



The Connected Hospital:

How Integrated Virtual Care Infrastructure Improves
Throughput, Expands Capacity, and Simplifies
Healthcare Technology

An Avidex Executive Whitepaper



EXECUTIVE SUMMARY

Healthcare leaders face a convergence of challenges unlike any period in recent history. Hospitals are under increasing pressure to improve patient throughput, maximize existing capacity, manage financial constraints, address workforce shortages, and modernize aging technology environments. At the same time, growing patient acuity and consumer expectations demand a higher level of care coordination, communication, and engagement.

Virtual care has emerged as a valuable tool to address these challenges. Yet many healthcare organizations have approached virtual care through isolated initiatives such as telehealth programs, virtual nursing pilots, remote patient observation, or standalone patient engagement platforms. While these solutions deliver meaningful value, they often create additional technology silos and operational complexity.

Leading health systems are taking a different approach. Organizations implementing integrated virtual care strategies have reported measurable improvements in workforce support, patient engagement, clinical collaboration, and care coordination while extending the reach of experienced clinicians across the care environment.⁵⁷

Organizations such as Atrium Health and The Christ Hospital Health Network have demonstrated that virtual care delivers its greatest value when

implemented as part of an integrated care delivery strategy rather than a standalone application. Their programs have evolved from tactical staffing solutions into enterprise-wide platforms that support workforce optimization, patient safety, clinical collaboration, and operational efficiency.¹⁷

The next generation of healthcare delivery will be built around the connected hospital: a technology-enabled environment where virtual care, patient engagement, clinical workflows, room technology, communications, and future AI capabilities work together as a unified ecosystem.

This paper explores the evolution of virtual care, emerging use cases that extend beyond virtual nursing, and the infrastructure strategy hospitals need to support scalable transformation.



THE CHALLENGE FACING HOSPITAL LEADERS

Historically, growth was often achieved through physical expansion. More beds, new facilities, and larger campuses created additional capacity.

Today's reality is different.

Many hospitals face constraints that limit their ability to expand through construction alone:

- Inpatient capacity challenges
- Delayed discharges
- Staffing shortages
- Rising operational costs
- Technology fragmentation
- Increasing patient acuity
- Margin pressures

As a result, many health systems have shifted their focus toward throughput optimization.

The ability to admit, treat, and discharge patients more efficiently can often create greater operational value than adding beds alone.

Virtual care technologies are increasingly supporting these efforts by reducing administrative burdens, streamlining clinical workflows, accelerating admissions and discharges, and improving care coordination throughout the patient journey. Common use cases include virtual admissions, discharge navigation, patient education, care planning, provider collaboration, and observation services.⁵⁶

The opportunity is no longer simply to digitize care. The opportunity is to redesign how care is delivered.

FROM TELEHEALTH TO THE CONNECTED HOSPITAL

Virtual care has undergone a rapid evolution.

Phase 1: Telehealth

The first generation of virtual care focused primarily on remote clinical visits.

The goal was straightforward: connect patients and providers regardless of location.

While valuable, these solutions largely existed outside the inpatient environment.

Phase 2: Virtual Nursing

The pandemic accelerated interest in virtual nursing as hospitals searched for innovative ways to support overburdened clinical teams.

Virtual nurses began assisting with:

- Admissions
- Discharge planning
- Patient education
- Care coordination
- Clinical mentoring
- Documentation support

Atrium Health launched its virtual nursing program in 2021 and rapidly expanded its capabilities. What began as a response to workforce challenges evolved into an operational model supporting multiple facilities and care environments. Virtual nurses now function as an extension of bedside teams, helping improve workforce utilization while maintaining patient-centered care.¹

Phase 3: Connected Care Infrastructure

The next phase is already emerging.

Rather than implementing individual virtual programs, hospitals are beginning to establish enterprise virtual care ecosystems that support:

- Virtual nursing
- Patient observation
- Command centers
- Clinical collaboration
- Specialist consultations
- Interpreter services
- Family participation
- Patient engagement
- AI-enhanced workflows

This evolution transforms virtual care from a staffing initiative into foundational healthcare infrastructure.¹⁶⁷

SEVEN HIGH-IMPACT CONNECTED HOSPITAL USE CASES

1. Throughput Acceleration

One of the clearest examples of virtual care's operational impact is patient throughput.

Many delays that occur during a patient's stay have little to do with clinical treatment. Admission documentation, medication reconciliation, discharge planning, patient education, and care coordination often consume valuable nursing time and can create bottlenecks that slow patient movement throughout the hospital.

At The Christ Hospital Health Network, virtual nurses support admissions, discharge navigation,

patient education, mentoring, and rapid response workflows. Rather than replacing bedside caregivers, virtual team members assume portions of the administrative and coordination work that often pull nurses away from direct patient care, helping extend the reach of bedside teams and alleviate operational pressures associated with patient throughput and staffing challenges.⁷

Common virtual nursing responsibilities include:

- Admission assessments
- Medication reconciliation
- Discharge instructions
- Patient education
- Care coordination

The result is not simply greater efficiency. Hospitals gain improved bed availability, faster patient progression through the continuum of care, and additional capacity without adding physical resources. As organizations face increasing pressure to optimize throughput, virtual care is proving to be both a workforce strategy and an operational strategy.

2. Capacity Expansion Without Construction

For decades, hospitals increased capacity by adding beds, building new towers, or expanding facilities. Today, many organizations are discovering that some of their greatest capacity opportunities exist within their existing footprint.

Virtual care makes it possible to extend clinical expertise beyond the traditional constraints of geography, staffing models, and physical space. Instead of concentrating resources within a single unit or facility, hospitals can distribute expertise across multiple locations and patient populations simultaneously.

Atrium Health demonstrated this approach by using virtual care teams as an extension of onsite clinical staff, creating a model that supports patients across facilities while helping clinical resources operate more efficiently. By centralizing certain functions and enabling remote collaboration, health systems can increase effective care capacity without the cost, disruption, or long timelines associated with physical expansion.¹

Examples of this approach include:

- Enterprise virtual nursing hubs
- Multi-facility support teams
- Remote specialist access

- Centralized command centers

For many healthcare leaders, the question is no longer how many beds can be added. The question is how existing beds, clinical expertise, and support resources can be utilized more effectively. Virtual care provides a pathway to expand capacity not by building larger hospitals, but by making better use of the people and resources already in place.

3. Workforce Optimization

Healthcare workforce challenges remain among the industry's greatest concerns.

Virtual roles enable hospitals to retain experienced clinicians who may no longer wish to work exclusively in physically demanding bedside environments.

Examples include:

- Nurse mentoring
- Preceptor programs
- Virtual charge nursing
- Clinical coaching
- Remote rounding

The Christ Hospital Health Network specifically identified retention of experienced nursing talent as a strategic objective when implementing virtual nursing. The program was designed to extend the reach of experienced nurses while supporting admissions, patient education, mentoring, care coordination, and bedside teams across the organization.⁷

4. Intelligent Patient Observation

Virtual observation is often associated with replacing traditional sitter programs, but leading health systems are beginning to view it as a broader patient safety and workforce strategy.

What started as a way to monitor high-risk patients more efficiently has evolved into a tool that supports multiple clinical and operational objectives.

Today, virtual observation programs commonly support:

- Fall prevention
- Behavioral health workflows
- Suicide-risk monitoring
- Escalation management
- Safety surveillance

This broader approach is helping hospitals



rethink how safety monitoring is delivered across the enterprise. In addition to reducing reliance on traditional sitter models, virtual observation technologies have demonstrated the potential to improve workforce utilization while enhancing both patient and caregiver experiences.³⁵

As staffing pressures continue and patient acuity rises, virtual observation is increasingly being recognized not simply as a cost-saving initiative, but as a scalable component of a modern patient safety strategy.

5. Enhanced Patient Experience

Today's patients expect communication, convenience, and connectivity throughout their healthcare journey.

Connected hospital environments can support:

- Family participation in care discussions
- Specialist access
- Interpreter services
- Personalized patient education
- Virtual consultations

Virtual care solutions strengthen patient engagement while improving information delivery and care coordination. Virtual nursing programs increasingly support education, discharge preparation, family participation, and specialist access, helping create a more connected and informed patient experience throughout the care journey.⁵⁶

6. Extending Digital Transformation to the Bedside

Many health systems have invested heavily in digital front-door initiatives. However, a gap often exists between outpatient digital experiences and inpatient care delivery.

The connected hospital closes that gap.

Integrated room technologies create a digital ecosystem connecting:

- Patients
- Nurses
- Physicians
- Care teams
- Operational leaders

As healthcare technology continues to evolve, patient rooms are increasingly becoming strategic elements of healthcare IT infrastructure rather than standalone audiovisual environments.²

7. Building the Foundation for AI-Enabled Care

Artificial intelligence is quickly becoming a strategic priority across healthcare.

Future use cases may include:

- Ambient clinical documentation
- Automated workflow orchestration
- Predictive staffing support
- Clinical decision support
- Intelligent room automation

These innovations require a connected infrastructure foundation capable of supporting sensors,



communications, clinical integrations, and enterprise data workflows.

Hospitals that establish scalable virtual care infrastructure today will be better positioned to adopt emerging AI technologies tomorrow.⁴⁶

WHY POINT SOLUTIONS FALL SHORT

The Integration Challenge

As virtual care programs expand, many healthcare organizations find themselves managing an increasingly complex technology environment.

Solutions are often introduced to solve specific problems, but collectively they can create operational complexity if they are not designed to function as part of a connected ecosystem.

Healthcare leaders frequently face challenges such as:

- Multiple vendor relationships
- Redundant integrations
- Disconnected workflows
- Inconsistent user experiences
- Increased support requirements
- Technology adoption challenges

The result is that technology intended to simplify care delivery can sometimes create additional burden for clinicians, patients, and IT teams

Designing the Connected Hospital

For healthcare leaders, the challenge is no longer determining whether virtual care belongs

in the hospital. The question is how to create an environment where virtual care technologies operate as part of a unified care delivery strategy rather than a collection of disconnected tools.

The most successful organizations are moving beyond individual use cases and focusing on the broader infrastructure required to support long-term transformation. They recognize that virtual nursing, patient observation, clinical collaboration, patient engagement, and emerging AI capabilities are interconnected components of a modern healthcare ecosystem.

Building this ecosystem requires thoughtful alignment between clinical workflows, operational objectives, technology architecture, governance, and user adoption.

Why Integration Matters

The value of technology is increasingly created through the connections between systems rather than the capabilities of individual platforms.

Organizations that approach virtual care as part of an integrated ecosystem are often better positioned to:

- Improve workflow efficiency
- Accelerate adoption
- Reduce redundancy
- Simplify operations
- Optimize existing investments
- Create more consistent patient and caregiver experiences

The Role of the Technology Integration Partner

As healthcare environments become more connected, many organizations are turning to strategic integration partners to help manage complexity and ensure alignment across technologies, workflows, and operational objectives.

An effective integration partner can help organizations:

- Assess current technology ecosystems
- Identify workflow and interoperability gaps
- Align technology investments with clinical and operational goals
- Coordinate multiple vendors and stakeholders
- Establish scalable deployment strategies
- Support long-term optimization and lifecycle management

The goal is not simply to deploy more technology. The goal is to ensure technology works together in ways that support care delivery, workforce efficiency, and organizational performance.

THE FUTURE PATIENT ROOM

The patient room is rapidly becoming the center of healthcare innovation.

In the connected hospital, every room becomes a flexible platform for delivering care.

Imagine a patient room where:

- Virtual nursing is available on demand
- Family members participate remotely
- Specialists connect instantly
- Patient education is personalized
- Observation occurs continuously
- Clinical teams collaborate seamlessly
- AI assists with documentation and workflows
- Technology supports care rather than complicates it

This vision is no longer theoretical.

The building blocks already exist today through advancements in virtual care, patient engagement technologies, and connected care platforms.¹⁴⁶

The challenge facing healthcare leaders is not identifying new technologies, but creating the infrastructure, governance, and integration strategy required to bring them together into a scalable, sustainable care delivery model.

The future patient room is not defined by any single platform or device. It is defined by how

effectively people, processes, and technology work together to support better patient outcomes, improved workforce experiences, and more efficient healthcare operations.

CONCLUSION

Virtual care has evolved far beyond telehealth visits and virtual nursing pilots. Leading health systems are already demonstrating how connected virtual care models can support workforce sustainability, patient engagement, operational efficiency, and future care delivery innovation.¹⁵⁷

For forward-thinking hospitals, virtual care is becoming foundational infrastructure that improves throughput, expands capacity, supports workforce sustainability, enhances patient experiences, and prepares organizations for future innovation.

The health systems that achieve the greatest success will not be those that deploy the most technology.

They will be the organizations that create the most connected environments.

QUESTIONS FOR HEALTHCARE LEADERS

As healthcare organizations plan for the next phase of digital transformation, leaders should consider:

- Is our virtual care strategy designed to scale beyond individual use cases?
- Are our patient rooms prepared to support future virtual and AI-enabled workflows?
- Where does technology fragmentation create operational inefficiencies?
- What infrastructure investments will create the greatest long-term flexibility?
- How can we improve throughput and capacity without expanding physical footprint?

Answering these questions can help establish a roadmap toward a more connected, efficient, and future-ready care environment.





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