UK HealthCare GBBN

TACKLING EVERYDAY ICU DESIGN

WHILE PREPARING FOR INFECTIOUS DISEASE NEEDS

HEALTHCARE FACILITIES symposium and expo

LEARNING OBJECTIVES

1. **Use the planning playbook** to implement design strategies that will enable your organization to maintain its daily business and care model
2. **Identify tangible design solutions** arising from multiple case studies that can apply to future projects at multiple scales
3. **Evaluate the effectiveness of evidence-based design** solutions in light of the specific contexts in which they could be deployed
4. **Explore the generated design guidelines** that apply to new buildings or renovations

1. Introductions
2. Background of UK & MICU
3. Research Methodologies & Results
4. Design Practices & Strategies
5. Questions

AGENDA

HEALTHCARE FACILITIES symposium and expo

HealthCare

JASON
GRONECK

KIRSTEN
MILLER

ANGELA
POWELL

STEPHANIE
SHROYER

UK HEALTHCARE
MICU

945 LICENSED BEDS

>42,000 DISCHARGES/YR

3 HOSPITALS

2.2 MILLION OUTPATIENT ENCOUNTERS/YR

>20,000 TRANSFERS

1 OF 29 U.S. academic health centers with a **Clinical & Translational Science Awards Program Hub**, a **National Cancer Institute Designated Cancer Center**, AND an **Alzheimer's Research Center**.

UK HealthCare

A U.S. News and World Report Best Hospital in Kentucky

SIX YEARS IN A ROW

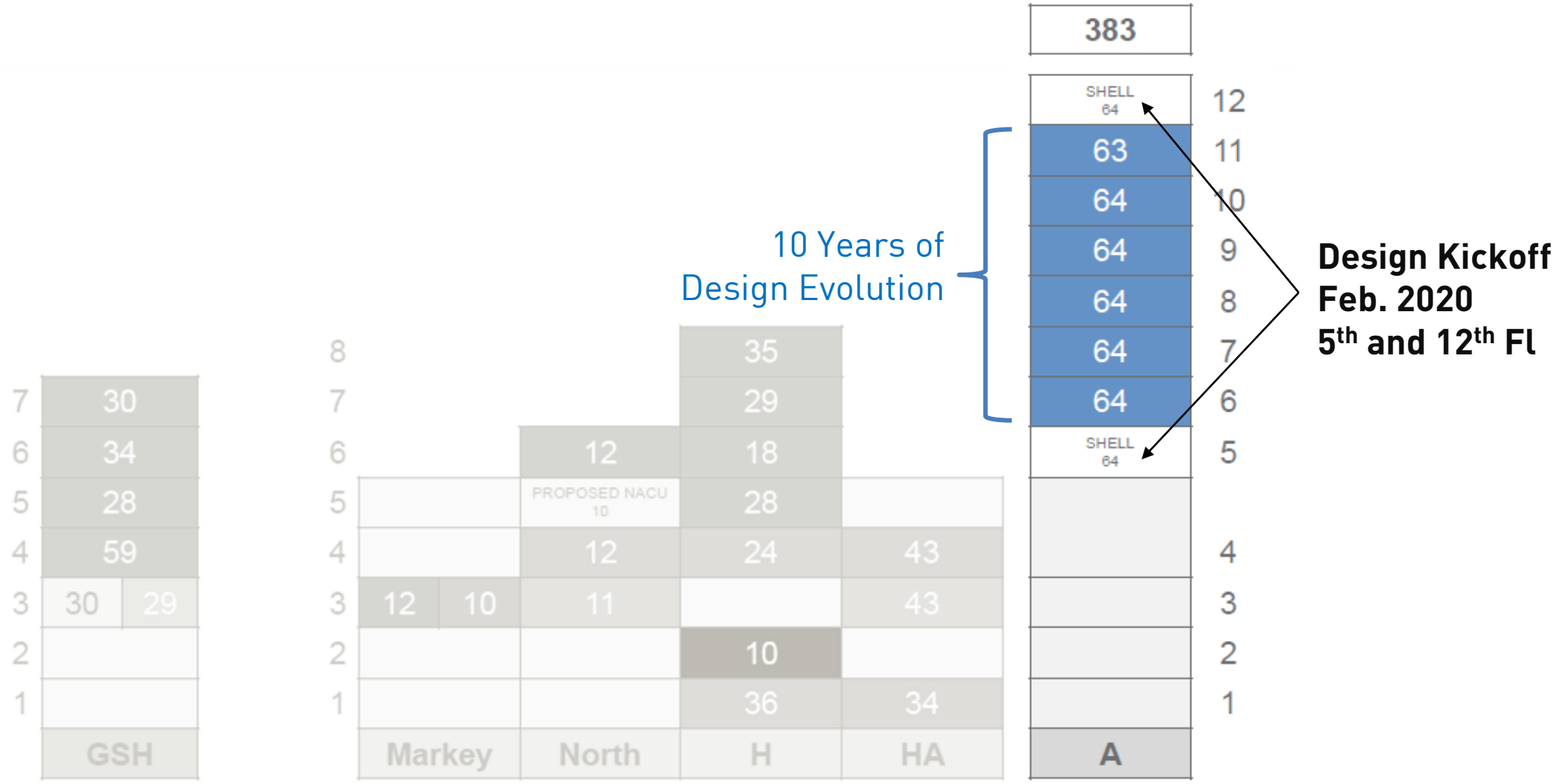
LEVEL 1 TRAUMA CENTER

MAGNET RECOGNIZED
AMERICAN NURSES CREDENTIALING CENTER

$126 MILLION in combined National Institute of Health funding: **MORE THAN DOUBLED OVER THREE YEARS**

LEVEL IV NICU

Spring 2020 B.P. (Before Pandemic)

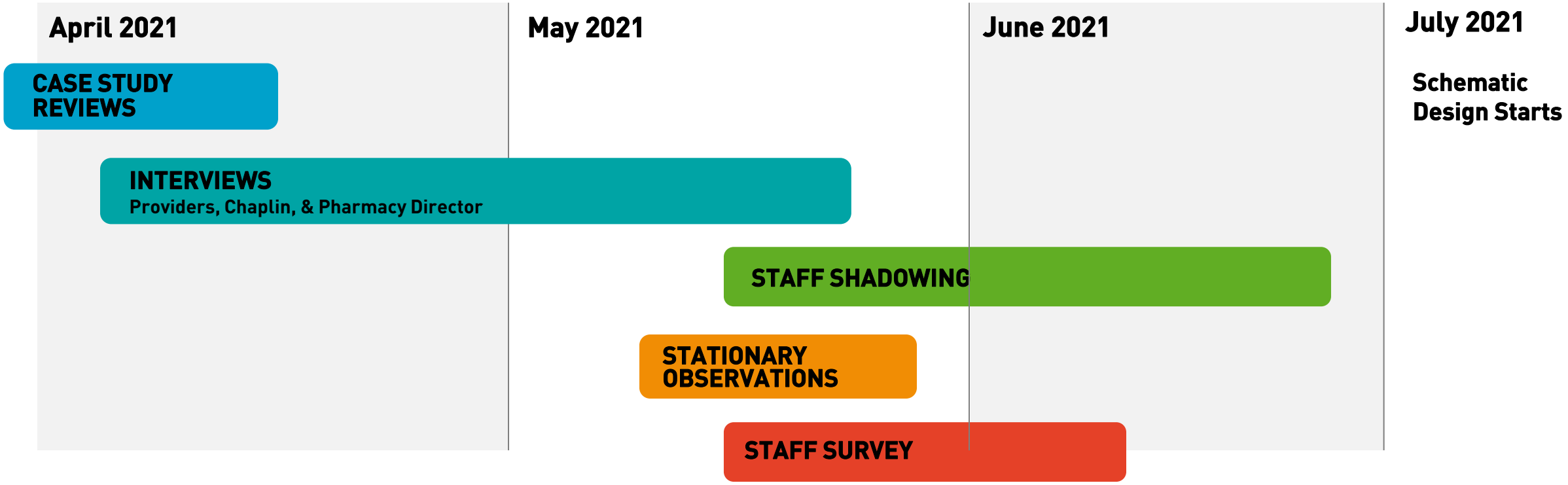


3 Weeks Later...

6 Months Later…

RESEARCH METHODS

RESEARCH PROCESS



CASE STUDIES: INTENSIVE CARE UNITS

UNC REX HEALTHCARE

Cleveland Clinic

Meritus™ Health

HOUSTON Methodist LEADING MEDICINE

Texas Children's Hospital®

CASE STUDIES: BIO-CONTAINMENT UNITS

The Bellevue Hospital
EST. 1917
Quality Care, Close To Home

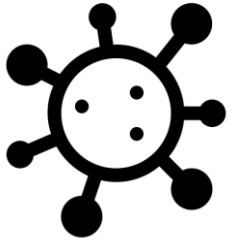
EMORY
HEALTHCARE

NIH
NIAID

JOHNS HOPKINS
MEDICINE

University of Nebraska Medical Center

DESIGN OPPORTUNITIES

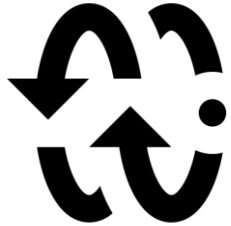


BOLSTERING RESISTANCE TO PATHOGENS

ACCESS CONTROL & ENTRY FUNCTION

BUILDING SYSTEMS

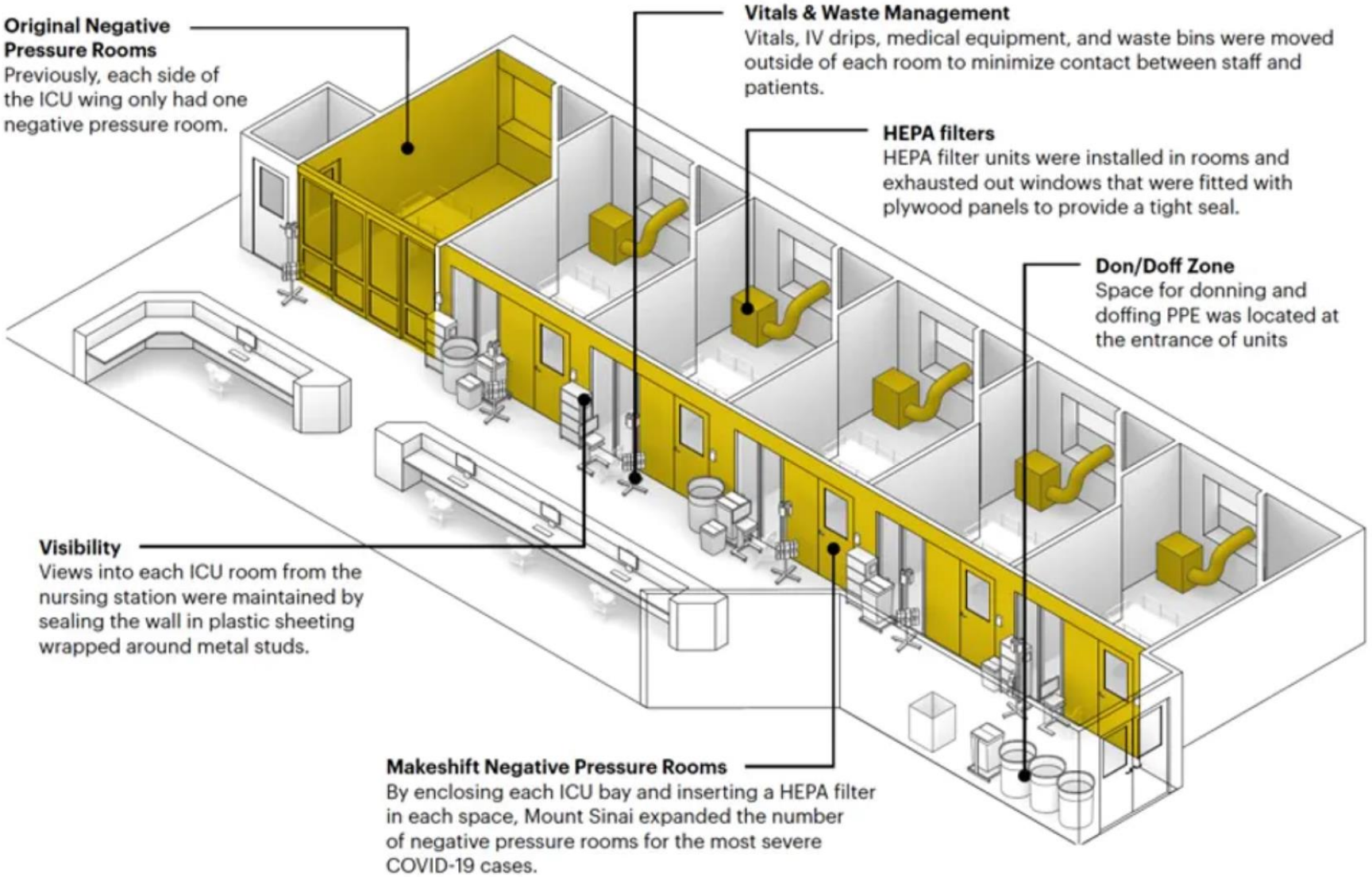
PATIENT SUPPORT



PROCESSES & FLOW

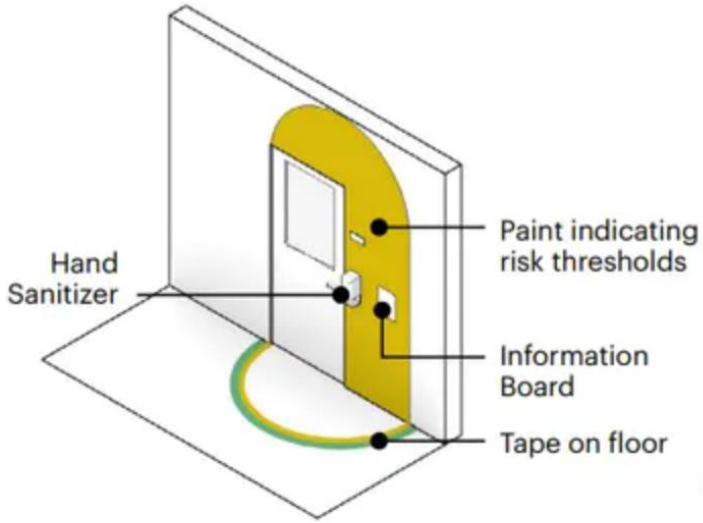
Meritus Health Regional Infectious Containment Unit

Mount Sinai Covid-19 Response



Mount Sinai Covid-19 Response

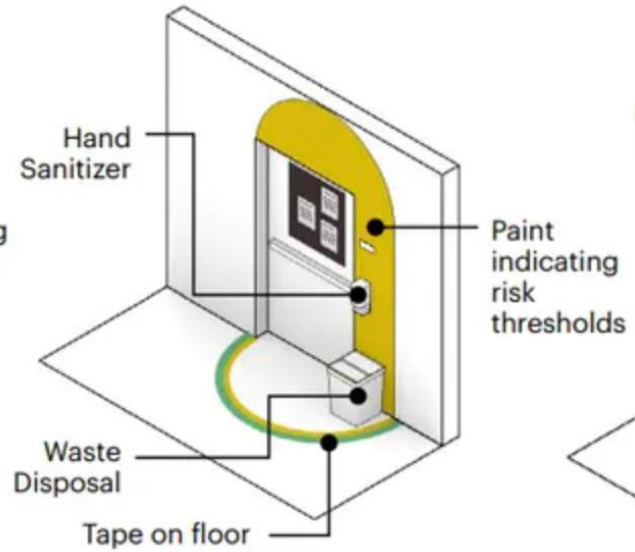
Entry into patient rooms



Objectives

- Create awareness around what risk zones staff are entering vs exiting
- Convey key information at a glance (such as whether patients are intubated)
- Increase staff efficiency

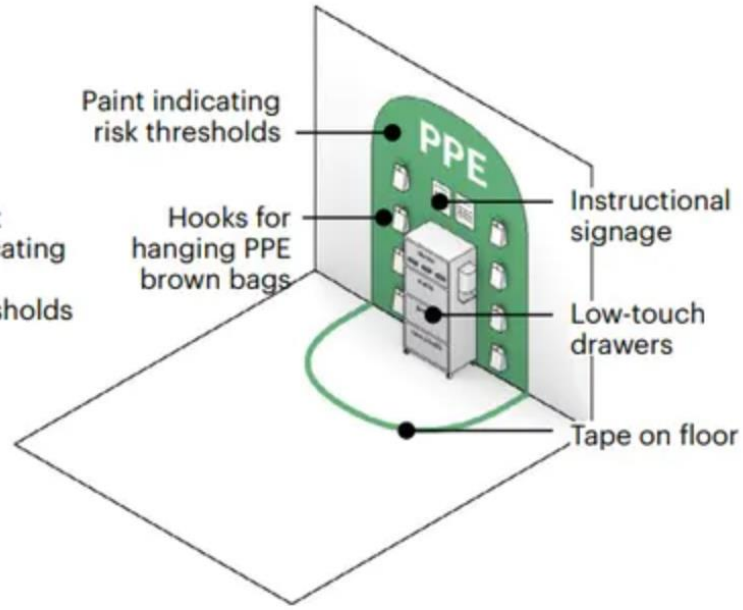
Exit from patient care unit



Objectives

- Create awareness around what risk zone staff are exiting vs entering
- Remind staff to get clean before leaving contaminated zones
- Reduce unnecessary movement between units
- Reduce disease transmission to non-COVID units

PPE access & storage

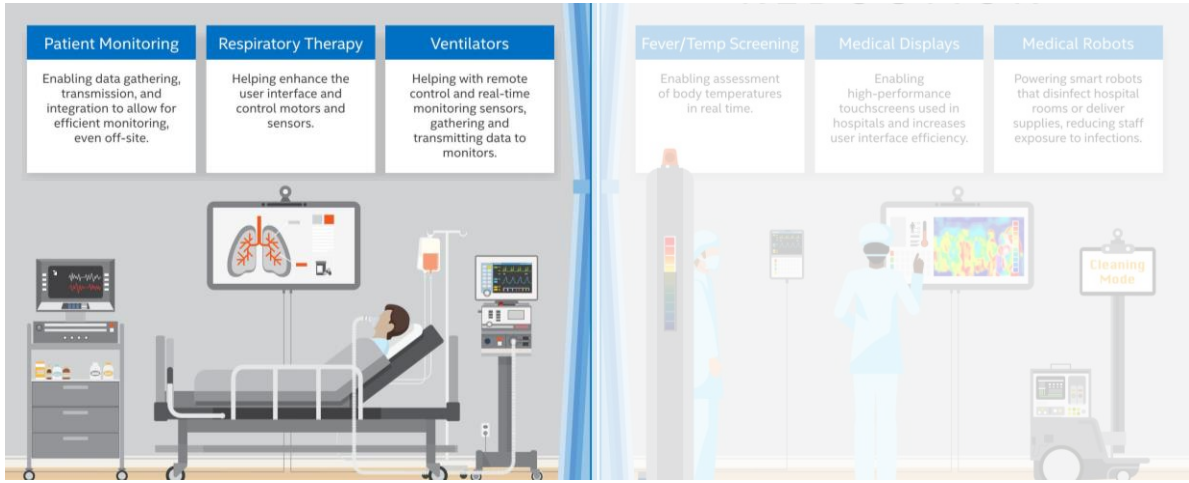


Objectives

- Create clear clean zones around PPE carts and donning areas
- Consolidate needed resources in one place
- Increase PPE adherence
- Reduce time and hassle in donning PPE
- Reduce PPE cart contamination

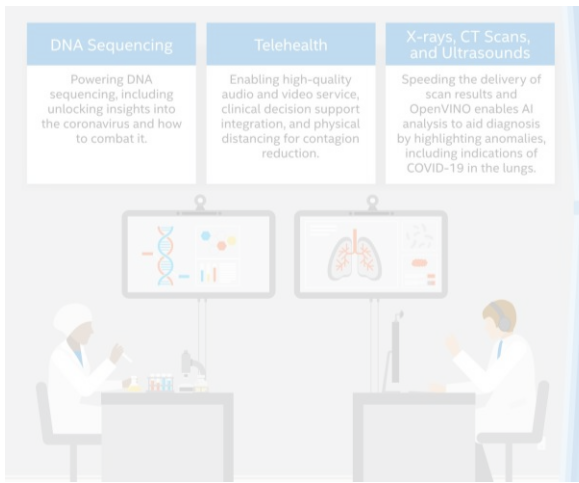
Houston Methodist Virtual ICU

Patient Room

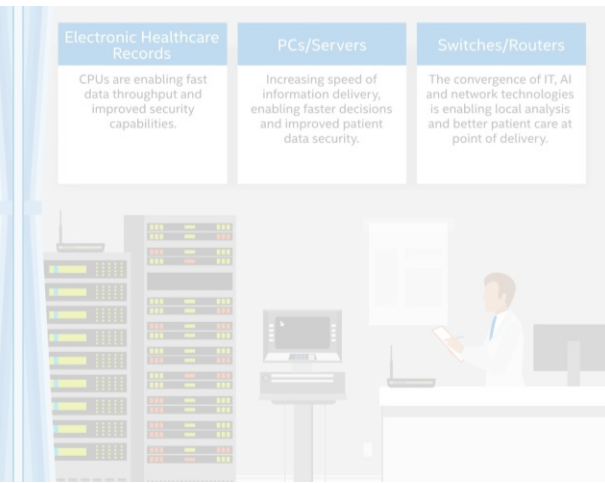


Outside of Patient Room

Diagnostics



Provider Monitor Center



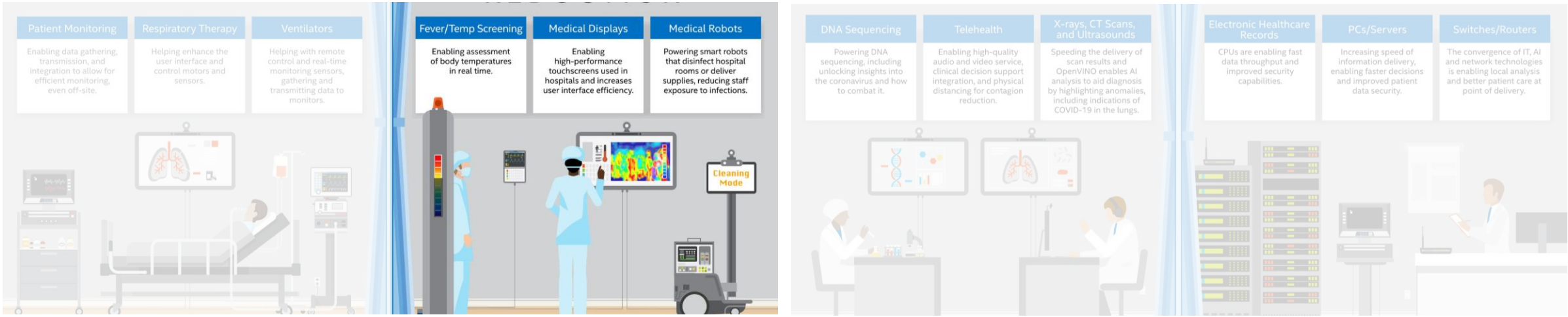
Houston Methodist Virtual ICU

Patient Room

Outside of Patient Room

Diagnostics

Provider Monitor Center



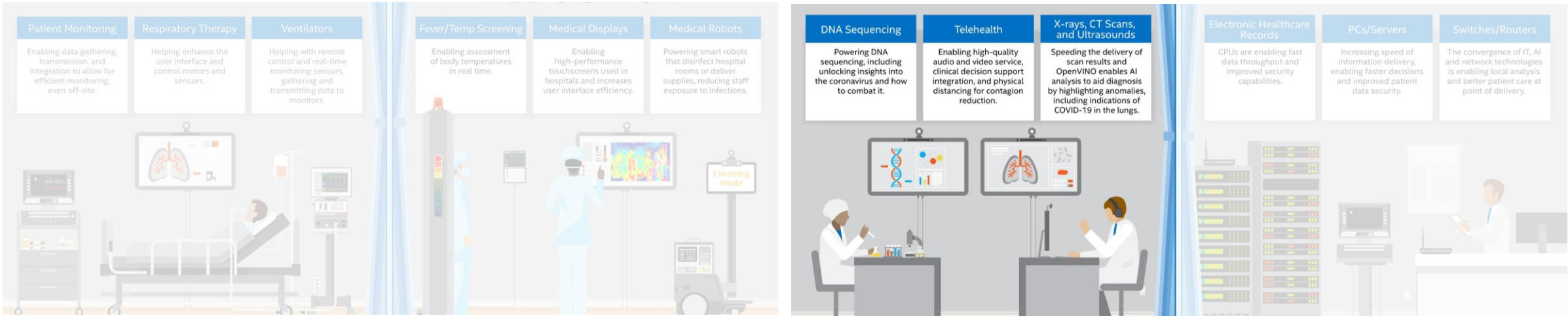
Houston Methodist Virtual ICU

Patient Room

Outside of Patient Room

Diagnostics

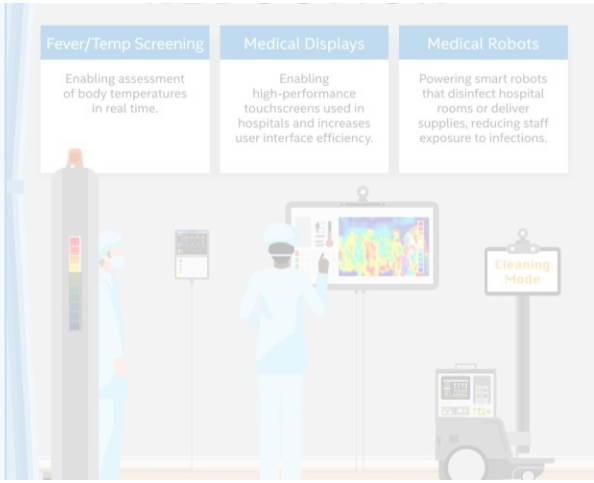
Provider Monitor Center



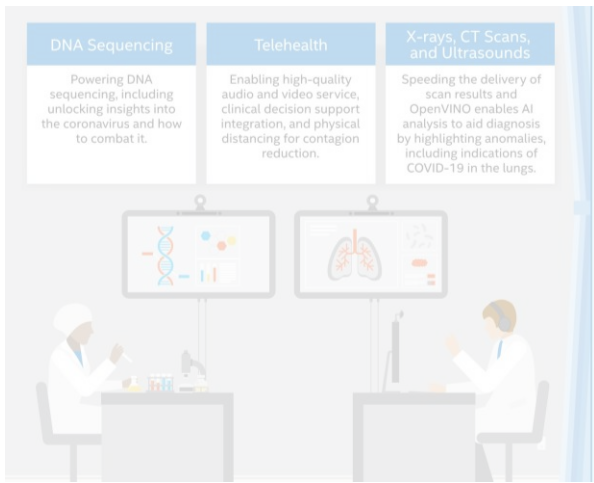
Houston Methodist Virtual ICU

Patient Room

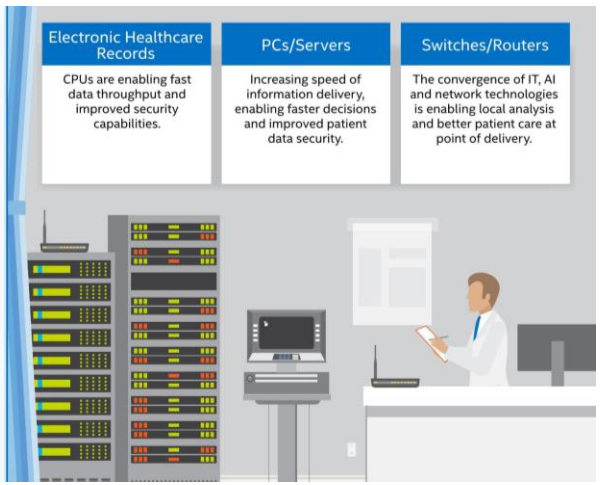
Outside of Patient Room



Diagnostics



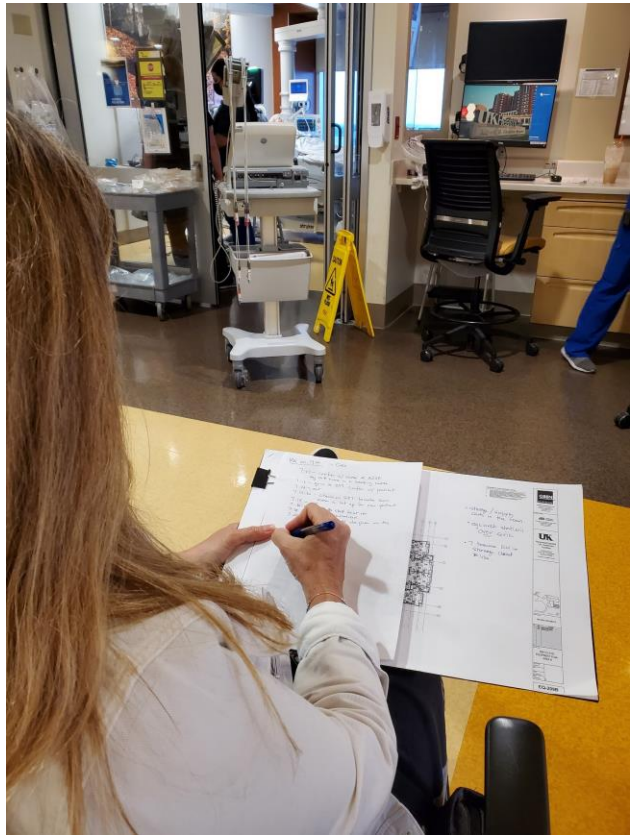
Provider Monitor Center



INTERVIEWS

	**Dr Adarsh Srivastava** Director of Critical Care Services at Piedmont Medical Center Rock Hill, SC	Not all critical cares are the same and protocols drive variabilities Monitor patients with Universal monitoring system **Combat staff fatigue** with good ratios, tranquility, natural light, etc Provide ample space for equipment Provide **visibility**
	**Dr. Paul Barach**, BSC, MD, MPH, Maj Clinical Professor at Wayne State University School of Medicine Detroit, MI	Include the **quadruple aim** in design Understand the daily **needs of the staff** ICU design did not help the workflow during the pandemic Limit distractions Promote spaces for **dying with dignity**
	**Deacon Jeff Strom** in the Diocese of Phoenix Chaplin at Valleywise Health Medical Center	Provide time and **space for staff** to have a break Allow for private conversations to happen in consult room and not a corridor Council human **dignity and dying**
	**Devlin Smith** Director of Pharmacy Operations at UK Healthcare	GSH and Chandler have a shared vision for medication distribution Spec tech model is only used on ICU Cart system is the old model and not longer used Pharmacy satellite could be an option on MICU

STAFF SHADOW OBSERVATIONS



STATIONARY OBSERVATIONS

NURSE
PATIENT/ FAMILY
PROVIDER

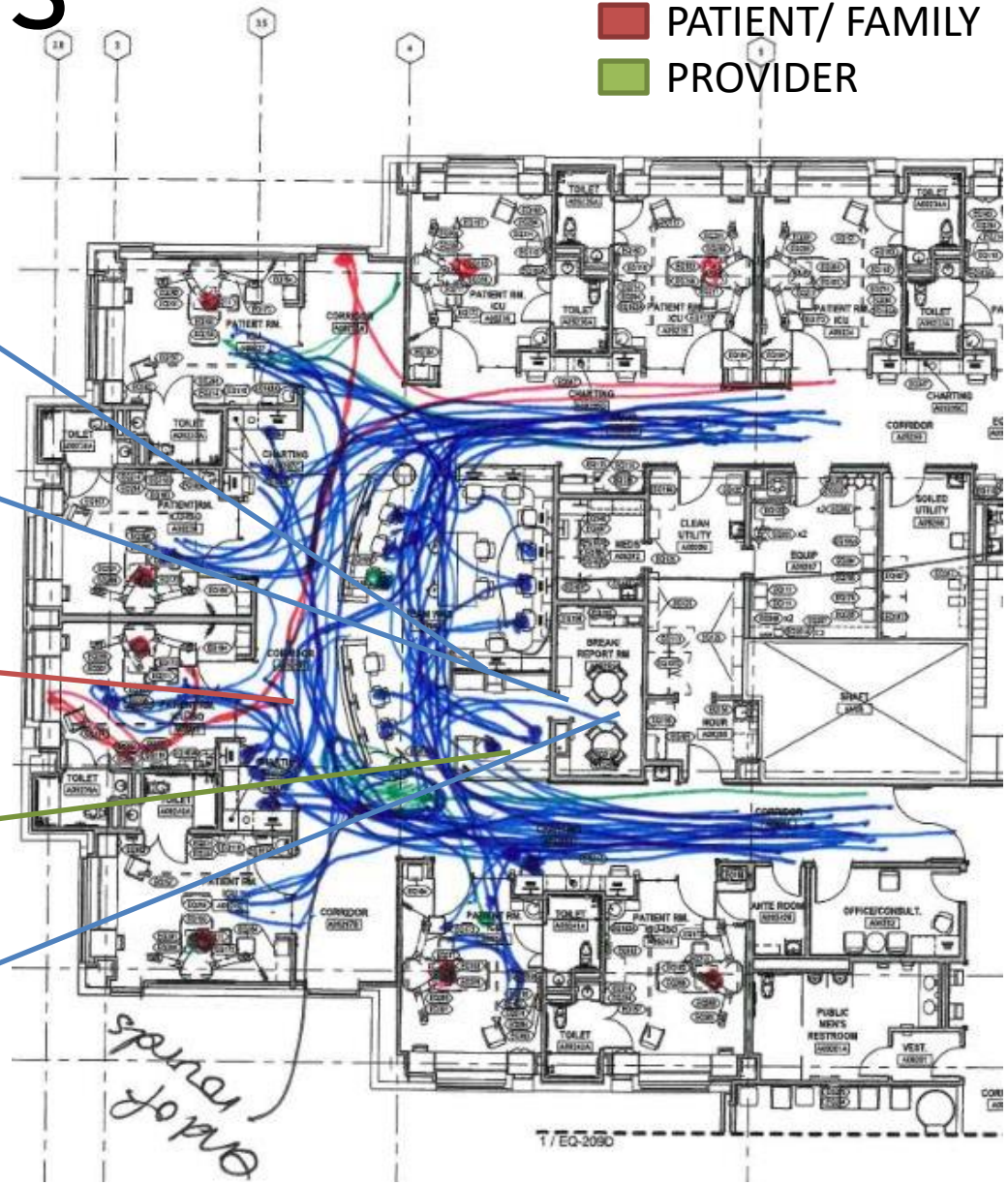
Counter becomes community congregation location.
Provides an opportunity for a collaborative workspace, rethinking how this space is used

Back of nurse station works as a cut-thru corridor for nurses
Indicates that there needs to be more connection (physical and visual) between the two corridors

Patients & Families stay close to room
Provides an opportunity for Patient and Family Respite

Providers used the plan south corridor more often
Closer to the unit entrance, more connection through the core possibly could alleviate congestion

Decentralized workstations near the unit entrance are very busy. **Observation occurred at the end of rounds, where the team was located**

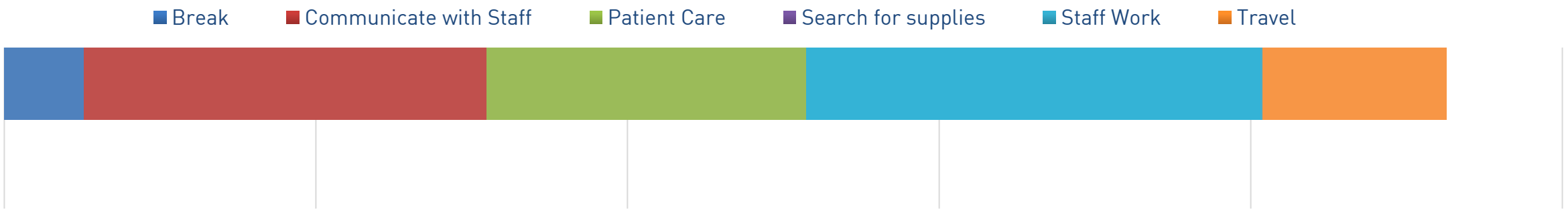


HEALTHCARE FACILITIES
symposium and expo

STAFF SHADOW: Time Allocation

PROVIDERS

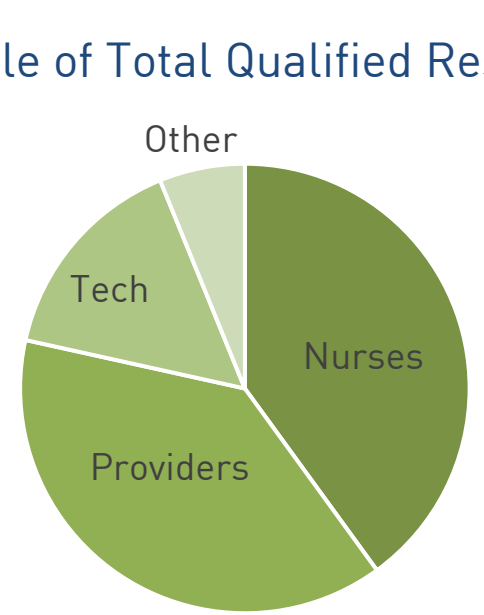
- Majority of the time is in three categories – communication with staff (including teaching), Patient Care, and Staff Work



NURSE

- Majority of the time is spent providing patient care

STAFF SURVEY



MOST IMPORTANT FOR FLEXIBILITY ON THE UNIT

	Total	Nurses	Providers	Tech	Other
Ability to communicate	42%	33%	46%	40%	100%
Access of supplies	35%	50%	29%	20%	0%
Ability to move furniture/ barriers	12%	17%	4%	20%	0%
Ability to switch out equipment	8%	0%	17%	10%	0%
Other	3%	0%	4%	10%	0%

STAFF SURVEY

The unit is too spread out…

Rooms are isolated…

Need space for uninterrupted/private work…

Need secure, quiet respite areas…

Space for private conversations…

Need a common space to collaborate…

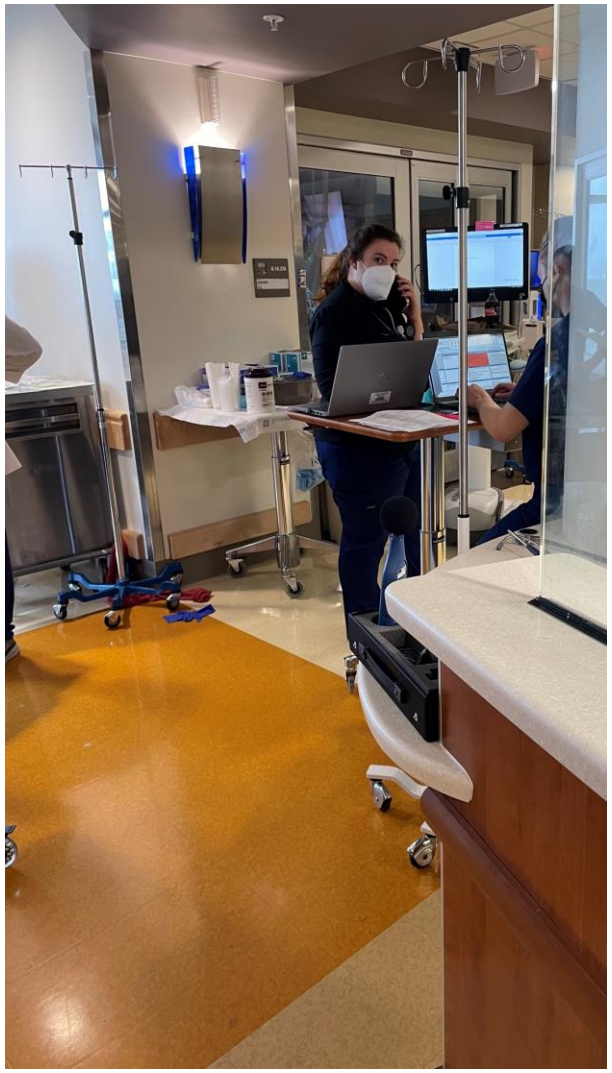
UK MICU
12th FLOOR DESIGN

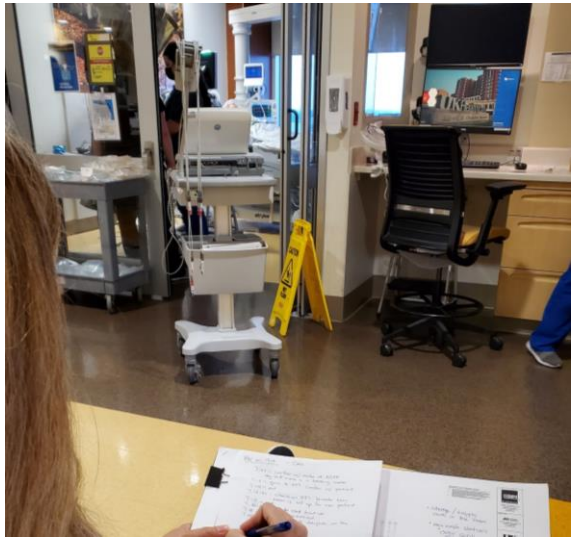
OUR DESIGN JOURNEY...

- **Design Team** researched pandemic lessons learned and best practice in academic medical centers
- **Engaged Leaders** set design boundaries and guiding principles to work within the existing infrastructure
- **Floor Stakeholders** provided key insight into current state challenges and future state needs

This unprecedented engagement and dialogue expanded the opportunities to guide the end user team to innovate a new flexible MICU, stretching the limits of previous design processes to go beyond a list of requirements to accommodate in an established building floorplate.

EXISTING CONDITIONS





12th FLOOR USER GROUP STRUCTURE

HOSPITAL OPERATIONS COMMITTEE
- Directors
- Managers
- VPs
- Providers
- Chairs

STEERING GROUP
- Senior Leadership Team
- Nursing
- Operations
- Pharmacy

USER GROUP A
- Physician Lead
- ICU Physician
- Infectious Disease Physician
- MICU APP
- Nurse Manager
- Registered Nurse
- Non- ICU RN
- Pharmacist
- Ops Pharmacist
- Infection Control RN
- RT

USER GROUP B
- Physician Lead
- Radiology Director
- MICU Fellow
- EVS
- Supply
- Case Mngt
- IT Architect
- PT/OT

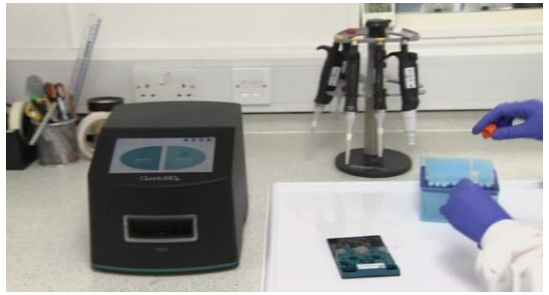
HEALTHCARE FACILITIES symposium and expo

PLAYBOOK

DESIGN STRATEGIES

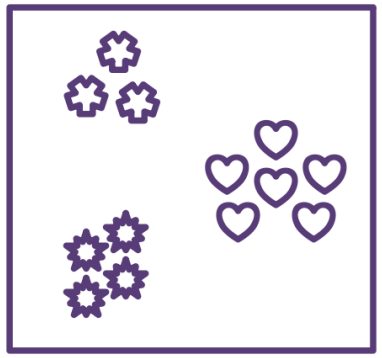
DESIGN: OPPORTUNITIES TO EXPLORE

1. Decentralized and Centralized Workspace with High visibility.
2. Staff Respite/Recharge
3. Staff Break and Storage:
4. Sound Control
5. Private Spaces:
6. Maximize eICU Capabilities
7. Supply and Med Room Standards
8. Flexible Corridor
9. Lab.
10. Hot Zones

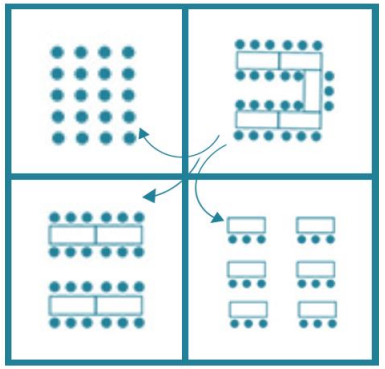


COMPONENTS OF FLEXIBILITY

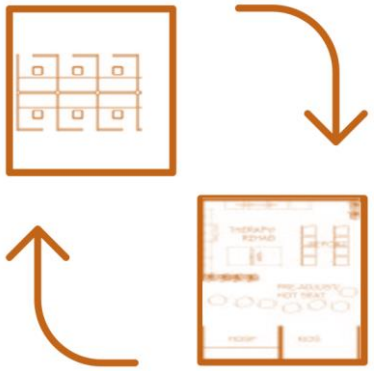
VERSATILITY



MODIFIABILITY



CONVERTIBILITY



SCALABILITY

*SOURCE: The Center for Advanced Design Research and Evaluation (CADRE) produced "FLEXX: a study of flexibility in outpatient setting"

12th FLOOR MICU: **SPACE PROGRAM**

PROGRAM ELEMENTS:

- **Patient Room** (64 – ALL ICU;
  - (East Tower (32 rooms) to be dbl occupancy)
- **Patient Toilets (64)**
- **Ante Room (8)** All negative pressure

- **Workrooms - PODS**
  - Combining the Care Team and pulling them all together
  - **Provider Team** – Attending, Fellows, Residents; **Nursing Team** – Charting, Nursing Care Tech, Unit Clerk ; **Consultative Team** – RT ,Dietary, OT/PT, Pharmacy, Case Management, and **RESPITE**

- **Patient/Staff Support**
  - Clean (6), Soiled (4), Equipment (4), Meds (6), Nourishment (6), Housekeeping (2), RT Clean Equipment

- **Staff Support**
  - Staff Toilets (7), Staff Shower (1), Communal Break (2), Lactation (2), Classroom/Conf (2), CNS Office (2), PCM Office (2), APCM 1-person office (2), Sleep Rooms

- **Serious Communicable Disease Lab and Hot Zone**
  - Lab, Donn/Doff Space, 4 patient Rooms, 2 patient rooms converted to staff space and shower for use in hot zone.

- **Pharmacy**
  - Category I Products per USP 795 with a Segregated Compounding Area (SCA – 12 air changes per hour)) and Bio Safety Cabinet (BSC).

SPACE PROGRAM

SCD LAB
HOT ZONE

SCD LAB/HOT ZONE PROGRAM ELEMENTS:

1 Patient Room

Four (4) Patient Rooms – one group of 4 hot patient rooms.
Two (2) patient rooms converted to staff space

- All six rooms to be switchable between negative and positive pressure. Or negative pressure only

2 Ante Room

- Two (2) Permanent ante rooms that are negative pressure.
- Two (2) areas that are designed to have temporary partitions erected to create the ante rooms for the two center patient rooms.
- The additional two patient rooms are not to have ante rooms

3 Corridor

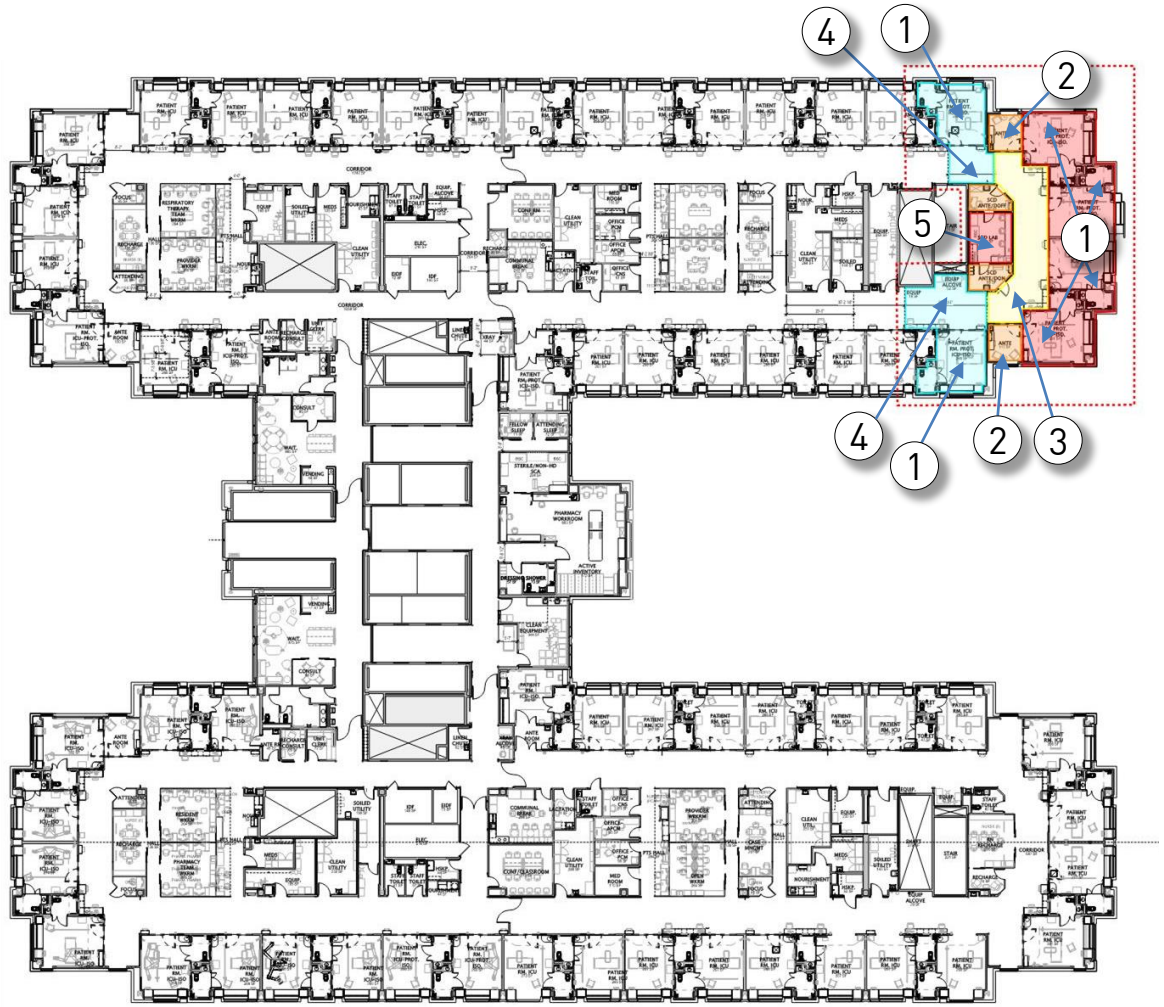
- Physical separation from the main corridor with temporary partitions, negative pressurization
- Verify the extend of the transition zone to avoid dead-end corridors.

4 Donning/Doffing Space

- Provide Donning and Doffing within the SCD hot zone

5 Serious Communicable Disease Lab

- 190 SF Lab with Don/Doff space 85 SF each. Viewing windows, changing/storage space, workspace



The Serious Communicable Disease Lab and Program move to the 12th floor MICU:

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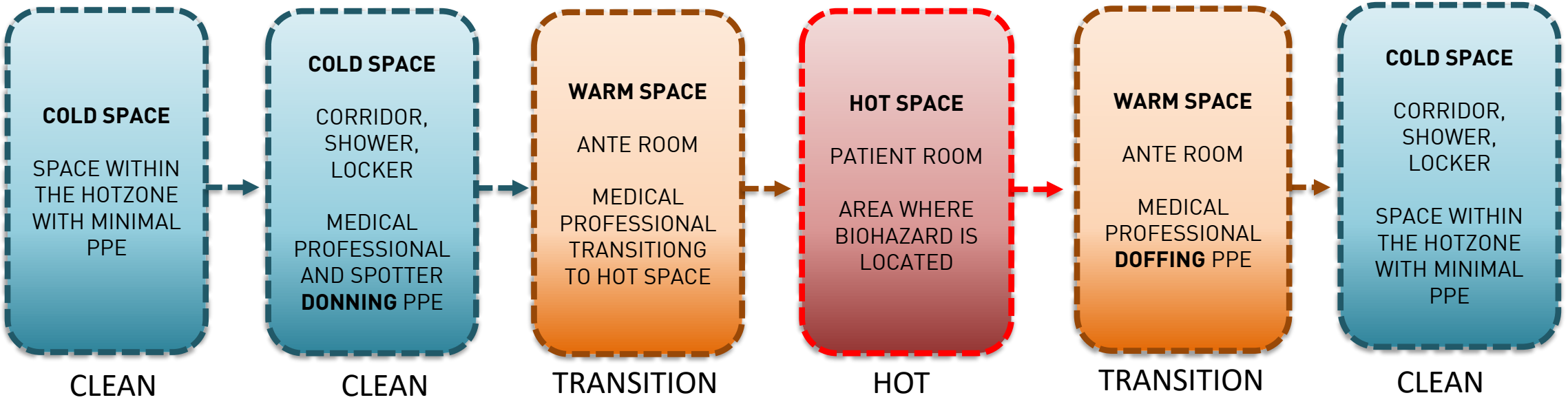
UK HealthCare

SERIOUS COMMUNICABLE DISEASE LAB

12TH FLOOR MICU: **SERIOUS COMMUNICABLE DISEASE LAB**



LAB - HOT ZONE FLOW

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UK HealthCare

12TH FLOOR MICU

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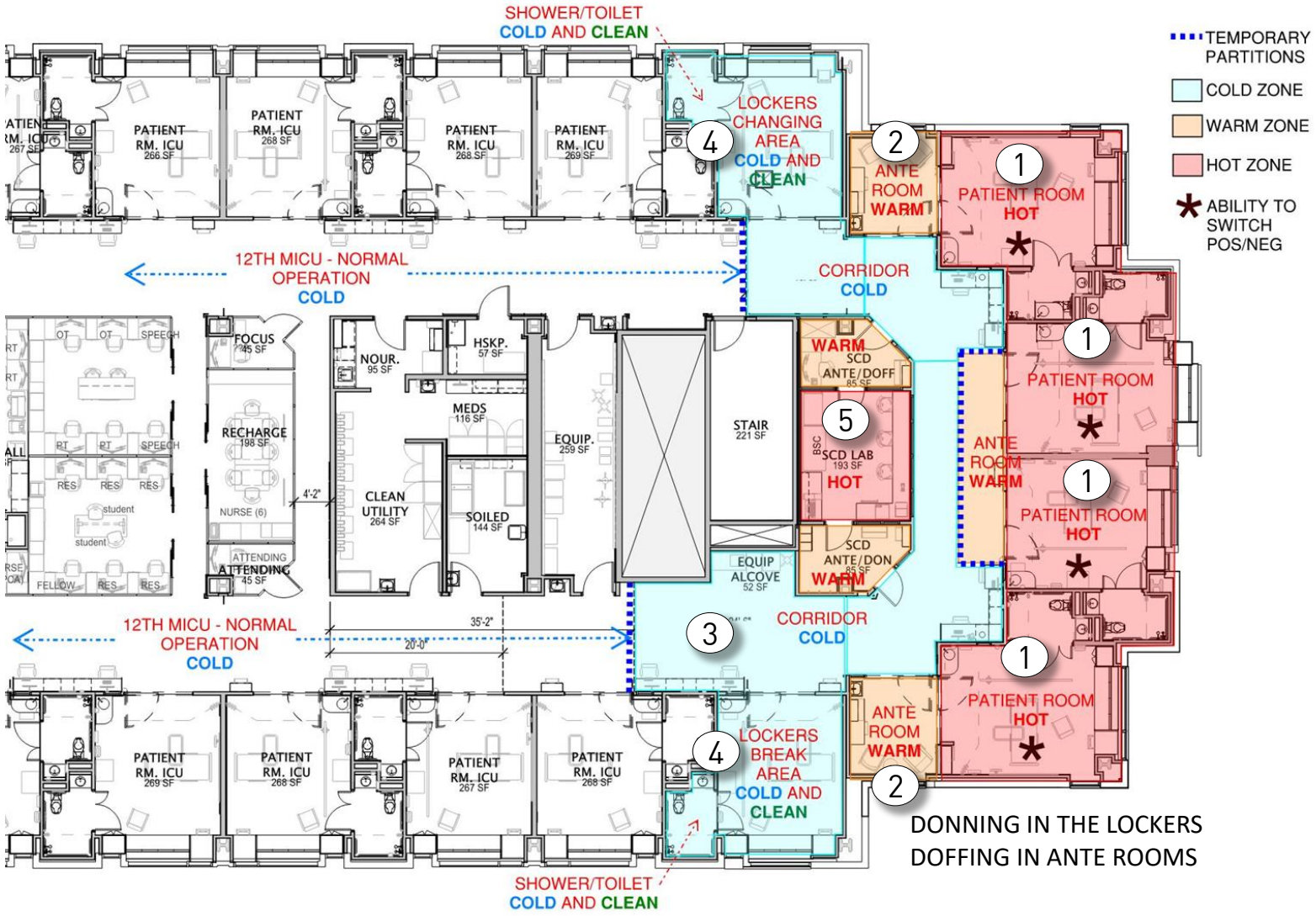
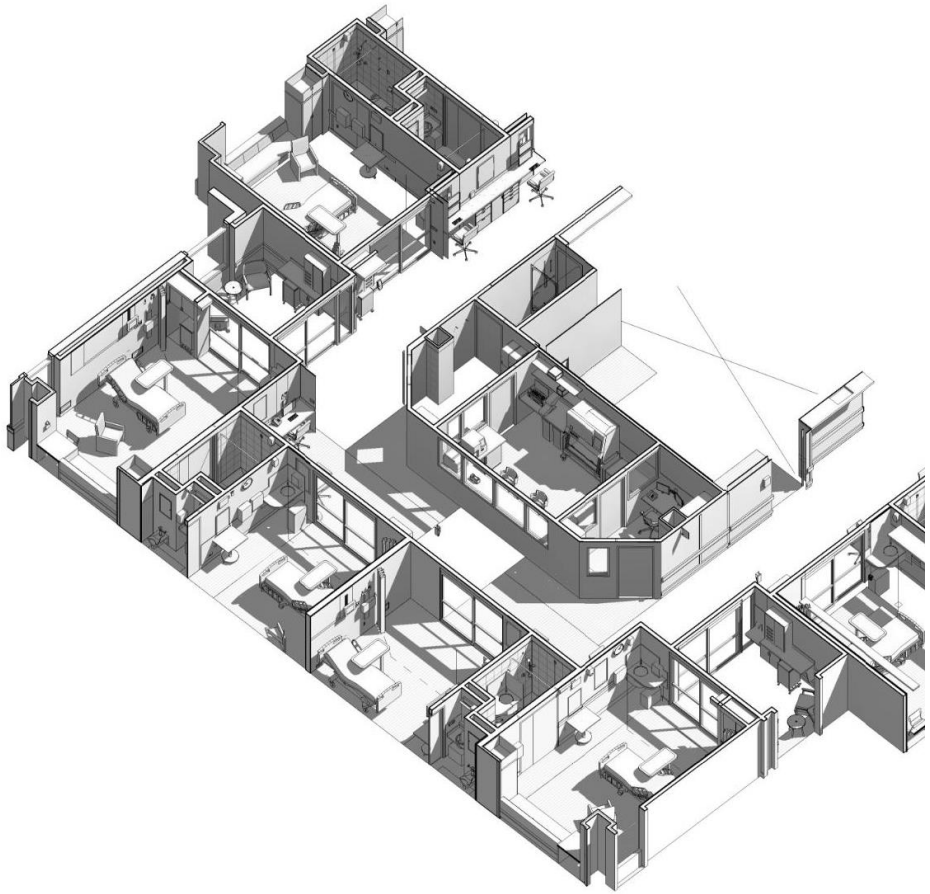
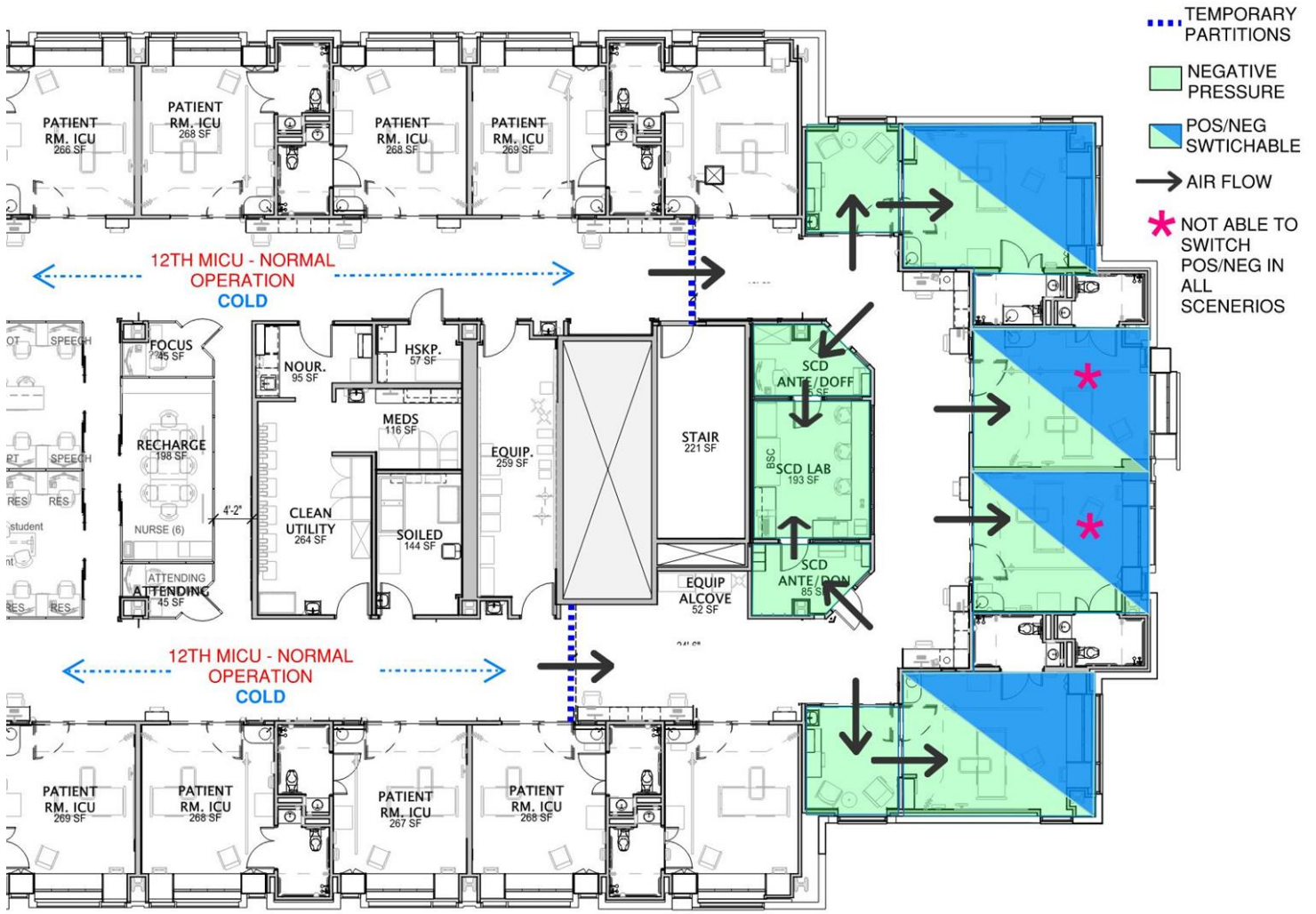


DONNING IN THE LOCKERS
DOFFING IN ANTE ROOMS

SCD LAB AND HOT ZONE

12TH FLOOR MICU





SCD AIR PRESSURIZTION

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UK HealthCare

STAFF SPACE
HIGH VISIBILITY

12th FLOOR MICU: **200 TOWER**

TOWER CORE

HEALTHCARE FACILITIES symposium and expo

UK HealthCare

12th FLOOR MICU: **WORKSPACE WITH HIGH VISIBILITY**

OPPORTUNITY
HIGH VISIBILTY

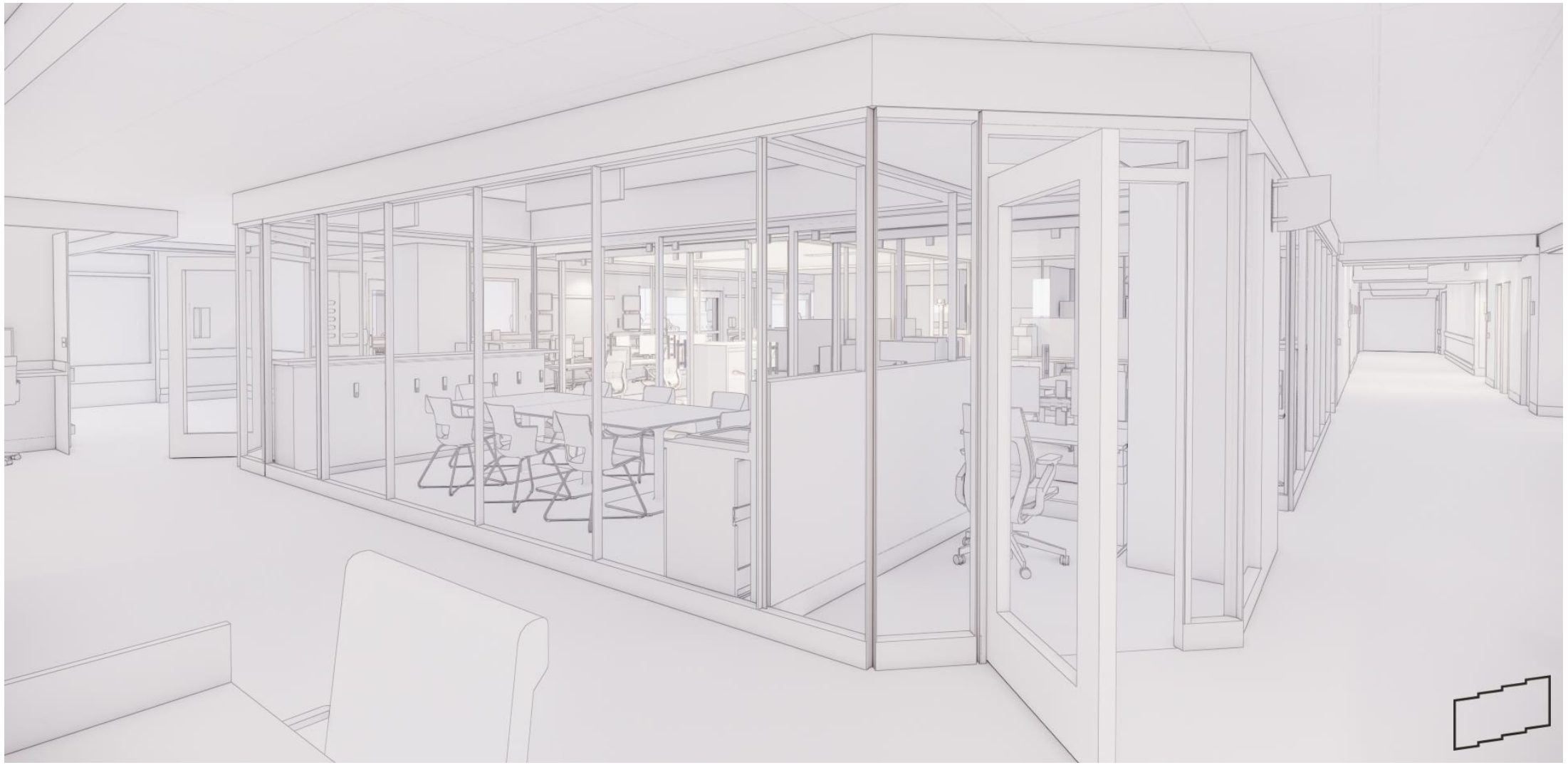
provide as much visual connection within the ICU workspace as possible to eliminate staff feeling of isolation

OPPORTUNITY
SUPPORT SPACES

provide cross-corridor access into the support spaces and easy access to supplies, equipment, and staff

TOWER CORE

12th FLOOR MICU: **WORKSPACE WITH HIGH VISIBILITY**



WORKROOM COMPONENTS

12th FLOOR MICU: **WORKSPACE WITH HIGH VISIBILITY**

Focus Room – open for dictation, continuing education, phone calls, etc.
Desktop Computer, Dual Monitor, Phone, Mobile Pedestal with storage and cushion

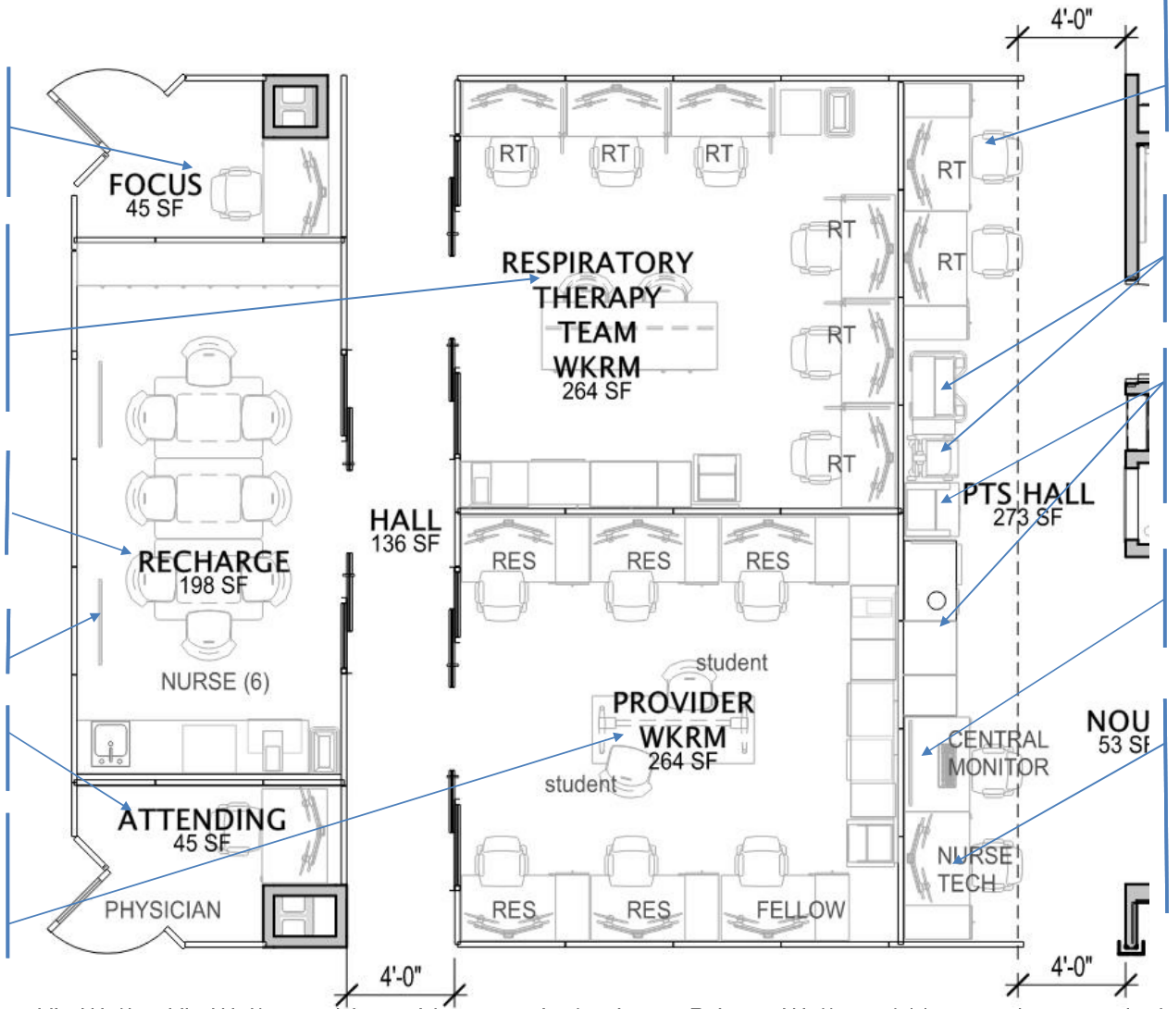
This workroom will change specialties in each quadrant of the floor.
RT has sit/stand desk with dual monitors and privacy dividers. Center Island to have 6 lockers (12Wx18Dx42H) on one side and two shortcut stools on the other. Work counter – UC frig, in cabinet trash, storage cabinets, printer/copier/fax on stand

Nurse Recharge
Lockers – TS Series Lockers with Keypad electronic locking, double lockers 12W x18Dx42H
Counter with sink, u/c frig, microwave, storage cabinet

Central Monitors Display Only mounted on soffit above for patient monitoring

Space for Attending Physician.
Desktop Computer, Dual Monitor, Phone, Mobile Pedestal with storage and cushion

Provider Workroom has sit/stand desk with dual monitors and HD Storage Wardrobes. Center table with seating. Work counter – UC frig, in cabinet trash, storage cabinets, confidential bin under counter, printer/copier/fax on stand



Each Pod to have a space for RT with HD Wardrobe. In the pod with the large RT workroom, this becomes hoteling

Storage for crash cart, POC Cart . Provide emergency power and data

Floor Printer/Copier Confidential Bin, Trash in cabinet with hole in counter, storage

Central Monitor control station on sit/stand desk

Nursing Tech workstation with sit/stand desk and HD wardrobe storage. Dual monitors, desktop, phone

NOTES:

- All wall to be Steelcase Privacy Wall or Steelcase Via Walls. Via Walls would provide acoustical privacy, Privacy Wall would be supplemented with sound masking.
- Doors to be sliding, locking with badge access.
- Gradient Window Film applied to all glass. Casper Cloaking Technology Film to be applied on workrooms

WORKROOM COMPONENTS

12th FLOOR MICU: **WORKSPACE WITH HIGH VISIBILITY**

CONSULTATIVE CARE TEAM WORKROOMS

1. RESPIRATORY THERAPY
2. OT/PT/SPEECH
3. PHARMACY
4. CLINICAL NUTRICIAN
5. CASE MANAGEMENT

OPPORTUNITY
POD TEAM SPACE

the micu divsion works in teams and depends on all team members from all disciplines – providers, nursing, consultative team.

Pulling the teams into pod workroom designs for each group of patient rooms brings the whole team into one space

POD CONCEPT | TEAM TOGETHER

HEALTHCARE FACILITIES symposium and expo

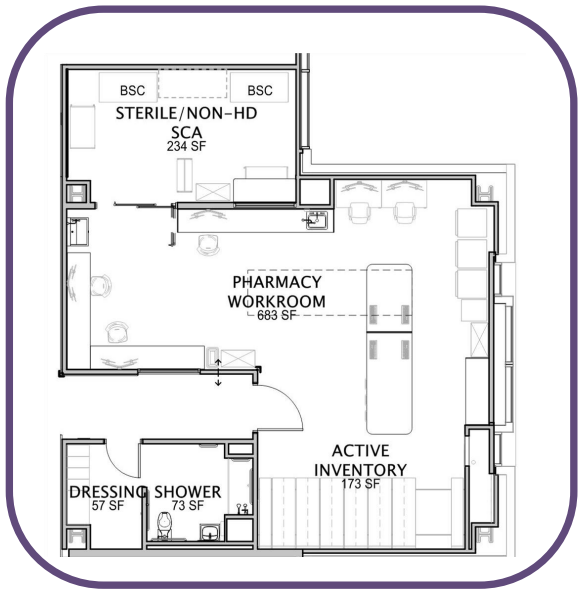
UK HealthCare

DEDICATED
PHARMACY

PHARMACY SCENARIOS

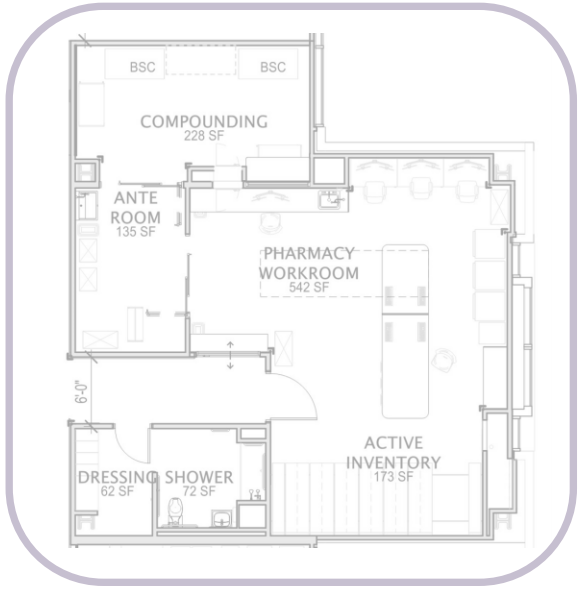
SCENARIO A

USP 797 with SCA



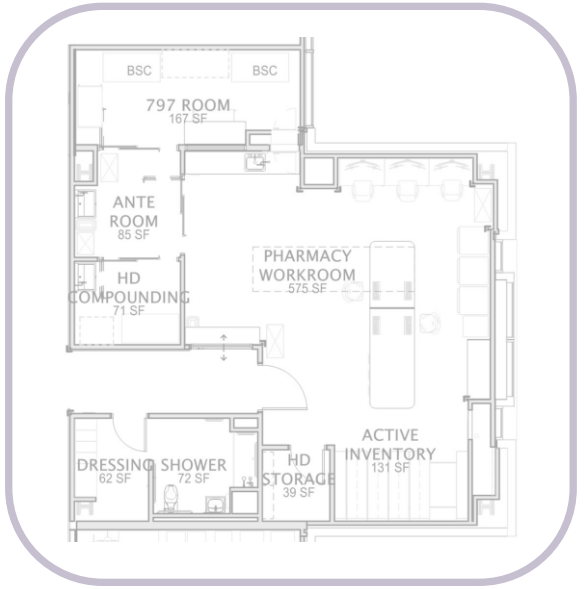
SCENARIO B

USP 797 NHD BUFFER ROOM



SCENARIO C

USP 800 HD CLEANROOM



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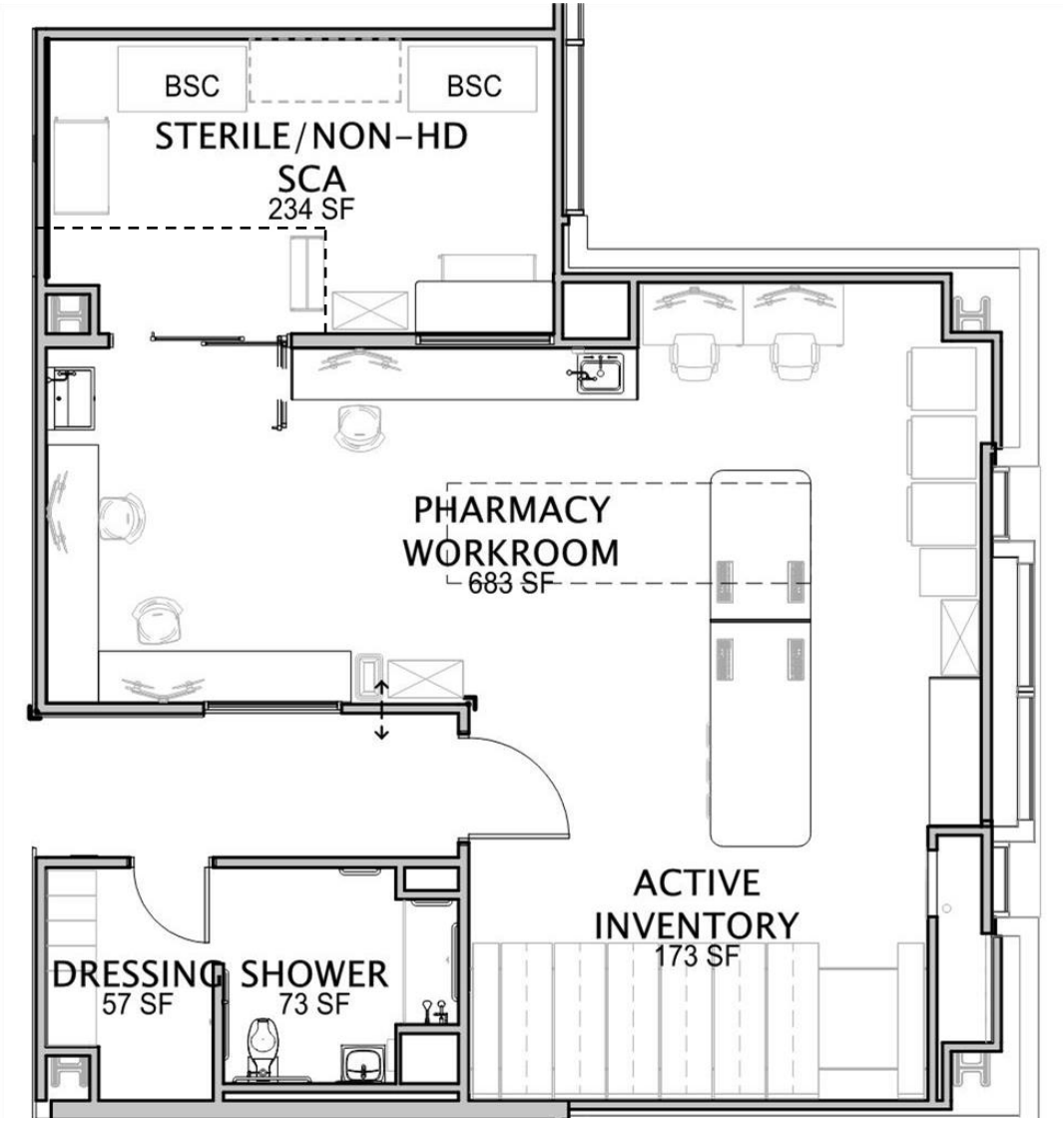
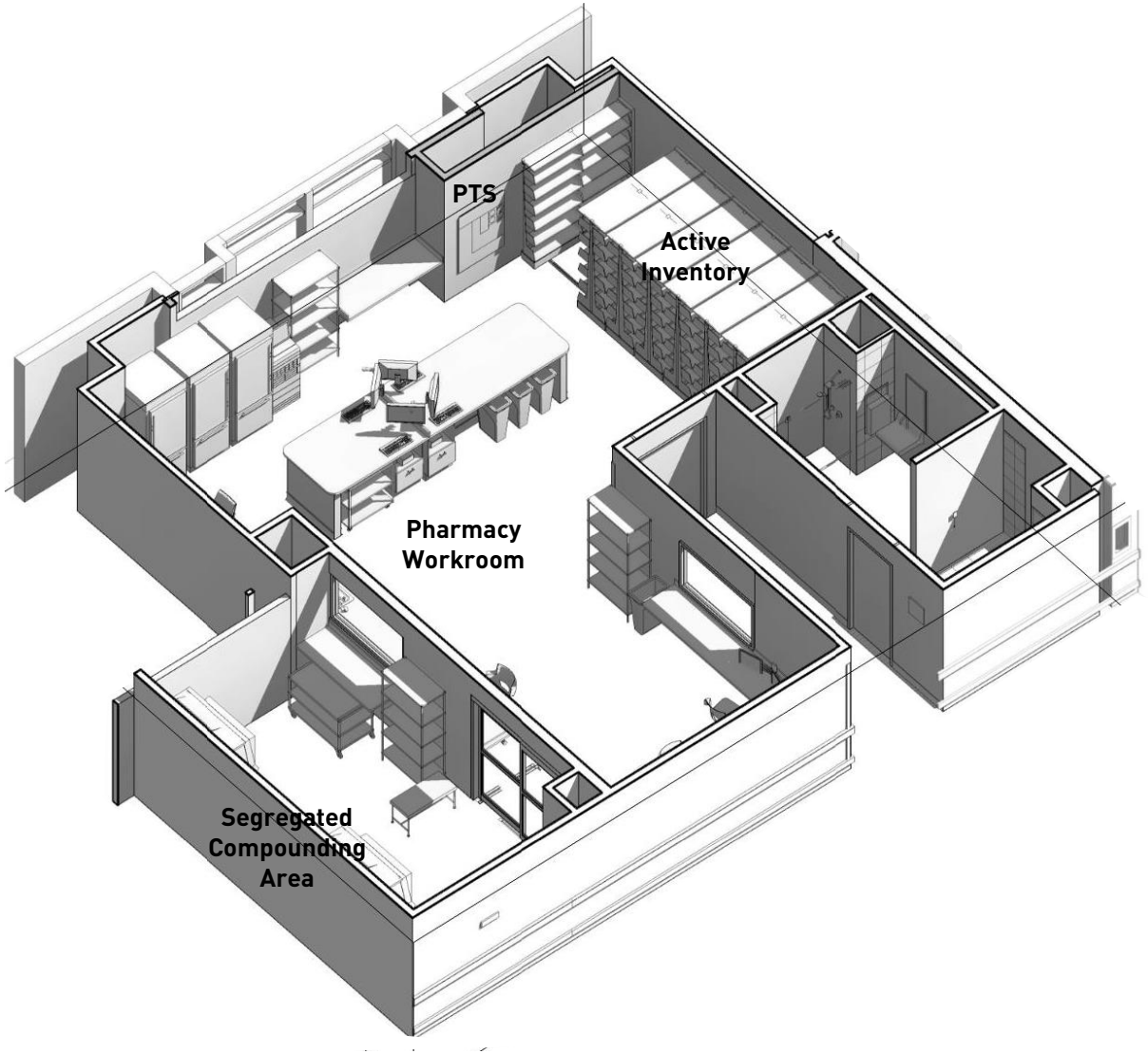
STERILE, NON-HAZARDOUS COMPOUNDING





PHARMACY

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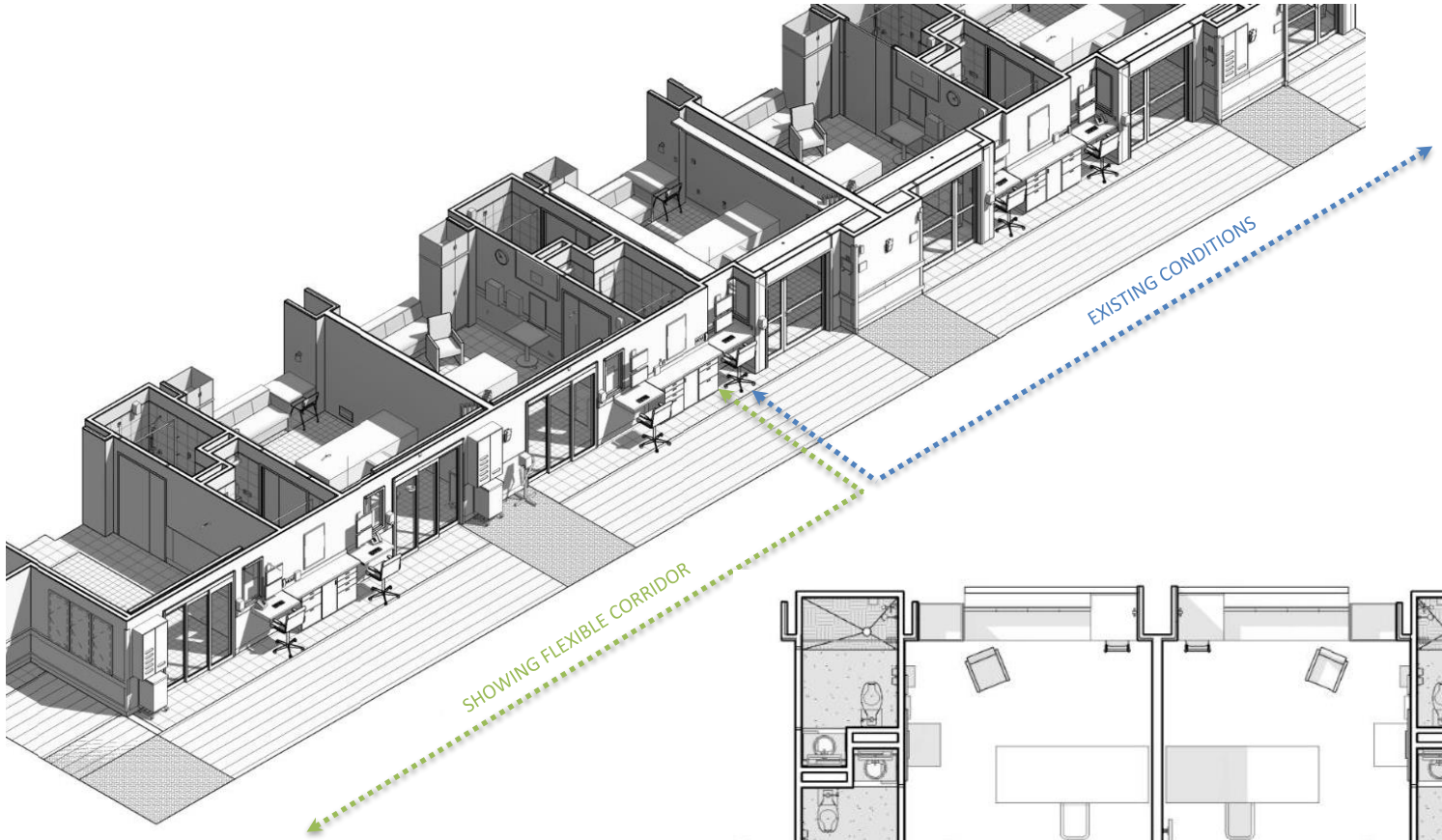
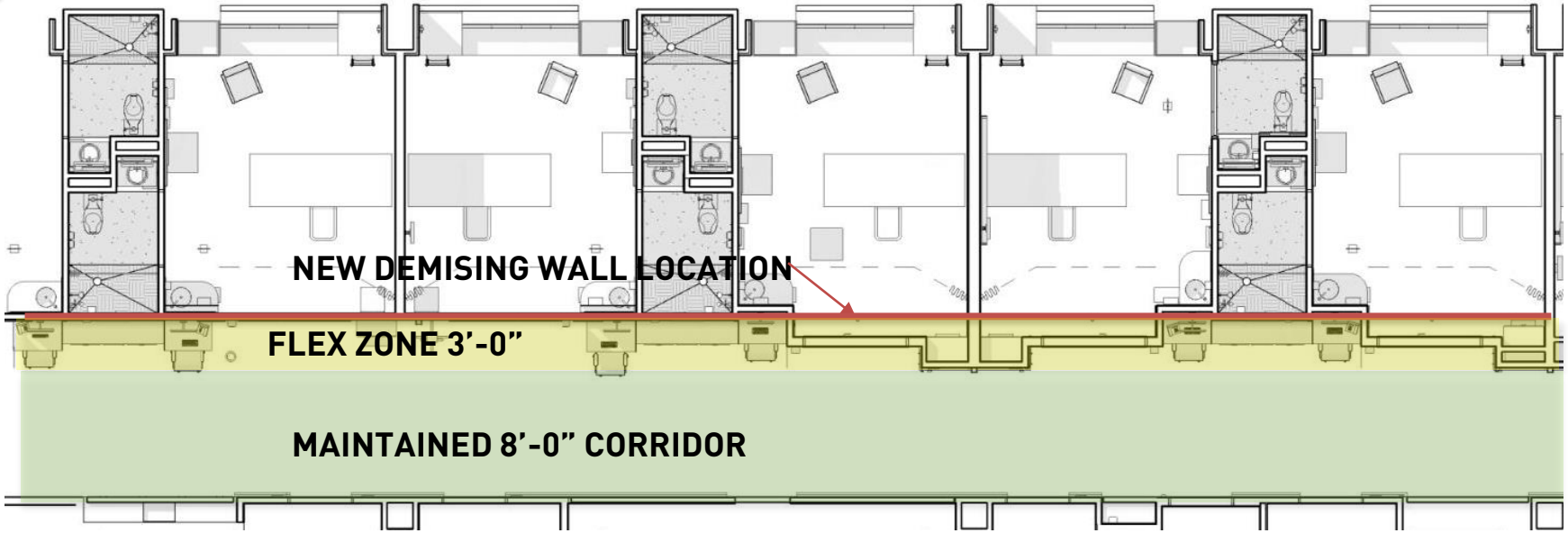
FLEXIBLE CORRIDOR



FLEXIBLE CORRIDOR CHANGES AND ADVANTAGES:

- Change to ICU sliders in lieu of bi-fold
- Straight demising wall between corridor and patient rooms
- PPE cabinets in corridor between rooms on rails. Add additional cabinets as needed
- Decentralized Nurse Station casework on rails. Flexible for future needs



FLEXIBLE CORRIDOR

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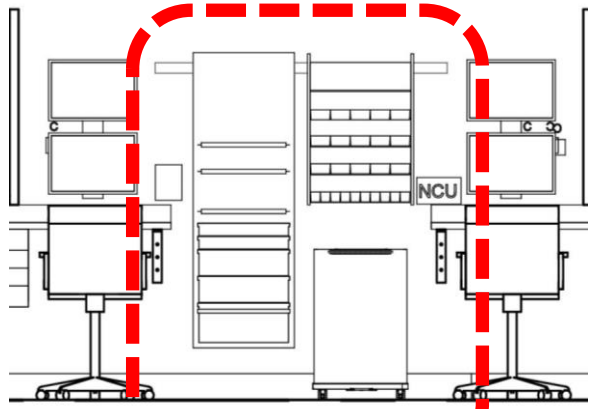

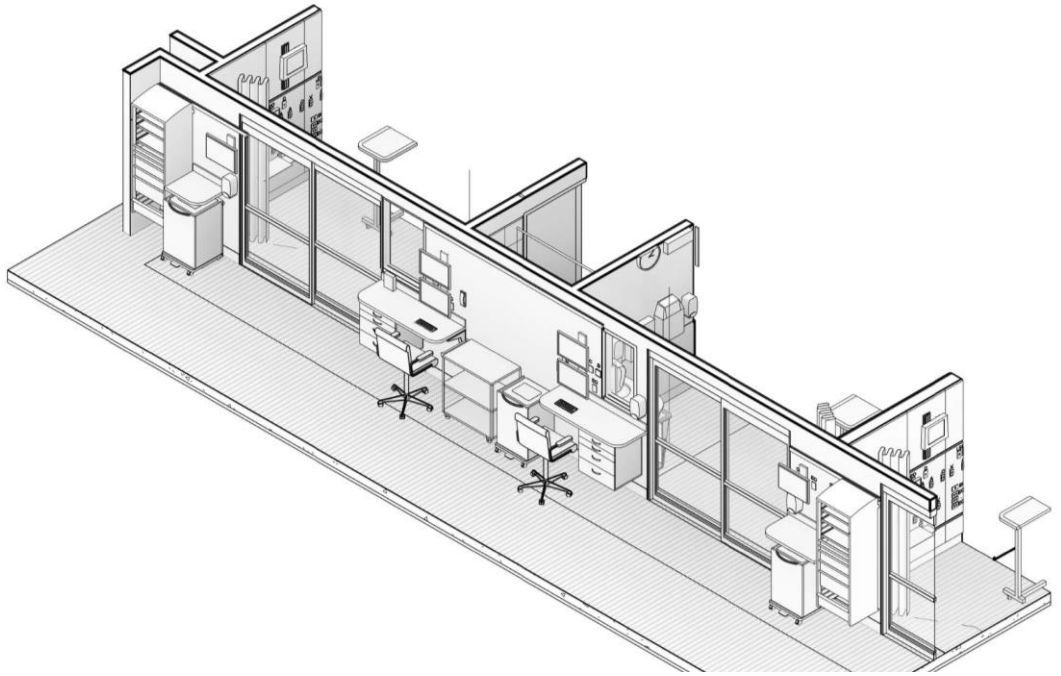

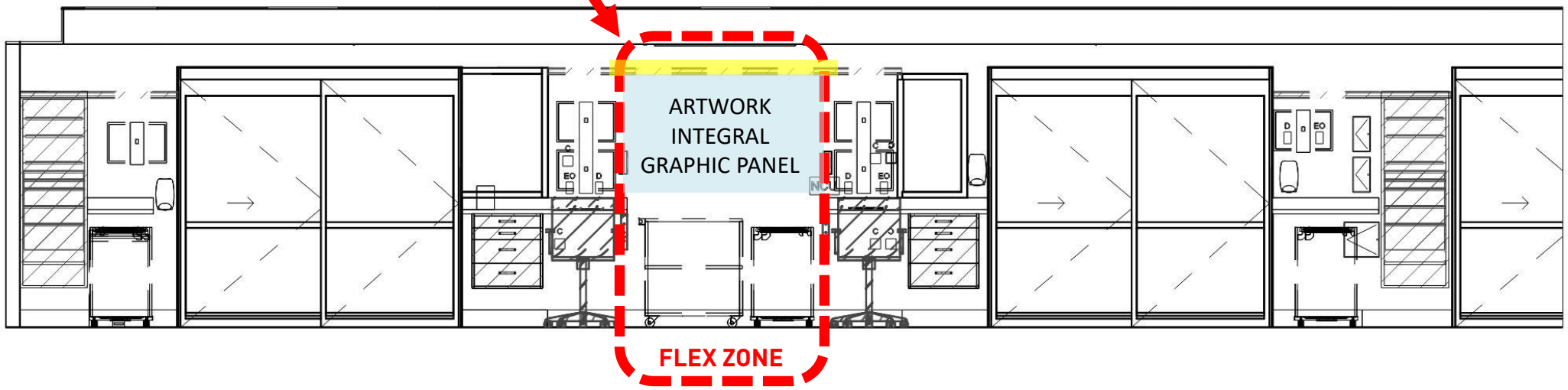

FLEXIBLE CORRIDOR

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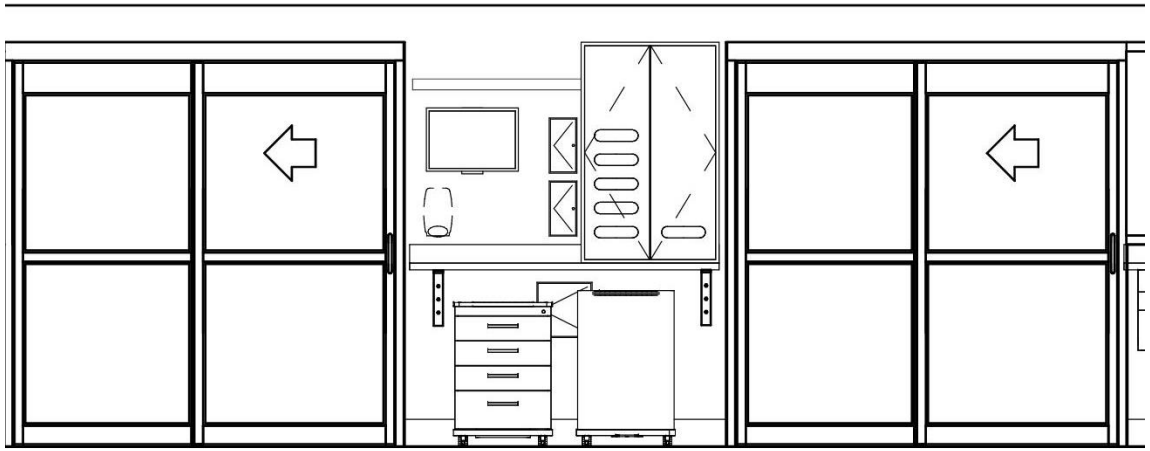

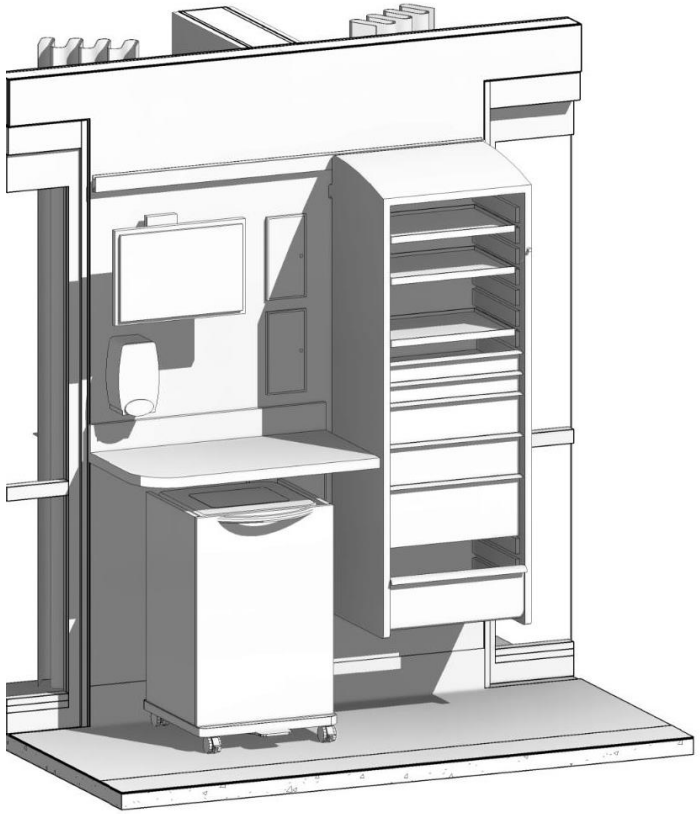

FLEXIBLE CORRIDOR PPE BETWEEN ROOMS:

- PPE cabinets in corridor between rooms on rails. Add additional cabinets as needed. Flexible for future needs
- Counter is nice to have, drawer for PPE storage is flexible
- Access from headwall into the corridor for cords and connection cables
- Soft Pass-thru for IV lines

FLEXIBLE CORRIDOR


HEROES WORK HERE