions for the facility, including sanitation, water, and food distribution.

This elective constituted an excellent model of disaster-response training in austere conditions with limited medical resources. We submit that resident physician participation in international medical relief provides a unique opportunity for service and education.

072.

Comparison of Two-Person CPR with Bag-Valve-Mask Device (BVM) to One-Person CPR Using the Kendall Cardiovent® (KCV®) Device in an Intubated CPR Mannequin

Selim Suner, MD, Ludi Jaeminas, MD, Robert H. Woolard, MD,
Gregory D. Jay, MD, PhD, G.J. Kleirtrnan, EMT-P,
Bruce M. Becker, MD, MPH
Brown University/ Rhode Island Hospital,
Providence, Rhode Island USA

Objectives: CPR in the prehospital setting requires at least two rescuers necessitating dispatch of additional rescue units. The KCV®, which permits simultaneous compression and ventilation by one rescuer was compared with two-person CPR with BVM.

Methods: A single-blinded, double cross-over study with six CPR instructors each performing one-person CPR with KCV and two person CPR with BVM on an intubated, recording, CPR mannequin (Resusci-Annie®). Tidal volume obtained by spirometry, and compression depth were recorded continuously during each 12-minute CPR session. Mean tidal volume (MTV), minute volume (MV), compression rate (CR), ventilation rate (VR), and errors in compression depth (ECD) were compared for CPR sessions performed by one person with KCV and two people with BVM. Student's *t*-test and regression analysis were used in statistical calculations (Statview II® software).

Results: A total of 1,894 ventilations and 10,532 compressions were performed in three separate 12-minute sessions. MTV and CR for KCV were significantly different than for BVM: 1,242.3 ml vs. 1,065.0 ml ($p = 0.0018$) and 63.2/min vs. 81.3/min ($p = 0.0076$) respectively. However, both KCV MV and VR were not statistically different than BVM: 14,760 ml vs. 16,058.7 ml ($p = 0.5649$) and 11.9/min vs. 14.9/min. ($p = 0.1226$) respectively. ECD rate of 9.78% was observed with KCV compared to 8.49% with two-person CPR ($p = 0.1815$). ECD, rate increased as a function of time equally for both KCV (1.8%/min) and two-person CPR (1.4%/min) ($r = 0.952$; $p = 0.0001$).

Conclusions: One-person CPR with KCV was equivalent or better than two-person CPR with BVM in all measured parameters except CR. Use of KCV will effect better staff allocation upon the prehospital patient requiring CPR. Further work is needed to determine whether the lower CR associated with KCV is clinically significant or correctable with practice effect.

073.

Physicians' (MDs) and Nurses' (RNs) Knowledge of and Attitude Toward Advanced Directives: Experience and Preference

Bruce M. Becker, MD, K. Neacy, BS, Robert H Woolard, MD
Brown University/Rhode Island Hospital,
Providence, Rhode Island, USA

Objectives: Patients' preferences for intensity and duration of medical treatment often are delineated in legal documents