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Highlights

- Implementation of new simulated PPE enabled participants to perform the act of "donning" appropriate PPE and indicate to colleagues what they were wearing
    - Revealed some confusion amongst participants about where to find PPE outside of COVID OR#7
    - Next time we need improve how we orient everyone to this convention and ensuring that they know the stickers will be located wherever the PPE is supposed to be
- This scenario effectively re-challenged some previously identified latent safety threats, particularly the lack of phone available at Perimeter and uncertainty regarding location of OBCU
- Again, great engagement from participants throughout the scenario and debrief process; giving participants a heads up about the scheduled simulation worked to decrease overall stress/anxiety
- Scenario enabled us to explore the functionality of existing clinical flow pathways and identify latent safety threats

In Situ Simulation Summary

Participants:

Perimeter screening staff, porter, OBCU and triage nurses, PSWs, OB consultant and residents, Anesthesia consultant and resident, NICU resuscitation team

Case Summary:

What we planned

29-year-old female @35 weeks GA G2T1P0A0L1, with PPROM and preterm labour, history of previous C/S 4 years ago. Husband is a truck driver who was self-isolating at home after a positive screen, but the patient has developed a sore throat and fever of 39°C. Presents to hospital with rupture of membranes and in labour accompanied by a support person (speaks English). In triage, FHR drops to 60 and does not recover despite any intervention, triggering the requirement for an emergency c-section. Patient does not speak any English (Polish = native language). Preterm baby needs advanced resuscitation by NICU.

What actually happened

what we need to keep doing
what we plan to do differently next time
∅ **= latent safety threat**
AGMP = aerosol generating medical procedures
PUI = person under investigation

STAGE 1: Entering hospital perimeter

- Patient + confederate reported to B1 perimeter where **patient was screened** and failed ARI screen
- **Perimeter screening staff had phone at desk and contacted triage while advising patient to don mask,** however **(support person was not directed to don mask, despite exposure to probable COVID patient)**
  - **Excellent collaboration between the perimeter staff**
  - Perimeter staff indicated to triage, "failed her ARI…she's in ACTIVE labour"
  - Patient and support person were on their way to the elevator 4:54 (received directions to B4) when they were intercepted, and support person advised that she could not accompany actively labouring patient to triage ∅ **(1)**
  - actively labouring patient waited in hospital lobby for 12 minutes
- **serious communication breakdown** between perimeter screening staff, OBCU triage nurse and porter meant that when patient arrived to B4 Triage, **OBCU team lacked critical information about the patient** (gestational age, native language, reason for presentation) ∅ **(2)**
- Perimeter staff is variably aware of Code OB, including indications to call this code ∅ **(3)**

STAGE 2: Non-Reassuring FHR and decision to proceed to emergency c-section

- Porter "handed patient off" to Triage nurse (in droplet precaution PPE) without any communication (patient completely bypassed registration clerk)
- Patient and **brought immediately into Isolation Room** in Triage
  - OB triage nurses worked well together, as they attempted to discern critical aspects of the situation (unsuccessful due to language barrier)
  - appropriate monitors applied
  - **People were coming in and out of the triage room wearing dirty PPE** ** this was a repeat issue**
  - unclear what happened to patient wheelchair (should be considered contaminated)
- OB team was uncertain about where to find PPE in triage ∅ **(4)** *[in ante-room, includes N95 masks as per Stacy L]*

- OB resident presented to triage promptly, performed initial assessment and **quickly identified abnormal fetal heart rate and low SaO2** and advised maternal O2 and admission with transfer to COVID OR#7
    - **high flow O2 by face mask applied in Triage, risk of aerosolization ∅ (5)**
    - **OB consultant and chief resident were notified** (at resident's request) by triage nurse with **clear, succinct handover by OB resident to remaining OB team**
    - **Anesthesia, RT and NICU notified** via Charge nurse (at request of Triage nurse) but limited information provided to all responders due to **failed chain of communication and non-english speaking patient**
    - Anesthesia resident presented to OB triage as the patient was being transported to COVID OR#7
- *[Simulation team intervened]* OB triage nurse eventually received information from support person over the phone (gestational age, native language) but **this information did not reach the Obstetrical team at the patient's bedside**
- **Bloodwork and IV access were obtained in triage** but **patient did not undergo COVID testing** likely due to the urgency of the situation
- **OB charge nurse delegated OB nurses to prepare COVID OR#7** -- meant that PPE cart was properly positioned outside OR 7 (back hallway) quickly and efforts made to limit number of HCW involved to minimize exposure
- Patient was brought to COVID OR#7 **along the back hallway** which limited exposure to other patients and staff
    - **There was no "clean person" assigned to open doors, clear hallways etc. **** this was a repeat issue from previous sim** **∅ (6)**
    - mask was applied to patient
- **OB staff and anesthesia consultant communicated efficiently and clearly** to determine plan for GA section in probable COVID patient - unclear how much this was communicated or heard by the full team. Significant noise in the room at this point.
- Support person eventually allowed up to OBCU -- **was asked to wait in Patient waiting room (despite COVID exposure)** *[according to existing protocol, support person should have waited in Rm 228 or stay in triage isolation room to minimize risk of contamination to other patients, other HCW]*
    - **support person received update from Triage nurse** re: patient status (emergency C/S)

STAGE 3: Induction of general anesthetic and emergency cesarean section

- Two circulating nurses **efficiently took the necessary steps to prepare the patient for OR** including foley insertion, ESU pad applied, patient wedge, Joey bed ready
- Anesthesia delegated RT to place monitors while airway equipment and medications were prepared

- OB team helped with transfer of patient to OR bed and directing team to prepare patient
- **Patient was never consented for surgery**, and attempt at AMPLE history was conducted in Arabic *[despite polish-speaking patient]*
- Some confusion about where PPE is kept for COVID OR#7 *[back hallway]*
- There was no teammember assigned to be a "spotter" to support those donning PPE
- Enhanced PPE (particularly N95 and faceshield) created +++difficulties with communication as it muffles and obscures voices
- OB team donned enhanced PPE and prepped/draped the patient, **then anesthesia directed the team to leave the OR for intubation** (anesthesia team was already wearing -actual- enhanced PPE from previous case)
    - Anesthesia team then clarified with OB team re: timing of c-section, which resulted in **full surgical team returning to the OR and being present for the intubation,** so the surgery could proceed immediately following confirmation of ETT placement by anesthesia
    - ****there was a LOT of confusion within the team about whether or not to be in the OR for the intubation**** ∅ **(7)**
    - **glidescope temporarily malfunctioned - screen flickering and freezing**
    - **OR was quiet during intubation**
- **surgical pause was not performed**
- NOTES ON INTUBATION
- **Intubation was performed by a senior, experienced operator (staff handed over to a fellow based on technical difficulties intubating the mannequin) and followed the Covid 19 intubating protocol (low O2 flows, videolaryngoscope, RSI, no BMV)**
- Joey bed was positioned in OR; OB team placed infant in Joey bed and circulating nurse promptly delivered it to NICU admissions nurse who was wearing enhanced PPE in OR hallway
- **NICU did not receive adequate handover from OBCU team, despite multiple information requests**
- Unclear whether OB team discussed limiting the number of OB staff in OR (junior and senior resident both present)
- **Lack of closed loop communication, at times, led to increased confusion, delays and uncertainty about who was completing the requested tasks**
    - "I need somebody to put monitors on"
    - "can I get report?"
    - "can someone call to main desk?"
    - "guys we need to get a history"

STAGE 4: Preparation for extubation and transfer to Room 228

- This portion of the simulation was carried out through an interactive discussion describing what the steps would be
- Discussion of extubation plans by Anesthesia included the following

    - ensure patient stable from surgical perspective and entire surgical team to leave OR (incl. OB and nursing)
    - entire surgical team to leave the room
    - use lidocaine/remifentanil to reduce coughing upon extubation
    - use of cover to prevent spray of sputum
    - don patient with mask prior to transfer
    - anesthetist present in room to move with patient to Rm 228
- Uncertainty about where the surgical team doffs PPE *[according to pathway, gown, gloves removed in OR, then mask and shield in scrub hallway - if soiled]*
- OR#7 automatic both doors open by contactless motion sensor ∅ **(8)**

Key Latent Safety Threats + Solutions

Observed Safety Threat	Recommended Solution(s)	Implementation plan
(1) Existing corporate policy (From MOH) that involves leaving support person at entrance/in car discriminates against non-English speaking patients leading to poorer quality of care	Encourage nursing and perimeter screening staff to consider extenuating circumstances and allow an english-speaking support person to attend triage with non-english speaking patient (wearing mask) Enhance chain of communication between perimeter and OBCU triage	Stacy will work with Deb and screeners and triage nurses to consider such extenuating circumstances
(2) Lack of clear, effective communication pathway to disseminate critical information to necessary teams when patient fails ARI at perimeter	More simulation will help. The triage intake form has all the necessary information aside from "last meal" and could be in the room as a visual "cue" for the nurse initiating initial assessment	Stacy will laminate a front sheet triage record and hang it on the wall in Room 1 as a visual cue.
(3) Perimeter staff is unaware of CODE OB and unprepared for possible imminent delivery at the perimeter	Provide guidance and education about Code OB	Slides are available electronically -- TT to contact John (Mac) Barry with info about code OB protocol to be disseminated to perimeter screening staff
(4) Lack of clarity about where to find PPE in triage and OR#7 *[this has also been flagged during actual/recent ?COVID urgent cases]*	Initiate per shift"walk-throughs" so that OB nurses, OB residents/staff, NICU, and anesthesia residents/staff can go through the process at least once to ensure clarity about where to find PPE in emergent cases Remind charge nurses that PPE cart MUST go out, even if ob/anesthesia team is already donned, as NICU admissions nurse may rely on this cart to access PPE Sterile glove sizes posted outside OR#7 to enable scrub/circulating	Charge nurse to delegate this task to float nurse or any available nurse/resident who has already completed the walk through? Walk-through video created by TT and MK to disseminate https://youtu.be/L-zYxDvUGcM ?Stacy to communicate this to charge nurses

	nurse to pull these and leave them with sterile gowns (open on sterile blue drape)	Already done by Erin Chantler
(5) High flow O2 applied in triage	Not advised -- consider having a COVID resusc. reminders posted in Isolation Room (?especially on /near wall O2 stating "flows < 6L/min recommended"	Roy created a sign to be posted at all wall O2
(6) Potential contamination as team transferred patient from Triage to OR #7	Add PSW to existing flow pathway "Obstetrical Care Triage Department: Admitting Process" as clean person to assist in transfer	Carmen/Stacy to add PSW to flow pathway and ensure PSW have opportunity to participate in one daily-walk through
(7) Collective confusion about whether or not OB team should stay in the OR during the intubation led to delays in intubation	Revise "Management of Labour, Birth, and postpartum care for PUI or confirmed COVID-19 Infection" pathway section on "C-section in OR7 Need to disseminate to all team members that main OR intubation protocol does not apply in OBCU (e.g. if true "crash" c-section necessitating GA, baby needs to be delivered urgently, thus entire team must have enhanced/protected PPE and remain in room during intubation to reduce door opening/closing post AGMP) Encourage OB and Anesthesia staff to review this together at the beginning of each shift	? Carmen/Stacy to revise? Consider covering this information in the per shift walkthrough
(8) motion sensor for doors within OR#7 has not yet been disabled, increasing risk of unintended door opening and contamination of OR hallway	Disable OR#7 motion sensor door opening function	D Wiseman is aware and has sent request April 13th - currently taped

Neonatal insights

- Handover from OB team is **essential** to enable safe resuscitation of the infant. Ideally, flow of communication would occur from Triage to the charge nurse, who would be the point person for NICU (when calling to notify NICU about ?COVID patient)

Critical questions arising from simulation

Maternal

- **Due to simulation, the Isolation Room door was kept open, how will triage staff communicate within and outside of the isolation room IRL when it's closed?**
  - Answer: there will be phones installed in each of the rooms to facilitate this flow of communication to keep the door closed
- **If the isolation room is occupied when this ?COVID patient arrived, the backup room would be antenatal (also lack phones in the rooms) -- how would this be managed?**
  - Answer: may need to assign clean person in hallway

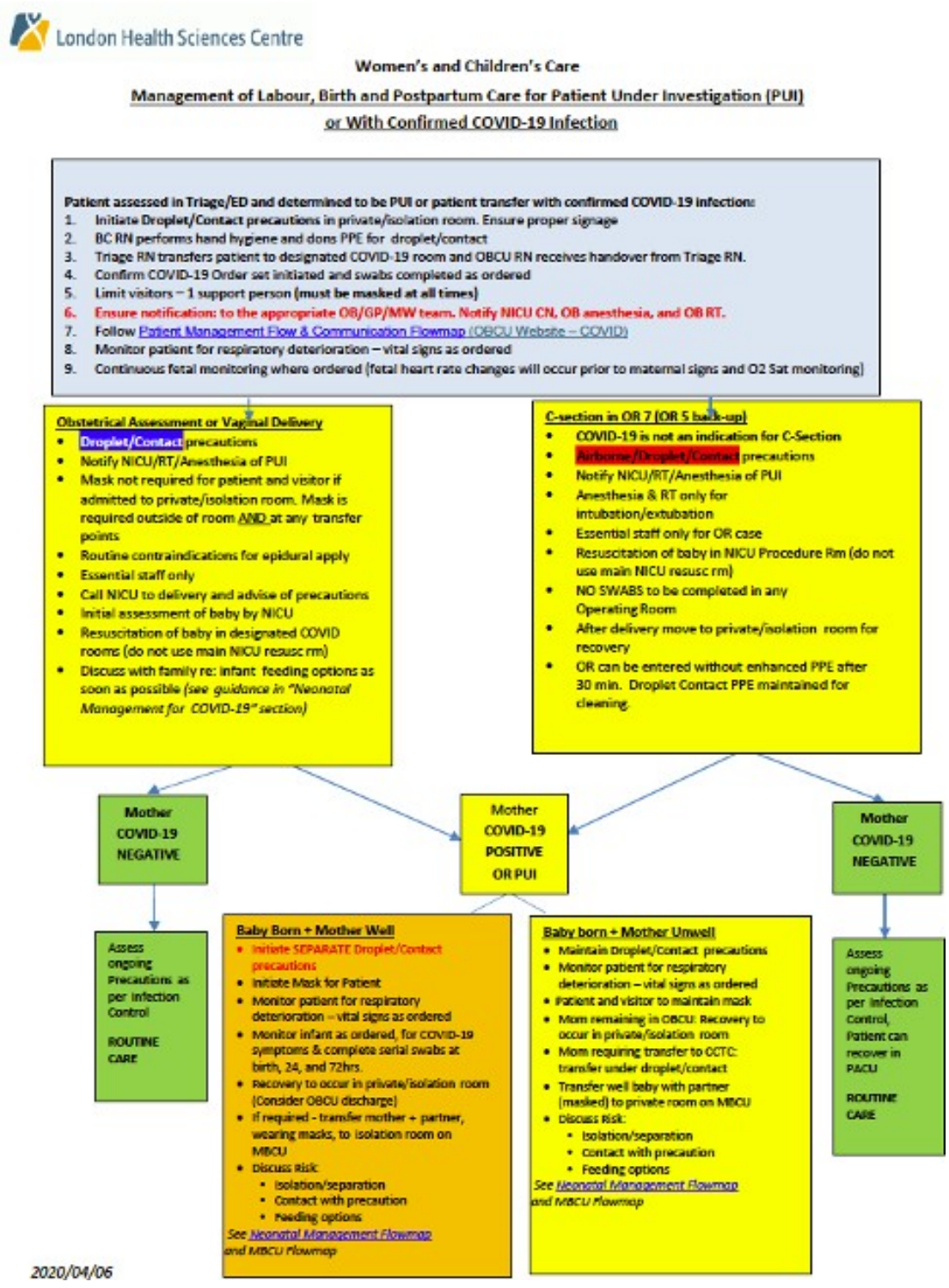
Neonatal

- **Where would babe have gone if not requiring ongoing NICU attention/support?**
  - Answer: according to initial

IPAC/Contamination

- **do we need a clean team to transport patient from triage to OR#7 or is one clean person sufficient?** ** need clarity from IPAC about this as the neonatal team has a clean team moving infant from OR to NICU**
- **can "dirty" anesthesia team member move patient from OR#7 to Room 228 at 15 min post-extubation?**
  - Likely anesthesia will doff gown/gloves and don new gown gloves, while keeping same N95/visor/goggles; anesthesia may decide to keep "dirty" PPE on while transferring patient and doff in ante-room (228)
- **What are the air exchanges in OBCU OR and what are the pressures (in room vs. in hallway)?**

Resources



London Health Sciences Centre

Women's and Children's Care

Management of Labour, Birth and Postpartum Care for Patient Under Investigation (PUI) or With Confirmed COVID-19 Infection

Patient assessed in Triage/ED and determined to be PUI or patient transfer with confirmed COVID-19 infection:

1. Initiate Droplet/Contact precautions in private/isolation room. Ensure proper signage
2. BC RN performs hand hygiene and dons PPE for droplet/contact
3. Triage RN transfers patient to designated COVID-19 room and OBCU RN receives handover from Triage RN.
4. Confirm COVID-19 Order set initiated and swabs completed as ordered
5. Limit visitors – 1 support person (must be masked at all times)
6. Ensure notification: to the appropriate OB/GP/MW team. Notify NICU CN, OB anesthesia, and OB RT.
7. Follow Patient Management Flow & Communication Flowmap (OBCU Website – COVID)
8. Monitor patient for respiratory deterioration – vital signs as ordered
9. Continuous fetal monitoring where ordered (fetal heart rate changes will occur prior to maternal signs and O2 Sat monitoring)

Obstetrical Assessment or Vaginal Delivery

- Droplet/Contact precautions
- Notify NICU/RT/Anesthesia of PUI
- Mask not required for patient and visitor if admitted to private/isolation room. Mask is required outside of room AND at any transfer points
- Routine contraindications for epidural apply
- Essential staff only
- Call NICU to delivery and advise of precautions
- Initial assessment of baby by NICU
- Resuscitation of baby in designated COVID rooms (do not use main NICU resusc rm)
- Discuss with family re: infant feeding options as soon as possible *(see guidance in "Neonatal Management for COVID-19" section)*

C-section in OR 7 (OR 5 back-up)

- COVID-19 is not an indication for C-Section
- Airborne/Droplet/Contact precautions
- Notify NICU/RT/Anesthesia of PUI
- Anesthesia & RT only for intubation/extubation
- Essential staff only for OR case
- Resuscitation of baby in NICU Procedure Rm (do not use main NICU resusc rm)
- NO SWABS to be completed in any Operating Room
- After delivery move to private/isolation room for recovery
- OR can be entered without enhanced PPE after 30 min. Droplet Contact PPE maintained for cleaning.

Mother COVID-19 NEGATIVE

Assess ongoing Precautions as per Infection Control

ROUTINE CARE

Mother COVID-19 POSITIVE OR PUI

Baby Born + Mother Well

- Initiate SEPARATE Droplet/Contact precautions
- Initiate Mask for Patient
- Monitor patient for respiratory deterioration – vital signs as ordered
- Monitor infant as ordered, for COVID-19 symptoms & complete serial swabs at birth, 24, and 72hrs.
- Recovery to occur in private/isolation room (Consider OBCU discharge)
- If required - transfer mother + partner, wearing masks, to isolation room on MBCU
- Discuss Risk:
  - Isolation/separation
  - Contact with precaution
  - Feeding options

See Neonatal Management Flowmap and MBCU Flowmap

Baby born + Mother Unwell

- Maintain Droplet/Contact precautions
- Monitor patient for respiratory deterioration – vital signs as ordered
- Patient and visitor to maintain mask
- Mom remaining in OBCU: Recovery to occur in private/isolation room
- Mom requiring transfer to OCTC: transfer under droplet/contact
- Transfer well baby with partner (masked) to private room on MBCU
- Discuss Risk:
  - Isolation/separation
  - Contact with precaution
  - Feeding options

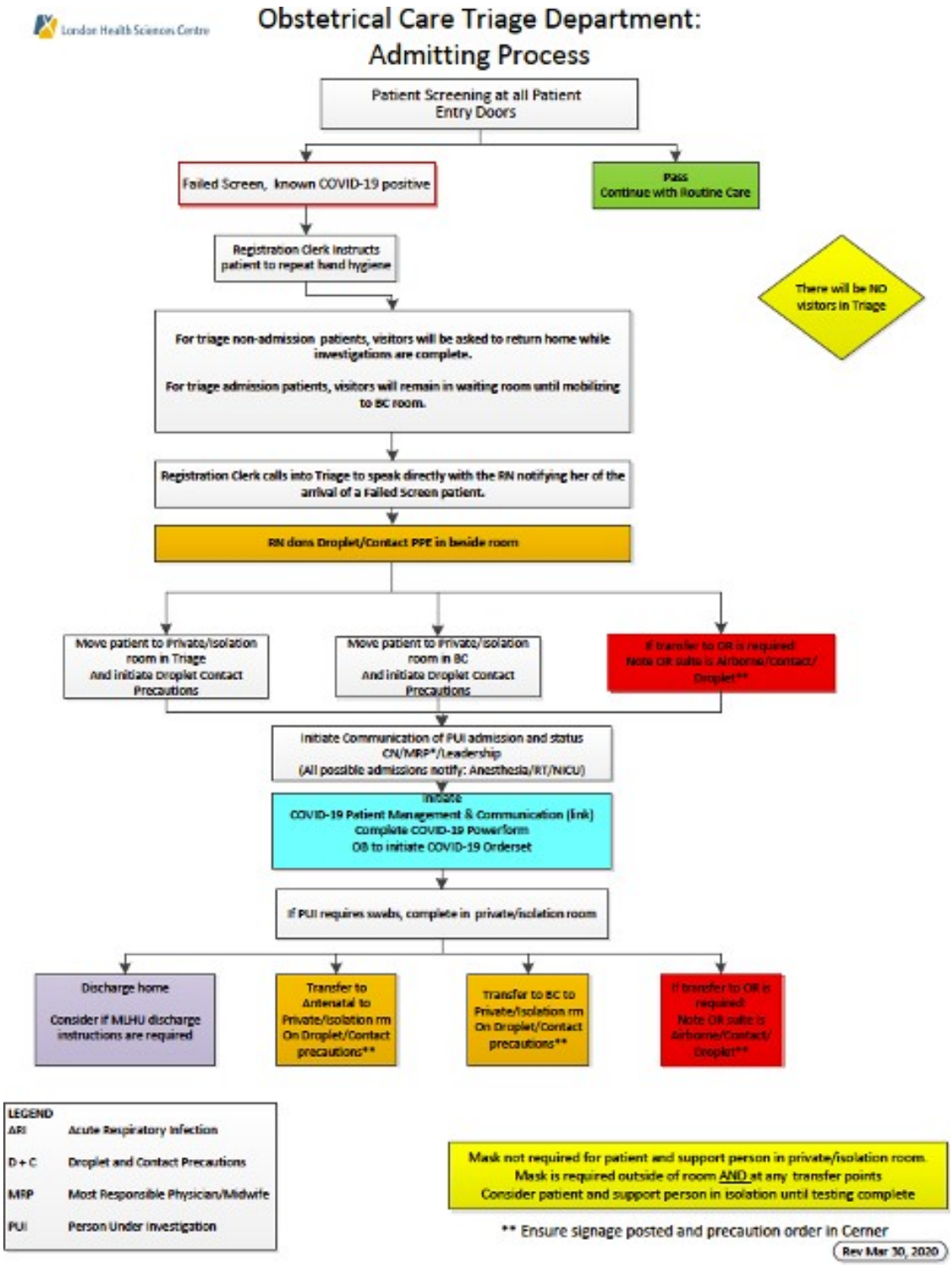
See Neonatal Management Flowmap and MBCU Flowmap

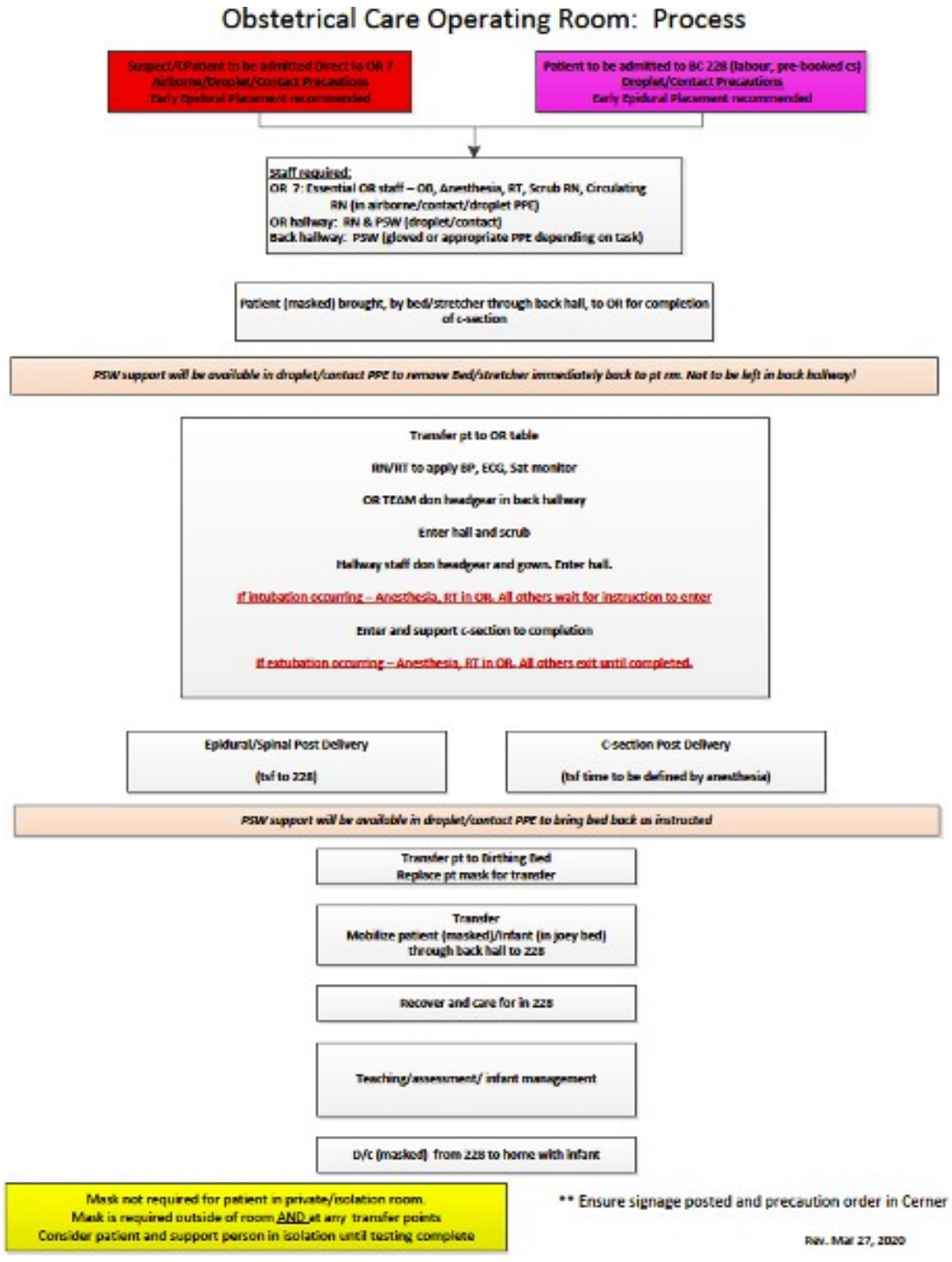
Mother COVID-19 NEGATIVE

Assess ongoing Precautions as per Infection Control, Patient can recover in PACU

ROUTINE CARE

2020/04/06


London Health Sciences Centre
Obstetrical Care Triage Department:
Admitting Process
Patient Screening at all Patient Entry Doors
Failed Screen, known COVID-19 positive
Pass
Continue with Routine Care
Registration Clerk instructs patient to repeat hand hygiene
There will be NO visitors in Triage
For triage non-admission patients, visitors will be asked to return home while investigations are complete.
For triage admission patients, visitors will remain in waiting room until mobilizing to BC room.
Registration Clerk calls into Triage to speak directly with the RN notifying her of the arrival of a Failed screen patient.
RN dons Droplet/Contact PPE in beside room
Move patient to Private/Isolation room in Triage
And initiate Droplet Contact Precautions
Move patient to Private/Isolation room in BC
And initiate Droplet Contact Precautions
If transfer to OR is required
Note OR suite is Airborne/Contact/ Droplet**
Initiate Communication of PUI admission and status
CN/MRP*/Leadership
(All possible admissions notify: Anesthesia/RT/NICU)
Initiate
COVID-19 Patient Management & Communication (link)
Complete COVID-19 Powerform
OB to initiate COVID-19 Orderset
If PUI requires swabs, complete in private/isolation room
Discharge home
Consider if MLHU discharge instructions are required
Transfer to Antenatal to Private/Isolation rm On Droplet/Contact precautions**
Transfer to BC to Private/Isolation rm On Droplet/Contact precautions**
If transfer to OR is required
Note OR suite is Airborne/Contact/ Droplet**
LEGEND
ARI Acute Respiratory Infection
D + C Droplet and Contact Precautions
MRP Most Responsible Physician/Midwife
PUI Person Under Investigation
Mask not required for patient and support person in private/isolation room.
Mask is required outside of room AND at any transfer points
Consider patient and support person in isolation until testing complete
** Ensure signage posted and precaution order in Cerner
Rev Mar 30, 2020


Obstetrical Care Operating Room: Process
Suspect/CPatient to be admitted Direct to OR 7
Airborne/Droplet/Contact Precautions
Early Epidural Placement recommended
Patient to be admitted to BC 228 (labour, pre-booked cs)
Droplet/Contact Precautions
Early Epidural Placement recommended
staff required:
OR 7: Essential OR staff – OB, Anesthesia, RT, Scrub RN, Circulating RN (in airborne/contact/droplet PPE)
OR hallway: RN & PSW (droplet/contact)
Back hallway: PSW (gloved or appropriate PPE depending on task)
Patient (masked) brought, by bed/stretcher through back hall, to OR for completion of c-section
PSW support will be available in droplet/contact PPE to remove Bed/stretcher immediately back to pt rm. Not to be left in back hallway!
Transfer pt to OR table
RN/RT to apply BP, ECG, Sat monitor
OR TEAM don headgear in back hallway
Enter hall and scrub
Hallway staff don headgear and gown. Enter hall.
If intubation occurring – Anesthesia, RT in OR. All others wait for instruction to enter
Enter and support c-section to completion
If extubation occurring – Anesthesia, RT in OR. All others exit until completed.
Epidural/Spinal Post Delivery
(txf to 228)
C-section Post Delivery
(txf time to be defined by anesthesia)
PSW support will be available in droplet/contact PPE to bring bed back as instructed
Transfer pt to Birthing Bed
Replace pt mask for transfer
Transfer
Mobilize patient (masked)/infant (in joey bed) through back hall to 228
Recover and care for in 228
Teaching/assessment/ infant management
D/C (masked) from 228 to home with infant
Mask not required for patient in private/isolation room
Mask is required outside of room AND at any transfer points
Consider patient and support person in isolation until testing complete
** Ensure signage posted and precaution order in Cerner
Rev. Mar 27, 2020

Ideas for Future In Situ Simulation Exercises

- sim coordinators need to wear something to indicate they are observers, not participants (and we need to limit # observers in any given clinical area when possible to decrease stress on participants who are stressed out by being watched)
- NICU suggestions -- next sim needs to include babe needing initial intervention and then is OK but mom is not, to practice troubleshooting where baby will go.
- Need to have some data capture or better follow-up with communication occurring between perimeter and OB triage, then cascade of information to entire OB team, anesthesia, RT and NICU
- resuscitation of a baby born to covid positive mom vaginally in Rm 228 to test our access and communication, particularly if mom also required an AGMP like intubation within RM 228. May be a big undertaking