What We Have Learned from COVID 19
Changing Practice, Affecting our Souls

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Disclosures

- Today I am speaking for
  - the victims of CoVID and those affected by this slippery virus
  - The healthcare providers who care for them and forget to care for themselves
- My discussion does not necessarily reflect the views of
  - Baxter
  - Grady Health or Emory University
  - Society of Critical Care Medicine
  - American Association of Critical Care Nurses
  - The United States government
  - ….or anyone except myself!

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Current State Of Preparedness: 2020

- Prior planning and preparation are crucial to provide any substantial level of emergency mass critical care
- Current disaster preparedness has largely ignored how to care for critically ill patients in the ED, surging in the ICU and in the in-patient arena
- Without additional planning and preparation many critical and acutely ill patients may not get life-saving care during a disaster!

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Is your center well prepared for pandemic?

- A. Very
- B. Partially
- C. Not at all
- D. I don't know

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Disaster Comes to Your Hospital

- Number of critically ill patients
- Rate of development of critical illness
- Duration of time that patients are critically ill
- Intact medical infrastructure
- Intact social and commerce infrastructure
- Justice and equality in healthcare
- Are your staff prepared?

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From the First Patient…. 2/28

- The first team deployed
  - Fear
  - Anxiety
  - Overwhelming concern
  - Rapidly increasing patients

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Transmission

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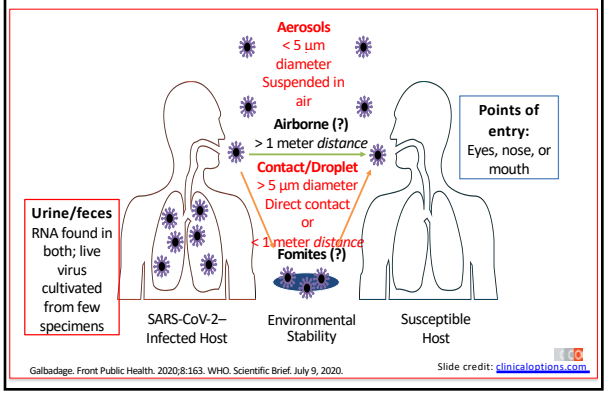
Todays Proposed Routes of SARS-CoV2 Transmission



Galbadage. Front Public Health. 2020;8:163. WHO. Scientific Brief. July 9, 2020.

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Key Considerations on Modes of SARS-CoV-2 Transmission

- Person-to-person considered predominant mode of transmission, likely via respiratory droplets from **coughing, sneezing, or talking**[1,2]
  - High-level viral shedding evident in upper respiratory tract[3,4]
  - Airborne transmission suggested by multiple studies, but frequency unclear in absence of aerosol-generating procedures in healthcare settings[2]
- Virus **rarely cultured in respiratory samples > 9 days after symptom onset**, especially in patients with mild disease[5]
- Multiple studies describe a correlation between **reduced infectivity with decreases in viral loads** and rises in neutralizing antibodies[5]
- ACOG: "Data are reassuring that vertical transmission appears to be uncommon"[6]

1. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html 2. WHO. Scientific Brief. July 9, 2020. 3. Wölfel. Nature. 2020;581:465. 4. Zou. NEJM. 2020;382:1177.
5. WHO. Scientific Brief. June 17, 2020. 6. ACOG. Practice Advisory: Novel Coronavirus 2019 (COVID-19). Last updated July 1, 2020.

Slide credit: clinicaloptions.com

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IDSA: SARS-CoV-2 Infection Prevention

Healthcare personnel caring for patients with suspected or known COVID-19

Use appropriate PPE* with proper donning/doffing (ie, gowns, gloves, eye protection)

Conventional Settings		Contingency or Crisis Settings	
Routine Patient Care	*Aerosol-Generating Procedures*	*Routine Patient Care*	*Aerosol-Generating Procedures*
Surgical mask or N95 (N99/PAPR)	N95 (N99/PAPR)	Surgical mask or Reprocessed N95	Face shield or surgical mask covering N95 to allow extended use/reuse or Reprocessed N95

*IDSA makes no recommendation regarding double vs single glove or shoe cover vs no shoe cover use.

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What does this mean to us?

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Safety when working with Hazardous Diseases

- Healthcare Worker Safety
  - Minimize risk of intervention to staff
- Patient Safety
  - Some interventions may be too risky in biocontainment
- Community Safety

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Healthcare Worker (HCW) Safety

- **Personal Protective Equipment (PPE)**
  - PPE effective at decreasing exposure to infected bodily fluids among healthcare workers
  - It alone not enough to avoid all transmission to HCW
  - Can introduce risk as well – proper donning & doffing
- Buddy system – highly recommended
  - *All donning & doffing of PPE observed by teammate*
- Consider check lists to prompt staff of proper protocols
  - All procedures observed & procedure list monitored by another HCW in PPE in the room to monitor for exposure

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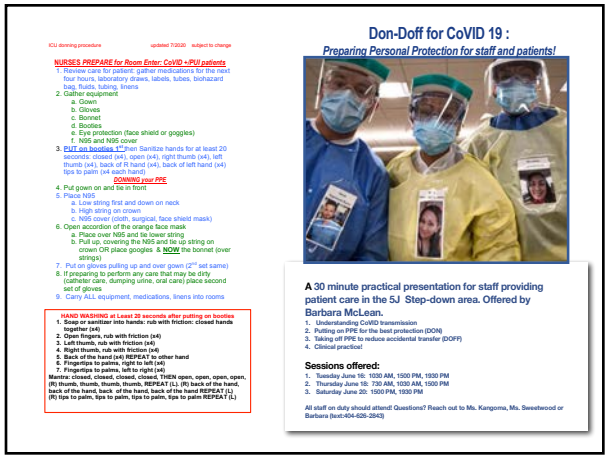

ICU donning procedure updated 7/2020 subject to change

NURSES *PREPARE* for Room Enter: CoVID +PUI patients

1. Review care for patient: gather medications for the next four hours, laboratory draws, labels, tubes, biohazard bag, fluids, tubing, linens
2. Gather equipment
   a. Gown
   b. Gloves
   c. Bonnet
   d. Booties
   e. Eye protection (face shield or goggles)
   f. N95 and N95 cover
3. PUT on booties 1st,then Sanitize hands for at least 20 seconds: closed (x4), open (x4), right thumb (x4), left thumb (x4), back of R hand (x4), back of left hand (x4) tips to palm (x4 each hand)

GOWNING your PPE

4. Put gown on and tie in front
5. Place N95
   a. Low string first and down on neck
   b. High string on crown
   c. N95 cover (cloth, surgical, face shield mask)
6. Open accordion of the orange face mask
   a. Place over N95 and tie lower string
   b. Pull up, covering the N95 and tie up string on crown OR place googles & **NOW** the bonnet (over string/s)
7. Put on gloves pulling up and over gown (2nd set same)
8. If preparing to perform any care that may be dirty (catheter care, dumping urine, oral care) place second set of gloves
9. Carry ALL equipment, medications, linens into rooms

HAND WASHING at Least 20 seconds after putting on booties
1. **Soap or sanitizer into hands: rub with friction: closed hands together (x4).**
2. **Open fingers, rub with friction (x4)**
3. **Left thumb, rub with friction (x4).**
4. **Right thumb, rub with friction (x4)**
5. **Back of the hand (x4) REPEAT to other hand**
6. **Fingertips to palms, right to left (x4)**
7. **Fingertips to palms, left to right (x4)**

Mantra: closed, closed, closed, closed, THEN open, open, open, open, (R) thumb, thumb, thumb, thumb, REPEAT (L) (R) back of the hand, back of the hand, back of the hand, back of the hand REPEAT (L) (R) tips to palm, tips to palm, tips to palm, tips to palm REPEAT (L)

Don-Doff for CoVID 19 :

Preparing Personal Protection for staff and patients!

A 30 minute practical presentation for staff providing patient care in the 5J Step-down area. Offered by Barbara McLean.

1. Understanding CoVID transmission
2. Putting on PPE for the best protection (DON)
3. Taking off PPE to reduce accidental transfer (DOFF)
4. Clinical practice!

Sessions offered:

1. Tuesday June 16: 1030 AM, 1500 PM, 1930 PM
2. Thursday June 18: 730 AM, 1030 AM, 1500 PM
3. Saturday June 20: 1500 PM, 1930 PM

All staff on duty should attend! Questions? Reach out to Ms. Kangoma, Ms. Sweetwood or Barbara (text:404-626-2843)

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Is there a strong, evidenced based PPE supply chain available at your site?

- A. Yes
- B. No
- C. I don't know

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Rigid methods of PPE

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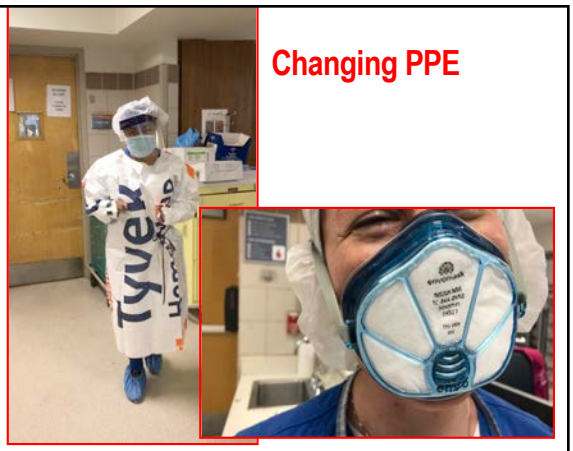

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"You will discover that you have two hands, one for helping yourself and the other for helping others."

-Audrey Hepburn

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Recognizing and Managing CoVID Organ Dysfunction

And why are they so sick?

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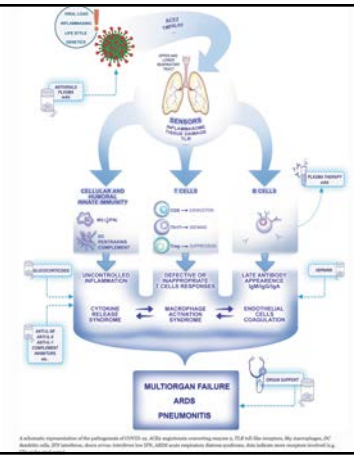

What's New in Intensive Care
Published: 05 June 2020
Ten things we learned about COVID-19
Maurizio Cecconi, Guido Forni & Alberto Mantovani

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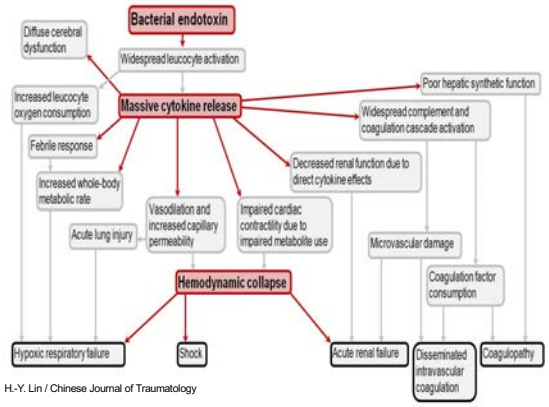

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Providing Critical Care

- Exuberant inflammatory response
- Severe hypoxia and loss of lung compliance
- Capillary permeability changes
- Profound histopathology changes
- Euvolemia, not hypervolemia
- Aggressive coagulation
- Increased blood viscosity

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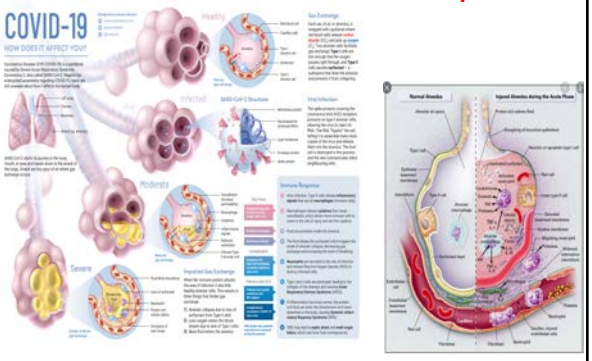
Acute Alveolar Injury: CARDS and Sepsis



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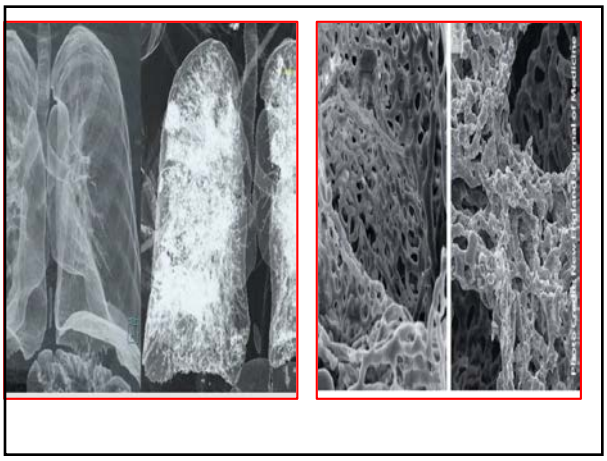

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Maintain euvolemia. There is a high risk of acute lung injury with hypervolemia
Excersize caution with newer none-evidence based strategies for ventilation

Hypoxemic, Vascular dysfunctional ARF

- Recognizing **L**ow elastance
  - ↑ compliance
  - Higher Fi02
  - Avoid inubation
  - Microvascular viral invasion
- High flow, CPAP, BiPAP
- Pulmonary hygiene
- Self prone
- Mobility
- Effervescent fever control
- No steroid recommendations

Classic ARDS type CoVID 19

- Recognizing **H**igh elastance
  - Elective early intubation
  - ↓compliance
  - Higher PEEP, LTV
  - Mean airway pressure strategies
  - Controlled Fi02
  - Rapidly progressing microvascular pathologies
- Early extreme lateral rotation, manual prone, roto-prone
- Effervescent fever control
- VV ECMO if available
- ? Dexmethasone

JAMA Insights | CLINICAL UPDATE
Management of COVID-19 Respiratory Distress

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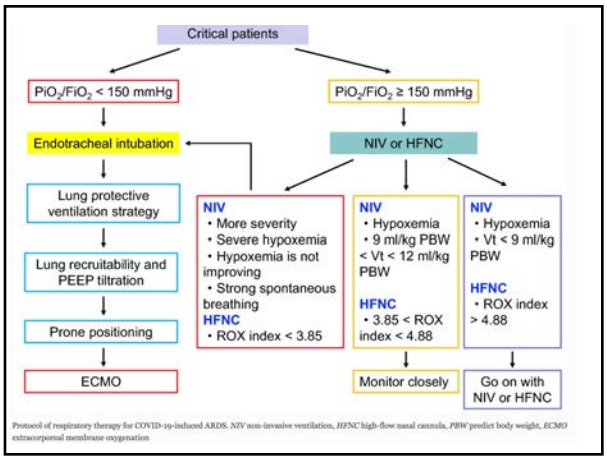

Protocol of respiratory therapy for COVID-19-induced ARDS. *NIV* non-invasive ventilation, *HFNC* high-flow nasal cannula, *PBW* predict body weight, *ECMO* extracorporeal membrane oxygenation

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Characterization of COVID-19 Patients Returning for Care After Hospitalization

- Retrospective cohort study of patients with confirmed SARS-CoV-2 infection discharged from 5 NYC hospitals (N = 2864)
  - 3.6% (n = 103) sought emergency care after median 4.5 days
  - 2.0% (n = 56) required inpatient readmission
- One half of patients returning for care experienced **respiratory distress**
- Compared with patients not returning for care, those seen again had:
  - More COPD (6.8% vs 2.9%) and hypertension (36.0% vs 22.1%)
  - Shorter median length of initial stay (4.5 vs 6.7 days)

Somani. J Gen Intern Med. 2020;[Epub].

Slide credit: clinicaloptions.com

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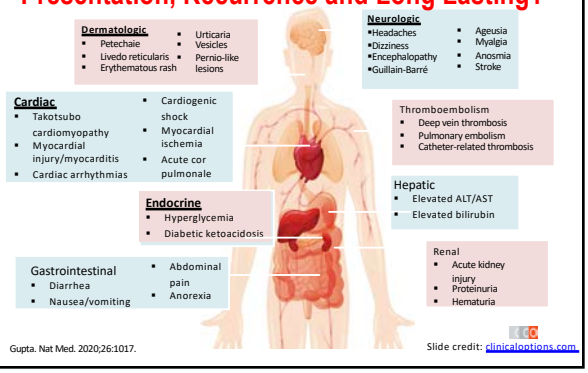
Extrapulmonary Manifestations of COVID-19: Presentation, Recurrence and Long Lasting?



Gupta. Nat Med. 2020;26:1017.

Slide credit: clinicaloptions.com

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Renal Dysfunction

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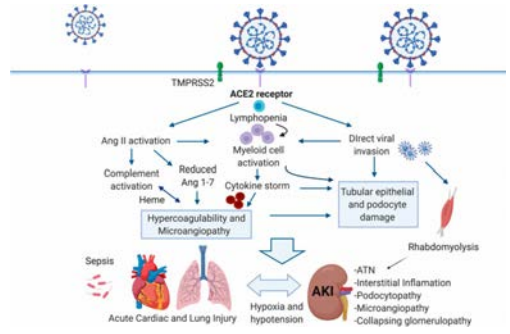
Targeting of ACE2 by SARS-CoV-2 results in angiotensin dysregulation, innate and adaptive immune pathway activation, and hypercoagulation to result in organ injury and AKI associated with COVID-19.



Daniel Batlle et al. JASN doi:10.1681/ASN.2020040419

JASN

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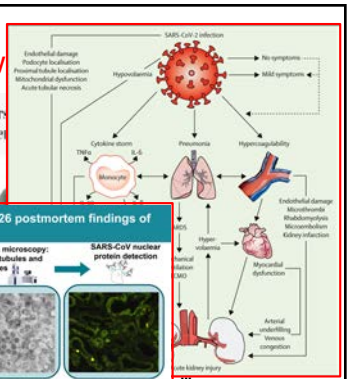
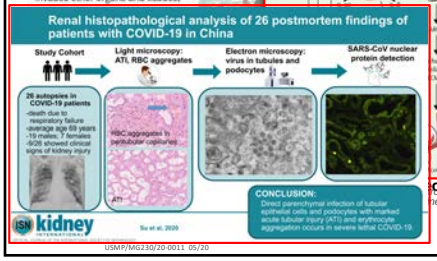
Kidney Damage Is A Key

Coronavirus destroys lungs. But doctors damage in kidneys, hearts and elsewhe

A small but growing body of evidence suggests the virus invades other organs and tissues,





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ogists on Lessons
ney Disease in COVID-19,

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Maintain euvolemia. There is a high risk of acute kidney injury with hyper/hypovolemia.
What can I do to improve CRRT in CoVID

- Limiting fluid resuscitation
- Monitored and early Anticoagulation (to the filter first)
- Blood flow advice
- DTI? What is the role
- Change in renal replacement methodology
- Citrate?
- Daily evaluation?
- Careful monitoring of filter, transmembrane, Δ pressure and return pressures
- Early intervention for refractory metabolic acidosis

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CRRT Is Preferred RRT Modality in COVID-19 Patients

- Clinical guidelines recommend CRRT for hemodynamically unstable patients
- Slow, gradual fluid removal allows time for the vascular space to refill, reducing the impact on hemodynamics and organ perfusion
- Accurate measures of fluid removal and infusion facilitate precise control over patient fluid balance
- Gradual process allows solute and fluid removal to be fine-tuned on an ongoing basis

CRRT (if available) is preferred over intermittent hemodialysis in the setting of biocontainment/isolation as intermittent hemodialysis requires 1:1 nursing support. *Health Trust, April 2020*

of print]

American Society of Nephrology (ASN)
"If available at an institution, the preferred modality for RRT in critically ill patients is CRRT or PIRRT…"
Acute Dialysis Quality Initiative (ADQI)
"Continuous types of RRT are recommended in situations where shifts in fluid balance and metabolic fluctuations are poorly tolerated."
Kidney Disease | Improving Global Outcomes (KDIGO)
"We suggest using CRRT, rather than standard intermittent RRT, for hemodynamically unstable patients."
Surviving Sepsis Campaign (SSC)
"We suggest using CRRT to facilitate management of fluid balance in hemodynamically unstable septic patients."

USMP/MG230/20-0011 05/20

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Issues?

- Can we provide enough CRRT in a CoVID surge?
- How do we deal with the increased clotting in a non-citrate hospital?
- Its not just about ventilators, it is about CRRT
  - Can you plan to increase your devices?
    - No hoarding allowed
- Remember the kidney is the last to recover, plan for longer term dialysis

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Surge plan: Acute Renal Support in the ICU

PD

- **CRRT/ Shift/ PIRRT**
  - **CRRT machines, less Patients**
  - **Cardiovascular instability** (cardiogenic shock, septic shock, acute liver failure)
  - **Metabolic acidosis**
  - **Volume control**
  - **Cerebral edema**
- **IHD/PIRRT/PD**
  - **MORE patients**
  - Hyperkalemia
  - Profound acidosis
  - Drug poisonings
  - Anticoagulation issues with CRRT

Used @ permission M. Connor

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Goals and demands

- A: acid base balance
- E: electrolyte disorders
- I: intoxications
- O: overload (fluid)
- U: uremia

- A: anticoagulation
- E: extra demands on staff
- I: immediate attention to *Filter* pressures and alarms
- O: overcoming immobility
- U: unexpected issues with drug clearance

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Everything you need to know is here

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Everything you need to know is here

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Everything you need to know is here

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Options for Ordering Fluid Removal during CRRT

NET zero: DO NOT remove ANY fluid, just solutes!: making patient positive

- do not remove the fluids you are giving and do not remove any fluid from the patient

Net Even: Match total Intake with total Output: making patient even

- During each 12 hour Shift - the Total Volume put into the patient and the total volume removed from the patient (pumps tubes and CRRT Should be equal

Net Negative Fluid Removal: making patient negative

Match I and O and then remove more!

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Unknowns of Hemofiltration for Sepsis/CoVID

- Interaction of immune system with foreign surface of the circuit?
  - Complement activation
  - Bradykinin generation
  - Leukocyte adhesion
- Clearance of anti-inflammatory mediators?
- Clearance of unknown good mediators?
- What do plasma levels of mediators really mean?
- What is next?

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Hperglycemia

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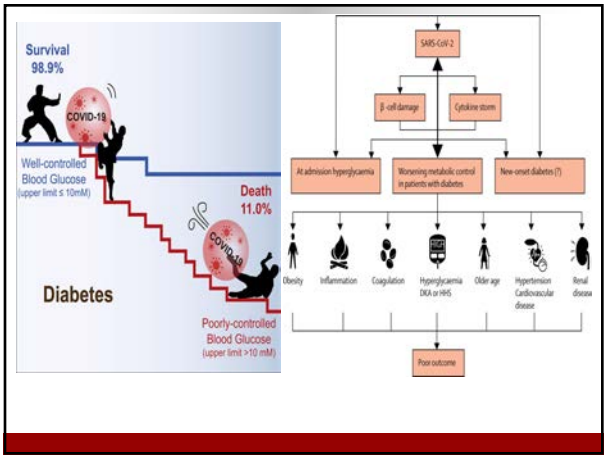

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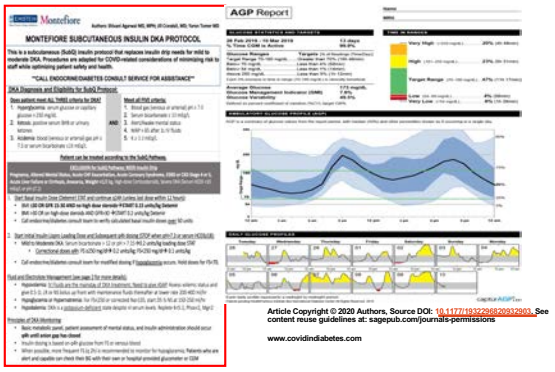
What can I do to improve Glycemic Control in CoVID: Bedside Advice that may impact Sepsis Care



www.covidindiabetes.com

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Prioritizing Critical Care Interventions

- Supports the organ systems most likely to cause death
- Do not introduce anything new without adequate training!
- Demonstrated effectiveness or best professional judgment to improve survival in similar clinical conditions
- Do not require prohibitively expensive equipment
- Should be implemented without consuming extensive staff or hospital resources

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Staff Psychological Issues

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Reactions to serving in a combat zone Just like a pandemic!

- Reactions to being in a pandemic zone may disappear when normalized
- The persistence of feelings of isolation and failure can cause significant feelings of despair
- Serving in a combat (pandemic) zone can change worldview
  - The world isn't safe
  - I might be harmed
  - I might harm my family and friends
  - I must be ready for danger at all times

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Psychological Issues

- Tips for Survival
  - Promotion of safety
  - Promote calm
  - Promote connectedness
  - Promote self-efficacy
  - Promote hope
  - **R**est
  - **R**eturn home
  - **Rejuvenate!**

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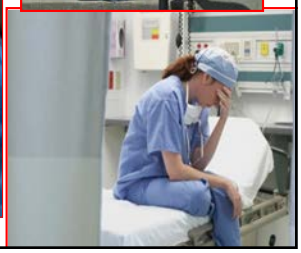
Sorrow and Sharing



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Prepare your staff

- practicing response roles
- implementing all levels of quarantine
- enforcing movement restrictions
- managing limited resources
- handling mass fatalities
- conducting mental health screening
- coping with high stress demands
- preparing for the needs of their families if workers are required to be more engaged at work or quarantined

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The pandemic stress: life in the time of CoVID

- physical strain of protective equipment (dehydration, heat, exhaustion)
- physical isolation (restrictions on touching others, even after working hours)
- constant awareness and vigilance regarding infection control procedures
- pressures regarding procedures that must be followed (lack of spontaneity)

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Prepare your staff

- Specific details about transmission of the COVID-19 virus
- When and how to screen patients and, potentially, family members
- The use of personal protective equipment
- When to invoke quarantine and isolation
- Ethical decision-making about triage and surge capacity issues

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Prepare your staff

- continued daily workload demands competing with COVID-19 preparation and treatment measures
- a need to maintain high standards in the face of a low-frequency event within which official recommendations and policies change regularly
- possible separation from and concern about family members
- fears about infection and subsequent implications for self, patients, and family
- inner conflict about competing needs and demands

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Be Observant

- PTSS
- Depression
- Substance abuse (usually ETOH)
- Panic Disorder
- Phobias
- Somatic Symptoms

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What we saw

- Extreme mental and physical challenges
- Isolation
- Spiritual decline
- PPE fatigue
- Short tempers
- Failure to filter
- Call-ins increasing
- Others picking up slack

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Working your staff to DEATH

- Monitor and support staff activities.
- If staff seem tired and wornout, ***REQUIRE*** them to take a break
- Provide resources to staff to help take care of their physical and emotional health
- Provide a meditative quiet room for emotional breaks

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Therapeutic endeavors

- Group therapy: sharing of traumatic experiences and support from other group members
- Group yoga or other mind-body relaxation techniques
- Regular in person and/or virtual support groups

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Does your system have methods to encourage dialogue and support staff?

- A. Yes
- B. No
- C. Possibly
- D. I don't know

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Mild TBI and PTSS have many smiliarities

Postconcussion Syndrome (PCS)

- Insomnia
- Impaired Memory
- Poor concentration
- Depression
- Anxiety
- Irritability
- Headache
- Dizziness
- Fatigue
- Noise/Light intolerance

Post Traumatic Stress Syndrome

- Insomnia
- Memory Problems
- Poor concentration
- Depression
- Anxiety
- Irritability
- Emotional numbing
- Avoidance
- Intrusive symptoms

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The pandemic stress: life in the time of CoVID

- Little things
  - Gratitude
  - Praise
  - Snacks and food
  - Spiritual prayer
- System awareness
  - Debrief
  - Meditation
  - Yoga
  - Quiet rooms
- Support circles
- 30 minutes down after death

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Little things

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Gratitude from colleague to colleague

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Innovation: BaLa face mask covers

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Partnership

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Innovation

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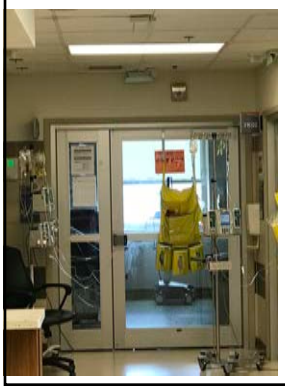
Innovation



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Innovation

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System and Self Accountability

- regular check-ins with colleagues, family, and friends
- working in partnerships or in teams
- brief relaxation/stress management breaks
- regular peer consultation and supervision
- time-outs for basic bodily care and refreshment
- increasing supervision, consultation, and collegial support
- regularly seeking out accurate information and mentoring to assist in making decisions
- focusing their efforts on what is within their power
- acceptance of situations they cannot change
- fostering a spirit of fortitude, patience, tolerance, and hope

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System and Self Accountability

- DO
  - self-monitoring and pacing
  - seeking out and sharing social support, virtually
  - checking in with other colleagues to discuss work experiences
  - scheduling time off work for gradual reintegration into personal life
  - talk about work experiences with others
- AVOIDING negative coping strategies such as:
  - use of alcohol, illicit drugs, or excessive amounts of prescription drugs, which all interfere with sleep cycles and prolong recovery
- AVOID
  - suddenly making big life changes
  - negatively assessing their work contributions
  - keeping too busy
  - viewing helping others as more important than self-care

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Lessons Learned from CoVID

- No one size fits all
  - High flow oxygen vs. ladder peep and Fi02
  - Less fluid and determined endpoint
  - Prone, prone, prone
  - Recognize refractory acidosis
  - Rigorous control of hyperglycemia
- All of our efforts WILL change our CoVID/sepsis care

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Lessons Learned from CoVID

- Rapid evolution of science, research and strategies
- Differences:
  - Pathology
  - Workload
  - Resource
  - Immediate burden
  - Innovation
  - Resilience

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How CoVID has impacted disaster preparedness in my hospital

- Resuscitation concerns and policies
- ***TRUE*** competency in Don/Doff and hazard preparedness
- ECC, EVS, Facilities, DM, CCM, Lab and nursing ALL together on this!
- Communication studies
- Drills, drills and drills
  - Long competency classes
  - Biweekly practice Don-Doff
  - Bimonthly spill practice
  - Monthly full scale drills
- Purchased additional CRRT and Mechanical Ventilators
- Rise up critical care program

Disaster Care: You can never really be prepared. You can never prepare enough!

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How we have impacted CoVID

- Pumps outside room
- Tablets, phones and EOL visits
- Meditation, mindfulness, psychology rounds
- Meals and snacks are delivered
- Urinary monitoring devices outside room via tablet

Staff awareness: the little and the giant things that assist with emotional and moral well being

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How we have impacted CoVID

- Mobility coach classes
- Prone leaders
- Daily Leadership calls
- Daily CoVID updates
- Daily personal check in
- Appreciation for intra unit support
- EOL scheduled visits

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Health Care Heroes

- Don't call us heroes
- We are not superhuman
- We need support
- We need space
- We need each other

- Gonzales, G. (2003). Deep survival. Who lives, who dies, and why. True stories of miraculous endurance and sudden death. W.W. Norton & Company. New York.
- Reissman, D. B., Watson, P. J., Klomp, R. W., Tanielian, T. L., & Prior, S. D. (2006). Pandemic influenzapreparedness: adaptive responses to an evolving challenge. Journal of Homeland Security and Emergency Management, 3(2).

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Sacrifices for us all

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What we have learned from CoVID

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Remember……

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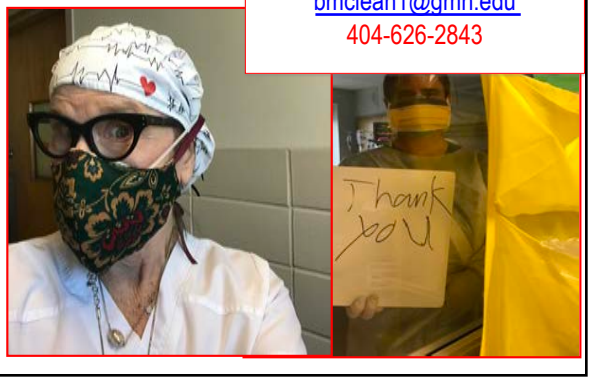

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