



the CARE course

"Just Make the Team Work"

"Connect, then Communicate"

"Crew Resource Management"

"Checklists Keep Us Safer"

"20 Second Review"

by Rural.
for Rural.

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Pre-Intubation Difficult Airway Prediction

Predict LARYNGOSCOPY

MMAP

Measure 3-3-1

- 3 fingers of mouth opening
- 3 fingers from hyoid to mentum
- 1 finger of lower jaw protrusion

Mallampati

Atlanto-occipital extension restricted

Pathology – bleeding, obstruction, etc.

Predict BVM VENTILATION

BOOTS

- Beard
- Obesity
- Older (over 55)
- Toothless
- Sounds - snoring, stridor, stiff lungs

Predict CRICOTHYROIDOTOMY

DART

- Distortion of the anatomy
- Access issues - obesity, limited head extension
- Radiation - previous radiotherapy to the neck
- Tumour

Predict SUPRA-GLOTTIC RESCUE

MoODS

- Mouth opening – limited
- Obstruction at or below the glottic opening (foreign body, tumour)
- Distortion, displacement or disruption of the airway
- Stiff lungs or chest wall eg. bronchospasm



Rural Coordination
Centre of BC



'Should this be an awake look / intubation?'

'Are we ready to deal with potential difficulties?'

DSI / RSI Drugs

Drug	Adult dose	[75Kg Adult]	Ped dose	Onset (Duration)	Cautions	Pearls
Atropine	0.5 mg	[0.5mg]	0.02 mg/kg	<1 min (10-20 min)	<i>consider routine pre-med only in infants <1 year</i>	Use if repeating succinylcholine
Ketamine	1-2 mg/kg	[100mg]	1-2 mg/kg	30-60 sec (15-20 min)	<i>caution in ↑BP, IHD avoid if <6mo of age</i>	Good for head injury, asthma, low BP
Etomidate	0.2-0.3 mg/kg	[20mg]	0.3 mg/kg	<30 sec (5-10 min)	<i>caution in sepsis (adrenal suppression)</i>	Minimal effect on BP
Propofol	1.0-2.5 mg/kg (ideal BW)	[185mg]	1-2 mg/kg	15-30 sec (3-10 min)	<i>hypotension common, avoid or reduce dose in shock and the elderly</i>	Consider <i>only</i> for seizures because risk of ↓BP
Rocuronium	1.5 mg/kg	[100 mg]	1.5 mg/kg	60-90 sec (20-35 min)		Non-depolarising
Succinylcholine	1.5-2 mg/kg	[120mg]	2 mg/kg	<1 min (5-10 min)	<i>avoid if:</i> <i>-High K⁺ (crush, burn, renal failure, paralysis for >24 hr)</i> <i>-FHx malignant hyperthermia</i>	Expect fasciculation

DSI-RSI Checklist

Do we need to intubate?

- Non-invasive ventilation (CPAP / BiPAP) / Awake intubation / DSI-RSI
- Now vs Later? Me vs Someone Else?

Review difficult airway prediction - MMAP, BOOTS, MoODS, DART

Optimize physiology

20 second review

Team roles

THREE TRAYS Checklist

Main	Rescue	Drugs (pre-drawn)
Laryngoscope (check light) +/- video laryngoscope 2 blades (one larger) Magill Forceps 3 ET tube sizes (check cuffs) Stylet in ET tube Lube'd tube 10mL syringe	ET CO ₂ device ET tube securing device or twill tape Bite block (OPA) BVM, mask, O ₂ attached Suction Bougie on chest Stethoscope	I-gel / King Tube / LMA (+/- inflation syringe) Surgical airway equip't Induction agent Paralytic agent BP rescue Maintenance: Sedation Analgesia +/- Paralysis

FINAL CHECK


-physiology optimized? -ready to switch to nasal prongs -3 trays set-up -bougie (on chest) -suction by right hand	-review drug doses -patient roll is planned / briefed -BURP prepared -C-spine immobilization, if necessary -IV running well
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**** Sterile Cockpit****



DSI / RSI Procedure



T-?	Preparation	Team, Equipment, Plan	3 TRAYS = Main, Rescue, Meds
T-3 min	Optimize physiology	100% O ₂ 3-5 min (mask & nasal prongs) Check BP, O ₂ Sat	avoid BVM if possible sedate if needed fluid? / pressor? / Atropine?
T-2 min	Pre-medication	Infants - consider: Atropine 0.02 mg/kg	
T-1 min	Induction (Anaesthetize)	Ketamine 1 - 2 mg/kg (good for low BP, head injury, asthma) or Etomidate 0.3 mg/kg (good for low BP, head injury) or Propofol 1.5 - 2.5 mg/kg Ideal Body Wt (good for seizures, CAUTION low BP)	
	Paralysis	Rocuronium 1.5 mg/kg or Succinylcholine 1.5 - 2 mg/kg	(**Ped dose 2 mg/kg) – Atropine ready
	NODESAT	Nasal prongs at high flow	- apnoeic oxygenation
	Pressure & Positioning	'Sniffing' position, ear at level of sternal angle. Prepare BURP	'Ramp' (shoulders & head) for obese patients
T-0 min	Pass ET Tube		consider BURP
	Proof of placement	EtCO ₂ detector Listen over axillae & epigastrium	Easy Cap ('gold is good')
	Post-intubation optimization	Sedation, Analgesia +/- Paralysis Recheck BP, HR, O ₂ Sat, ETCO ₂	See RSI Useful Numbers card for maintenance doses, vent settings, etc.



avoid aspiration

avoid can't intubate/can't ventilate

avoid hypotension

DSI / RSI Useful Numbers



ETT Size	ADULT Male 8-8.5 Female 7-7.5	PEDS>1yr (Age /4)+3 (cuffed)
ETT Depth at teeth (cuff 1.5-2cm below cords)	~21-24 cm	Age +10 cm (approx)
Manual Ventilation Rates	10-12 breaths/min	20-30 breaths/min

Initial Ventilation Parameters

(ideal body weight, in non-hypoxic, non-acidotic patient – adjust for pathology – seek advice)

Rate	12-16 breaths/min	20-30 breaths/min
Tidal Volume	5 - 8 mL/kg	5 - 8 mL/kg
Arterial Gases	$\text{PaCO}_2 \approx \text{End-tidal CO}_2 + 2 - 5 \text{ mmHg}$ $\text{PaCO}_2 >45 = \text{hypoventilation}$ $\text{PaCO}_2 <35 = \text{hyperventilation}$	



MAINTENANCE Sedation / Analgesia / Paralysis

Drug	ADULT Infusion	ADULT Bolus	[75Kg Adult Bolus]
Midazolam	2 - 4 mg/hr	0.025 - 0.1 mg/kg q 30-60 min	2 - 5 mg
Fentanyl	1 - 10 mcg/kg/hr	0.5 - 2 mcg/kg q 20-30 min	50 - 100mcg
Morphine	2 - 4 mg/hr	0.025 - 0.1 mg/kg q 20-30 min	2 - 5mg
Ketamine	1 - 2 mg/min	0.5 - 1 mg/kg	35 - 70 mg
Rocuronium**	0.6 - 0.7mg/kg/hr	0.1 - 0.2 mg/kg q 20-30min	10 - 15 mg

****Ensure patient is sedated, not just paralyzed****

Ketamine <i>peds >6mo of age</i>	5 - 20 mcg/kg/min	<i>Ketamine provides sedation & analgesia</i>
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Seizure Prophylaxis – moderate to severe head injury

Levetiracetam	SAFER than phenytoin. No clear consensus re dose. Use local guidelines/advice.	
Phenytoin (caution re hypotension, dysrhythmias)	15 - 20 mg/Kg IV max rate 50 mg/min with ECG and BP monitoring	Peds: 15 - 20 mg/kg IV at 25 - 50 mg/min if <17 kg, 15-20 mg/kg at 1 - 3 mg/kg/min with ECG and BP monitoring

Pressors / Inotropes / Chronotropes, Anaphylaxis and Dantrolene

Drug	Indication	Adult IV Dose	Detail
DOPamine <i>Undifferentiated / non-cardiogenic shock</i>		Infusion: 5 - 20 mcg/kg/min +titrate [Pre-mixed = quick start]	- when able, change to norepinephrine - watch for arrhythmias **high doses = pure $\alpha 1$ (vasoconstriction)
Norepinephrine <i>Cardiogenic shock / sepsis</i>		Infusion: 2 - 12 mcg/min + titrate	= mixed $\alpha/\beta 1$ (vasoconstriction, inotrope & chronotrope)
EPInephrine <i>Hypotension</i> <i>Refractory anaphylaxis</i>		Mix: 1 mL of 1:10,000 <i>cardiac</i> Epi in 9 mL saline (= 10 mcg/mL) <u>Push</u> 0.5-2 mL q2-5 min	= mixed $\alpha 1 / \beta 1$ & $\beta 2$ (vasoconstriction, inotrope, chronotrope & bronchodilation) <i>Onset 1 minute</i> <i>Duration of action 5-10 min</i>
		<u>Infusion</u> : 1 mcg/min +titrate (max 5 mcg/min)	
PHENYLEphrine		Mix: 10 mg (1 mL) in 100 mL bag (= 100 mcg/mL) <u>Push</u> 0.5-2 mL q2-5 min	= pure α (vasoconstriction only) <i>Onset 1 minute</i> <i>Duration of action 5-20 min</i>
		<u>Infusion</u> : 20 mcg/min + titrate	
EPHEDrine		Mix: 1 mL of 50 mg/mL in 10 mL saline (= 5 mg/mL) <u>Push</u> 1 mL q 2-5 min	= mixed α & β (vasoconstriction, inotrope & chronotrope) <i>Onset almost instant.</i> <i>Duration of action 5-10 min</i>
Atropine		<u>Push</u> 0.5 mg	-inhibits parasympathetic drive (\uparrow HR)

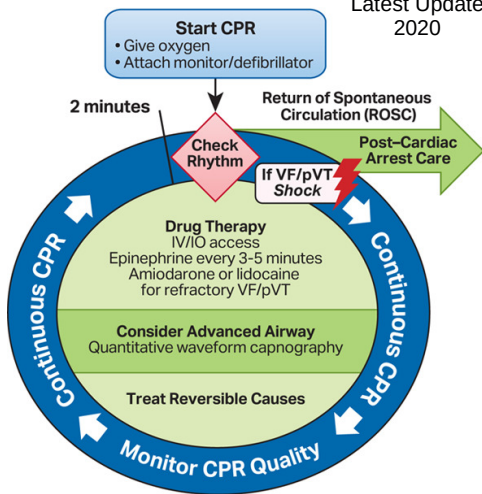


Anaphylaxis	Adult Dose	Detail
Epinephrine	0.5 mg q 3min IM/SC	
Glucagon	<u>Push</u> 1-5 mg slow IV over 5min	-if on β -blockers & not responding to epi

Malignant Hyperthermia (muscle spasm/rigidity, \uparrow ETCO ₂ , \uparrow HR, \uparrow BP, \uparrow Temp)		
Dantrolene	Rapid <u>push</u> 2.5 mg/kg IV q5min prn, usual max 10 mg/kg but up to 30 mg/kg	

ACLS ADULT Cardiac Arrest Algorithm

Latest Update
2020



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
 - If PETCO₂ is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
 - **Monophasic:** 360 J
- Ped Defib: 2 J/kg, then 4 J/kg then increase (max 10 J/kg or adult dose)

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.
- or
- **Lidocaine IV/IO dose:** First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

Hypovolaemia	Tension pneumothorax
Hypoxia	Tamponade
Hydrogen ion (acidosis)	Toxins
Hypo/hyperkalaemia	Thrombosis, PE
Hypothermia	Thrombosis, MI
(Hypoglycaemia)	

ACLS Tachycardia Algorithm

Latest Update 2020

Assess appropriateness for clinical condition.
Heart rate typically ≥ 150 /min if tachyarrhythmia.

Identify and treat underlying cause

- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
- IV access
- 12-lead ECG, if available

Persistent tachyarrhythmia causing:

- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

Yes

Synchronized cardioversion

- Consider sedation
- If regular narrow complex, consider adenosine

No

Wide QRS?
 ≥ 0.12 second

Yes

Consider

- Adenosine only if regular and monomorphic
- Antiarrhythmic infusion
- Expert consultation

No

- Vagal maneuvers (if regular)
- Adenosine (if regular)
- β -Blocker or calcium channel blocker
- Consider expert consultation

Doses/Details

Synchronized cardioversion:

Refer to your specific device's recommended energy level to maximize first shock success.

Adenosine IV dose:

First dose: 6 mg rapid IV push; follow with NS flush.
Second dose: 12 mg if required.

Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia

Procainamide IV dose:

20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases $>50\%$, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.

Amiodarone IV dose:

First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.

Sotalol IV dose:

100 mg (1.5 mg/kg) over 5 minutes. Avoid if prolonged QT.

If refractory, consider

- Underlying cause
- Need to increase energy level for next cardioversion
- Addition of antiarrhythmic drug
- Expert consultation

Assess appropriateness for clinical condition.
Heart rate typically <50/min if bradyarrhythmia.

Identify and treat underlying cause

- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
- IV access
- 12-Lead ECG if available; don't delay therapy
- Consider possible hypoxic and toxicologic causes

Persistent bradyarrhythmia causing:

- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

Monitor and observe

No

Yes

Atropine

If atropine ineffective:

- Transcutaneous pacing
and/or
- Dopamine infusion
or
- Epinephrine infusion

Consider:

- Expert consultation
- Transvenous pacing

ACLS Bradycardia Algorithm

Latest update 2020

Doses/Details

Atropine IV dose:

First dose: 1 mg bolus.
Repeat every 3-5 minutes.
Maximum: 3 mg.

Dopamine IV infusion:

Usual infusion rate is
5-20 mcg/kg per minute.
Titrate to patient response;
taper slowly.

Epinephrine IV infusion:

2-10 mcg per minute infusion.
Titrate to patient response.

Causes:

- Myocardial ischemia/infarction
- Drugs/toxicologic (eg, calcium-channel blockers, beta blockers, digoxin)
- Hypoxia
- Electrolyte abnormality (eg, hyperkalemia)

ACLS Drugs

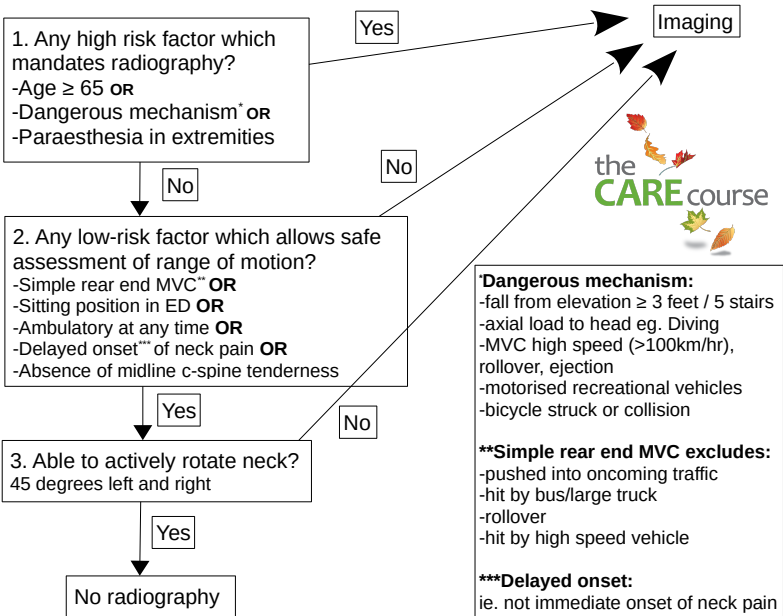
[latest update 2020]

DRUG	ADULT DOSE (IV doses unless noted otherwise)
Adenosine	6mg IV push as rapidly as possible - if not successful, 12 mg IV push avoid in AF (can cause VF if pre-excitation)
Epinephrine	pulseless patient: 1 mg IV q 3-5 min bradycardia: infusion 2 - 10 µg/min
Amiodarone	in V.Fib / pulselessVT: bolus 300 mg, then 150 mg 5 – 10 min later in perfusing rhythms: 150 mg over 10 min followed by 1 mg/min over 6 hrs infusion – can repeat 150 mg bolus if VT recurs maximum: 2.2 g in 24 hrs. avoid in AF with pre-excitation
Atropine	Bradycardia: 1 mg q 3-5 min to maximum of 3 mg
Digoxin	0.5 mg, then 0.25 mg q 2 - 3 hrs to a maximum of 1 mg avoid in AF with pre-excitation
Diltiazem	15 - 20 mg (0.25 mg/kg) over 1 - 2 min . avoid in AF with pre-excitation
Dopamine	bradycardia: 5 - 20 µg/kg/min
Lidocaine	in VFib / pulseless VT: 1 - 1.5 mg/kg bolus - rpt 0.5 - 0.75 mg/kg x1. max total dose = 3 mg/kg
Mg ⁺⁺ Sulphate	2 g bolus [NOTE: higher dosing for eclampsia]
Metoprolol	5 - 10 mg over 5 min (may be repeated)
Procainamide	in stable monomorphic wide complex tachycardia: 20-50 mg/min until arrhythmia resolves, hypotension occurs, or QRS duration increases by > 50% to max total 17 mg/kg. (avoid if prolonged QT or CHF) maintenance infusion 1-4 mg/min
Sodium Bicarb	1-2 meq/kg for average adult, ~1 - 2 x 50 ml amps (8.4% = 1mEq/ml)
Sotalol	in stable wide complex tachycardia: 100mg (1.5 mg/kg) over 5 min avoid in prolonged QT
Verapamil	2.5 - 5 mg over 2 - 3 min. avoid in AF with pre-excitation

This table is *not* a prescribing guide and contains partial information. Check all doses, indications/contraindications & use clinical judgement.

Canadian C-spine Rule is for *stable* trauma patients, over 16 years old, with neck pain or (visible injury above the clavicles + non-ambulatory + dangerous mechanism of injury)

Rule NOT applicable if: Non-trauma, GCS<15, unstable vital signs, acute paralysis, known vertebral disease, previous c-spine surgery



OR use Nexus low risk criteria Irrespective of mechanism of injury
C-spine imaging is indicated for patients with trauma unless they meet all of the following criteria:

- No posterior midline cervical-spine tenderness
- No evidence of intoxication
- Normal level of alertness
- No focal neurologic deficit
- No painful distracting injuries

Adding 'painless neck rotation'
increases sensitivity of NEXUS criteria

Reading C-Spine X-rays

Note: Plain films can miss up to 10-15% of significant injuries

3 views: Lateral, A-P and Open Mouth

Lateral views - AABCDs

Adequate films. Must include top of T1 on lateral.

Alignment. Four (4) lines

- Anterior vertebral
- Posterior vertebral
- Spino-laminar
- Spinous processes

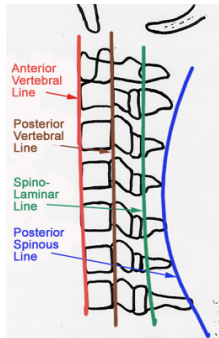
Bones. Symmetry of vertebral bodies and posterior elements

Cartilage. Pre-dental space < 3 mm adults, < 5 mm children

Discs. Symmetry.

Soft tissue swelling, pre-vertebral space

Level	Adult	Child
C1	<10mm	<10mm
C3	<5mm	<5mm
C5	<22mm	<14mm



A-P views

- alignment of spinous processes
- symmetry of disc spaces

Open Mouth views - check adequate quality.

- dens
- lateral bodies
- fracture lines



Severe Pre-Eclampsia and Eclampsia

Severe Hypertension = Syst ≥ 160 or Diast ≥ 110

If < 34 wks,
consider
betamethasone

****SEEK EXPERT HELP BUT DO NOT DELAY STARTING MEDICATIONS****

BP Med	Initial Dose	Repeat Dose
Labetalol	20 mg IV over 2 min	Double the dose prn q 30min (i.e. 20 \rightarrow 40 \rightarrow 80 mg IV) (200 mg PO is alternative if IV not available, but is slower-acting) <i>Avoid in asthma, cardiac decompensation, bradycardia</i>
Hydralazine	5 mg IV over 2 min	5 - 10 mg IV q 20 min prn (max total 20 mg) <i>Watch for hypotension, tachycardia</i>
Nifedipine	5 - 10 mg PO (immediate release capsule, don't chew)	10 - 20 mg PO every 20 min prn (max total 50 mg) <i>Can induce rapid hypotension and is not titratable</i>

Magnesium Sulphate (MgSO_4) for seizures or seizure prophylaxis.

IM: 10g total - give as 5 g in each thigh/buttock (**injection is painful but might be faster if no IV access**)

OR

IV load: with 4-6 g diluted to at least 30 mL over 15-20 min

Infusion following IV load: 1-2 g/hr (adjust for renal function)

[seek expert advice for ongoing dosing if had IM dose]

****Monitor frequently for MgSO_4 toxicity****

- O_2 sat, heart rate, respiratory rate
- urine output
- level of consciousness
- deep tendon reflexes

If MgSO_4 toxicity, stop infusion & consider **antidote**. Discuss with specialist unit.

Calcium Gluconate 10% 1 g IV slowly over 10 min initially. If in cardiac arrest, start at 1.5 - 3 g IV

Furosemide IV may help to increase excretion of Mg^{2+}



Shoulder Dystocia - "Legs up, Rock & Roll"



Don't **push** on the fundus

Don't **pull** on the head

Don't **pivot** the neck on the maternal coccyx

Don't **panic**!

A	Ask for help	Communicate to team re shoulder dystocia
L	Lift maternal legs hyperflexed to the chest (McRoberts manoeuvre)	Flatten head of bed. Remove pillows. Get legs UP
A	Anterior shoulder disimpaction	Up on a stool at side of mum. Place heel of hand just above symphysis. Rock in angled CPR-like motion toward the side baby is facing, trying to dislodge anterior shoulder. Use your weight - lock your elbows. Can try in between contractions (uterus relaxed)
R	Rotate baby's shoulders ("corkscrew") - while still attempting anterior shoulder disimpaction if possible	Put 2 fingers on the back of the anterior shoulder, and 2 fingers on the front of the posterior shoulder. Push both to rotate. If no movement, reverse the direction of the push.
M	Manual removal of the posterior arm	Sweep post'r arm forward across chest. (More space posteriorly)
E	Episiotomy	(suggested only if need to increase hand/working space)
R	Roll mother onto all-fours	Consider rolling back again, if on all-fours unsuccessful.

Each manoeuvre should take 30-60 seconds. Success is usually achieved early in the sequence. Fetal pH drops by 0.04/min with a totally occluded umbilical cord... Ideally, these 7 manoeuvres should take a maximum of 7 min, resulting in a drop of fetal pH by 0.28 (7x0.04)

Rural Coordination
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Last efforts: break the clavicle / symphysiotomy / replace baby in uterus → c-section

****ALARMER** is from SOGC, ALARM, MORE^{OB}

Postpartum Haemorrhage



Call for HELP

Hand on the fundus

Lay bed FLAT

O₂

IV x2

Call for Blood

IV Oxytocin 20-40 U in 1L NS, IV *wide open*
or **IM** Oxytocin 10 U q 5 min

Consider External Aortic Compression
(temporizing, gives time to think & get help)

Where's the Placenta? - IN

- Controlled gentle, firm cord traction
- Counter pressure to uterus
- If placenta remains or cord tears,
→ manual removal of placenta
(consider IV opioid / Entonox)

Where's the Placenta? - OUT

- Bimanual compression between fundus & fist on/behind cervix - hold
- Give **meds** • Empty bladder – Foley
- Uterine balloon tamponade (Bakri or improvised)
- Examine vagina/cervix to find / clamp / suture tear: weighted speculum
(or improvised) bright light, gauze ++, assistance.

Medications:

Carboprost (Hemabate)	0.25 mg IM q 15min prn Max total of 1.25 mg (5 doses)	<i>Caution with asthma, hyper/hypotension</i> ** stored in fridge / refrigerated cart **
Misoprostol (tablets)	400 mcg SL/PO (faster onset than PR)	Side effects: <i>nausea and vomiting, diarrhoea abdominal pain, fever, shivering</i>
Ergometrine (IM or IV)	0.25 mg IM - rpt q 2 hr prn Max total of 1.25 mg (5 doses) if peripherally shut down, can give 0.25 mg IV slowly over 1-2 min - can rpt x1 in 15 min **Avoid with HTN / Eclampsia	Side effects: <i>hypertension, vomiting, vasospasm</i>
TXA (IM or IV)	1g IV over 30-60 seconds – rpt x1 in 30min (IM is same dose)	<i>Not uterotonic, so prioritize other measures but give in parallel as early as possible</i>

4 T's of PPH: - Lack of **TONE** is *most common*. Once placenta out → Massage/Compress, meds

- Consider **TISSUE** if uterus not contracted despite meds++. Consider clot / tissue removal.
- Consider **TRAUMA** if uterus is well-contracted. Ergometrine - explore vagina - clamp/suture
- Consider **THROMBIN** if not clotting. Give blood products and consult urgently



Neonatal Resuscitation Algorithm

[latest update 2020]



1 minute

Antenatal counseling.
Team briefing.
Equipment check.

Birth

Term gestation?
Good tone?
Breathing or crying?

Yes

Stay with mother for initial steps,
routine care, ongoing evaluation.

No

Warm, dry, stimulate, position
airway, suction if needed.

Apnea or gasping?
HR <100 bpm?

No

Labored breathing or
persistent cyanosis?

Yes

PPV.
Pulse oximeter.
Consider cardiac monitor.

Position airway, suction if needed.
Pulse oximeter.
Oxygen if needed.
Consider CPAP.

No

HR <100 bpm?

Yes

Ensure adequate ventilation.
Consider ETT or laryngeal mask.
Cardiac monitor.

Post-resuscitation care.
Team debriefing.

No

HR <60 bpm?

Yes

ETT or laryngeal mask.
Chest compressions.
Coordinate with PPV-100% oxygen.
UVC.

No

HR <60 bpm?

Yes

IV epinephrine every 3-5 minutes.
If HR remains <60 bpm,
• Consider hypovolemia.
• Consider pneumothorax.

Target Oxygen Saturation Table

1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%
Initial oxygen concentration for PPV	
≥35 weeks' GA	21% oxygen
<35 weeks' GA	21%-30% oxygen

Preemies: (<37 wks)

Handle gently - No 'head down' position, Anticipate resp support.
If <1500g or <32wk use Ziploc bag / plastic wrap. Watch temp and glucose.
10% Dextrose 2 mL/kg IV if symptomatic & glucose <2.6 mmol/L

Neonatal Resuscitation Drugs



Drug	Route	Dose	Administration notes
Epinephrine [1 in 10,000 = 0.1 mg/mL]	IV/IO	0.02 mg/kg = 0.2 mL/kg [1 in 10,000]	Rapid push Flush with 3mL of normal saline Repeat every 3-5 minutes if HR <60
	(ETT)	0.1 mg/kg = 1 mL/kg [1 in 10,000]	If no IV access yet Rapid ETT push No need to flush – ventilate (PPV)
Normal saline	IV	10 mL/kg	Over 5-10 min
Dextrose 10%	IV	2 mL/kg	Over 5-15 minutes if glucose <2.6 and symptomatic



Ventilation matters most!



Source: NRP Oct 2020 revision