



Strategic capacity expansion planning powered by GE HealthCare's Digital Twin simulation

Case Study: Providence Swedish - First Hill campus

Background

As part of a \$1.3 billion expansion, Providence Swedish is building a new 12-story tower at its First Hill campus in Seattle, scheduled to open in 2027. The new facility will unite two campuses and feature a new emergency department, 24 state-of-the-art operating rooms, 3 new intensive care units, including a 35-bed acuity-adaptable unit, and centralized imaging.

Anticipating higher patient demand and increasingly complex care needs, Providence Swedish needed to ensure the new design would enable efficient care orchestration, optimal bed utilization, and flexible acuity management. In combining campuses, the team faced a critical question: could they design adaptable units capable of serving every level of acuity – while ensuring sufficient capacity for emergency, surgical, and transfer patients?

Approach

Providence Swedish partnered with GE HealthCare to leverage its Digital Twin – an advanced simulation that creates a digital replica of hospital operations. Using historical data, the Digital Twin models patient flow, acuity levels, and resource utilization to test “what-if” scenarios, helping hospitals evaluate design options before implementation.

Working together, Providence Swedish and GE HealthCare used the Digital Twin to:

- Determine the optimal bed mix and unit configuration for the new tower
- Evaluate the adaptability of cardiology and neuroscience units
- Plan for daily variation in patient volumes and acuity

“I was initially skeptical of the Digital Twin. I am now a full convert. Even the most tech-averse folks have mentioned how essential GE HealthCare's Digital Twin has been to determining the ideal fit for the new campus and for demonstrating to senior leadership what we needed based on the clear data-driven approach the Digital Twin made possible.”

— David N. Selander, MD, MBA, Swedish Acute Care Executive Medical Director and Medical Director of the Providence Swedish Staffing, Transfer, and Operations Center

Impact

Acuity Scorecard

The team developed an acuity scorecard using the Digital Twin to model foundational scenarios for the new tower. This analysis revealed the most effective distribution of ICU and intermediate care beds and validated key design decisions.

Highlights included:

- Optimized allocation across four ICUs and two IMCUs
- Co-location of cardiac patients to enhance resource sharing
- Adjacency between MICU and SICU to improve staffing flexibility
- Dedicated acuity-adaptable floor
- Direct ICU access to imaging
- Dedicated unit to house ED admits which will enable the regulation of patient flow from the ED to the units

These insights built confidence across clinical and operational teams that the proposed design would sustain efficiency under real-world demand.

Patient Population Analysis

The patient population analysis simulated projected patient volumes, admission patterns, and acuity variation. This allowed leadership to evaluate capacity limits, identify potential bottlenecks, and refine unit design to maintain access and throughput across all entry points.

Result

By simulating dozens of scenarios, the Digital Twin produced an optimal bed and capacity plan - giving leaders confidence they could meet future demand in the new tower while keeping wait times within acceptable limits across all entry points.

“The GE HealthCare team has been awesome to work with. I can't imagine how we would have made such detailed and precise design recommendations, and gotten the buy-in of everyone involved, without their expertise and the digital twin. It has been amazing.”

— David N. Selander, MD, MBA, Swedish Acute Care Executive Medical Director and Medical Director of the Providence Swedish Staffing, Transfer, and Operations Center