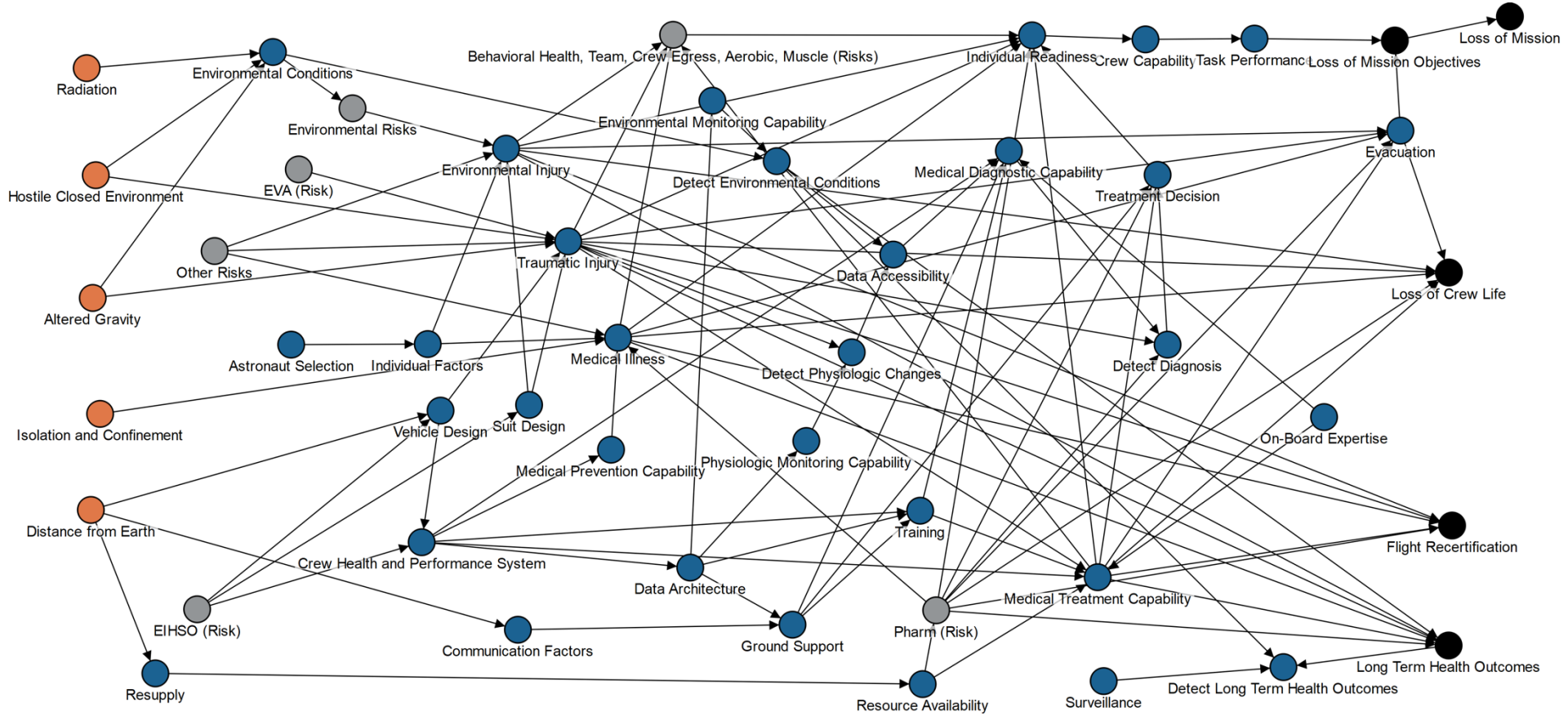
Medical Risk DAG Narrative

The Medical Risk boils down to two parts – First, what medical conditions/events are going to happen in a given mission. Second, what can be done to decrease the likelihood (prevention) or the consequence (treatment) of those events.

- For the first part: Total Medical Events are made up of three categories – Environmental Injuries, Traumatic Injuries, and Medical Illnesses.
  - **Environmental Injury** likelihood is affected by Environmental Conditions (and other Environmental Risks), EVAs, and **Vehicle** and **Suit Designs**. **Individual Factors** inform the bio-variability in response to environmental insults.
  - Traumatic Injury likelihood is affected by EVAs, Vehicle and Suit Designs, and other risks (Bone fracture, Dynamic Loads, Crew Egress, Muscle and Aerobic (Risks)).
  - **Medical Illness** likelihood is affected by other risks and **Individual Factors**.

Each of these categories can affect mission level outcomes, especially if not planned for. This is why there is a second part – What can we do about it?

- For the second part: The **Crew Health and Performance System** provides for a variety of capabilities intended to mitigate medical risk. These include **Medical Prevention Capabilities** (designed to decrease likelihood of conditions) and **Medical Treatment Capabilities** (designed to decrease the consequence of conditions that have occurred). Deciding on what treatment to provide is an information dependent process that requires **Physiologic** and **Environmental Monitoring Capabilities** and **Diagnostic Capabilities**. These are closely linked to a **Data Architecture** and depend on **Data Accessibility** to inform the correct **Treatment Decision**. If an incorrect **Treatment Decision** is reached, risk is not mitigated, and it may be increased. **Diagnostic** and **Treatment Capabilities** are dependent on the **On-Board Expertise**, **Ground Support**, **Training**, **Resource Availability**, and **Data Architecture** provided by the **Crew Health and Performance System**.
- **Resource Availability** is dependent on **Resupply**. **Ground Support** is dependent on **Communication Factors** including communications delay. Both of these are dependent on **Distance from Earth**.


Radiation
Environmental Conditions
Behavioral Health, Team, Crew Egress, Aerobic, Muscle (Risks)
Individual Readiness
Crew Capability
Task Performanc
Loss of Mission Objectives
Loss of Mission
Environmental Risks
Environmental Monitoring Capability
Hostile Closed Environment
EVA (Risk)
Environmental Injury
Detect Environmental Conditions
Medical Diagnostic Capability
Treatment Decision
Evacuation
Other Risks
Traumatic Injury
Data Accessibility
Altered Gravity
Loss of Crew Life
Astronaut Selection
Individual Factors
Medical Illness
Detect Physiologic Changes
Detect Diagnosis
Isolation and Confinement
Vehicle Design
Suit Design
On-Board Expertise
Medical Prevention Capability
Physiologic Monitoring Capability
Distance from Earth
Training
Flight Recertification
Crew Health and Performance System
Data Architecture
Medical Treatment Capability
EIHSO (Risk)
Communication Factors
Ground Support
Pharm (Risk)
Long Term Health Outcomes
Resupply
Resource Availability
Surveillance
Detect Long Term Health Outcomes