

COVID-19 Considerations for Ambulatory Care

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Disclosures

- No relevant disclosures

Pathophysiology

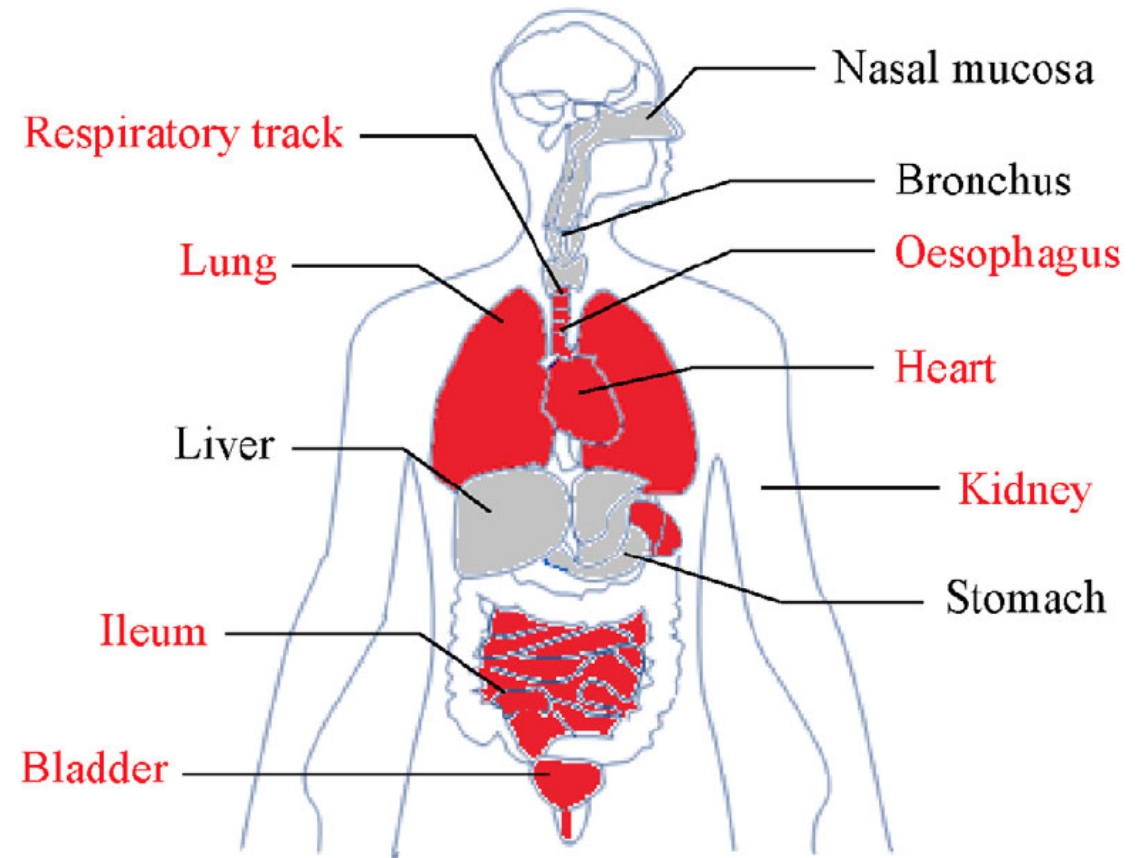
Transmission

Spike protein

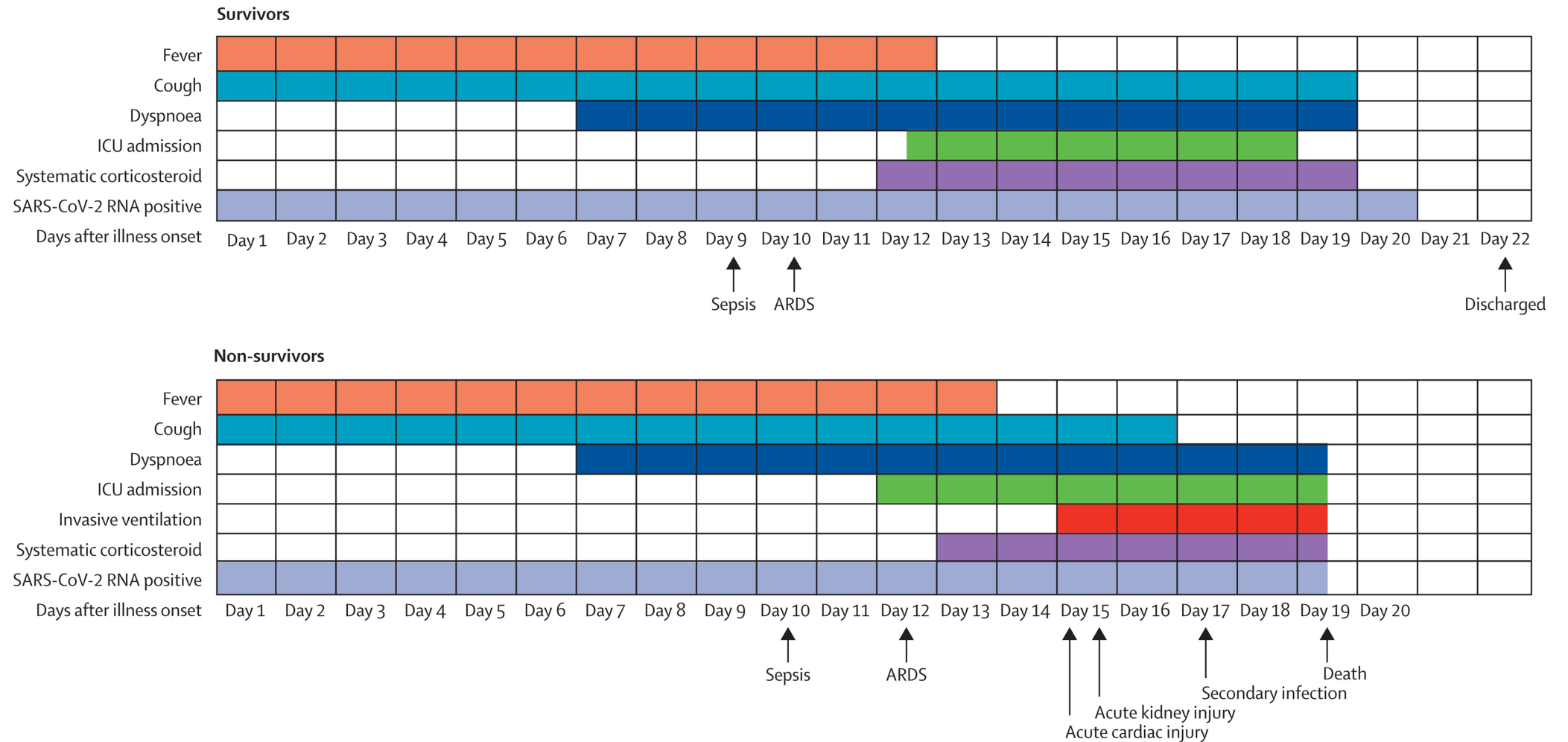
ACE2 Receptor

High relative receptor affinity

Alveolar pneumocytes
Stratified epithelial cells
Absorptive enterocytes



Clinical Course



Prone position

Indications

-↓ mortality (33% → 16%)

Logistics

Risks

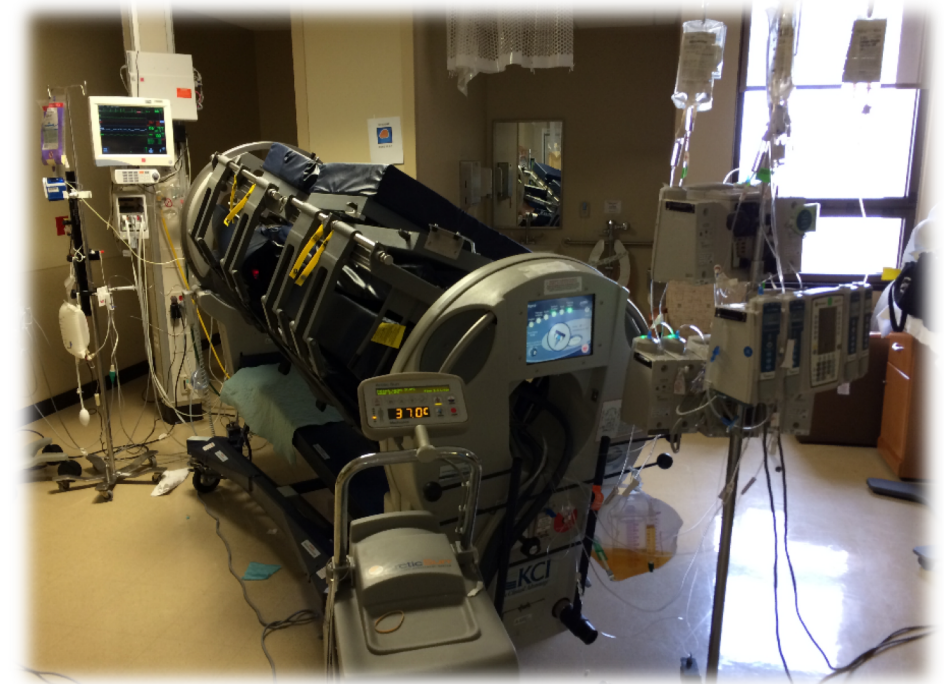
The **NEW ENGLAND**
JOURNAL *of* **MEDICINE**

ESTABLISHED IN 1812

JUNE 6, 2013

VOL. 368 NO. 23

Prone Positioning in Severe Acute Respiratory Distress Syndrome



Hypoxia Therapies

Always ↓ ventilator induced lung injury (VILI)

PEEP

Recruitment maneuvers

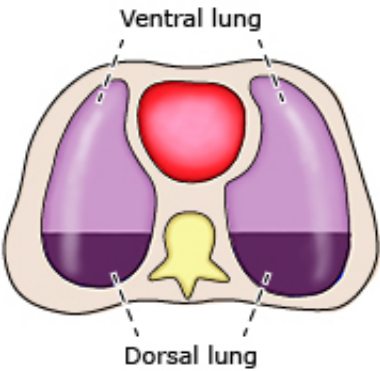
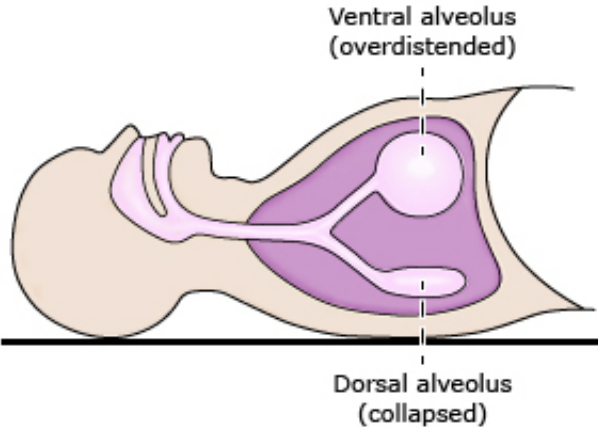

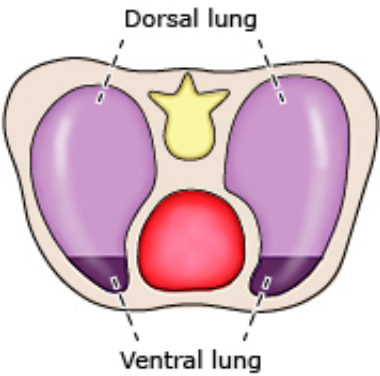
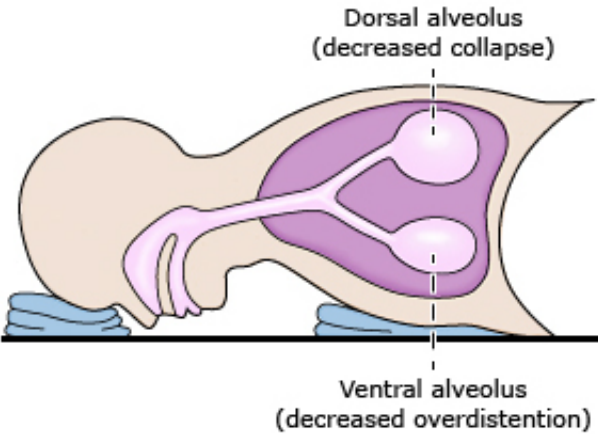

Prone (deep sedation) +/- NMB

Nitric oxide??

ECMO (V-V or V-A)



Worsening

		PTP	Blood flow
Supine position			
 <p>Ventral lung</p> <p>Dorsal lung</p>	 <p>Ventral alveolus (overdistended)</p> <p>Dorsal alveolus (collapsed)</p>	<p>+++</p> <p>---</p>	
Prone position			
 <p>Dorsal lung</p> <p>Ventral lung</p>	 <p>Dorsal alveolus (decreased collapse)</p> <p>Ventral alveolus (decreased overdistention)</p>	<p>+</p> <p>-</p>	

Transpulmonary Pressure: PTP

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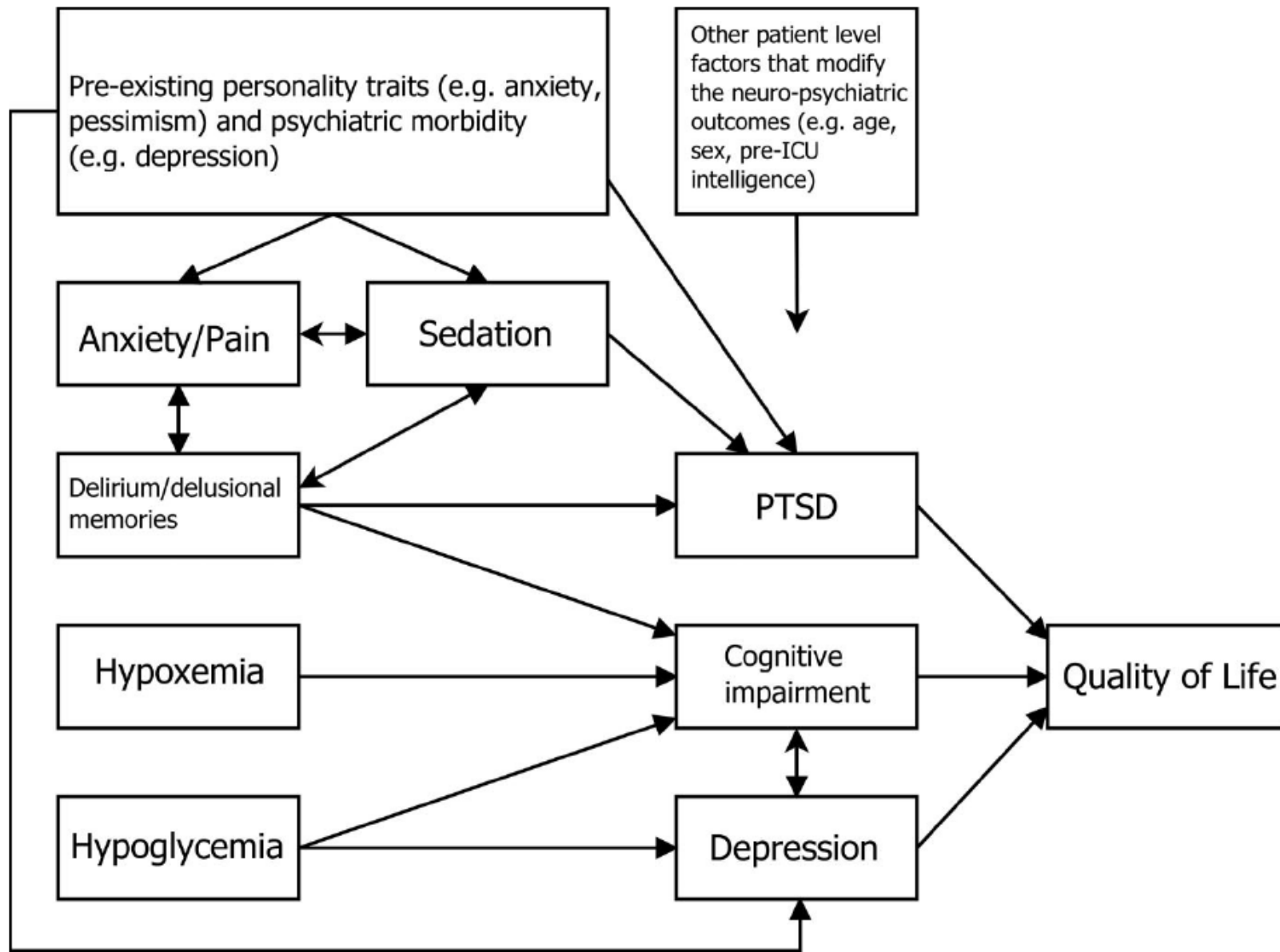
A.B.2

Critical Care Management Issues

- Sedation
- CV stability, access
- P-SILI (lung injury) prevention
- Nutrition
- AKI
- Nosocomial infection
- Methylprednisolone
- Mobilization

ICU Complications

- Neurological- 50% neuropathy
- Psychiatric- 1/3 PTSD, MDD
- ADLs- Early PT is key
- Cognitive- 75% ICU discharges
- Ongoing healthcare use
- **Anticoagulation...**
- **Renal dysfunction...**
- **Adrenal insufficiency...**



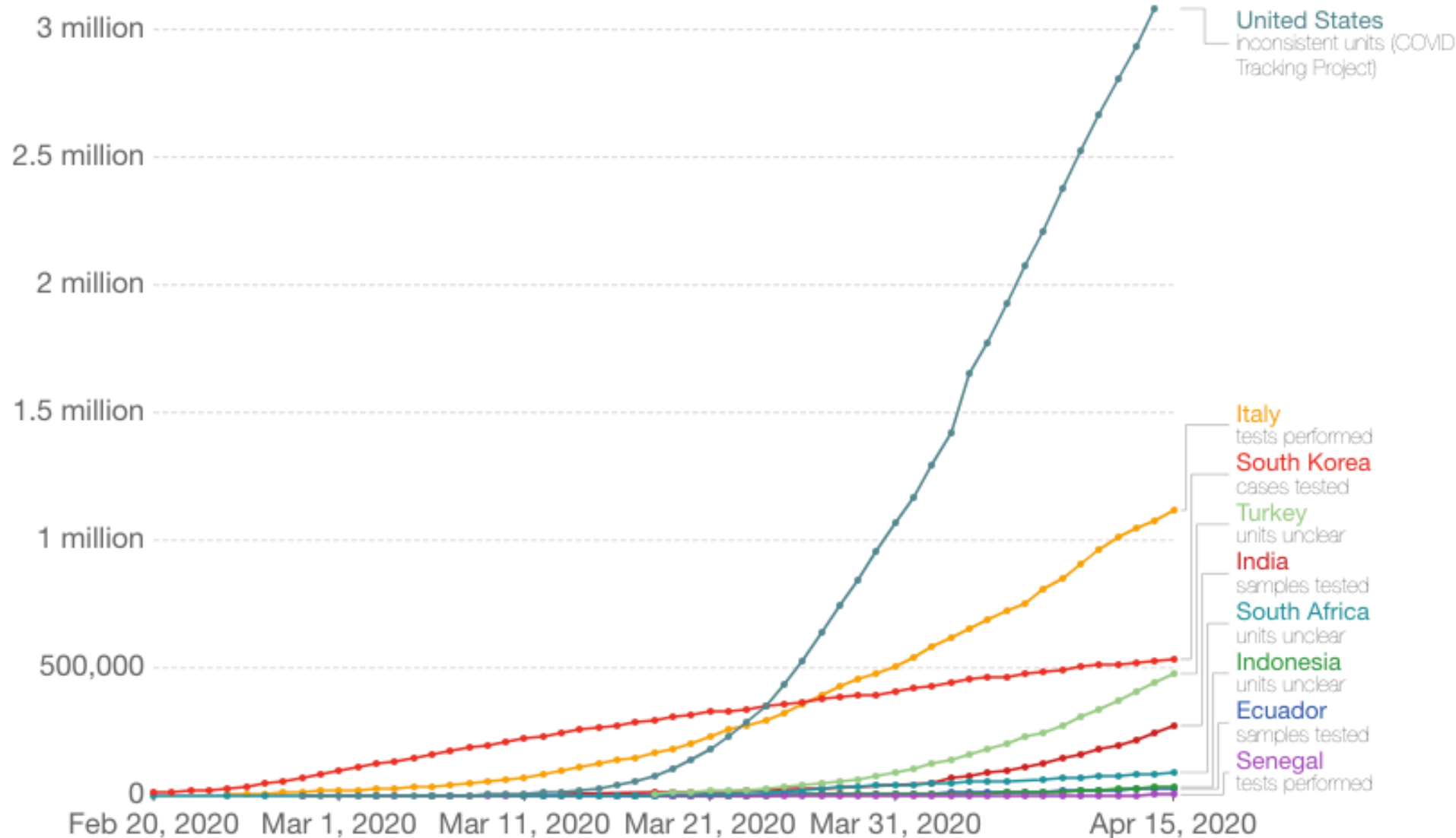
Chronic effects of prolonged ICU stay

- CCI 8% of ICU admissions in the US
 - Prolonged mechanical ventilation (72%) and sepsis (64%)
 - Chronic co-morbid conditions in 56% of CCI patients
- Fatigue common following ARDS
- PTSD
- Unclear relationship to OR respiratory function

Kahn JM, Le T, Angus DC, Cox CE, Hough CL, White DB, Yende S, Carson SS, Investigators PSG: The epidemiology of chronic critical illness in the United States*. Crit Care Med 2015; 43: 282-7

Neufeld KJ, Leoutsakos JS, Yan H, Lin S, Zabinski JS, Dinglas VD, Hosey MM, Parker AM, Hopkins RO, Needham DM: Fatigue Symptoms during the First Year after ARDS. Chest 2020

Total tests for COVID-19



Source: Official sources collated by Our World in Data

OurWorldInData.org/coronavirus • CC BY

Note: There are substantial differences across countries in terms of the units, whether or not all labs are included, the extent to which negative and pending tests are included and other aspects. Details for each country can be found at ourworldindata.org/covid-testing.



Table. The 28 Commercial SARS-CoV-2 in Vitro Diagnostic Assays Given an EUA From the FDA as of 4 April 2020

Date in 2020 That EUA Was Issued*	Manufacturer	Test Name	Test Type
Currently FDA authorized for use in clinical laboratories			
3 April	Luminex Corporation	ARIES SARS-CoV-2 Assay	NAAT
3 April	Co-Diagnostics	Logix Smart Coronavirus Disease 2019 (COVID-19) kit	NAAT
3 April	ScienCell Research Laboratories	SARS-CoV-2 Coronavirus Real-time RT-PCR (RT-qPCR) Detection Kit	NAAT
2 April	Becton, Dickinson and Company (BD)	BioGX SARS-CoV-2 Reagents for BD MAX System	NAAT
1 April	Ipsium Diagnostics	COV-19 IDx assay	NAAT
1 April	Cellex	qSARS-CoV-2 IgG/IgM Rapid Test	Lateral flow chromatographic immunoassay
30 March	NeuMoDx Molecular	NeuMoDx SARS-CoV-2 Assay	NAAT
30 March	QIAGEN GmbH	QIAstat-Dx Respiratory SARS-CoV-2 Panel	NAAT
27 March	Luminex Molecular Diagnostics	NxTAG CoV Extended Panel Assay	NAAT
26 March	BGI Genomics	Real-Time Fluorescent RT-PCR Kit for Detecting SARS-2019-nCoV	NAAT
25 March	Avellino Lab USA	AvellinoCoV2 test	NAAT
24 March	PerkinElmer	PerkinElmer New Coronavirus Nucleic Acid Detection Kit	NAAT
23 March	BioFire Defense	BioFire COVID-19 test†	NAAT
20 March	Primerdesign	COVID-19 genesig Real-Time PCR assay	NAAT
19 March	GenMark Diagnostics	ePlex SARS-CoV-2 Test	NAAT
19 March	DiaSorin Molecular	Simplexa COVID-19 Direct assay†	NAAT
18 March	Abbott Molecular	Abbott RealTime SARS-CoV-2 assay	NAAT

17 March	Quest Diagnostics Infectious Disease	Quest SARS-CoV-2 rRT-PCR	NAAT
17 March	Quidel Corporation	Lyra SARS-CoV-2 Assay	NAAT
16 March	LabCorp	COVID-19 RT-PCR test	NAAT
16 March	Hologic	Panther Fusion SARS-CoV-2 Assay	NAAT
13 March	Thermo Fisher Scientific	TaqPath COVID-19 Combo Kit	NAAT
12 March	Roche Molecular Systems	cobas SARS-CoV-2 Test	NAAT
29 February	Wadsworth Center, New York State Department of Public Health (CDC)	New York SARS-CoV-2 Real-time Reverse Transcriptase (RT)-PCR Diagnostic Panel	NAAT
4 February	CDC	2019-nCoV Real-Time RT-PCR Diagnostic Panel	NAAT

Currently FDA authorized for use outside the clinical laboratory environment

27 March	Abbott Diagnostics Scarborough	ID NOW COVID-19 assay	NAAT
23 March	Mesa Biotech	Accula SARS-CoV-2 Test	NAAT
20 March	Cepheid	Xpert Xpress SARS-CoV-2 test	NAAT

CDC = Centers for Disease Control and Prevention; EUA = Emergency Use Authorization; FDA = U.S. Food and Drug Administration; NAAT = nucleic acid simplification test; SARS-CoV-2 = severe acute respiratory syndrome-related coronavirus-2.

* Dates of EUA are indicated to highlight the speed with which the diagnostic landscape is changing. † Performed on instruments for which other assays from the same manufacturer have been FDA authorized for use outside the clinical laboratory environment, indicating the potential for a similar designation for SARS-CoV-2 assays in the future.

Local hospital testing example

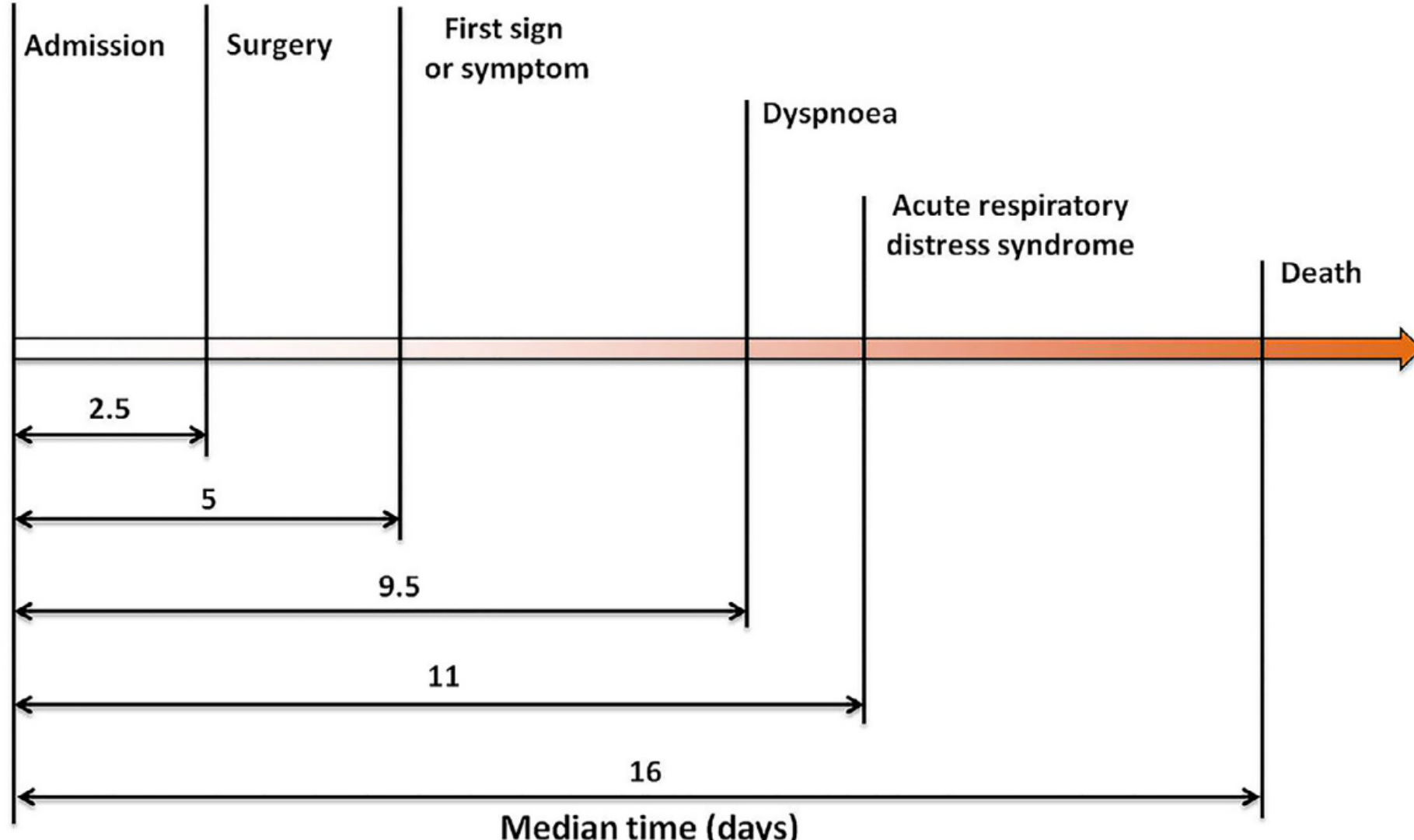
- 98.7% concordance between Abbott and RTPCR (Labcorp)
- 72% sensitivity, 97% specificity
- 84% PPV, 94% NPV
- Swabs & Tracheal Aspirates 100% concordant
- **Fever (> 100.4 °F), sore throat, cough, dyspnea, diarrhea, anosmia, dysgeusia, myalgia, diffuse pulmonary infiltrates, flu-like illness**

ASCs

- Vector control
- 15% UGI, 15% laparoscopy
- Airway management
- Regional anesthesia
- Steroid administration

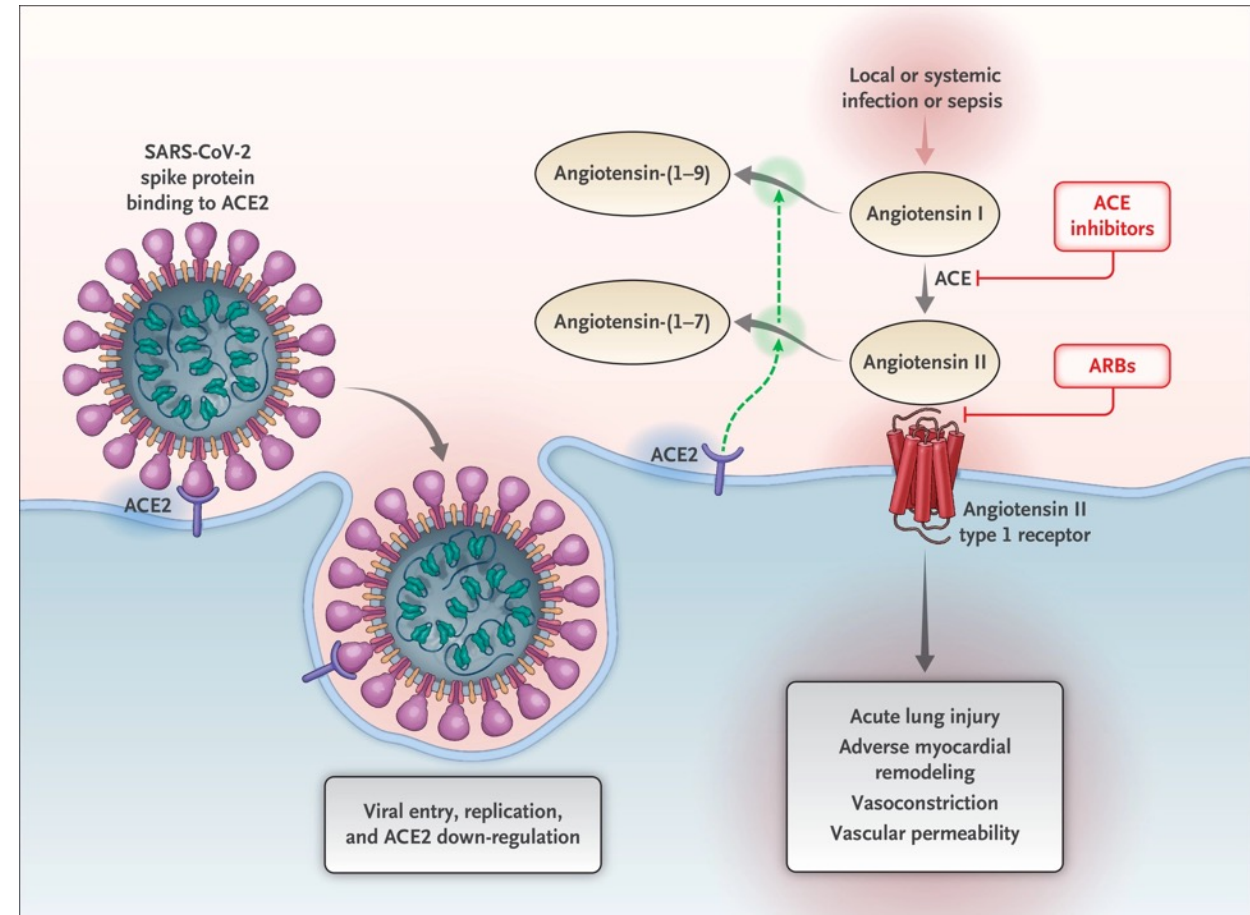
Elective Surgery Outcomes

- Lei et al, January 1- February 5, 2020
- 34 patients, asymptomatic when case started
- 100% PNA, 44.1% (15) ICU admission, 20.5% (7) deaths
 - Pancreatoduodenectomy
 - Esophagectomy
 - Thoracoscopic lobectomy x 2
 - Radical resection of rectal cancer
 - Artificial femoralhead replacement
 - Total hip replacement NA



Pre-operative Considerations

- ACE inhibitors
- NSAIDs
- Immune function (pre/post)
- Prophylaxis?



Summary

- Testing will be key to any ambulatory setting
- Multiorgan failure may have ramifications
- COVID-19 is particularly harmful in the perioperative setting
- Long-term effects under investigation