



KAISER PERMANENTE NORTHERN CALIFORNIA

**COVID-19 INTENSIVE CARE UNIT, MEDICAL SURGICAL and MEDICAL SURGICAL
TELEMETRY UNIT SURGE PLAYBOOK**

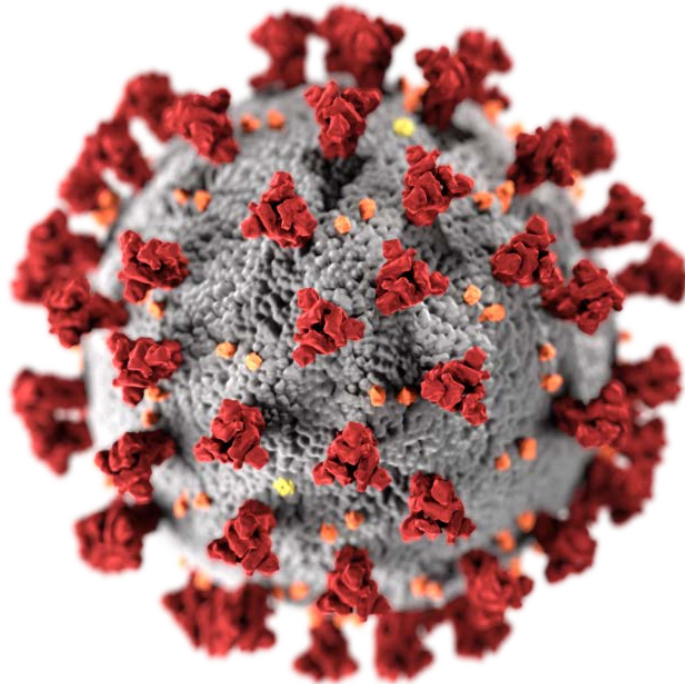


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Executive Summary

The Coronavirus Pandemic is growing, and the number of cases in the United States is rising quickly. Given the number of COVID patients reported in other countries, KP Northern California can expect an influx of COVID patients, particularly critically ill patients, requiring hospitalization in the next few weeks.

The following ICU and Medical/Surgical/Telemetry (MST) Expansion Checklists should be used as a quick reference (please refer to the link below).

[COVID Pandemic Planning ICU and MST Expansion Quick Checklist.](#)

This playbook reviews strategies for rapid expansion of a medical facility's existing inpatient and critical care capacity using a *Space, Stuff, Staff* strategy. KP Northern California (NCAL) medical facilities should plan to address these three key areas to rapidly create a **twofold** increase in hospital capacity and a **threefold** increase in critical care capacity. This playbook was produced by the KP NCAL Regional Coronavirus Response Team and incorporates recommendations from the following departments:

Anesthesia	Labor & Delivery
Clinical Technology	Nutrition Services
Continuum of Care	Patient Care Services
Critical Care	Pediatrics
Emergency Management	Pediatric Critical Care
General Surgery	Pharmacy
Hospital Based Specialists	Regulatory
Hospital Operations	Resource Management
Infection Control	Respiratory Therapy
KPHC	Supportive Care Services

Introduction: Space, Stuff, Staff, Census Management

Kaiser Permanente NCAL hospitals should plan and prepare to provide hospital care each day of the response for a patient census at least **twofold** above usual capacity or baseline (including a **threefold** increase in critical care capacity). Essential planning for augmenting hospital and critical care capacity during a disaster includes considerations for “space” (how much and where), “stuff” (equipment), and “staff” (number, training strategies, etc.). The space, stuff, staff approach is a simplified way to break down factors determining hospital/ICU capacity and capability to allow an organized approach to planning.

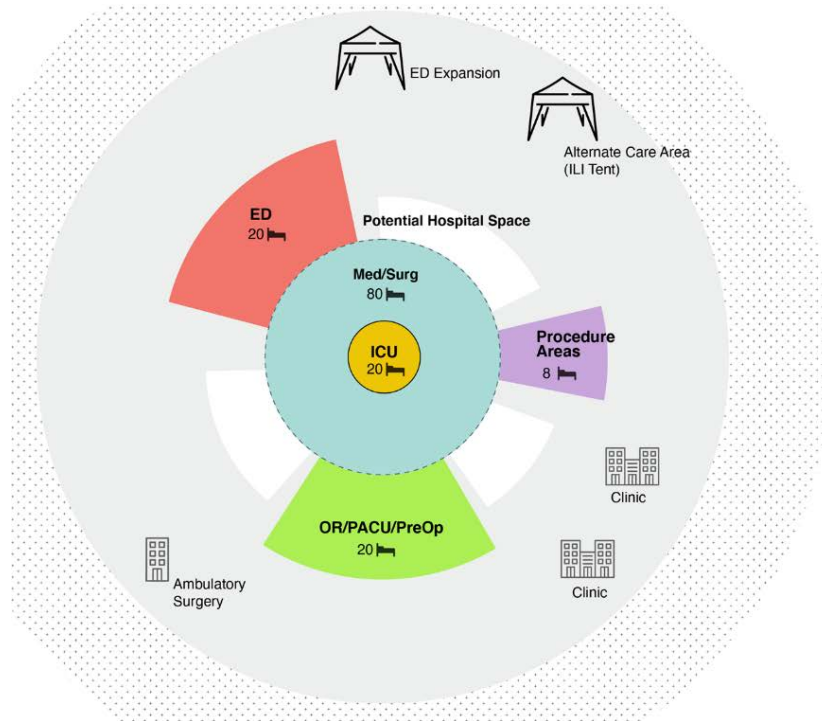
Space refers to where you will treat patients requiring hospitalization (including critical care). This includes areas both within and outside of the critical care/medical/telemetry units that can be modified to allow care for hospitalized patients. You should also be aware of adjacent areas (physically or functionally adjacent) that may have an impact on the flow into and out of the hospital such as triage areas that will be a frequent source of patient intake or wards for patients who will receive palliative care when critical care is not appropriate. As of March 20, 2020, The State of California has waived Title 22, and program flexes are no longer required.

Some general space concepts apply:

- Maximize critical care surge areas
 - Prioritize and maintain ICU patients within the hospital when possible
 - Utilize all existing ICU beds: Trauma, Cardiovascular, Neuro, Pediatric (for patients up to 21 years of age)
 - Maximize transfer out of ICU and into MS (Med Surg) or MST (Med Surg Telemetry) when possible
 - Consider early palliative care consult on COVID patients
- Maximize existing hospital space for critical care and MST patients
 - Operating Room space (PACU, Operating Room, Pre-Op)
 - Intermediate Care Areas
 - Interventional Radiology, Cath Labs, CDA, Outpatient Procedure Space/Ambulatory Surgery Units that are contiguous with the hospital
 - Medical/Surgical hospital beds
 - MCH Mother Baby (MBU) Rooms, Pediatric Inpatient Units (for non-COVID, non-PUI care)
 - Other inpatient care areas
- Expansion of Inpatient Clinical Care Areas for additional ICU, MS and MST Space
 - Double occupancy in single ICU, MS or MST rooms
 - Hallway beds
- Conversion of Non-Clinical Care Areas to MS or MST Space
 - Visitors’ Waiting Rooms
 - Conference Room Space, Dining Rooms/Cafeterias
 - Shelled space

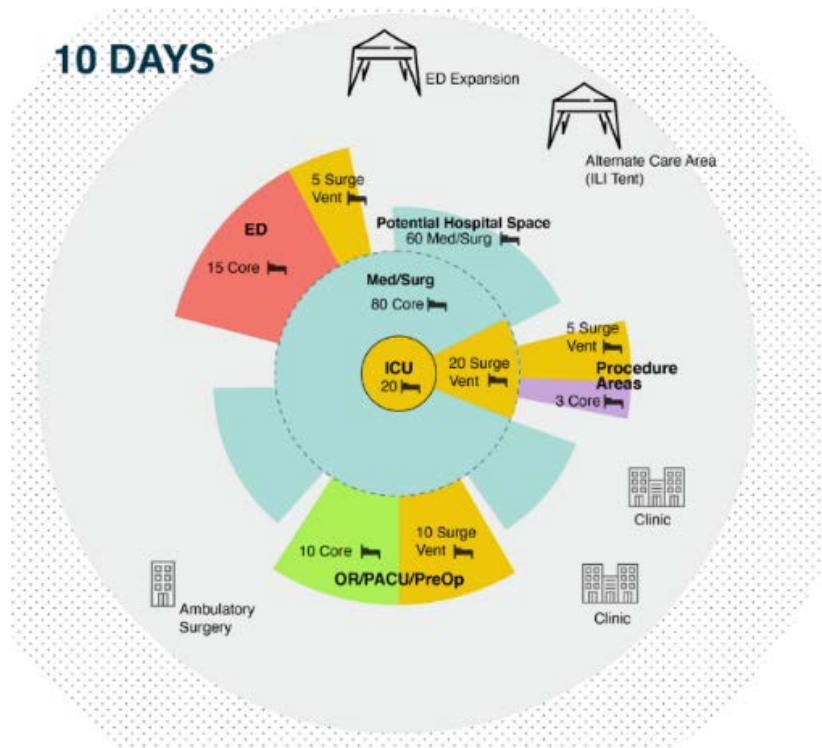
o Tents

An example of a (hypothetical) hospital at baseline and after expansion in 10 days (Expansion Level 1) is show below. Additional options for capacity expansion (Expansion Level 2) are shown in the third slide.



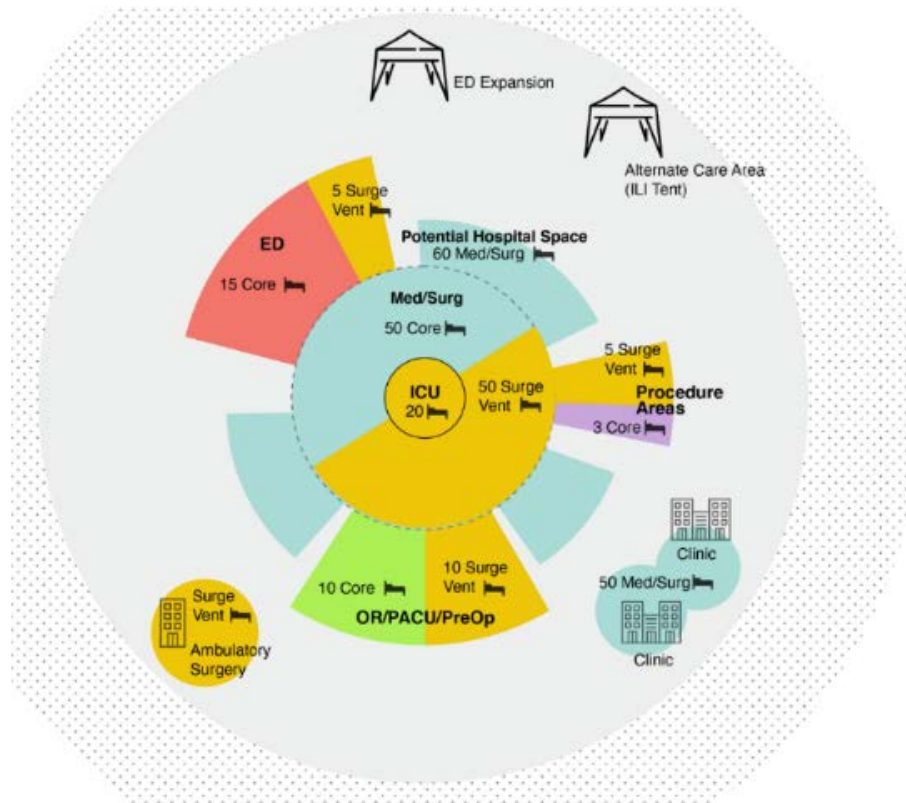
Today

HOSPITAL SPACE	# Beds
ICU	20
Med/Surg around ICU	100
Halls/double beds	
Around Med/Surg	
Procedure Areas	8
OR/PACU/PreOp	20
ED	20
CAMPUS SPACE	
Clinics	
Ambulatory Surgery	
Alternate Care Area	ILI Tent
ED expansion	Tent



**Expansion Level 1
Max Hospital Space**

HOSPITAL SPACE	# Beds
ICU	20
Med/Surg around ICU	
ICU	20
Med/Surg	80
Med/Surg potential space	60
Around Med/Surg	
Procedure Areas	3/5
OR/PACU/PreOp	10/10
ED	15/5
CAMPUS SPACE	
Clinics	
Ambulatory Surgery	
Alternate Care Area	ILI Tent
ED expansion	Tent



Expansion Level 2 Max Indoor Campus

HOSPITAL SPACE	# Beds
ICU	20
Med/Surg around ICU	
ICU	50
Med/Surg	50
Med/Surg potential space	60
Around Med/Surg	
Procedure Areas	3/5
OR/PACU/PreOp	10/10
ED	15/5
CAMPUS SPACE	
Clinics	90 Med/Surg
Ambulatory Surgery	ICU beds
Alternate Care Area	ILI Tent
ED expansion	Tent

Stuff refers to the equipment and supplies required to manage hospitalized patients. This includes equipment such as cardiac monitors, mechanical ventilators, BIPAP, IV pumps, medications, medical gases, IV poles, etc. Common mistakes include failure to consider disposable or support items (e.g., enough ventilator circuits to treat the expected number of patients).

Staff refers to the human resources required to care for patients. In addition to your usual staff, hospital staff, your facility may require supplementary assistance from other healthcare providers in the hospital or outpatient setting. Usual staffing ratios will be difficult to maintain during a surge, and the waiver of Title 22 by the State has alleviated staffing ratios through June 30, 2020. Personnel less experienced in critical care may be needed to augment staffing in the ICU, and personnel less experienced in hospital care may be needed to augment hospital staffing, with the necessary supervision provided. **Prior and just-in-time training of supporting staff should be considered, and a roster of staff outside with helpful competencies should be created and maintained.**

Every hospital facility has a unique footprint. This playbook serves as a general guideline. Local facility leadership should work with facility operations, clin tech, and IT to determine which spaces are most appropriate for expansion of services in each facility.

Risk Stratification and Clinical course of COVID+ and COVID Patients-Under-Investigation

Data regarding the clinical course and prognosis of patients-under-investigation (PUIs) for COVID is still emerging. The current data suggest that a subset of these patients progressively worsen during the second week of their illness. Deterioration of respiratory status may be abrupt and severe.

The diagrams below indicate high-risk features and stages of COVID infection as described by: Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease 2019 (COVID-19), Massachusetts General Hospital COVID guidelines, Italian Ultrasound Academy, and KPNC COVID treatment experience. These should be used to guide decisions regarding the level of care likely to be required during hospitalization. Because the clinical course of COVID patients can be unreliable, patients with non-COVID conditions and a more predictable clinical course may be more amenable to treatment in alternate spaces and early transfer to non-monitored beds.

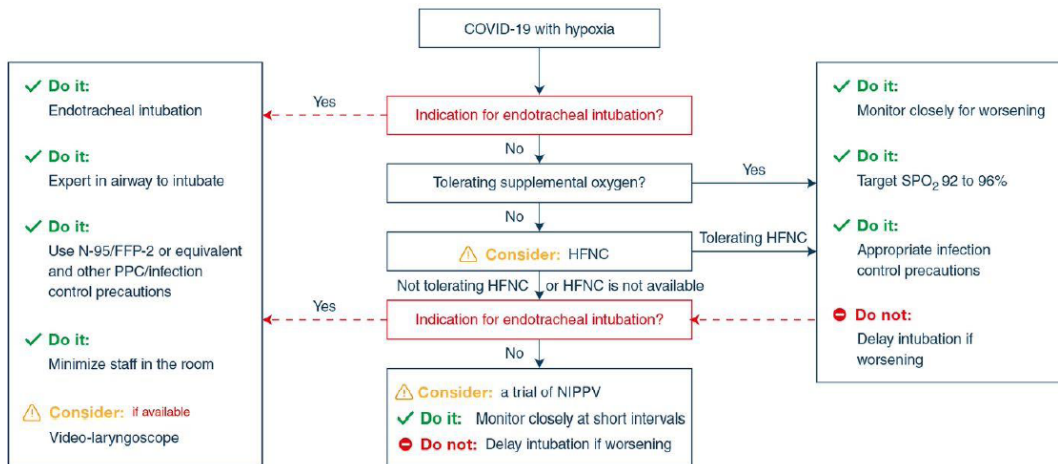
If a COVID patient is deteriorating, the decision to intubate sooner to prevent a severe decompensation requiring CPR is appropriate. This also allows time to transport the patient to an airborne isolation or closed room and to plan donning and doffing. Early intubation may also decrease staff exposure due to bag-valve-mask or non-invasive ventilation.

Identify High-Risk Patients

High-risk features may include:

Epidemiological	Vital Signs	Labs
Age >55	Respiratory rate > 24 breaths/min	D-dimer > 1000 ng/mL
Pre-existing pulmonary disease	Heart rate > 125 beats/min	CPK > twice upper limit of normal
Chronic kidney disease	SpO2 < 90% on ambient air	CRP > 10mg/dL
Diabetes with A1c > 7.6%		LDH > 245 U/L
History of hypertension		Elevated troponin
History of cardiovascular disease		Admission absolute lymphocyte count < 0.8
Use of biologics		Ferritin > 300 ug/L
History of transplant or other immunosuppression		
All patients with HIV (regardless of CD4 count)		

Clinical Decision Tree to Support COVID Management



Source: <https://www.sccm.org/getattachment/Disaster/SSC-COVID19-Critical-Care-Guidelines.pdf>

Placement of Medical/Surgical and Medical/Surgical/Telemetry COVID+ and PUI Patients

Stage	ICU/MST Placement	Screening Symptoms + Imaging	Hypoxia Treatment	Action
I	Discharge Home	<ul style="list-style-type: none"> Fever Respiratory Symptoms No hypoxia or mild hypoxia that corrects easily with supplemental oxygen 		
II	Alternative Care Space (e.g. hallways, conference rooms, tents)	<ul style="list-style-type: none"> Fever Respiratory symptoms Opacities on CXR Mild hypoxia: O2 2-6 L/min by NC required to maintain SpO2 92-96% 	<ul style="list-style-type: none"> Symptomatic treatment for spO2<92%: low flow NC, gentle IVFs, monitoring 	<ul style="list-style-type: none"> Admit med surg Prepare for potential, rapid deterioration
III	Inpatient Clinical Areas (e.g. Adult/MCH/Pediatric units, procedure area, surgical area, PACU/Pre-Op)	<ul style="list-style-type: none"> All of Stage II Diffuse opacities on CXR Respiratory rate > 24 breaths/min Heart rate > 125 beats/min Moderate hypoxia: O2 6-12 L/min by mask or non-rebreather required to maintain SpO2 < 92-96% 	<ul style="list-style-type: none"> Target SpO2 92-96%: if not improving, consider moving into stage IV O2 10-15 L by mask or high flow oxygen Perform high-risk aerosolizing procedures in airborne isolation or a room with closed door: (ex: nebs) High flow oxygen is NOT a high-risk procedure 	<ul style="list-style-type: none"> Admit Adult/MCH/Pediatric Unit: move to ICU before reach Stage IV If hypoxia improves with high flow oxygen: sub-intensive care unit
IV	Inpatient Clinical Areas (e.g. Adult/MCH/Pediatric Inpatient Units, surgical area, PACU/Pre-Op)	<ul style="list-style-type: none"> All of Stage III Pre-ARDS Severe hypoxia: High flow O2 15-30 L/min up to FIO2 0.65 or NIPPV required to obtain SpO2 92-96% 	<ul style="list-style-type: none"> High flow NC O2 (preferred) up to 30 L/min FiO2 0.65 or NIPPV to reach SpO2 92-96%, If not improving in 2 hours, move to phenotype V 	<ul style="list-style-type: none"> Admit ICU
V	Inpatient ICU	<ul style="list-style-type: none"> All of Stage IV ARDS: intubate early Unable to maintain SpO2 92-96% on High flow O2 15-30 L/Min up to FIO2 0.65 or NIPPV 	<ul style="list-style-type: none"> Intubation and pressor support as needed = airborne precautions during high-risk procedure 	<ul style="list-style-type: none"> Admit ICU

Source: Adapted from Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease 2019 (COVID-19) ([link](#)), Italian Ultrasound Academy ([link](#)), and KPNC COVID treatment experience.

Infection Prevention in a COVID ICU or Medical/Surgical/Telemetry Care Unit

One of the most unique aspects of a COVID ICU, MS or MST unit is maintenance of infection prevention during the care of COVID+ patients and COVID patients-under-investigation (PUIs). During hospitalization, infection prevention precautions must be taken for both COVID+ Patients and COVID PUIs.

General Infection Prevention Principles

- **When possible, COVID+ patients should be cohorted: no minimum distance between COVID+ patients is required.**
- **A minimum distance of 6 feet must be maintained between two COVID PUIs.**
- Patients-under-investigation should be assumed to be positive and treated with appropriate infection prevention precautions unless they are ruled out with a negative test.
- All COVID patients should be placed under droplet precautions + contact precautions + eye protection.
 - Mask + gown and gloves + eye protection
- During **high-risk procedures**, all COVID patients should be placed under airborne precautions + contact precautions + eye protection.
 - N95 or CAPR/PAP + gown and gloves + eye protection
 - High-risk procedures: intubation, CPR, bronchoscopy, administration of nebulizer or aerosolized medication, sputum induction, BIPAP, nasal/endotracheal suctioning, ventilator disconnecting
 - *High flow NC O2 is NOT considered a high-risk procedure*
 - When possible, high-risk procedures should be performed in an airborne isolation room. If an airborne isolation room is not available, high-risk procedures should be performed in a room with the door closed and in negative air pressure conditions (as available). Consider consolidated aerosol-generating procedural areas.
 - CAPR/PAPRs are the preferred respirators for intubation and bronchoscopy. If not available, N95 plus face shield can be used.
 - A face shield used during a high-risk procedure should be discarded after a single use.

Hot Zone

- A “hot zone” (i.e., a contaminated area that includes the patient’s treatment space) surrounding COVID+/COVID PUIs should be established. Within this hot zone, appropriate PPE (see General Infection Prevention Principles above) for care of a COVID+/COVID PUIs patient must be maintained.

- There is no minimum distance that two COVID+ patients must be kept from each other; however, a distance of 2-3 feet between patient beds is advised for ease of movement between patients.
- Two COVID PUIs should be kept 6 feet from each other.
- **A 6-foot perimeter from the patient to the edge of the hot zone must be maintained.**
- A hand hygiene and gloves station AND a waste container should be maintained within the hot zone.
- If possible, the hot zone should include a sink.
- When possible, doors to rooms should remain closed
- **PPE inside the hot zone:**
 - **Healthcare workers (HCWs) should change their GLOVES ONLY and perform hand hygiene in between two COVID+ patients, unless gown is soiled or damaged.**
 - A gown that is soiled or damaged should be changed.
 - **Healthcare workers should change their GLOVES AND GOWN and perform hygiene in between two COVID PUIs.**
 - The HCW's respiratory protection and eye protection do not need to be changed between patients in the hot zone unless they are soiled, contaminated or damaged.

Cold Zone

- A “cold zone” (i.e., a noncontaminated area used for planning and staging) should be established at the periphery of the hot zone. Within the cold zone, PPE is not required.
- A PPE station for donning should be established in the cold zone.
- The cold zone must be at least 6 feet from patients in the hot zone.

General Donning/Doffing Guidance in the Hot and Cold Zones

Please detailed PPE donning/doffing guidelines in the [Appendix](#).

- The HCW dons appropriate PPE in the cold zone.
 - Droplet precautions + contact precautions + eye protection
 - For high-risk procedures: airborne precautions + contact precautions + eye protection
- The HCW steps into the hot zone.
- The HCW remains in PPE while in the hot zone.
 - Between 2 COVID+ patients, the HCW changes gloves and performs hand hygiene.
 - Between 2 COVID PUIs, or a COVID+ and a PUI patient, the HCW changes gloves and gown and performs hand hygiene.
- Gloves and gowns (if doffing gown) should be doffed in the hot zone.
- If using the Reuse protocol, mask and eye protection should be doffed in the cold zone and stored for reuse per guidelines (please see appendices)

- If using the Extended Use protocol, mask and eye protection should not be doffed but instead can be worn in the cold zone while in between episodes of patient care.

Please detailed PPE donning/doffing guidelines in the Appendix.

- [CAPR for High Risk](#)
- [PAPR for High Risk](#)
- [N95 for High Risk Reuse](#)
- [Routine Care Reuse](#)
- [Routine Care with Extended Use](#)

Please see SharePoint site for additional PPE guidance, including videos ([link](#)).

PPE Stewardship Guidelines

May also be posted as signage.

- [PPE & Stewardship Guidelines for COVID +, PUIs, and Enhanced Respiratory Precautions.](#)

The image shows two side-by-side charts titled "PPE & STEWARDSHIP GUIDELINES". The left chart is for "PUI & COVID-19" and the right chart is for "ENHANCED RESPIRATORY PRECAUTIONS (ERP)". Both charts have columns for different PPE types: Goggles, Mask, Goggles, N95, GOWN, GLOVES, Goggles, and Face Shield. The rows represent different care scenarios: ROUTINE CARE and PRECAUTIONS WITH RESERVE FOR PUI/ERP. Each cell in the grid contains a red 'X' or a green checkmark, indicating whether that PPE is required for that scenario. Below the charts, there is a note: "Discard when PPE is visibly soiled, contaminated, damaged, or at the end of shift." and "Kaiser Permanente."

Signage in the Hot and Cold Zones

- [Droplet, Contact and Eye Protection Guidelines](#)

The image is a vertical signage graphic. At the top, it is split into two sections: "DROPLET PRECAUTIONS" (green background) and "CONTACT PRECAUTIONS" (red background). Below this, it says "+ EYE PROTECTION". There are three lines of text in English, Spanish, and Chinese: "Visitors: Please check with a nurse before entering.", "Visitantes: Por favor, consulte con una enfermera antes de entrar.", and "探訪者：請與護士諮詢後方可入內。". The main body of the sign is divided into "ENTERING" and "EXITING" sections. The "ENTERING" section lists: 1. Clean HANDS (Get on Soap & Water), 2. Put on GOWN (Front to Back), 3. Put on MASK, 4. Wear EYE PROTECTION (Goggles or Face Shield), 5. Put on GLOVES (Over Gown Cuffs), 6. Close DOOR. The "EXITING" section lists: 1. Remove GOWN & GLOVES (Roll Inside Out), 2. Clean HANDS & Put on GLOVES, 3. Remove EYE PROTECTION & MASK, 4. Remove GLOVES & Clean HANDS, 5. Close DOOR. At the bottom, it says "Performs hand hygiene between steps if hands become contaminated." and "Kaiser Permanente."

EVS Considerations

- EVS services should follow the same protocols and take the same precautions as with standard COVID rooms.
- Biohazardous waste does not require any special handling. It should be handled through standard processes.
- In order to preserve PPE, it is recommended that EVS staff do not do a daily room clean of bedded patients that are NOT cohorted, but rather that the high touch surfaces are wiped down by HCW once daily. At patient's discharge, EVS will perform a standard terminal clean.

SPACE: Expansion of Clinical Spaces for Acutely Ill COVID patients

General Guidance

- Treatment of hospitalized patients in alternate care areas should only be pursued when existing ICU, MS and MST unit areas are at capacity
- Augmenting ICU and MST space assumes the following:
 - Critical care patients will be placed in clinical areas with headwalls first.
 - Willingness to assess options for using alternative spaces outside of the ICU and MST units to care for patients.
 - Elective, non-emergency surgeries requiring ICU or inpatient postoperative care are postponed.
 - Early palliative care consult on all COVID patients guides placement in the hospital.
- If multiple areas in a facility are re-purposed, there may be general facility-wide considerations regarding adequate supply of oxygen, medical air, suction, and electrical outlets. Facility engineering should be consulted to confirm potential structural or engineering barriers.
 - Please see [Medical Air and Oxygen Capacity](#) Document
- As of March 20, 2020, The State of California has waived Title 22, and program flexes are no longer required through June 30, 2020.

Meeting Basic Equipment Requirements for Conversion to Intensive Care Space

Please refer to the [Basic Equipment Checklist for ICU and MST Patients](#).

- Headwall
 - Please refer to the [Basic Equipment Checklist \(Headwall\) for specific details on oxygen wall supply, medical air wall supply, suction, electrical source, and call system considerations](#).
- Patient Monitoring System
 - A patient monitoring system should be placed at the bedside and used to monitor the patient's vital signs, including EKG, SpO₂, EtCO₂, non-invasive and invasive BP.
 - The patient monitoring system must be monitored (auditory) at the bedside in accordance with standard ICU monitoring protocols. This monitoring can be accomplished by a healthcare worker at the bedside. It can also be accomplished with a virtual monitor that has audio capability.
 - Note: Not all patient monitoring systems in existing clinical spaces are currently integrated with KPHC. ClinTech and IT should be consulted to assist in configuring the system.
- Ventilator/Associated equipment

- A ventilator should be placed at the bedside of each patient requiring ventilator support
- Note: Ventilators from the hospital should be brought to the conversion space by Respiratory Therapy (RT).
- Line of Sight
 - Each intensive care patient receiving care should be observable by healthcare providers to the extent possible. With the State’s waiver of Title 22, maintaining Line of Sight is no longer a regulatory requirement through June 30, 2020.
- Critical Care Bed
 - For some spaces, gurneys in each patient care space will need to be converted into a hospital bed in order to accommodate an ICU patient. If bed not available, may need to substitute gurney or cot.
- Bed Assignment in KP Health Connect
 - See KPHC and Technology Considerations

Meeting Basic Equipment Requirements for Conversion to MST Space

The patient’s clinical presentation and risk for decompensation determine the basic equipment requirements and level of care needed during hospitalization. Higher acuity patients should generally be managed in pre-existing clinical care areas which have access to built-in patient monitoring equipment and headwalls containing oxygen, suction, medical air. Lower acuity patients may be managed in alternate care areas with portable monitoring and equipment.

Beds with pre-existing telemetry capability should be optimized.

Please refer to the [Basic Equipment Checklist for ICU and MST Patients.](#)

- Higher acuity: pre-existing inpatient clinical areas
 - Headwall: Once acquired, minimal adjustment is needed for appropriate MST level of care. Please refer to the [Basic Equipment Checklist \(Headwall\) for specific details on oxygen wall supply, medical air wall supply, suction, electrical source, and call system considerations.](#)
 - Patient monitoring system: telemetry or portable bedside monitor with EKG, SpO2, ETcO2, noninvasive BP
- Lower acuity: alternate care areas
 - Portable oxygen, suction and medical air
 - Oxygen and medical air provided by tanks should be frequently monitored to ensure they are replaced appropriately.
 - Optional: portable monitor
- Line of sight
 - With the State’s waiver of Title 22, maintaining Line of Sight is no longer a regulatory requirement through June 30, 2020.
 - If each patient within the MST space is not directly visible to the healthcare provider, strategies should ideally be in place to support periodic reassessment, no less frequently than every 4 hours.

- Virtual line of sight via a monitor is acceptable.
- Hospital Bed
 - For some spaces, gurneys in each patient care space will need to be converted into a hospital bed in order to accommodate the patient. If bed not available, may need to substitute gurney or cot.
- Bed Assignment in KP Health Connect
 - See KPHC and Technology Considerations

Conversion of Clinical Areas into an Intensive Care or MST Space

Inpatient clinical care areas which are not originally designated ICU, MS or MST may need to be converted to increase ICU, MS and MST capacity. Some of these spaces can be shared by several patients (e.g. PACU).

These clinical spaces typically have a headwall containing oxygen, medical air, suction, and a call light. Some inpatient clinical areas will also contain patient monitoring equipment. If monitoring equipment is not available, a portable monitor should be supplied if clinically indicated.

Existing inpatient care areas which may be converted to ICU, MS or MST space may include:

- OR rooms, PACU, Pre-Op
- Interventional Radiology Lab, Cath Lab
- CDA
- Outpatient Procedure Space/Ambulatory Surgery Units that are contiguous with the hospital
- Inpatient Rooms
 - Med/Surg/Tele Rooms
 - MCH Mother Baby (MBU) Rooms, as a last resort
 - Pediatric Inpatient Rooms, as a last resort

Shared Patient Areas:

The conversion of the space is site dependent as the footprint may vary from site to site; however, conversion of a shared patient care space into an ICU or MST space must account for the [basic equipment requirements](#):

- Headwall
- Patient monitoring system
 - Existing bedside monitors should be assessed. Patient data from the bedside monitors may not be setup to flow into KPHC: ClinTech and IT should be consulted and can assist in configuring the system if this is desired.
 - ClinTech should ensure that equipment is properly configured with the appropriate modules for monitoring of a ventilated patient (EKG, SpO2, EtCO2, NIBP, and IBP).
 - Portable monitoring system may be required in (ex: Pre-Op)

- Individual nurse may monitor vital signs. There may not be central monitoring.
- Ventilator/Associated equipment placed at the bedside of each patient requiring ventilator support.
- Line of Sight
 - Required for ICU patients:* In a shared patient setting, line of sight is ideally maintained by directly visualizing each patient.
 - With the State’s waiver of Title 22, maintaining Line of Sight is no longer a regulatory requirement through June 30, 2020.
- Hospital Bed
 - The gurney in each patient care space will need to be converted into a hospital bed in order to accommodate a patient.
- Bed Assignment in KP Health Connect
 - See KPHC and Technology Considerations

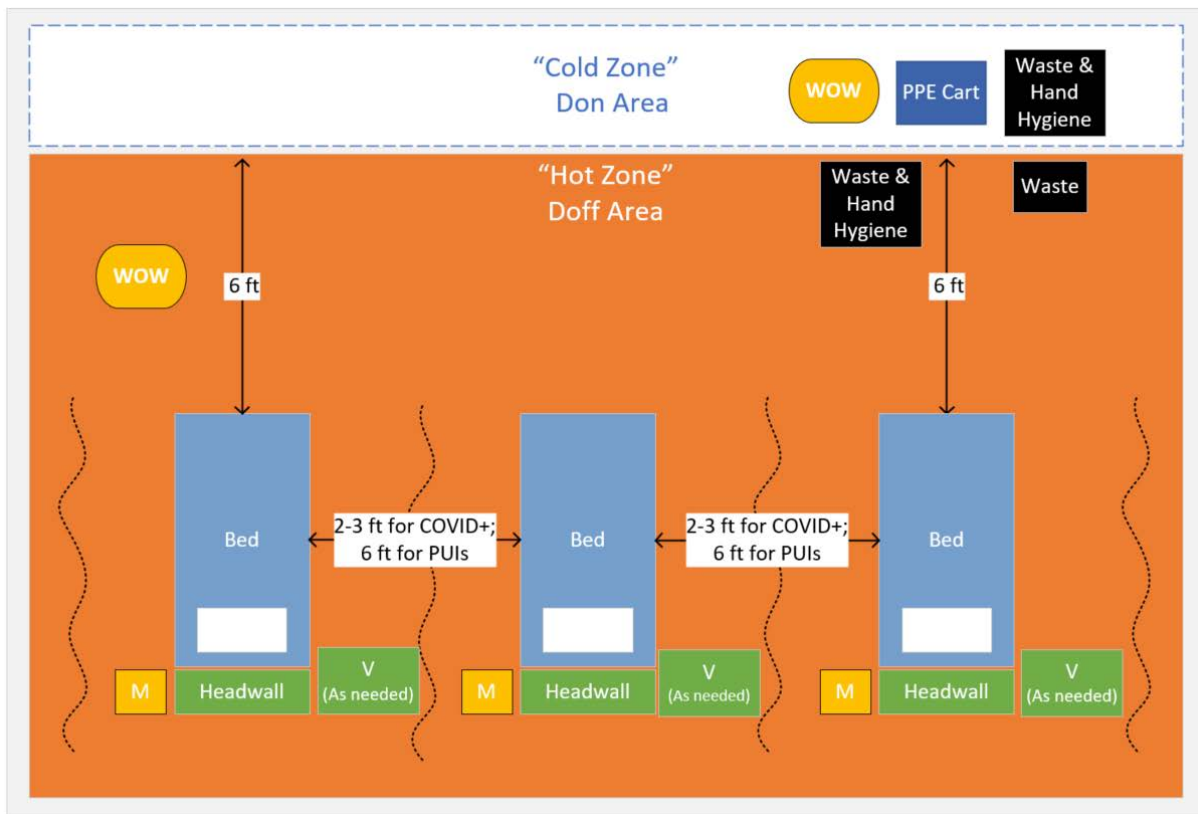


Figure 1: Shared Patient Area Converted to ICU or MST space

Additional Considerations for shared patient care areas

- May be utilized for cohorted COVID+, COVID PUIs, or non-COVID patients
- Multiple Beds

- COVID+: Beds in shared patient space should be spaced far enough from each other to allow patient providers to pass between the beds and administer care (ex: 2-3 feet) if all patients are COVID+
 - If all patients are COVID+, there is no minimum distance between beds that must be maintained for infection control purposes.
- COVID PUIs: Beds in shared patient space must be 6 feet from each other if patients are COVID PUIs
- Aerosolizing procedures should NOT be performed in shared patient spaces. Aerosolizing procedures should be performed in an airborne isolation room or a room with a closed door.
- OR/PACU/Pre-Op
 - A minimum of two operating rooms (OR's) must be reserved for emergent/urgent OR cases (i.e. Red Room)
 - One OR should be reserved for non-COVID emergent cases, and one OR should be reserved for COVID+ emergent cases
 - For some facilities (ex: trauma), more than two operating rooms may be required to hold on reserve
 - A pathway through the cold zone of the PACU or Pre-Op should be established for transport of emergent/urgent cases into and out of the operating room.
- Health Connect Access
 - Consider health connect access in the form of a Workstation on Wheels within the hot zone for patient charting

Individual Rooms:

The conversion of the space is site dependent as the footprint may vary from site to site; however, conversion of individual rooms into an ICU or MST patient space must account for the [basic equipment requirements:](#)

- Headwall
- Patient monitoring system (for ICU and MST only)
 - A patient monitoring system is sometimes integrated into individual rooms
 - A portable monitoring system or appropriate telemetry box should be placed at the bedside as needed
 - If the room contains an access point for telemetry, it is possible that the portable monitoring system can be linked to a central monitoring system.
 - If the monitoring system cannot be linked to a central monitoring system, it must be monitored (auditory) at the bedside in accordance with standard monitoring protocols. This monitoring can be accomplished by a HCW at the bedside. It can also be accomplished with a virtual monitor that has audio capability.
- Ventilator/Associated equipment placed at the bedside of each patient requiring ventilator support.
- Line of Sight

- With the State’s waiver of Title 22, maintaining Line of Sight is no longer a regulatory requirement through June 30, 2020.
- Most med surg rooms do not have a window to accomplish line of sight.
 - Each intensive care patient receiving care in a med surg room must ideally be observable by healthcare providers. This can be accomplished virtually by a monitor.
 - Line of sight may also be accomplished by having a healthcare provider directly visualize each patient from within the room.
- Hospital Bed
 - Use existing bed in hospital room. For pediatric rooms, may need to exchange existing bed for adult-sized bed.
- Bed Assignment in Health Connect:
 - See KPHC and Technology Considerations

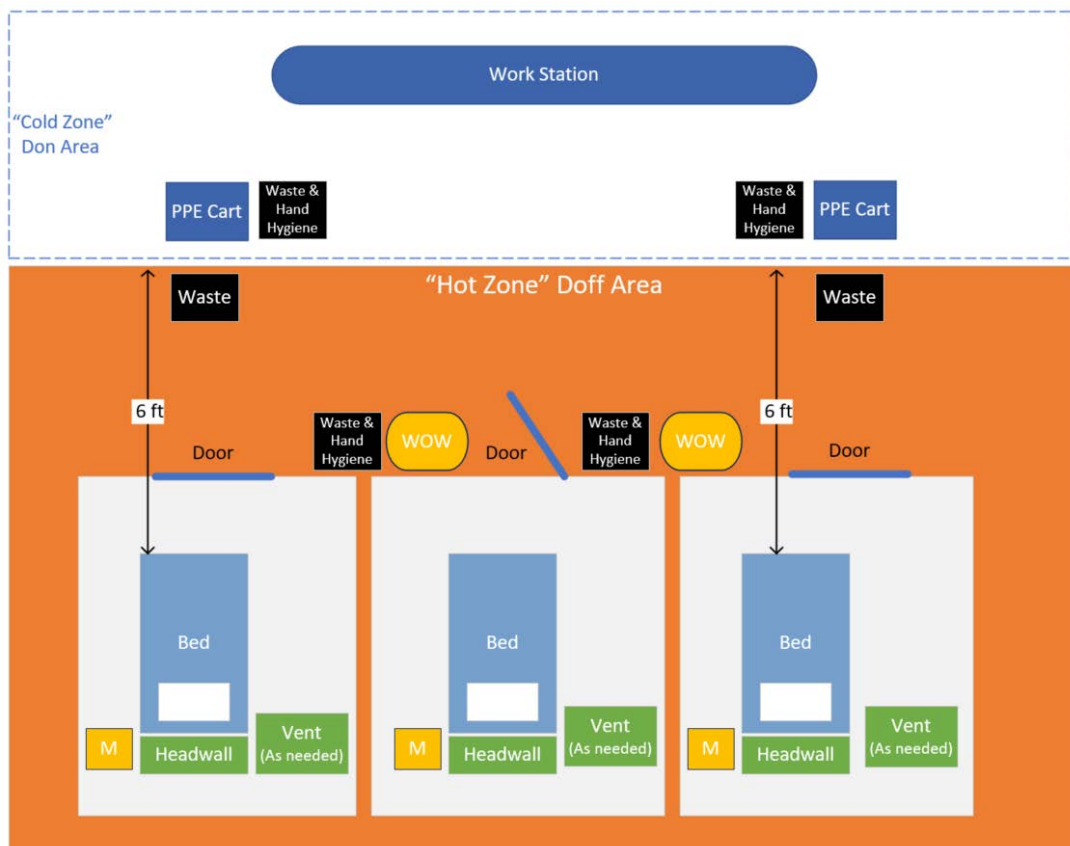


Figure 2: Conversion of Individual Rooms for COVID-19 or PUI Patients

Additional Considerations for single patient rooms

- **A 6-foot distance from the patient to the edge of the hot zone must be maintained.**
- When possible, door to room should remain closed.
- Consider extending hot zone into hallway outside of rooms for PPE Stewardship

- **HCW should change GLOVES ONLY and perform hand hygiene in between two COVID+ patients, unless gown is soiled or damaged.**
 - A gown that is soiled or damaged should be changed.
- **HCW should change GLOVES AND GOWN and perform hygiene in between two COVID PUIs.**
- Health Connect Access
 - Consider health connect access in the form of a Workstation on Wheels within the hot zone for patient charting
- For Non-COVID patients:
 - Consider transfer of pediatric patients to adult rooms in non-COVID wards to create space for COVID ward
 - Consider transfer of pediatric patients from low-occupancy pediatric wards to hospitals with high-occupancy pediatric wards
 - Consider re-opening well baby nurseries to house pediatric COVID+/COVID PUIs
 - Consider double-occupancy of Mom/Baby in MCH MBU rooms (two mother/baby pairs in one room) and double-occupancy in pediatric rooms

Expansion of Inpatient Clinical Care Areas for Additional ICU, MS or MST Space

Additional areas which are not originally designated ICU, MS or MST space may need to be expanded to increase ICU, MS and MST capacity. Some of these spaces can be shared by several patients (i.e. double-occupancy room).

These clinical spaces typically do not have a headwall or patient monitoring equipment and may need to be supplied by portable equipment.

Double Occupancy in a Single Room:

If two patients are roomed inside one room, existing basic equipment should be utilized for one of the patients. For the other patient, the strategies to meet the [basic equipment requirements](#) are:

- Headwall
 - Verify if headwall has adequate capacity to manage multiple patient beds.
 - Many headwalls contain 2 oxygen ports, 2 medical air ports, capability for suction for two patients, and two call lights
 - If headwall does not have capacity to manage multiple patient beds, consider utilization of bottled gasses and adding electrical capacity through approved extension cords and power ports.
 - Oxygen wall supply: portable oxygen (tank) should be provided to the patient. May require H/K tanks for support
 - Medical air wall supply: portable medical air (tank) should be provided to the patient

- Suction: portable suction should be maintained in the room
 - Electrical source: utilize existing electrical outlets in the room
 - Call system for patient assistance
- Patient monitoring system
 - A portable monitoring system should be placed at the bedside as needed.
 - The portable monitoring system must be monitored (auditory) at the bedside. This monitoring can be accomplished by a healthcare worker at the bedside. It can also be accomplished with a virtual monitor that has audio capability.
- Ventilator/Associated equipment placed at the bedside of each patient requiring ventilator support.
- Line of Sight:
 - With the State’s waiver of Title 22, maintaining Line of Sight is no longer a regulatory requirement through June 30, 2020. Ideally Line of Sight is ideally provided in ICU patients; may be accomplished via a window or virtually via a monitor.
- Hospital Bed
 - An additional hospital bed should be placed in the room
- Bed Assignment in KP Health Connect
 - One bed in the room has a corresponding room assignment in health connect
 - The additional bed in the intensive care room should be assigned a Z-bed in health connect
 - See KPHC and Technology Considerations [below](#)

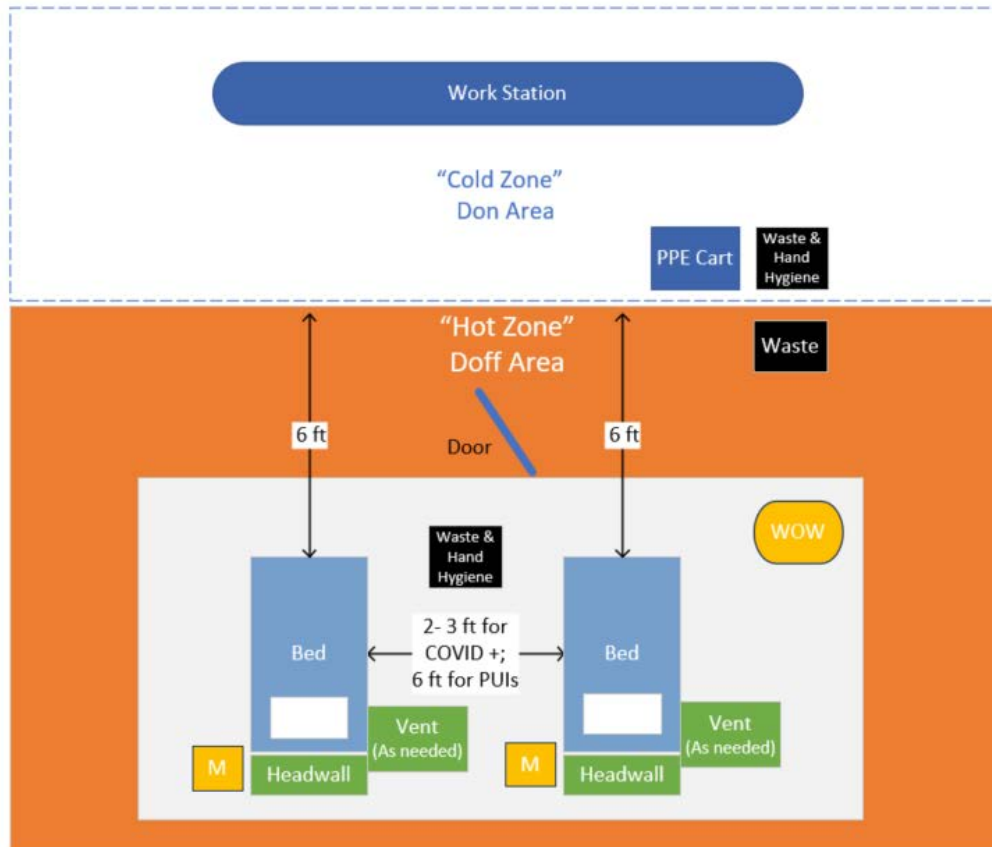


Figure 3: Double Occupancy for COVID-19+ or COVID-19 PUIs

Additional Considerations for double-occupancy rooms

- May be utilized for cohorted COVID+, COVID PUIs, or non-COVID patients
- Multiple Beds
 - COVID+: Beds in shared patient space should be spaced far enough from each other to allow patient providers to pass between the beds and administer care (ex: 2-3 feet) if all patients are COVID+
 - If all patients are COVID+, there is no minimum distance between beds that must be maintained for infection control purposes.
 - COVID PUIs: Beds in shared patient space must be 6 feet from each other if patients are COVID PUIs
 - Aerosolizing procedures should NOT be performed in shared patient spaces. Aerosolizing procedures should be performed in an airborne isolation room or a room with a closed door.
- **A 6-foot distance from the patient to the edge of the hot zone must be maintained.**
- When possible, door to room should remain closed.
- Consider extending hot zone into hallway outside of rooms for PPE Stewardship
 - **HCW should change GLOVES ONLY and perform hand hygiene in between two COVID+ patients, unless gown is soiled or damaged.**
 - A gown that is soiled or damaged should be changed.

- **HCW should change GLOVES AND GOWN and perform hygiene in between two COVID PUIs.**
- Health Connect Access
 - Consider health connect access in the form of a Workstation on Wheels within the hot zone for patient charting

Conversion of Non-Clinical Areas to ICU and MST Care Space

Non-clinical care areas which are not originally designated ICU, MS or MST may need to be converted to increase ICU, MS and MST capacity. Some of these spaces can be shared by several patients (i.e. conference room).

These spaces will typically be supplied by portable equipment.

Existing inpatient care areas which may be converted to ICU, MS or MST space may include:

- Hallways
- Visitors' Waiting Rooms
- Conference Room Space
- Shell Space
- Dining Room
- Tents

Hallways/Waiting Room/Conference Room/Shell Space/Dining Room/Tent Converted to Patient Care Areas:

- Headwalls will not be available
 - Utilization of bottled gasses and adding electrical capacity through approved extension cords and power ports.
 - Oxygen wall supply: portable oxygen (tank) should be provided to the patient. May require H/K tanks for support
 - Medical air wall supply: portable medical air (tank) should be provided to the patient
 - Suction: portable suction should be maintained in the space
 - Electrical source: utilize existing electrical outlets in the space
 - Alternate Call system for patient assistance needs to be identified
- Patient monitoring system
 - A portable monitoring system should be placed at the bedside as needed.
 - The portable monitoring system must be monitored (auditory) at the bedside. This monitoring can be accomplished by a healthcare worker at the bedside. It can also be accomplished with a virtual monitor that has audio capability.
- Line of Sight:

- With the State’s waiver of Title 22, maintaining Line of Sight is no longer a regulatory requirement through June 30, 2020. Line of Sight is ideally provided in ICU patients; may be accomplished via a window or virtually via a monitor.
- Hospital Bed
 - A hospital bed, if available, should be placed in the converted space
- Bed Assignment in KP Health Connect
 - The bed should be assigned a Z-bed in health connect, as applicable
 - See KPHC and Technology Considerations [below](#)

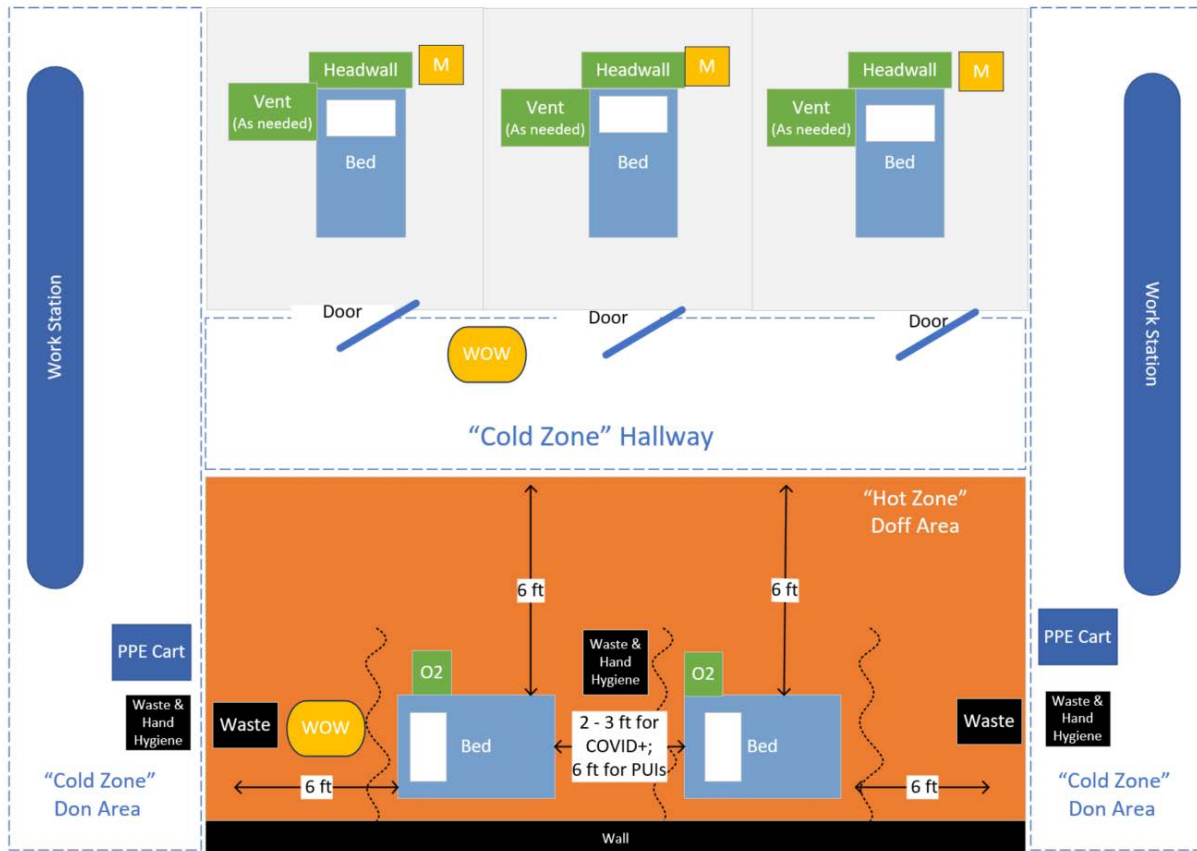


Figure 4: Hallway Beds for Covid-19 + and PUIs

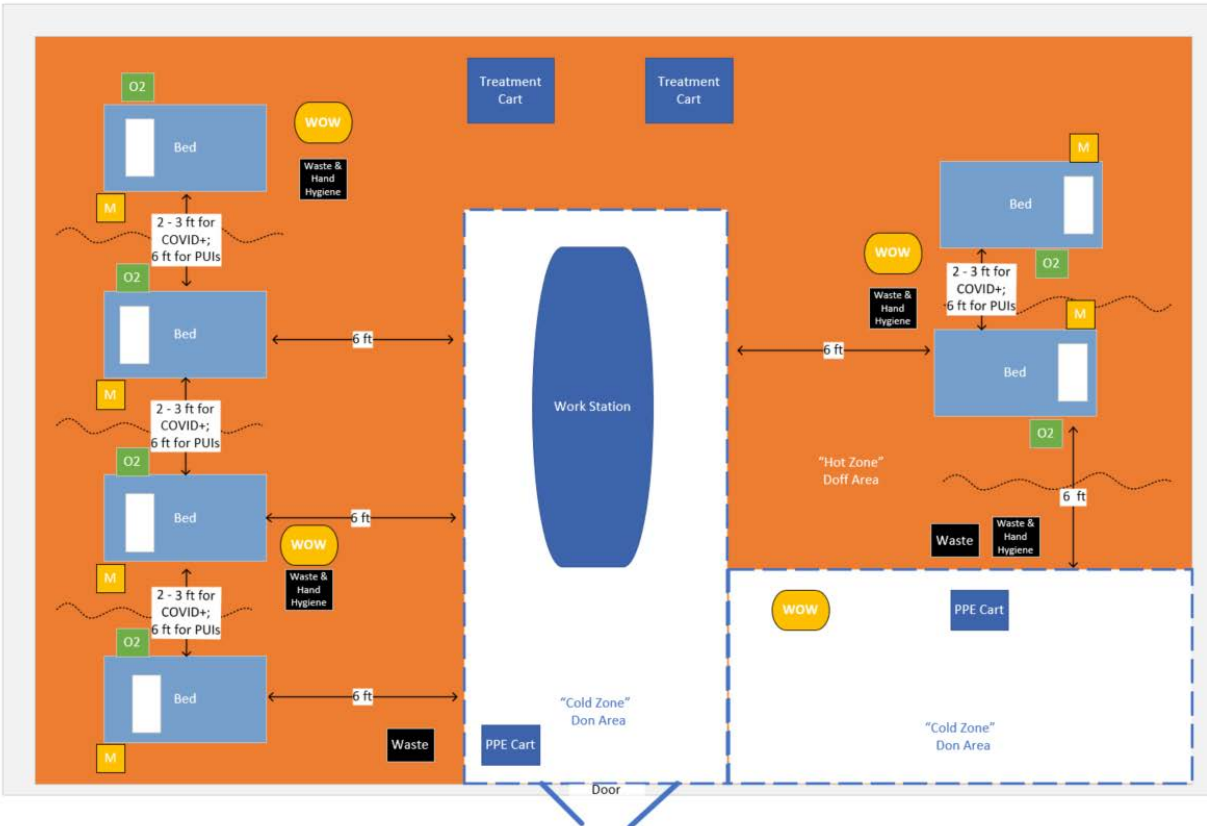


Figure 5: Conference Room or Tent for COVID+ and COVID PUIs

Additional Considerations for converted non-clinical spaces

- May be utilized for cohorted COVID+, COVID PUIs, or non-COVID patients
- Multiple Beds
 - COVID+: Beds in shared patient space should be spaced far enough from each other to allow patient providers to pass between the beds and administer care (ex: 2-3 feet) if all patients are COVID+
 - If all patients are COVID+, there is no minimum distance between beds that must be maintained for infection control purposes.
 - COVID PUIs: Beds in shared patient space must be 6 feet from each other if patients are COVID PUIs
 - Aerosolizing procedures should NOT be performed in the hall. Aerosolizing procedures should be performed in an airborne isolation room or a room with a closed door.
- **A 6-foot distance from the patient to the edge of the hot zone must be maintained.**
- When possible, a privacy screen should be supplied.
- PPE in the hot zone:
 - **HCW should change GLOVES ONLY and perform hand hygiene in between two COVID+ patients, unless gown is soiled or damaged.**
 - A gown that is soiled or damaged should be changed.

- **HCW should change GLOVES AND GOWN and perform hygiene in between two COVID PUIs.**
- Health Connect Access
 - Consider health connect access in the form of a Workstation on Wheels within the hot zone for patient charting
- Bed Assignment in KP Health Connect
 - The bed should be assigned a Z-bed in health connect, as applicable
 - See KPHC and Technology Considerations [below](#)

STUFF: ICU, MS and MST Equipment

The following items describe basement equipment for conversion of an existing clinical space or a non-clinical space into an ICU, Med/Surg or Telemetry space. Consider consolidating equipment into carts ([see example](#)). **This list is intended as a general guideline and is not necessarily comprehensive: please adapt it to the specific circumstances of your medical facility.**

NOTE: Follow the Equipment Request and Relocation Workflow ([Appendix](#)) to request additional equipment.

Basic Equipment Checklist for ICU, MS and MST Patients

At **bare minimum**, the following equipment is needed for each patient bed:

- Oxygen Source
 - If wall supply not available, procure portable oxygen tank with regulator (e.g. H/K tank with flowmeter) with key
 - Medical air and oxygen capacity guidance is provided [here](#).
- Electrical outlet- suggest 6 per bed minimum for ICU, 4 per bed minimum for MST
- Hospital Bed
- Patient call system
- KP Health Connect
 - See KPHC and Technology Considerations [below](#).

Additional requirements for telemetry area include:

- Monitor requirement of EKG, NIBP, SpO2**
 - MP5 monitor and/or IntelliVue wearable patient monitor (tele box)
 - MX40 has continuous ECG and SpO2 option
 - M4851A is an ECG only IntelliVue telemetry device
- Monitors with capability for 1-2 pressure lines preferred
- Pressure cables
- EKG cables and electrodes
- SpO2 cable

- EtCO2 tubing
- Modules as applicable
- Alarms set and audible
- Central Station (12 or 24 tele beds per Patient Information Center)
- Antenna System/Access Points (system to include all antennae/access points, amplifiers, and couplers as necessary for uniform coverage over the Telemetry Care Area)

Additional requirements for ICU patients frequently include:

- Monitor**
 - Minimum requirement:
 - EKG, SPO2, ETcO2, noninvasive BP
 - Intermediate requirement:
 - EKG, BP, SPO2, ETcO2, invasive arterial BP, SG catheter (invasive line x1)
 - Complex requirement:
 - EKG, BP, SPO2, ETcO2, invasive arterial BP, SG catheter (invasive line x2+)
- Head Wall**
 - Oxygen
 - Wall supply: (engineering to confirm utilities available to support high demand)
 - Ventilators are designed to use medical gases supplied at a pressure of 50 psi.
 - Medical air wall supply
 - Or compressors for compressed air and medical air flowmeter
 - Electrical outlets—suggest minimum of 6 per bed
 - Suction and vacuum regulator
 - Suction tubing and kits
 - Closed/in-line suction kits
 - Patient call system
- Ventilator and associated equipment**
 - Ventilator integration capsule technology middleware
- Noninvasive Positive Airway Pressure Unit**
- High-flow Nasal Cannula System with Humidifier**
 - Nasal Cannula, Oxygen mask, O2 Connectors
- **Equipment in situ or supplied with portable equipment:**
 - Patient beds with pressure relieving surfaces
 - Privacy curtains or screens between patients if shared space
 - Sink
 - Lighting, Examination/Procedure Light
 - Workstations on Wheels—ideally 1 for every 2 patients
 - KPHC with monitor integration and capsule middleware for vent integration ideal

- If integration is not available, RN/RT will need to be informed that all data must be manually charted
 - Mapped printers/beds and label printer
 - May need to phase in minimal documentation using approved Disaster standards
- If possible, desktop computer with KPHC
 - Desktop printer mapped to computer
- Waste disposal
 - Toilet
 - Sharps containers
 - Biohazard containers
 - Pharmaceutical waste container
 - Universal waste containers
- Access to bathroom facilities for staff
- Crash cart with defibrillator, code medications, intubation tray, aspirator, video laryngoscope
- Medication area, PYXIS preferred
 - When telemetry/med-surg/PACU/OR used for expansion, consult with pharmacy to add critical care medications (e.g. vasopressors, neuromuscular blockers) and validate current medications in pyxis
 - Consider locked medication carts/cabinets as alternative to pyxis
 - Emergency medication supplies
- IV equipment
 - IV fluid bags
 - IV start supplies
 - Infusion pump controller and pump modules and extra channels
 - IV poles
 - Vein finder
 - Syringe pump
 - Flushes
 - Needles and syringes
 - Alcohol swabs
 - IV port caps
 - ABG kits, ABG analyzer
- Isolation cart(s) with Droplet + Contact precautions + eye protection
 - Gowns
 - Gloves
 - Isolation masks
 - Goggles
 - Disposable thermometers
 - Disposable stethoscopes
 - Paper bags for masks

- Sharpie to label bags
- Hand sanitizer on top of cart
- Donning and doffing checklist
- Droplet and contact precautions signage
- COVID-19 Stewardship guidance/signage
- High risk/aerosolized procedure cart (ideally located in closed room)
 - Gowns
 - Gloves
 - N95/PAPR/CAPR
 - Face shields/eye protection
 - Disinfectant wipes
 - Paper bags for N95 masks
 - Sharpie to label bags
 - Hand sanitizer on top of cart
 - Video Laryngoscope
 - (Optional: Bronchoscope)
- Central line cart, central line kits, central line dressing kits
- Glucometer(s)
- Language matters tablet
- Bedside commodes
- Optional: NICOM
- Optional: Ultrasound, bladder scanner
- Optional: scale, enteral feeding pump
- Optional: SCDs
- **Patient Care Supplies**
 - Linen cart with sheets, towels, washcloths, pillowcases
 - Pillows
 - Patient Positioning/Lifting Equipment
 - IV poles, pumps, extra channels
 - Lab supplies
 - Gauze/dressings/wound care
 - Central line dressing kits
 - Suction tubing and kits
 - Closed/in-line suction kits
 - Oral care supplies
 - Bath wipes/shampoo caps
 - CHG wipes
 - Urinals/bedpans/urinary catheter supplies
 - Tracheostomy care supplies

- **Chronic ventilator patients cared for in telemetry units**
 - Recommend using ventilators with built in compressors
 - Will require suction and ventilator disposables
 - EtCO2 monitoring can be achieved utilizing the ventilator module
 - Ambu bag must be at bedside
 - Ventilator trach patients must have obturator at headwall and back up trach, one size smaller than currently used
 - Disposable inner cannulas
 - Trach cleaning kits
 - Oral care supplies

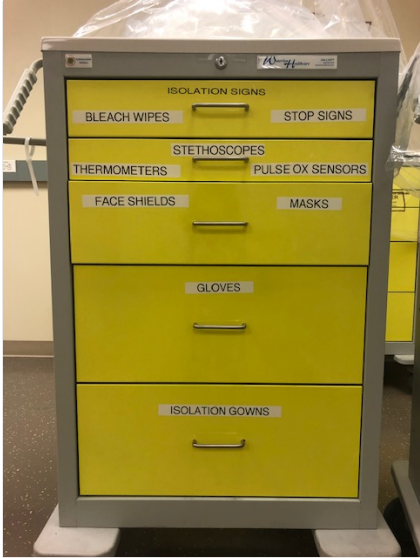
Example of MST Room:



Example of ICU room:



Example of Supplies Cart:



Ventilator Strategies

Ventilator Supply in KP NCAL

- Types of ventilators:
 - Current list of the types of invasive ICU, adult capable ventilators in KP NCAL:
 - Adult ICU ventilators (Hamilton G5, PB840),
 - Transport ventilators (Hamilton T1/C1, LTV1200),
 - NICU vent w/ adult capabilities (Maquet Servo-i/Servo-U),
 - NICU vents (Maquet Servo-n, Draeger VN500),
 - Adult high frequency vents (Carefusion 3100B)
- The following neonate/pediatric ventilators may be used on adult patients:
 - Maquet Servo-i and Servo-U ventilators may be used with adult patients
 - Place in adult mode and apply adult ventilator circuit and applicable filters
- Additional ventilators are being procured and will be deployed throughout the region based on need.

- Disaster vents (pneumatic emergency vents): located in medical facilities
 - VORTRAN basic ventilators
 - Not recommended for use in ARDS
 - Consume 100% oxygen

Additional Options for Expanding Ventilator Supply in KP NCAL

The following options should only be considered after other ventilator options have been exhausted.

- Use of BIPAP for invasive ventilation
 - The V60 BIPAP machine can be placed in invasive mode and used as a ventilator
 - Place ventilator in PCV Mode, add HME/heater to unit
- Use of Anesthesia machines as Ventilators
 - Use of Anesthesia machines as ICU ventilators is not indicated
 - Risks of an anesthesia device used for ICU ventilation may be significantly greater for pediatric or neonatal patients. Such use is strongly discouraged
 - Anesthesia devices are designed and intended to be fully attended/monitored devices, which always requires a clinician to be in proximity of the device
 - There are currently 371 anesthesia machines across the region
 - Anesthesiologist, CRNA, or anesthesia intensivist support is generally required for use of anesthesia machines
 - Disposables Needed:
 - Circuits

- a. Circuits for anesthesia machines have a different connector size than ICU vents so the circuits are NOT interchangeable between machines and vents
- b. All anesthesia circuits from all vendors are the same universal size so vendors are interchangeable
- c. Current vendor is King Circuit
 - i. King circuits come with and without filter – we should be ordering both. Most other vendors sell circuits without filters
- Filters
 - a. Filter between circuit and machine is required to prevent condensation in machine
 - b. Filters can be purchased separately and are universal size for all anesthesia machine and circuits regardless of vendor
- Suction
 - a. Anesthesia machines do not have built in closed system suction like ICU vents
 - b. There is an adapter that converts for closed system suction
 - c. There is a specific suction tubing for use in this system which is not the same as ICU vent suction tubing
 - d. Anesthesia machines require external red cap suction canister to provide suction

Ventilator Disposables

- Disposables inventory and trends are tracked by NCAL Regional Respiratory Practice Consultant and National Supply Chain
- Disposables are ordered by facility RT Manager
- In case of high priority disposable shortage, contact NCAL Regional Respiratory Practice Consultant to facilitate dispatch of supplies ASAP.
- As part of the COVID mitigation plan, reusable supplies may be distributed when necessary.

Ventilator Maintenance Support

- Provided by Clinical Technology: a “Service Now” ticket should be submitted for a non-functioning ventilator.

Process for Ordering Ventilators

- Local Respiratory Therapy (RT) Manager is the facility POC for local vent and supplies availability for immediate use
- The Regional Command Center is responsible for receiving and approving any ventilator reallocation requests from facilities. All ventilator equipment transfers are documented through PlaniTrac.

KP Equipment Request & Relocation Workflow

- Clinical Manager (e.g., RT Manager) identifies need and creates request with Hospital Command Center.
- Local Command Center evaluates request. If request is confirmed by Hospital Command Center request is placed in PlaniTrac
- PlaniTrac request needs to be placed to Ncal Regional Command Center, with the following information
 - Location requesting equipment
 - Quantity of equipment needed/requested
 - Specify equipment if special needs
 - Contact name and phone at requesting facility
- The Regional Command Center will contact the Planning Section to review request
- The Planning Section Clinical Consultant will utilize the COVID Census Data of Critical Equipment and ensure all local resources have been utilized before requesting equipment moves
- Once request is approved by Regional Command Center Planning Section, it will be updated in PlaniTrac and sent to Transportation Administration, with the following information
 - Pick Up Facility Info
 - Address of location to pick up
 - Quantity of equipment
 - Local Contact name and phone number of sending facility
 - Pick up of equipment will occur at loading dock
 - Pick up Time Request and Delivery Time
 - Receiving Facility Info
 - Address of location to delivery ventilators
 - Local Contact name and phone number at receiving facility
 - Delivery will occur on loading dock, take to ClinTech for equipment check-in, before using
- Transportation is monitoring the Transportation administration queue in PlaniTrac 24/7 and will arrange the appropriate transportation for request.

Oxygen Source

- Oxygen wall supply is a critical, minimum requirement.
 - Compressed air wall supply is necessary for ventilator usage, as many ventilators do not have compressors
 - Stand-alone compressor can be ordered from vendors [how?] through PlaniTrac
- Alternate/Back-up option to wall supply is portable oxygen tank with a regulator

- KP NCAL Regional Command Center is working with its oxygen vendor and portable tank vendors to ensure adequate supplies are maintained and that there is a process for deployment of liquid oxygen and portable tanks/regulators by usage.

Respiratory Therapist Training

- RTs are trained in use of standard and pneumatic emergency vents
- RTs are not trained on anesthesia machines.
- RTs are ACLS trained; PALS/NRP training is preferred for all RTs, but skills may be facility dependent
- RT Leaders are trained on operational use of all ventilators (except anesthesia machines) in their home facility and have completed ABG competency

STAFF: Staffing for Expanded ICU and MST Care for COVID Patients

Nurse Staffing Strategy for COVID ICU and MST Units

- Optimize ratios
 - Nurse to patient staffing in ICU and MS per current guidelines if possible
 - The state of CA waived Title 22 through June 30, 2020, allowing for more flexibility in nursing ratios to meet patient needs
- Utilize nurses via regional system
 - Use Planitrac to submit requests for nurses
 - Additional ICU, Med Surg Telemetry, Med Surg travelers will be assigned by the Regional Command Center
 - Continuum of Care Service Directors (COCSDs) to report Patient Care Coordinator (PCC) staffing needs to the Regional Liaison who will coordinate with Regional Command Center as needed
 - Local and Regional non-represented staff will be expected to support the clinical and operational functions of the local facilities to ensure patient safety
- Consider Nursing Teams and Tiered Nursing
 - If nursing resource constraints warrant, Regional Command Center will work with local medical centers to evaluate alternate, tiered options for staffing

Additional Considerations: Competency for ICU and MST management

- Each RN needs a skills assessment and individualized core education plan
- Consider tiered staffing with experienced ICU RN paired with PACU or MST RN to maximize staffing coverage.
- Staff should be oriented to the new unit and space as appropriate.

Advance Alert Monitor (AAM) Rapid Response Workflow

Assume that there are no Rapid Response Team (RRT) RNs available at the local sites, unless otherwise indicated

- The Virtual Quality nursing team will continue to remotely monitor for AAM alerts in KP HealthConnect
 - The Virtual Quality nursing team will call the unit ANM using the **RRT contact number**
 - Only initial alerts will be called to the local medical center, not repeat alerts
- The ANM will either contact the Assistant Nurse Manager (ANM) on the unit where the alerted patient is, or will call the HBS physician directly for assistance in evaluating the patient

Respiratory Therapist Staffing for COVID MST Units

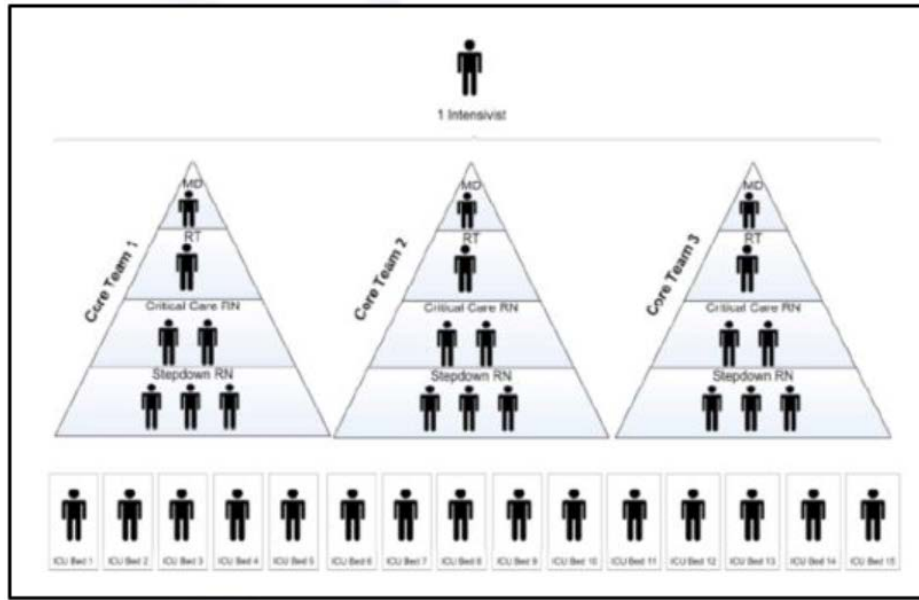
- Staff Floating
 - Ideal state: Recommend to limit floating from adult to newborn to reduce transmission risk
 - If RT must float between Adult and MCH, floating RT should not be assigned isolation patients to limit possible transmission exposure
- Critical RT support:
 - CRNAs, Anesthesia providers, Pulmonologists and outpatient RTs will undergo training to provide critical respiratory support
 - Nursing will assume certain tasks, such as nebulizers for patients

Physician Staffing for COVID MST Units

These recommendations serve as a general guideline and should be adjusted to fit current circumstances at the medical center.

SCCM guidelines for tiered healthcare staffing during a disaster

Follow guidelines for tiered healthcare staffing per [Society of Critical Care Medicine \(SCCM\)](#) Augmenting Critical Care Capacity During a Disaster. These recommendations serve as a general guideline and should be adjusted to fit current circumstances at the medical center.



Reproduced with permission from the Ontario Health Plan for an Influenza Pandemic Workgroup. *Critical Care During a Pandemic*. http://www.cidrap.umn.edu/sites/default/files/public/php/21/21_report.pdf. Accessed October 2013.

Source: [Society of Critical Care Medicine \(SCCM\) Augmenting Critical Care Capacity During a Disaster](#).

Critical Care Physician Staffing

- Maximize double-boarded physicians with critical care training
- Pediatric intensivists support adult ICU in procedures, vent management
- Tiered Physician Staffing in the ICU setting
 - 1 non-intensivist (HBS) to 5 patients; 3 non-intensivists (HBS) to 1 intensivist
 - Non-intensivists= HBS physicians, anesthesiologists, general surgeons, medical subspecialties
 - Ratio of intensivist: non-intensivist: patient will vary with census and medical facility
- Non-intensivists are responsible for general care of patients
 - Respond first to changes in patients' conditions
 - Document care and care plan
 - Most noncritical care medical issues
 - Address Critical Care issues after consulting intensivist or implementing standardized order sets
 - The intensivists manage acute emergencies and ventilator-patient interaction, consult on general critical care issues
 - Non-intensivists (HBS) should receive basic critical care training as part of COVID preparedness
 - Town Hall Refresher on Vasopressor, Ventilator and Non-Ventilator Management training
 - Review COVID-19 podcast on EmCrit
 - Use standardized order sets to reduce variability and errors of omission
- Non-intensivists assist with procedures in the ICU

- General surgeons, anesthesiologists to assist with central lines, intubation, and other procedures

Hospital Based Specialist Physician Staffing

- Physician's patient census:
 - Normal census
 - ~10-14 patients/HBS team
 - Increased hospital census
 - Increase census to 15-18 patients/HBS team
 - Tiered staffing model
 - 1 HBS physician supervises with 2-3 non-HBS rounders (midlevel, AFM, medical subspecialist)
 - ~30-40 patients/tiered team
- Streamlined admissions
 - Allocate 30-45 minutes per patient for straightforward admissions
 - Allocate 45-60 minutes per patient for complex admissions, including ICU
 - Cross Coverage
 - Designate a separate provider to manage cross coverage of inpatients
 - If hospital census doubled, add additional cross-coverage physician
- Medical subspecialty support:
 - Create clear lines of communication with subspecialty consultants:
 - Rapid turnaround of inpatient consults (less than 4 hours)
 - Closed loop communication after consult completed with focus on what needs to be achieved for disposition
 - Non-procedural subspecialty departments consider admitting patients relevant to their specialty.
- Surgical service support:
 - General surgery and surgical subspecialties to evaluate, admit, and manage surgical patients on the floors. HBS consult only as needed.
 - Ex: general surgery admits all gallstones; ortho admits all hip fractures
- Surge planning:
 - Facilities to look at current staffing levels and capacity (what average % of beds are managed by HBS)
 - Consider positioning physicians geographically to maximize efficiency
- Additional Staffing Support:
 - Recently graduated AFM and subspecialty physicians
 - PA/NP's to assist in rounding
 - Regional staffing (i.e. larger facilities support smaller ones via regional pool of physicians who can flex to multiple specialties)
 - Subspecialists support as above
 - Create rapid onboarding plan with local Department Technology Leads (DTLs) - <https://kphctraining.kp.org/wn/NewHire/login.php>

Additional Strategies for Increasing Physician Staffing Capacity

- Consider use of virtual care
 - Telehealth privileges for all critical care physicians
 - Consider use of virtual care during the day to round on COVID patients
 - Use of Teams to augment physician rounds
 - Create remote cross coverage at night – have centrally located HBS/physician extender answering cross cover calls for multiple sites (facilities in same service areas or adjacent service areas)
 - Utilize physician having to stay at home due to quarantine
 - Remote prep of charts (problem list, med recon, etc.)

Expedited Credentialing and Privileging Process for Disaster

An expedited pathway has been developed for disaster privileges. Several approvals (HBS, ED) will be prepared in advanced and approvals can be granted immediately in the Local Command Center with Photo ID, evidence of Licensure, and a 1-page form. Details of this accelerated process are embedded as an [Appendix](#).

[Palliative Care Expertise for COVID ICU and MST Units](#)

Consider the following strategies to leverage Palliative Care expertise:

- Early Palliative care consults on COVID patients: This population can deteriorate suddenly, and they benefit from specialty palliative care for goals of care discussions, emotional and spiritual support and symptom management.
- Palliative care team members included in ICU rounds daily: to prioritize patients with the greatest need for goals of care conversations or symptom and distress management.
- HBS and PC rounds daily: Palliative care team member to meet with HBS daily to identify and prioritize patients that would benefit from specialty palliative care consultation.

[Pharmacy Considerations for COVID ICU and MST Units & Surge](#)

- Define clinical pharmacy services that will be supplied
- Maximize use of current staff
- Bring in other staff members, e.g., ambulatory staff pharmacists
- Add additional runners to deliver drugs
- Maximize remote support
- Consider Pharmacist and Pharmacist Technicians from Registry
- Refer to Inpatient Pharmacy Surge Plan ([Appendix](#))

[Laboratory Considerations for COVID ICU and MST Units & Surge](#)

- Identify new ICU bed locations and assure that glucometers and downloaders/ chargers are available.
- Monitor supplies
- Blood Supply: Working with blood providers for critical levels.

- Consideration of resource sharing between medical centers
- A condition level transfusion service response for labs and physicians is in progress
- Leverage less utilized staff such as outpatient Lab Assistants and Pathology Assistants to draw in ED or surge tents and act as runners for samples.
- Implement 12-hour shifts if staffing levels fall below core.
- Implement abbreviated training and competency for inter-facility staff movement (in process)
- Implement reduced testing menu (Note: this requires executive level authorization)
 - Utilize licensed Lab Management for (limited testing menu) in critical staffing shortages

Radiology Considerations for COVID ICU and MST Units & Surge

- Designate/Use portable x-ray unit in the ICU department.
- Utilize Regional Imaging/Staffing Partners to address gaps in staffing, when/if indicated
- CT is not recommended for screening PUI or COVID+ patients
- Imaging is postponing non-urgent exams and procedures (with clinician review) and screening exams until at least 4/1/2020.

Nutrition Services Considerations for COVID ICU and MST Units & Surge

- National Nutrition Services has been working with regional and national contracts to project surge food quantities that would be needed.
- Food and Nutrition Services (FANS) Managers are assessing storage capabilities for increased capacity.
- Registered Dietitians (RDs) will assess patients remotely as much as possible and provide telephonic consultation to the patient and care team to preserve PPE.
- FANS managers to escalate any staffing concerns to local HR and/or Hospital Command Center

KPHC and Technology Considerations

Assigning New Beds to a Unit in KPHC (KP Health Connect)

Note: KPHC planning for hospital surge and disaster preparedness in progress. High-level guidance is included below, with tactical approaches to follow.

- Where possible, use existing unit infrastructure for printers/labels/Pyxis with z-bed designation
 - This includes double occupancy in a room or patient placement in a non-clinical area (hallway, cafeteria, etc.)
 - Z-beds for existing units will map to the unit's existing pyxis machine/printers/nursing station
 - Z-beds are built regionally
- When new infrastructure is needed (wi-fi, WOWs, laptops, printers, label printers)
 - Create a new unit with appropriate number of beds
 - Map to new IT infrastructure (printers, label printers)
 - Use nearby Pyxis OR no Pyxis
 - All such build plans will be supported by region
- We will build beds for Med/Surg expansion into MOBs and Tent spaces (likely 400 per area as baseline)
 - Once infrastructure is known, will map to beds as appropriate
- New Vent Surge locations (i.e. ICU expansion)
 - If using a med-surg space, no changes required unless you want to use the ICU nurse station:
 - If near ICU and plan to use ICU nursing station, printers→Can use ICU Z-beds (more can be requested if needed)
 - If using existing med surg nursing station, printers→Can use the existing med-surg beds
 - If using ED space:
 - We will likely create new unit for inpatient care of vent patients in current ED (would point to existing infrastructure). Recommendation is in progress.
 - If using PACU space or Procedure space:
 - Likely no build required. Recommendation in progress.
 - If using current ambulatory space (i.e. Ambulatory Surgery Units), KPHC will build out a new inpatient unit for these beds
 - Will add any missing IT infrastructure
 - Will map to existing/new IT infrastructure will follow
 - Pyxis access may not be present
 - Med lock box workflows may be required
- ED space expansion
 - If adding ED beds (including in a tent) and planning on using ED workflows:
 - Use Virtual beds already in system
 - If creating a forward triage system, and diverting patients to a tent

- Use ODC (Outpatient Disaster Clinic) workflow; may need to add new ODCs if multiple are required
- Ensure generic ODC providers are attached to the ODCs

Advantages of virtual Monitoring in Patient Rooms

- Reduces the use of PPE by having care providers visualize and communicate with patients without room entry:
 - Virtual nursing and physician rounding to mitigate room entry
 - Communication with the patient
- In closed rooms where there are no windows, this strategy supports line of sight into the room

Documentation

- Implement phased approach to documentation; efforts to define minimum documentation requirements during a disaster are underway
- Ensure documentation continues electronically (not downtime paper) for communication of patient status, location, equipment tracking, safety, command center oversight
- Continue use of barcode scanning for medications for safety
- Leverage Pandemic/ Surge policy (new) – to support reduction in documentation (*minimum dataset Surge flowsheet currently under review*)
- Constraints to consider include lack of equipment (WOW carts, BCMA scanners) as patient volume increases beyond usual capacity as well as staffing constraints (number and skill/ background of staff)
 - Regional/National team currently assessing options to support mobile documentation, especially in non-traditional care areas of the hospital

Regulatory Considerations

As of March 20, 2020, The State of California has waived Title 22, and program flexes are no longer required through June 30, 2020.

Census Management & Alternatives to Admission

Alternatives to Admission:

- Work closely with ED, HBS admitters, and ED Patient Care Coordinator (PCC) to review admissions and determine if care can be provided in any other alternative venue (infusion clinic, Clinical Decision Area [CDA], Skilled Nursing Facility [SNF], caregiver support for home etc.)
- Continue partnership with PCCs, social services, and Continuum for timely SNF placement

- For non-COVID, non-PUI patients, work with your local Continuum Administrator & SNF director to consider opportunities for agreements for alternative short-term placement
- Optimize CDA capacity
 - Consider 24/7 HBS or ED physician rounding on the patients in CDA every 4 hours
 - Facilities that **close their CDA** for space needs can consider:
 - Using alternative care location for CDA
 - Working with ED and HBS to determine best staffing model
 - Focus on placing non-PUI/non-COVID patients with expected 12-24 turnaround times
 - Work with your Nuc Med, PT and other specialties to ensure that these studies/tests are prioritized to maintain throughput
 - Dedicated PCC or Resource Management (RM) supervision of patients in this space
 - Using this space for ED patients needing:
 - SNF placement
 - Psych consult/placement
 - Detox from EtOH, etc
- Discuss with local leaderships ability to staff up (ex: infusion clinic staffing, Wound Care Nurse/Recuperative Skills in ED) for extended hours or 24/7
- HBS and Specialty services – available to support consults in timely manner and care for admitted patients awaiting inpatient bed to manage and disposition from ED if possible
 - General surgery, vascular surgery, GYN, HBS to round on patients in ED to see if they can be closely managed in the ED to prevent admission. Expedite consultant engagement (Cardiology, ID, Nephrology, Neurology) in the ED.

Census Management Plan:

- When possible, COVID+ patients should be cohorted
- Collaborate with Local Leadership: HBS/RM/PCS/APIC Hospital Operations to review all patients who have reached a LOS of 3 days
- Assess number of Med Surg and Tele beds that are available and able to flex up (alternative areas)
- Compile census by unit with anticipated length of stay to assess capacity for ED admissions and ICU downgrades twice a day
- HBS or ICU MD/COCSD or PCC Manager/Nurse Leader (ANM)/RT or Medical Director regular rounds to:
 - Downgrade telemetry where appropriate
 - Change RT orders from nebulizers to metered-dose inhalers (MDI) where appropriate
 - Discontinue or reorder appropriate isolation based on test results
 - Physicians to expedite early discharge orders, ANMs on the floors to manage discharge boarding process and optimize telemetry use to reduce bottlenecks.
 - HBS to assess patients for downgrade from MST to appropriate level of care

- Collaborate closely with continuum leadership (Home health/hospice/SNF/Durable Medical Equipment [DME])
 - Identify SNF/Complex discharges and work with SNF/complex hubs
 - Timely DME equipment delivery
 - Consider increasing DME closet stock on campus for walkers, O2 tanks, nebulizer, wheelchairs to accelerate discharge process
 - Review complex ventilator dependent SNF placements with leadership daily in attempt to expedite discharge
 - For non-COVID, non-PUI patients, work with your local Continuum Administrator & SNF director to consider opportunities for agreements for alternative short-term placement following inpatient stay
 - Escalation plans in place for each service
- Regular UM rounds with PCC, Physician leadership and PCC manager to proactively identify and mitigate barriers
- Inpatient procedures prioritized (scopes, cath) to maintain throughput
- Implement regional inpatient discharge to home, assisted living, or board in care workflows for COVID positive and PUI patients (see [Appendix](#)).










Emergency Prospective Review Program (EPRP) & Outside Utilization Resource Services (OURS)









Emergency Prospective Review Program (EPRP) assists in the transfer from outside KP facility to KP facilities. Outside Utilization Resource Services (OURS) manages all inpatient admissions from outside KP facility to KP facilities.

- I. EPRP/OURS will adopt recommended infectious disease screening
 - a. Screen requests for (1) respiratory complaints (cough, shortness of breath, or increased work of breathing).
 - i. If yes to respiratory complaints, repatriation is not recommended without a corresponding negative COVID-19 test result.
 - b. Consult with local ID for repatriations for patients with infectious respiratory illnesses.
- II. Transferring Patients
 - a. If transfer is needed, use EMS guidelines for PUI or COVID + patients
 - b. The transfer of patients requires consultation and connection from Infectious Disease physicians of accepting facility.
 - c. Once patient arrives at KP facility, follow the workflow for inpatient admissions via ambulance.

Appendices

Table of Appendices & Attachments

Document Title	Brief Description	PDF Attachment (For opening in MS Word)	PDF Attachment (For opening in Adobe PDF)
COVID-19 Pandemic Planning ICU and MST Expansion Checklist	Checklist for expanding space into ICU and/or Med/Surg/Tele Space, including what equipment is needed and ensuring alignment with infection prevention. <i>Updated 3/24/2020</i>	 COVID Pandemic Planning ICU and MST	
Droplet, Contact and Eye Protection (Signage)	Signage on entering and exiting space under droplet + contact + eye protection precautions <i>Distributed 3/19/2020</i>	 Droplet + Contact + Eye Precautions 3.18.2	
PPE & Stewardship Guidelines	Grid of PPE and stewardship guidelines for enhanced respiratory precautions, COVID-19 + and PUIs. <i>Distributed 3/19/2020</i>	 PPE and Conservation Guidelin	
Donning and Doffing Guidance for PAPR in High-Risk Aerosol-Generating Procedures	See Document Title. <i>Updated 3/21/2020</i>	 PAPR for High Risk FINAL 3.21.20.pdf	
Donning and Doffing Guidance for CAPR for High-Risk Aerosol-Generating Procedures	See Document Title. <i>Updated 3/21/2020</i>	 CAPR for High Risk FINAL 3.21.20.pdf	
Donning and Doffing Guidance for N95 in High-Risk Aerosol-Generating Procedures	Describes Donning/Doffing for N95 masks as well as how to reuse. <i>Updated 3/21/2020</i>	 N95 for High Risk REUSE FINAL 3.21.20.1	
PPE Guidelines for Routine Care with Reuse of PPE	Guidance on reuse of PPE (i.e. masks, face shield, or goggles) during routine care. <i>Updated 3/21/2020</i>	 Routine Care REUSE FINAL 3.21.20.pdf	
PPE Guidelines for Routine Care with Extended Use of PPE	Guidance on donning PPE and using continuously between patients without doffing and redonning. <i>Update 3/21/2020</i>	 Routine Care with EXTENDED USE FINAL	
PPE and Infection Prevention Procedures for Intubation of Patients with Confirmed or Suspected COVID-19	Guidance for intubation of patients with confirmed or suspected COVID-19, including FAQs and Order Sets. <i>Updated 3/13/20</i>	 PPE and Infection Prevention Procedure:	

Document Title	Brief Description	PDF Attachment (For opening in MS Word)	PDF Attachment (For opening in Adobe PDF)
NCAL Kaiser Permanente Postmortem Care Guidelines (COVID-19)	Postmortem Care Guidelines specific to COVID-19 (3 pages)	 Postmortem Care Guideline COVID-19_N	
COVID-19 Credentialing and Privileging	One-pager for credentialing and privileging specific to COVID-19.	 COVID-19 Credentialing and Priv	
Disaster Privileging Process Guide	One-pager outlining step-by-step instructions to grant disaster privileges.	 Disaster Privileging Process Guide.pdf	
Medical Air and Oxygen Capacity Guide	Discusses the sizing criteria for design of medical air and oxygen systems, as well as criteria to assess estimated number of ventilators to support existing systems.	 KP NFS Kaiser FSPDE Medical Air and Oxyg	
Discharge Workflows for COVID Positive and PUI Patients— Inpatient to Nursing Facility	See Document Title. <i>Updated 3/19/20</i>	 Inpatient to Nursing Facility.pdf	
Discharge Workflows for COVID Positive and PUI Patients— Inpatient to Home	See Document Title. <i>Updated 3/19/20</i>	 COVID IP to Home Discharge_CL 03.19.20	
Discharge Workflows for COVID Positive and PUI Patients— Inpatient to Assisted Living and Board & Care	See Document Title. <i>Updated 3/19/20</i>	 COVID IP to ALF-BC Discharge Workflow 3	
Inpatient Pharmacy Hospital Surge Plan	A pharmacy surge plan for Kaiser Permanente hospitals. <i>Updated 3/21/20</i>	 Inpatient Pharmacy Surge Plan_3_21_2020	

COVID Pandemic Planning ICU and MST Expansion Quick Checklist

1. Identify potential areas to expand ICU MS/MST beds

- Conversion of Inpatient Clinical Care Areas
- Expansion of Inpatient Clinical Care Areas for additional MS or MST Space
- Conversion of Non-Clinical Areas to MS and MST Care Space

2. Infection Control: provide space to maintain hot zone/cold zone

- Cold zone is area for transportation where staff do not require PPE, at least 6 feet from each patient
- Hot zone is the area within 6 feet of each patient where PPE is required
- Maintain isolation cart at the edge of cold zone for donning
- Maintain biohazard trash can and hand hygiene station at the edge of hot zone for doffing
- Consider marking division with tape on the floor
- Maintain 6 feet between uninfected or PUI patients
- Maintain 3 feet between known COVID+ patients
- While inside the hot zone, providers should change gloves between COVID+ patients. Provider should change gowns and gloves and perform hand hygiene between COVID PUIs. Masks and eye protection do not need to be changed.**

3. Basic Equipment Checklist Needed for Each ICU and MST Patient

At **bare minimum**, the following equipment is needed for each patient bed:

- Oxygen Source
 - If wall supply not available, procure portable oxygen tank with regulator (e.g. H/K tank with flowmeter) with key
 - Medical air and oxygen capacity guidance is provided [here](#).
- Electrical outlet- suggest 6 per bed minimum for ICU, 4 per bed minimum for MST
- Hospital Bed
- Patient call system
- KP Health Connect
 - See KPHC and Technology Considerations [below](#).

Additional requirements for telemetry area include:

- Monitor requirement of EKG, NIBP, SpO2**
 - MP5 monitor and/or IntelliVue wearable patient monitor (tele box)
 - MX40 has continuous ECG and SpO2 option
 - M4851A is an ECG only IntelliVue telemetry device
- Monitors with capability for 1-2 pressure lines preferred
- Pressure cables
- EKG cables and electrodes
- SpO2 cable
- EtCO2 tubing

- Modules as applicable
- Alarms set and audible
- Central Station (12 or 24 tele beds per Patient Information Center)
- Antenna System/Access Points (system to include all antennae/access points, amplifiers, and couplers as necessary for uniform coverage over the Telemetry Care Area)

Additional requirements for ICU patients frequently include:

- Monitor**
 - Minimum requirement:
 - EKG, SPO₂, ETcO₂, noninvasive BP
 - Intermediate requirement:
 - EKG, BP, SPO₂, ETcO₂, invasive arterial BP, SG catheter (invasive line x1)
 - Complex requirement:
 - EKG, BP, SPO₂, ETcO₂, invasive arterial BP, SG catheter (invasive line x2+)
- Head Wall**
 - Oxygen
 - Wall supply: (engineering to confirm utilities available to support high demand)
 - Ventilators are designed to use medical gases supplied at a pressure of 50 psi.
 - Medical air wall supply
 - Or compressors for compressed air and medical air flowmeter
 - Electrical outlets—suggest minimum of 6 per bed
 - Suction and vacuum regulator
 - Suction tubing and kits
 - Closed/in-line suction kits
 - Patient call system
- Ventilator and associated equipment**
 - Ventilator integration capsule technology middleware
- Noninvasive Positive Airway Pressure Unit**
- High-flow Nasal Cannula System with Humidifier**
 - Nasal Cannula, Oxygen mask, O₂ Connectors
- **Equipment in situ or supplied with portable equipment:**
 - Patient beds with pressure relieving surfaces
 - Privacy curtains or screens between patients if shared space
 - Sink
 - Lighting, Examination/Procedure Light
 - Workstations on Wheels—ideally 1 for every 2 patients
 - KPHC with monitor integration and capsule middleware for vent integration ideal
 - If integration is not available, RN/RT will need to be informed that all data must be manually charted
 - Mapped printers/beds and label printer
 - May need to phase in minimal documentation using approved Disaster standards

- If possible, desktop computer with KPHC
 - Desktop printer mapped to computer
- Waste disposal
 - Toilet
 - Sharps containers
 - Biohazard containers
 - Pharmaceutical waste container
 - Universal waste containers
- Access to bathroom facilities for staff
- Crash cart with defibrillator, code medications, intubation tray, aspirator, video laryngoscope
- Medication area, PYXIS preferred
 - When telemetry/med-surg/PACU/OR used for expansion, consult with pharmacy to add critical care medications (e.g. vasopressors, neuromuscular blockers) and validate current medications in pyxis
 - Consider locked medication carts/cabinets as alternative to pyxis
 - Emergency medication supplies
- IV equipment
 - IV fluid bags
 - IV start supplies
 - Infusion pump controller and pump modules and extra channels
 - IV poles
 - Vein finder
 - Syringe pump
 - Flushes
 - Needles and syringes
 - Alcohol swabs
 - IV port caps
 - ABG kits, ABG analyzer
- Isolation cart(s) with Droplet + Contact precautions + eye protection
 - Gowns
 - Gloves
 - Isolation masks
 - Goggles
 - Disposable thermometers
 - Disposable stethoscopes
 - Paper bags for masks
 - Sharpie to label bags
 - Hand sanitizer on top of cart
 - Donning and doffing checklist
 - Droplet and contact precautions signage
 - COVID-19 Stewardship guidance/signage
- High risk/aerosolized procedure cart (ideally located in closed room)
 - Gowns
 - Gloves
 - N95/PAPR/CAPR

- Face shields/eye protection
 - Disinfectant wipes
 - Paper bags for N95 masks
 - Sharpie to label bags
 - Hand sanitizer on top of cart
 - Video Laryngoscope
 - (Optional: Bronchoscope)
- Central line cart, central line kits, central line dressing kits
- Glucometer(s)
- Language matters tablet
- Bedside commodes
- Optional: NICOM
- Optional: Ultrasound, bladder scanner
- Optional: scale, enteral feeding pump
- Optional: SCDs
- **Patient Care Supplies**
 - Linen cart with sheets, towels, washcloths, pillowcases
 - Pillows
 - Patient Positioning/Lifting Equipment
 - IV poles, pumps, extra channels
 - Lab supplies
 - Gauze/dressings/wound care
 - Central line dressing kits
 - Suction tubing and kits
 - Closed/in-line suction kits
 - Oral care supplies
 - Bath wipes/shampoo caps
 - CHG wipes
 - Urinals/bedpans/urinary catheter supplies
 - Tracheostomy care supplies
- Chronic ventilator patients cared for in telemetry units**
 - Recommend using ventilators with built in compressors
 - Will require suction and ventilator disposables
 - EtCO2 monitoring can be achieved utilizing the ventilator module
 - Ambu bag must be at bedside
 - Ventilator trach patients must have obturator at headwall and back up trach, one size smaller than currently used
 - Disposable inner cannulas
 - Trach cleaning kits
 - Oral care supplies

Donning & Doffing Guidance

COVID-19 PPE Donning & Doffing Guidance for CAPR for High Risk Aerosol-Generating Procedures

Guidelines must be used in conjunction with your department's PPE Stewardship Guidelines

To be used when performing or present during High Risk Aerosol-Generating procedures: Intubation, Extubation, Bronchoscopy, Sputum Induction, Positive Pressure Ventilation by Mask including CPAP and BIPAP, open Endotracheal/Nasopharyngeal/Oropharyngeal Suctioning, and Nasopharyngeal/Oropharyngeal Swabbing.

Note: Nasopharyngeal/Oropharyngeal Swabbing for COVID-19 may be done wearing an N95 respirator

COVID-19 PPE Donning Guidance for CAPR in High Risk Procedures

- Perform hand hygiene
- Plug CAPR cord into battery and helmet
- Attach battery pack to the back of your scrubs / belt / pants
- Put on gown and tie in back underneath battery and cord
- Put on CAPR helmet
- Put on clean gloves

Infection Control while in the room:

1. Remember to keep hands away from face and head
2. Limit surfaces touched to minimize contamination
3. Change gloves when torn or heavily contaminated and perform hand hygiene between each change.

COVID-19 PPE Doffing Guidance for CAPR in High Risk Procedures

GENERAL DOFFING GUIDELINES:

- If exiting a room with an anteroom, remove all PPE except the CAPR **inside** the room at least three feet away from the patient, following doffing protocol as outlined below. Do not remove the CAPR until in the anteroom or outside patient care room.
- If exiting a room with no anteroom, remove all PPE except the CAPR **inside** the room at least three feet away from the patient prior to exiting the room (door must remain closed), following the doffing protocol according to steps below. Do not remove the CAPR until outside the room.

COVID-19 PPE DOFFING GUIDELINES for CAPR in HIGH RISK PROCEDURES

- | | |
|---|--|
| <input type="checkbox"/> Remove gown and gloves inside the room. Remain at least 3 feet from patient while doffing. | <input type="checkbox"/> Loosen helmet headband |
| <input type="checkbox"/> To remove gown and gloves, pull from the front of the gown down, rolling sleeves into a ball including removal of gloves. Place in red biohazard waste container | <input type="checkbox"/> Remove helmet from head in the forward direction |
| <input type="checkbox"/> Perform hand hygiene | <input type="checkbox"/> Remove disposable lens cuff by grasping both sides at the connector. Pull forward and discard the lens into red biohazard waste container |
| <input type="checkbox"/> Put on clean gloves | <input type="checkbox"/> Remove comfort strips from helmet and place in red biohazard waste container |
| <input type="checkbox"/> Wipe outside of CAPR device: take one wipe and wipe back to front the entire helmet including face shield. Use a hospital approved disinfectant wipe: White Top, Red Top, Green Top, Blue Top, Purple Top, or Orange Top only.
NOTE: Allow time to dry | <input type="checkbox"/> Disconnect helmet cord from the battery pack |
| <input type="checkbox"/> Remove gloves | <input type="checkbox"/> Place helmet in designated bin |
| <input type="checkbox"/> Perform hand hygiene | <input type="checkbox"/> Remove battery and belt (if used) and place in designated bin |
| <input type="checkbox"/> Put on clean gloves | <input type="checkbox"/> Remove gloves |
| | <input type="checkbox"/> Perform hand hygiene |
| | <input type="checkbox"/> Put on clean gloves |
| | <input type="checkbox"/> Place lid on designated bin |
| | <input type="checkbox"/> Remove gloves |
| | <input type="checkbox"/> Perform hand hygiene |

COVID-19 PPE Donning & Doffing Guidance for PAPR in High Risk Aerosol-Generating Procedures

Guidelines must be used in conjunction with your department's PPE Stewardship Guidelines

To be used when performing or present during High Risk Aerosol-Generating procedures: Intubation, Extubation, Bronchoscopy, Sputum Induction, Positive Pressure Ventilation by Mask including CPAP and BIPAP, open Endotracheal/Nasopharyngeal/Oropharyngeal Suctioning, and Nasopharyngeal/Oropharyngeal Swabbing.

Note: Nasopharyngeal/Oropharyngeal Swabbing for COVID-19 may be done wearing an N95 respirator.

COVID-19 PPE Donning Guidelines for PAPR in High Risk Procedures

- Perform hand hygiene
- Put on PAPR belt with PAPR blower unit positioned in the back
- Put on gown, fasten at neck and tie in back underneath blower unit
- Attach PAPR hose to PAPR hood
- Turn on PAPR
- Put on PAPR hood
- Put on clean gloves

Infection Control while in the room:

1. Remember to keep hands away from face and head
2. Limit surfaces touched to minimize contamination
3. Change gloves when torn or heavily contaminated and perform hand hygiene between each change.

COVID-19 PPE Doffing Guidelines for PAPR in High Risk Procedures

GENERAL DOFFING GUIDELINES:

- If exiting a room with an anteroom, remove all PPE except the PAPR **inside** the room at least three feet away from the patient, following doffing guidelines as outlined below. Do not remove the PAPR until in the anteroom.
- If exiting a room with no anteroom, remove all PPE except the PAPR **inside** the room at least three feet away from the patient prior to exiting the room (door must remain closed) following the doffing guidelines according to steps below. Do not remove the PAPR until outside the room.
- Place a designated red biohazard waste container inside and outside of the room for disposal PPE. **Do not use regular waste containers.**
- Remove PPE according to the doffing guidelines below:

COVID-19 PPE DOFFING GUIDELINES for PAPR in HIGH RISK PROCEDURES

- | | |
|---|--|
| <input type="checkbox"/> Remove gown and gloves inside the room. Remain at least 3 feet from patient while doffing. | <input type="checkbox"/> Remove hood: lean forward and carefully remove hood and place hood in red biohazard waste container |
| <input type="checkbox"/> To remove gown and gloves, pull from the front of the gown down, rolling sleeves into a ball including removal of gloves. | <input type="checkbox"/> Remove PAPR tubing from hood and blower unit |
| <input type="checkbox"/> Place in red biohazard waste container. | <input type="checkbox"/> Place tubing in designated bin with biohazard label |
| <input type="checkbox"/> Perform hand hygiene | <input type="checkbox"/> Turn off blower unit |
| <input type="checkbox"/> Put on clean gloves | <input type="checkbox"/> Remove the belt-mounted blower unit and belt and place in designated bin |
| <input type="checkbox"/> Wipe outside of PAPR hood: take one wipe and wipe the outside of the hood back to front. Use a hospital approved disinfectant wipe: White Top, Red Top, Green Top, Blue Top, Purple Top, or Orange Top only. NOTE: Allow to dry | <input type="checkbox"/> Remove gloves and dispose of into red biohazard waste container |
| <input type="checkbox"/> Remove gloves | <input type="checkbox"/> Remove gloves |
| <input type="checkbox"/> Perform hand hygiene | <input type="checkbox"/> Perform hand hygiene |
| <input type="checkbox"/> Exit room | <input type="checkbox"/> Put on clean gloves |
| <input type="checkbox"/> Perform hand hygiene | <input type="checkbox"/> Place lid on designated bin |
| <input type="checkbox"/> Put on clean gloves | <input type="checkbox"/> Remove gloves |
| <input type="checkbox"/> Rotate PAPR to right hip | <input type="checkbox"/> Perform hand hygiene |

**COVID-19 PPE Donning & Doffing Guidance for N95 in High Risk Aerosol
Generating Procedures – REUSE of PPE**

Note: Can only reuse N95 if worn with face shield

REUSE = HCW dons and uses the same PPE (Mask, Face Shield, Goggles) during contact with multiple different patients but doffs and re-dons in between contact with different patients. Gown and gloves are not reused.

Guidelines must be used in conjunction with your department's PPE Stewardship Guidelines

To be used when performing or present during High Risk Aerosol-Generating procedures: Intubation, Extubation, Bronchoscopy, Sputum Induction, Positive Pressure Ventilation by Mask including CPAP and BIPAP, open Endotracheal/Nasopharyngeal Suctioning, and *Nasopharyngeal/Oropharyngeal Swabbing).

Note: Nasopharyngeal/Oropharyngeal Swabbing for COVID-19 may be done using an N95

Storage Between Use: Hang in a designated area not touching other PPE or in a breathable bag

Cleaning Between Use: NO CLEANING REQUIRED between uses

Infection Control During Use:

- Use gloves when doffing, hanging, and/or placing in bag
- Use gloves when removing from storage and re-donning
- Re-don PPE carefully to prevent contact of the face, mouth, nose, eyes with the exterior of the PPE
- Use hand hygiene before and after handling PPE

When to Discard:

- When soiled or damaged or having difficulty breathing or seeing
- If worn with goggles during high risk procedure
- At end of shift

COVID-19 PPE Donning Guidance for N95 in High Risk Procedures

Follow the below donning guidelines if using new PPE items:

- Perform hand hygiene
- Put on gown; fasten at the neck and back.
- Put on N95 respirator
- Put on eye protection (face shield or goggles)
- Put on clean gloves

****Refer to the Putting On PPE picture for technique in donning individual PPE. Note this workflow uses an N95 respirator rather than a surgical mask as pictured.***

Follow the below donning guidelines if reusing PPE (Mask, Face Shield, Goggles):

- Perform hand hygiene
- Put on gown; fasten at the neck and back.
- Don gloves before handling reuse items
 - Don reuse items carefully to prevent contact of the face, mouth, nose, eyes with the exterior of the PPE item
- Put on mask and face shield or goggles (if worn, N95 must be discarded after doffing)
- Remove gloves
- Perform hand hygiene
- Put on clean gloves

****Refer to the Putting On picture for technique in donning individual PPE. Note this workflow uses an N95 respirator rather than a surgical mask as pictured.***

Infection Control while in the room:

1. Remember to keep hands away from face and head
2. Limit surfaces touched to minimize contamination
3. Change gloves when torn or heavily contaminated and perform hand hygiene between each change.

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

- 1. GOWN**
 - Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
 - Fasten in back of neck and waist
- 2. MASK OR RESPIRATOR**
 - Secure ties or elastic bands at middle of head and neck
 - Fit flexible band to nose bridge
 - Fit snug to face and below chin
 - Fit-check respirator
- 3. GOGGLES OR FACE SHIELD**
 - Place over face and eyes and adjust to fit
- 4. GLOVES**
 - Extend to cover wrist of isolation gown

USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene



COVID-19 PPE Doffing Guidance for N95 in High Risk Procedures

GENERAL DOFFING GUIDELINES:

- Remove gown and gloves inside the room. Maintain at least 3 feet from patient at all times. If unable to do so, doff outside of the room.
- Dispose of gown and gloves in red biohazard waste containers. **Do not use regular waste containers.**
- Do not doff N95 until outside of patient care room or in anteroom**
- Remove PPE according to the doffing guidelines below:

COVID-19 PPE DOFFING GUIDELINES for N95 in HIGH RISK PROCEDURES

****Refer to the Remove picture for technique in removing individual PPE. Note that our COVID-19 workflow includes additional hand hygiene and gloving.***

- Remove gown and gloves inside the room. Place in red biohazard waste container. **Do not use regular waste containers.**
- Perform hand hygiene
- Exit room
- Perform hand hygiene
- Put on clean gloves
- Remove goggles or face shield
 - If using goggles, clean with disinfectant wipe; rinse or wipe with material dampened with water and allow to dry before storing
 - Face shield must be discarded after high risk procedure
- Store goggles in pre-designated area:
 - Hang up not touching other PPE items or store in breathable bag
- Remove the N95 respirator and store in pre-designated area.
 - NOTE: You may only reuse N95 respirator if worn with face shield
 - Hang up not touching other PPE items or store in breathable bag
- Remove gloves
- Perform hand hygiene



PPE Guidelines for Routine Care with REUSE of PPE

REUSE = HCW dons and uses the same PPE (Mask, Face Shield or Goggles) during contact with multiple different patients but doffs and re-dons in between contact with different patients. Gown and gloves are not reused.

Guidelines must be used in conjunction with your department PPE Stewardship Guidelines

To be used:

When caring for a suspect (PUI) or confirmed COVID-19 patient.

Note: This protocol is NOT to be used when performing or present during High Risk Aerosol-Generating procedures (Intubation, Extubation, Bronchoscopy, Sputum Induction, Positive Pressure Ventilation by Mask including CPAP and BIPAP, open Endotracheal / Nasopharyngeal / Oropharyngeal Suctioning, and Nasopharyngeal / Oropharyngeal Swabbing. See COVID-19 PPR/CAPR/N95 Protocol for the PPE checklist for this situation.

NOTE: NP Swabbing may be done using an N95

Storage Between Use: Hang in a designated area not touching other PPE or in a bag (breathable bag such as paper bag)

Cleaning Between Use: NO CLEANING REQUIRED between uses except for goggles

Infection Control During Use:

- Use gloves when doffing, hanging, and/or placing in bag
- Use gloves when removing from storage and re-donning
- Re-don PPE carefully to prevent contact of the face, mouth, nose, eyes with the exterior of the PPE
- Use hand hygiene before and after handling PPE
- **When to Discard:**
 - When soiled or damaged or having difficulty breathing or seeing
 - At end of shift or extended period of use

Infection Control while in the room:

- Remember to keep hands away from face and head
- Limit surfaces touched to minimize contamination
- Change gloves when torn or heavily contaminated and perform hand hygiene between each change.

COVID-19 PPE Donning Guidance for Routine Care

Follow the below donning guidelines if using new PPE items:

- Perform hand hygiene
- Put on gown; fasten at the neck and back.
- Put on mask
- Put on eye protection (face shield or goggles)
- Put on clean gloves

****Refer to the Putting On PPE picture for technique in donning individual PPE.***

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



4. GLOVES

- Extend to cover wrist of isolation gown



USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene



Follow the below donning guidelines if reusing PPE (Mask, Face Shield, Goggles):

- Perform hand hygiene
- Put on gown; fasten at the neck and back.
- Don gloves before handling reuse items
- Don reuse items carefully to prevent contact of the face, mouth, nose, eyes with the exterior of the PPE item
- Put on mask and face shield or goggles
- Remove gloves
- Perform hand hygiene
- Put on clean gloves

COVID-19 PPE Doffing

Guidance for Routine Care

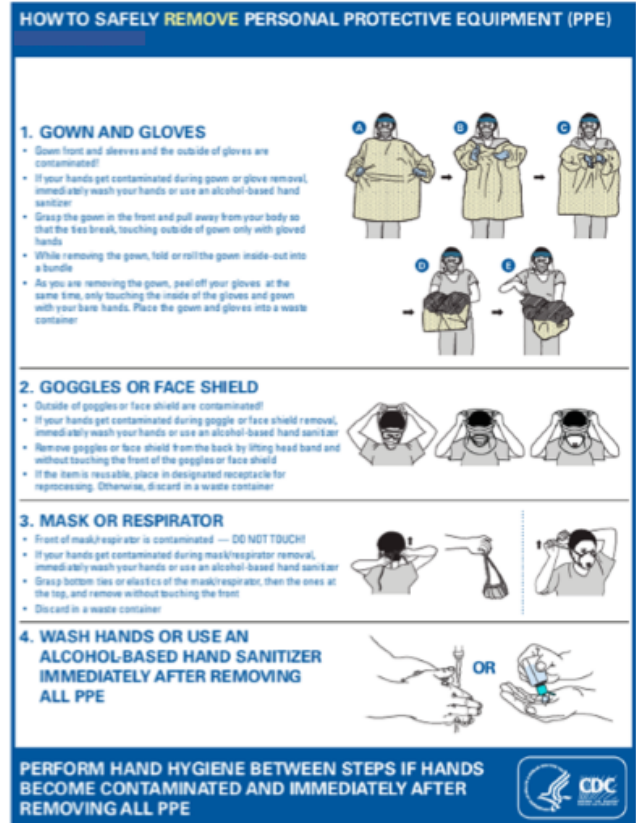
GENERAL DOFFING GUIDELINES:

- Remove gown and gloves inside the patient room. Maintain at least 3 feet from patient at all times. If unable to do so, doff gown and gloves outside of the room.
- Dispose of gown and gloves in red biohazard waste containers. **Do not use regular waste containers.**
- Please see below for additional doffing guidance:

DOFFING GUIDELINES:

***Refer to the Remove PPE picture for technique in removing individual PPE.**

- Remove gown and gloves inside the room. Place in red biohazard waste container. **Do not use regular waste containers.**
- Perform hand hygiene
- Exit room
- Perform hand hygiene
- Put on clean gloves
- Remove goggles or face shield
- If using face shield, store in pre-designated area. Face shields may not be cleaned but can be reused if not visibly contaminated or damaged.
- If using goggles, clean with disinfectant wipes then rinse with water or wipe with material dampened with water. Allow to dry.
- Store goggles or face shield in pre-designated area:
 - Hang up not touching other PPE items or store in breathable bag
 - Alternatively, place goggles in a designated receptacle for batch cleaning
- Remove the mask and store in pre-designated area
 - Hang up not touching other PPE items or store in breathable bag
- Remove gloves
- Perform hand hygiene



PPE Guidelines for Routine Care with EXTENDED USE of PPE

EXTENDED USE = HCW dons PPE and wears it for multiple patients continuously without doffing and redonning between patient contacts. Gown and gloves are not reused.

Guidelines must be used in conjunction with your department PPE Stewardship Guidelines

To be used:

1. When caring for a suspected or confirmed COVID-19 patient.

Note: This protocol is NOT to be used when performing or present during High Risk Aerosol-Generating procedures (including Intubation, Extubation, Bronchoscopy, Sputum Induction, Positive Pressure Ventilation by Mask including CPAP and BIPAP, open Endotracheal/Nasopharyngeal/Oropharyngeal Suctioning, and Nasopharyngeal Swabbing. See COVID-19 PAPR/CAPR/N95 Guidance for the PPE guidelines for this situation.

NOTE: NP Swabbing may be done with N95.

When to Use:

- For HCW caring for a cohort of patients requiring the same PPE in the same location

Storage: No storage needed. PPE must be discarded after doffing when leaving the care area

Cleaning: NO CLEANING REQUIRED; discard after doffing

Infection Control During Use:

- Don and doff carefully per protocol
- Perform hand hygiene before and after use

When to Discard:

- After doffing; and/or after leaving the care area
- When soiled or damaged

COVID-19 PPE Doffing

Guidance for Routine Care

GENERAL DOFFING GUIDELINES:

- Remove Gown and Gloves inside the patient room. Maintain at least 3 feet from patient at all times. If unable to do so, doff gown and gloves outside of the room.
- Dispose of gown and gloves in red biohazard waste containers. **Do not use regular waste containers.**
- Please see below for additional doffing guidance:

DOFFING GUIDELINES FOR EXTENDED USE PPE:

***Refer to the Remove PPE picture for technique in removing individual PPE.**

Between each patient contact:

- Remove gown and gloves inside the room. Place in red biohazard waste container. **Do not use regular waste containers.**
- Keep the face shield / goggles and mask on
- Perform hand hygiene
- Exit room
- Perform hand hygiene

When done with all patient care and leaving the care area:

- Remove gown and gloves inside the room. Place in red biohazard waste container. **Do not use regular waste containers.**
- Remove goggles or face shield. Place in red biohazard waste container.
- Remove the mask and discard in red biohazard waste container
- Perform hand hygiene
- Exit room
- Perform hand hygiene

