**DOCUMENTATION**

The UML diagram for the proposed system Emergency Room Simulation is as below:

A diagram of a company

AI-generated content may be incorrect.

The modern healthcare infrastructure contains emergency rooms that function as essential sections for urgent medical treatment of patients in distress. Emergency room management demands an organized method which achieves effective treatment processes together with resource distribution while maintaining workflow between healthcare workers. Emergency room simulations have proven themselves important in enhancing healthcare processes through better decision making and better professional training. The UML diagram for this simulation visualization includes all essential elements describing the fundamental system components with their relational structure alongside the key interaction mechanisms of emergency room functionality.

**Patient Registration and Triage Process**

All simulation activity revolves around the patient that reaches the emergency room for medical help. The system initiates patient contact when the receptionist performs a registration process and conducts a triage assessment for measuring patient condition severity. At this stage patient registration establishes the exact emergency level which aligns critical patients to fast medical care while other cases follow a different treatment path. The receptionist functions as an intermediate between patients and clinical personnel by guiding patients to proper medical staff members depending on their health condition.

**Roles of Medical Staff: Doctors and Nurses**

Doctor or nurse staff assigns the patient to care based on the outcome of their triage assessment. Through medical diagnosis and prescription, the doctor assumes responsibility for detecting health problems as well as treatment application and vital medical choices. Medical doctors at public hospitals work with several patients and need nurses to aid them in performing their patient care duties. Patient monitoring together with treatment execution and medical instruction adherence are primary responsibilities for nurses as healthcare professionals. The UML diagram presents the relationships between doctors, nurses and patients in an efficient manner that displays their system interactions (Badri and Hollingsworth 13).

**The Treatment Room and Resource Management**

The emergency room simulation depends heavily on a functioning treatment room as this area becomes the main location for medical treatment of patients. The healthcare system contains several treatment rooms that doctors and nurses assign patients through availability rules. Both doctors and nurses share the treatment room space to deliver quick patient care services. Management of patient flows depends heavily on the fundamental interaction between hospital staff and treatment facilities during the simulation.

**The Role of the Hospital System**

As the core organizational element, the hospital system directs all operations within its emergency room. The hospital system maintains continuous information transmission between patient registration and medical consultation as well as treatment stages. The UML diagram displays the main structural relationships between different elements which create a responsive emergency room operation. Such relationships exist to mirror actual hospital operational dynamics thus making this simulation flexible at various levels of scale.

**Design Goals and System Efficiency**

The UML design structure follows the main objectives established for the project. The simulation requires maximum efficiency because it needs to duplicate emergency room operations in a realistic manner. Under different work conditions, the system performs optimally because of its patient prioritization capabilities along with component-based division of work and structured communication channels (Badri and Hollingsworth 13). This design supports systematic expansion because it provides the necessary functionality for system growth in the future. Expansion of medical personnel and specific departments or new treatment centres will integrate seamlessly into the existing simulation structure. The modular design structure makes the simulation adaptable to developing system requirements.

**Conclusion**

The UML diagram grasps emergency room operational aspects which creates an enduring base for creating an operational and adaptable simulation. The UML diagram facilitates superior emergency room operation analysis to establish a framework applied in medical training and hospital administration and system enhancement applications. The emergency room simulation remains efficient and realistic because of its structured design of core components and their relationship system. Through this approach the UML diagram successfully replicates emergency medical complexities which boosts ongoing healthcare system improvements.

**REFERENCES**

Badri, Masood A., and John Hollingsworth. "A simulation model for scheduling in the emergency room." *International Journal of Operations & Production Management* 13.3 (1993): 13-24.