Based on the predicates provided in the safety case pattern for the GPCA system, the instantiated safety case hierarchy is as follows:

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G1: Operational safety is verified in Generic Patient-Controlled Analgesia (GPCA) system

- S1: Argument over the satisfaction of all specs over GPCA system (undeveloped)

- G2: All operational hazards are mitigated

- S3: Argument over operational hazards (with context C2: Operational hazards are given by hazard.allInstances())

- G3: Overinfusion is mitigated

- S4: Argument over the applied scenarios of Overinfusion (with context C3: All related scenarios are given by Overinfusion.)

- G4: Overinfusion is mitigated under condition of dose limit exceeded

- S5: Argument over all specs related to scenario of dose limit exceeded (with context C4: All related specs are given by scenario.spec.allinstances())

- G5: Flow rate sensor is equipped is appropriate for the scenario of dose limit exceeded

- S6: Argument the appropriateness of spec over properties (with context C5: Properties are given by spec.property.allinstances())

- G6: "Flow rate sensor is equipped" property is appropriate for the spec

- S7: Argument over the source of the "flow rate sensor is equipped" property definition (with context C6: Source is given by property.source)

- G7: FDA standard is appropriate and trustworthy

- Sn1: FDA standard

- G8: "Flow rate sensor is equipped" property definition is sufficient

- Sn2: Flow rate sensor feature specifications

- G3: Underinfusion is mitigated

- S4: Argument over the applied scenarios of Underinfusion (with context C3: All related scenarios are given by Underinfusion)

- G4: Underinfusion is mitigated under condition of programmed rate too low

- S5: Argument over all specs related to scenario of programmed rate too low (with context C4: All related specs are given by scenario.spec.allinstances())

- G5: Period set to trigger underinfusion alarm is appropriate for the scenario of programmed rate too low

- S6: Argument the appropriateness of spec over properties (with context C5: Properties are given by spec.property.allinstances())

- G6: "Period set to trigger underinfusion alarm" property is appropriate for the spec

- S7: Argument over the source of the "period set to trigger underinfusion alarm" property definition (with context C6: Source is given by property.source)

- G7: Expert opinion is appropriate and trustworthy

- Sn1: Expert opinion validity source

- G8: "Period set to trigger underinfusion alarm" property definition is sufficient

- Sn2: Programmed rate control settings

- S2: Argument over reliability in all suitable levels of GPCA system (undeveloped)

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This instantiated tree structure represents a detailed safety argument. It relates the goals, strategies, and solutions directly to the context of the GPCA system. Specific scenarios, properties, and sources are placed accordingly in the structure to demonstrate how each is supported in the assurance case for safety.