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Be Prepared!

37th Annual AHCA Seminar and Expo

October 17-19, 2021

FGI Emergency Conditions in Health and Residential Care Facilities

Course Number: AHCA2021_03

Credit Designation: 1LU/HSW

AIA CES Provider Number: E240

October 18, 2021

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1 OBJECTIVE

Describe how the new *Guidance for Emergency Conditions* will influence future facility design to provide flexibility during a surge capacity event, whether man-made or weather related.

2 OBJECTIVE

Apply the risk assessment and zone map concept to regions and areas of the United States to determine facility resiliency and surge capacity.

3 OBJECTIVE

Explain the concepts behind and the physical attributes of alternate care sites critical to providing a satisfactory patient experience and outcome.

4 OBJECTIVE

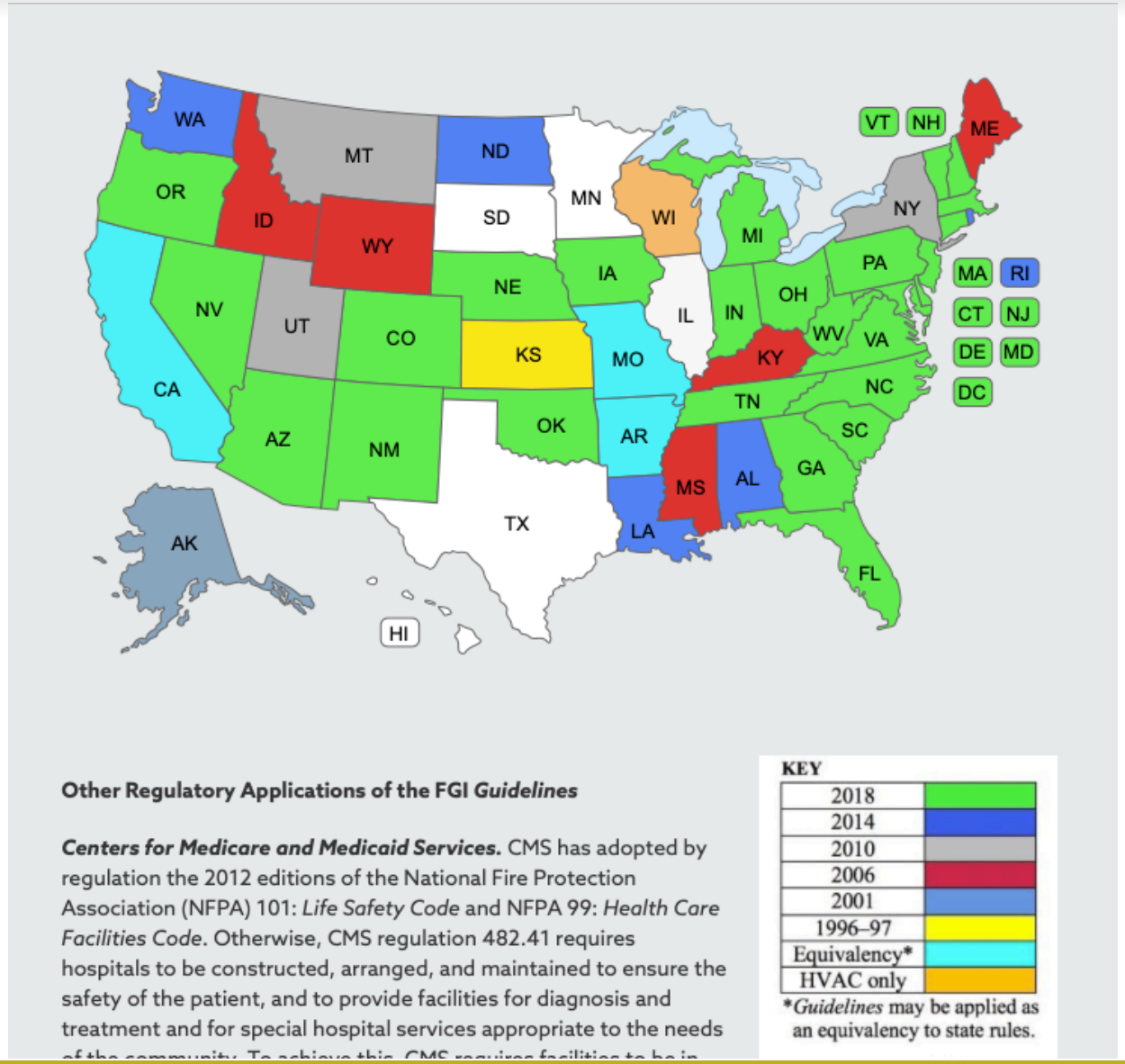
Use the *Guidance for Emergency Conditions* in the project design and delivery period to creating facilities that serve their intended purpose during man-made and weather-related events.

Today's Speaker

- Douglas S. Erickson, FASHE, CHFM, HFDP, CHC
- Chair of the 2010, 2014 and 2018 editions
- Immediate Past Chair 2022
- CEO of the Facility Guidelines Institute
- Senior Healthcare Advisor, Specified Technologies

The views and opinions expressed in this presentation are the opinion of the speakers and may not be the official position of FGI or the Health Guidelines Revision Committee.

Who is FGI?



- 501(c)(3) not-for-profit
- Over 140-person multidisciplinary volunteer committee of experts
- Develops and authors fundamental standards and best practice white papers
- Produces three *Guidelines*
- Referenced by 43 states and federal agencies
- Public process for proposed changes and comments on changes

2022 HGRC
130+ Multidisciplinary Committee

20% - Architects

18% - Medical professionals

16% - State AHJs

13% - Engineers

10% - HC administrators/HC org. reps

8% - Federal AHJs (IHS, CMS, HUD, VA)

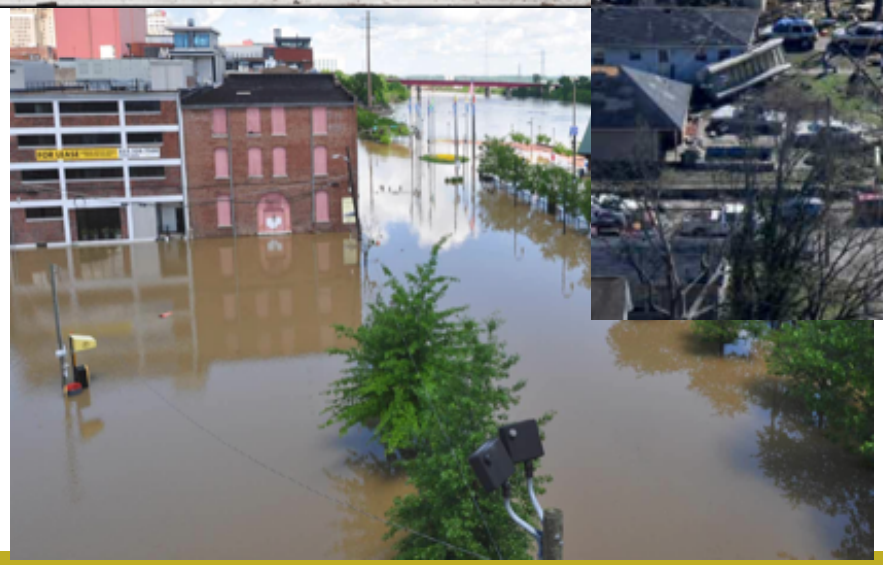
7% - Infection control experts + NIH/CDC

4% - Construction professionals

4% - Interior designers

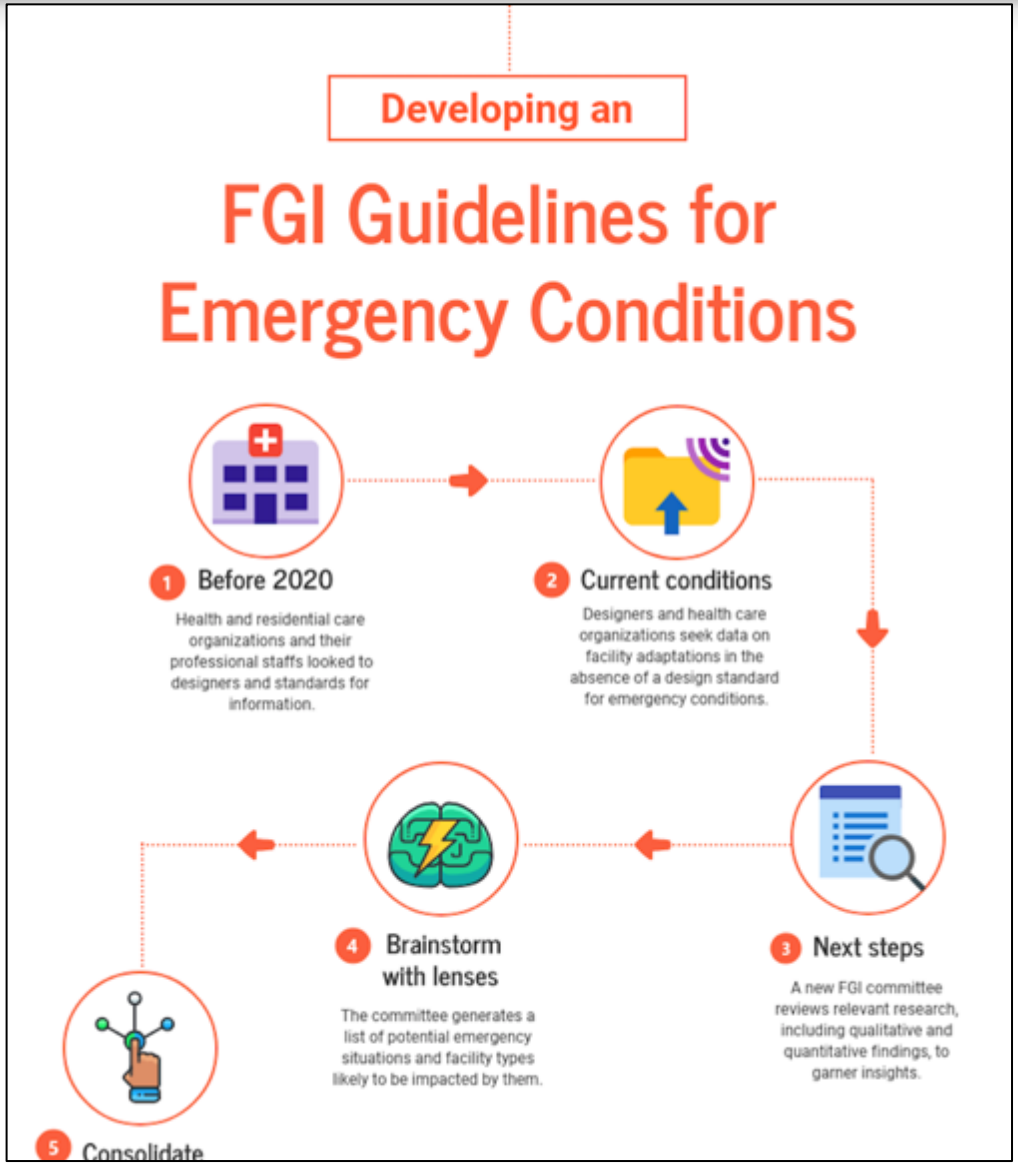
2022 HGRC
The Florida Contingent

- Robert Booth
- Greg Pace
- David Shapiro, MD (FGI Board and HGRC)
- Scott Waltz
- Michael Sheerin (ASHRAE 170 and HGRC)
- Deborah Smith
- Skip Gregory (FGI Board)

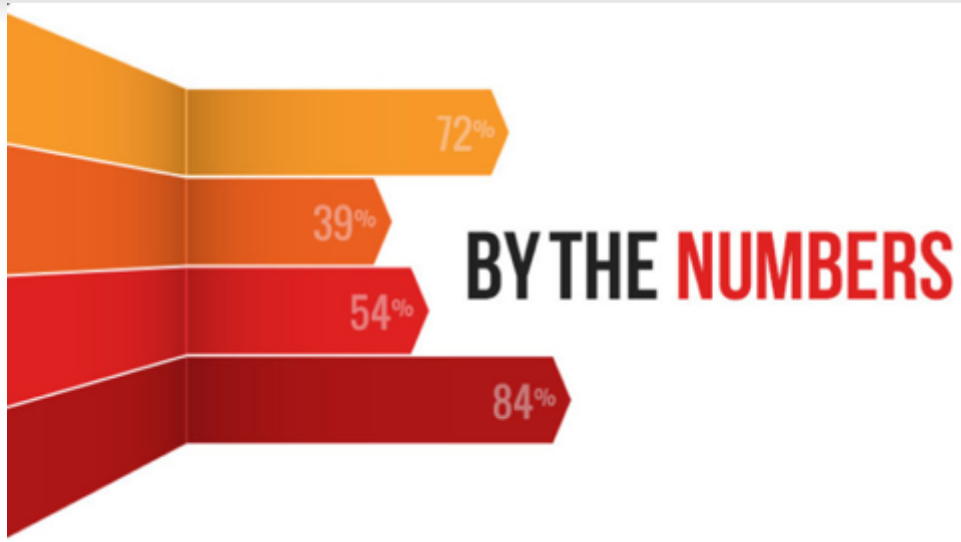


Guidance for Designing Health and Residential Care Facilities that Respond and Adapt to Emergency Conditions

Why FGI?

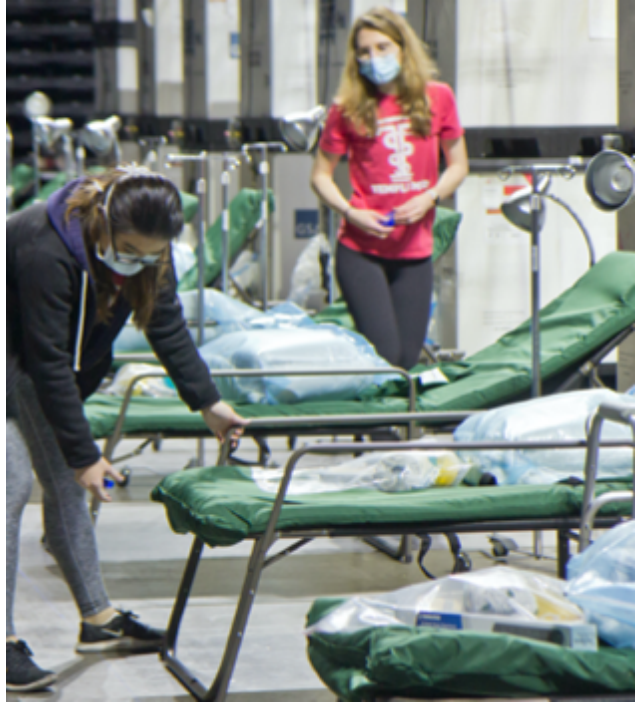

Developing an
FGI Guidelines for Emergency Conditions
1 Before 2020
Health and residential care organizations and their professional staffs looked to designers and standards for information.
2 Current conditions
Designers and health care organizations seek data on facility adaptations in the absence of a design standard for emergency conditions.
3 Next steps
A new FGI committee reviews relevant research, including qualitative and quantitative findings, to garner insights.
4 Brainstorm with lenses
The committee generates a list of potential emergency situations and facility types likely to be impacted by them.
5 Consolidate

Project Overview



- **130 members**
- **9 subcommittees and Executive, Steering, and Advisory committees**
- **Most began meeting in May; SRA was formed in July**

- Safety Risk Assessment
- Surge Capacity
- Alternate Care Sites
- Modular
- Resiliency
- Renovations/Future Facilities
- Small and/or Rural Health Care Facilities
- Long-term/Residential Care Considerations
- Operational Considerations

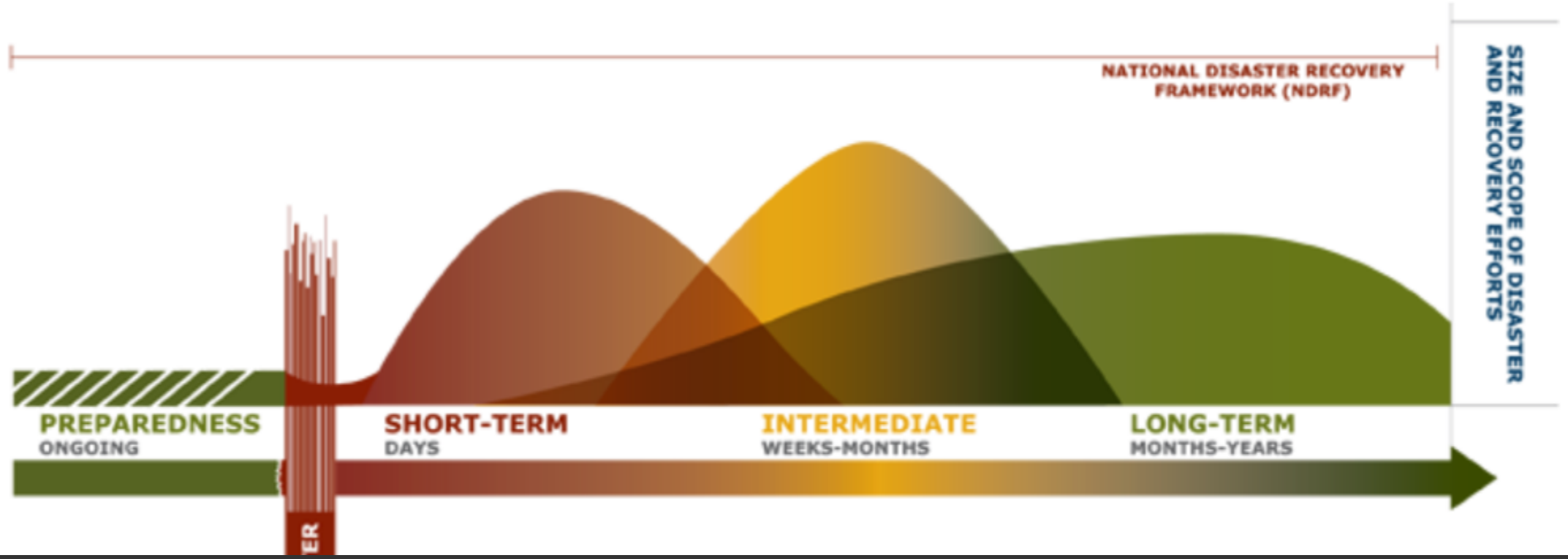


Project Overview

- Assemble design guidance for facilities during the following emergency situations:
  - Weather
  - Pandemics
  - Wildfires
  - Other emergency situations
- Establish baseline planning and design standards for health and long-term care facilities.
- Created a white paper with best practices and draft *Guideline's* requirements for public review.
- ~~Create new Emergency Conditions *Guidelines* with baseline requirements.~~

Timeframes:

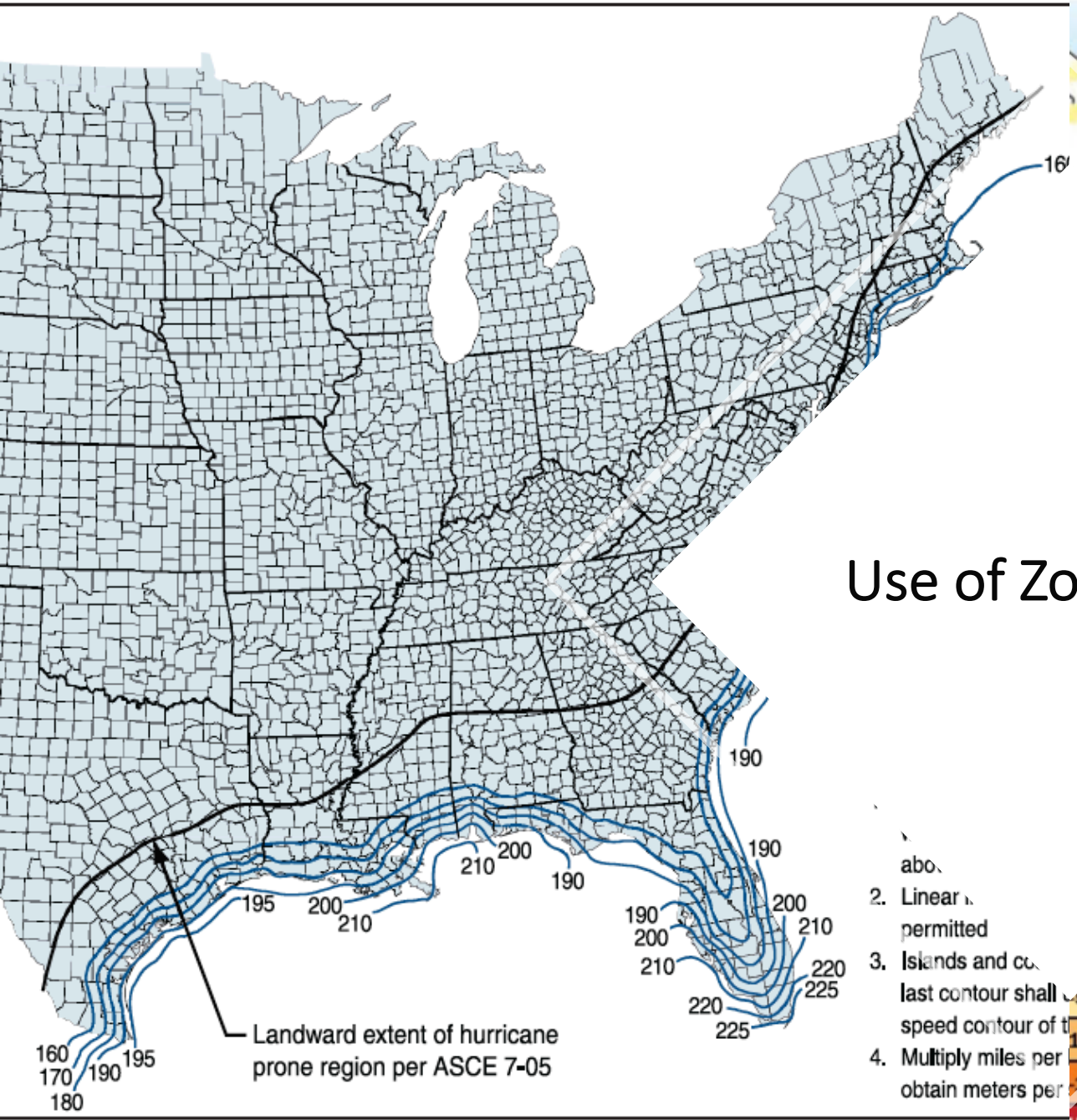
1. Immediate
2. Temporary
3. Semi-Permanent
4. Permanent



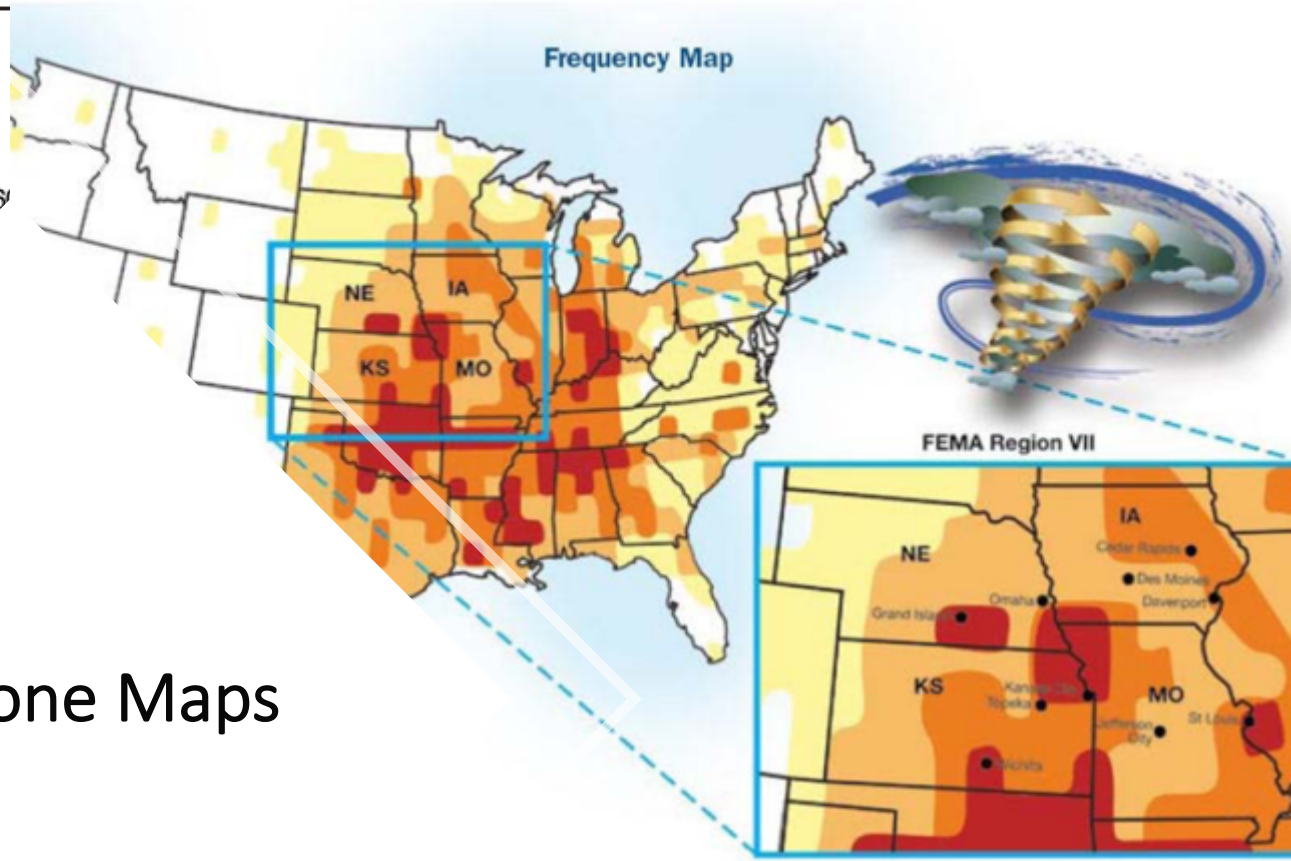
Chapter 1: Risk Assessments

- Builds hazard vulnerability assessment into development of safety risk assessment
- Requires identification of anticipated hazards specific to geographic location
- Disaster, Emergency, and Vulnerability Assessment (DEVA) prompts assessment of hazards specific to the project, risk/likelihood of emergency events, consequences of such events, and potential solutions.
- “Design features that provide resilience, hardening, flexibility and adaptability during a disaster/emergency shall be identified.”

Use of Zone Maps



Hurricane Safe Room Design Wind Speed Map from the ICC-500



ruction Guidance for Community Shelters, July 2000

abo
2. Linear
permitted
3. Islands and co
last contour shall
speed contour of t
4. Multiply miles per
obtain meters per

nd Events

	Wind Zone (see Frquency Map)			
	I	II	III	IV
	LOW Risk	LOW Risk	LOW Risk	MODERATE Risk
5	LOW Risk	MODERATE Risk	HIGH Risk	HIGH Risk
10	LOW Risk	MODERATE Risk	HIGH Risk	HIGH Risk
15	HIGH Risk	HIGH Risk	HIGH Risk	HIGH Risk
15	HIGH Risk	HIGH Risk	HIGH Risk	HIGH Risk

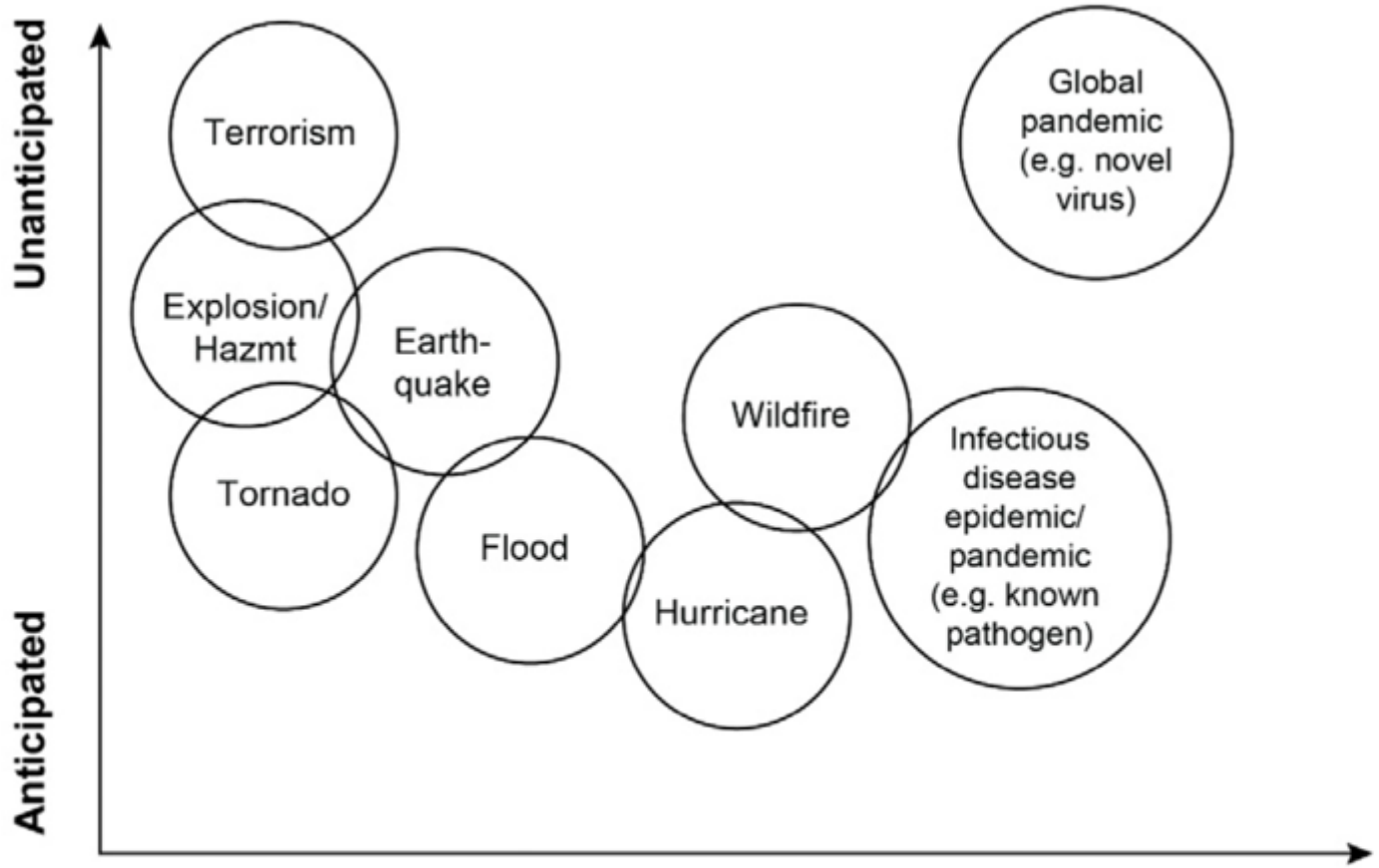
LOW Risk – Sheltering from high winds is a matter of preference.

MODERATE Risk – Shelter should be considered for protection from high winds.

HIGH Risk – Shelter is the preferred method of protection from high winds.

HVA/DEVA Examples

Figure 1-1: Examples of Hazard Anticipation and Effect



HVA/DEVA Examples

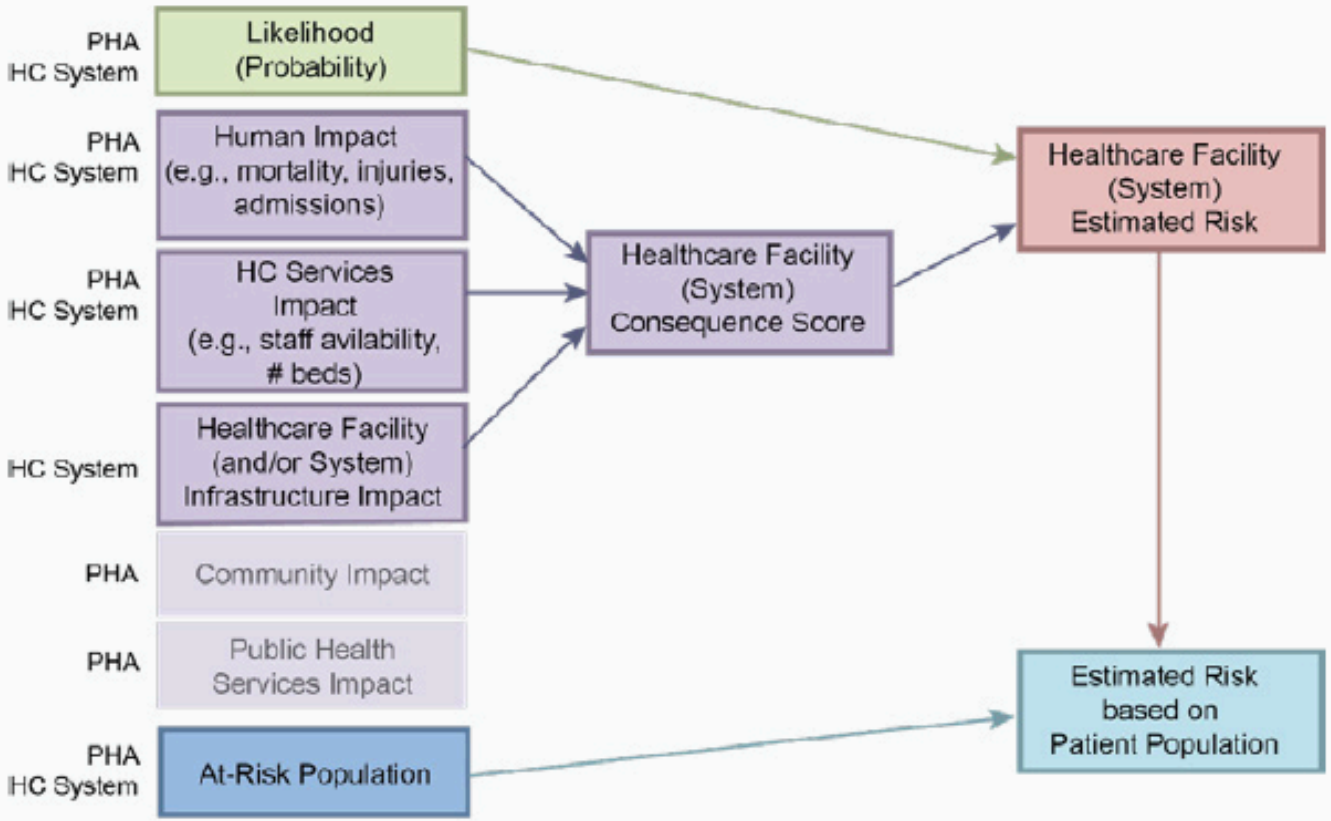
Table 1-3: Likelihood of Disruption, Typically Identified in the Hazard Vulnerability Assessment

Rank	Property Damage	Critical Infrastructure	Environmental	Economic
None	Not likely to result in property damage	Not likely to disrupt assets or services	Not likely to result in environmental damage	Not likely to disrupt business/ financial activities
Low	Could cause minor, mostly cosmetic damage	Could cause minor disruption of assets or services	Could cause localized and reversible damage; quick cleanup possible	Disruption of business/financial activities or the economy of the local area
Med	Localized severe damage	Could cause major but localized or short-term disruptions to critical infrastructure services	Could cause major but reversible damage; clean up difficult	Could result in losses for a few businesses, some negative consequences for the economy of the region
High	Widespread severe damage	Could cause widespread severe, ongoing disruption of assets or services	Could cause severe, irreversible damage; cleanup not possible	Could result in losses for an industry or severe economic impact in the region

Source: Ontario Provincial Hazard Identification and Risk Assessment Program

HVA/DEVA Examples

Figure 1-2: Pennsylvania Health Care Facility Risk Model



PHA: Public health authority evaluation
HC System: Health care system evaluation

Source: Adapted from the Pennsylvania Public Health Risk Assessment Tool

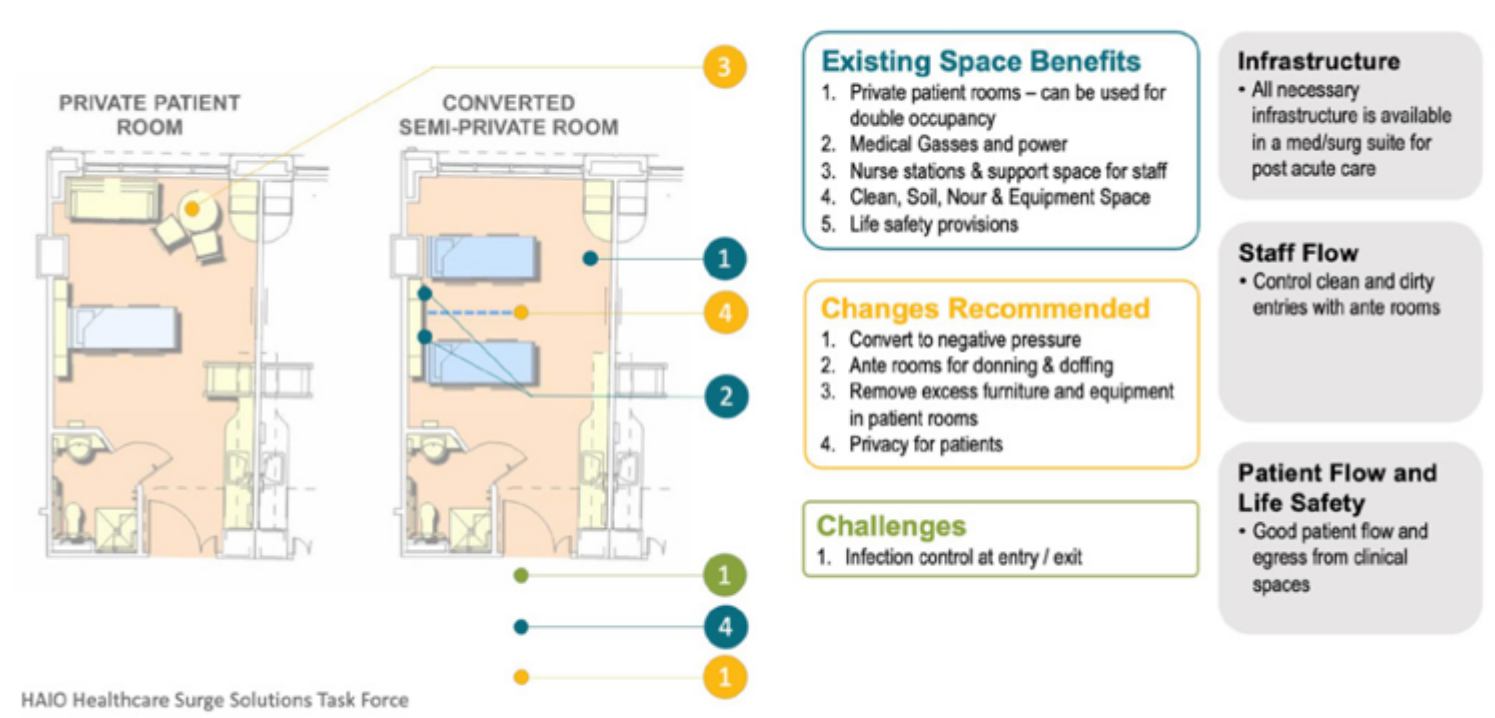
Chapter 2: Surge Capacity Considerations

Hospitals

- Additional storage for remote facilities
- Considerations for infrastructure needed to convert from a non-clinical space to a patient space
- In areas identified as surge capacity locations, any added med gas outlets or electrical outlets shall be in a secured tamper-resistant housing
- Exterior surge locations shall be identified, and a risk assessment performed
- Impact of emergency events on supply chain, supply storage
- Means to locate IV pumps and monitors outside patient rooms

Surge Capacity Examples

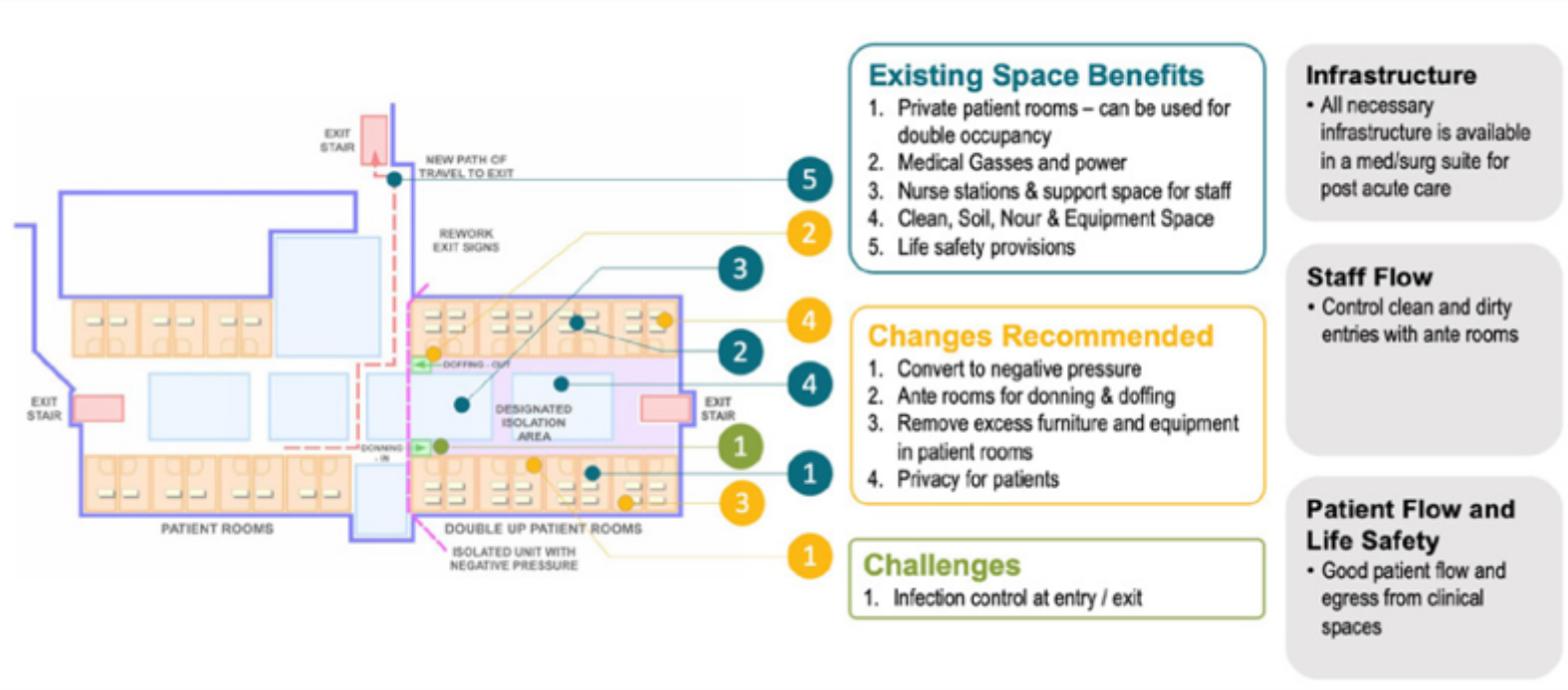
Figure 2-4: Private Patient Room Conversion Diagram



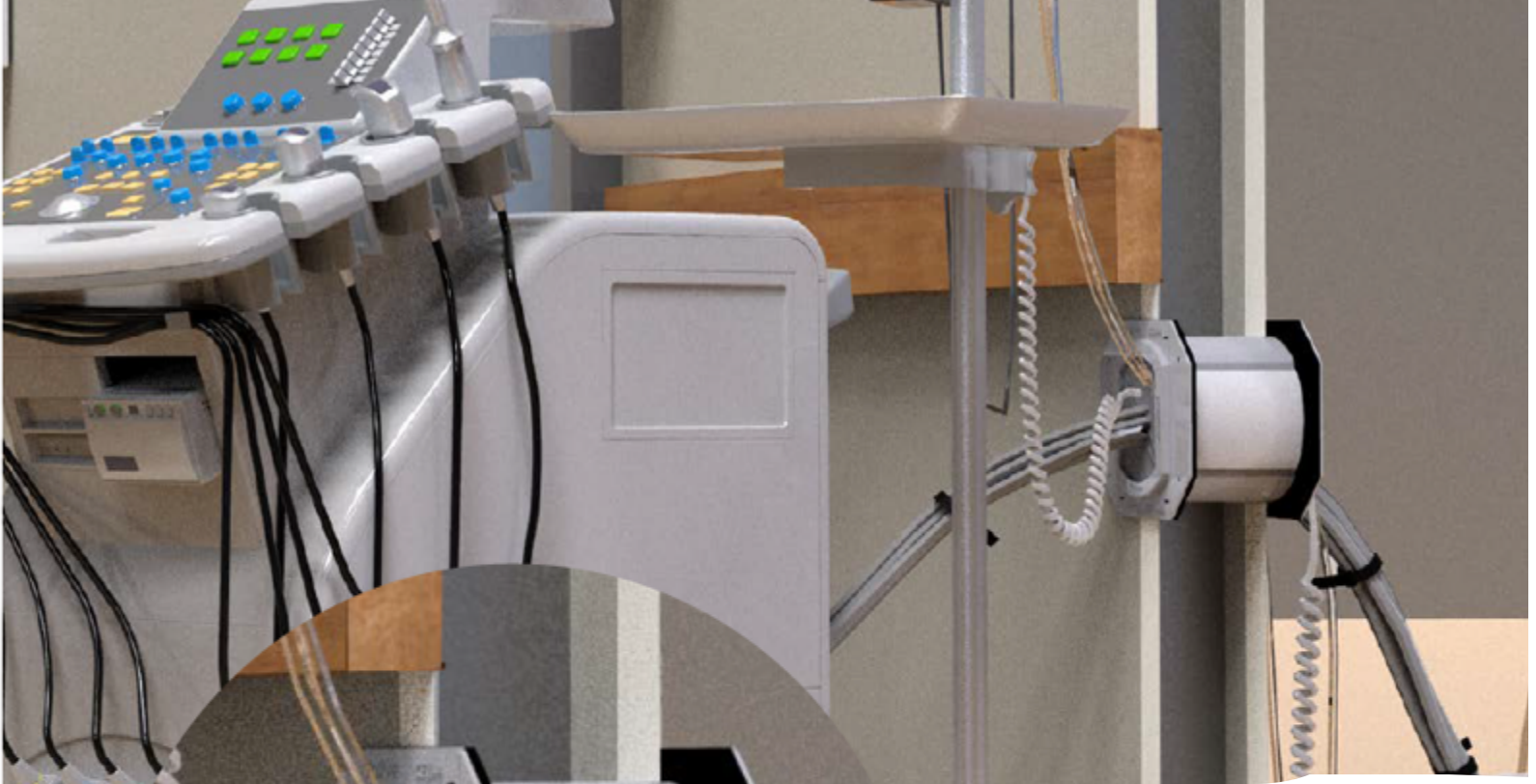
Source: Healthcare Associated Infections Organization

Surge Capacity Examples

Figure 2-5: Medical/Surgical Unit to ICU Conversion Diagram



Source: Healthcare Associated Infections Organization



Surge Capacity Examples

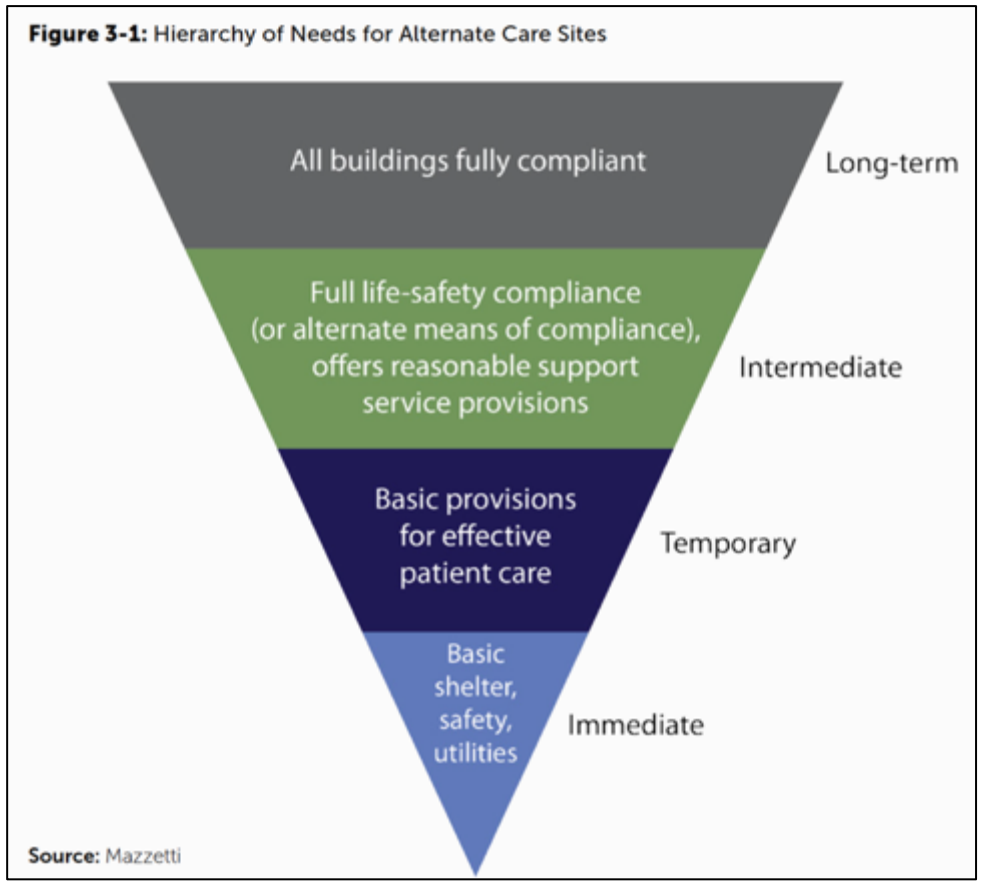
And we all know we want to avoid this…

Figure 2-10: A Highly Compromised Bedside with Splitters Mounted on Splitters

In this example, infrastructure has not kept pace with clinical need and a dangerous clinical space has been created.

Source: Paladin Healthcare, LLC

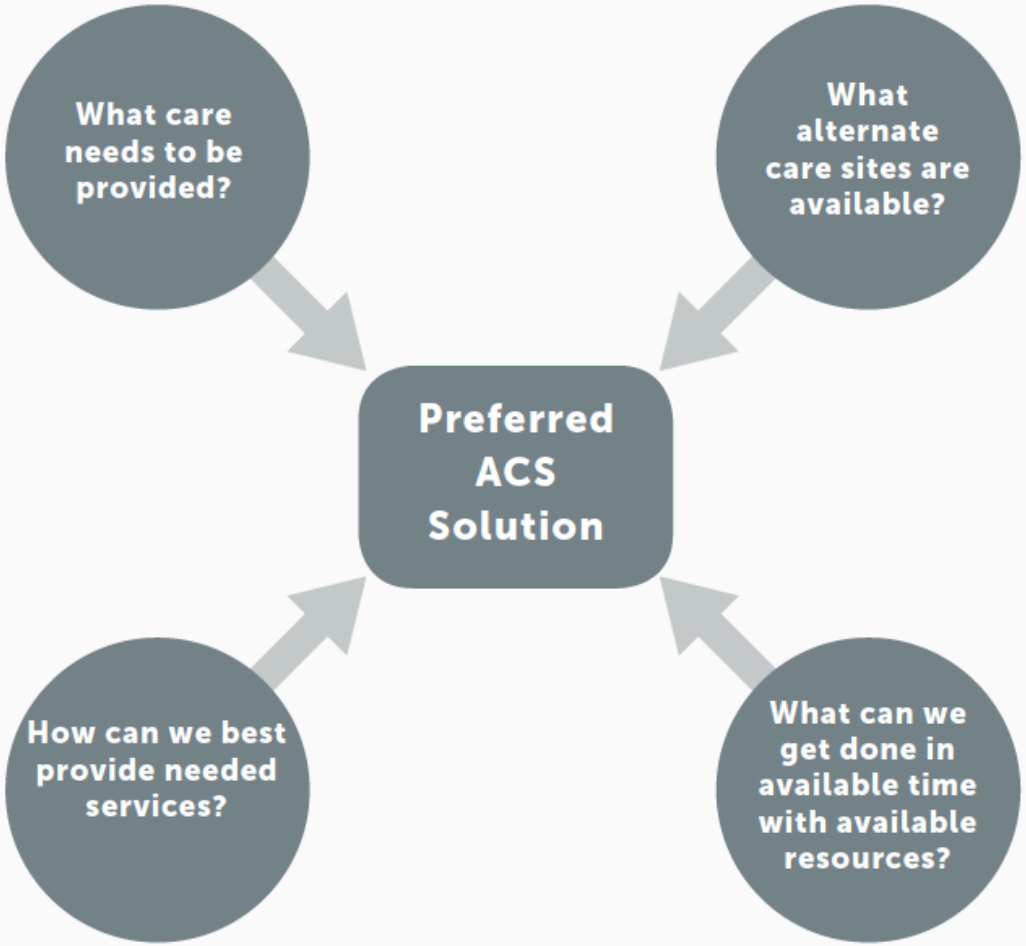
Chapter 3: Alternate Care Sites



- The ACS subcommittee addressed strategies for compliance and created a compliance matrix tool to assist facilities that need to surge to an alternate care site.
- Recommends addressing potential for ACS deployment in emergency planning.
- Discusses advantages/disadvantages of tents, repurposed structures, and modular buildings.
- Includes technical recommendations for building systems operating in ACSs.

Alternate Care Sites

Figure 3-2: Factors Influencing ACS Choice



Assessment Matrix

Figure 3-4: Alternate Care Site Compliance Assessment Matrix

Alternate Care Site Compliance Assessment Matrix

Program Statement:
Acuity of Patient Population:
Date of Deployment:
Duration of Care:
Facility Type:
Date of Assessment:

COMPLIANCE GUIDELINES PER SERVICE AND DURATION		SHORT-TERM (Measured in hours or days after an event)						INTERMEDIATE			LONG-TERM Permanent (> 6 months)		
		Immediate			Temporary								
1. Confirm required approval entities. 2. Determine criteria for deploying to the ACS. 3. Identify risk tolerance for each group (see the disaster, emergency, and vulnerability assessment - DEVA). 4. Select columns to the right based on duration of anticipated stay. 5. Modify compliance categories in alignment with the DEVA.		Immediate response measured in hours or days after an event			Temporary response in service no more than 60 days			Temporary response put into service within 90 days and intended for no more than 6 months. An extension may apply (see _____)			Permanent response intended for 6 months or longer		
Service Use Type	**Description of Service**	**Group I**	**Group II**	**Group III**	**Group I**	**Group II**	**Group III**	**Group I**	**Group II**	**Group III**	**Group I**	**Group II**	**Group III**
Site Analysis	Building access				Per the DEVA			Per the DEVA					
	Site access												
	Parking												
	Perimeter security												
Building Systems	Mechanical/electrical/plumbing (MEP), fire protection				Per the DEVA			Per the DEVA					
	Low-voltage/security												
Patient Provisions	ADA				Per the DEVA			Per the DEVA					
	Accommodations for individuals of size												
Intake/Assessment	Intake/evaluation												
	Triage												
	Patient holding												
	Stabilization												
	Donning and doffing												
Emergency Services	Exam/treatment												
	Observation												
	Trauma/resuscitation												
Diagnostic and Treatment	General exam/testing												
	Treatment												
	Diagnostic imaging												
	Nuclear medicine/radiation												
	Interventional radiology												
	Non-invasive procedure												
	Invasive procedure/surgery												
	Pre/post-procedure care												
	Infusion												
	Hyperbaric												
	Dialysis												
	Pharmacy services												
	Respiratory therapy												
Inpatient Care	Critical care												
	Intermediate/transitional care												
	Medical/surgical												
	Protective environment (PE)												
	Airborne infectious isolation (AII)												
	Labor/delivery/recovery (LDR)												
	Behavioral health												
Public and Administrative	Waiting												
	Staff support												
	Administrative offices												
General Support	Sterile processing												
	Linen services												
	Materials management												
	Waste management												
	Environmental services												
	Food service												
	Morgue												
	Areas of respite												
	Family liaison/support												
	Supply receiving area												

Triage, treat, and sustain life in response to an event. Intent is to stabilize for transfer to a compliant medical facility. Due to emergency need and limited expected duration, application of code requirements not expected. Expected use will dictate what compliance will be provided.

Modular Construction Recommendations

- Modular subcommittee recommendations have been rolled into Alternate Care Sites.
- Modular subcommittee created recommendation for pre-approved prototype that could be quickly deployed for emergency use.

Chapter 4: Resiliency

Incidents Covered:

- Airborne Chemical, Biological or Radiological Attacks
- Civil Unrest
- Flooding and Sea Level Rise
- Hurricanes
- Pandemics
- Severe and Artic Cold Events
- Tornados
- Utility Outages
- Wildfires

Chapter 4: Resiliency

Hospital

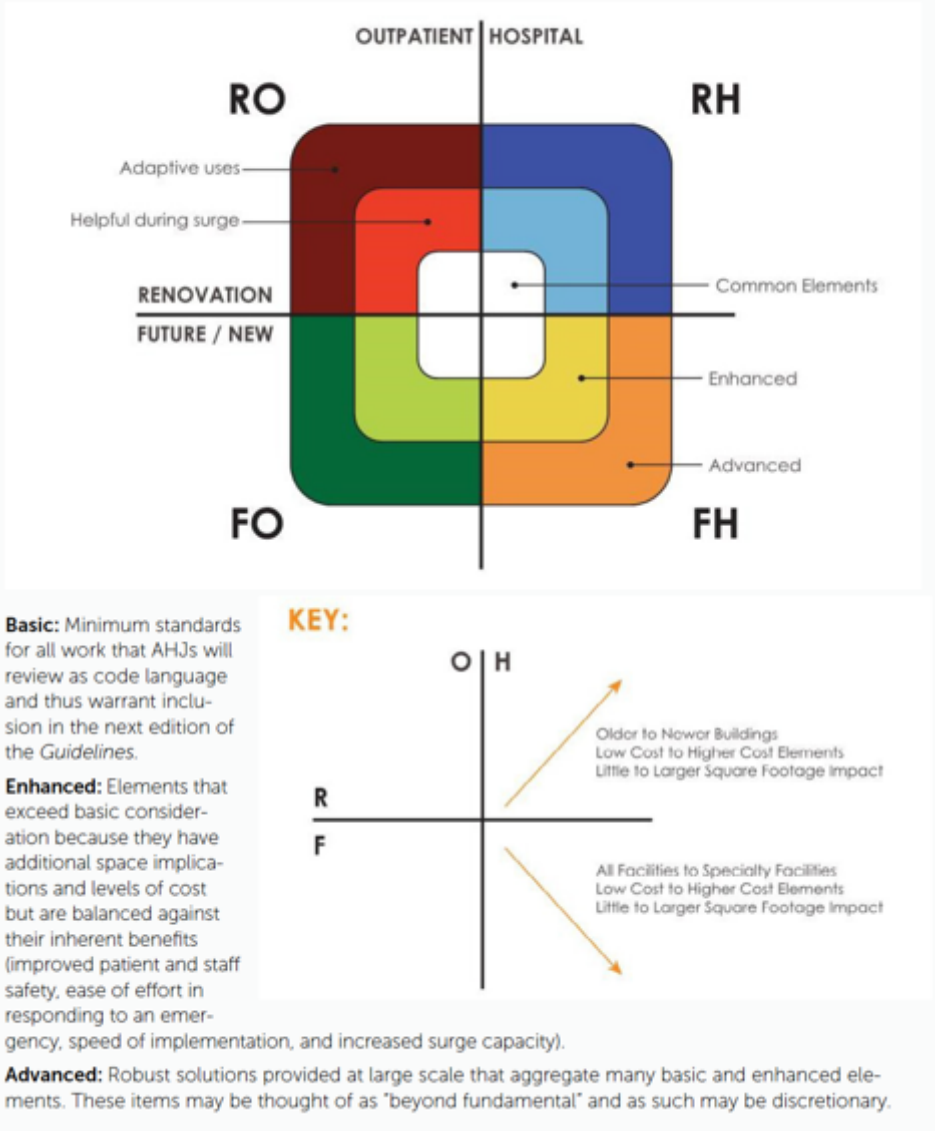
- An incident command center (ICS) room
  - 200 sq. ft. minimum
  - Accommodate the number of seats necessary for critical positions
  - Be supplied with essential electrical power
- Critical function areas located above floodplain
  - Pharmacy
  - Laboratory
  - Blood bank/storage
  - Sterile processing facilities

Chapter 5: Renovations and Future Facilities

- Recommend inclusion of “acuity adaptable exam rooms”
- All exam rooms ”telemedicine-capable”; recommendation that requirement is HIPAA, not space-based
- % of PACU capable of negative pressure (ICRA based)
- % of PACU AII conversion-ready with an anteroom
- One EVS room per patient unit to improve ability to contain
- New staff shower room required
- Added oxygen and vacuum outlets for most patient care spaces

Emergency Conditions Response Levels

Figure 5-1: Emergency Condition Response Levels

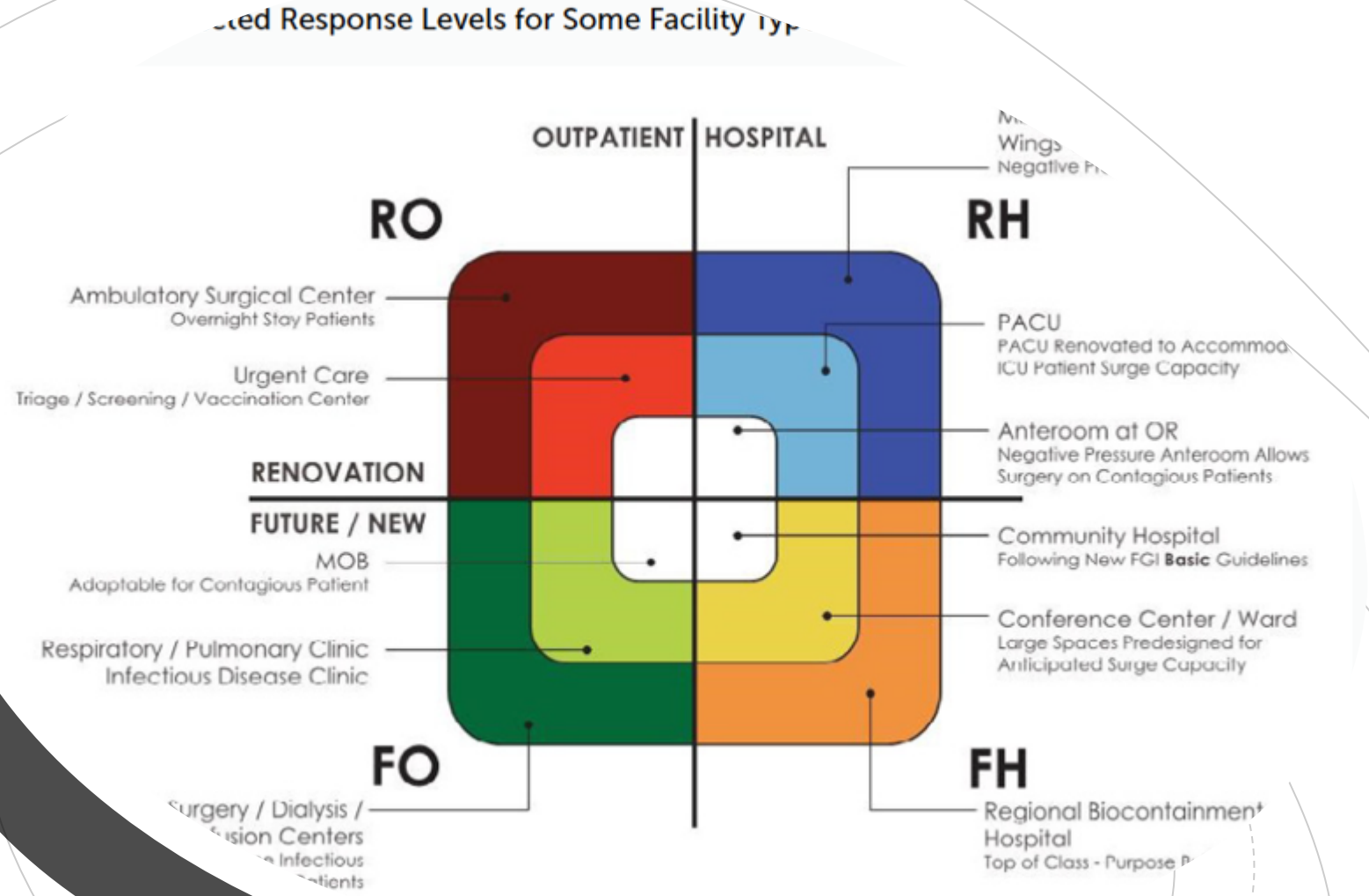


Basic: Minimum standards for all work that AHJs will review as code language and thus warrant inclusion in the next edition of the *Guidelines*.

Enhanced: Elements that exceed basic consideration because they have additional space implications and levels of cost but are balanced against their inherent benefits (improved patient and staff safety, ease of effort in responding to an emergency, speed of implementation, and increased surge capacity).

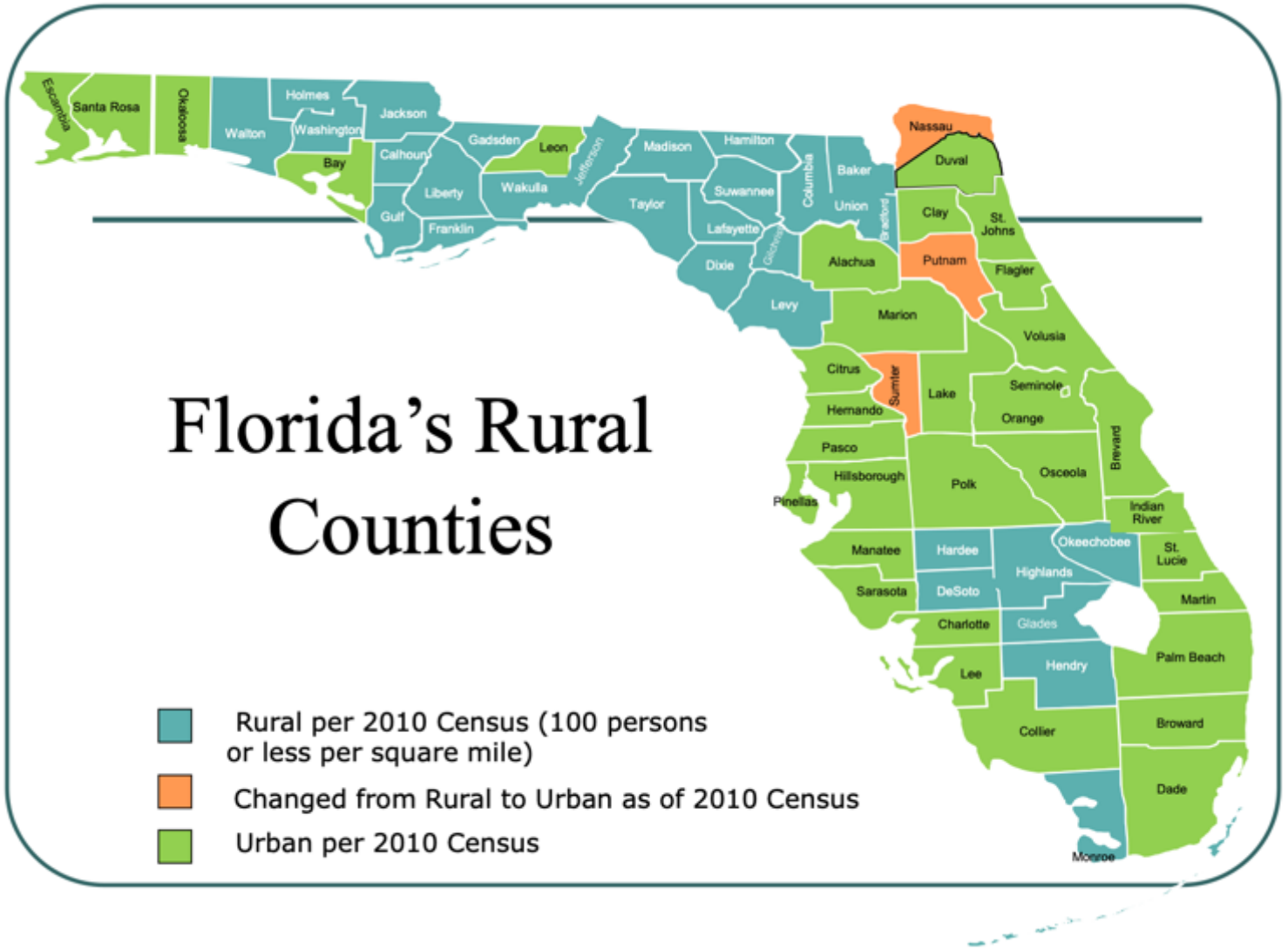
Advanced: Robust solutions provided at large scale that aggregate many basic and enhanced elements. These items may be thought of as "beyond fundamental" and as such may be discretionary.

Expected Response Levels



Chapter 6: Small and/or Rural Health Care Facilities

- Multidisciplinary team to develop Incident Command System
- Allow percentage of patient rooms to be converted to negative pressure
- Flexible triage/intake space to accommodate unidirectional flow
- Appendix considerations for site preparations, such access control, communications, etc.



- Disrupters
  - Policy/reimbursement
  - Economic conditions
  - Site access
  - Utilities and associated costs
  - Partner and community resources

Table 6-1: Emergency Response Disrupters Matrix

Emergency Response Disrupters Matrix

Compiled Ratings for Emergency Response Disrupters for Small and/or Rural Health Care Facilities

#	Category	Disrupter Items	Rural*			Urban/Suburban			avg.	STDEV
			CAH (IP)	Small (IP)	Clinic (OP)	Small (IP)	Small Specialty (IP)	Clinic (OP)		
1	Policy/reimbursement									
		CAH reimbursement advantage	29	28	12	23	21	18	21.83	6.369
		Impact of CMS rules and regulations (Medicare/Medicaid)	38	38	34	35	31	30	34.33	3.386
		Eligibility for federal stimulus funds	36	37	38	32	34	35	35.33	2.160
		Access to emergency relief funds	38	38	39	34	35	33	36.17	2.483
		Underserved populations incentive program (Census)	32.5	32.5	32.5	31	33	32	32.25	0.689
	Sum		173.5	173.5	155.5	155	154	148		
	Average		34.7	34.7	31.1	31	30.8	29.6	31.98	2.172
2	Economic									
		Impact of poverty (insured versus uninsured)	39	42	40	39	33	34	37.83	3.545
		Facility limitations (e.g., older facility, size issues, infrastructure issues)	43	41	39	38.5	36.5	36.5	39.08	2.558
		Access to grants or financing options	30	33	32	29	29	30	30.50	1.643
		Access to resource plentiful community with large tax basis	29	20	24	21	21	21	24.00	3.600
		Multigenerational households (i.e., crowding)	34	34	33	31	31	31	32.33	1.506
		Traditionally low profit margins	37	38	38	31.5	30.5	32.5	34.58	3.456
		Disproportionate elderly demographic	40	41	41	31	31	31	35.83	5.307
	Sum		252	257	247	221	212	216		
	Average		36.0	36.7	35.3	31.6	29.6	30.9	33.34	3.018
3	Access/site									
		Proximity to population served	43	42	40	24	24	23	32.67	9.913
		Proximity to ground/air transport	42	41	38	23	23	20	31.17	10.187
		Emergency support (e.g., fire, police, EMS transportation)	39	38	36	23	23	23	30.33	8.091
		Consistent access from mobile diagnostics	41	41	36	24	24	23	31.50	8.781
		On-site decontamination support	39	39	36	33	32	31	35.00	3.521
		Limited on-site logistical support (portable/temporary structures)	39	39	31	37	35	33	35.67	3.266
		Provision of on-site helipad for patient transfer	39	39	28	29	28	25	31.33	6.088
	Sum		282	279	245	193	189	178		
	Average		40.3	39.9	35.0	27.6	27.0	25.4	32.52	6.716
4	Utilities and associated costs									
		Availability, uninterrupted broadband service	49	49	47	28	28	27	38.00	11.349
		Telephone (landline) or cell phone coverage	42	42	40	27	23	26	33.33	8.892
		Water and sewer availability/capacity	34	34	31	24	24	23	28.33	5.241
		Natural gas availability/capacity	33	33	30	26	26	24	28.67	3.882
		Medical gas availability/capacity	41	41	29	30	30	23	32.33	7.202
		Generator and oxygen fuel source proximity	43	42	33	36	36	28	36.33	5.610
		Waste disposal availability	32	32	28	26	26	23	27.83	3.601
	Sum		274	273	238	197	193	174		
	Average		39.1	39.0	34.0	28.1	27.6	24.9	32.12	6.155
5	Partner and community resources									
		Affiliation to associated facility or higher acuity	38	36	36	22	22	21	29.17	8.256
		Availability of support from partnering system	39	39	36	30	30	29	33.83	4.708
		Food supply access	38	37	28	35	35	27	33.33	4.676
		Available staff (all levels)	49	49	45	38	39	36	42.67	5.750
		Specialists professional workforce and ability to supply primary care	38	37	33	26	26	24	30.67	6.121
		Opportunities for community engagement in disaster	39	39	36	30	29	27	33.33	5.317
		Limited available space or flexible space	40	39	34	37	36	30	36.00	3.633
		PPE reserve storage access	41	41	39	37	37	34	38.17	2.714
	Sum		322	317	287	255	254	228		
	Average		40.3	39.4	35.4	31.9	31.8	28.5	34.54	4.662

Highest rating

second tier highest rating

Chapter 7: Emergency Preparedness in Residential Settings

Fundamental Requirements

- Single-bedded resident rooms
- Maximum of 10% of resident rooms can be double
- Negative pressure visitation room – divided into zones
- Shower and changing area for staff use

Appendix

- Dedicated staff entrance physically separated from other entrances
- Technologies enabling e-visits
- Real-time locating systems to track residents

We have a long road ahead of us…the single bed resident room!

Figure 7-3: Sample Companion Room Layout

Images courtesy of Cleary O'Farrell/ Shoesmith Cox Architects

Source: Bethany of the Northwest/Cleary O'Farrell Photography and Shoesmith Cox Architects

Residential Matrix Overview

Figure 7-1: Residential Subcommittee Matrix Overview

Emergency Situation	Type(s) of Threats	Risks	Threats to Physical Structure/ Campus	Typical Duration of the Immediate Threat	External Stakeholders involved in response	Access to building restricted during threat?	Evacuation or Protect-in-Place	Considerations for Building & Systems
Weather/ Tectonic	Tornadoes, hurricanes, storms, extreme temperatures, earthquakes	High winds, excessive water and/ or flooding, Ice, life-threatening temperatures (cold or hot), falling objects	Failure and/or compromised building enclosure, structural damage, loss of utility services, impeded access to property if roads become blocked	"Hours/Day/ Days *dealing with the aftermath may stretch into weeks."	Utility company personnel, possibly fire department if responding to utility that may result in fire risk, contractors	Not likely Family and community can still come in and be connected with residents and staff. Family presence may be instrumental in support and relieve. Caregiver burden	Most commonly protect-in-place unless hurricane evacuation orders are issued.	Anticipating interruptions in water supply and other utilities such as electrical, HVAC, telecommunications, structural redundancy in building design
Wildfire	Uncontrolled burning	Excessive heat, smoke	Failure and/or compromised building enclosure, structural damage, loss of utility services, impeded access to property if roads become blocked	"Hours/Day/ Days/ Weeks *dealing with the aftermath may stretch into weeks."	Utility company Personnel, fire department, contractors	Not likely Family and community can still come in and be connected with residents and staff. Family presence may be instrumental in support and relieve Caregiver Burden	If building is in the path of fire, and/or air quality is life threatening, evacuation may be required.	Protecting building and property from destruction due to fire, anticipating loss of utility services
Pandemic	Contagions	Uncontrolled spread of pathogens that result life-threatening illness	No real threats to the physical structure of the building or campus	Weeks/ Months/Year	Local/State/ National Health Departments	Yes Restricted access	Protect in Place	HVAC systems and indoor air quality become more critical/ scale and spatial referents become more critical to manage distances between individuals.
Hostile Threats or Trespass: Active Shooter/ Search for Violent Offender/Civil Unrest	Individual(s) with a weapon intent on harm	Injury or death to residents/ staff/ visitors	Failure and/or compromised building enclosure.	Hours/Day/ Days	Law enforcement	Yes Restricted access	Protect in place	Surveillance systems, communication technology. Management of entrances and exits; considerations for views and visual access.

This?

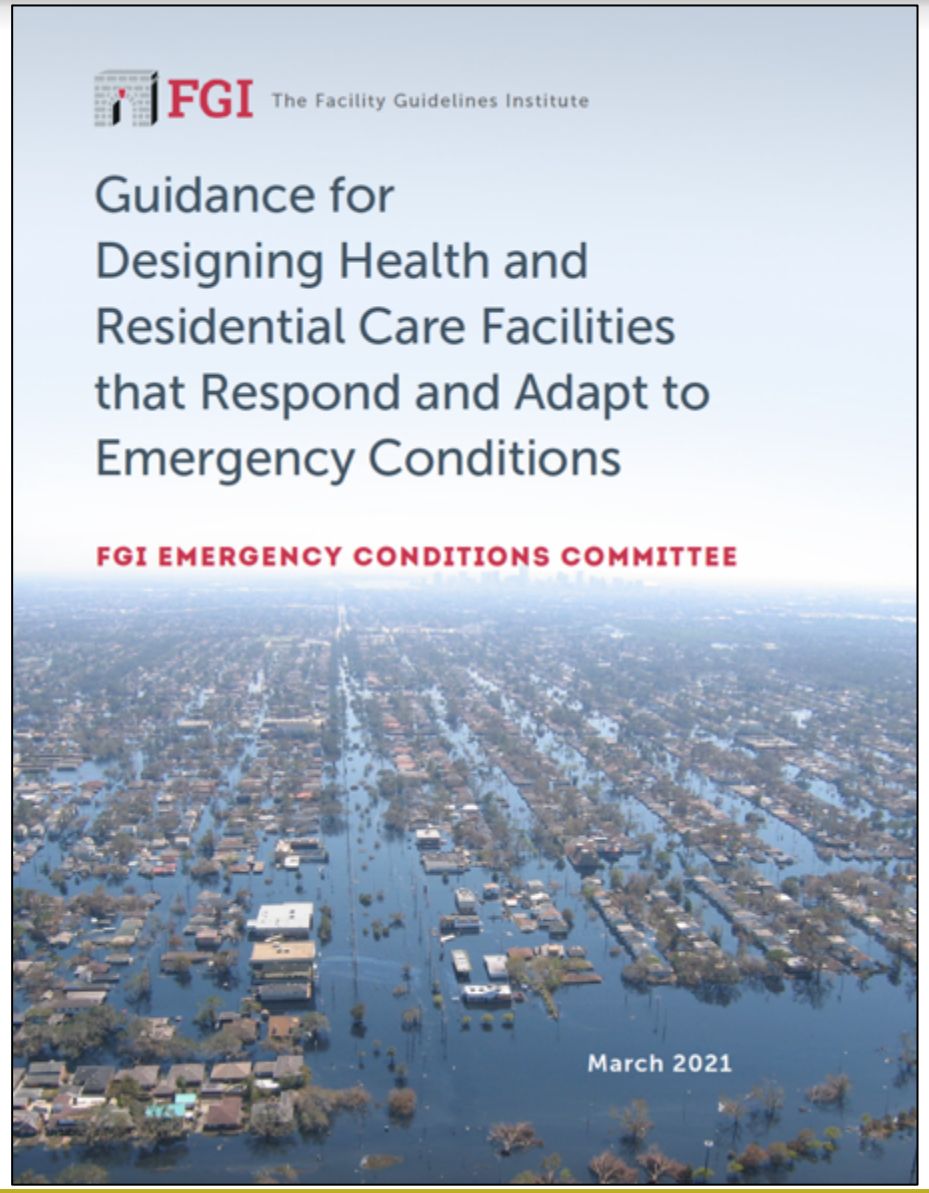
Or this?

We must do better!

Operational Considerations

Provides considerations for new, renovated, and temporary facilities. Chapter addresses:

- Support services
- Staffing and staff support concerns
- Circulation patterns
- Flexible-use space
- Social and economic impact
- Considerations for airborne infection control



- Released April 1, 2021
- Available for free download at www.fgiguidelines.org

How will we present these new requirements?

- DEVA will be added to the 2022 series of *Guidelines*
- New task group will be appointed for 2026 revision cycle for emergency conditions
- Incorporate new language on emergency conditions into the 2026 *Guidelines*

Thank you for your attention!