



*National Science  
Foundation  
United States Antarctic  
Program*

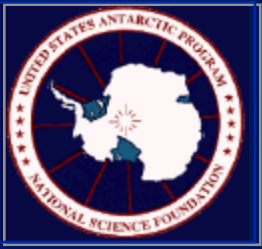
**Defining the Medical Care  
Requirements to Support the NSF's  
Research Enterprise in Antarctica**





# *Stakeholders*

- Antarctic participants (users)
- NSF (provider)
- Institutional (NSF): research mission
- Public
  - end user of research enterprise
  - ultimate “payer”
- Other international antarctic programs
- Private expeditions



## *Population Demographics*

- ~ 3500 persons deploy during the year (3 stations, 2 ships)
- ~325 persons winter-over
  - physically isolated for up to 8 months
- Average age: ~ 37 years
- 65% male, 35% female
- Population medically screened annually
  - variations based on age, length / location of deployment



## ***“On-ice” Medical Care***

- **Based on “health care needs assessment”**
  - **historical clinic workloads**
  - **population size, demographics**
  - **pre-deployment medical screening to eliminate existing problematic medical conditions**
  - **ability to sustain quality of care over the long-term**
  - **ability to evacuate patient, if necessary**



## *Medical Care Overview*

- **Comparable to ambulatory/emergent care clinic in US**
- **Majority of clinic visits “routine”**
- **Minimal in-patient care**
- **Seasonal, station-to-station variability**
- **Highlight “problem cases”**
  - accidents/injuries
  - cases requiring transport elsewhere for definitive care



# *Risk Management*

- **Physical environment, isolation**
- **Medical emergencies** (existing medical conditions or exacerbated by environment)
- **“Job” risks** (accidents, injuries)
- **Risks to mission, program**



## *Experience*

- Clinic workload statistics
- “Med-evac” experience
- Effectiveness of medical screening





## *Trend analyses*

- **Medical care on-ice**
  - routine ambulatory / emergent care clinics (borne out by data)
  - staffed for routine activities, with contingency plans for emergencies
  - do not staff for “mass casualty” situation (rather, prepare / plan to maximize community response)



## *Trending, con't*

- **Emergencies / problem cases**
  - cardio-vascular
  - “acute abdomens”
  - injuries
- **Prevention, wellness activities**
  - injuries ~45% of med-evacs
  - significant impact on lost - work time
  - musculo-skeletal injuries predominate



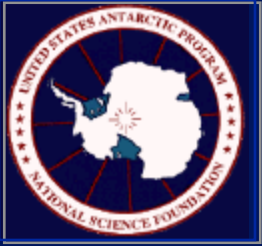
## *Focus for improvement*

- **Better screening?**
  - for cardio-vascular risks, sensitivity and selectivity of non-invasive screening methods possibly inadequate
  - better profiling of medical risk factors
- **Better on-ice diagnostics, treatment**
  - Tele-medicine providing distinct improvements
  - If evacuation easy, clinically better for patient
  - “Standard of care” expectations rising
- **Accident prevention programs**
  - Where’s the better pay-off..on prevention ...or treatment ?



# *Challenges*

- **Medical screening tools**
  - sensitivity, selectivity of tests
  - projecting risks over next 12-month period
  - where to set the cut-off threshold
- **Logistics limitations**
- **Leveraging on-ice capabilities with technologies**
- **Balancing program risks with personal risks**
- **Public perceptions of emergencies**
- **Return-on-investment decisions**
- **Staff clinic for routine or disaster situations ?**
- **Acceptable risk: how safe is “safe enough”**



## *Impacts / Outcomes*

- **Clinic operations**
  - Maintain wellness, productivity of staff
  - Manage emergencies
- **Maximize ROI (medical care -vs- research mission)**
- **Satisfy stakeholder expectations**



# Any questions?

