Based on the provided predicates, instantiate the safety case pattern for the Generic Patient-Controlled Analgesia (GPCA) system and represent it in a hierarchical tree format:

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G1: Operational safety is verified in GPCA system

- S1: Argument over the satisfaction of all specs over GPCA system [Undeveloped]

- C1: All specs are given by specifications of GPCA system

- G2: All operational hazards are mitigated

- S3: Argument over operational hazards

- C2: Operational hazards are given by "Overinfusion" and "Underinfusion"

- G3: Overinfusion is mitigated

- S4: Argument over the applied scenarios of Overinfusion

- C3: All related scenarios are given by "Flow rate exceeds dose limit due to programming error"

- G4: Overinfusion is mitigated under scenario "Flow rate exceeds dose limit due to programming error"

- S5: Argument over all specs related to "Flow rate exceeds dose limit due to programming error"

- C4: All related specs are given by "Flow rate sensor is equipped and operating correctly"

- G5: "Flow rate sensor is equipped" is appropriate for "Flow rate exceeds dose limit due to programming error"

- S6: Argument the appropriateness of "Flow rate sensor is equipped" over properties

- C5: Properties are given by "Flow rate sensor operates under expected parameters"

- G6: "Flow rate sensor operates under expected parameters" is appropriate for spec "Flow rate sensor is equipped"

- S7: Argument over the source of the property definition

- C6: Source is given by "FDA standard and previous knowledge"

- G7: "FDA standard" is appropriate and trustworthy [Developed]

- Sn1: Citation of FDA standard for medical devices

- G8: "Flow rate sensor operates under expected parameters" definition is sufficient [Developed]

- Sn2: Engineering specifications and validation test results of the Flow rate sensor

- G3: Underinfusion is mitigated

(Similar hierarchical structure expansion as for Overinfusion could follow for Underinfusion showing specific scenarios and specs.)

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This hierarchical tree format depicts how each goal and strategy is supported by subsequent, lower-level goals, contextual information, and evidence, specifically tailored to the GPCA system. Each element, including strategies, goals, and contexts, is instantiated with specific details relevant to the GPCA system, replacing placeholders with system-specific information. This approach ensures that the safety case is thoroughly developed, focusing on real hazards and mitigation strategies backed by credible sources and specifications.