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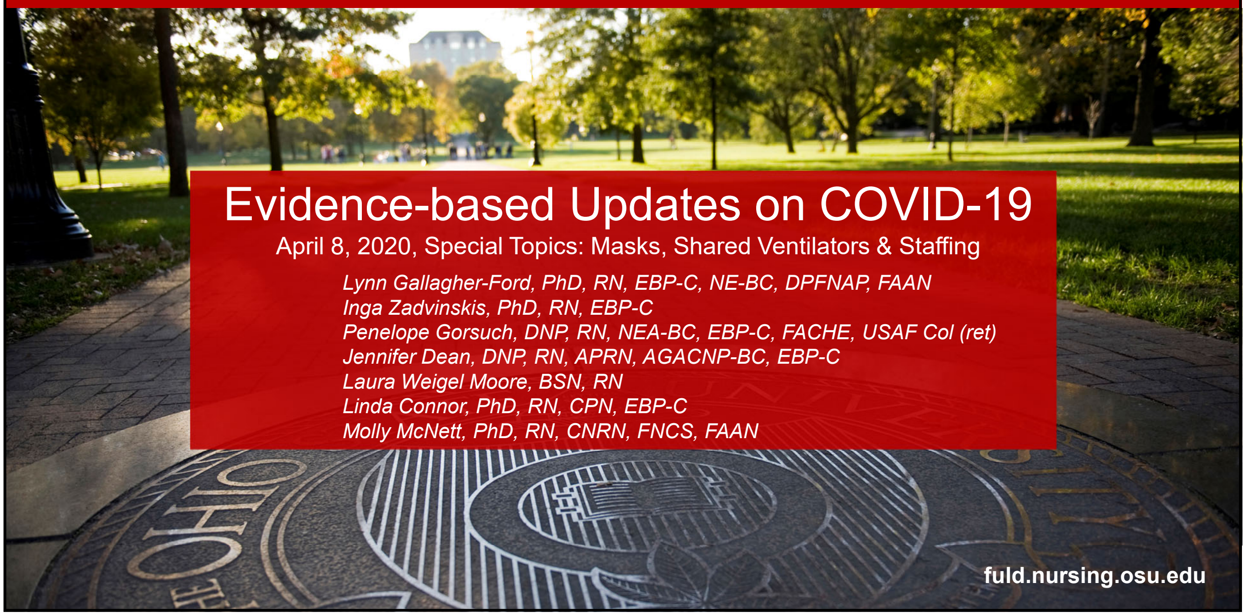

Evidence-based Updates on COVID-19

April 8, 2020, Special Topics: Masks, Shared Ventilators & Staffing

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Spirit of Inquiry

Colleagues are wondering….

- *Is there any evidence about whether to use a **homemade cloth face mask**…and of so, what's the best way to make them?*
- *Is there a safe way to put more than one patient on a single **ventilator**?*
- *Is there any evidence about the best way to provide healthcare **staffing** during a pandemic?*
- *Is there any evidence about "**proning** patients" (positioning them on their stomachs) with COVID-19 before intubation?*
- *What are the best practices for **postmortem care** of COVID-19 patients…for the hospital morgue and funeral homes?*

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COVID-19 Special Topics for Today

1) Homemade cloth face masks
   (Lynn Gallagher-Ford & Inga Zadvinskis)


2) Ventilator sharing during a pandemic
   (Penny Gorsuch & Jennifer Dean &
   Laura Weigel Moore)



3) ICU staffing during a pandemic
   (Molly McNett & Linda Connor)


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Homemade Cloth Face Masks

Lynn Gallagher-Ford
Inga Zadvinskis

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Homemade cloth face masks

- Recommendations for healthcare workers
- Recommendations for consumers

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Based on the current evidence, the Fuld Institute for EBP **recommends and supports the provision of personal protective equipment (PPE) for healthcare workers (HCWs) at all points of care and that HCWs use appropriate PPE consistently and correctly rather than homemade cloth face masks.**

HCWs should consider homemade cloth face masks only as a last resort.

(03/31/2020)

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Respirator: (N95 masks) A tight-fitting, fit-tested, **personal protective device** that filters out at least 95% of particles (including bacteria and viruses) from the air to protect the wearer.

Surgical mask: A loose-fitting, commercially made, disposable device that creates a physical barrier over the mouth and nose of the wearer **to protect others from the wearer's respiratory emissions** and to protect the wearer against large droplets or sprays.

Homemade cloth face mask: A loose-fitting, homemade device that creates a physical barrier over the mouth and nose of the wearer **to protect others from the wearer's respiratory emissions** and to protect the wearer from inhaling particles in the environment.

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How do N95 respirators, surgical masks, and homemade cloth face masks differ in terms of their protection against the transmission of respiratory particles?

1. **An N95 respirator provides adults with**
   - **25x** the protection of surgical masks and
   - **50x** the protection of homemade cloth face mask (van der Sande et al., 2008)
2. **Surgical masks offer about**
   - **2x** the protection of homemade cloth face masks (van der Sande et al., 2008)
3. **Homemade cloth face masks provides the wearer with**
   - some protection from particles in the environment

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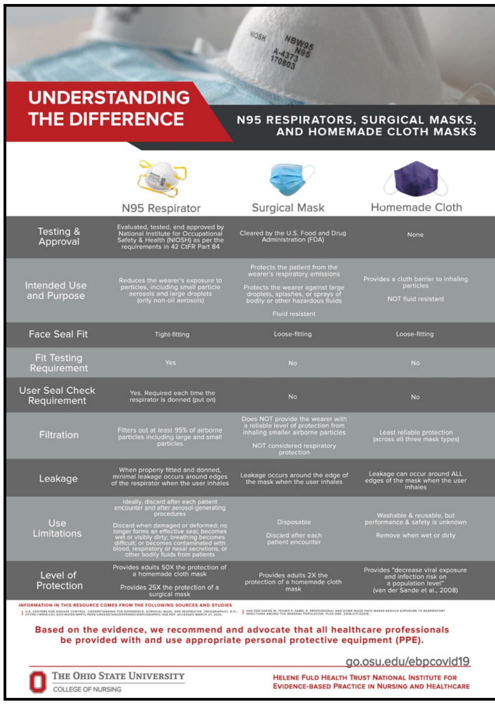

UNDERSTANDING THE DIFFERENCE

N95 RESPIRATORS, SURGICAL MASKS, AND HOMEMADE CLOTH MASKS

	N95 Respirator	Surgical Mask	Homemade Cloth
Testing & Approval	Evaluated, tested, and approved by National Institute for Occupational Safety & Health (NIOSH) as per the requirements in 42 CtFR Part 84	Cleared by the U.S. Food and Drug Administration (FDA)	None
Intended Use and Purpose	Reduces the wearer's exposure to particles, including small particle aerosols and large droplets (only non-oil aerosols)	Protects the patient from the wearer's respiratory emissions Protects the wearer against large droplets, splashes, or sprays of bodily or other hazardous fluids Fluid resistant	Provides a cloth barrier to inhaling particles NOT fluid resistant
Face Seal Fit	Tight-fitting	Loose-fitting	Loose-fitting
Fit Testing Requirement	Yes	No	No
User Seal Check Requirement	Yes. Required each time the respirator is donned (put on)	No	No
Filtration	Filters out at least 95% of airborne particles including large and small particles	Does NOT provide the wearer with a reliable level of protection from inhaling smaller airborne particles NOT considered respiratory protection	Least reliable protection (across all three mask types)
Leakage	When properly fitted and donned, minimal leakage occurs around edges of the respirator when the user inhales	Leakage occurs around the edge of the mask when the user inhales	Leakage can occur around ALL edges of the mask when the user inhales
Use Limitations	Ideally, discard after each patient encounter and after aerosol-generating procedures Discard when damaged or deformed; no longer forms an effective seal; becomes wet or visibly dirty; breathing becomes difficult; or becomes contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients	Disposable Discard after each patient encounter	Washable & reusable, but performance & safety is unknown Remove when wet or dirty
Level of Protection	Provides adults 50X the protection of a homemade cloth mask Provides 25X the protection of a surgical mask	Provides adults 2X the protection of a homemade cloth mask	Provides "decrease viral exposure and infection risk on a population level" (van der Sande et al., 2008)

INFORMATION IN THIS RESOURCE COMES FROM THE FOLLOWING SOURCES AND STUDIES

Based on the evidence, we recommend and advocate that all healthcare professionals be provided with and use appropriate personal protective equipment (PPE).

go.osu.edu/ebpcovid19

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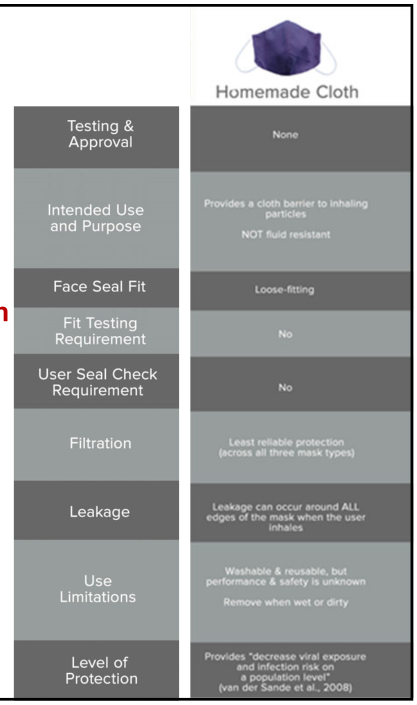
The CDC Infographic with homemade cloth face mask information added

go.osu.edu/ebpcovid19



	Homemade Cloth
Testing & Approval	None
Intended Use and Purpose	Provides a cloth barrier to inhaling particles NOT fluid resistant
Face Seal Fit	Loose-fitting
Fit Testing Requirement	No
User Seal Check Requirement	No
Filtration	Least reliable protection (across all three mask types)
Leakage	Leakage can occur around ALL edges of the mask when the user inhales
Use Limitations	Washable & reusable, but performance & safety is unknown Remove when wet or dirty
Level of Protection	Provides "decrease viral exposure and infection risk on a population level" (van der Sande et al., 2008)

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Should healthcare workers wear a homemade cloth face mask during a pandemic if nothing else is available?

Yes, if nothing else is available.

HCWs with good adherence to wearing a mask or respirator had a lower risk of respiratory infection (Yang et al., 2011).

Recommendations:

- Be vigilant about other infection-prevention measures (hand hygiene, not touching eyes or mask) because masks can give a false sense of security
- To protect against the ***potential increased risk of infection with a homemade cloth mask***
  - Remove when the mask becomes moist
  - Only reuse if/when the mask has been appropriately laundered

(MacIntyre et al., 2015)

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"The protective effect of masks is created through a ***combined effect*** of the transmission-blocking potential of the material, the fit and related air leakage of the mask, and the degree of adherence to proper wearing and disposal of masks"

(van der Sande et al., 2008).

Fit and filtration make the difference!

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Table 1. Synthesis Table: Level of Evidence regarding the Use of Homemade Cloth Face Masks in Healthcare Workers (HCWs)

	1	2	3	4	5	6	7	8	9	10	11
	WHO (2020)	CDC (2020)	Mac-Intyre et al. (2015)	Jung et al. (2014)	Van der Sande et al. (2008)	Chughtai, Seale, & MacIntyre (2013)	Davies et al. (2013)	Offeddu et al. (2017)	Patel et al. (2019)	Dato et al. (2006)	Yang et al. (2010)
Level I: Systematic review or meta-analysis											
Level II: Randomized controlled trial (RCT)			X								
Level III: Controlled trial without randomization											
Level IV: Case-control or cohort study											
Level V: Systematic review of qualitative or descriptive studies						X		X			
Level VI: Qualitative or descriptive study, CPG, Lit Review, QI or EBP project				X	X		X				X
Level VII: Expert opinion	X	X							X	X	

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Table 2. Synthesis Table: Evidence regarding the Use of Homemade Cloth Face Masks in Healthcare Workers (HCWs)

	1	2	3	4	5	6	7	8	9	10	11
	WHO (2020)	CDC (2020)	Mac-Intyre et al. (2015)	Jung et al. (2014)	Van der Sande et al. (2008)	Chughtai, Seale, & MacIntyre (2013)	Davies et al. (2013)	Offeddu et al. (2017)	Patel et al. (2019)	Dato et al. (2006)	Yang et al. (2010)
No	X		X[b]	X[c]				X[d]			
Yes, **during a crisis or pandemic situation**		X[a]			X		X[a]		X[e]	X	
Possibly (evidence gap)						X					X

LEGEND: a = when nothing else is available; b= due to increase in infection;
c = conducted under experimental conditions; d=cited MacIntyre et al. (2015);
e = cited Davies et al. (2013)

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Recommendations for Consumers

Wearing a homemade cloth face mask does NOT provide complete protection

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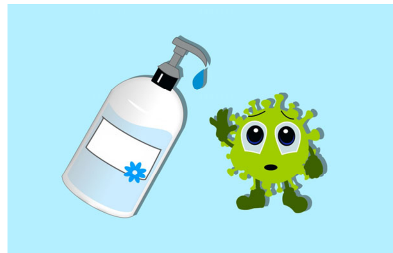
Recommendations for Consumers



1. Stay home!
- *Avoid exposure*
- *Decrease spread (without knowing it)*

2. Wash your hands

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Checklist: How to Make a Homemade Cloth Face Mask Work Better based on Science

	Actions
✓	Wash your hands before putting on and after taking off a mask
✓	Distance yourself (physically) from people
✓	Design purposefully
✓	Select a fabric that is stretchy, soft, and has a tight weave
✓	Remove mask when damp because moisture affects filtration
✓	Consider using a pantyhose tube (open on both ends) to hold the face mask in place to prevent air leakage

For references, see: go.osu.edu/ebpcovid19

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Homemade Face Masks

Fabric Recommendations

- Research results vary
- Consider using a:
  - Hanes sweatshirt material (Rengasamy et al., 2010)
  - Tea towel (van der Sande et al., 2008, Davies et al., 2013)
  - Cotton blend t-shirt (Davies et al., 2013)
- *The **FIT** is probably more important than the fabric*

Image by Pezibear from Pixabay

Davies A, Thompson KA, Giri K, Kafatos G, Walker J, Bennett A. Testing the efficacy of homemade masks: Would they protect in an influenza pandemic? Disaster Medicine and Public Health Preparedness. 2013;7(4):413-418.

Rengasamy S, Eimer B, Shaffer RE. Simple respiratory protection—Evaluation of the filtration performance of cloth masks and common fabric materials against 20–1000 nm size particles. Annals of Occupational Hygiene. 2010;54(7):789-798.

van der Sande M, Teunis P, Sabel R. Professional and home-made face masks reduce exposure to respiratory infections among the general population. PLos One. 2008;3(7):e2618.

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Homemade Face Masks

Other Design Recommendations

- Fit the mask snugly around the nose & mouth (Chughtai et al., 2013, & Davies et al., 2013)
- Use a cone or tetrahedral shaped pattern (filters the most *air pollution* particles) (Shakya et al., 2017)
- Remember: Any mask is better when the seal on the face is good (Cherrie et al., 2018)

Cloth Mask1

Image from Shakya et al., 2017

Cherrie JW, Apsley A, Cowie H, et al. Effectiveness of face masks used to protect Beijing residents against particulate air pollution. Occupational Environmental Medicine. 2018;75:446-452.

Chughtai AA, Seale H, MacIntyre CR. Use of cloth masks in the practice of infection control - Evidence and policy gaps. International Journal of Infection Control. 2013;9(3).

Davies A, Thompson KA, Giri K, Kafatos G, Walker J, Bennett A. Testing the efficacy of homemade masks: Would they protect in an influenza pandemic? Disaster Medicine and Public Health Preparedness. 2013;7(4):413-418.

Shakya KM, Noyes A, Kallin R, Peltier RE. Evaluating the efficacy of cloth facemasks in reducing particulate matter exposure. Journal of Exposure Science and Environmental Epidemiology. 2017;27(3):352-357.

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Homemade Face Masks

IF you make a rectangular-shaped mask

- Use pleats to improve filtration efficiency (Quesnel, 1975)
- Create a mask that extends far back over the cheeks and under the chin to prevent leakage (Quesnel, 1975)

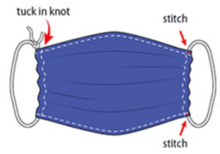

Image by Pezibear from Pixabay

Quesnel LB. The efficiency of surgical masks of varying design and composition. BJS (British Journal of Surgery). 1975;62(12):936-940.

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Ventilator Sharing

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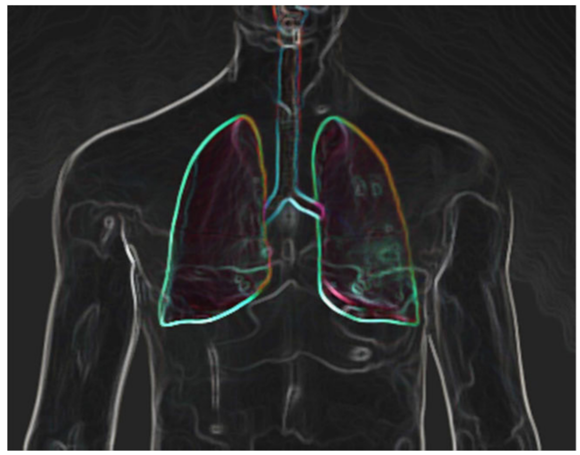
Multiple patients to one ventilator

- Not studied in humans
- Literature:
  - Simulation or sheep
  - Maximum of 12 hours
- Concerns:
  - Microbial cross contamination
  - Lung compliance
  - PEEP & Tidal volume

(Neyman & Irvin, 2006; Paladino et al., 2008)



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Consensus Statement on Multiple Patients per Ventilator
March 26, 2020

The SCCM, AARC, ASA, APSF, AACN, and CHEST issued this consensus statement on the concept of placing multiple patients on a single mechanical ventilator.

- The above-named organizations advise clinicians that sharing mechanical ventilators should not be attempted because it **cannot** be done safely with current equipment.
- The physiology of patients with COVID-19-onset acute respiratory distress syndrome (ARDS) is complex.
- Even in ideal circumstances, ventilating a single patient with ARDS and nonhomogeneous lung disease is difficult and is associated with a **40%-60% mortality rate**.

Retrieved from https://www.sccm.org/Disaster/Joint-Statement-on-Multiple-Patients-Per-Ventilator

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AGILITIES Scoring System

General guidelines and AGILITIES Scoring System

Recommended guidelines for framers of federal, state, local, and institutional medical resource allocation plans (mechanical ventilators).

Wilkens, E. P., & Klein, G. M. (2010). Mechanical ventilation in disaster situations: A new paradigm using the AGILITIES score system. *American Journal of Disaster Medicine, 5*(6), 369-384.

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Sequential (Sepsis-Related) Organ Failure Assessment (SOFA) Score

- Evaluates the severity of the patient’s illness with an assessment of six organ systems
  - Daily assigns 1 to 4 points depending on level of dysfunction: respiratory, circulatory, renal, hematology, hepatic and CNS
- Predictor of short-term & long-term mortality
- △SOFA is a greater predictor of mortality than a fixed SOFA score
  - Literature is mixed on timeframe
- SOFA Score >2 is a higher risk for mortality
- In COVID-19, elevated SOFA, advanced age and d-dimer >1µg/mL can identify those with a poor prognosis

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CriSTAL

- Criteria for Screening and Triaging Appropriate aLternative care
- Identify elderly who would benefit from end of life care
  - Age ≥ 65
  - VS
  - Blood glucose, urinalysis
  - Medical history
  - Frailty assessment
  - ECG
- Rapid response inpatient
  - Score >6

(Cardona-Morrell & Hillman, 2015; Cardona et al., 2018; Cardona et al., 2019)

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Framework for allocation of mechanical ventilation

1. Likelihood for short term survival
2. Likelihood of long-term survival

- Pregnancy
- Consider life stage
- Exclusion

TABLE 1] Proposed Strategy for Ventilator Allocation in Epidemics of Novel Respiratory Pathogens

Principle	Specification	Point System 1	2	3	4
Prognosis for short-term survival	Adults (SOFA) or pediatrics (PELOD-2)	SOFA score ≤ 8	SOFA score 9-11	SOFA score 12-14	SOFA score > 14
		PELOD-2 ≤ 12	PELOD-2 12-13	PELOD-2 14-16	PELOD-2 ≥ 17
Prognosis for long-term survival	Prognosis for long-term survival (assessment of comorbid conditions)	...	...	Severe comorbid conditions; death likely within 1 y	...
Secondary consideration					
Lifecycle considerations	Prioritize those who have had the lease chance to live through life's stages (age)	Age 0-49 y	Age 50-69 y	Age 70-84 y	Age ≥ 85 y

Examples of severe comorbid conditions with associated life expectancy < 1 year are listed. This list is meant as a guideline and is not exhaustive. Patients meeting the criteria of < 1 y predicted survival based on what of the listed or other similar conditions should be assigned a score of 3. NYHA = New York Heart Association.
1. NYHA class IV heart failure.
2. Advanced lung disease with FEV_1 < 25% predicted, total lung capacity < 60% predicted, or baseline P_{AO_2} < 55 mm Hg.
3. Primary pulmonary hypertension with NYHA class III or IV heart failure.
4. Chronic liver disease with Child-Pugh score > 7.
5. Severe trauma.
6. Advanced untreatable neuromuscular disease.
7. Metastatic malignant disease or high-grade primary brain tumors.

(Biddison et al., 2019)

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Pediatric Triage Considerations

Many disaster management plans do not fully incorporate pediatric patients into the disaster planning process (Hamele, 2018)

- Tools are available for:
  - Assessing healthcare resource consumption
  - Predicting risk of mortality in pediatrics

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AGILITIES in Pediatrics

•AGILITIES tool differs from the validated pediatric mortality risk tools because the score assesses resource utilization rather than mortality risk (Wilkens & Klein, 2010)

•Advantages:

1. **No age limitation**
2. No laboratory values (quick!)
3. Continuous assessment

•Assesses: relative health, duration of time on mechanical ventilation, and patient's use of resources and provider's time during a crisis to determine a triage score (Wilkens & Klein, 2010)

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Pediatric Mortality Predication Tools

•Valid tools are available to assess pediatric **mortality risk** (Ramazani & Hosseini, 2019; Kim et al., 2013)

•Some states use one of the tools in the pediatric triage guidelines (NY state, 2015; Biddison et al., 2019)

Limitations:

1. Not valid tools for triage-only have been validated in pediatric intensive care unit
2. Require laboratory test results for assessment (time)
3. Pediatric mortality rates are relatively low-may not decrease demand of resources

(Gall et al., 2016)

	PELOD-2	PIM3	PRISM III
Validated Tool for PICU setting	x	x	x
Validated Tool for Triage			
Annual License Required ($)			x
Calculates Mortality Risk		x	x
Calculates Severity of Multiple Organ Dysfunction	x		
Timeframe Assessed	Throughout	Admission	Admission
Laboratory Tests Needed	x	x	x

(Leteurtre et al., 2013; Straney et al., 2013; Kim et al., 2012)

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PEdiatric Logistic Organ Dysfunction Score

PELOD-2

TABLE 6. Scoring the Pediatric Logistic Organ Dysfunction-2 Score

Organ Dysfunctions and Variables[a]	Points by Severity Levels						
	0	1	2	3	4	5	6
Neurologic[b]							
Glasgow Coma Score	≥ 11	5–10			3–4		
Pupillary reaction	Both reactive					Both fixed	
Cardiovascular[c]							
Lactatemia (mmol/L)	< 5.0	5.0–10.9			≥ 11.0		
Mean arterial pressure (mm Hg)							
0 to < 1 mo	≥ 46		31–45	17–30			≤ 16
1–11 mo	≥ 55		39–54	25–38			≤ 24
12–23 mo	≥ 60		44–59	31–43			≤ 30
24–59 mo	≥ 62		46–61	32–44			≤ 31
60–143 mo	≥ 65		49–64	36–48			≤ 35
≥ 144 mo	≥ 67		52–66	38–51			≤ 37
Renal							
Creatinine (μmol/L)							
0 to < 1 mo	≤ 69		≥ 70				
1–11 mo	≤ 22		≥ 23				
12–23 mo	≤ 34		≥ 35				
24–59 mo	≤ 50		≥ 51				
60–143 mo	≤ 58		≥ 59				
≥ 144 mo	≤ 92		≥ 93				
Respiratory[d]							
Pao_2 (mm Hg)/Fio_2	≥ 61		≤ 60				
$Paco_2$ (mm Hg)	≤ 58	59–94		≥ 95			
Invasive ventilation	No			Yes			
Hematologic							
WBC count (× 10^9/L)	> 2		≤ 2				
Platelets (× 10^9/L)	≥ 142	77–141	≤ 76				

[a]All variables must be collected, but measurements can be done only if justified by the patient's clinical status. If a variable is not measured, it should be considered normal. If a variable is measured more than once in 24 hr, the worst value is used in calculating the score. Fio_2: fraction of inspired oxygen.

[b]Neurologic dysfunction: Glasgow Coma Score: use the lowest value. If the patient is sedated, record the estimated Glasgow Coma Score before sedation. Assess only patients with known or suspected acute central nervous system disease. Pupillary reactions: nonreactive pupils must be > 3 mm. Do not assess after iatrogenic pupillary dilatation.

[c]Cardiovascular dysfunction: Heart rate and mean arterial pressure: do not assess during crying or iatrogenic agitation.

[d]Respiratory dysfunction: Pao_2: use arterial measurement only. Pao_2/Fio_2 ratio is considered normal in children with cyanotic heart disease. $Paco_2$ can be measured from arterial, capillary, or venous samples. Invasive ventilation: the use of mask ventilation is not considered invasive ventilation.

Logit (mortality) = –6.61 + 0.47 × PELOD-2 score.

Probability of death = 1/(1 + exp [–logit(mortality)]).

- **Variables:**
  - **Neurologic*:** GSC & pupillary reaction
  - **Cardiovascular:** Lactatemia & MAP
  - **Renal:** Creatinine
  - **Respiratory*:** PaO2, PaCO2, & Invasive ventilation
  - **Hematologic:** WBC count, & Platelets
- Scores range from 0 (best) to 33 (worst)
- Equation available to calculate probability of death

(Leteurtre et al., 2013)

*=highest contribution to mortality according to multiple regression score

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Staffing ICUs During Pandemic, Disaster and Crisis Conditions

Molly McNett
Linda Connor

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Staffing Models

Abundant literature on staffing ratios and impact on patient, clinician, organizational outcomes that can inform recommendations during "usual care".

However, we are not in a state of "usual care"

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Staffing Models

What are recommendations during a pandemic?

Level of Evidence:

Observational

Expert Opinion

Image credit: https://twitter.com/PannuJasleen

Based on previous pandemics, projected scope and impact of pandemic, resources, severity of disease

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Pandemic Staffing Models

Synthesis of Evidence: ICU Staffing During Pandemic, Disaster and Crisis Conditions

	1	2	3	4	5
	Society for Critical Care Medicine, 2020	Department of Defense, 2020	CHEST Consensus Statement Hick et al., 2014	CHEST Consensus Statement Einay et al., 2014	Sandrock, et al., 2010
Care team model	X	X	X	X	X
Expand clinician expertise (Expand the scope of practice pharmacist role, train non-ICU staff to provide ventilator care)	X	X	X		X
Tiered staffing strategy (see Figure 1)	X	X			
Limit routine services (elective surgery, clinic visits)			X	X	
Curtail administrative and teaching responsibilities			X		
Cancel staff vacation and leaves			X		
New divisions of labor (reassign staff) based on the skill sets needed rather than traditional roles or functions of providers	X		X		
Assess resource commitments based on Treater, Time, Treatment and Threat (see Table 2)		X	X		

Legend: X = Recommended practice

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Recommendations for Intensive Care Unit (ICU) Staffing in Pandemic, Disaster and Crisis Conditions

Based on the evidence, we recommend

- Implement a care team model
- Expand clinician expertise
- Use a tiered staffing strategy
- Limit routine services
- Curtail administrative and teaching responsibilities
- Cancel staff vacation and leaves
- Reassign staff

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Pandemic Staffing Models

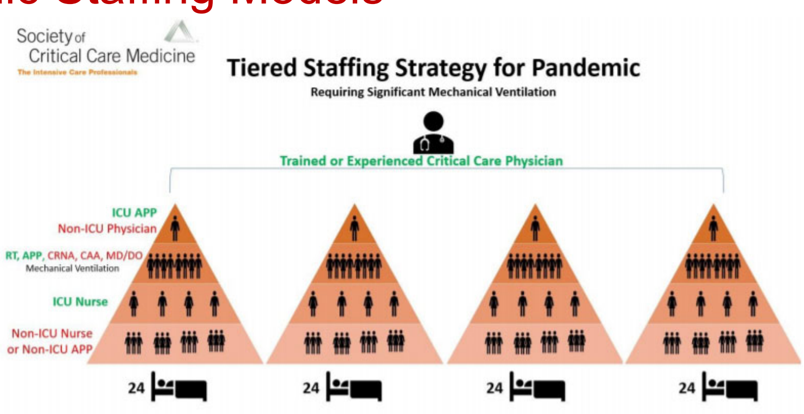

Image source:
Society of Critical Care Medicine (SCCM) https://sccm.org/Blog/March-2020/United-States-Resource-Availability-for-COVID-19
& Ontario Health Plan for an Influenza Pandemic http://www.cidrap.umn.edu/sites/default/files/public/php/21/21_report.pdf

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Key Components to Consider When Assessing Resource Commitments

Component	Details
Treater	The amount of staff expertise required to provide critical care
Time	The amount of staff time required to manage the patients
Treatment	The amount of resources required to manage the patients
Threat	Any risks to the provider or patient generated by the situation due to infrastructure damage, imminent dangers to providers and patients, or a high risk of disease transmission without appropriate personal protective equipment (PPE) available

Hick et al., 2014.

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Synthesis of Evidence: Strategies to Support Staff During Pandemic, Disaster and Crisis Conditions

	1	2	3	4	5
	Society for Critical Care Medicine, 2020	Department of Defense, 2020	CHEST Consensus Statement Hick et al., 2014	CHEST Consensus Statement Einay et al., 2014	Sandrock, et al., 2010
Provide childcare support for staff	X	X		X	
Provide on-site respite (food, quiet spaces)				X	X
Provide on-site housing				X	X
Vary the length of shifts				X	X
Drive staff to and from the hospital				X	X
Plan in advance			X		

Legend: X = Recommended practice

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Recommendations/Strategies for Intensive Care Unit (ICU) Staff Support During Pandemic, Disaster and Crisis Conditions

Based on the evidence, we recommend:

- Provide childcare support for staff
- Provide on-site respite (food, quiet space)
- Provide on-site housing
- Vary the length of shifts
- Drive staff to and from the hospital
- Plan in advance

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Innovation

Consider innovative solutions generated by ICU nurses in the field who are currently managing COVID-19 patients in order to achieve the following:

- Reduce unnecessary use of personal protective equipment (PPE)
- Promote staff safety and readiness
- Reduce foot traffic
  - Improve staffing ratios (isolation patients are 1:1)
  - Utilize a runner (a nurse who is not assigned a patient, but is designated to help 2-3 other nurses)
  - Clumping of activities (reduce # of times nurse has to enter the room, patient gets to rest)
  - Video monitoring (a camera in the room allows team to assess the patient while outside the room)
  - Use a team approach to consolidate care (1 person inside the room, one helper outside)

Newby, JC, Mabry MC, Carlisle BA, Olson D, Lan BE. Reflections on Nursing Ingenuity During the COVID-19 Pandemic. Journal of Neuroscience Nursing; 2020. DOI: 10.1097/JNN.000000000000052

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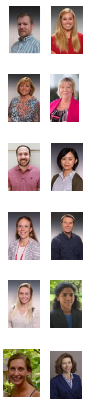
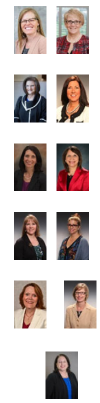


We believe that evidence is an especially powerful tool in a time like this. We hope that putting these evidence-based resources into your hands will help you make the best decisions possible while caring for COVID-19 patients and families.



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