Acute Radiation Syndromes Risk revised
MLDs
Risk of Acute Radiation Syndromes Due to Solar Particle Events

ACUTE RADIATION SYNDROMES (Due to Solar Particle Events)

- Prodromal effects (e.g. nausea, vomiting, fatigue)
- Immune and hematological effects (e.g. increased risk of infection and hemorrhage)
- Skin effects (e.g. erythema, epilation, burns, blistering)

- Improper radiation exposure (1)
- Lack of Countermeasures (CMs) for ARS due to SPE (2)
- Interaction with other spaceflight factors (3)
Factor 1

Improper radiation exposure (1)

Environmental factors (e.g. dose, dose-rate, radiation quality) (1a)

Dose
Dose-rate
Energies

Ineffective shielding

Latency
Deep space transit

Lack of information on probabilities of ARS at energies, doses and dose-rates simulating SPEs

Mission-related factors (1b)

Ineffective warning

EVA

Lack of understanding of interaction with other spaceflight factors

Lack of dietary and/or pharmaceutical countermeasures
Factor 2

Lack of Countermeasures (CMs) for ARS due to SPE (2)

See detailed description in RMAT
Factor 3

Interaction with other spaceflight factors (e.g. microgravity) (3)

- Altered circadian rhythms (3a)
  - Linked to BHP
- Fatigue/stress (3b)  
  - Linked to HHC (Immuo risk)
- Immune system changes (3c)  
  - Linked to HHC (Nutrition risk)
- Nutrition (3d)  
  - Linked to HHC (Pharma risk)
- Other medications (3e)

- Lack of information on probabilities of ARS at energies, doses and dose-rates simulating SPEs
- Lack of understanding of interaction with other spaceflight factors
- Lack of dietary and/or pharmaceutical countermeasures