London Health Sciences Centre

Maternity Care Simulation

Case:
COVID-19 Crash C-Section

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Creation date:
April 2nd 2020

Last update:
April 7th 2020

Target population:
Perimeter Screeners, OB Staff/Residents, OBCU Nurses, Anesthesia Staff/Residents, RTs

Objectives

Group	Objective
Perimeter Screeners	-Complete a full screening questionnaire under duress. -Identify need for, and implement, isolation of patient/family member. -Communicate to Triage team incoming COVID+ Patient and properly direct patient to OB triage.
Obstetricians	-Recognize need for PPE, and don appropriate protective equipment for various clinical scenarios. -Demonstrate situational awareness in recognizing abnormal FHR and communicate to other health professionals the urgency of the situation. -Prioritize personal and staff protection while working to manage a time sensitive emergency.
Nurses	-Complete appropriate screening and ensure patient and staff are wearing appropriate precautions. -Communicate effectively the presence, location, and transfer of a likely covid patient to other key team members to enable preparation.
Anesthesiologists	-Recognize the need for airborne precautions; ensure you and your team are adequately protected.

	-Balance the time needed for donning of protective equipment with that of an emergency c-section; staff safety takes precedence. -Ensure clear communication strategies are employed with all care providers. -Correctly Don/Doff appropriate level of PPE utilizing a spotter -Modify your airway management to reduce aerosolization.
Respiratory Therapist	-Recognize need for Enhanced Aerosol PPE and correctly don/doff. -Use cognitive aids developed to assist Anesthesiologist with airway management.
Neonatology Team	-Practice workflow involved in managing a preterm neonate delivered from a COVID+ mother requiring resuscitation

Simulated case summary:

29-year-old female @35 weeks GA G2T1POAOL1, 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 with rupture of membranes and in labour. In triage, FHR drops to 60 and does not recover despite any intervention, triggering the requirement for an emergency c-section.

Scenario Requirements

Equipment	Moulage	Confederates	Adjuncts (e.g. Imaging, bloodwork, forms)
☐ COVID Swab ☐ Tocometer ☐ C-Section Tray ☐ GlideScope ☐ 2nd Gen LMA ☐ ETT ☐ Bougie ☐ COVID Cart ☐ NICU equipment ☐ "PPE" stickers	☐ None Required	☐ Husband/Family	☐ Antenatal History

Participants:

Actual Identity	Role in Scenario
Somebody from Sim Team	Husband/Family member (confederate)

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Time required for simulation:

Event	Duration
Set-up	20 min
Simulation	20 min
Debrief	45 min

Baseline simulator physiologic state:

(leave blank if not relevant)

HR: 83	**BP:**118/79	**RR**:18	**SpO2:**97%
Temp:37.7	**FHR:**118	**Other:**	

Neuro	GCS15, anosmia
Resp	Mild Wheezing throughout chest. Otherwise GAEB.
CVS	Normal S1 S2 no murmurs
GI	Mild nausea, no vomiting
GU	Normal
Other	FM+, ongoing LOF, pink discharge, contraction q 5-7 min for the past 2 hours, increasing in intensity in the past hour. Fetus in breech position

Full background information for scenario:

(For the information of instructors/confederates only. Information provided to participants as appropriate for scenario)

HPI	29yo G2T1 at 35 weeks, confirmed PPROM (still obviously leaking - no speculum exam needed.) History strongly suggestive of COVID infection. Presents in labour and subsequently has a prolonged deceleration in FHR that does not recover, necessitating a crash section.	
OB History	GBS negative. 35 weeks GA. Uneventful Pregnancy thus far; No gHTN, no GDM. Previous c-section in 2016 at 39+6 for failure to progress at 7cm and atypical FHR . Known breech.	
PMHx	Mild Asthma, but otherwise healthy. PUGA. NKDA.	
ROS	Fever, sore throat, and known covid-positive contact with husband. FM+, gush of clear fluid at 0600 ongoing leaking since, soaking through pads, pink discharge, feeling contractions for the past 2 hours, increasing frequency and intensity (pain 10/10) in the past hour.	
Meds	PNV	
Allergies	NKDA	
P/E	**General**	Unremarkable
	Wt/Ht	90kg/170cm
	Vitals	AVSS as above
	CNS/LOC	GCS15

	CVS	Normal
	Resp	Mild Wheezing; otherwise normal. Airway reassuring Malampatti II, good MO, neck ROM.
	Abdo	Soft, nontender. Gravid uterus, SFH measuring 36 cm
	Pelvic	Cervix 4cm/80%, sp-2, breech
Investigations	GBS negative. Previous CBC from 4 months ago unremarkable. Known Rh+, WBC 4.0 Hb 110, Plt 250, Cr 65, AST 50, ALT 60, normal electrolytes Real time scan (if performed): breech presentation, low amniotic fluid levels	

Information for participants:

Instructions about what information should be given to participants, including background and instructions regarding behaviour, scripted phrases, trigger points, etc.

Participant	Initial information provided
Screening Nurse/Volunteer	N/A -- no pre-brief other than to inform potential participants about the PPE convention with stickers to preserve actual PPE.

Scenario timeline:

Stage 1:Initial Presentation

Objectives addressed by this stage: Appropriate screening of Patient, intact chain of communication from perimeter to Triage			
Key event(s) in this stage: Perimeter Screen, Transfer to OBCU Triage and into an assessment room while COVID precautions taken.			
Patient information	**Scenario adjuncts** (e.g. confederate tasks, environmental cues, results)	**Expected Behaviours** (i.e. observed and 'what if')	**Progression if expected behaviours not met**
History/condition: 29yo G2T1 at 35 weeks, 1 day history of sore throat and fever ad 39C. Hx previous c-section in 2016. Presents with PPROM and preterm labour. Normal FM, leaking since 0600 clear fluid, pink discharge, contractions q5-7 mins for the past 2 hours, more intense in the past hour.	Patient presents to B1 for screen. Positive screen from symptoms and contact history.	**Screening staff** request patient + family perform hand hygiene and don mask. - Contact OB triage to alert to incoming COVID+ patient.	Patient will increasingly moan/cry out if screening person does not respond urgently

Known breech presentation. GBS negative Patient in active labour			
Vital signs: Triage assessment HR 89 BP 118/79 RR 18 FHR 120-135 w/ **minimal variability**		**Triage Nurse**- Recognizes COVID+ status. - Re-Screening performed, appropriate PPE donned. - Patient moved to assessment room with appropriate signage. -Consideration for COVID swab to be performed - OB team alerted to patient.	
Physical Exam: Unremarkable Mild wheezing Cervix 4cm/80%/sp-2/ breech			

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

Objectives addressed by this stage: Clear communication and early planning between teams (triage to OB and charge nurse; charge nurse to OR team/OB/Anesthesia/RT)			
Key event(s) in this stage: FHR drop recognized and organization of OR and transfer of patient occurs for an emergency caesarean section in suspected COVID patient.			
Patient information	**Scenario adjuncts** (e.g. confederate tasks, environmental cues, results)	**Expected Behaviours** (i.e. observed and 'what if')	**Progression if expected behaviours not met**
History/condition: astient continues to moan in pain, still leaking FHR drops to 60 shortly after OB team		**Obstetrician**-Dons appropriate contact/droplet PPE and assesses patient. -FHR drop recognized, and appropriate resuscitative measures taken (vaginal exam, LUD, IV start/fluid	

arrives - does not respond to intrauterine resusc. measures Worsening abdominal pain with bright red blood per vaginal;		bolus; if sat checked need for supplemental O2 recognized, but no more than 6L/min applied). -Communication with Charge nurse, remainder of OB team, and Anesthesia + RT + NICU RE: potential need for emergency section of covid+ patient, preterm, previous C/S and breech. -communicates to patient/partner need for urgent c.section with verbal consent discussion	
Vital signs: Maternal HR 120 R 20 BP 100/70 SaO2 94% (96% if any O2 provided) FHR 60		**Nursing/Charge Nurse**- Alerts OR team to open/prepare for crash section in covid+ patient. -Ensures clear communication and early alert of all individuals involved (Nurses, OB, Anesthesia, RT, NICU). -Ensures appropriate PPE available and ready for staff involved in anticipated emergency C/S by placing PPE in the red designated square outside OR#7 (**PROTECTED droplet/contact with enhanced PPE).** -Communicates to team once OR prepared. -IV started, bloodwork sent (or discussion with anesthesia about starting in OR). -Assign “clean” person to open doors etc. on route to OR#7	

Physical Exam: Abdominal tenderness cx 4 cm dilated sp-2 (if not yet done by triage nurse) presenting part palpable and felt to be breech.		**Anesthesia-**Prepares medications and equipment. -Calls for COVID cart -Verbalizes plan for General Anesthetic -Second anesthetist called; RT called if not done already. -Ensures proper enhanced Airborne precautions donned by all involved with airway management. -Communicates to team when ready for patient.	

Stage 3: Induction of General Anesthesia and caesarean section

Objectives addressed by this stage: Communication, coordination, and execution of a caesarean section under general anesthesia, with reduction in individuals present during aerosol generation (intubation). Coordination of handoff of baby in a covid+ patient to NICU.			
Key event(s) in this stage: Patient intubated, caesarean section performed, baby handed off to NICU team.			
Patient information	**Scenario adjuncts** (e.g. confederate tasks, environmental cues, results)	**Expected Behaviours** (i.e. observed and 'what if')	**Progression if expected behaviours not met**
History/condition: No change in maternal status. FHR remains unresponsive to any intrauterine resuscitation		**OB team** – PROTECTED contact/droplet with Enhanced PPE -Prep/Drape Patient and help nursing staff to urgently prepare patient for section (see tasks below) -discussion about minimal # of people needed -perform pre-anesthetic surgical pause -Perform C/S -OB to place baby in sterile draped Joey bed	

Vital signs: start -> induction HR 98 -> 72 BP 127/89 -> 98/66 RR 24 -> apnea FHR 60 ->60		**Nursing** -Monitors applied, foley inserted, patient wedged, ESU pad applied -Only critical staff in room for intubation -Remainder of staff return to room wearing PROTECTED contact/droplet + enhanced PPE once intubation complete -Minimize OR door opening -circulating nurse passes the baby on Joey bed to the OR corridor to NICU admissions RN	
Physical Exam: Unchanged		**Anesthesia** -Pre-Oxygenate -IV antibiotics administered -Perform covid-specific RSI once OB ready. -Intubation with minimum number of individuals for assistance wearing PROTECTED contact/droplet + enhanced PPE **-Usual maintenance of anesthetic, may include pre-emptive vasopressor.** **-Discussion of extubation options and disposition.**	
Other:	COVID 19 NICU resusc. team = Admissions Team RN, RRT, 1 medical team member	**NICU** – Admissions team RN dons PROTECTED contact/droplet + enhanced PPE outside OR scrub corridor -receive baby from circulating nurse in the OR corridor, cover bed with plastic cover and transfer to NICU procedure room (B4-260) for resuscitation	

Stage 4: Emergence and transfer of patient to Room 228 for recovery

Objectives addressed by this stage: Communication, coordination, and execution of emergence and extubation of patient, as well as transfer to recovery room.			
Key event(s) in this stage: Patient extubated and transferred to Room 228 for recovery.			
Patient information	**Scenario adjuncts** (e.g. confederate tasks, environmental cues, results)	**Expected Behaviours** (i.e. observed and 'what if')	**Progression if expected behaviours not met**
History/condition: Vitals stable throughout section. No difficulty oxygenating or ventilating. No hemodynamic instability or bleeding.		**OB team** - Complete c-section. - Review blood loss and confirm uterine tone.	
Vital signs: GA -> emergence HR 68 -> 88 BP 100/70 -> 115/78 RR vent -> 14		**Nursing** - Only essential documentation brought in to OR. - Patient chart kept outside room - ?Reduction of unnecessary individuals in the OR for extubation. - No re-entry into room for 15 minutes without PPE. - Ensure room 228 is prepared to receive patient with contact/droplet precautions used.	
Physical Exam: Unchanged Adequate uterine tone, EBL 800mL, foley in place draining clear urine.		**Anesthesia**- Communicates stability of patient and plan for extubation and transfer to 228 for recovery. - Reduces unnecessary staff in room. - Modifies extubation plan to reduce	

		aerosolization and coughing. - Communicates need to keep room clear of any unprotected staff for 15 minutes. - Face mask set to <6L/min for transfer. - Ensures a 'clean' individual to open doors and transfer patient to room 228. - Appropriately Doffs PPE.	
Other:		NICU -- see NICU documents for plan re: resuscitation of preterm infant	

Discussion and Debriefing Guide:

Error Type	Common Errors Observed	Teaching Points
Technical Skills		
Crisis Resource Management		
Latent Safety Threats		

Resources:

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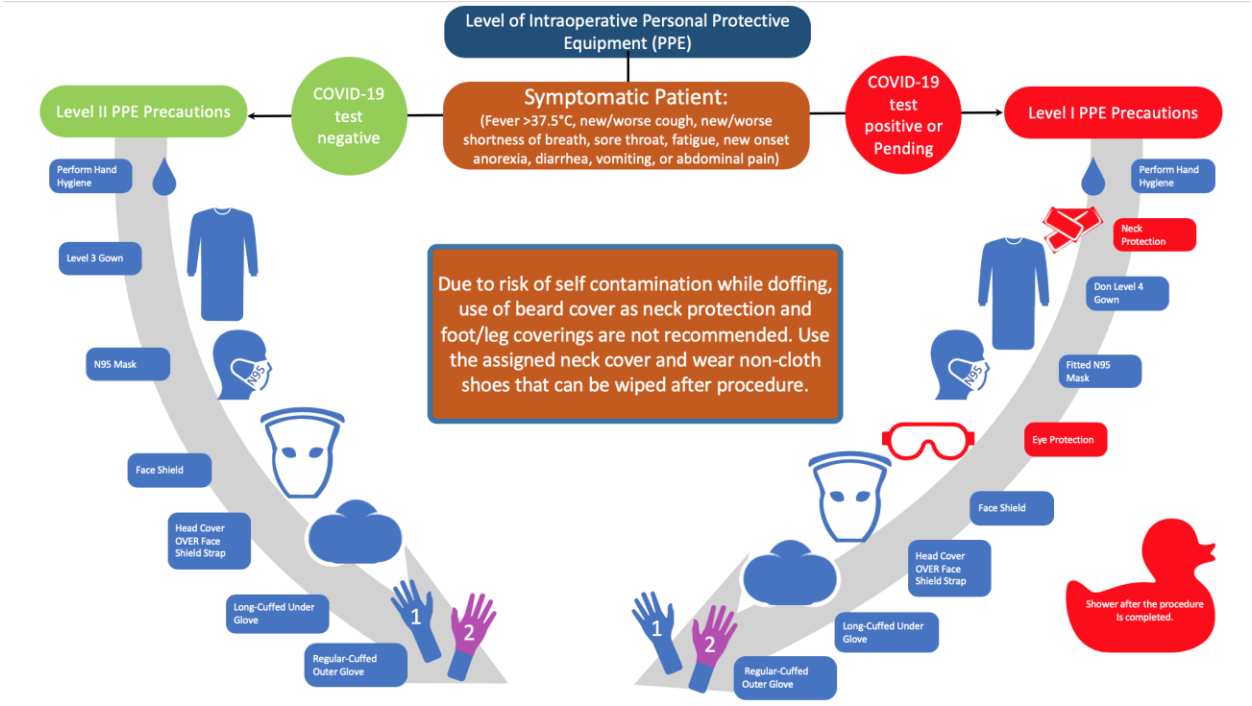
Personal Protective Equipment (PPE) in the Perioperative Environment

Location	Types of Personal Protective Equipment (PPE)	Details
Holding area (Pre-op)	Droplet + Contact precautions	Surgical mask , Isolation gown, Gloves and Eye protection.
Intraoperative (Anesthetic administration & surgical procedures are considered aerosol-generation medical procedures (AGMP))	Level I; symptomatic suspected/infected patients (Test is positive for COVID-19) Level II; Symptomatic with –ve test or Asymptomatic (status is unknown) Droplet; Asymptomatic and test is negative for COVID-19	Level I: Fit tested N95 respirator, disposable goggles, full face shield, hair bouffant, level 4 gown Gloves that cover the wrists, and neck protection Level II: Level I: Fit tested N95 respirator, full face shield, hair bouffant, level 3 or higher gown and Gloves that cover the wrists. Droplet + Contact Precautions
PACU	Droplet + Contact precautions	Surgical mask , Isolation gown, Gloves and Eye protection. **Note**: Transferred to PACU; after the patient is extubated in the OR and 15 minutes lapsed (no airway issues)

Modified from Public Health Ontario; Updated IPAC Recommendations for Use of Personal Protective Equipment for Care of Individuals with Suspect or Confirmed COVID-19. March 25, 2020



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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 CCTC: 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

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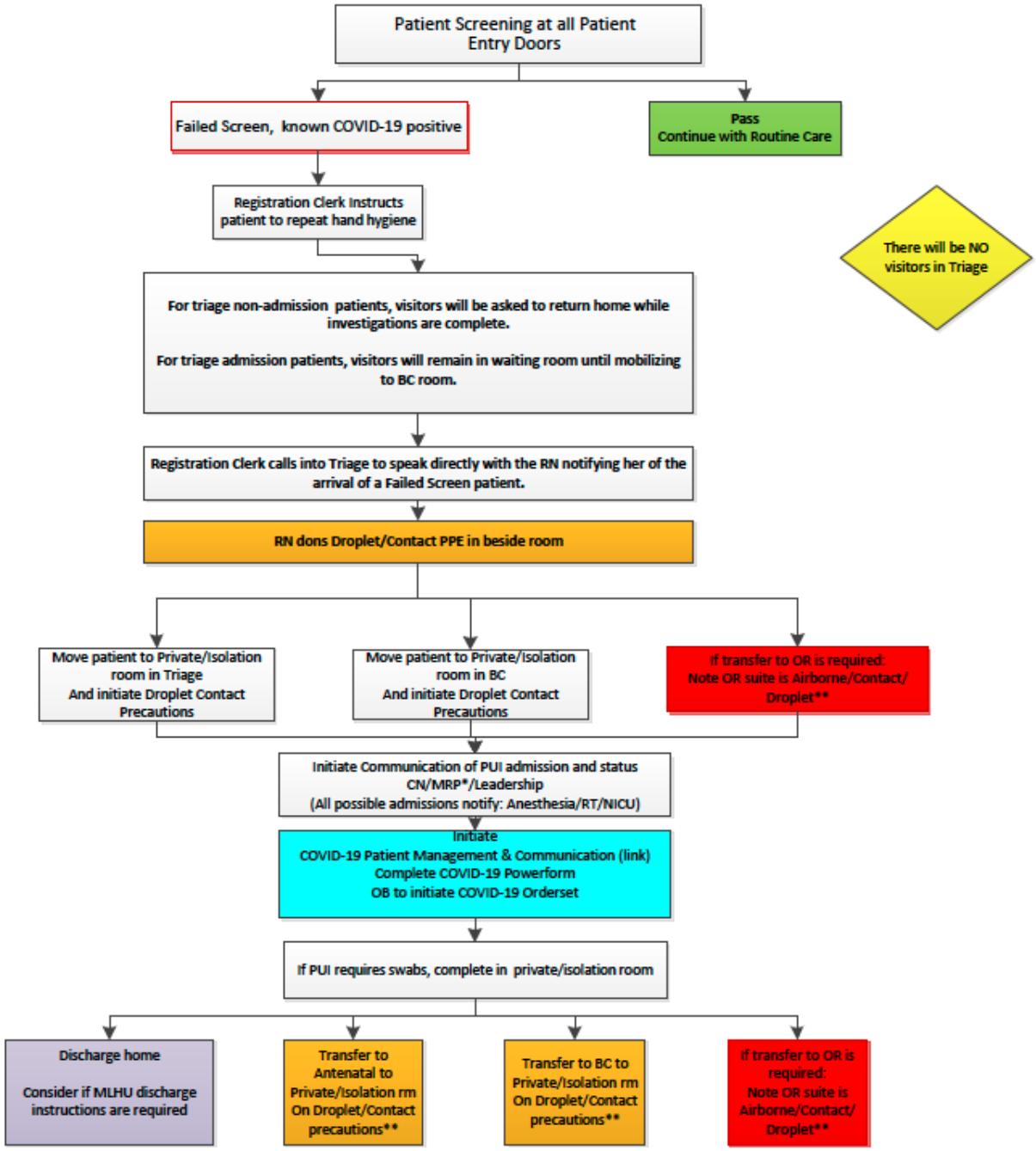
Obstetrical Care Triage Department: Admitting Process



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

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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

(tsf to 228)

C-section Post Delivery

(tsf 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