significant risk factors for CA-MRSA carriage included the rating of Sonar Technician (Submarine), working within the Navigation spaces and self reported axillary skin infections in the preceding year.

CONCLUSIONS: The prevalence rates of S. aureus and CA-MRSA nasal colonization among Pacific Fleet Submarine crewmembers are consistent with those of the general population. However, certain workspaces may increase the risk of carriage. The presence of CA-MRSA aboard deployed submarine crewmembers presents a relatively high risk to the crew due to the limited antibiotic selection, absence of diagnostic testing, and the relative lack of medical referral while underway.

SESSION E: Hyperbaric Chamber Patient Management

Moderator: L. Weaver & I. Aksenov

-E1- (Resident/Trainee Competition)

REDUCING COMPRESSION RATE DURING CLINICAL HYPERBARIC THERAPY WILL REDUCE THE RATE OF OTIC BAROTRAUMA

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Oral Presentation

BACKGROUND: Otic barotrauma (OB) in patients undergoing hyperbaric oxygen therapy (HBO) has been reported to be as high as 31.5 % to 37%. It occurs even with careful instructions in pressure equalization, in 8% in one study. The routine wound healing protocol used at Duke is 2 ATA/2 hours. Compression rate from 1 to 2 ATA is typically 0.4 ATA/min (FAST), with adjustment if individual patients report ear discomfort or difficulty equalizing. Compression rate to higher pressures is generally increased according to patient tolerance. A quality assurance (QA) review of otic barotrauma during hyperbaric oxygen therapy was performed in September of 2005, after which the compression rate was changed to 0.13 ATA/min from 1 to 2 ATA, with further compression at a rate calculated to produce a constant rate of volume change (SLOW). The present review was performed to determine whether the reduction in compression rate has had any effect on the incidence of otic barotrauma.

MATERIALS AND METHODS: Retrospective analysis was performed on a consecutive series of 68 patients receiving 1358 HBO treatments from October 2005 to January 2006 using the SLOW compression rate. The incidence of OB was compared with a series of 2078 patients treated using the FAST compression protocol. All patients receiving HBO in the Duke multiplace hyperbaric oxygen chambers were included with the exception of divers treated for DCS (who were excluded due to the learned skill allowing them to equalize the middle ear). OB was assessed by examining each patient before and after the first treatment, and thereafter whenever clinically indicated.

RESULTS: In the SLOW compression rate group 6 out of 68 patients (8.8%) developed OB, compared to 375 out of 2078 patients (18%) in the FAST group ($X2=3.80, P=0.05$).

DISCUSSION: The slower compression rate appeared to reduce the OB rate by approximately 50%. We conclude that a slow compression rate based on a constant rate of change of volume reduces the probability of OB.

-E2- (Resident/Trainee Competition)

EVALUATING ALARIS® IV INFUSION SYSTEM FOR FUNCTIONAL ACCURACY AND SAFETY UP TO 6 ATA

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BACKGROUND: The Alaris® System infusion pump (AIP, Alaris® Medical Systems, San Diego, CA) has been tested and approved for use in multiplace hyperbaric chambers [1]. However, the accuracy of the delivery rate under these conditions has not been published. The goal of this study was to evaluate the AIP functional accuracy and safety under different hyperbaric conditions for different infusion rates.

MATERIALS AND METHODS: Two Alaris® System, Point-of-Care Unit, 8000 Series, five Pump Modules, 8100 Series, three Syringe Modules, 8110 Series were subjected to various atmospheric pressures (1, 2, 2.45, 3.06, 6 ATA), infusion durations and infusion rates (1, 5, 10, 15, 20 mL/h for syringe modules and 1, 50, 75, 125, 250 mL/h for IV tubing pumps). The Point-of-Care Unit, Pump Modules, and Syringe Modules were wrapped with commercially available clear plastic bags and purged with nitrogen gas to minimize the risk of fire. Actual flow rates were measured by timed collection of 0.9% normal saline; volumes were measured gravimetrically. AIPs were programmed to start infusing at each set rate 5 minutes after the chamber reached a test depth and to stop infusing when a set infusion volume had been completed (times typically 29.5 to 30 minutes). Measured rate was compared with preset rate. Variability was assessed by calculating coefficient of variation (CV). The results were compared with the manufacturer's specifications.

RESULTS: Twenty-five sets of observations, forty data samples, were obtained (see table 1). CV of infusion rate was inversely related to infusion rate; CV increased with ambient pressure. Syringe modules had a higher