

It Takes a Village: Coming Together Amidst the Pandemic

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Session Summary

HTM departments have been tremendously impacted by COVID-19.

Cedars-Sinai Medical Center and **Huntington Health** will share their experiences, focusing on various medical equipment related initiatives and collaborative work with other departments, especially the end users to support the day-to-day needs that were constantly changing.

We will also be sharing initiatives that were put in place to support the continued pandemic needs.



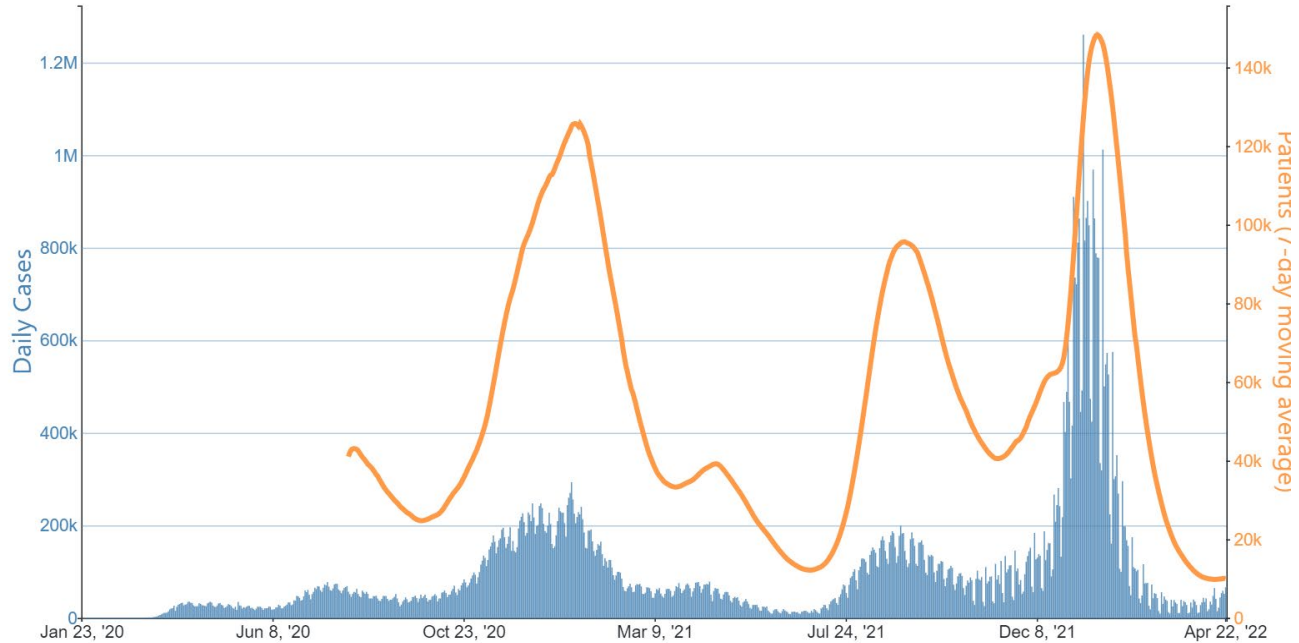
Agenda

- ◆ National and Community Covid Dashboards
- ◆ Perspectives and Initiatives
 - Cedars-Sinai Medical Center
 - Huntington Health
- ◆ Lessons Learned



National Covid-19 Dashboard

Daily Trends in Number of Cases and 7-day Average of Current Hospitalized Patients with Confirmed COVID-19 in The United States Reported to CDC



Cedars-Sinai Covid-19 Dashboard

Cedars-Sinai has been one of the nation's leaders in the number of COVID-19 patients cared for, as well as in developing many innovations in the care of people with COVID-19.

CSMC Coronavirus Confirmed Patients (Cumulative)

Data As of 12:00am Apr 13, 2022

Last 800 Days

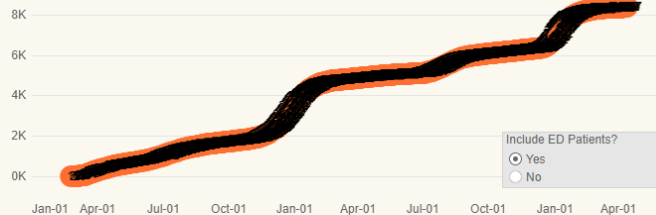
Confirmed Patients

8,387
patients
+0 Last 24 Hours

1,168
ICU patients
(14% of Total)

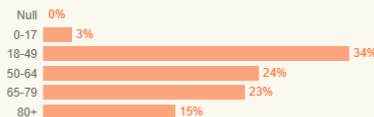
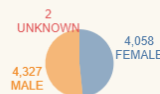
8,373
Have been discharged
(100% of Total)

Cumulative Confirmed Patients*



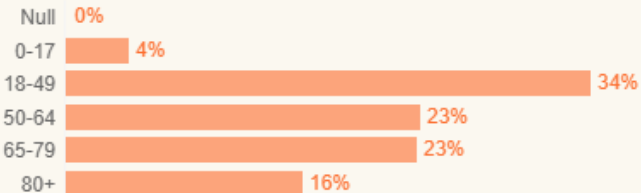
Include ED Patients?
 Yes
 No

Daily New Patients



As of 09/27/2022

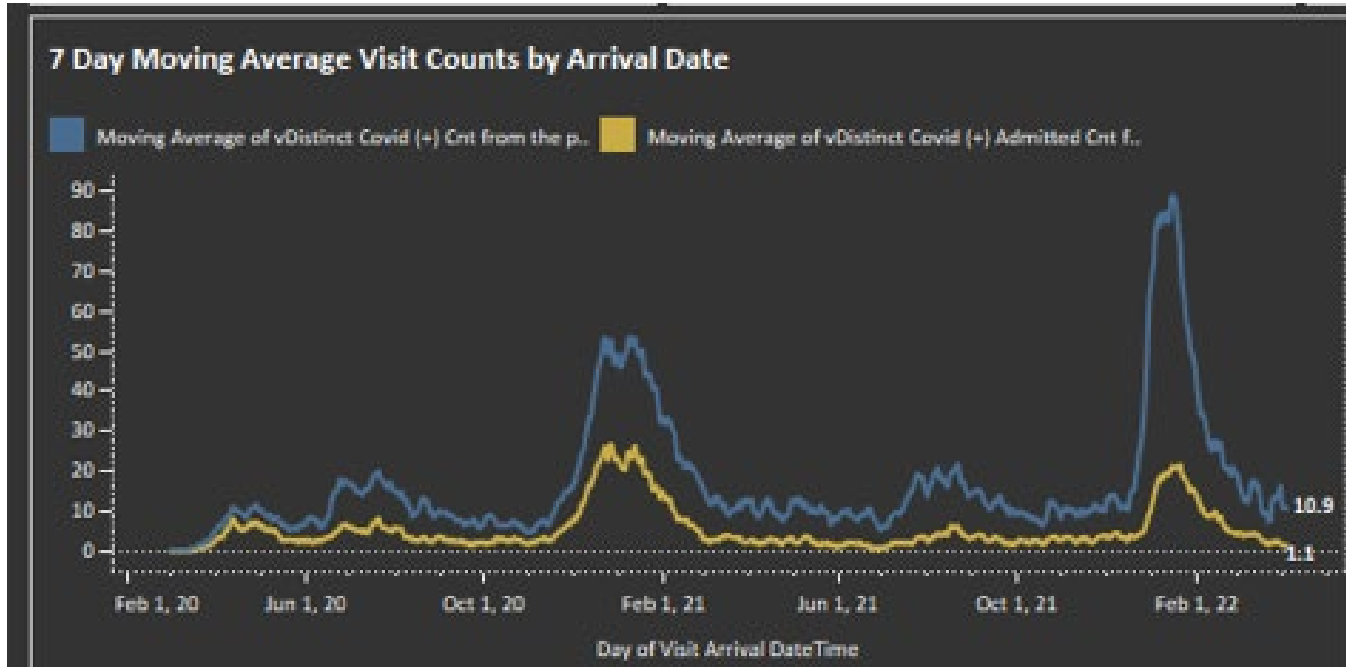
Confirmed patients: 10,232 with the following distribution:



*Distinct counts of Inpatient & Observation Patients w/ Active COVID+ Flag on for a portion the patient stay. The dates are based on date of confirmation for patients' COVID status.
Source: Cedars-Sinai Enterprise Data Intelligence



Huntington Health Covid-19 Dashboard



Cedars-Sinai & Huntington Health: Affiliation

Huntington Hospital Affiliation with Cedars-Sinai Becomes Official

Published on Wednesday, August 4, 2021 | 12:18 pm



The affiliation between [Huntington Hospital](#) and [Cedars-Sinai Health System](#) became official Wednesday, with the completion of the appropriate regulatory approvals. The affiliation will strengthen Huntington's long-term commitment to providing affordable, accessible, high-quality care to the San Gabriel Valley.



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Cedars-Sinai Medical Center Overview



- ◆ Located in West Hollywood/Beverly Hills.
- ◆ The main hospital has 889 licensed beds.
- ◆ Over 14,000 employees.
- ◆ 91,014 patients seen in the Emergency Dept. Annually.
- ◆ 6,252 births annually.
- ◆ 32,000 (approx.) surgeries annually.
- ◆ 105 anesthesia locations.
- ◆ Clinical Engineering is 33 members strong.
- ◆ Manages over 33,000 medical devices.
- ◆ Reports to Enterprise Information Systems.



Cedars-Sinai Medical Center: Clinical Engineering Pandemic Support

- ◆ Surge Planning
- ◆ Medical Equipment
- ◆ Supplies
- ◆ Room Conversions
- ◆ Assisting Other Departments



Cedars-Sinai Medical Center: Surge Planning

- ◆ Clinical Engineering provided analysis of house-wide patient monitoring capabilities (integrated, stand-alone, mobile, etc.) to the hospital administrators to enable them to prepare a better Surge Plan with phases.
- ◆ Participated in system-wide twice-daily planning huddles.

EXISTING	TOTAL EXISTING BEDS INCLUDING NICU (W/OUT L&D)	889	TOTAL	W/L&D
	TOTAL ICU BEDS INCLUDING 6N ICU/3SCCT (W/NICU (45))	201	889	911

PHASE-1 SURGE PLAN	TOTAL BEDS POSSIBLE W/PHASE-1 ACTIVATION (W/OUT L&D)	966	TOTAL	W/L&D	W/WARD
IMMEDIATE CONVERSION OR WITHIN 24HRS	TOTAL ICU BEDS/BAYS w/VENTILATOR SPACE (W/NICU (45))	247	966	988	988
	NON-COVID M/S, WOMEN'S, PEDS (W/OUT L&D)	316	TOTAL	W/L&D	
	NON-COVID ICU (W/NICU (45))	99	415	437	
	COVID - M/S BEDS	403	TOTAL	W/WARD	
	COVID - ICU OR ICU-SINGLE ORGAN BEDS	148	551	551	
	COVID - WARD BEDS	0			



Cedars-Sinai Medical Center: Surge Planning (cont.)

PHASE-2A SURGE PLAN	TOTAL BEDS POSSIBLE W/ACTIVATION REQUIRED (W/OUT L&D)	1133	TOTAL	W/L&D	W/WARD
MOVE TO NON-TRADITIONAL CAPACITY	TOTAL ICU BEDS/BAYS w/VENTILATOR SPACE (W/NICU (45))	398	1133	1155	1155
	NON-COVID M/S, WOMEN'S, PEDS (W/OUT L&D)	316	TOTAL	W/L&D	
	NON-COVID ICU (W/NICU (45))	99	415	437	
	COVID - M/S BEDS	419	TOTAL	W/WARD	
	COVID - ICU OR ICU-SINGLE ORGAN BEDS	299	718	718	
	COVID - WARD BEDS	0			

PHASE-2B SURGE PLAN	TOTAL BEDS POSSIBLE W/ACTIVATION REQUIRED (W/OUT L&D)	1272	TOTAL	W/L&D	W/WARD
MOVE BEYOND CURRENTLY EQUIPPED CLINICAL CAPACITY (TRADITIONAL & NON-TRADITIONAL)	TOTAL ICU BEDS/BAYS w/VENTILATOR SPACE (W/NICU (45))	416	1272	1294	1372
	NON-COVID M/S, WOMEN'S, PEDS (W/OUT L&D)	340	TOTAL	W/L&D	
	NON-COVID ICU (W/NICU(45))	99	439	461	
	COVID - M/S BEDS	438	TOTAL	W/WARD	
	COVID - ICU OR ICU-SINGLE ORGAN BEDS	317	755	833	
	COVID - WARD BEDS	78			



Cedars-Sinai Medical Center: Surge Planning (cont.)

PHASE-3 SURGE PLAN	TOTAL BEDS POSSIBLE W/ACTIVATION REQUIRED (W/OUT L&D)	1530	TOTAL	W/L&D	W/WARD
ACTIVATE "IN-THE-BOX PLUS" AND NON-CLINICAL, MASS-CARE SITES	TOTAL ICU BEDS/BAYS w/VENTILATOR SPACE (W/NICU (45))	509	1530	1552	1787
	NON-COVID M/S, WOMEN'S, PEDS (W/OUT L&D)	340	TOTAL	W/L&D	
	NON-COVID ICU (W/NICU (45))	99	439	461	
	COVID - M/S BEDS	446	TOTAL	W/WARD	
	COVID - ICU OR ICU-SINGLE ORGAN BEDS	410	856	1091	
	COVID - WARD BEDS	235			

PHASE-4 SURGE PLAN	TOTAL BEDS POSSIBLE W/ACTIVATION REQUIRED (W/OUT L&D)	2158	TOTAL	W/L&D	W/WARD
ACTIVATE "OUTSIDE THE BOX" NON-CLINICAL, MASS-CARE SITES	TOTAL ICU BEDS/BAYS w/VENTILATOR SPACE (W/NICU (45))	786	2158	2180	2766
	NON-COVID M/S, WOMEN'S, PEDS (W/OUT L&D)	340	TOTAL	W/L&D	
	NON-COVID ICU (W/NICU (45))	99	439	461	
	COVID - M/S BEDS	446	TOTAL	W/WARD	
	COVID - ICU OR ICU-SINGLE ORGAN BEDS	687	1133	1719	
	COVID - WARD BEDS	586			



Cedars-Sinai Medical Center: Surge Planning (cont.)

CSMC Emergency Department
Triage Tents in March 2020



Cedars-Sinai Medical Center: Surge Planning (cont.)

CSMC Surge Tents &
Portable Oxygen in the parking lot



Cedars-Sinai Medical Center: Medical Equipment



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Clinical Engineering provided a list of essential equipment to the administrators to assist in planning to utilize tents, conference rooms, and other non-traditional areas for patient care if needed.

Type of Equipment	Inventory In House	EMR Integrated (y/n)	Anticipated Surge Needs	Gap	Gap Remediation Plans & Notes
Physiological Monitors -mounted on wall- 735	926	Y			
Physiological Monitors - mounted on roll stand- 57		32 (Y); 25 (N)		37	Obtaining quote for (50) Philips X3 machines. Will need approval from J.S. These will be required for the ORs in Phase 2a in rooms that will be tripled/doubled up
Physiological Monitors -mounted on Anesthesia carts- 99		Y			
Physiological Monitors - not mounted- 35		N			Clinical Engineering repair back-up.
MMS (ECG, SpO2, NIBP, 1 IBP, 1 Temp)--Multi Measurement Server is used attached to the Phillips physiological monitor with the exception of the (32) MP5 monitors which have a built in MMS.	927	N (see notes)			Model Intellivue X2 MMS which are currently in use in 6 South, are being used as transport monitors as well for transporting the patient. Once removed, the X2 module stays integrated while in transport.
Internal Pressure Modules				150	Required for provision of (3) invasive pressures measurements per Dr. N. Currently sourcing for supply
Tele Boxes	398	Y			
Vital Signs Monitors	550	377(Y); 173 (N)			
Stand Alone Pulse Oximeters	211	N			Masimo Radical 7, Rad 5, and Rad 57.
Integrated Pulse Oximeters	87	Y			Masimo Root/Radius wearable pulse oximeter used in the Med/Surg, 3SPT, and 3N areas for continuous SpO2 monitoring.
Ventilators, Intensive care & others		177 (Y); 75 (N) - See tab labeled "Ventilator Distribution" for details			To be supplied by Respiratory Therapy
Alaris Infusion Pump PCU Model 8015 (Brain)	1650	Y			integrated except ED, SOCCI, THO, VOMG, TACRI
Infusion Pump LVP Modules, Model 8100	3711	Y			integrated except ED, SOCCI, THO, VOMG, TACRI
Crash Cart Defibrillator/ Monitor/Pacemaker	195	N			
Transport Defibrillator/ Monitor/Pacemaker/EtCo2/Invasive Pressure (3)	168	N			

Cedars-Sinai Medical Center: Medical Equipment (cont.)



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- ◆ Analyzed all ventilators at the beginning of the pandemic with EMR integration status.
- ◆ Anticipating an increase in demand for additional ventilators, accelerated the purchase of budgeted and planned equipment for the next few years.

Vent Type	Manufacturer	Model	Quantity	Patient Type	EMR Integrated (y/n)	Notes
ICU Ventilator	GE	Carescape R860	59	Adult	Yes	
ICU Ventilator	Philips	V60	54	Adult/Peds	Yes	
ICU Ventilator	Puritan Bennet	840	33	Adult	Yes	
ICU Ventilator	Carefusion	Avea	4	Adult	Yes	
ICU Ventilator	Viasys	LTV 1200	17	Adult	No	Active, County issued
ICU Ventilator	Viasys	LTV 1200	13	Adult	No	In storage, being activated, County issued
NICU Ventilator	Viasys	Avea	27	Neo/Peds	Yes	
High Frequency Ventilator	Sensormedics	3100A	9	Neo	No	
High Frequency Ventilator	Sensormedics	3100B	2	Adult	No	
MRI Ventilator	Carefusion	LTV 1200 MRI	2	Adult	No	
Adult Ventilator	Various other brands	In storage	15	Adult	No	No breathing circuits
Veterinary	Various		17		No	
		Total Units	252			
Purchased and Planned						
ICU Ventilator	GE	Carescape R860	20	Adult	Yes	To be shipped from GE on 4/13/2020
ICU Ventilator	GE	Carescape R860	5	Adult	Yes	

Cedars-Sinai Medical Center: Medical Equipment (cont.)



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A list of infusion pump control units (PCU) and pump modules (LVP) by location and quantity in-house & in outlying areas provided to administrators by Clinical Engineering.



Owner Departments	Number of LVPs (pump modules)
AHSP TRAINING / SIM CTR.	18
CARDIOLOGY-Research	5
CENTRAL ISSUES	3360
COMPREHENSIVE CANCER CEN.	152
HEART INSTITUTE	1
PED CHILDREN'S HEALTH CENTER	2
THE ANGELES CLINIC (TACRI)	52
THO Cancer Center Infusion	75
TRANSPLANT SERVICES	2
VALLEY ONCOLOGY MEDICAL GROUP (VOMG)	44
Grand Total	3711
Owner Department	Number of PCUs (the brains)
AHSP TRAINING / SIM CTR.	8
CARDIOLOGY-Research	3
CENTRAL ISSUES	1487
COMPREHENSIVE CANCER CEN.	65
THE ANGELES CLINIC (TACRI)	28
THO Cancer Center Infusion	35
TRANSPLANT SERVICES	2
VALLEY ONCOLOGY MEDICAL GROUP (VOMG)	22
Grand Total	1650

Cedars-Sinai Medical Center: Supplies



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- ◆ Clinical Engineering made recommendations to Central Supply & Administration on patient monitoring supplies which should be stocked in larger quantities.
- ◆ Clinical Engineering kept a supply of ECG leads & power strips to back-up Central Supply and Facilities Engineering.

CABLES/Hoses & other accessories	CENTRAL ISSUES PART#	MANUF. PART#	Quantity to Stock	Notes
Philips Phys. Monitor EKG Trunk Cable for 3 lead sets	30266	M1669A	100	
Philips Phys. Monitor EKG Trunk Cable for 5 lead sets	Does not carry	M1663A	100	
Philips EKG 3-lead set	30362	M1673A	100	
Philips EKG Leads (5 lead set for M4841 Tele boxes & ICU)	30374	989803152071	100	
Philips EKG Leads (5 lead set for MX40 Tele boxes with SpO2)	Does not carry	989803171851	30	
Philips EKG trunk cable for 5 and 10 lead	30178	M1949A	50	Central Supply carries this 5 lead or 10 lead use trunk cables.
Philips NIBP hose	30368	M1599B	50	
Philips Internal Pressure Cable, Model PX1800 (from Edwards Lifesciences)	Does not carry	896083021	100**	**4/4/20: order of 10 and then 30 placed by Central Issues recently. Edwards acct. Manager recommends ordering in small increments. Since ordering additional extension modules, will possibly need more than 100.
Edwards Arterial Lines (6 different kinds)	See notes	See notes	See Notes	Per Edwards acct. manager, Central Issues placed a large order recently.
Capsule vitals Plus NIBP Hoses (from Capsule)	Does not carry	SL-VP-APHSE-3M	50	
Capsule Vitals Plus SpO2 cables (from Capsule)	Does not carry	See notes	50	The current spo2 cable is being sold as a set for \$575; Clin Eng will communicate with VP of Capsule sales. Part# SL-VP-XXXX-SNSR
Breathing circuits for ICU Vents: GE Carescape R860, Avea, PB840 (Use the same heated circuit)			Ask RT	Same heated circuit for all 3 but LM knows part number.
Primary IV Tubing set for Alaris Pump (from BD)	01059	2420-0500		
Secondary IV Tubing set for Alaris Pump (from BD)	00698	14230-28		
Buretrols	?	?	Ask Material Mgmt	
Masimo Spo2 cables for: (All items from Masimo)				
Philips Vital Signs Monitors	32041	2831	100	
Stand Alone Pulse Oximetry	32046	2406	100	
Zoll X-series defibrillator	32045	2404	50	

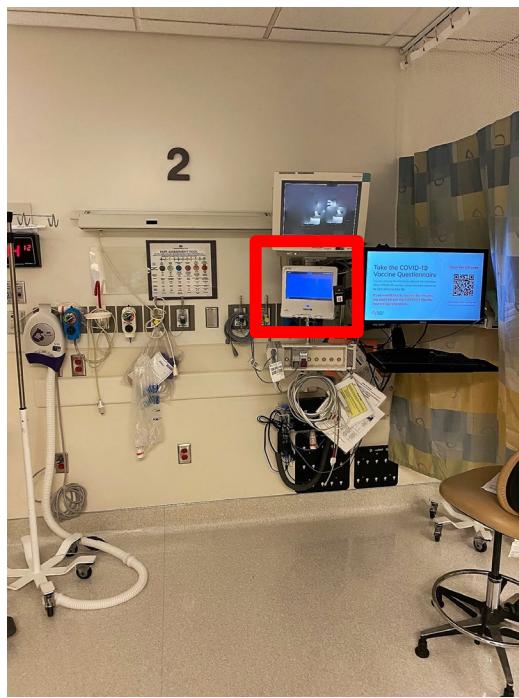
Cedars-Sinai Medical Center: Room Conversions



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PACU & Med/Surg Spaces:

- ◆ Converted PACU & Med/Surg spaces into Critical Care Units overnight by relocating patient monitors across campus, including configuration and integration with EMR by installing the necessary middleware.
- ◆ Each PACU bedside monitor was made capable of measuring three invasive pressure lines.
- ◆ CE kept a supply of ECG leads & power strips to back-up Central Supply and Facilities Engineering.



Cedars-Sinai Medical Center: Room Conversions (cont.)



Deluxe single rooms into double rooms:

Planned and tested the conversion of 96 deluxe single patient rooms into two-patient rooms with nurse call system and bed exit alarm configured to handle both patients.



Cedars-Sinai Medical Center: Assisting Other Departments



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- **Purchase, Rental, Donation of Equipment:**
 - Assisted the clinicians in the purchase and rental of medical equipment as well as evaluating donated equipment for patient use.
 - Performed incoming inspection on 3,246 pieces of medical equipment 3/2020-2/2021.
- **Back-up Repair Equipment:**

Prepared all Clinical Engineering repair back-up equipment with accessories for deployment if needed.



Cedars-Sinai Medical Center: Assisting Other Departments (cont.)



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- **Alternative Equipment Solutions:**
To minimize entrance of clinicians into Covid-19 patient rooms:
 - Purchased 400 vital sign monitors with SpO2 Bluetooth monitoring capability.
 - Utilized remote displays near the entrance of patient rooms when supported by the device.
 - Purchased a 20-bed complete physiological monitoring kit for the non-traditional areas.
- **PAPR:** CE undertook maintenance of Powered Air Purifying Respirators (PAPR).
- **Affiliated Medical Centers:** Prepared ventilators for transferring to affiliated medical centers.

Huntington Health Overview



- Level II Trauma Center with 619 licensed beds
- Bariatric & Stroke Center
- 18 Operating Rooms
- 3 DaVinci Robotic Systems
- 4 Cath Labs & 2 IR Suites
- 6500+ personnel
- 300+ applications
- 4500+ end user computing devices
- Affiliate of the Cedars-Sinai Health System
- Clinical Technology has 8 biomedical technicians, 3 support staff, and a director.

Huntington Health: Surge Planning

Task/Need	Department	Who	Comments
Equipment Needs			
Adult sized beds in all slots in PICU	Clinical Technology		In process- 2 ICU beds and 6 rentals with ICU quality mattresses
Ultrasound for docs putting in central lines	Pediatrics has acceptable ultrasound		Verify newer one is available
Glucometers (2)	Lab		
Transport Defib	Pull from ICU		
Pyxis- still there? Needs to be stocked with Adult ICU meds	Pharmacy		In process 3/26
Additional Medication Refrigerator	Pharmacy		In process 3/26
Wows- need 5	IT		Now present- 1 being repaired
Medical Air Regulators			
Oxygen Regulators			
Ventilators	Respiratory Services		
Suction Regulators			
Leg Squeezers	CS/Clinical Technology		
Doppler- need 1	Clinical Technology		
Safe pt handling Equipment			
IV Pumps- 24 in department for opening	Clinical Technology	might be of assistance	Will only need 24 pumps

- **Items to consider...**
 - Types of equipment needed
 - Parameters required
 - Type of patient population
 - Quantities
 - Responsible department
 - Supplies/accessories



Huntington Health: Equipment Demands

- **Exponential Increase in Equipment Demand**
 - Handheld IR thermometers and screening stations
 - Commissioned equipment from storage
 - Portable X-Ray Machines
 - Sourced batteries for obsolete equipment
 - PAPRs
 - Ventilators/Bipaps



Huntington Health: Equipment Demands (cont.)

- Infusion Pumps
 - Rentals
 - Purchase
- Beds and Stretchers
 - Rentals
 - Commissioned equipment from storage



Huntington Health: Equipment Demands (cont.)

- Patient Monitoring
 - Telemetry
 - License moves to different units
 - Removed from medical floors to add ICU bed monitoring
 - Increase in teleboxes
 - Purchased an additional 10 teleboxes
 - Increase use of SPO2 off teleboxes



Huntington Health: Equipment Demands (cont.)



- Patient Monitoring (cont.)
 - Increasing ICU Beds/Monitors
 - Added additional 20 ICU bed capability
 - Vital Signs Machines



Huntington Health: Physical Space



- **High Need for Physical Space for Patient Care**
 - Repurposing Decommissioned Units
 - Medical units, PICU
 - Rooms capable of double occupancy were transitioned to doubles



Huntington Health: Physical Space (cont.)



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- Endoscopy, Angio/IR, Surgery, PACU, others all converted to ICU beds, and surgeries were suspended

CCU Monitoring and Integration Related to Possible Alternative Locations
August 2020

Standard CCU Monitor and Integration Set Up: (2 nd floor and 4 th floor East Tower) and PICU	PACU ("Closet")	PACU (Main)	Peds DOU	IR Admit/ Recovery Area	4 E, Module 4	St. 31 (Rms 3114-3125), rooms 3101-3110 not configured for ICU beds
Central Station	No	No	Yes (in PICU)	No	Requires purchase and wiring	Central station for Tele present, location requires wall mounts and wiring (rentals would not include central station)
Fully integrated with Cerner	No (Not all CO data integrates)	No (Not all CO data integrates)	No, but per Clinical Technology would be easy to do	Vital signs only	Requires purchase and wiring OR wireless rentals lack necessary features.	Requires purchase and wiring OR wireless rentals lack necessary features.
Monitor model #	MP 30 (3 channels displayed)	Full featured but 17 years old	MP50	MP30	No current monitors, likely QSHPD, questionable whether licensing possible for long term	No current monitors
Wall mounted monitors	Yes	Yes	Yes	Yes	No current monitors	No current monitors

Huntington Health: Physical Space (cont.)



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- Pasadena Convention Center prepped
- Tents
 - Increase ED intake capacity
 - Increase ED available beds



Huntington Health: Operational Support



- **Command Center**

- 24/7
- Staffed by Clinical and Non-Clinical Directors/VPs
- Dashboards and predictive analytics

- **Communication**

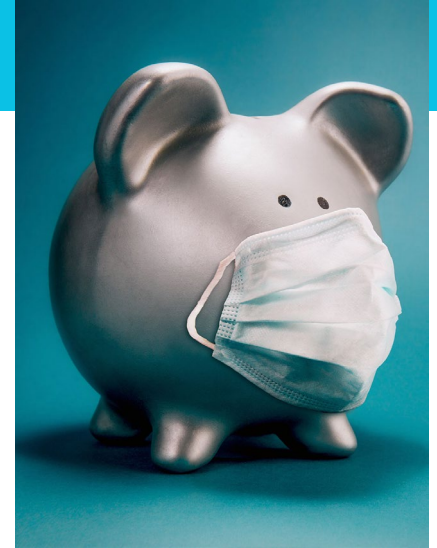
- CEO
- Educational videos from Infection Prevention
- Intranet
- Regular meetings, huddles, and more



Huntington Health: Operational Support (cont.)

- **Financials**

- COVID cost center
- Approval process
- Creative shopping (eBay)
- P-card limits increased to expediate purchases
- State/Government support



Lessons Learned

- **Collaboration with all departments, clinical and non-clinical, as well as vendors**
 - Facilities
 - Environmental Services
 - Materials Management
 - Purchasing
 - Nursing
 - Information Technology
 - And more...

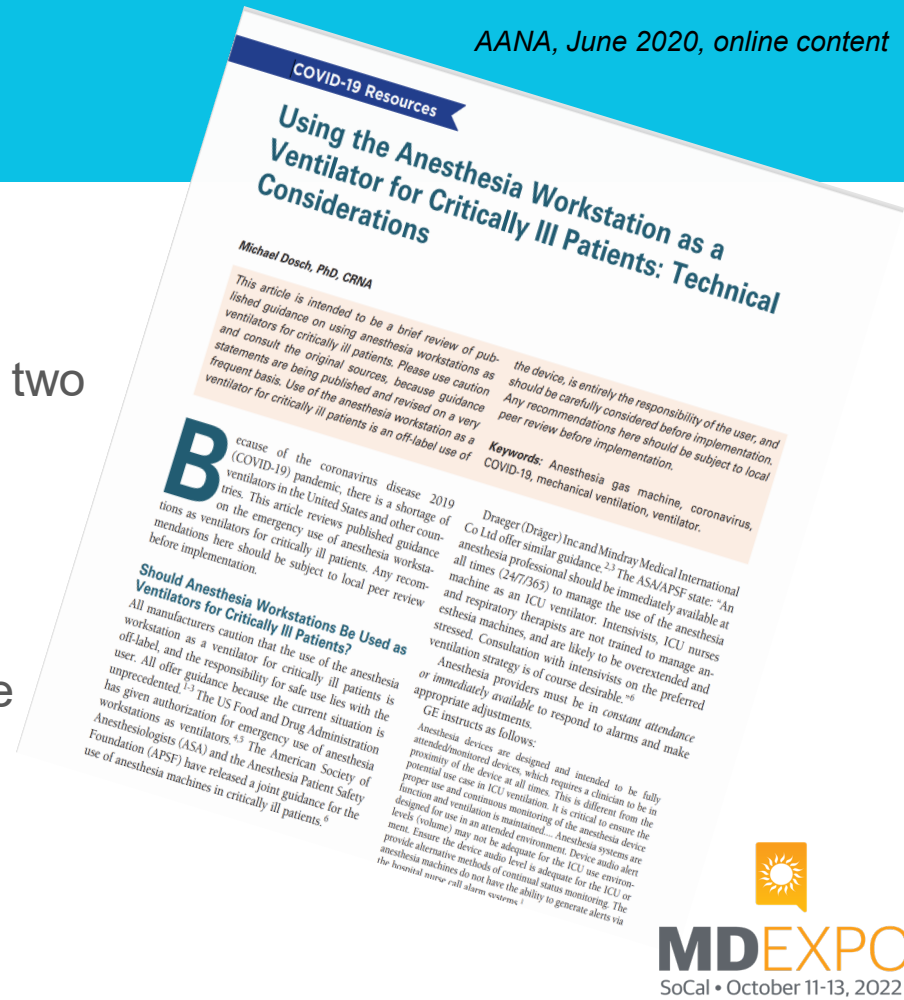


Lessons Learned (cont.)

AANA, June 2020, online content

- **Creative Thinking**

- Modification of vents to support two patients
- Converting external vents to invasive vents
- Anesthesia machines as vents
- Intubation tents
- Homemade and 3D printed face shields
- N95 mask sterilization



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Lessons Learned (cont.)



- **Local and State Regulations Do's and Don'ts**
- **Inventory Control**
 - How organized are you within the hospital?
 - Repurposing decommissioned equipment
- **Champions for different initiatives**
 - SMEs
- **Playbook document**



Lessons Learned (cont.)



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- **Staffing competencies**
 - Labor Pool
- **Equipment standardization**
 - Sharing resources, labor, parts
- **Community support**
 - Donated and loaner ventilators
 - Urine output measurement devices
 - Consumables (masks and other PPE)



Our path to success during the pandemic surges was the direct result of multi-disciplinary teams coming together and each bringing their best.

Thank You!