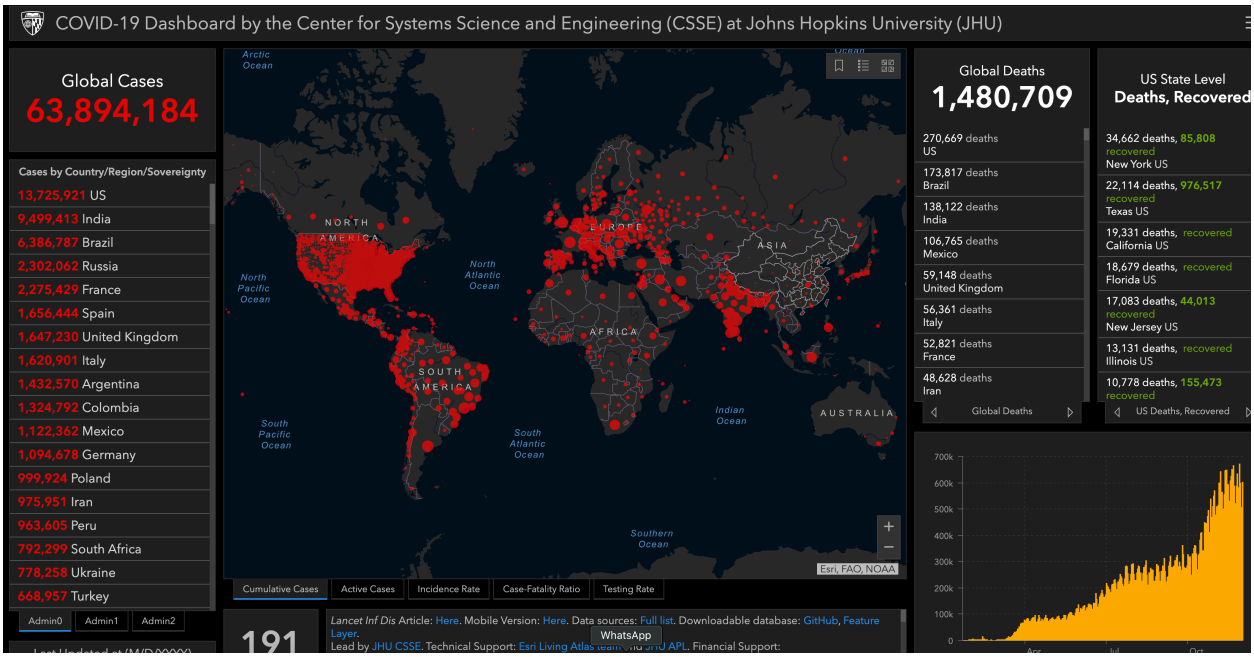
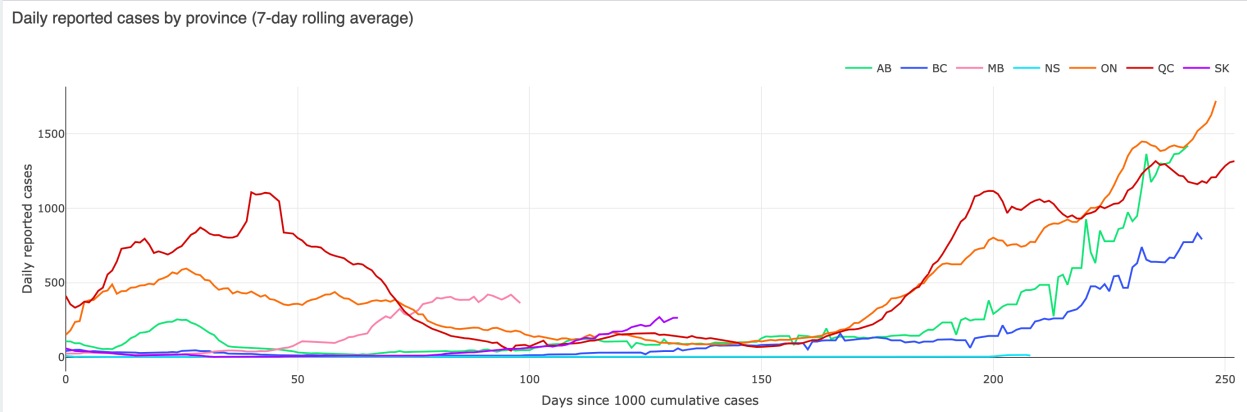
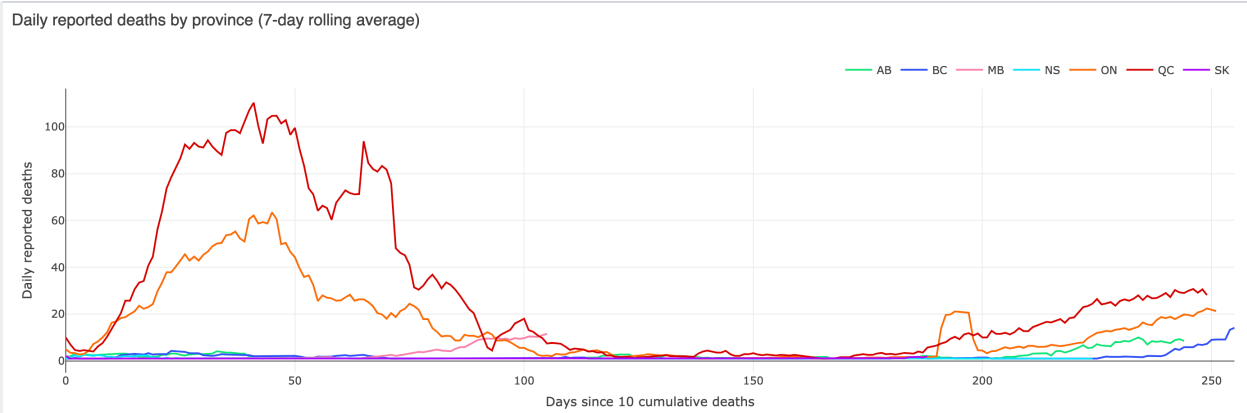
Adam Thomas Hussein Kanji Anish Mitra

BC Critical Care Network Update - November







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COVID Literature

All-Cause Mortality and Excess Deaths

To reassure everyone a little, we are middle pack, and improving our COVID related deaths per 100,000.

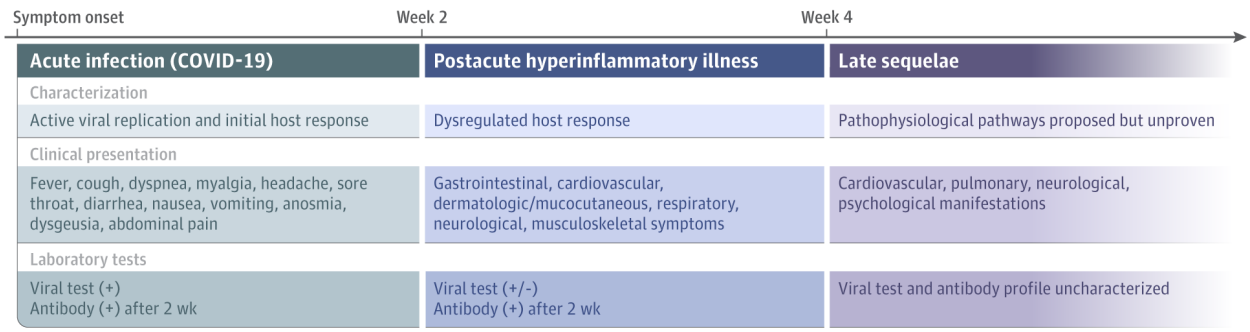
Table 2. Excess All-Cause Mortality in the US Compared With That in Other Countries[a]

Country	Excess all-cause mortality per 100 000			Excess US deaths from all causes (% of reported deaths)		
	Since the start of the pandemic	Since May 10, 2020	Since June 7, 2020	Since the start of the pandemic	Since May 10, 2020	Since June 7, 2020
Moderate mortality (COVID-19 deaths, 5-25/100 000)						
Norway	−2.6	−4.3	−2.1	235 610 (100)	102 598 (44)	63 952 (27)
Denmark	5.1	1.9	1.8	218 664 (93)	96 375 (41)	57 910 (25)
Israel	8	7.5	5.4	209 376 (89)	77 932 (33)	46 091 (20)
Germany	10.0	1.4	−0.2	202 547 (86)	97 905 (42)	63 952 (27)
Canada	13.3	−3.7	−7.6	192 009 (81)	102 598 (44)	63 952 (27)
Switzerland	17.0	−3.6	−2.7	179 545 (76)	102 598 (44)	63 952 (27)
Austria	17.1	3.2	1.4	179 208 (76)	92 042 (39)	59 375 (25)
Finland	19.1	8.7	5.4	172 706 (73)	74 116 (31)	46 264 (20)
High mortality (COVID-19 deaths, >25/100 000)						
Sweden	50.8	14.9	3.7	68 540 (29)	53 429 (23)	51 864 (22)
France	51.5	5.9	2.6	66 167 (28)	83 301 (35)	55 512 (24)
The Netherlands	55.1	0.1	−0.7	54 282 (23)	102 157 (43)	63 952 (27)
Belgium	67.8	−4.6	−6.4	12 638 (5)	102 598 (44)	63 952 (27)
United Kingdom	94.5	13.7	−1.2	−75 196 (−32)	57 659 (24)	63 952 (27)
Spain	102.2	2.1	1.8	−100 768 (−43)	95 784 (41)	57 948 (25)
United States	71.6	31.2	19.4			

[a] Data on deaths are through July 25, 2020 (week 30, n = 235 610 excess US deaths compared with 145 546 reported COVID-19 deaths). Countries lacking publicly available all-cause mortality data through this time are omitted. Excess deaths were estimated by week, compared with 2015-2019, beginning when a country surpassed 1 COVID-19 case per million population. In columns 3-5, due to large sample sizes, all mortality rates are statistically significantly different from the corresponding US mortality rates ($P < .001$). Scenarios in the last 3 columns assume that compared with the country in a given row: (A) the US had a comparable cumulative mortality rate; (B) the US excess all-cause mortality rate was unchanged until May 10 (week 20, n = 133 012 deaths), when it became comparable to the other country's death rate; and (C) the US excess all-cause mortality rate was unchanged until June 7 (week 24, n = 171 659 deaths), when it became comparable to the other country's death rate. Totals are truncated to avoid exceeding US estimated deaths. Due to reporting lags, these data include less follow-up time than Table 1, which in some cases produces lower cumulative death rates.

New COVID-19 timeline proposed framework

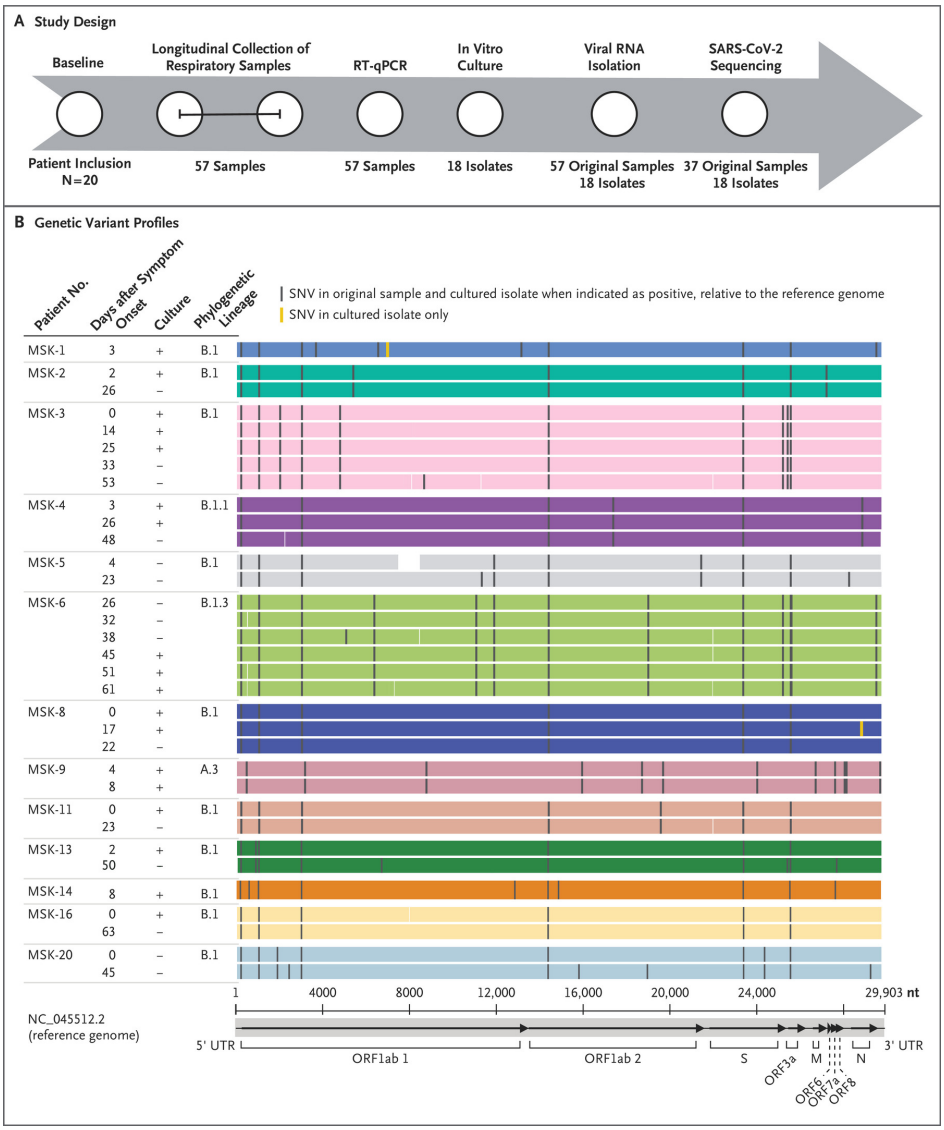
Given the experience to date, the CDC has proposed the following timeline of infection to help guide research and clinical approaches



Duration of viral shedding

In this meta-analysis, duration of viral shedding primarily peaks within the first week, but viable virus can continue to shed (mean vs maximally) 17 vs 83 days in the upper resp tract, 14.6 vs 59 days in the lower Resp tract, 16.6 vs 126 days in stool and 26 days in serum. Of course, this is all very variable.

Following this area of inquiry, NEJM published an interesting case series of 20 immunosuppressed patients (BMT or CAR T-cell therapy) showed persistent shedding of viable virus, confirmed by cell culture.



Lessons from a US aircraft carrier

The USS Roosevelt is a great example of infection characteristics amongst young individuals working in close quarters: of the 1331 infected, on 55% were ever symptomatic. Do to their young age and relative lack of any medical issues, only 1.7% required hospitalization, 0.3% required ICU and 1 individual died.

Hospital Acquired Infection

JAMA published a cautionary tale of the importance of in hospital precautions, and how hospital clusters can happen: In this example from Durban, SA, 1 unsuspected SARS-CoV-2 patient lead to 5 hospital ward outbreaks, a LTC and dialysis unit. This included 80 staff and 39 patients, of which 15 died. These were phylogenetically confirmed to be related infections. To be reassured though, when universal masking is implemented, HCW infection rates mirror those of the community they are in.

As discussed in Sept, HCW infections usually come from community spread, but in hospital has been linked to break rooms.

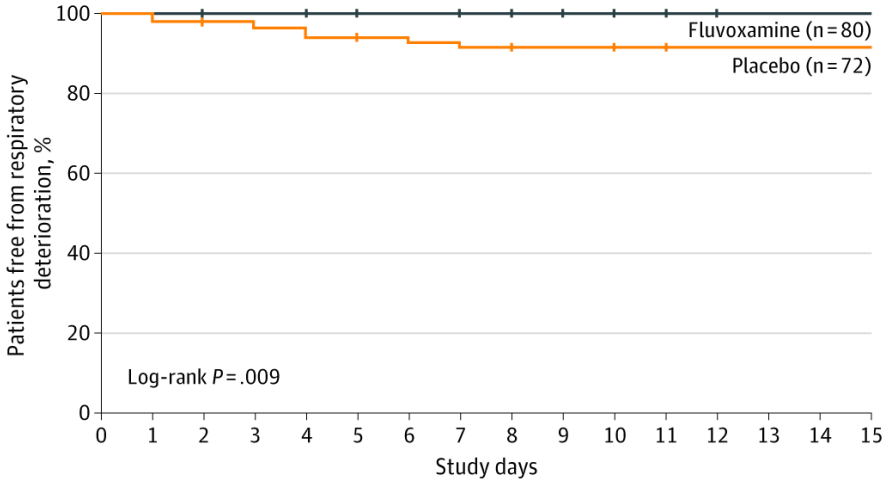
COVID-19 and VTE

This JAMA review around thrombotic complications (eg Stroke, MI, Aortic Syndrome, VTE). The underlying coagulopathy continues to include endothelial damage and relatively higher platelet aggregation at lower than predicted thrombin concentrations. Risk factors being:

- Age > 65
- Critical Illness
- Cancer
- Prior VTE
- Thrombophilia
- Severe immobility
- D-Dimer >2 times ULN

Serotonin and Disease progression

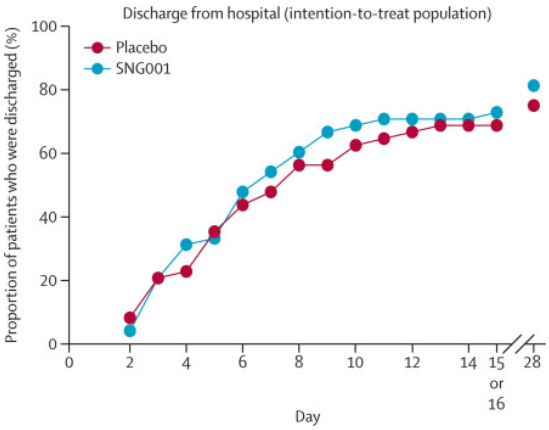
Following the hypothesis of 5-HT role in platelet activation, this SMALL RCT of 152 patients compared the SSRI Fluvoxamine vs placebo on clinical deterioration or disease progression. 0/80 patients in the intervention group progressed, were 6/72 in the placebo group progressed. This is very preliminary.

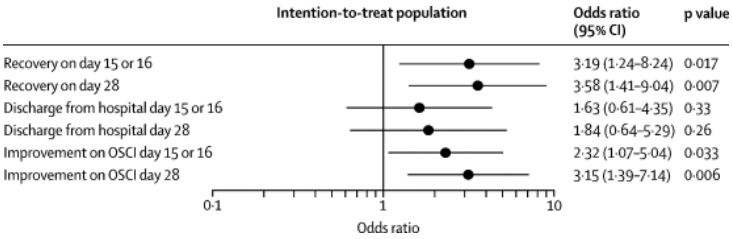


No. at risk																
Fluvoxamine	80	80	80	77	76	75	71	71	70	67	66	64	63	62	62	62
Placebo	72	72	70	68	67	65	64	63	61	59	59	56	53	53	53	53

Inhaled interferon beta-1a, not a magic bullet

In this small RCT published in the Lancet, patients treated with inhaled interferon did not leave hospital faster.





SARS-CoV-2 and CNS involvement

In this post-mortem of 43 German individuals, half had detectable virus in brain tissue. Most common sites of involvement were lower brainstem cranial nerves. No direct brain tissue damage was detected.

COVID-19 Ventilation in the Netherlands

The Dutch have published their experience of the spring as the PRoVENT-COVID study. Of their 553 vented patients, 35% died, despite relatively exceptional adherence to ARDS management (median TV 6.3cc/kg, PEEP 14, driving pressure 14, compliance 31.9, prone use 53%).

COVID-19 and Perc Trach

In this Italian experience published in CCM, they trach'd 74% of their cohort (most got a trach very early by day 6 of intubation). They did show modest mortality benefit, with the caveat that non-trach group had a lower compliance and higher SOFA score.

TABLE 1.
Characteristics and Outcome of Tracheostomized and Not Tracheostomized Patients

Variables	Not Tracheostomized	Tracheostomized	*p*	Adjusted OR (95% CI; *p*)
Number of patients	43 (26%)	121 (74%)		
Hospital mortality (%)	27 (62.8%)	55 (45.5%)	0.08	0.03 (0.00–0.25; $p = 0.01$)
Male sex (%)	33 (77%)	28/93 (77%)	1	
Age (yr)	65 (11)	65 (9)	0.88	
Body mass index (kg/m^2)	29 (26–33)	28 (25–31)	0.03	0.88 (0.74–1.00; $p = 0.08$)
Arterial hypertension	11 (26%)	20 (17%)	0.26	
Diabetes mellitus	10 (23%)	9 (7%)	0.01	0.05 (0.00–0.48; $p = 0.02$)

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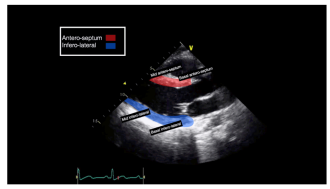
Non-Covid Literature

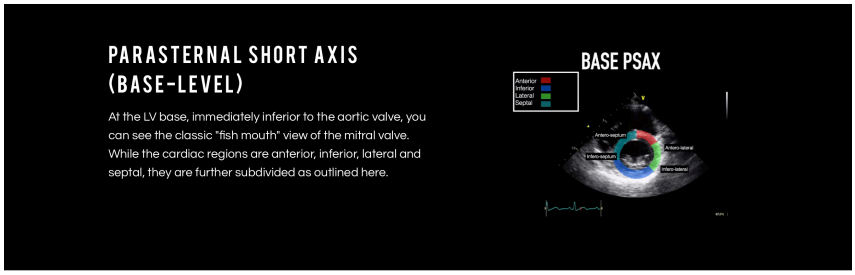
Saline vs Balanced Crystalloid for DKA

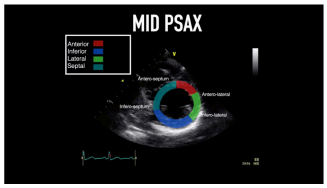
In this RCT published in JAMA, balanced crystalloid led to faster resolution of DKA

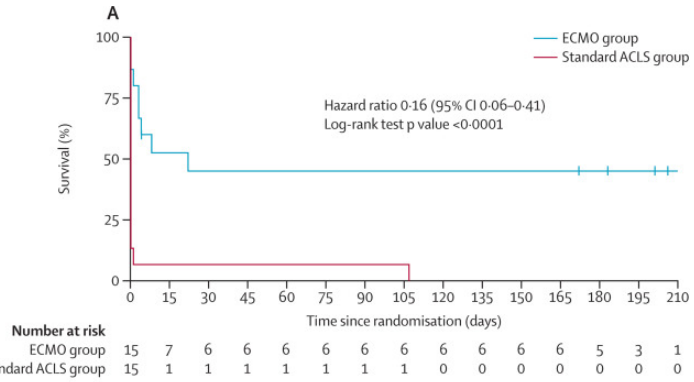
POCUS Resource

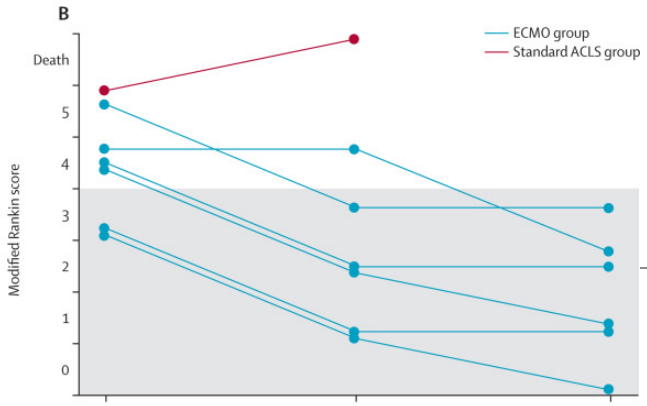
The U/S group out of UofA has put together an amazing resource for point of care ultrasound. Great tool for the novice or advanced practitioner needing a little refresher.

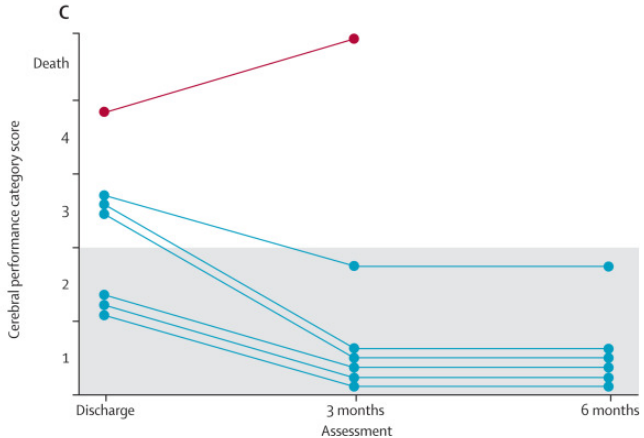












ARREST Trial is out

This phase 2 trial of ECPR network for OHCA secondary to VF and VT. Heading up this system of care in Minnesota, was Demetris Yannopoulos. Although it is difficult to generalize these findings to another system, as there are many complexities at various levels, survival to hospital discharge (with relatively good Neuro outcomes) was 43% in the ECPR group vs 7% in the ACLS group.