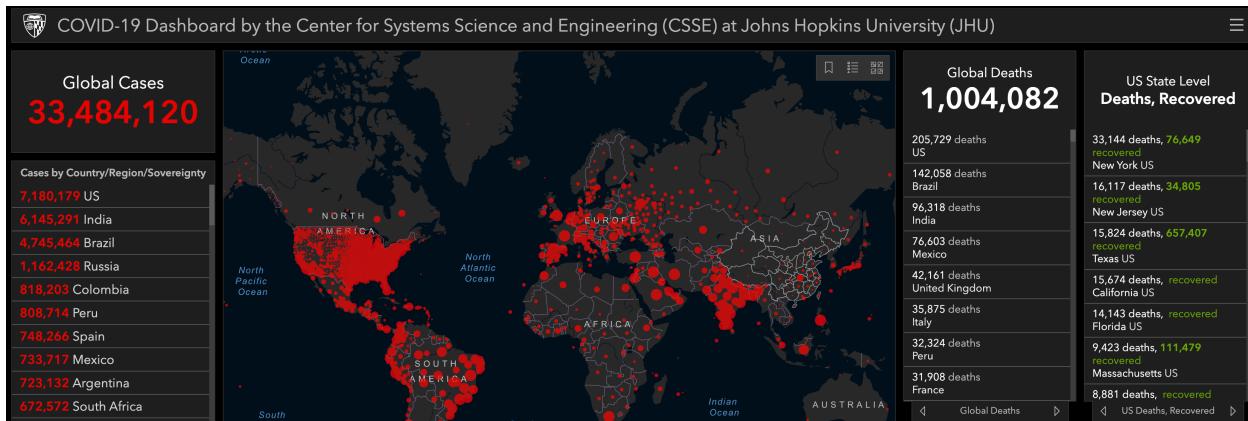
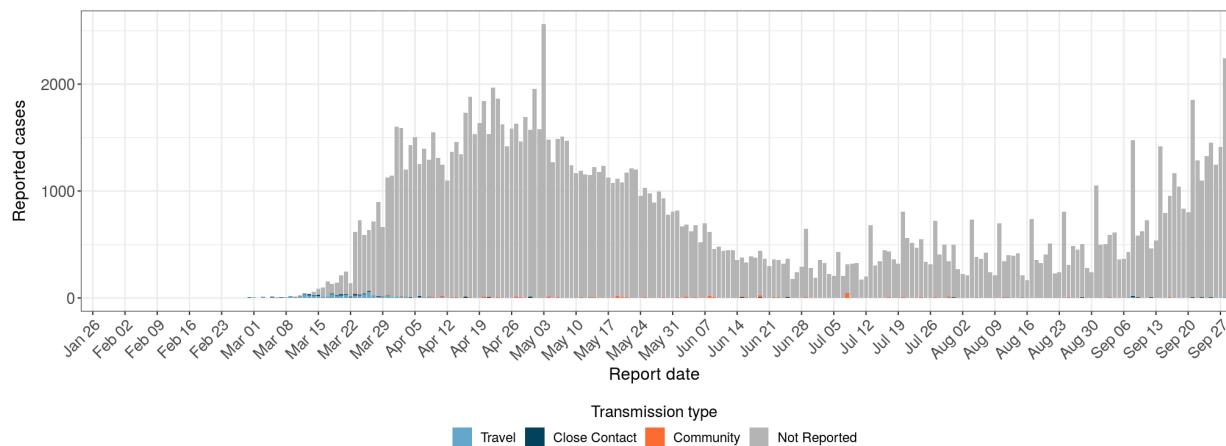


# BC Critical Care Network Update - September

## COVID LITERATURE



Reported cases in Canada (n = 157,478)



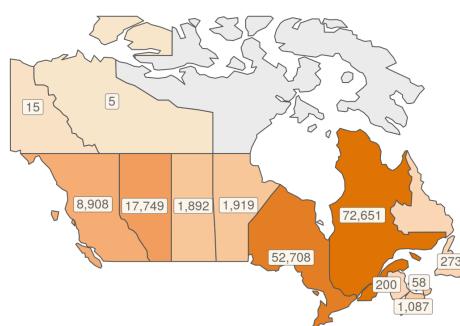
Repatriated cases are included in the Canada-wide total.



Last updated: 2020-09-28 20:30 EDT

Daily update notes (click + to expand)

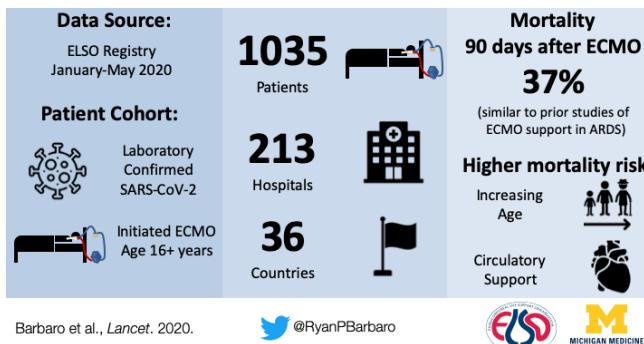
Reported cases are cumulative and include both confirmed and presumptive positive cases. Repatriated cases are included in the total but not shown in the map below.



## ECMO Outcome

In this recent [Lancet article](#), experience in the first phase of the pandemic is described with ECMO outcomes in the ELSO database. This data counter acts the original statements of poor ECMO outcomes.

### Patients with COVID-19 may benefit from ECMO



## ECMO Support in COVID-19: The Registry Report from the Extracorporeal Life Support Organization

Ryan P Barbaro, Graeme MacLaren, Philip S Boonstra, Theodore J Iwashyna, Arthur S Slutsky, Eddy Fan, Robert H Bartlett, Joseph E Tonna, Robert Hyslop, Jeffrey J Fanning, Peter T Rykus, Steve J Hyer, Marc M Anders, Cara L Agerstrand, Katarzyna Krysiwicz, Rodrigo Diaz, Roberto Lorusso, Alain Combes, Daniel Brodlef, for the Extracorporeal Life Support Organization

THE LANCET

A potential role for ECMO in SARS-CoV-2 related acute severe hypoxic respiratory failure has been suggested by international organizations including WHO, ESCMID/SCCM (Surviving Sepsis Campaign), & ELSO, due to severity of COVID-19 and recent clinical evidence supporting ECMO use in ARDS. Despite early reports described mortality greater than 90%, no large international cohorts of extracorporeal support in COVID-19 reported to date.

Here, an analysis of the Extracorporeal Life Support Organization Registry data to characterize epidemiology, hospital course, & outcomes of ECMO-supported patients with laboratory confirmed COVID-19. Novel findings include determination of independent associations between mortality & risk factors in this cohort. Results for subsets of ECMO cases are also reported: patients classified as having ARDS, with initial veno-venous configuration for respiratory support alone, non-ARDS patients & patients receiving ECMO with circulatory support.

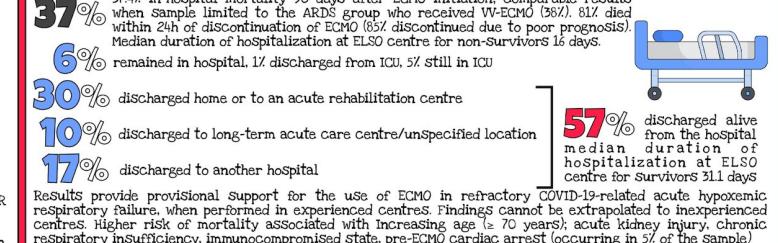
**213 hospitals worldwide** **36 countries**

**1035** patients included in the analysis:

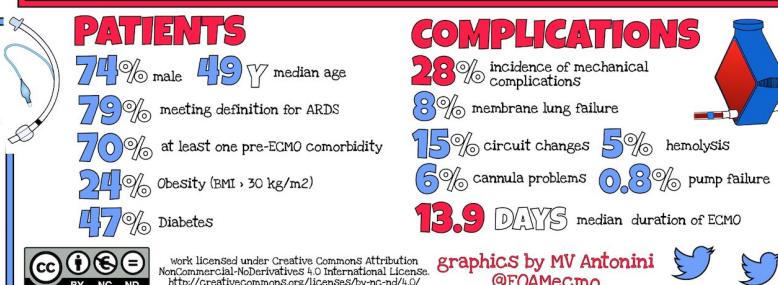
- ★ ECMO cases (run initiated from Jan 16<sup>th</sup> through May 1<sup>st</sup>, 2020)
- ★ confirmed presence of SARS-CoV-2 on laboratory testing
- ★ ≥16 years
- ★ ELSO Registry COVID-19 Addendum completed
- ★ no prior ECMO run

**94% VV-ECMO** 96% respiratory support  
**4% VA-ECMO** 3% cardiac support: 1% ECPB  
**0.9% VAV-ECMO** 0.4% other configuration

**99%** received conventional ventilation prior to ECMO initiation, median PaCO<sub>2</sub>:FiO<sub>2</sub> within 6h 72 mmHg, higher PaCO<sub>2</sub>:FiO<sub>2</sub> associated with lower mortality.  
**59%** received non-invasive ventilatory support (NIV/HFNC) prior to ECMO  
**4 DAYS** median duration from endotracheal intubation to ECMO initiation  
**29%** received inhaled pulmonary vasodilators prior to ECMO  
**72%** received neuromuscular blockade prior to ECMO initiation  
**60%** were proned before ECMO  
**44%** received tracheostomy during ECMO support.



Results provide provisional support for the use of ECMO in refractory COVID-19-related acute hypoxic respiratory failure, when performed in experienced centres. Findings cannot be extrapolated to inexperienced centres. Higher risk of mortality associated with increasing age (≥ 70 years), acute kidney injury, chronic respiratory insufficiency, immunocompromised state, pre-ECMO cardiac arrest (occurring in 5% of the sample).

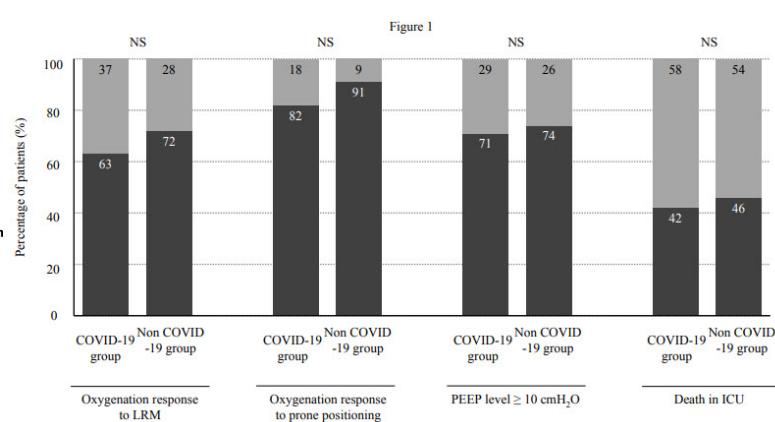
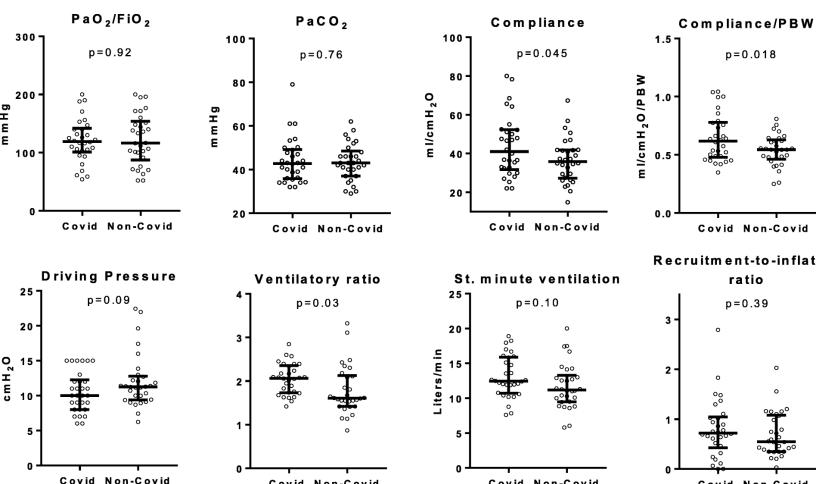
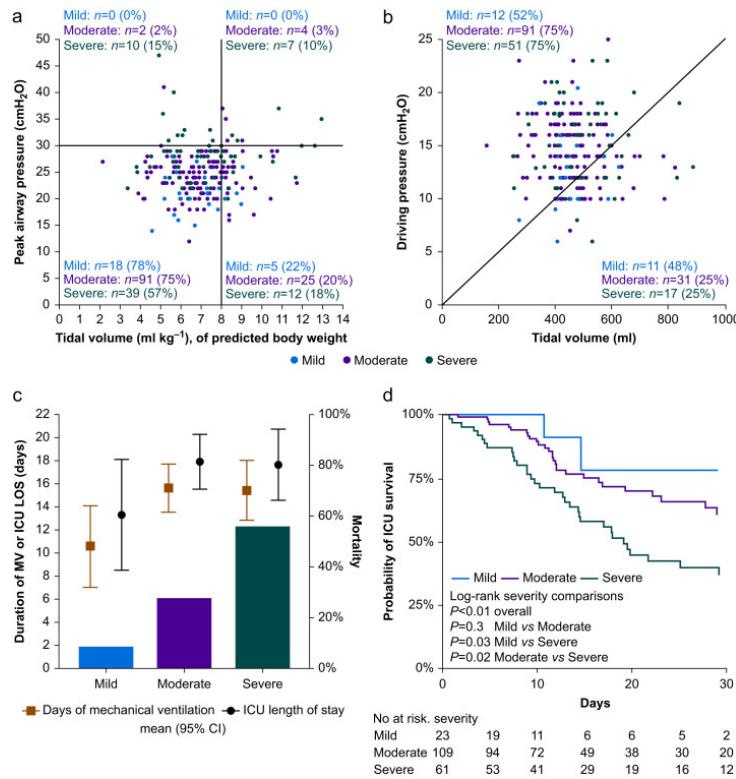


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## COVID-19 ARDS outcomes similar to non-COVID ARDS

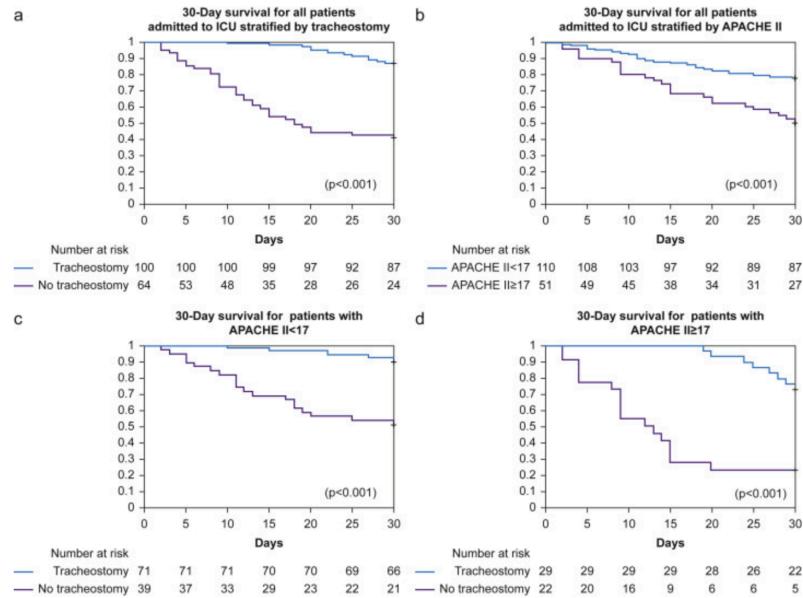
[In this published British centre](#), outcome data for COVID-19 ARDS was similar to outcomes seen in non-COVID ARDS cases. More importantly, its reassuring in this group that clinicians are sticking with lung protective ventilation, with greater adherence to lung protective ventilation than seen in LUNG SAFE trial.

[French Data](#) also corroborates this. ARDS continues to be heterogeneous, despite the cause.  
[Italian Data](#) Corroborates as well.



## Safety of tracheostomy in COVID-19 patients

[In this UK single centre cohort](#), of the 164 patients admitted to their ICU for IMV, they ended up traching 100 of them. 30 day survival was higher in Trach patients (85% vs 42% NB: caution with survivorship bias). When stratified for APACHEII score >17, trach patients survived more (68% vs 19%). When trach was performed <14 days, associated with 1 less day on vent. Most importantly, No trach associated HCW infections were documented.



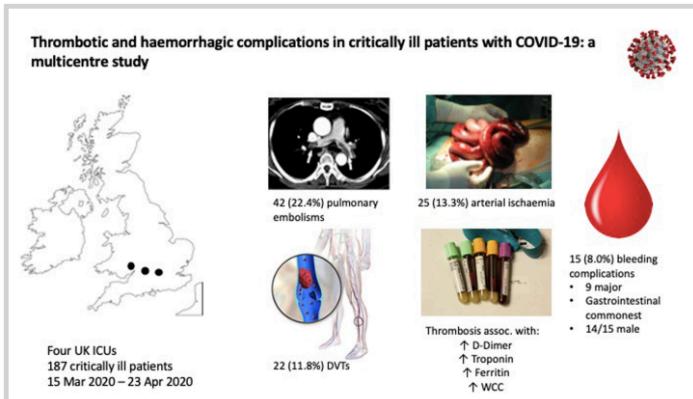
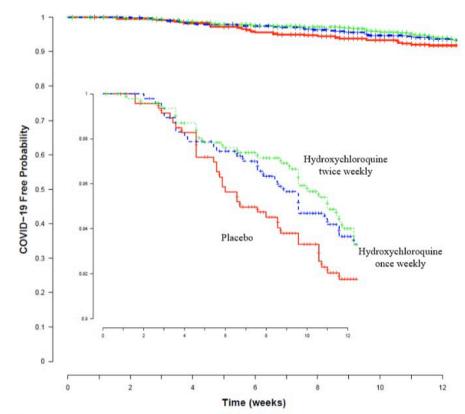
## Hydroxychloroquine does not work for Healthcare worker prophylaxis

[In this pre print of the RCT of HCW on PrEP](#), there was no difference for the development of confirmed or probable COVID-19. McGill and Manitoba both contributed to this study

## COVID-19 Thrombotic and Bleeding complications

[Further experience from the UK](#), corroborating local experience. In Severe and Critical COVID illness, watch out for these complications. [This larger multi centre cohort](#) confirms the VTE findings.

Figure 2: Kaplan Meier Estimates of Time to Covid 19 Compatible illness.



## Duration of antibody response to SARS-COV-2 may not as robust as hoped

[In this JAMA article](#), the antibody response of ~600 healthcare workers was explored.

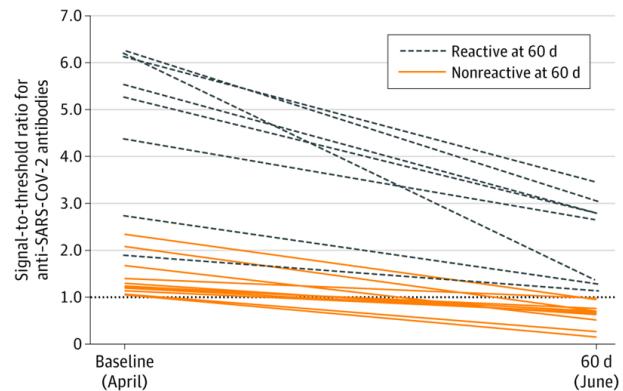
Table. Seropositivity at 60 Days, Symptom Prevalence, and Mean Signal-to-Threshold Values of Anti-SARS-CoV-2 Immunoglobulin Antibodies Among 19 Health Care Personnel Seropositive at Baseline

|                            | No. (%)    | SARS-CoV-2 ELISA results | Symptomatic <sup>b</sup> | Asymptomatic <sup>b</sup> | Signal-to-threshold value, mean (median) <sup>a</sup> | 60 d      |
|----------------------------|------------|--------------------------|--------------------------|---------------------------|---|-----------|
| Total reactive at baseline | 19 (100)   | 11/19 (58)               |                          | 8/19 (42)                 | 2.8 (1.9)   | 1.3 (1.0) |
| Total at 60 days           |            |                          |                          |                           |   |           |
| Reactive <sup>a</sup>      | 8/19 (42)  | 6/8 (75)                 |                          | 2/8 (25)                  | 4.8 (5.4)   | 2.3 (2.7) |
| Nonreactive                | 11/19 (58) | 5/11 (45)                |                          | 6/11 (55)                 | 1.4 (1.2)   | 0.6 (0.7) |

Abbreviations: ELISA, enzyme-linked immunosorbent assay; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

<sup>a</sup> anti-SARS-CoV-2 antibody presence.<sup>4</sup>

<sup>b</sup> Symptomatic denotes those with symptoms of a viral respiratory illness, including fever, cough, shortness of breath, myalgias, sore throat, vomiting, diarrhea, dysgeusia, or anosmia, between February 1, 2020, and the baseline visit in April 2020. Others were classified as asymptomatic.



## No association with Blood type and Outcome in COVID-19

Counter to associations seen in early Pandemic days, [this JAMA article](#) reviews the mixed data around the issue, with likely less of an association compared to prior thought.

## Risks for Health Care Worker Infections

[In this large case-control](#) (n=244 HCW infections with n=886 controls) during pandemic in 67 countries, the risk factors for HCW infection were explored. Highlights: Respirators, working in ICU, Dedicated COVID units, and Negative pressure rooms all associated with less infection. Prolonged non-aerosol generating contact >45min associated with increased infections. Community factors still the highest risk for HCW (gatherings >10, going to restaurants/bars, public transport (Ors 3-16).

## Current Explorations into Immunomodulation in COVID-19

Here is a [nice summary](#) of therapeutic targets

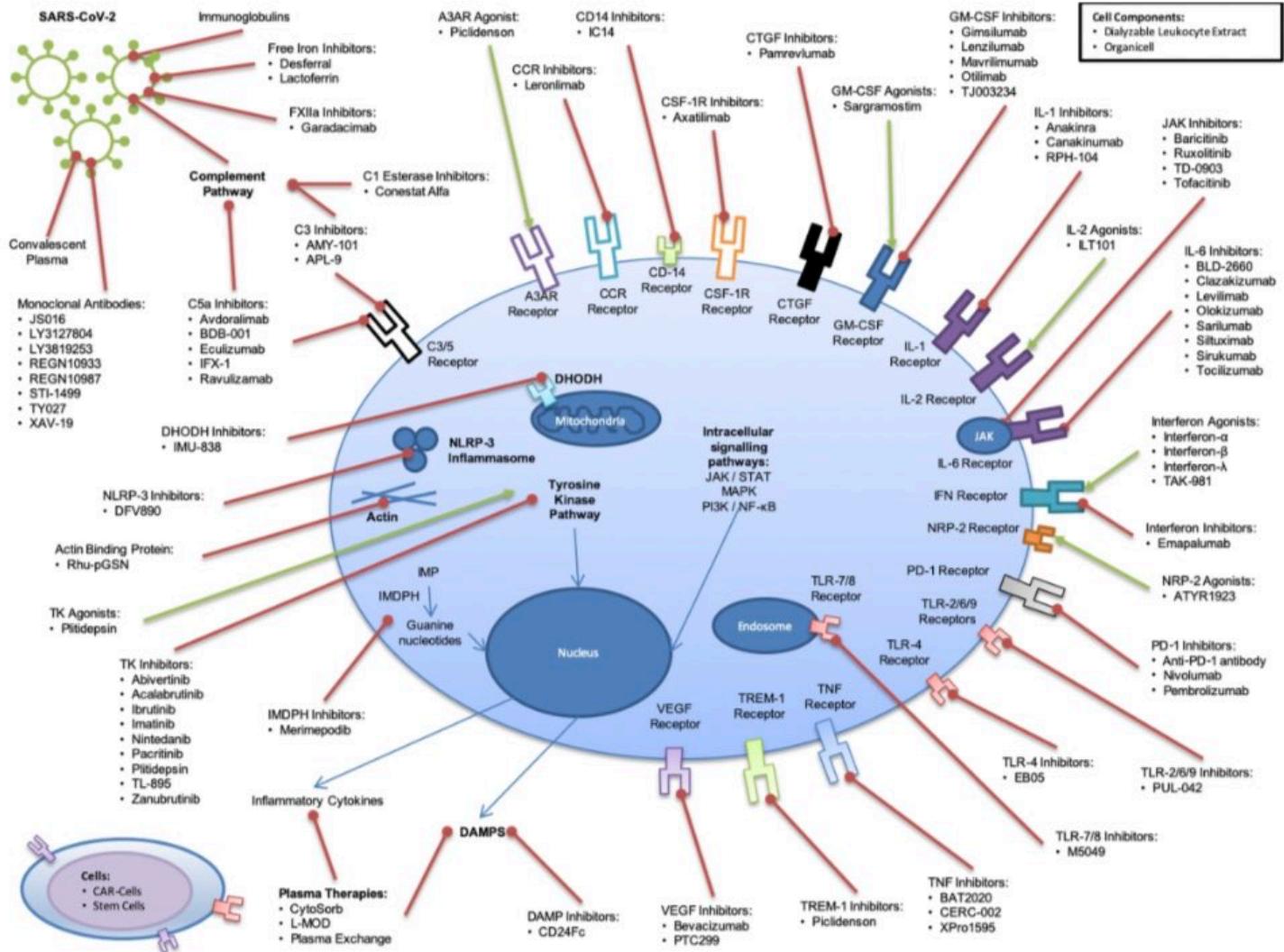


Figure 1: Summary of biological therapies undergoing randomised controlled trials in COVID-19

## Non COVID Literature

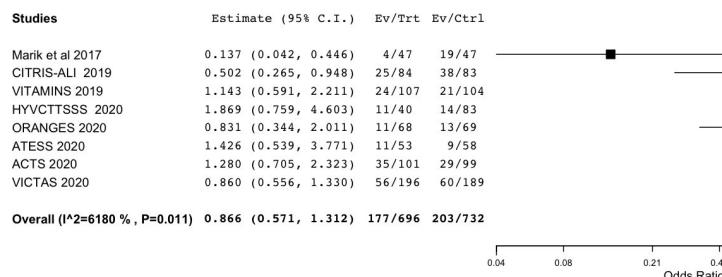
## MIDAS trial is out: no benefit of oral midodrine in shock

[In this RCT](#), which is not a mainstay of practise in BC, but if you were using midodrine in hopes of weaning of pressors early, this practise has proven tone ineffective.

## NAVA vs Lung Protective Ventilation

[In this RCT published in Intensive Care Medicine](#) No mortality benefit, but less days on vent. Interesting.

## VICTAS



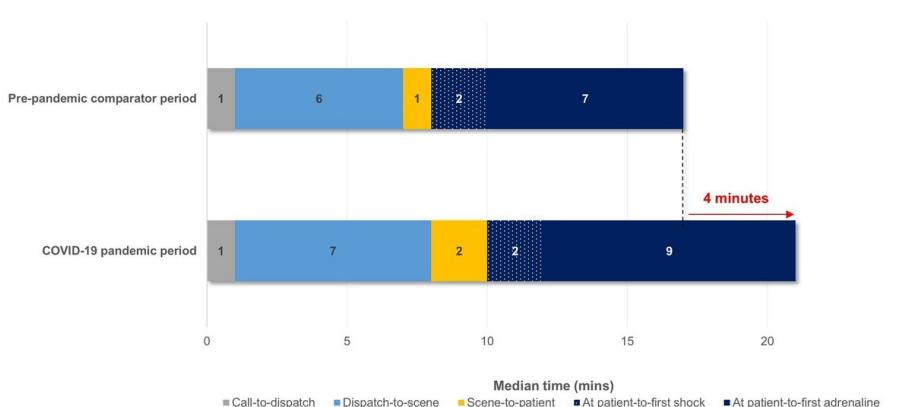
The authors for the VICTAS trial have updated the clinical [trials.gov](#) site. This was going to be the largest RCT, with plans for >2000 patients randomized to HAT or not. After 500 patients enrolled, the trial has been stopped do to futility,

| All-Cause Mortality @                            |                        |          |                        |          |  |
|--|------------------------|----------|------------------------|----------|--|
|  | Treatment Protocol     |          | Control Protocol       |          |  |
|  | Affected / at Risk (%) | # Events | Affected / at Risk (%) | # Events |  |
| Total  | 56/252 (22.22%)        |          | 60/249 (24.10%)        |          |  |
| ▼ Serious Adverse Events @                       |                        |          |                        |          |  |
|  | Treatment Protocol     |          | Control Protocol       |          |  |
|  | Affected / at Risk (%) | # Events | Affected / at Risk (%) | # Events |  |
| Total  | 0/252 (0.00%)          |          | 0/249 (0.00%)          |          |  |
| ▼ Other (Not Including Serious) Adverse Events @ |                        |          |                        |          |  |
|  | Treatment Protocol     |          | Control Protocol       |          |  |
|  | Affected / at Risk (%) | # Events | Affected / at Risk (%) | # Events |  |
| Blood and lymphatic system disorders             | 2/252 (0.79%)          |          | 0/249 (0.00%)          |          |  |
| Hemorrhagic shock due to hemolysis *             | 1/252 (0.40%)          | 1        | 0/249 (0.00%)          | 0        |  |
| Renal and urinary disorders                      | 1/252 (0.40%)          |          | 0/249 (0.00%)          |          |  |
| Worsening of renal function *                    | 1/252 (0.40%)          | 1        | 0/249 (0.00%)          | 0        |  |

|                        | Randomization to Med | Mortality     | Time Off Pressors |
|------------------------|----------------------|---------------|-------------------|
| <b>CITRIS-ALI 2019</b> | 6hrs                 | Improved      | Not Reported      |
| <b>VITAMINS 2020</b>   | q - l2hrs            | No Difference | No Difference*    |
| <b>HYVCTTSSS 2020</b>  | ???                  | No Difference | No Difference     |
| <b>ORANGES 2020</b>    | q,qhrs               | No Difference | Improved          |
| <b>ACTS 2020</b>       | 2hrs                 | No Difference | No Difference     |
| <b>ATESS 2020</b>      | 1hr                  | No Difference | No Difference     |

## Systems of Care are being disrupted: OHCA outcomes worse

In this experience from Australia [published in Resuscitation](#), not only is the chain of survival being broken, but interesting less arrests as well. Relative survival to discharge decreased by 50% (11.7% vs 6.1%)



## OHCA: Stay and play > Grab and Go

This Issue Views 13,499 | Citations 0 | Altmetric 260

### Original Investigation

September 15, 2020

# Association of Intra-arrest Transport vs Continued On-Scene Resuscitation With Survival to Hospital Discharge Among Patients With Out-of-Hospital Cardiac Arrest

Brian Grunau, MD, MHSc<sup>1,2</sup>; Noah Kime, BS<sup>3</sup>; Brian Leroux, PhD<sup>3</sup>; et al

» Author Affiliations

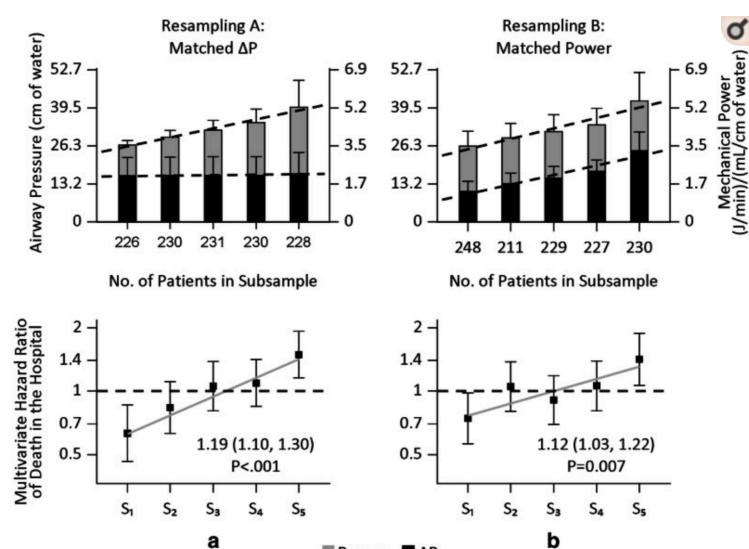
JAMA. 2020;324(11):1058-1067. doi:10.1001/jama.2020.14185

The ROC group has also published their >49k patient COHORT study on prehospital intra-arrest transport to hospital or continuing resuscitation efforts in the field. Survival to discharge (4% vs 8.5%) and neurologic outcome were all higher in on scene resuscitation (2.9% and 7.1%).

## Driving pressure and Mechanical power: More observations

In this smaller cohort from Utah, similar associations between driving pressure and mechanical power were seen, in the same line as discussed last month.

Fig. 1



Hazard ratio of in hospital death across relevant subsamples after multivariate adjustment. Multivariate adjusted hazard ratio of 60-day in-hospital death across patient strata. Strata in a (upper) have comparable values of driving pressure, but increasing values of mechanical power across strata. HR for each stratum is presented below. b Has comparable values of mechanical power, but increasing values of driving pressure across strata. Y1 axis is airway pressure; Y2 axis is mechanical power normalized to compliance. X axis reports cohort sample sizes

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## Brain Death Criteria Consensus

[JAMA has published](#) this colossal guidelines document on determination of brain death, aka the “World Brain Death Project”. New proposed criteria similar to our practice in BC:

- No arousal, awareness, facial, limb movement to max external stimulation
- Pupils fixed, nonreactive
- Absent corneal, oculo-cephalic/vestibular, gag, cough reflexes
- No spontaneous respirations pH <7.30, PaCO<sub>2</sub> 60 mmHg