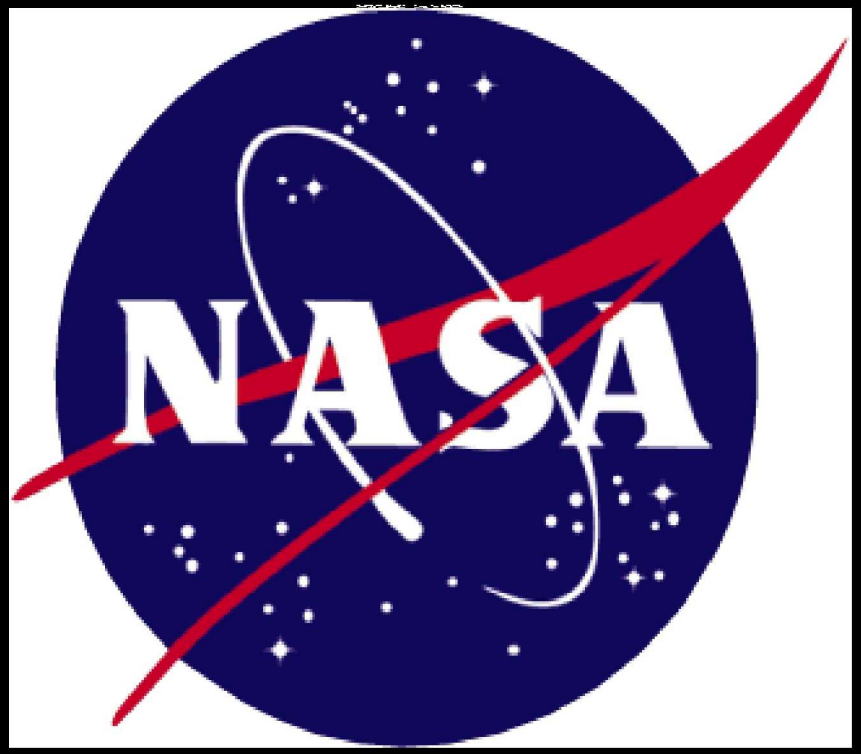
Occupational Surveillance for Spaceflight Exposures

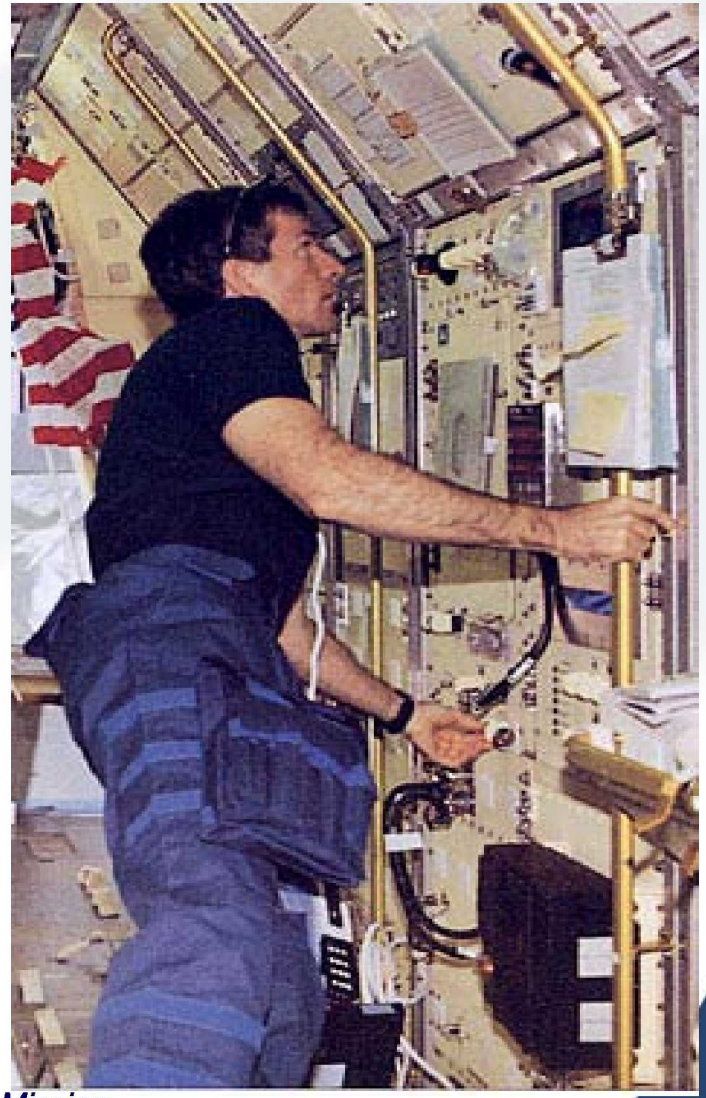


William Tarver, MD, I
Chief, Clinical Services
NASA Johnson Space Center

Your Health is Our Mission

Medical Versus Occupational Surveillance

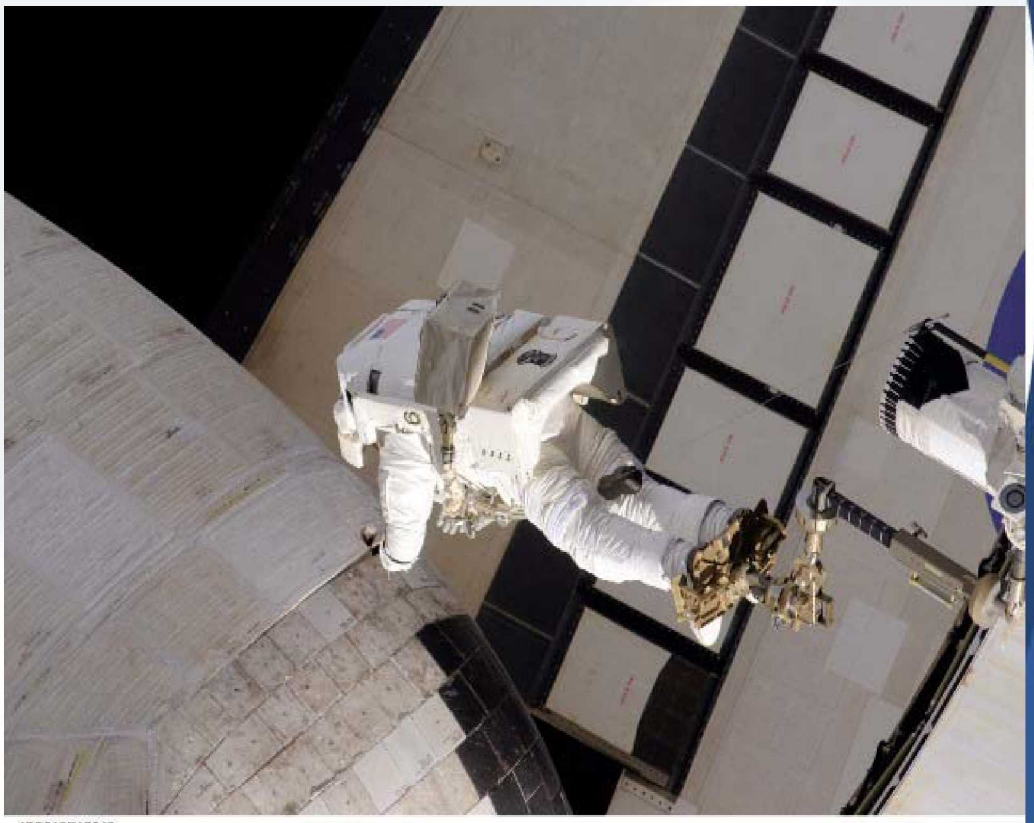
- Medical- What risks you bring to the table (cholesterol, hypertension, etc)
- Occupational- What risks you come away with a result of the occupation



The Work Environment

Controls

- OSHA and NIOSH do not dictate controls or reporting for space work
- Hazards are controlled by the individual programs
- Ethical and moral obligation to perform surveillance, but no legal obligation currently



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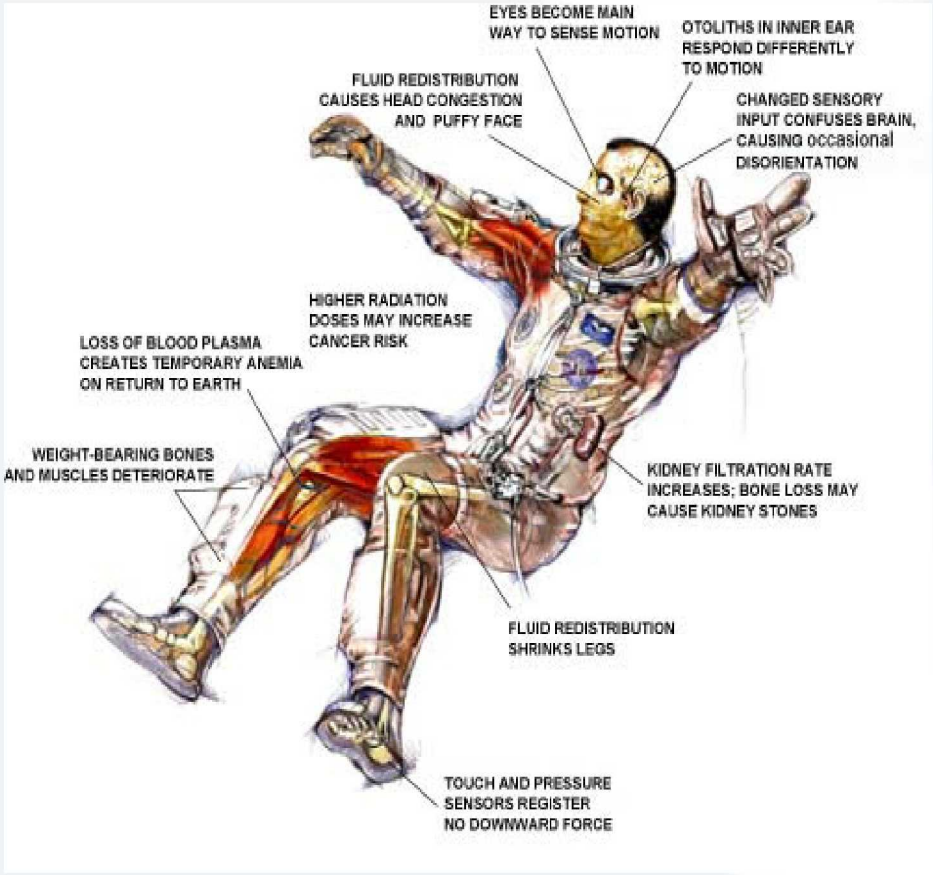
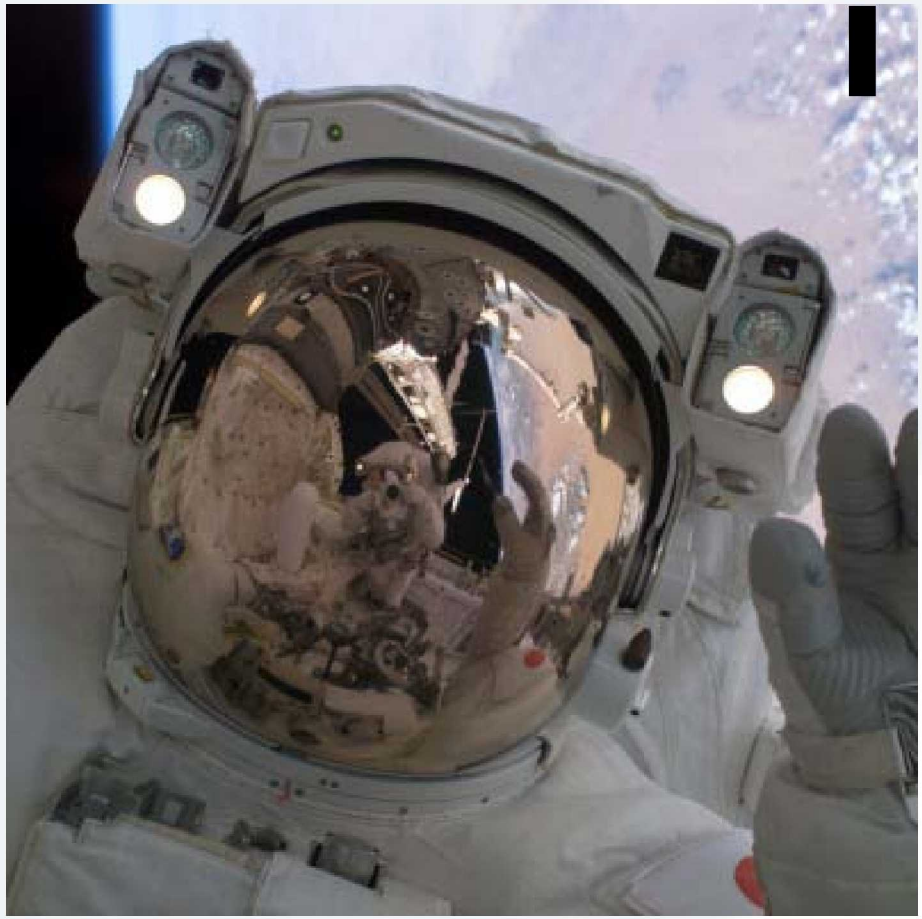
Occupational Hazards in Space



From Scientific American

- Radiation of the Space Variety
- Bone loss
- Lasers
- Cadmium
- Hydrazine
- Nitrogen Tetroxide
- Ammonia
- Noise
- Weightlessness

Conversion from a Study to a Lifetime Surveillance Program



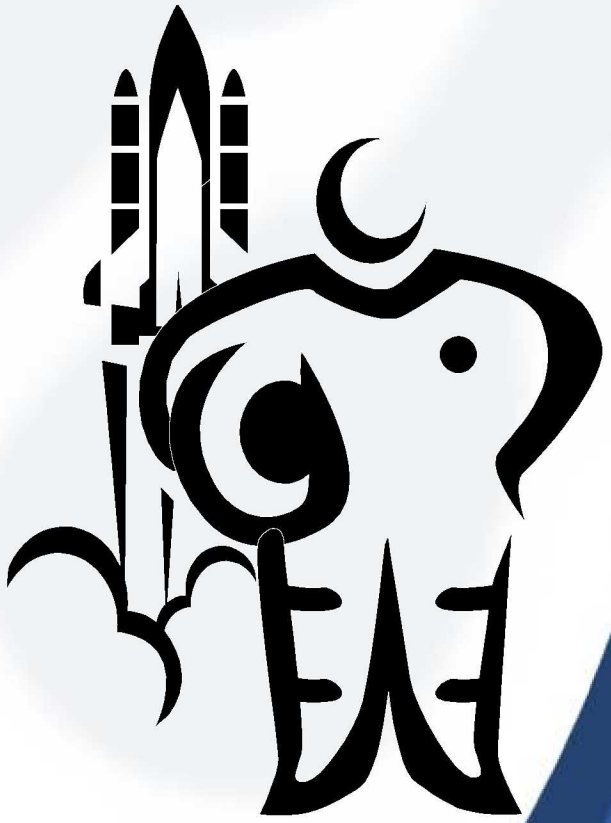
- Benchmarked off of similar programs in DoD and the Department of Energy
- Allows insight into longterm sequelae from exposures in the workplace

Brief History of Longitudinal Study of Astronaut Health

- Phase 1
- Phase 2
- Workforce controls for comparison
- Low Statistical Power
- No Consent

Institute of Medicine Recommendations

1. Must serve two sometimes conflicting goals of research and occupational surveillance...
2. No comparison group can meet every goal or need, it should be individualized...
3. Increase the quality and quantity of preventive care to increase the data...
4. NASA should assume responsibility for the lifelong health care of its active and former astronauts.



New LSAH

- Preventive Medicine Protocols
  - Age Based (40, 45, 50, 60, etc)
  - Ultrasound
  - Mammography
  - MRI
  - Colonoscopy
  - Stress Test
  - Complete Physicals
  - Derm Surveys
  - DEXA
  - Etc, etc.

- Occupational Health Surveillance Protocols
  - Radiation
  - Bone
  - Eye
  - Cadmium
  - Hydrazine
  - Lead
  - etc, etc.

Improving the Research

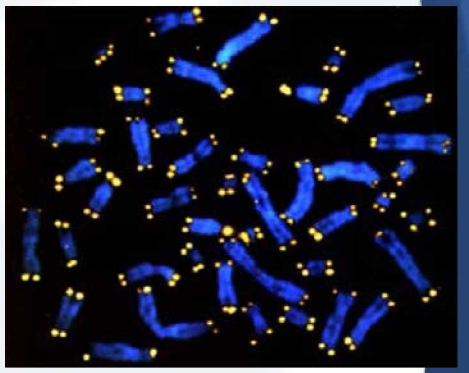
Before

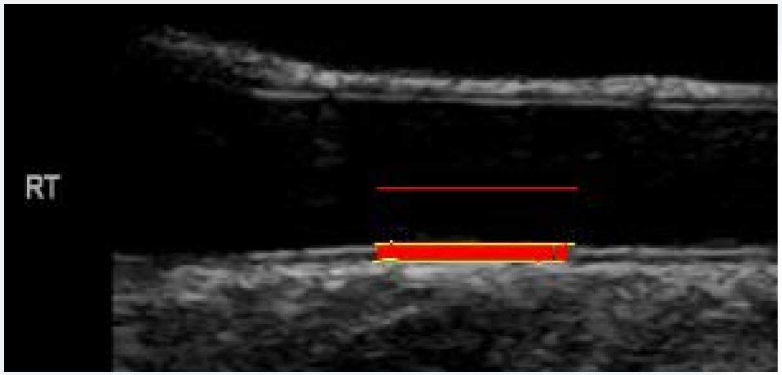
- Query the data and compare to 3 NASA workers for each astronaut....
- No consent obtained, just implied.
- Poor statistical power.
- No flight data incorporated!!!!

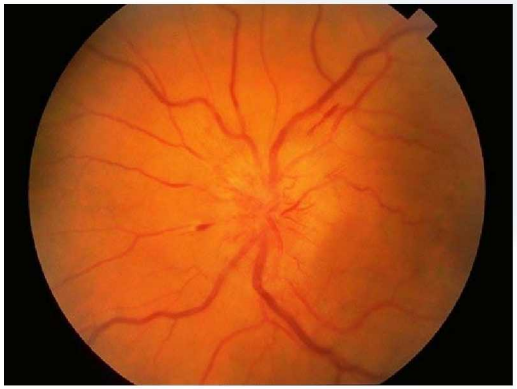
After

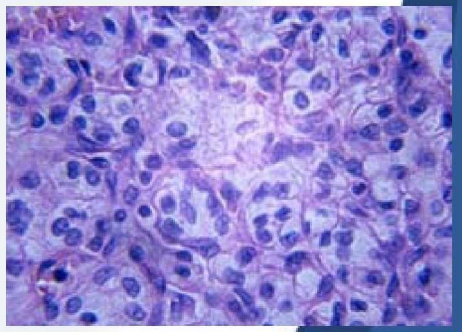
- Query the database and find the best comparison group to answer the question being asked
- Much more statistically powerful.
- Consent for direct studies, no consent needed for generic occ health trends.
- Flight data incorporated.

Identifying long term health risks and employing preventive medicine









Your Health is Our Mission

Occupational Surveillance for Spaceflight

- Meets Ethical and Moral obligation
- Increases data available to research
- Identifies and prevents exposure related disease
- Allows feedback into spacecraft design
- Allows NASA to follow long term health impacts