

The Virtual Hospital

Advanced Care at home

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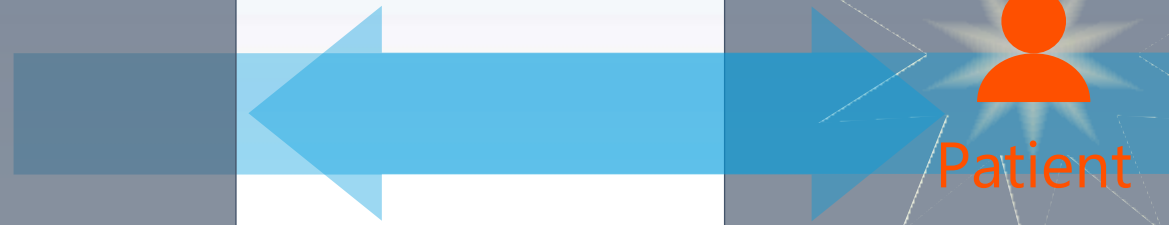
LEARNING OBJECTIVES

- Cite three reasons why patients may prefer to have their care in the home setting
- Identify three advantages to setting up a virtual hospital ward
- Compare the three main objectives to the Advanced Care at Home program

Start with the "WHY?"

Traditional Hospital

Patient Home



Hospital

Expertise

Technology

Care Delivery Models

Hospital

Expertise

Technology

Delivery Models

Home

Comfort

Convenience

Control & Freedom



The Voice of the Patient

“I can’t see my family”

“Food is terrible”

“I’m stuck in bed”

“No one tells me what’s going on”

“I can’t sleep in this bed”

Ideas and Opinions | 6 October 2020

How Hospital Stays Resemble Enhanced Interrogation

Kenneth J. Mishark, MD  , Holly Geyer, MD, Peter A. Ubel, MD

[Author, Article and Disclosure Information](#)

<https://doi.org/10.7326/M19-3874>



PDF



Tools



THE ORIGINAL HOME HOSPITAL



Problems with Hospitalization



Unintended adverse clinical events



Access to care



Cost

Unintended adverse clinical events

Delirium

Weakness

Infections

Creditor MC. Ann Intern Med. 1993.

Hung WH et al. JAMA Intern Med. 2013.

Covinsky K. JAMA 2011.

Cost of U.S. Healthcare

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REGION

3 day average
cost ~\$30,000

Bankruptcy
~66% tied to
medical



Healthcare.gov

Himmelstein et al American Journal of Public Health 2019

AARP 2020

2009 Meta-Analysis¹



- Meta-analysis of 10 HaH RCTs including n=1,372 patients
- 38% reduction in six month mortality (p<0.05)
- Trend toward higher patient satisfaction
- Trend toward reduction in cost.

2012 Meta-Analysis²



- Meta-analysis of 61 HaH RCTs including n=6,992 patients age >16 yrs
- 19% reduction in mortality (p<0.05)
- 25% reduction in readmission (p<0.05)
- Significant reduction in cost
- Higher patient satisfaction

¹Shepperd S, Doll H, Angus RM, et al. Avoiding hospital admission through provision of hospital care at home: a systematic review and meta-analysis of individual patient data. *CMAJ*. 2009. 180(2):175-182.

²Captain GA, Suliman NS, Mangin DA, et al. A meta-analysis of "hospital in the home". *MJA*. 2012. 197(9): 512-519.

Limitations



The model hasn't changed in 100 years.

- Expenses are high compared to return (physician to patient ratios 1:4).
- Resources are limited (only so many providers, nurses, meds, etc.).
- Geographic coverage is limited (one hub model).

Advanced Care at Home

Virtual care option including around-the-clock access to Mayo Clinic-led care team; convenient video and electronic monitoring for questions and evaluations

In-home visits by nurse practitioners and other health care professionals

Lab tests, mobile imaging and IV therapies, as well as supply delivery right to patient's home

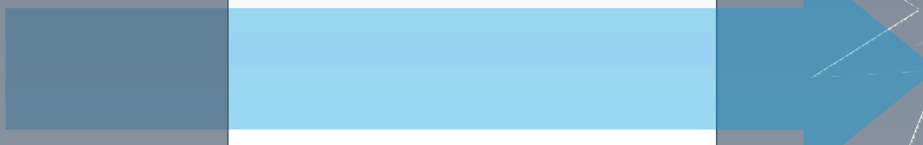


Advanced Care at Home

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Mayo Clinic

Patient Home



Patient



Home
Technology

Home Technology



IN-HOME TECHNOLOGY

Virtual care of ACH patients is supported by Bluetooth-enabled technology



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Software
Platform

Patient Home



Patient



Home
Technology



Software Platform

Command Center / Mission Control

Cesia

Epic

Notes
Orders
MAR
Face sheets
ADT
Phases of Care
Lab Results
Vital Signs

Cesia

Virtual Hospital Room
Supply Chain Fulfillment
Patient Schedule
Biometric Alerts
Technology Alerts
Video & Phone
Vital Signs

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Software Platform



Command Center



Patient Home



Patient



Home Technology



Command Center





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Software Platform



Command Center



Supplier Network

Patient Home



Patient



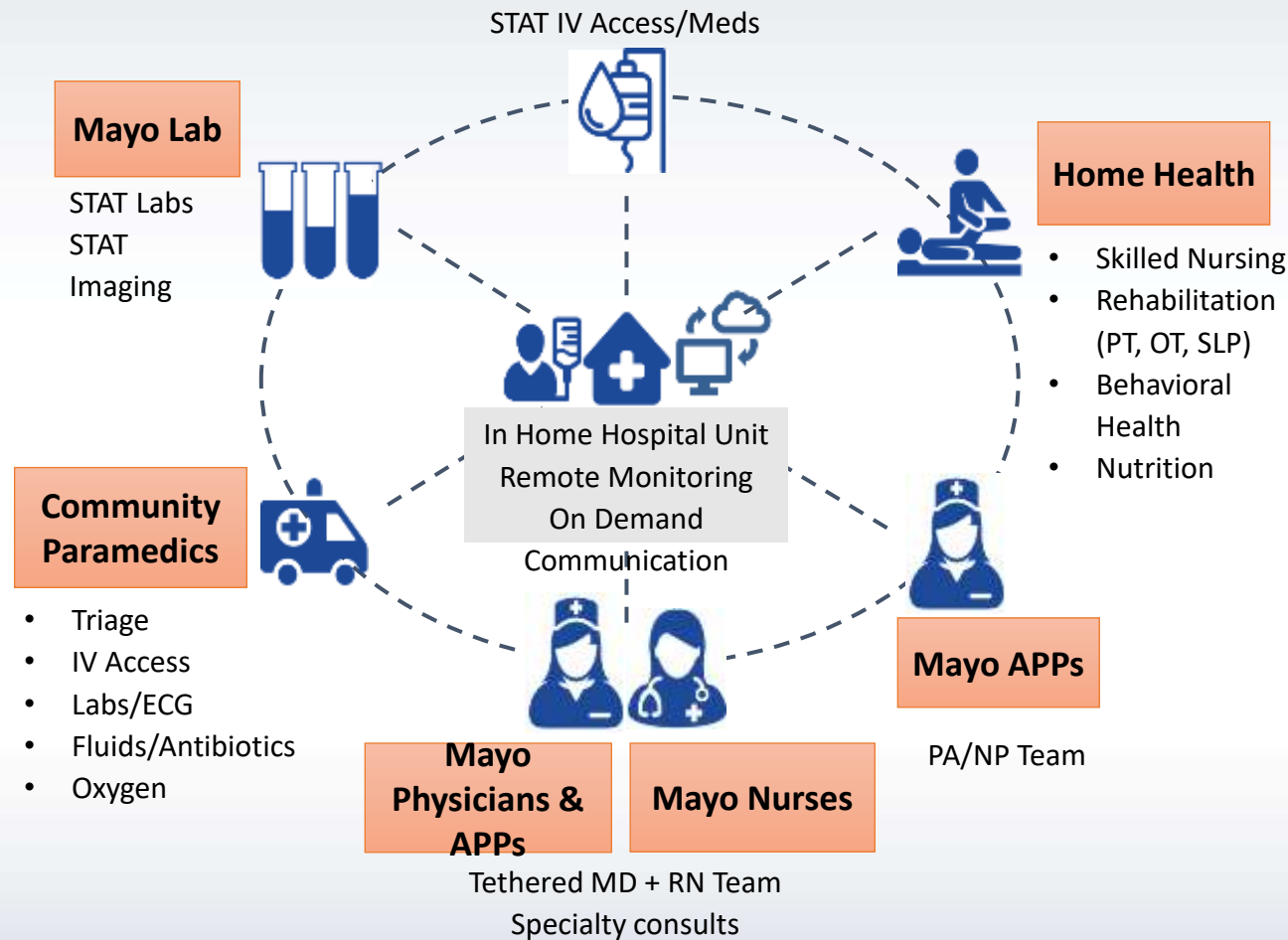
Home Technology

| | | | | | |
|------------------------------|--------------------|---------------|-------------------|--------------------|--------------------|
| Community Paramedicine / ARR | Courier | DME | Home Health Aides | Home Care Services | Home Technology |
| Infusion Therapy | Lab Processing | Medical Meals | Medical Supplies | Medical Waste | Mobile Diagnostics |
| Nurse Practitioner | Oxygen/Respiratory | Phlebotomy | Pharmacy | Security | Transportation |

Supplier Network



Advance Care at Home Ecosystem



Our goal is to replicate as closely as possible the capabilities of a brick and mortar hospital



Advanced Care at Home

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Software
Platform



Command
Center



Supplier Network

Patient Home



Patient



Home
Technology

01

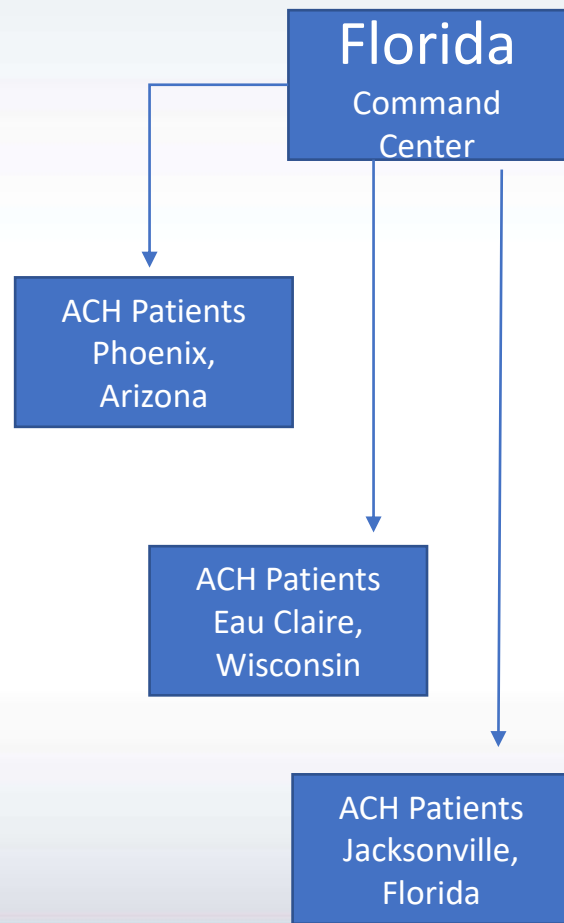
Unlimited

02

25 mile radius

03

Advanced Care at Home Across Mayo Clinic Geographies



Mayo Clinic Care Network

Current Members by Location



Eligible Patients

Inclusion Criteria

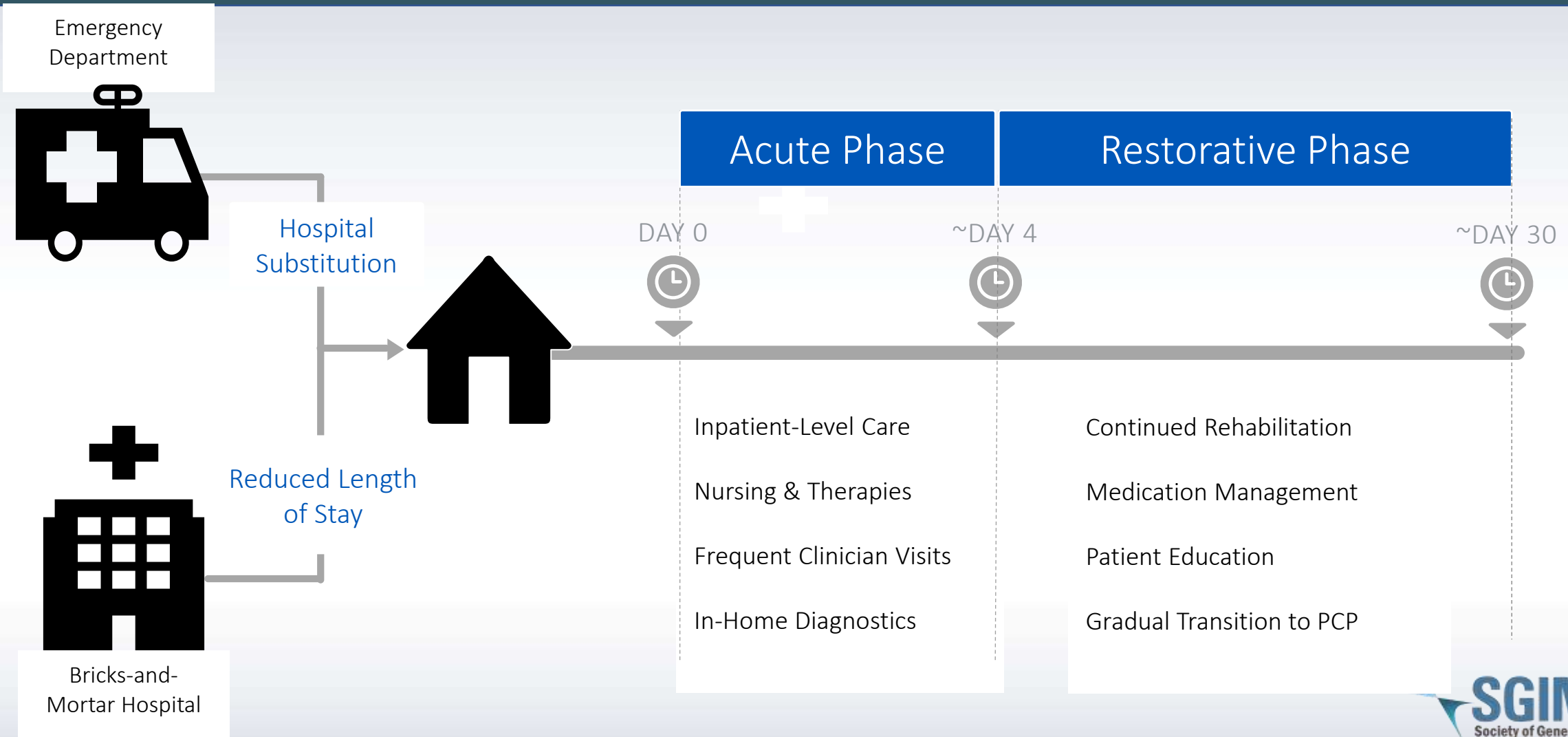
- Clinical stability
- Geography – within 25-30 miles of hospital (hub)
- Social determinants
- Payer
- Age (adults only)
- Acute exacerbation requiring inpatient-level care

Exclusion Criteria

- Uncontrolled mental illness
- IV pain medication needs
- Requiring 24/7 assistance with ADLs
- Unstable arrhythmia
- Requires telemetry monitoring

Diagnoses

| | |
|------------------------|-----------------------|
| CHF | COPD |
| Renal Failure | Cellulitis |
| Gastroenteritis | Electrolyte Disorders |
| Pancreatitis | Respiratory Failure |
| Migraines / Headaches | Pulmonary Embolism |
| Pneumonia | DVT |
| Bronchitis with Asthma | UTI |
| Bone Marrow Transplant | Post-Surgical |



Patient Experience: Day in the life of a patient



A Typical Hospital

| | |
|---------|---|
| 6 AM | Blood draw for daily labs |
| 8-11 AM | Physician visit |
| 11-1 PM | Watch TV & wait for x-ray |
| 2 PM | Sponge bath in bed |
| 4 PM | Push call button to speak to physician |
| 5 PM | Physician stops by |
| 6 PM | Dinner is served |
| 11 PM | Hospital is quiet enough to fall asleep |



Advanced Care at Home

| | |
|----------|------------------------------------|
| 9 AM | Blood draw for daily labs |
| 10 AM | Physician video visit |
| 10-12 PM | Children stop by to say hello |
| 12 PM | X-ray |
| 2 PM | Shower with the help of aide |
| 4 PM | Use iPad to connect with physician |
| 6 PM | Enjoy home-cooked meal |
| 9 PM | Fall asleep in your own bed |

Patients in a typical hospital have to wait for a physician visit, have to go to the x-ray department, have to wait for a bath, and have to wait for dinner. Patients in advanced care at home have immediate access to their physician at the touch of a button.



Challenges

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Scaling to
create
economic
efficiencies



Defining home
hospital quality
measures &
benchmarks



Building the
workforce of
the future



Changing
regulatory
environment



Our Experience

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Safe

Happy

Affordable

Admissions

750+

Building experience
with each new encounter

Reducing Readmissions

50%

30-day hospital readmission
is approximately 50% lower
than the comparable
population within the
traditional hospital practice

Severity of illness

2.8

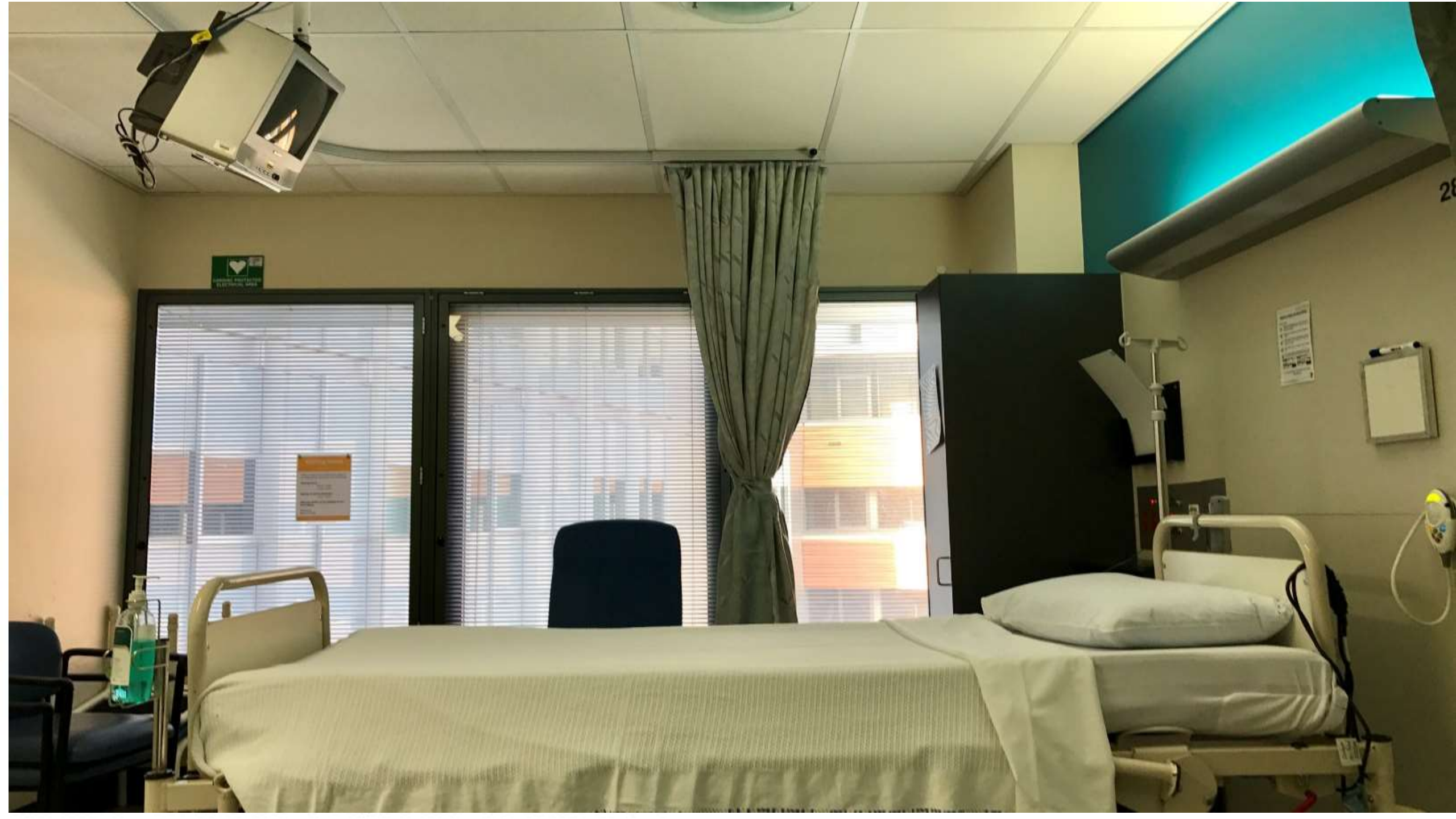
Despite caring for high acuity
patients, zero mortalities have
occurred in the program

Patient Experience

92%

of patients responded as highly
likely to recommend the
program





Questions and Discussion

