### HHC - Risk of Early Onset Osteoporosis due to Spaceflight

**Early Onset Osteoporosis (Osteo)**

1. **Osteo 1: Bone Standard**
   - A new acceptable bone health standard using an expanded surrogate for bone health needs to be defined for the flight environment.

2. **Osteo 2: Osteo Prevalence**
   - What is the incidence & prevalence of early onset osteoporosis or fragility fractures due to exposure to spaceflight?

3. **Osteo 3: Fracture Risk ID**
   - We need a validated clinically relevant method for assessing the effect of spaceflight on osteoporosis or fracture risk in long-duration astronauts.

4. **Osteo 4: Countermeasures**
   - We don't know the contribution of each risk factor on bone loss and recovery of bone strength, and which factors are the best targets for countermeasures application.

5. **Osteo 5: In-flight Monitoring**
   - We need an inflight capability to monitor bone turnover and bone mass changes during spaceflight.

6. **Osteo 7: Mitigation**
   - We need to identify options for mitigating early onset osteoporosis before, during and after spaceflight.

#### PPBE19 Baseline

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**Updated Bone Standard**

- RCAP 3

**Risk Status**

- FE Task Group Meeting II

**Hip QCT**

- SHFH: Vertebral Strength Analysis II

**Bone Epidemiologic Analysis (380)**

**Calcium Isotope-Flight**

**Bisphosphonates SMO (56)**

**Bone Turnover Markers (Biochem Profile)**