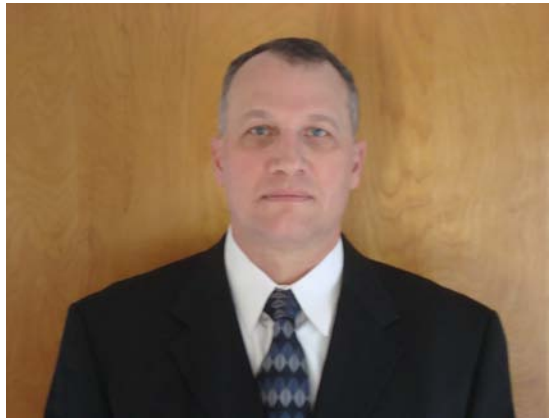


2011 UHMS Associates Recognition Scholarship Recipient



James Bell, CHT, EMT

Abstract Submission for UHMS 2011 ASM

Performance of the Hospira Plum A+ (HB) Hyperbaric Infusion Pump.

Bell JE, Weaver LK, Haberstock D, Wilson G, Wegesser WB, Holt JD. Department of Hyperbaric Medicine, Intermountain LDS Hospital, Salt Lake City, UT and Intermountain Medical Center, Murray, UT

INTRODUCTION / BACKGROUND: We evaluated the Hospira Plum A+ hyperbaric infusion pump (FDA 510K, K081412) to confirm published delivery accuracy; $\pm 5\%$ at 1 ATA and $\pm 12.5\%$ at 3 ATA, monoplace; or $\pm 5\%$ in multiplace chambers.

MATERIALS AND METHODS: Pump flow accuracy was tested in monoplace and multiplace hyperbaric chambers at different rates, fluid viscosities, pressures, and volumes (1). The pump was programmed for saline at rates of 1, 5, 100, 250 and 999 ml/hr, and OXEPA® enteral formula (Abbott Nutrition) and packed red blood cells (PRBC) at 100 ml/hr. Output was recorded from the pump (programmed) and from graduated cylinders (actual). We concurrently evaluated both infusion ports A and B using Microbore cassettes (12202-01) for infusions <5 ml/hr and standard cassettes (11007-01) for infusions ≥ 5 ml/hr, assembled with extension #11647-48 for hull penetration on monoplace chambers. The lead acid battery life was recorded for multiplace trials.

The average for PRBC at 100 ml/hr at 3 ATA was 0.1% greater than programmed. The pump low battery alarm sounded at 1.5 hours at 999 ml/hr, and >4 hours at rates <251 ml/hr.

RESULTS: In monoplace chambers at 3 ATA, using Microbore cassettes for 1 and 5 ml/hr, the average delivered saline volume was 3.2% greater than programmed (range

0-4.8%). Using standard cassettes for 100, 250 and 999 ml/hr the average delivered volume was 0.7% less than programmed (range -13.0-5.6%). OXEPA® was delivered at 0.7% less than programmed (range -8.4-3.7%), and PRBC were delivered at 3.4% less than programmed (single trial).

At 2 ATA and 3 ATA in a multiplace chamber, using standard cassettes, the average delivered saline volume was 0.5% less than programmed (range -4.7-1.7%). The average for PRBC at 100 ml/hr at 3 ATA was 0.1% greater than programmed. The pump low battery alarm sounded at 1.5 hours at 999 ml/hr, and >4 hours at rates <251 ml/hr.

CONCLUSIONS: The average Plum A+ performance was within Hospira delivery accuracy tolerances of $\pm 5\%$ (or 12.5% at 3 ATA).

Brief Background of Jim Bell

Undersea and Hyperbaric Medical Society (UHMS) Accreditation Surveyor since 2003
Certified Hyperbaric Technologist (CHT) since 1991
Emergency Medical Technician (EMT) since 1989
Chamber Safety and Technical Director since 2007
Commercial Diver 1980-2007

Education / Certification

Undersea and Hyperbaric Medicine Surveyor Training:
UHMS satellite office, San Antonio, TX, October 2003
Hyperbaric Safety Director Training:
ATMO, Nix Hospital, San Antonio, TX, March 2003
Advanced and Technical Aspects of Hyperbaric Medicine:
ATMO, Nix Hospital, San Antonio, TX, March 2000 & 2002 (presenter 2002)
Business Management Certificate:
Minneapolis Community and Technical College, Minneapolis, MN, 1998
Certified Hyperbaric Technologist #086:
National Board of Diving and Hyperbaric Medical Technology, since Nov 1991
Emergency Medical Technician-B: Utah #2007908003- certification since Nov 1989
Commercial Deep Sea Diver: The Divers Institute of Technology, Seattle, WA; 1980

Career Experience

UHMS Materials Testing Committee 2010
UHMS Practice Compliance Committee 2009, 'Ask the Experts' panel member
National Fire Protection Association (NFPA), Technical Committee Member
NFPA 99 hypo/hyper technical committee, since January 2008
Hypobaric / Hyperbaric Technical / Safety Supervisor
LDS Hospital and Intermountain Medical Centers since February 2007
Hyperbaric Chamber Technician
Hennepin County Medical Center, October 1992 to April 2003
Minneapolis Medical Research Foundation, June 1989 to October 1992