



Undersea Medicine Workshop

- Monitoring Tools in Submarine Medicine
- Framing talks: How Changes in Submarine Operations Since 2000 Have Shaped Submarine Medicine Research

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Overall Classification of this Briefing is **UNCLASSIFIED**

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The Submarine Medical Community Raison d'être

- A submarine is a system of systems that operates for extended periods in a remote, harsh, and austere environment that largely precludes outside assistance for physical contingencies
 - The crew as one of those systems
 - Reliability of that system is paramount
- The Undersea Medical Community facilitates
 - Screening of healthy entrants – reliability by quality control
 - Widened talent pool by 50% since 2000
 - Maintenance of a healthy crew – reliability by conservative operations
 - Medical and health services, environmental control, minimizing medical UPL and MEDEVAC
 - Resulting healthy quality of life post-service





Have Submarine OPS driven medical research?

- From a health perspective – OPS remain largely the same
 - Cold War, GWOT, return to Great Power Competition – no difference from a physiological perspective
- However – advances in undersea medicine and understanding of human performance improved the reliability of the human parts of the submarine system
- From the perspective of the operator – manning, and remaining on mission
 - We deal in snapshots
- From the perspective of the health care provider – How do you grade your own homework? What does your long-term trend data tell you?



Screening Healthy Entrants

- **Women in Submarines**

- There has been no larger generational change to the crew “system” than this
- Study by undersea medical professionals – confidently and safely enabled integration of women into submarine crews
 - NSMRL Lab Report 1219 for example





Maintenance of a Healthy Crew

- 24 hour day vs 18 hour day
- Embedded Mental Health
- Elimination of smoking
- Nutrition and fitness to improve resilience
- Allowed materials list
- Enables post-service quality of life





Where should the future focus be

- **Combat**
 - How to enhance human performance during extended combat operations not seen since WWII
 - Coping with combat casualties
- **The operational focus of the Submarine Force is combat -**





Questions/Discussion



APEX Predators!