

**Title Page**

**IMPLEMENTATION OF A VIRTUAL INTERPROFESSIONAL ICU LEARNING  
COLLABORATIVE: SUCCESSES, CHALLENGES, AND INITIAL REACTIONS  
FROM THE STOP-VIRUS COLLABORATORS**

**Supplemental Digital Content**

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## Supplemental Methods

### *Data Collection and Analytics*

Total and individual learner Zoom™ mean attendance at each session was monitored. The attendance rate was defined as the number of attendees to each synchronous session divided by the total possible participant hours. Data regarding Blackboard™ engagement was gathered using embedded Annoto™ analytics (Petah Tikva, Israel) software. Total hours viewed, mean number of hours per participant and mean completion rate was assessed across the entire platform, rounded to the closest hour.. Engagement with CERTAIN online modules was assessed using “watch time”- defined as *the aggregated number of minute the user has watched in all view sessions, rounded to hours* - and “mean completion rate”- defined as *the sum of percent time watched in each view session divided by number of views* (how well the user performed in terms of dropout). Satisfaction was measured using a mixed methodology. For quantitative data a weekly anonymized online survey was distributed through Google Docs™ (Mountain View, CA, USA) to attendees of each session via Zoom™ chat. The following questions were included: 1) “How would you rate today’s session overall?”, 2) “How would you rate this topic matched the current scope of your practice?”, 3) “How likely you are to recommend today’s session to a colleague?”. Responses were quantified using a 5-point Likert scale (5-excellent, 4-very good, 3-good, 2-fair 1-poor). Qualitative data was provided through a comments section within the post-session survey. The response rate to these weekly surveys was calculated as the total number of responses divided by the mean attendance of participants across all sessions who could have responded multiplied by the total number of sessions. Live feedback was also encouraged in chat boxes during weekly sessions, during a mid-program interview with each participating site team, and through exchange

of personal emails. Suggestions were incorporated into future curriculum planning and modification. Reach beyond the collaborative was assessed using engagement with the SCCM STOP-VIRUS website modules and use of the Twitter<sup>TM</sup> hashtag *#STOPVIRUScollab*.

**Supplemental Table 1: CERTAIN Online Modules**

<b>CERTAIN Online Modules</b>	<b>Format</b>
A1. Structure Approach to Critical Illness	Video lecture presentation
A2. CERTAIN Admission Demonstration	Clinical simulation video demonstration
A3. CERTAIN Rounding Demonstration	Video lecture presentation and simulation video demonstration
A4. CERTAIN Ultrasound: POCUS as a “Stethoscope”	Video lecture presentation
A5. CERTAIN Ultrasound Demonstration	Clinical simulation video demonstration
A6. CERTAIN Tools	Checklists, GTKMB, clinical decision support cards†
A7. Differential Diagnosis Algorithms	Decision support algorithms
B1. Patient/Family Engagement	Video lecture presentation
B2. Shared Decision-Making in the ICU	Video lecture presentation
B3. Shared Decision-Making Demonstration	Clinical simulation video demonstration
B4 Get to Know Me Board Demonstration	Clinical simulation video demonstration
B5. Get to Know Me Board	Video filling out instructions
C1. Essential Communication Skills	Video lecture presentation
C2. Critical Care Research: Current State, Future, and Collaboration	Video lecture presentation
C3. Introduction to Clinical Informatics	Video lecture presentation
C4. Simulation to Improve patient safety in Critical Care Medicine	Video lecture presentation
S1. CERTAIN Global Clinical Trials	Video lecture presentation
S2. Implementation Science	Video lecture presentation
S3. Introduction to Palliative Care	Video lecture presentation
S4. Assessment of a Person with Advanced Illness	Video lecture presentation
S5. Tough Talks: Strategies for difficult patient/family conversations in the ICU	Video lecture presentation
S6. American Medical Education	Video lecture presentation
S7. Critical Care Training in the USA	Video lecture presentation
S8. Introduction to Mayo Clinic	Video lecture presentation
CERTAIN; Checklist for Early Recognition and Treatment of Acute Illness and iNjury, GTKMB; Get To Know Me Board, ICU; intensive care unit, POCUS; Point-of-Care-Ultrasound	
† <a href="https://www.icertain.org/library">https://www.icertain.org/library</a>	

**Supplemental Table 2: STOP-VIRUS curriculum**

<b>Block/month</b>	<b>Topic</b>
<b>Pre-Course/March</b>	<i>Asynchronous pre-course learning</i>
	<b>CERTAIN Online modules via Blackboard® (optional)</b>
	<i>Synchronous weekly Zoom® sessions</i>
	Orientation
	The CERTAIN Approach: An Overview
	Case based demonstration / discussion
<b>1/April</b>	<b>Approach to Respiratory Failure in the COVID-19 Patient</b>
	State-of-the-Art Update: Noninvasive Management of Respiratory Failure during COVID-19: Case Presentation; Nutrition Support for the COVID-19 Patient = NIV/HFNC
	Case based presentation / discussion
	QI Community Learning Session
	Case based presentation / discussion
<b>2/May</b>	<b>ABCDEF Bundle: Implementation and Challenges</b>
	State-of-the-Art Update: Sedation Practices
	Case based presentation / discussion: ABCDEF Bundle Delirium, PICS
	Promoting Value in Critical Care by Implementing (Next Five) Choosing Wisely for Critical Care; ICU Liberation Bundle (E = Early Mobility)

	Case based presentation / discussion
<b>3/June</b>	<b>Infectious Complications and management of COVID-19 Infection / Nosocomial</b>
	Infectious Complications of COVID-19; Infection Control in COVID-19
	Treatments of Moderate and Severe COVID-19 Pneumonia
	QI Learning community session
	Case presentation: COVID-19 Persistent and Recurrent Symptoms
<b>4/June-July</b>	<b>Cardiovascular complications: Venous Thromboembolism, Myocarditis, and Shock</b>
	VTE and COVID-19; Anti-Xa Monitoring in VTE Prophylaxis: Is There a Role?
	Case presentation: Multisystem Inflammatory Syndrome in Children
	QI Learning community session
	Case presentation: Arterial Ischemia in COVID-19; Is Ischemic Stroke More Prevalent with COVID-19?
<b>5/July-August</b>	<b>Fluids, Electrolytes, and Acute Kidney Injury</b>
	COVID-19-Associated Acute Kidney Injury
	<i>Break</i>
	QI Community Learning session
	<i>Break</i>
<b>6/August-September</b>	<b>Shared Decision Making and End of Life Care</b>

	Challenges and Some of the Potential Solutions to Delivering Patient- and Family-Centered Care
	Managing Health Disparities in the Setting of Triage Decisions
	Family Centered Care
	Supporting Our Community: Well-Being, Moral Distress, and Burnout
	QI Community Learning session: COVID-19: Lessons from the Front Line
<p>ABDEF; intensive care unit liberation bundle (A-F), CERTAIN; Checklist for Early Recognition and Treatment of Acute Illness and iNjury, COVID-19; coronavirus disease 2019, HFNC; high flow nasal cannula, NIV; non-invasive ventilation, PICS; post intensive care syndrome, QI; quality improvement, VTE; venous thromboembolism</p>	



**Supplemental Table 3:** Number of visits to STOP-VIRUS Learning Modules on [SCCM.org](https://www.sccm.org) between July 1 and November 1, 2021

	Webpage visits, n (%)					
Module	July 2021	August 2021	September 2021	October 2021	November 2021	Total
<b>Multisystem Inflammatory Syndrome in Children</b>	100 (16)	181 (13)	29 (5)	22 (3)	22 (7)	354 (10)
<b>VTE and COVID-19; Anti-Xa Monitoring in VTE Prophylaxis: Is There a Role?</b>	97 (15)	159 (11)	29 (5)	26 (4)	15 (5)	326 (9)
<b>COVID-19 Persistent and Recurrent Symptoms</b>	50 (8)	69 (5)	14 (2)	11 (2)	0 (0)	144 (4)
<b>Infectious Complications of COVID-19; Infection Control in COVID-19</b>	56 (9)	140 (10)	51 (8)	20 (3)	17 (6)	284 (8)
<b>Treatments of Moderate and Severe COVID-19 Pneumonia</b>	137 (22)	541 (38)	351 (58)	162 (23)	146 (49)	1337 (37)
<b>Sedation Practices</b>	68 (11)	118 (8)	25 (4)	7 (1)	13 (4)	231 (6)
<b>Promoting Value in Critical Care by Implementing (Next Five) Choosing Wisely for Critical Care; ICU Liberation Bundle (E = Early Mobility)</b>	19 (3)	24 (2)	50 (8)	11 (2)	0 (0)	104 (3)
<b>Family Centered Care</b>	0 (0)	16 (1)	7 (1)	0 (0)	0 (0)	23 (1)
<b>ABCDEF Bundle Delirium; Post Intensive Care Syndrome: PICS</b>	30 (5)	51 (4)	18 (3)	14 (2)	18 (6)	131 (4)
<b>STOP-VIRUS Learning Community Session</b>	14 (2)	20 (1)	0 (0)	5 (1)	0 (0)	39 (1)

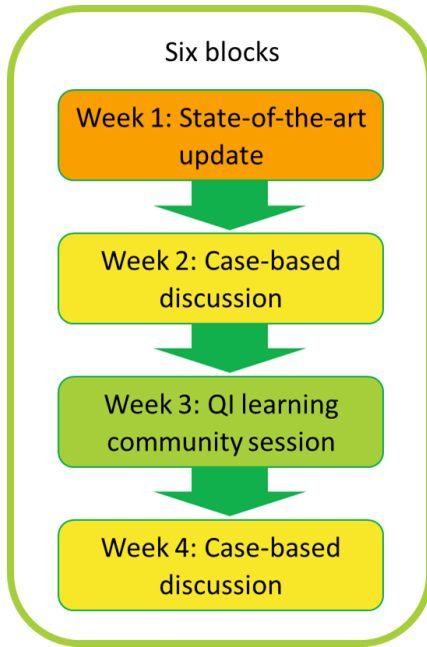
<b>Noninvasive Management of Respiratory Failure during COVID-19: Case Presentation; Nutrition Support for the COVID-19 Patient = NIV/HFNC</b>	55 (9)	100 (7)	30 (5)	10 (1)	0 (0)	195 (5)
<b>COVID-19: Lessons from the Front Line</b>	N/A	N/A	N/A	153 (22)	0 (0)	153 (4)
<b>Supporting Our Community: Well-Being, Moral Distress, and Burnout</b>	N/A	N/A	N/A	74 (11)	10 (3)	84 (2)
<b>Challenges and Some of the Potential Solutions to Delivering Patient- and Family-Centered Care</b>	N/A	N/A	N/A	21 (3)	10 (3)	31 (1)
<b>Managing Health Disparities in the Setting of Triage Decisions</b>	N/A	N/A	N/A	23 (3)	8 (3)	31 (1)
<b>COVID-19-Associated Acute Kidney Injury</b>	N/A	N/A	N/A	94 (13)	25 (8)	119 (3)
<b>Arterial Ischemia in COVID-19; Is Ischemic Stroke More Prevalent with COVID-19?</b>	N/A	N/A	N/A	49 (7)	12 (4)	61 (2)
<b>Total</b>	626 (17)	1419 (39)	604 (17)	702 (19)	296 (8)	3647 (100)

ABCDEF; intensive care unit liberation bundle (A-F), COVID-19; coronavirus disease 2019, HFNC; high flow nasal cannula, NIV; non-invasive ventilation, PICS; post intensive care syndrome, VTE; venous thromboembolism  
N/A: webpage not posted

**Supplemental Table 4: Learner Feedback Comments for all sessions**

<b>Learner comments April 2021 – September 2021 (n = 41)</b>	
<b>n = 41</b>	<b>Comment</b>
1	More time
2	<p>I enjoyed the case presentation. I will say that all the links to articles that were posted within the chat were difficult to copy while listening to the presentation - would be great if those could be sent to us in an attachment after the call. I would like to read what was sent out.</p> <p>The other feedback I would have is that our hospital is small, and quite literally declared bankruptcy in October. We have a very different patient population than an academic medical center such as Mayo Clinic - and as such our resources are also very different. For example, Giapreza is not on our formulary because we could not afford it. During the spring of 2020 our organization furloughed half of the staff within the hospital. Luckily, we did not have a big surge of patients in the spring, like NYC, Boston, and other large cities. This affected our ability to mobilize patients and also struggled with getting ancillary services into the patient rooms.</p> <p>Additionally, I reviewed a number of the videos on the blackboard website - many of them seem to be geared towards physicians - ultrasound, evaluation of patients, etc. Would love for you to highlight specific tools that would be helpful for all the disciplines (nursing, respiratory, pharmacy).</p> <p>During today's presentation, the description of the Hamilton 5 ventilator and the esophageal balloon by the RT from Mayo was great (as were the other presenters). Also liked hearing from Erin about Giapreza even though our hospital doesn't have it. Appreciate the multidisciplinary input. They will be a tough act to follow. Thank you!</p>
3	let the junior people talk a bit.
4	Longer breakout rooms
5	Please increase the time in breakout rooms
6	More time for breakout room discussion please! Otherwise, everything was great!
7	Break rooms always make me feel we are missing on some important conversations. Is there a way to keep the group together more often than not?
8	Deeper discussion on specific topics. I think we started to broad therefore no much time to really get to a discussion that can be practice changer or optimize current practice.
9	Can we extend it to 90 mins at least
10	I enjoyed the breakout group
11	Appreciated the additional time in the breakout session
12	Having more best practice and meta-analysis resources posted in the chat would very useful. Thank you. Great session
13	I would like to have more participation from people in our breakout session or more people. The discussion was a little lagging trying to keep it going with 4 people. The more peds involvement we get the better this will be.
14	Loved having more time for small group and then large group discussion. Very helpful.
15	Please share the twitter impression, total tweets, retweets

16	I almost would like to break into groups by discipline. As a pharmacist I'm not involved in goals of care discussions, or vent management strategies, etc. Really great to get our data-excited to review that. I enjoy the calls very much.
17	Additional time in breakout sessions or objectives assigned
18	Discussion board is clunky and we did not get a good use of it...Maybe try Twitter again?
19	Any recommended reading at the end from topic matter experts at the end.
20	More time for the meeting!!!
21	Having structured small groups might be helpful (or sometimes it is not), but could streamline the discussions across groups so we can have a powerful but focused experience. But overall, thank you SO SO much for leading this herculean effort.
22	More time for break outs
23	Excellent discussions!
24	Longer session
25	Increase participants if possible
26	I really liked the discussion today by Dr Kalil. Such great information was shared. I found it especially helpful to hear him talk about the studies, also that they had stepped away from fixed duration Remdesivir. I appreciated the links in the chats. Great session!
27	I always feel we need more time but there are only 24 hours in a day
28	More case based
29	Appreciate the references included in the chat box. I wonder if they can be made available after the meeting is completed?
30	n/a
31	great speakers and discussion!
32	None at this point
33	Having it available labor to watch on a later time is important
34	More time to explore the topic
35	More time
36	I loved hearing real patient and family experiences as we are usually never able to see the long term impacts or voices of these patients. I think more of these stories aligning with our topics as able and appropriate provides a lot of insight that can be taken into our practice.
37	This was my favorite session thus far. Really loved the story from Ken and Susan and particularly the points raised by Alex about disparity in healthcare.
38	I really enjoy the smaller breakout groups because you get to know people within the collaborative more than when it is the full sized group
39	Continue this work around patient safety and quality care
40	Continue with the collaborations!
41	None at this point



**Supplemental Figure 1: STOP-VIRUS Curriculum Block Structure.** The curriculum was divided into six, four-week topic blocks. Each block consisted of a state-of-the-art update delivered by SMEs or moderators, two case-based discussions facilitated by moderators, SMEs, or volunteer learners, and a quality improvement learning community session led by faculty.