Maternal, Newborn, and Children's Simulation
Obstetric-Neonatal Scenario: Maternal sepsis/PROM + Neonatal Sepsis/PPHN

Set Up:

Mannequin /Confederate	Moulage	Equipment available	Drugs available
SimNewB	IV with drainage (mother)	Oxygen/mask/Flow meter + tubing for mother	Adrenaline 1:10,000
Simulated patient-mother	pink fluid for Mama Nat	IV giving set + pump	Normal Saline 3 X 1 L bags
1 Confederate-midwife		26g Needle + 1 ml /10/30 + 50 ml syringes	
Mama Natalie with Sim Pt		intubation equipment-0 & 1 miller blade + laryngoscope 3.5 mmETT/introducer + paedicap	morphine
	Umbilical cord, clamped in manikin	Neonatal self-inflating bag	Sux/atropine/fentanyll
	Blood in newbi umbi	Neonatal resuscitaire + neopuff with blender	curosurf
Confed: Neo nurse/midwife		Single UV Catheter/IV with drainage bag	Syntocinon/
		Neonatal hat	Penicillin /gentamicin/amplicillin/flagyll
		Neonatal stethoscope	10% Dextrose
		Adult stethoscope	Vitamin K ampoule
		Paediatric pack/sterile gloves/umbi cord tie/straight scalpel blade	Dopamine/dobutamine/Noradrenaline ampoules
		Maternal & neonatal blood pressure cuff	
		Maternal urinary catheter	

Monitor: **Mother:** Basic, Oxygen saturation, then ECG if asked for (SIM MON).
Baby: Basic: Oxygen saturation, allowing a HR

Paperwork Required: Cord Blood gas - venous
Maternity obs chart (partogram)
Blood glucose (baby)

Learning Objectives:

(1) *Medical*

- Obstetric management of prolonged ruptured membranes + sepsis
  Instigation of effective basic & advanced neonatal life support
  Management of Persistent Pulmonary Hypertension of the Newborn

(2) *CRM*

- Demonstrate effective handover & communication between midwifery/obstetric & neonatal team, and within teams

Synopsis of Scenario

Patient is a 32 yr old primigravida, with ruptured membranes for 60 hours. She is febrile. The infant delivers and is difficult to bag-mask ventilate by midwifery team, and neonatal team, is hypotensive, poorly perfused, with evidence of pulmonary hypertension. Neonatal Team must commence advanced life support, sedate, muscle relax, and consider curosurf

Patient Demographics

Patient Name:	Debbie Smith	DOB/Age:	32 yoa	
Medical Record#:	1301000	Weight:	70 kgs	
Allergies:	Nil	Female	x	
Dx/Procedure:	G1P1 39 weeks gestation			
Other:	On erythromycin			

Introductory information:

- 32 yr old G1 P1 at 39 weeks gestation
- Prolonged ruptured membranes 60 hours ago
- Precipitant delivery 1 hour after started contracting: Mother Febrile 39 ° C, HR 112/min, BP 85/60
- Infant not crying, poor respiratory effort, and floppy

Method of bringing team into the simulation

Confed Midwife calls for 2 midwives just after delivery: ISBAR HANDOVER by confederate midwife (should recognise that obstetric team are needed)Asks 1 midwife to help with care of mother and 1 to go to baby, as baby is not crying and is floppy. One 1 confed stays with mother and 1 with baby. The one with the baby says she is junior and doesn't know what to do for the baby and asks them to take over.

Initial Observations:

Mother

	↑, N, ↓, absent	Description
Appearance	Mother- flushed due to fever, becomes quieter	
HR	↑	115/min (mother)
RR	↑	20 (mother)
Temp – peripheral	Normal	39° (mother)
Saturation	Not measured	98% if measured
Non- invasive BP –	↓	80/60 if asked for
Pupils	Normal	3-4mm E&R,

Newborn After delivery

	↑, N, ↓, absent	Description
Appearance	Floppy, poorly perfused, cyanosed	
HR	↓	70/min
RR	absent	apneic
Temp – peripheral	cool	35.6°C if asked for
Saturation	↓	$SpO_2$65%
Non- invasive BP – upper limb	43/29 if measured	CR 5 sec (to be cued)
Pupils		3mm E&R

ISBAR HANDOVER (Mother)

I I am X and this is Debbie Smith
S She has just delivered a baby and is febrile, tachycardic, and her blood pressure is dropping
B She is 39 weeks pregnant but had ruptured membranes for 2 ½ days
A I think she has chorioamniitis and is developing sepsis
R I think she (and the baby) needs urgent management

ISBAR HANDOVER (Neonate)

I This is baby Smith
S She has just delivered and is not responding to stimulation
B Her mother had ruptured membranes for 2 ½ days and is currently febrile
A The baby is poorly perfused and not breathing
R I think the baby needs urgent resuscitation

Progression Good

Mother	
Examination	**Ideal Management**
DRS ABC	Mother has warm shock- needs volume
CR: (Cue)	Was normal, now 4 sec
HR : 125/min	Should consider giving fluid
RR: (20/min)	
BP: Normal to cue (on Sim Mon), 2nd BP post delivery BP- 75/55	Calls for obstetric help Delivers placenta Checks for tears and bleeding Checks vital signs Antibiotics-triple Volume 1 L fluid, then consider another litre
Neuro: Mother becomes more lucid as volume is given	Syntocinon Considers broad spectrum antibiotics Considers HDU Communicates with mother

Newborn	
Examination	**Ideal Management**
DRS ABC	Checks resuscitaire
HR ↓70 /min	Resuscitate in air
RR↓ apneic	Looks for chest rise: Starts IPPV
Temp – cool to touch (cue)	Calls Neonatal code blue Monitoring placed (NOTE: increased compliance on manikin)
	Continues IPPV until paed reg arrives (SpO2 low until after reg arrives, reassesses, and commences IPPV) ISBAR handover to Fellows & NICU nurse
HR 80/min, Saturation 70%, does not increase unless PIP ↑ by reg SpO2 ↑ to 75% after PIP ↑, HR ↑ 90/min	Reassess ABC, Takes over IPPV , **↑ PIP to 35 (of Neopuff)** Increases oxygen to 100% after 3min Considers intubation & call for more help 2nd Paed dr may arrive
SpO2 ↑ to 80% after ↑PIP BP remains low unless UVC inserted & volume given SpO2↑ to 88% after volume & muscle relaxation	Fellow/s discuss plan of management Reg suggest intubation Intubates, Increases PIP to 40cm H2O/inc rate Considers Curosurf Insertion of UVC, Volume- 20ml/kg NSaline Sedation, Pancuronium
	Give Vitamin K Asks about communication with family Calls NICU/NETS re INO set up with HFOV

Mother: HR decreases to 100/min, BP inc 125/80, fever to 36.9 degrees if volume given and antibiotics ordered. Cries, asking how her baby is.

If in If intubated, IPPV ↑, curosurf, volume & Muscle relaxant given, neonatal HR ↑ to 170/min, Oxygen saturation to 88 %

Progression Poor

Mother

Prompt	if Poor Management
DRS ABC Forgets to treat with volume and antibiotics	Should call for help Apply oxygen by mask Call NICU team if not there
CR 5 sec	ISBAR Handover to NICU team
HR 130/min	Deliver placenta Gives syntocinon Give volume 1 L, followed by another litre
RR 20/min	Deteriorates if not fluid resuscitated
BP If not treated- BP remains low: midwife to cue to check if not checked again	
Neuro slowly more confused if not fluid resuscitated	Communicates with mother & NICU team

Newborn

Prompt: intial conf midwife	if Poor Management
DRS ABC-cold	Does not Check resuscitaire
HR ↓ to 50/min if no IPPV,	Or Resuscitates in 0xygen
RR initially apneic	Hr drops(50) if does not Start IPPV
	Start CPR if HR < 60/min
Saturation 60% if no IPPV, Prompt if not calling code blue	Calls Neonatal code blue Continues IPPV until paed reg/fellow arrives
Non- invasive BP – upper limb **43/29** if measured Pupils normal	Handover to paediatric reg /fellow Reassess ABC Midwife/reg to continue CPR Midwife/reg Takes over IPPV , **↑ PIP** **Considers intubation** **ETT adrenaline if no help & still bradycardic** (fellow and NICU nurse late to arrive)
Continues bradycardia if no resuscitation	hands over to fellow & NICU nurse
NICU nurse/NeoFellow to prompt poor perfusion & palor-allow reg to come up with decisions **SpO2/HR/color improve if appropriate treatment**	Fellow asks plan of management Intubates Curosurf, muscle relaxation, UVC, antibiotics/ volume 20ml/kg as above Communicate with Mother Give Vitamin K

Resources:

RWH Clinical Practice Guidelines:

Persistent pulmonary Hypertension of the Newborn

2010 ARC guidelines-Basic and advanced Neonatal Life Support

Scenario finishes after 15 min if management appropriate, communication with obst team/family & NICU,
SpO2 to 94%, HR to 150/min, % Oxygen about to be dec to 90%,