Theatre Checklists - Routine & Emergency

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Sources

Australian Resuscitation Co*uncil - www.resus.org.au*
Difficult Airway Society UK - *www.das.uk.com*
National Patient Safety Foundation - *www.apsf.net.au*

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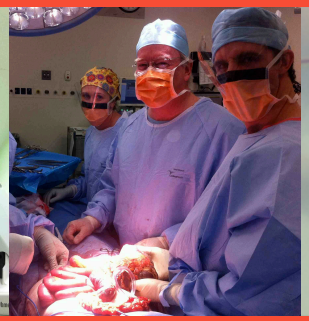
Although not a fan of 'cookook medicine', there is no doubt that checklists can help eliminate simple errors or oversight in even the most experienced doctor - particularly when task-loaded in an emergency. These checklists and aide memoires have been compiled from a variety of sources and should be used in theatre both routinely and in an evolving crisis.

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Please notify any errors, omissions or suggestions for improvement.

Responsibility for drug doses remains with the prescriber. If in doubt, check.

No liability is accepted for errors in this compilation of checklists & algorithms

KNOW, MODIFY and OPTIMISE THE ENVIRONMENT

establish protocols and procedures
ensure room set up is conducive to crisis - layout, equipment etc
how can things be improved (this includes equipment)

ANTICIPATE and PLAN FOR A CRISIS

patient - procedure - equipment - drugs - personnel - retrieval
- global plans
- specific plans

ENSURE LEADERSHIP and ROLE CLARITY

assign leader
preferably not responsible for tasks ie: has an overview of the situation
leader decides, prioritises and assigns tasks to team

COMMUNICATE EFFECTIVELY

leadership and followrship aided by clear communication
eye contact, use names, clear instructions, ensure understanding and report back
close the loop - upstream/downstream communication

CALL FOR HELP or SECOND OPINION EARLY

call for help early - even if not in a crisis
second opinion may be reassurance enough or suggest alternatives
avoid therapeutic inertia

ALLOCATE ATTENTION and USE AVAILABLE INFORMATION

fixation errors common
beware attentional tunnelling / situational overload
if you are stressed you are likely to be missing something

DISTRIBUTE WORKLOAD and USE AVAILABLE RESOURCES

maintain situational awareness
delegate tasks, use external resources (telemedicine/retrieval)
if all else fails, think laterally - improvise/adapt/overcome

PRINCIPLES OF CRISIS MANAGEMENT

	SCARE	SCAN	CHECK	ALERT/READY	EMERGENCY
C	**C**olour, **C**irculation, **C**apnography	BP, HR, Rhythm, ETCO2 SpO2, Colour	Radial pulse, correlate, SPO2 dislodged?	Allocate roles - IV access Arrest trolley	LARGE BORE IVs, FLUIDS, DEFIB, DRUGS
O	**O**xygen Supply & **O2** Analyser	FiO2, Rotameter, O2 analyser matches FiO2	Increase FiO2, watch MAC	FiO2 100% Maintain anaesthesia?	HIGH FLOW OXYGEN AVOID AWARENESS
V	**V**entilation & **V**aporisers	Ventilation - RR, TV Vaporiser & Mix	Check circuit & vaporiser, ventilate by hand	Self-inflating bag, turn off vaporiser (use propofol?)	VENTILATE BY BAG
E	**E**TT tube & **E**liminate Machine	ETT position & security Able to Eliminate (bag)?	Distance in cm? Kinked? Bag and O2 available?	Switch ETT or use LMA Eliminate circuit/machine	ENSURE ETT PLACED OR ALTERNATIVE
R	**R**eview - Monitors & Equipment	Review monitors, update records, review equipment	Review monitors, review equipment - any changes?	Emergency Equipment RETRIEVAL?	DELEGATE OPERATION OF EQUIPMENT
A	**A**irway (face or laryngeal mask), meticulous attention to ETT	Airway position, patent? Distance in cm	Observe & palpate neck, ETT position, cuff	Aspiration, Laryngospasm Obstruction, ETT/LMA	AIRWAY PATENT & PROTECTED
B	**B**reathing (SV/IPPV)	Breathing pattern OK?	Observe, palpate & auscultate chest. ETCO2?	Bronchospasm, Oedema, Hypoxia, Hypoventilatiion	ADDRESS HYPOXIA, HYPOVENTILATION
C	**C**irculation, IV, Blood loss, ECG	Circulation - trends, fluids and blood loss	Cross check BP, IV, losses & response to Rx/surgery	Hypo/Hypertension Arrhythmia, Arrest Algorithm	CRYSTALLOID, BLOOD VASOPRESSORS, CPR
D	**D**rugs - consider all given & not given, check emergency drugs	Drugs given & appropriate response?	Check drugs (error?) and patency IV line. Flushed?	Drug error? Antidote? ANAPHYLAXIS?	ATROPINE 10mcg/kg ADRENALINE 10mcg/kg
A	Be **A**ware of **A**ir and **A**llergy	Awareness - Patient Asleep, Self OK?	Awareness, Air Embolism, Anaphylaxis, Air in Pleura?	Awareness, Air Embolism, Anaphylaxis, Air in Pleura?	MAINTAIN SITUATIONAL AWARENESS
SWIFT CHECK	Check Patient, Surgeon, Processes & Responses	Progress of Surgeon and of Operation	Question surgeon, review old Notes	Notify Surgeon & Mobilise Staff	DEFINITIVE SURGERY OTHER CRISIS?

COVER ABCD - A Swift Check

BEFORE INDUCTION

Nurse & Anaesthetist

Has patient confirmed identity, site, surgery and consent?

Yes ❑

Is the surgical site marked?

Yes ❑ Not applicable ❑

Is the anaesthetic machine & medication check complete?

Yes ❑

Are pulse oximeter, BP & ECG on the patient, functioning & acceptable?

Yes ❑ Snapshot taken? ❑

Does the patient have a known allergy?

No ❑ Yes ❑

Difficult airway or aspiration risk?

No ❑ Yes & equipment/help available ❑

Risk > 500ml blood loss (7ml/kg children)?

No ❑ Yes & 2 IVs sited, blood available ❑

BEFORE INCISION

Nurse, Surgeon & Anaesthetist

Confirm all team members name & role

Yes ❑

Confirm patient name & nature of surgery

Yes ❑ Not applicable ❑

Confirm antibiotic prophylaxis given

Yes ❑

ANTICIPATED CRITICAL EVENTS

To Surgeon

What are critical or non-routine steps? ❑
How long will case take? ❑
Anticipated blood loss? ❑

To Anaesthetist?

Any patient-specific concerns? ❑
Eyes taped, pressure points protected? ❑

To Nursing Team

Has sterility been confirmed? ❑
Any equipment issues or any concerns? ❑

Is appropriate imaging displayed? ❑

BEFORE LEAVE OT

Nurse, Surgeon & Anaesthetist

Nurse verbally confirms :

Name of the procedure ❑

Equipment, sponge & sharp counts correct ❑

Specimens labelled? ❑

Any equipment issues arising? ❑

To surgeon, anaesthetist & nurse

What are the key concerns for this patient in recovery and ongoing management?

Recovery staff

Patient awake & adequate ventilation? ❑

Drug chart completed? ❑

Antibiotics and analgesia addressed? ❑

DVT thromboprophylaxis? ❑

Responsible Doctor identified & available? ❑

SAFE SURGERY CHECKLIST

Prepare Patient

Is position optimal?

- ear to sternum
- ramp if obese
- MILS for trauma

Is preoxygenation adequate?

Can this patient's condition be optimised any further prior to intubation?

- O2, Haemoglobin
- Cardiac contractility, rate
- Afterload, Preload
- PEEP
- IV access adequate & secure

How will anaesthesia be maintained post induction?

- vaporisers full & checked
- adequate IV medications
- pump sets available

Prepare Equipment

Is patient monitoring applied, functioning and values acceptable?

- SpO2
- ECG
- BP
- ETCO2
- BIS

Is equipment checked and immediately available?

- self-inflating bag
- appropriate sized Guedel/NPO
- laryngoscope working & spare
- ET tube and alternatives
- Suction
- Bougie

Do you have all the necessary drugs, including vasopressors?

- Amnesic and/or Analgesic
- Induction agent
- Neuromuscular blockade

Prepare Team

Delegate and brief team :

- team leader
- intubator
- assistant
- cricoid pressure
- MILS
- drug administration
- extra assistance required

How do we get further help if required?

- other *theatre staff available?*
- *other doctors available*?
- *retrieval service notified?*

LEMON Assessment

Look - *beard, no neck, dentition*
Evaluate - *thyromental > 6cm*
Mallampati score : *I - IV*
Obstruction - *stridor/burns*
Neck Movement - *collar/arthritis*

Anticipate Problems

If airway is difficult, can we wake this patient?

Yes ❑ No ❑

If intubation is difficult, how to maintain oxygenation?

Plan A - Intubate & Ventilate
Plan B - iLMA/VL/Fibreoptic
Plan C - Oxygenation with BMV
Plan D - CICO, Surgical Airway

Is the necessary equipment immediately available?

Are there any specific problems anticipated?

- awareness, aspiration
- profound desaturation
- hypotension, arrhythmias
- patient positioning/transfer
- other?

EMERGENCY INDUCTION

Oxygen supply

Check :

- *Pressure gauges*
- *Flow meters*
- *FiO2*
- *Vaporizer housing*

Anaesthetic machine

Check Ventilator :

- *VT*
- *Rate*
- *Airway Pressures*
- *Mode*

Anaesthetic circuit

Check Circuit :

- *connections*
- *one-way valves*
- *filter*
- *soda lime*

Patient Airway

Check Airway :

Exclude obstruction

- *in native airway*
- *in filter*
- *in airway devices*

Exclude secretions/plugging - pass suction catheter beyond end of ETT

Ventilation of patient

Ensure adequate ventilation:

- *exclude bronchial intubation*
- *look/listen for bilateral AE*
- *assess adequacy of MV*
- *exclude bronchospasm*
- *recheck airway pressures*
- *exclude pneumothorax*

Patient Lungs

Consider Gas Exchange :

- *aspiration*
- *pulmonary oedema*
- *consolidation*
- *atelectasis*

Consider Embolism

- *of thrombus, air or fat*

Patient Circulation

Circulation

- *low cardiac output*

Anaemia

- *reduced O2 carriage*
- *high O2 extraction*
- *decreased mixed venous PO2*

Patient Tissues

Tissue Uptake of O2

Increased metabolism

- *fever*
- *thyroid crisis*
- *etc*

HYPOXIA

SpO2 < 90% or SpO2 falling by > 5%

INCREASED ETCO2

Inhaled / Exogeneous CO2

Inhaled
Check capnograph for return to baseline

Exogeneous
Laparoscopic CO2 insufflation
NaHCO3 administration
Inspired CO2 (soda lime exhausted)
Incompetent valves
Re-breathing

Hypoventilation

Respiratory depression
Increased mechanical load on lungs
(decreased compliance, increased resistance in system)
Inadequate IPPV - check TV/RR/PEEP
Increased dead space - anatomical/physiological

Increased Production of CO2

Fever
Parenteral nutrition
Malignant hyperthermia

DECREASED ETCO2

Airway

Consider oesophageal intubation, accidental extubation

Circuit

Air entrainment (leak),
Dilution with circuit gases (sampling problem)

Ventilator

Ventilator settings,
Overenthusiastic bagging

Gas Exchange Problem

Pulmonary embolism,
Cardiac failure/arrest,
Severe hypotension

Decreased Production

Hypothermia
Hypothyroidism
Decreased metabolism

END TIDAL CO2

Apnoea causes rise of PaCo2 8-15mmHg in first minute, then 3mmHg/min

Gas supply

Check Gas Supply:

- check O2 bypass

- ensure O2 flush not jammed

- eliminate other high pressure source

Anaesthetic circuit

Check Circuit :

- bag / ventilator switch?
- obstruction to expiration in circuit/ventilator/scavenger system?
- PEEP valve & settings?
- exclude circuit & machine by ventilating with bag

Patient airway

Exclude Obstruction :

- filter

- airway

- ETT

- secretions / foreign body

Patient lungs

Bilateral chest expansion?

Endobronchial intubation, PTX

Breath sounds?

Bronchospasm, atelectasis, aspiration, pulmonary oedema, endobronchial intubation

Patient pleural space

Consider and exclude :

- pneumothorax
- haemothorax

14G needle (2nd ICS MCL)

Finger or tube thoracostomy (ant axillary line 5th ICS)

Patient chest wall

Exclude inadequate chest wall relaxation

- inadequate muscle relaxation
- opioid-induced rigidity

- malignant hyperthermia

- obesity

Surgical procedure

Raised intrathoracic pressure

- surgical intervention

- insufflation

- patient position

- assistant leaning on chest !

HIGH AIRWAY PRESSURES

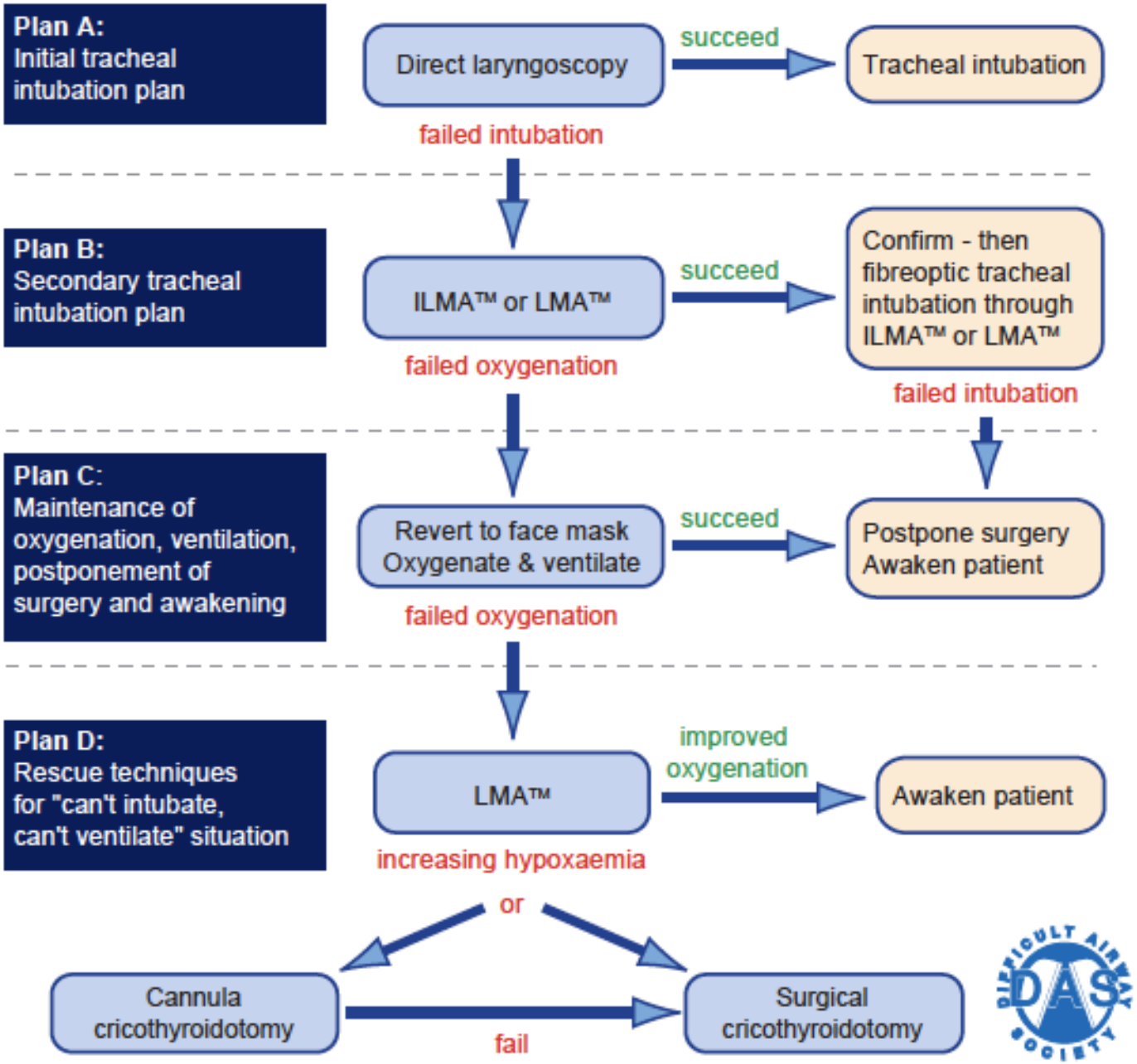
Difficulty ventilating patient
decreased compliance in bag
poor chest expansion
reduced tidal volume
high airway pressure alarm

Hypoxia
(due to hypoventilation)

Circulatory collapse
(high intrathoracic pressure)

Tachycardia

HIGH AIRWAY PRESSURES



MAXIMUM THREE ATTEMPTS
CHANGE POSITION - BLADE - OPERATOR
USE BOUGIE - CONSIDER STYLET - VL

SECONDARY INTUBATION PLAN

FastTrach iLMA
KingVision Videolaryngoscope
Ambu Ascope through dedicated iLMA

BAG MASK VENTILATION
WAKE THE PATIENT

RESCUE TECHNIQUES

Declare a CICO Emergency

Continue to use LMA to attempt oxygenation

Identify cricothyroid membrane
Needle or Scalpel-Bougie-ETT Technique

Consider Frova (oxygenating bougie)

DIFFICULT AIRWAY - OVERVIEW

DIFFICULT AIRWAY - ROUTINE INDUCTION

Unanticipated difficult tracheal intubation- during routine induction of anaesthesia in an adult patient

Direct laryngoscopy → Any problems → Call for help

Plan A: Initial tracheal intubation plan

Direct laryngoscopy - check:
Neck flexion and head extension
Laryngoscope technique and vector
External laryngeal manipulation - by laryngoscopist
Vocal cords open and immobile
If poor view: Introducer (bougie) - seek clicks or hold-up
and/or Alternative laryngoscope

Not more than 4 attempts, maintaining:
(1) oxygenation with face mask and
(2) anaesthesia

succeed → Tracheal intubation

Verify tracheal intubation
(1) Visual, if possible
(2) Capnograph
(3) Oesophageal detector
"If in doubt, take it out"

failed intubation

Plan B: Secondary tracheal intubation plan

ILMA™ or LMA™
Not more than 2 insertions
Oxygenate and ventilate

succeed →

Confirm: ventilation, oxygenation, anaesthesia, CVS stability and muscle relaxation - then fibreoptic tracheal intubation through IMLA™ or LMA™ - 1 attempt
If LMA™, consider long flexometallic,nasal RAE or microlaryngeal tube
Verify intubation and proceed with surgery

failed oxygenation
(e.g. SpO_2 < 90% with FiO_2 1.0)
via ILMA™ or LMA™

failed intubation via ILMA™ or LMA™

Plan C: Maintenance of oxygenation, ventilation, postponement of surgery and awakening

Revert to face mask
Oxygenate and ventilate
Reverse non-depolarising relaxant
1 or 2 person mask technique
(with oral ± nasal airway)

succeed →

Postpone surgery
Awaken patient

failed ventilation and oxygenation

Plan D: Rescue techniques for "can't intubate, can't ventilate" situation

Difficult Airway Society Guidelines Flow-chart 2004 (use with DAS guidelines paper)

DIFFICULT AIRWAY - FAILED RSI

Unanticipated difficult tracheal intubation - during rapid sequence induction of anaestheia in non-obstetric adult patient

Direct laryngoscopy → Any problems → Call for help

Plan A: Initial tracheal intubation plan

Pre-oxygenate
Cricoid force: 10N awake → 30N anaesthetised
Direct laryngoscopy - check:
- Neck flexion and head extension
- Laryngoscopy technique and vector
- External laryngeal manipulation - by laryngoscopist
- Vocal cords open and immobile

If poor view:
- Reduce cricoid force
- Introducer (bougie) - seek clicks or hold-up and/or Alternative laryngoscope

succeed → Tracheal intubation

Not more than 3 attempts, maintaining:
(1) oxygenation with face mask
(2) cricoid pressure and
(3) anaesthesia

Verify tracheal intubation
(1) Visual, if possible
(2) Capnograph
(3) Oesophageal detector
"If in doubt, take it out"

failed intubation

Plan C: Maintenance of oxygenation, ventilation, postponement of surgery and awakening

Maintain 30N cricoid force

Plan B not appropriate for this scenario

Use face mask, oxygenate and ventilate
1 or 2 person mask technique
(with oral ± nasal airway)
Consider reducing cricoid force if ventilation difficult

succeed → Postpone surgery

failed oxygenation
(e.g. SpO_2 < 90% with FiO_2 1.0) via face mask

LMA™
Reduce cricoid force during insertion
Oxygenate and ventilate

succeed → Postpone surgery
and awaken patient if possible or continue anaesthesia with LMA™ or ProSeal LMA™ - if condition immediately life-threatening

failed ventilation and oxygenation

Plan D: Rescue techniques for "can't intubate, can't ventilate" situation

Difficult Airway Society Guidelines Flow-chart 2004 (use with DAS guidelines paper)

Failed intubation, increasing hypoxaemia and difficult ventilation in the paralysed anaesthetised patient: Rescue techniques for the "can't intubate, can't ventilate" situation

failed intubation and difficult ventilation (other than laryngospasm)

Face mask
Oxygenate and Ventilate patient
Maximum head extension
Maximum jaw thrust
Assistance with mask seal
Oral ± 6mm nasal airway
Reduce cricoid force - if necessary

failed oxygenation with face mask (e.g. SpO_2 < 90% with FiO_2 1.0)

call for help

LMA™ Oxygenate and ventilate patient
Maximum 2 attempts at insertion
Reduce any cricoid force during insertion

succeed → Oxygenation satisfactory and stable: Maintain oxygenation and awaken patient

"can't intubate, can't ventilate" situation with increasing hypoxaemia

Plan D: Rescue techniques for "can't intubate, can't ventilate" situation

or

Cannula cricothyroidotomy

Equipment: Kink-resistant cannula, e.g. Patil (Cook) or Ravussin (VBM)
High-pressure ventilation system, e.g. Manujet III (VBM)

Technique:

1. Insert cannula through cricothyroid membrane
2. Maintain position of cannula - assistant's hand
3. Confirm tracheal position by air aspiration - 20ml syringe
4. Attach ventilation system to cannula
5. Commence cautious ventilation
6. Confirm ventilation of lungs, and exhalation through upper airway
7. If ventilation fails, or surgical emphysema or any other complication develops - convert immediately to surgical cricothyroidotomy

fail →

Surgical cricothyroidotomy

Equipment: Scalpel - short and rounded (no. 20 or Minitrach scalpel)
Small (e.g. 6 or 7 mm) cuffed tracheal or tracheostomy tube

4-step Technique:

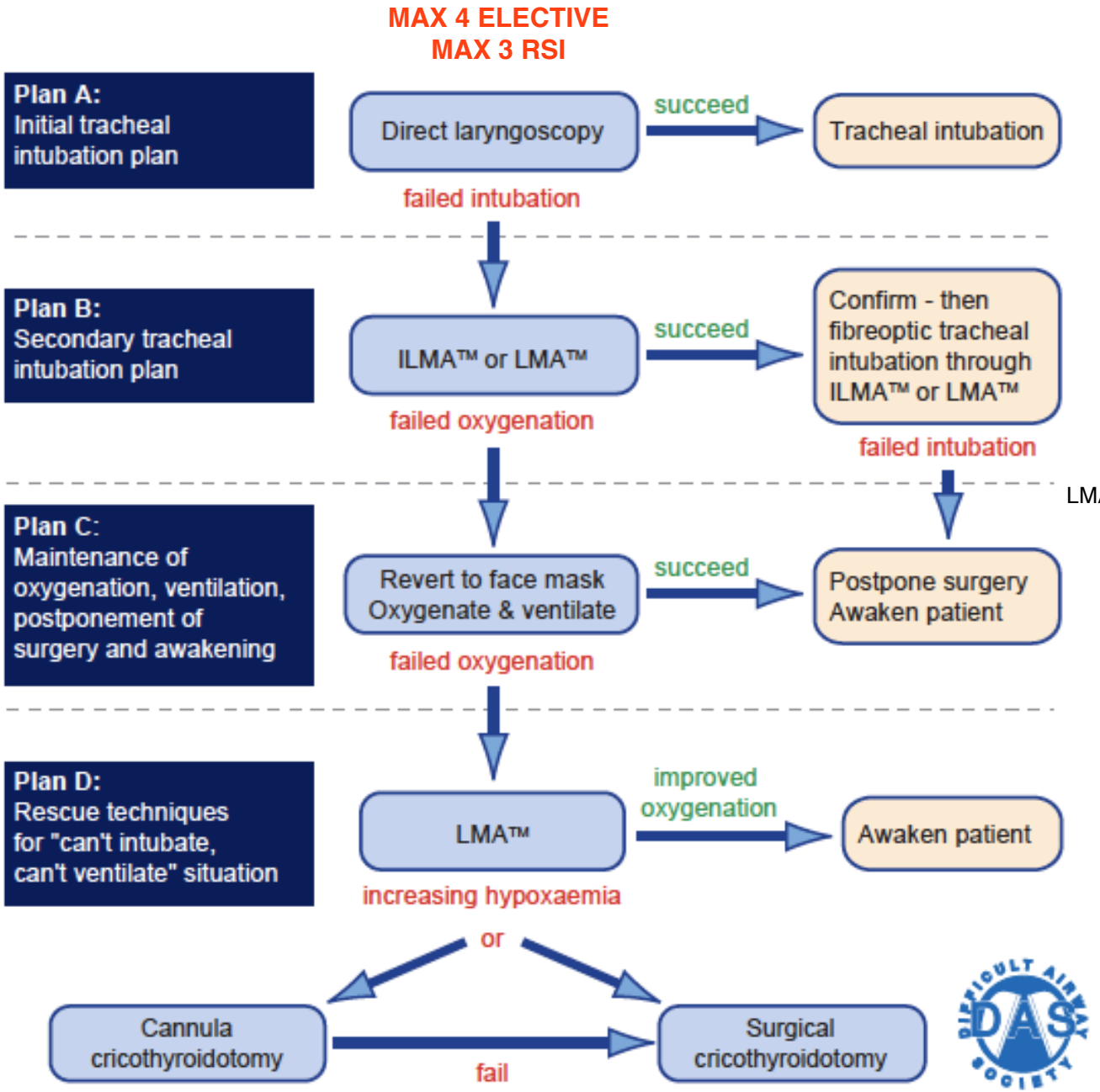
1. Identify cricothyroid membrane
2. Stab incision through skin and membrane
   Enlarge incision with blunt dissection (e.g. scalpel handle, forceps or dilator)
3. Caudal traction on cricoid cartilage with tracheal hook
4. Insert tube and inflate cuff

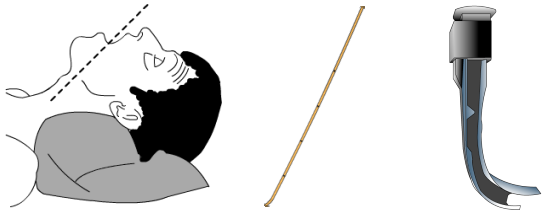
Ventilate with low-pressure source
Verify tube position and pulmonary ventilation

Notes:

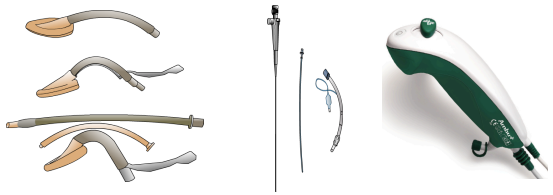
1. These techniques can have serious complications - use only in life-threatening situations
2. Convert to definitive airway as soon as possible
3. Postoperative management - see other difficult airway guidelines and flow-charts
4. 4mm cannula with low-pressure ventilation may be successful in patient breathing spontaneously

Difficult Airway Society guidelines Flow-chart 2004 (use with DAS guidelines paper)

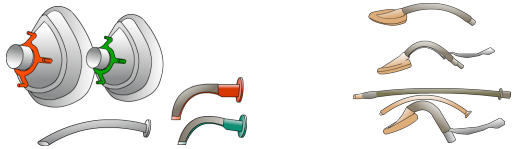




INTUBATE THE TRACHEA
Re-Position - Use a Bougie - Videolaryngoscope



LMA as a CONDUIT TO ETT
LMA, ProSeal/Supreme iLMA FastTrach or AmbuAscope via iLMA



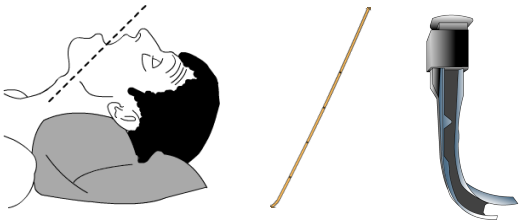
AWAKEN & POSTPONE or RE-GROUP
BMV - NPO & Guedels - LMA - Consider Suggamadex

CICV RESCUE TECHNIQUES
Cannula - Jet Insufflation - Melker Dilatation
Scalpel - Bougie - ETT

DIFFICULT AIRWAY - KIT

PLAN A
TRACHEAL INTUBATION PLAN

max 3 attempts RSI
max 4 attempts ELECTIVE

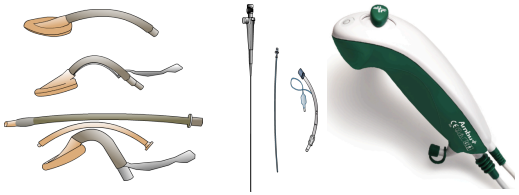


Ramp - Ear to Sternum
Bougie - Aintree Catheter - Frova Oxygenating Bougie
Change Blade Size
Consider Straight Blade / McCoy / Kessel
AirTraq - KingVision VL

Re-Position - Use a Bougie - Videolaryngoscope

PLAN B
SECONDARY INTUBATION PLAN

not in RSI
maintain oxygenation & ventilation

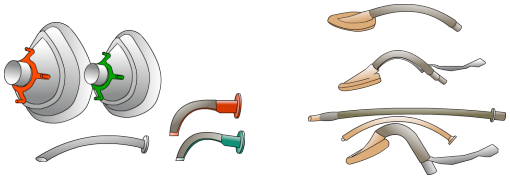


Use LMA - ProSeal or Supreme
FastTrach iLMA
Ambu Ascope2 via iLMA

ETT via iLMA blind or fibreoptic

PLAN C
AWAKEN

re-group
postpone surgery



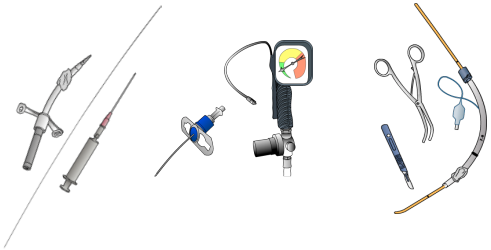
Bag Mask Ventilate
Guedels - Nasopharyngeal Airway
LMA inc iGel

Suggamadex at 4-8mg/kg

two handed BMV - Adjuncts - LMA

PLAN D
CICO/CICV

needle or
surgical airway



Consider USS to locate and mark cricothyroid membrane
14 G jelco and O2 connection with 3-way tap
Manu-Jet
Size 22 scalpel - Bougie - size 6.0 ETT

DIFFICULT AIRWAY - KIT CHECKLIST

B	Buy time	*Sit up, use non-rebreather, increase FiO2, NIV, PEEP (BMV or vent)*
I	Indication	*Do we really need to intubate? Can it wait?* *Options : wait for help - videolaryngoscopy - iLMA or Proseal - awake intubation*
G	Get help	*Extra hands. Talk to retrieval.*
R	Ramp	*Use pillows, ear to sternum, flat on top - RAMP RAMP RAMP!*
A	Apnoeic O2	*Oxygenation via nasal specs at 10-15 l/min during RSI*
M	Minimal drugs	*Nebulise lignocaine & spray the cords!* *Ketamine/Propofol (100mg each in 20ml syringe)*
P	Preoxygenate	*With NIV for 3-5 mins max*
P	Paralysis	*Only if needed. Sux 1mg/kg or Roc 1.2mg/kg*
P	Plan for failure	*Plan B - Plan C - Plan D (CICV)*
P	Post intubation	*NGT, IDC, IV, sedation/paralysis* *paperwork for transfer*

OBESE INTUBATION - BIG RAMP PPP

VENTILATOR ASSISTED BMV

SIMV MODE - PEEP 10 - PS 5-10 above PEEP

TV 5-7ml/kg ideal body weight - RR12 - FIO2 100% - Flow 15-30 l/min - ETCO2 in line

RSI

IV induction agent & paralysis

position once obtunded

connect vent to mask
(settings as above)

cricoid, two handed mask seal

ETT once OXYGENATION OPTIMAL

REMEMBER CLIFF REID'S PROPOFOL ASSASSINS !

The pretty white stuff drops SV and SVR without incr. in heart rate

Drop in BP can add to cerebral hypoperfusion - BAD BAD BAD

Consider KETAMINE 1.5 - 2 mg/kg
or FENTANYL 100-200 mcg

RSA

IV induction agent & paralysis

position once obtunded

connect vent to mask
(settings as above)

cricoid, two handed mask seal

SGA once PARALYSED

decompress stomach via SGA

optimise oxygenation

consider iLMA as conduit for ETT

else remove LMA and place ETT

CRICOID

DSI

ketamine induction 1.5 - 2.0 mg/kg

position once obtunded

patient should remain spont vent

connect vent to mask
(settings as above)

two handed seal, cricoid

allow vent to deliver assisted breaths

ETT once OXYGENATION OPTIMAL

ETT - size above/below

KingVision Videolaryngoscope

iLMA - FastTrach

AirQ and scope
(AmbuAscope or Levitan)

SICK COMBATIVE RSI - RSA - DSI

STEP ONE

Continuous nebulised salbutamol
Nebulised ipratropium bromide
Methylprednisolone 125mg (1.5 mg/kg) IV
MgSO4 2g (50mg/kg max 2g) IV

DOSES

Use O2 for nebs, not room air
500mcg 20min x 3 then hourly
Alternative DXM 20mg IM or IV
Give MgSO4 over 20 mins

Consider the differential

heart failure, ACS, arrhythmia
pulmonary embolism
PTX, pericaridal tamponade,
obstruction, foreign body
anaphlyaxis

IF NO IMPROVEMENT

STEP TWO

Adrenaline 0.5mg IM (0.01mg/kg) = 0.5ml 1:1000
Fluid bolus 20 ml/kg
CXR, ECG, VBG, Electrolytes, FBC

IF NO IMPROVEMENT - ABLE TO TOLERATE NIV?

NO

AGITATED PATIENT

ketamine 1.5 mg/kg IV over 30 secs
then 1 mg/kg/hr titrate to effect

if no IV, 5mg/kg IM

IF WORSENING

NIPPV
iPAP PS 8cm H2O
ePAP PEEP 3 cm H2O

continue nebuliser through NIPPV

YES

COOPERATIVE PATIENT

NIPPV
iPAP PS 8cm H2O
ePAP PEEP 3 cm H2O

continue nebuliser through NIPPV

IF WORSENING

ketamine 1.5 mg/kg IV over 30 secs
then 1 mg/kg/hr titrate to effect

if no IV, 5mg/kg IM

AVOID INTUBATION IF POSSIBLE

IF YOU HAVE TO INTUBATE

Indications - fatigue, resp distress,
deterioration, arrest

Maximise preoxygenation
Optimise first pass success
Largest ETT possible
Beware breath stacking

Ketamine 2mg/kg IV
Rocuronium 1.2 mg/kg or Sux 2mg/kg IV

Assist control / Volume control
RR 8 TV 5-7 ml/kg IBW
PEEP 2cm H2O IE 1:5 FiO2 100%

permissive hypercarbia
Ext chest compression
Pplat < 30cm H2O
Aggressive suctioning, check K

LIFE THREATENING ASTHMA

Hypertension

Pre-existing hypertension

- *treated or untreated?*
- *medication taken?*

Sympathetic reflex response

- *light anaesthesia? Exclude vaporizer leak, IV disconnected*
- *hypoxia*
- *hypercarbia*
- *check SpO2, ETCO2*
- *cerebral event?*
- *raised ICP?*
- *ischaemia?*
- *vasospasm?*

Sympathomimetic effect?

Exogeneous *ie : administration of vasopressor*
Endogeneous *eg: phaeochromocytoma*

Surgical

- *aortic clamp*
- *tourniquet*
- *position eg: Trendelenburg*
- *stimulus*

Hypotension

Hypovolaemia

- *blood loss*
- *fluid deficit*

Cardiogenic

- *contractility, rate, dysrhythmia*
- *anaesthetic agent*
- *vasodilators*

Distributive (vasodilation)

- *drugs*
- *sympathetic block*
- *sepsis*
- *anaphylaxis*

Obstructive

- *high intrathoracic pressures*
- *tamponade (cardiac, bilateral tPTX)*
- *pulmonary embolus*
- *AORTOCAVAL COMPRESSION @ 18/40 weeks onwards*

CIRCULATION - BP

Whilst vasopressors elevate BP, treatment should be directed to cause

Control Bleeding

Minimise time to Surgery
Use tourniquets to control peripheral
Tamponade bleeding eg: pelvic binder, direct pressure, sutures
Uterine massage, oxytocin, misoprostol, haemabate

Consider Massive Transfusion Protocol (MTP)

ABC Score
Anticipate needs, if > 4 units/2hrs

Mobilise Resources

Lab staff, Porters, Nursing, Theatre Staff
Retrieval Service & Blood Bank

Empirical Treatment

Transfuse at a 1:1 ratio of PRCs : FFP
Permissive hypotension MAP 65-70 mmHg
(unless TBI/spinal injury/exsanguination)
Send FBE, X-Match, Venous Gas, Calcium, Coags
Arterial line, consider Calcium (citrate toxicity)
WARM FLUIDS/WARM THEATRE

ABC SCORE

penetrating injury
positive FAST exam
HR > 120/min
systolic BP < 90mmHg
[no lab results - purely clinical]

0/4 = 1% risk of MTP
1/4 = 10% risk of MTP
2/4 = 41% risk of MTP
3/4 = 48% risk of MTP
4/4 = 100% risk of MTP
[Activate MTP if 3 + criteria met]

IV ACCESS - LARGE BORE IV x 2 (14G)
CONSIDER USE OF RAPID INFUSER KIT (7Fr)

CONSIDER USE OF INTEROSSEOUS DEVICE
CONSIDER VENOUS CUTDOWN

TRANEXAMIC ACID - give 1g stat in first 3 hrs for TRAUMA

WARM FLUIDS - level I infuser/water bath

CRYSTALLOID - 250ml boluses titrate to MAP/radial pulse

AIM FOR

t > 35, pH > 7.2, Lactate < 4, BE < -6
Ca > 1.1, Plt > 50, INR < 1.5 Fibrinogen > 1

MASSIVE BLOOD LOSS

AT RISK

Ischaemic heart disease
Hypertension
Fluid losses
Diabetes
Smoker, Lipids, FHx etc.

MITIGATION

Perioperative Beta-blockade
Hb > 10g/dL
Oxygenation
BP in 3 digits, HR 2 digits, BGL digit
Regional Anaesthesia

SHOULD THIS ANAESTHETIC BE GIVEN IN THIS LOCATION?

SYMPTOMS & SIGNS

May be none in anaesthetised patient

HIGH INDEX OF SUSPICION
WATCH FOR ECG CHANGES (lead II)

Caution in Pre- & Post-operative periods

TAKE A SNAPSHOT BEFORE START

Lead position "white is right; smoke (black) above fire (red)" on the L side

OH CRAP !

Oxygen, **H**aemoglobin
Contractility, **R**ate
Afterload, **P**reload

MANAGEMENT

Are SpO2, BP, HR, Hb, PEEP optimised? ❑

Changes verified with ECG? ❑

Surgeon aware of problem? ❑

Defibrillator & Pacing available ? ❑

RATE CONTROL (box) addressed? ❑

BLOOD PRESSURE (box) addressed? ❑

CARDIOLOGIST CONSULTED? ❑

Specific therapy agreed - ASPIRIN,HEPARIN, NITRATES etc ❑

Plan for Extubation & Recovery? ❑

Lead II is best for detecting arrhythmias. CM5 detects 89% of ST-segment ischaemic changes (right arm electrode on manubrium, left arm electrode on V5 and indifferent lead on left shoulder).

RATE CONTROL

Exclude hypovolaemia, awareness, CO2 as cause of tachycardia

NEXT

BETA-BLOCKADE (aim for HR < 60)

Esmolol - 0.25-0.5 mg.kg bolus
25-300 mg/kg/min infusion

Metoprolol - 1-15 mg titrated over 15 mins

If beta-blockade contra-indicated use verapamil - 2.5 mg - repeat if needed

FILLING

Optimise filling, consider need for PEEP ❑

CAUTION USE OF VASOPRESSORS

For hypertension, consider
GTN - sublingual (0.3-0.9 mg)
IVI(0.25 - 4 mgm/kg/min - titrate to effect)

Clonidine
(30 mg every 5 minutes up to 300 mg)

RECOVERY

Plan Plan for Extubation & Recovery? ❑

CARDIOLOGY ADVICE? 13STAR ❑

MYOCARDIAL ISCHAEMIA

BRADYCARDIA

Medications
Electrolyte disturbance
Hypoxia
Ischaemia

Give OXYGEN - exclude HYPOXIA

First line is Atropine (1.2mg vial) - 300-500mcg bolus to total 3mg

TACHYCARDIA

Wide-complex tachycardias

Narrow-complex tachycardias

Atrial fibrillation

Atropine 10-20 mcg/kg kids (300-600 mcg bolus adults) IV

Metaraminol 0.5mg bolus IV (10mg in 20ml, 1ml = 0.5mg)

Ephedrine 3-6mg bolus IV

Esmolol 500micrograms/kg IV

100mg/ml dilute in 10ml = 10mg/ml

70kg=35mg=3.5ml, 100kg=50mg=5ml

Adrenaline Bolus (1mg/ml 1/1000 - 1mg/10ml 1/10,000)
50-100mcg bolus IV titrated to effect
Infusion 3mg in 50ml (60mcg/ml) run 5ml/hr to effect

Isoprenaline (1mg in 50ml 5% Dex or 1mg/500ml
Give 20mcg (1ml) then infuse at 1-4mcg/min (3-12 ml/hr)
or 30-120ml/hr if using 500ml bag

Transcutaneous Pacing
Pads AP over L sternum & L spine
Start at 60mA, increase to 10% over capture, rate 80bpm
Don't forget sedation!

	Wide	Narrow	A/Fib
1st	Amiodarone	Adenosine	Esmolol Amiodarone
2nd	Lignocaine	Amiodarone Esmolol Digoxin	Diltiazem Amiodarone Digoxin

Amiodarone 300mg load *then* 0.5mg/kg/hr IV

Adenosine 6mg/12mg/18mg bolus IV, fast running drip

Diltiazem 0.25mg/kg IV

Digoxin 250 to 500 mcg IV

Metoprolol 2.5-5 mg bolus IV

DC shock - SYNC MODE - 100J

CARDIAC ARRHYTHMIAS

Resuscitation Council (UK)

Adult bradycardia algorithm

- Assess using the ABCDE approach
- Give oxygen if appropriate and obtain IV access
- Monitor ECG, BP, SpO_2, record 12-lead ECG
- Identify and treat reversible causes (e.g. electrolyte abnormalities)

Adverse features?
- Shock
- Syncope
- Myocardial ischaemia
- Heart failure

YES → **Atropine** 500 mcg IV → **Satisfactory response?** YES → Risk of asystole?

NO → Risk of asystole?

Satisfactory response? NO → Interim measures

Risk of asystole?
- Recent asystole
- Mobitz II AV block
- Complete heart block with broad QRS
- Ventricular pause > 3 s

YES → Interim measures

NO → **Observe**

Interim measures:
- Atropine 500 mcg IV repeat to maximum of 3 mg
- Isoprenaline 5 mcg min^{-1} IV
- Adrenaline 2-10 mcg min^{-1} IV
- Alternative drugs *

OR
- Transcutaneous pacing

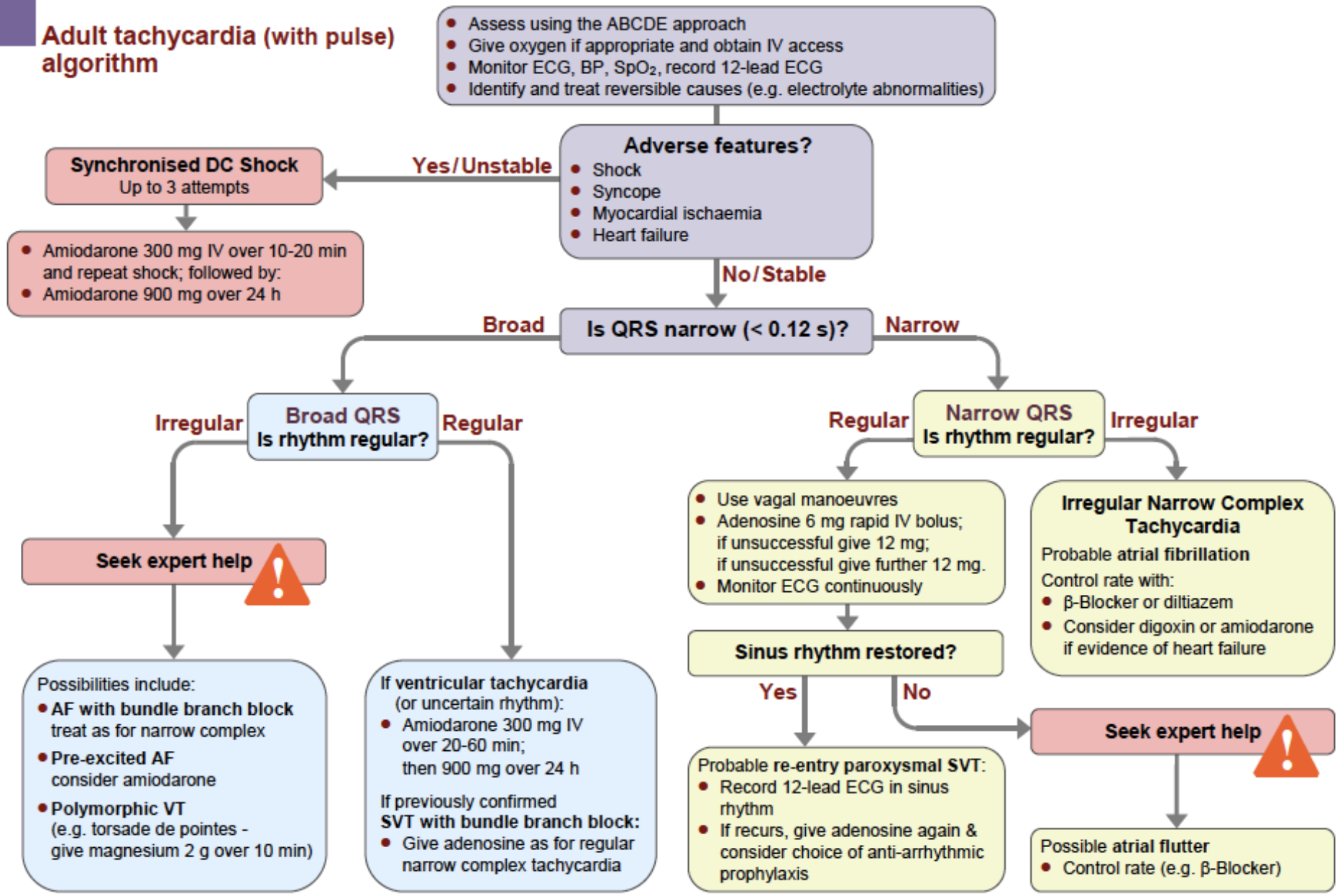
→ **Seek expert help**
Arrange transvenous pacing

*Alternatives include:
- Aminophylline
- Dopamine
- Glucagon (if beta-blocker or calcium channel blocker overdose)
- Glycopyrrolate can be used instead of atropine

2010 Resuscitation Guidelines

Resuscitation Council (UK)

Adult tachycardia (with pulse) algorithm

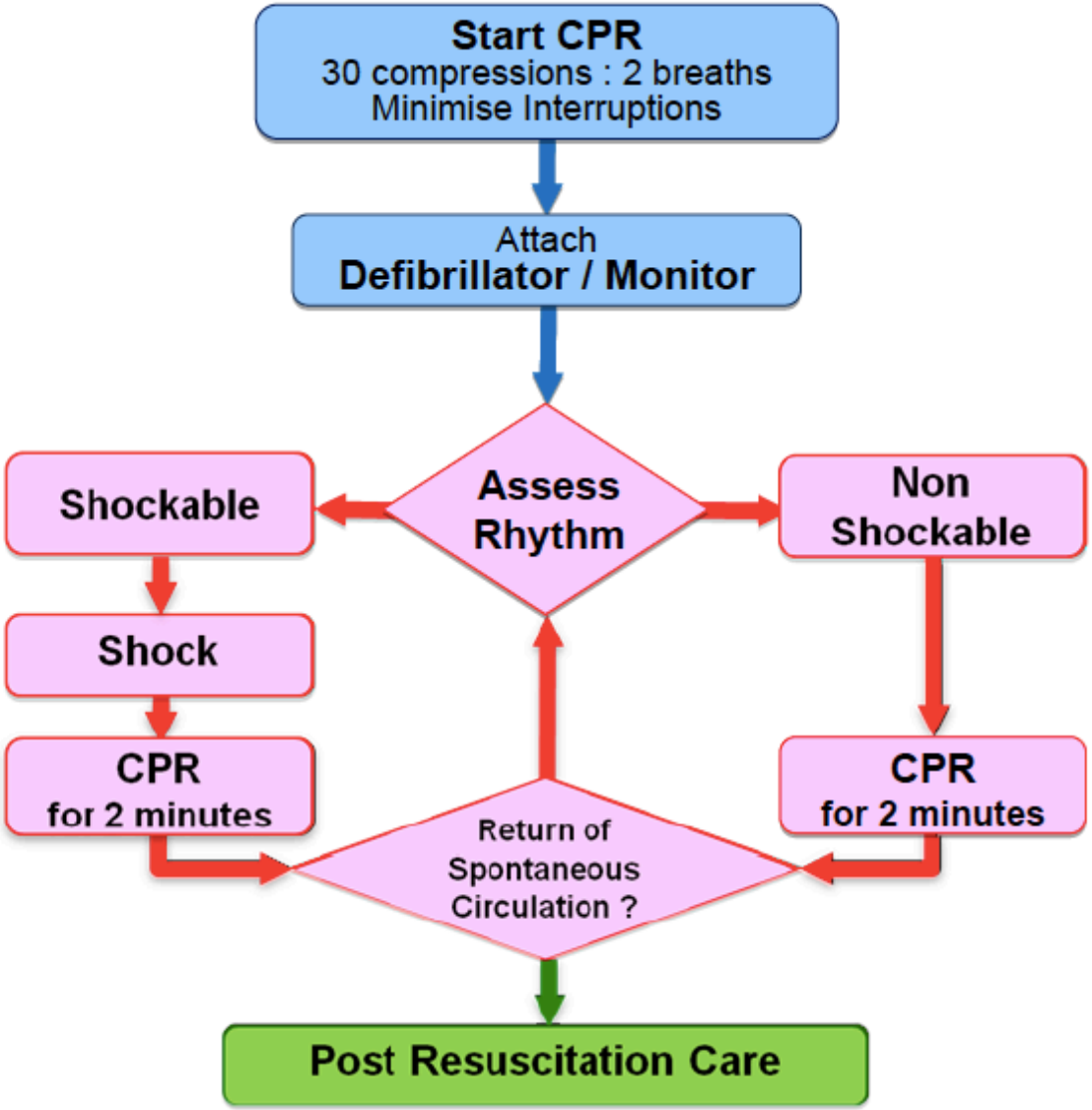


CIRCULATION - TACHYCARDIA

New Zealand Resuscitation Council

Advanced Life Support for Adults

Australian Resuscitation Council



During CPR

Airway adjuncts (LMA / ETT)
Oxygen
Waveform capnography
IV / IO access
Plan actions before interrupting compressions
(e.g. charge manual defibrillator)
Drugs
- Shockable
  - * Adrenaline 1 mg after 2nd shock (then every 2nd loop)
  - * Amiodarone 300 mg after 3rd shock
- Non Shockable
  - * Adrenaline 1 mg immediately (then every 2nd loop)

Consider and Correct

Hypoxia
Hypovolaemia
Hyper / hypokalaemia / metabolic disorders
Hypothermia / hyperthermia
Tension pneumothorax
Tamponade
Toxins
Thrombosis (pulmonary / coronary)

Post Resuscitation Care

Re-evaluate ABCDE
12 lead ECG
Treat precipitating causes
Re-evaluate oxygenation and ventilation
Temperature control (cool)

December 2010

CIRCULATION - ADULT ARREST

PRESENTATION

Wide range of possible presentations
Most common include :

cardiovascular collapse / hypotension (88%)
erythema (48%)
bronchospasm (40%)
angioedema (24%)
cutaneous rash (13%)
urticaria (8%)

EXCLUSIONS

Anaesthetic circuit obstruction
filter, kinked ETT, cuff herniation, tube migration

Disconnect circuit and ventilate directly with self-inflating bag

if pressure still high, problem is in airway/ETT

Foreign body in the airway?
Air embolism?
Tension PTX?
Severe bronchospasm?

IMMEDIATE MANAGEMENT

STOP TRIGGERS
colloids/latex/antibiotic/blood/NMB

MAINTAIN ANAESTHESIA
with **INHALATIONAL AGENT** if possible

Call for **HELP**, note **TIME**, give 100% **OXYGEN**, give **FLUIDS**

ADRENALINE 50-100mcg IV
(0.5ml-1ml of 1/10,000)
titrate to response

or **0.5mg IM** (thigh) if no IV access

ANTIHISTAMINE, HYDROCORTISONE 200mg 6/24

SALBUTAMOL 250 mcg IV or 2.5-5mg nebuliser into circuit

RISK FACTORS

History of previous exposure not reliable to exclude.

Worse in asthma, beta-blockade, hypovolaemia, neuraxial blockade (reduced endogeneous catecholamine)

INVESTIGATIONS

Draw blood for mast-cell released tryptase at 0, 1hr, 24hrs
Store at - 20 degrees C
Refer to regional allergy centre

REMEMBER - ADRENALINE CONCENTRATIONS
1ml of 1/1000 = 1mg
10ml of 1/10,000 = 1mg

ANAPHYLAXIS

PRESENTATION

Excess absorption of fluid during TURP

EARLY MANIFESTATIONS

CVS
bradycardia, hypertension

GI
nausea & vomiting, abdominal distension

CNS
anxiety/confusion, headache,
dizziness, slow waking GA

LATE MANIFESTATIONS

CVS
hypotension, angina, cardiac failure

RESP
dyspnoea, tachypnoea, cyanosis

CNS
twitching, visual changes, seizures, coma

GU
renal tubular acidosis, reduced urine output

EXCLUSIONS

Congestive cardiac failure

All other causes of confusion

RISK FACTORS

Absorption 1-2 litres fluid per 40 mins operating
Large prostate
Prolonged operation > 60 mins
Hypotonic fluids given IV
Volume of irrigation > 30 litres
Inexperienced surgeon
Height of irrigation > 60cm above patient
Comorbidities - liver disease, renal stones, UTI

Immediate Management

High index of suspicion

ABC - 100% Oxygen

Stop irrigation fluid infusion, catheterise

Check **Na** and **Hb** regularly & correct them

Frusemide 40mg IV

TURP SYNDROME

LA CONCENTRATIONS

0.5% = 5mg/ml
1% = 10mg/ml
2% = 20mg/ml

TOXICITY

Initially CNS agitation, peri-oral tingling, seizures
then CNS depression, coma, myocardial depression

DRUG	ONSET (minutes)	DURATION (hrs)	TOXIC DOSE mg/kg
Amethocaine	2 mins	1 hr	1.5
Prilocaine	5-10 mins	1-2 hrs	6
Bupivacaine plain	10-15 mins	3-12 hrs	2
Bupivacaine with Adrenaline	10-15 mins	4-12 hrs	2
Ropivacaine	10-15 mins	3-12 hrs	3.5
Lignocaine plain	5-10 mins	1-2 hrs	3
Lignocaine with Adrenaline	5-10 mins	3-4 hrs	7

IMMEDIATE MANAGEMENT

DISCONTINUE INJECTION - HIGH FLOW OXYGEN - INTUBATE AND VENTILATE IF NOT ALREADY DONE
MIDAZOLAM 3-10mg for SEIZURES CARDIOPULMONARY RESUSCITATION
INTRALIPID 20% 1.5ml/kg over one minute (100ml for 70kg) then infuse at 0.25ml/kg/min

LOCAL ANAESTHETIC TOXICITY

PRESENTATION

masseter spasm
tachypnoea in spontaneous breathing patient
rise in ETCO2 in ventilated patient
unexplained tachycardia, progressing to hypoxaemia
raised temperature
arrhythmias

EXCLUSIONS

Inadequate anaesthesia / analgesia

Infection / Sepsis

Tourniquet Ischaemia

Anaphylaxis (exclude hypotension)

Phaeochromocytoma or Thyroid Storm

Immediate Management

DISCONTINUE VOLATILES
and give
100% OXYGEN VIA HIGH FLOW

CALL FOR HELP - MH BOX

HYPERVENTILATE WITH NEW CIRCUIT

MAINTAIN ANAESTHESIA with **PROPOFOL** and **OPIOID**

EXPEDITE SURGERY

DANTROLENE 1mg/kg IV up to 10mg/kg

COOLING - AXILLA / GROIN / NECK

COLD FLUSH NGT and IDC

RISK FACTORS

Family history

Death under anaesthesia in family

Volatiles and Suxamethonium

INVESTIGATIONS

ABG, U&Es, CK, FBC, Clotting
Muscle biopsy

MOBILISE RESOURCES

Surgeon - Theatre Staff - Ward Staff - ICU will be needed

MALIGNANT HYPERTHERMIA

SPINAL ANAESTHETIC

Tuffier's line intersects spinous process L4-5
Cord ends L2

Prep/Drape/Gown/Gloves/Hat/Mask
LA infiltrate

Midline until CSF
Inject LA with Opiate, Barbotage

LSCS T4-6
~2.5ml 0.5% bupivacaine + 25mcg fentanyl

TURP T8-10
~3.2ml 0.5% bupivacaine with opiate
100-200mcg morphine or 15-25mcg fentanyl

FLUID BOLUS
METARAMINOL or EPHEDRINE BOLUSES

EPIDURAL ANAESTHETIC

Explanation and consent
Prep/Drape/Gown/Gloves/Hat/Mask

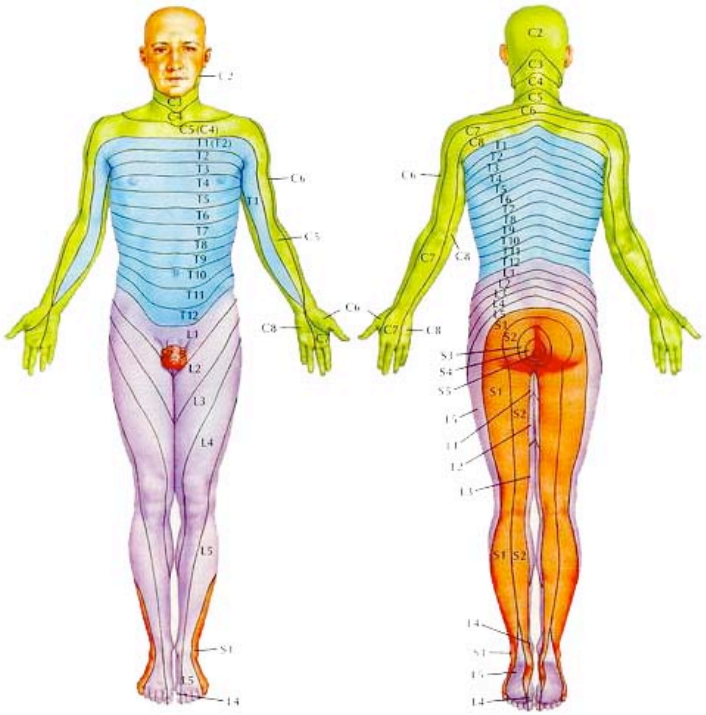
2% xylocaine with 1/200,000 adrenaline for both local infiltrate to skin & initial test dose

Note depth of LORTS or LORTA
Thread catheter 3-5cm further
Aspirate (CSF or blood?)

Test dose 3ml 2% xylo 1/200,000 adrenaline

If no block, proceed with premix
20ml 0.125% bupivacaine/200mcg fentanyl

If inadvertent spinal either reinsert or thread catheter & top up with spinal dose 3ml of 2% xylo 1/200,000 adrenaline **ONLY by SELF**



LSCS to T4-6 TURP to T8-10

BROMAGE SCORE

Grade	Criteria	Block
I	Free movement legs/feet	0%
II	Flex knees, move feet	33%
III	Can't flex knees, move feet	66%
IV	Can't move legs or feet	100%

ANTICOAGULANTS

Aspirin/NSAIDS no contraindication

Clopidogrel cease 7 days before

Heparin > 6hrs between insertion/removal
Clexane > 12 hrs between insertion/removal

Warfarin INR < 1.5

COMPLICATIONS

Hypotension - Itching - Backache 1/10
Failure 1/25
Headache 1/100
Transient nerve damage 1/2000
Cardiac arrest 1/3000
Unexpected high spinal 1/5000
Permanent nerve damage 1/60,000
Spinal abscess 1/100,000

NEURAXIAL BLOCKADE

DO I NEED BLOOD?

Position of placenta
Previous LSCS/scarring
Multigravid
Multiparous
Gestational DM
Sepsis
Traumatic delivery
Prolonged labour

RECORD KEEPING

Positioning

Time called
Time arrived
Time anaesthesia initiated
Time of KTS
Time of delivery
Time of drugs

Specify risks/consent
GGHM Prep/Drape
LA/Strict asepsis

Document if offered conversion to GA and if this was declined

Any complications?
Epidural catheter tip

PREPARE PATIENT AND PARTNER

IV access 16G, IV fluids on pump set
Consider need for Paediatrician

Sodium citrate drink
Left lateral tilt to avoid aortocaval syndrome

GA SECTION

Preoxygenate - 100% oxygen
Anticipate difficult airway and rapid desaturation
Cricoid pressure
RSI : Propofol - Suxamethonium - ET Tube

Once sux wears off paralyse with nondepolarising NMB

NEURAXIAL SECTION

Spinal 2.5ml 0.5% bupivacaine with 25mcg fentanyl
or top up existing epidural (T10) to T4 for LSCS
supplemental nitrous if needed 50:50 N20/O2

Give antibiotics unless contraindication
Oxytocin 5 U IV once baby out (check not twins!)
Oxytocin infusion - 40U/1000ml @ 250ml/hr

Postoperative Analgesia & DVT Prophylaxis

MANAGEMENT OF PPH

Tone - Trauma - Tissues - Thrombin

Oxytocin for all - 5 U IV once uterus empty

Oxytocin infusion 40U @ 10U/hr for 4 hrs

Fundal rub to uterus

Misoprostol 1000mcg PR

Haemabate 0.25mg IM
Up to five doses, min 15 min gap between

LARGE BORE IV - WARM FLUIDS - BLOOD

CONSIDER SURGICAL OPTIONS

Pre-Eclampsia

4g $MgSO_4$ over 15 mins, then 1g/hr IVI

Labetalol 50mg IV
Hydralazine 5mg IV

NEONATAL RESUS

HR 60-100 assisted ventilation
HR < 60 start CPR 3:1
Adrenaline 10mcg/kg IV (use the 1V, not 2A)

CAESAREAN SECTION

Emergency GA LSCS CHECKLIST

- CITRATE GIVEN? ❑
- LARGE BORE IV ACCESS AND SECURED? ❑
- FLUIDS PRELOADED? ❑
- TABLE IN LEFT LATERAL TILT? ❑
- PREOXYGENATED 100% O2 > 4 MINUTES? ❑
- ETT - STYLET - BOUGIE - TAPE ❑
- SUCTION - ETCO2 - MONITORING ❑
- FAILED RSI PLAN DISCUSSED?
- RSI ❑
- CRICOID ❑
- PROPOFOL 2mg/kg ❑
- SUXAMETHONIUM 1mg/kg ❑
- ETT PLACEMENT CONFIRMED WITH ETCO2 ❑
- VOLATILE ❑
- NEUROMUSCULAR BLOCKADE ❑
- OXYTOCIN available post-delivery ❑
- 40 UNITS / 1000ml @ 250ml/hr if needed ❑
- NEONATAL RESUS ANTICIPATED? ❑

Emergency SPINAL LSCS CHECKLIST

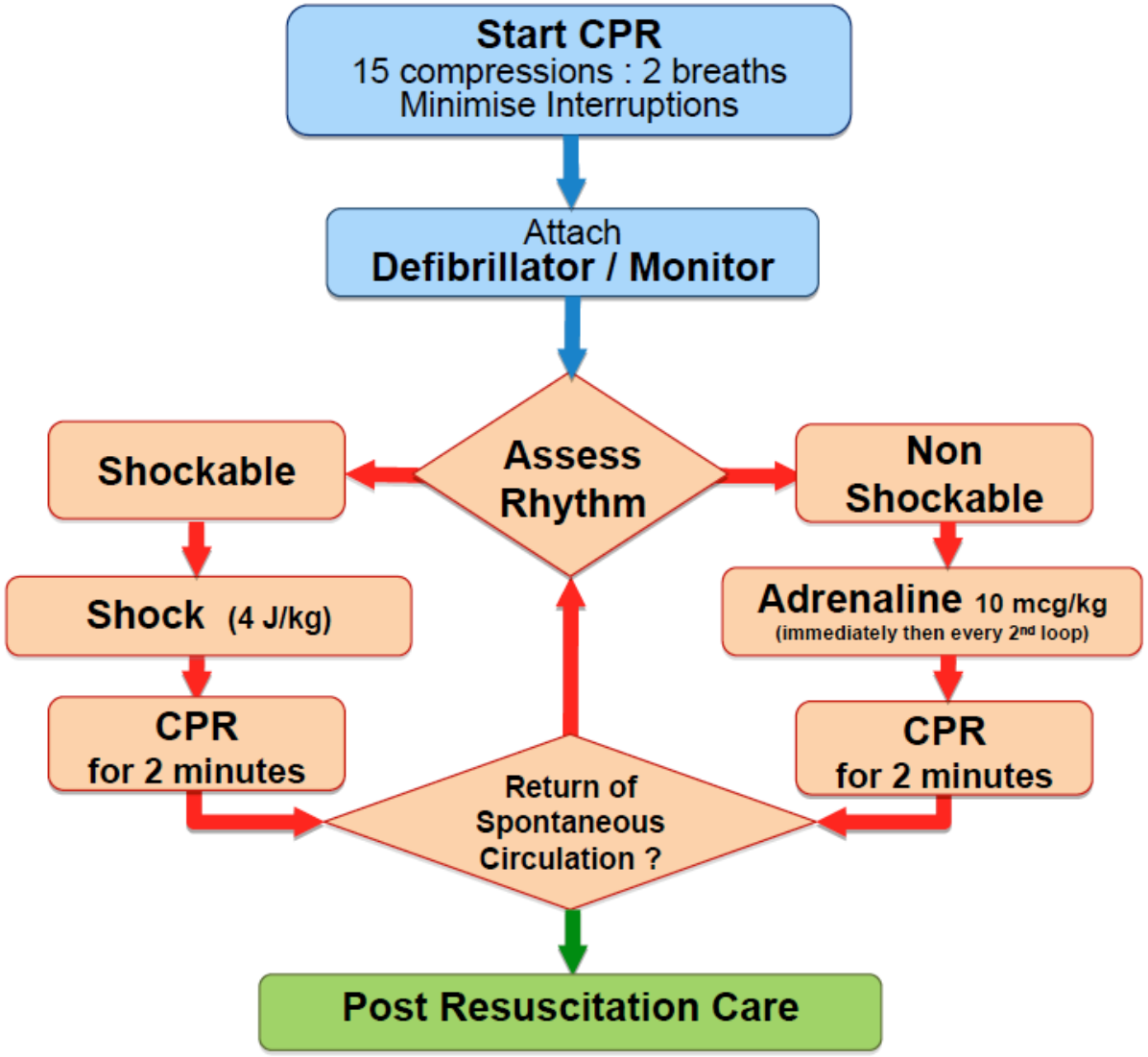
- CITRATE GIVEN? ❑
- LARGE BORE IV ACCESS AND SECURED? ❑
- FLUIDS PRELOADED? ❑
- TABLE IN LEFT LATERAL TILT? ❑
- L4-5 INTERSPACE IDENTIFIED? ❑
- PREP - DRAPE - GOWN - GLOVES - MASK - HAT ❑
- ANTISEPTIC REMOVED FORM SPINAL TRAY ❑
- LOCAL ANAESTHETIC 2% XYLOCAINE/ADRENALINE ❑
- 2.5ML BUPIVACAINE 0.5% with FENTANYL 20-25MCG ❑
- SKIN INFILTRATION ❑
- INTERSPINOUS LIGAMENT IDENTIFIED ❑
- CLEAR CSF ❑
- SWIFT INJECTION WITH BARBOTAGE ❑
- OXYTOCIN available post-delivery ❑
- 40 UNITS / 1000ml @ 250ml/hr if needed ❑
- NEONATAL RESUS ANTICIPATED? ❑

CAESAREAN SECTION

New Zealand Resuscitation Council
Whakahauora, Aotearoa

Advanced Life Support for Infants and Children

Australian Resuscitation Council



During CPR
Airway adjuncts (LMA / ETT)
Oxygen
Waveform capnography
IV / IO access
Plan actions before interrupting compressions
(e.g. charge manual defibrillator to 4 J/kg)
Drugs
Shockable
* Adrenaline 10 mcg/kg after 2nd shock (then every 2nd loop)
* Amiodarone 5mg/kg after 3rd shock
Non Shockable
* Adrenaline 10 mcg/kg immediately (then every 2nd loop)

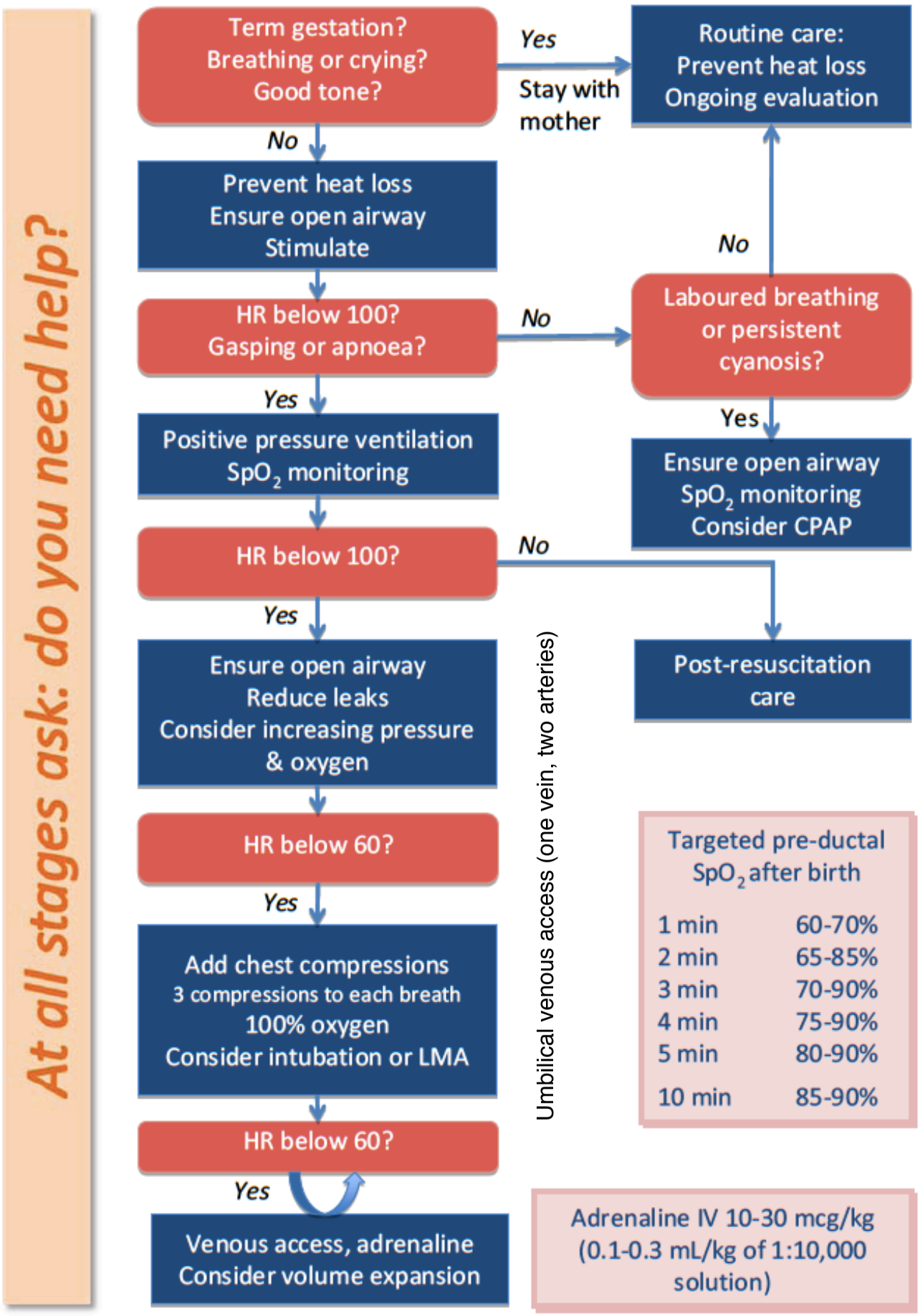
Consider and Correct
Hypoxia
Hypovolaemia
Hyper / hypokalaemia / metabolic disorders
Hypothermia / hyperthermia
Tension pneumothorax
Tamponade
Toxins
Thrombosis (pulmonary / coronary)

Post Resuscitation Care
Re-evaluate ABCDE
12 lead ECG
Treat precipitating causes
Re-evaluate oxygenation and ventilation
Temperature control (cool)

December 2010

PAEDIATRIC CARDIAC ARREST

Newborn Life Support



NEONATAL RESUSCITATION

ADENOSINE
first dose 0.05mg/kg
second dose 0.10mg/kg
then 0.20mg/kg
GIVE VIA FAST FLUSH

ADRENALINE
IV: 0.01 mg/kg (10mcg/kg)
1/10,000 - 0.1 ml/kg IV
ie. 10kg - 1ml
ETT - 1/1000 - 0.1ml/kg

ADRENALINE INFUSION
0.3mg/kg in 100ml N-saline
Start at 1ml/hr
= 0.05mcg/kg/min
Range 1-20ml/hr

AMIODARONE
5 mg/kg load
infuse 0.5mg/kg/hr

ATRACURIUM
0.5mg/kg

ATROPINE
20mcg/kg IV (max 600 mcg)
dilute 0.6 mg to 6 mls
= 100 mcg/5 mls
So give 1 ml per 5kg IV

CODEINE
1mg/kg

DEFIBRILLATION
2-4 J/kg – Biphasic

DEXTROSE
0.5 gm/kg
10% - 5 ml/kg IV
50% - 1 ml/kg IV

ETT Length
Age/2 + 12cm to teeth

ETT Diameter
>1yr - Age/4 + 4

FENTANYL
1 mcg/kg IV (0.5mcg/kg IN)

KETAMINE SEDATION
2-4 mg/kg IM
0.25 - 0.5 mg/kg IV
repeat as needed

KETAMINE - ANAES
5-10 mg/kg IM
1-2 mg/kg IV
repeat as needed

METARAMINOL
0.01 mg/kg IV
10mg in 20 mls=0.5 mg/ml

MIDAZOLAM
0.1 - 0.2 mg/kg IV

MORPHINE
0.1 mg/kg IV

NEOSTIGMINE
0.05 mg/kg IV

PARACETAMOL
15 mg/kg

PROPOFOL
1-3.5 mg/kg IV

REMIFENTANIL
1mg/20ml = 50 mcg per ml
Run at 10mcg/kg/min

ROCURONIUM
0.6-1.2 mg/kg IV STAT
0.1 mg/kg boluses

SALBUTAMOL
Undiluted 5mg/5ml
5mcg/kg over 1 min

SUXAMETHONIUM
2 mg/kg IV, 3mg'kg neonate
4 mg/kg IM

THIOPENTONE
4 mg/kg IV

VECURONIUM
0.1 mg/kg IV

VOLUME EXPANSION
20mls/kg N/saline

WEIGHT (kg)

Infants < 12 months
(age in months + 9) / 2

Children 1-5 years
2 x (age in years + 5)

Children 5-12 years
4 x age in years

EMERGENCY

Adrenaline 10mcg/kg

Atropine 20mcg/kg

Metaraminol 10mcg/kg

Propofol 2mg/kg

Sux 2mg/kg

Thio 4mg/kg

Fluids 20ml/kg

4J/kg Biphasic

PAEDIATRIC CHEAT SHEET

Adrenaline IM 1/1000
0.01ml/kg to max 0.5ml
IM lateral thigh, repeat 5 minutely

Adrenaline IV 1,10,000
1mg/10ml 1/10,000 IV
10mcg (0.1ml) per kg of 1/10,000

Adrenaline Infusion
1/1,000 = 1mg/ml
3mg in 50ml N saline
0.3mg/kg - 60mcg/ml
2mcg/min = 2ml/hr to
20mcg/min = 20ml/hr

Amiodarone
5mg/kg over 20 min
can push over 2 mins
central access IV

Amiodarone Infusion
600mg in 50mls 5% dextrose
0.5mg/kg/hr central access

Atracurium
0.5 mg/kg (0.3-0.6mg/kg) IV induce,
then 1/3rd dose subsequently

Atropine
600mcg in 6ml NS
10-20mcg/kg kids
300-600mcg adults

Cis-atracurium
0.15mg/kg IV

Dextrose
0.5 gm/kg
10% - 5 ml/kg IV
50% - 1 ml/kg IV

Ephedrine
3-6mg bolus IV

Esmolol
0.5mg/kg
100mg/ml dilute in 10ml = 10mg/ml
100kg=50mg=5ml

ETT Length
Age/2 + 12cm to teeth

ETT Diameter
>1yr - Age/4 + 4

Fentanyl
100mcg/2ml
2-3 mcg/kg IV
0.5-1 mcg/kg intranasal

GTN Infusion
50mg in 50ml 5% dextrose
1mg/ml at 3-12ml/hr

Heparin Infusion
25,000 units in 500ml (50U/ml)
1000U/hr = 20ml/hr

Insulin IVI
50 units in 50ml
5-10 U/hr = 5-10ml/hr

Isoprenaline
1mg in 50ml 5% dextrose
Give 20mcg (1ml)
then infuse at 1-4mcg/min
(3-12 ml/hr)

Ketamine Induction
1-2 mg/kg IV
5-10mg/kg IM

Ketamine Sedation
0.2-0.5 mg/kg IV sedation
2-4mg/kg IM sedation

Ketamine Infusion
0.25mg/kg/hour

Ketamine/Midazolam Infusion
200mg Ketamine : 50mcg fentanyl
in 50ml run @ 2-5ml/hr

Magnesium Sulphate Infusion
4 ampoules (2.47g x 4 = 9.88g) to
100ml N saline = 120ml

Load 4g (50m) over 20 mins
(150ml/hr over 20 mins)
then 1g/hr (12ml/hr)

Metaraminol
0.5mg bolus

Midazolam
01.-0.2 mg/kg IV

Morphine
0.1 mg/kg IV

Morphine/Midazolam Infusion
50mg each in 50ml NS
1mg/ml (1mg/10ml)
at 10mcg/kg/hr
= 2.5 - 15ml/hr

Naloxone
0.1 to 0.2 mg IV 2-3 minutely to
desired degree of reversal

Neostigmine
005mg/kg IV

Paracetamol
20mg/kg first dose
then
15mg/kg PO

Propofol
2mg/kg titrate

Remifentanil
1mg/20ml = 50 mcg per ml
Run at 0.1mcg/kg/min

Rocuronium
0.6-1.2 mg/kg IV STAT
(get same intubating conditions as
sux if use roc 1.2mg/kg)
0.1 mg/kg boluses thereafter

Salbutamol IV
10mcg/kg IV bolus over 10 mins

Sodium Bicarbonate 8.4%
1-2 ml/kg

Suxamethonium
1 mg/kg adult
2 mg/kg paed

Thiopentone
3-5 mg/kg

Vecuronium
0.1 mg/kg load
bolus every 30m with 5-10mg vec

Vecuronium Infusion
0.1 mg/kg/hr

Volume Expansion
20mls/kg N/saline

FORMULARY

ADRENALINE 1mg/1ml amp	3mg in 50ml N/saline = 60mcg/ml	run at 2 - 20 ml/hr incr. to keep MAP > 70
AMIODARONE 150mg/3ml amp	dilute 600mg (12ml) up to 50ml 5% DEX = 12mg/ml	run at 0.5mg/kg/hr central access
ESMOLOL 100mg/10ml	load 500 mcg/kg over 60secs maintain 50mcg/kg/min	100kg = 5ml (100mg/10ml) 100kg = 30ml/hr
FENTANYL	100 mcg/2ml or 500 mcg/50ml premix	run at 0 - 100 mcg/hr
GTN 50mg/10ml amp	dilute 50mg up to 50ml 5% DEX = 1mg/ml	run at 3 - 12 ml/hr titrate to BP/pain
HEPARIN	25,000 U in 50ml 500 U/ml	load 5000 U IV then 2ml/hr, titrate APTT
INSULIN IVI	50U in 50ml = 1 U/ml	load 10U IV (not kids) then run @ 5-10 ml/hr
ISOPRENALINE	1mg in 50ml 5% DEX = 20mcg/ml	1 ml bolus to response then 3-12 ml/hr
KET/MIDAZ	200mg ketamine /50 mcg fent in 50ml	run at 2-5 ml / hr
MgSO4 (eclampsia)	Add 4 amps (2.47g) to 100ml N/saline = 120 ml total volume (1g/12ml)	bolus 50ml (4g) over 20mins ie : 150ml/hr for 20 mins then 1g/hr (12 ml/hr)
MORPH/MIDAZ	50mg each to 50ml with N/saline (1mg/ml)	run 100 mcg/kg/hr (2.5-15 ml/hr)
PROPOFOL	1-4 mg/kg 500mg/50ml (10mg/ml)	dose range 0.5 mg/kg/hr (use body wt = ml/hr eg 70kg = 70ml/hr)
REMIFENTANIL	1mg in 20ml = 50mcg/ml	run at 0.1 mcg/kg/min (100kg = 12ml/hr)
VECURONIUM	1mg/ml reconstitute in water for injection	0.1 mg/kg/hr eg: 8mg/hr in 80kg patient

INSULIN SLIDING SCALE
50U/50ml = 1U/ml

BGL mmol	RATE U/hr = ml/hr
< 4	0 - STOP IVI
4.1 - 9	2
9.1 - 13	3
13.1 - 17	4
17.1 - 28	6
> 28	8
	check running

(see Sliding Scale above)

INFUSIONS

Ideally use dedicated syringe driver (10 - 50ml capacity) eg Niki T34

GENERAL PRINCIPLES

Use the **MINIMUM VOLUME**, and **STRONGEST STRENGTH** of drug

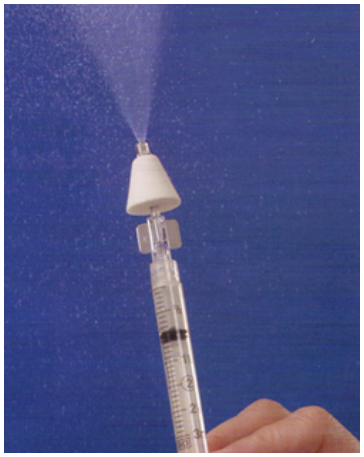
Use an **ATOMISER** where possible

Administer **HALF** to **EACH NOSTRIL** to maximise mucosal area

STANDARD MONITORING inc. SpO2 and supplemental O2

Warn that may **STING INITIALLY**.

Be aware will wear off so consider **ONGOING NEEDS**
and method of **DELIVERY** (repeat IN, IV, oral etc)



Examples of MAD (Mucosal Atomisation Devices)
from PACMED

ANALGESIA

Fentanyl 2 micrograms/kg

Ketamine 0.5 - 1mg/kg

Lignocaine 2% (topical) 5ml

SEDATION

Fentanyl 1.5 - 3 micrograms/kg

Ketamine 10 mg/kg

Midazolam 0.5 mg/kg

SEIZURES

Midazolam 0.2 - 0.3 mg/kg (use 10mg in adults)
Use concentrated 5mg/ml preparation

OPIATE WITHDRAWAL

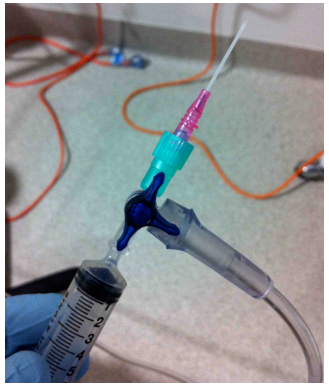
Naloxone 2mg (2ml)

TOPICALISING THE AIRWAY

There are many different methods. Here is my preferred method for AFOI:

Use an anti-sialogogue (glycopyrrolate 0.2 – 0.4 mg IV or IM (4 – 5 mcg/kg, 4 – 8 mcg/kg in children). If require sedation then consider that your topicalisation has failed and risk inching towards a true GA!

3-5mg/kg of lignocaine (2% = 20mg/ml) administered using cannula jet opposite



USE

10 ml syringe

3 way tap

20 G cannula

Oxygen flow to drive

INTRA-NASAL MEDICATIONS

CONSIDER	ANAESTHETIC RISK		
MENTAL HEALTH SAFETY/RISK	**LOW** thin, fit, fasted	**MEDIUM** ASA II - III	**HIGH** old, sick, difficult airway OSA etc
LOW flat, depressed, no Hx violence, low risk suicidal patient "happy" drunk thought disordered but compliant	low risk reassurance mild anxiolytic	restraint monotherapy longer acting agents 1:1 nursing	avoid drugs if possible orientation reassurance 1:1 nursing
MEDIUM intoxicated / disinhibited unpredictable delusional with poor insight anxious +++	sedation needed single agent antipsychotic (+/- benzo)	as above heavier sedation airway adjuncts to hand	airway risk non-pharmacy preferred short acting BDZ tincture of time
HIGH violence /weapons physical threats persecutory delusions around care "big guy" you whom cannot restrain	as above then ketamine sedation or RSI/ETT	as orange but delay until fasted await retrieval?	balance of minimal sedation & own airway vs GA/ETT

Olanzapine - first line oral antipsychotic; wafer 10-20mg oral, rapid onset

Quetiapine - second line oral antipsychotic; mania, behavioural-based agitation or previous use

Haloperidol - 5mg ORAL or 10mg IM to max 50mg; 5-10mg IV up to max 20mg
benztropine 1-2mg IV should be available to treat acute dystonia

Midazolam - IM 5-20mg, IV 0.1-0.2mg/kg in aliquots, IN 0.2mg/kg, ORAL 0.5mg/kg
flumazenil 0.2-0.5mg IV should be available if acute reversal required

Ketamine - PRE-KETAMINE SEDATION ESSENTIAL to MINIMISE DELIRIUM ie : BDZ
IM 5mg/kg, IV 0.5-1.5mg/kg sedation. Ketamine infusion has been used for transport.
Consider antisialogogue adjunct (atropine or glycopyrrolate)

See also : Minh le Cong et al. "*Ketamine sedation for patients with acute agitation and psychiatric illness requiring aeromedical retrieval*" EMJ May 2011 - ketamine sedation used to avoid RSI/ETT of red/black patients in risk matrix above

MINIMUM SEDATION MONITORING - SpO2, ECG, NIBP. Consider ETCO2 via HM. SUPPLEMENTAL **OXYGEN AT ALL TIMES**
RFDS restraints or net, 45 degree head up to maximise SV and minimise aspiration risk. **CHECK BGL!**

LIAISE WITH RETRIEVAL TEAM

RAPID ASSESSMENT ACUTE AGITATION

AIRWAY?
BREATHING?
CIRCULATION
DISABILITY, DRUGS?
ENVIRONMENT, ECG
FULL BLADDER?
GLUCOSE?
HEAD INJURY?

SUGGESTED ALGORITHM

NO IV ACCESS

oral olanzapine 10-20mg stat
and/or
IMI midazolam 5-10mg
and/or
IMI ketamine 4mg/kg

IV ACCESS OBTAINED

IV midazolam 2-5mg
and/or
IV haloperidol 5-10mg
and/or
IV ketamine 1-1.5mg/kg

repeat every 5-10 mins, target RASS 0 to -3

SAFE PSYCH SEDATION MATRIX

RICHMOND AGITATION SEDATION SCALE

Term	Description	Score
COMBATIVE	overtly combative, violent, immediate danger to self/others	**+4**
VERY AGITATED	pulls or removes tube(s), catheter(s), aggressive	**+3**
AGITATED	frequent non-purposeful movement, fights ventilator	**+2**
RESTLESS	anxious but movements not aggressive or vigorous	**+1**
ALERT & CALM	Doctor or Nurse	**0**
DROWSY	Not fully alert, but sustained awakening to voice (**eyes open > 10s**)	**-1**
LIGHT SEDATION	briefly awakens with **eye contact to voice < 10s**	**-2**
MODERATE SEDATION	movement or eye opening to voice **but no eye contact**	**-3**
DEEP SEDATION	no response to voice, but **movement or eye opening to physical stimulation**	**-4**
UNROUSABLE	**no response to voice or physical stimulation**	**-5**

Procedure

(i) observe patient - patient is alert, restless, agitated or combative (0 to +4)

(ii) if not alert, state patient's name and say to open eyes and look at speaker
-1 if awakens with sustained eye contact to voice > 10s to voice
-2 if awakens with eye contact to voice < 10s
-3 if moves or opens eyes to voice but no eye contact

(iii) if no response to voice, use physical stimulus (shoulder shake, trapezius squeeze, jaw thrust)
-4 if any movement to physical stimulation
-5 if no response to physical stimulation

TARGET RASS is 0 to -3

AIRWAY EQUIPMENT and MONITORING must be available

1:1 NURSING, 10 minutely obs

LIAISE WITH RETRIEVAL SERVICE

RICHMOND AGITATION SEDATION SCALE

TRANSFER INFORMATION

Sometimes important details can get forgotten. I use the ABC approach to handover to retrieval team, as follows: "*Thank God you're here! OK, this is John Doe age 21 involved in a motor vehicle accident with prolonged extrication and transferred via ambulance to us. He needs transfer to a trauma centre for a laparotomy for internal bleeding. In terms of summary, here's his ABC...*"

A - Airway	Intubated on arrival for GCS M3V1E1 - grade I view. Airway now patent, protected with size 8.5 ETT tube 22cm teeth and tied. Cervical collar in situ.
B - Breathing	Paralysed with vecuronium and on volume control TV 600 RR 12 R sided HTX and a 34Fr intercostal catheter in place, drained 400ml blood. SpO2 96%
C - Circulation	Haemodynamically stable after 750ml crystalloid titrated to radial pulse in 250ml aliquots (permissive hypotension). HR 90 BP 74/50 Bleeding likely from HTX, abdomen and pelvis.
D - Disability/ Drugs	M3V1E1 PEARLA initially, now M1V1E1 on propofol/vecuronium infusion.
E - Exposure	R HTX drained as above. Abdomen tense and tender in LUQ, suspect splenic injury. No other injuries on log roll, pelvic binder applied. Warm blankets and Bair hugger
F - Fluids	3 x 250ml crystalloid aliquots titrated to radial pulse (SBP 70) IDC in situ and drained 300ml clear urine
G - Gut	Last ate 7pm. NG passed and on free drainage.
H - Haematology	Hb 114 on iStat, INR 1.1 No ACoTS.
I - Infusions	Not needed vasopressors On propofol and vecuronium infusions for transport
J - JVP	Not elevated - no signs tPTX/tamponade.
K - Kelvin	Temp is 36 degrees with active warming
L - Lines	14G IV R wrist 8Fr rapid infuser L ACF
M - Micro	Has been given ADT
N - Notes/NOK	His notes are in this envelope, including copies of plain X-rays NOK are aware and here are their contact details.

The above would take 90 seconds and is an ordered summary of the patient for handover.

Parallels are often drawn between anaesthesia and aviation. This is not always in a good light, with the oft-repeated comment that "*giving an anaesthetic is like flying an airplane - 99% boredom and 1% sheer terror*" alluding to the relative safety of anaesthesia and the infrequency of crises - but the severity of those crises if they occur demands swift action else disaster awaits. More recently, anaesthesia has borrowed concepts of crew resource management from the aviation industry, applicable in a crisis. Checklists are mandatory in aviation and are beginning to be used in the Operating Theatre to aid safety.

Interesting Parallels	
Pre-operative Evaluation	Preflight
Anaesthetic machine & Equipment check	Aircraft and Preflight checklist
Induction	Take off
Deepening anaesthesia	Ascent
Intraoperative period	Cruising altitude
Lightening anaesthetic	Descent
Emergence & Recovery	Landing and Taxiing




ANESTHESIA & AVIATION

"Anaesthetics - isn't it just like flying an aeroplane, cruising along on autopilot with the real skill only needed if something goes wrong?"

If one more person tells me that giving an anaesthetic is like flying a plane, I will swing for them, I really will. Look - the whole point of a plane is that it is *designed* to fly, and if it's not working properly then you don't take it off the ground. And you certainly don't try to fly the damn thing whilst an Engineer (surgeon) is taking bits off it and doing on-the-spot repairs. Human beings, in contrast, are *not* designed to be anaesthetised, and are often not working properly when the occasion arises. They are also rather poorly provided with back-up systems and spares, and frequently have long histories of inadequate servicing.

So if giving an anaesthetic is like flying a plane, then *this* must be what flying a plane is like :

Captain James Bigglesworth stepped out into the thin sunlight and took a deep breath of the damp air. It was good to be alive. He was taking up a new crate today, and he relished the little knot of mixed tension and anticipation that always formed at the pit of his stomach under such circumstances. He strode briskly towards the hangar.

The Junior Engineer was waiting next to the aeroplane. He handed Biggles a single sheet of paper, on which he had scrawled a haphazard note of his work on the craft. "Is this all?" asked Biggles, "Where is the service record?"

"It seems to be lost. The filing department say it may still be at the previous airfield."

"And the manual?"

The Junior Engineer looked startled. "I don't think there is one. We thought you knew how to fly a plane."

A cloud drifted slowly across the sunny sky of Biggles' mind. He began his walk-round. "Where's this oil coming from?"

The Junior Engineer frowned seriously. "I don't know."

Biggles sighed. But he too, long ago, had once been a Junior Engineer. "Where do you think it might be coming from?"

"The engine?" hazarded the youth.

"Of course. So what's the oil level in the engine?"

"I don't know."

"Have you checked the oil level?"

"No."

Biggles could feel his voice becoming a little tight, a little cold. "So could you check it now, please?"

"But you're just going to take off. The Chief Engineer wants you to take off right away."

"Not without an oil level. And this undercarriage strut is broken. And the port aileron is jamming intermittently."

At that moment, the Chief Engineer arrived. "Biggles, old chap! Ready to take her up? Good man."

"She's not remotely airworthy. I need an oil level and some basic repairs."

The Chief Engineer sighed. "What do you want an oil level for? You know it's going to be low. We've got to get her into the air before we can control the leak. And that undercarriage and aileron aren't going to get any better while we stand here. She needs to be in flight before I can properly assess them. Come on, old chap - the tower's given us a slot in ten minutes' time. If we don't take off then, we'll be waiting all day." He eyed the plane despondently, and tapped a tyre with the toe of his boot. "And, frankly, I don't think she'll last much longer."

Biggles rippled the muscles of his square jaw. The Bigglesworths had never balked at a challenge, but this... well, there seemed to be no way out of it. He was going to have to take the old crate into the air, just as she stood. Deuced bad luck, of course, but no point in whining.

Twenty minutes later, they were aloft. The plane kept trying to fly in circles, and the engine temperature gauge was sitting firmly in the red. The Engineer was out on the cowling with a spanner. "Just turn her off for a bit," he bawled over the clattering roar of the sick engine.

Biggles was astonished. "What?"

"Turn off the engine. There's nothing I can do about this leak until the engine's stopped."

Reluctantly, Biggles turned off the engine, and trimmed the aircraft for a shallow glide. The weight of the Engineer, out there on the nose, was not helping matters at all.

Four minutes passed in eerie silence, as the treetops swam up to meet them. "I'm going to need power again soon." There was no response from the Engineer. Another thirty seconds passed. "I need power." No answer. "I'm turning on now." The engine roared, and the Engineer recoiled, cursing, in a cloud of black smoke.

"What's your game, Biggles, old man? I almost had the bally thing fixed, and now we'll need to start all over again!"

Biggles bit back an angry retort, and concentrated on guiding the crippled plane upwards. This time, now that he knew what was going on, they would start their glide from a lot higher.

After another protracted glide, the Engineer clambered back into the cockpit, beaming. "All fixed!"

Biggles tapped the oil pressure gauge. "Pressure's not coming up," he said. "It will, it will," said the Engineer breezily. "Don't be such a fusspot. Now let's get the aileron sorted." He crawled out onto the wing, and began to strike the recalcitrant aileron with a hammer.

A minute later, the plane rolled violently to the right. Biggles struggled momentarily for control, his lips dry. By crikey, they'd almost lost it completely, there. "Don't do that!" he called hoarsely to the Engineer.

"Do what?"

"Whatever you did, just then."

"I wasn't doing anything, old man."

Almost at that moment the plane lurched again, more fiercely, and rolled through forty-five degrees. "That!" screamed Biggles, fighting the controls for his very life. "Don't do that!"

"Fair enough," said the Engineer, cheerily. A minute later he did it again, and the plane was inverted for ten long seconds before a sweating Biggles regained any vestige of control.

"Fixed! Undercarriage next!" called the Engineer, and clambered out of sight below the fuselage.

Ten minutes later, Biggles caught brief sight of a set of wheels dropping away earthwards. "Couldn't save 'em," said the Engineer matter-of-factly when he regained the cockpit. "Better off without them, frankly."

"I still have very little oil pressure," said Biggles, worriedly.

The Engineer pursed his lips and tapped the pressure gauge reflectively. "Well, the leak's fixed, old man. Must be something about the way you're flying her." He reached under his seat and pulled out a parachute. "Look, I'm most frightfully sorry about this, but the nice men from Sopwith are taking me out to dinner tonight, so I've got to dash. Be a brick, Biggles old fellow, and just put her down anywhere you like. I'll cast an eye over her in the hangar tomorrow morning."

And with that, he was gone.

Biggles thought longingly of his own parachute. But he couldn't abandon the old girl now. It wasn't her fault, after all. Black, oily smoke was already billowing out of the engine cowling, however - he needed to put her down soon. He began to peer around for a flat place to land and, almost immediately, he spotted a distant grassy field.

He moved the controls a little so that he could take a closer look - it certainly looked flat enough. Oddly, someone had painted huge white letters across the level green grass - ICU, it 0.75read. He had no idea what that meant, but it seemed vaguely comforting, for some reason. The engine coughed once, and then stopped. He could see a fitful orange glow beneath the cowling. This rummy ICU field would just have to do, it seemed.

As he swung the ailing aircraft around to make his final approach, he realised that the landing field was just a little too short for comfort. He licked his lips, and prayed that there would be enough room…,

THIS IS FROM A TEXT SENT TO ME AND ATTRIBUTED TO AN ARTICLE IN 'TODAY'S ANAESTHETIST' BY DR GRANT HUTCHISON (UK)

DIY Kit for topicalising the airway

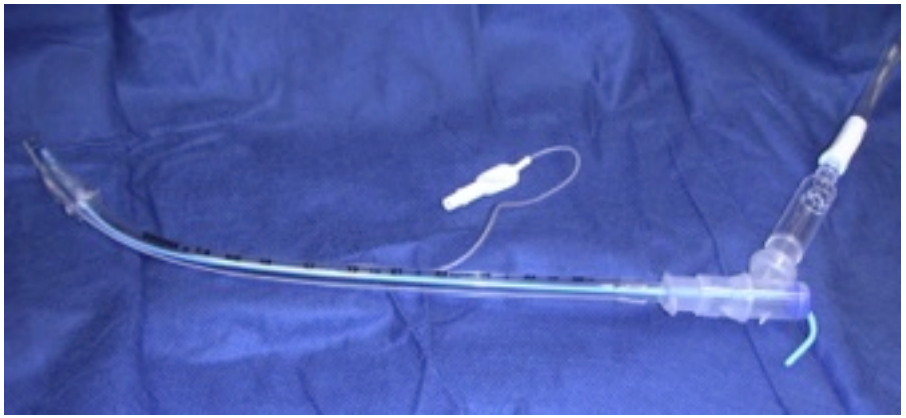
Size 20 cannula (trocar removed) attached to a three way tap and also connected to O2 at 10l/min.

Inject local anaesthetic (2 or 4% xylocaine) to topicalise the nasal passages/oropharynx as a nebuliser.

Surgical Airway Kit

Size 20 scalpel
Tracheal hook (optional)
Tracheal dilators or artery forceps to dilate trachea

I also use a bougie then railroad a size 6 ETT



Novel suction apparatus

I still need to wet test this, but the idea is simple

In case of torrential bleeding/vomit, can use a swivel adaptor (bronchoscope adpator) to the end of an ETT, and attach a meconium aspirator to the suction tubing and outlet. Then can use the ETT as a sucker - once placed, if the trachea is soiled then exchange with Aintree for a fresh ETT

DIFFICULT AIRWAY - KIT PHOTOS

Intubating stylet eg: Bonfils, Levitan

AirTraq Optical Laryngoscope - cheap at $90 each, but lose situational awareness as optical only and needs practice to place ETT

Pentax AWS Videolaryngoscope

McGrath Videolaryngoscope

Good image quality, but poor in glare, flimsy and no video out. The blade is sheathed in a disposable protective sleeve. Mid range price

C-MAC Videolaryngoscope

Like other VLs, it accelerates the learning curve of laryngoscopy as the monitor allows others to see what the intubator sees.
Playback is good for teaching

EXPENSIVE at $15K cf KingVision

KingVision Videolaryngoscope

The dogs nuts as far as I am concerned - cheap, video out to PC/monitor and easy laryngoscopy (bit of a learning curve - common mistake is to advance ETT too soon)

$800 for screen/handle
and blades $30 each

DIFFICULT AIRWAY - KIT PHOTOS

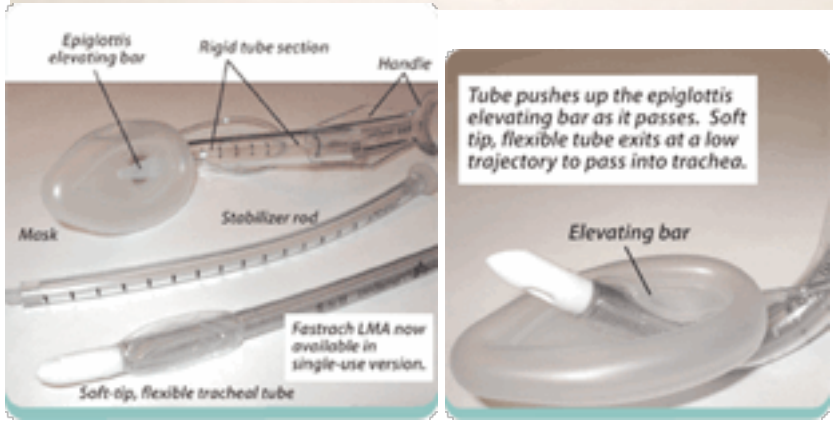
Range of ETT tips

The Parker (third form left) and FastTrach iLMA tipped ETTs are particularly suited to difficult intubation and use with VL as less likely to get 'hooked' on the right arytenoid cartilage

Worth getting a few Parker tip ETTs for difficult airways

The CombiTube

Easy obturation of oesophagus and tracheal ventilation
Probably the most under used piece of kit - many hospitals don't even carry them, but easy to use



FastTrach iLMA

Allows ventilation via iLMA then blind placement of an ETT
May need Chandy maneouvre
Not always successful.
A newer VL version allows confirmation of ETT placement

DIFFICULT AIRWAY - KIT PHOTOS

Ambu Ascope 2

An affordable alternative to expensive fibreoptic systems.
At $2500 for five, this is a disposable system.

Would allow awake fibreoptic intubation
(see excellent video on youtube at
http://www.youtube.com/watch?v=c9pAQ3DUKVM&feature=related)

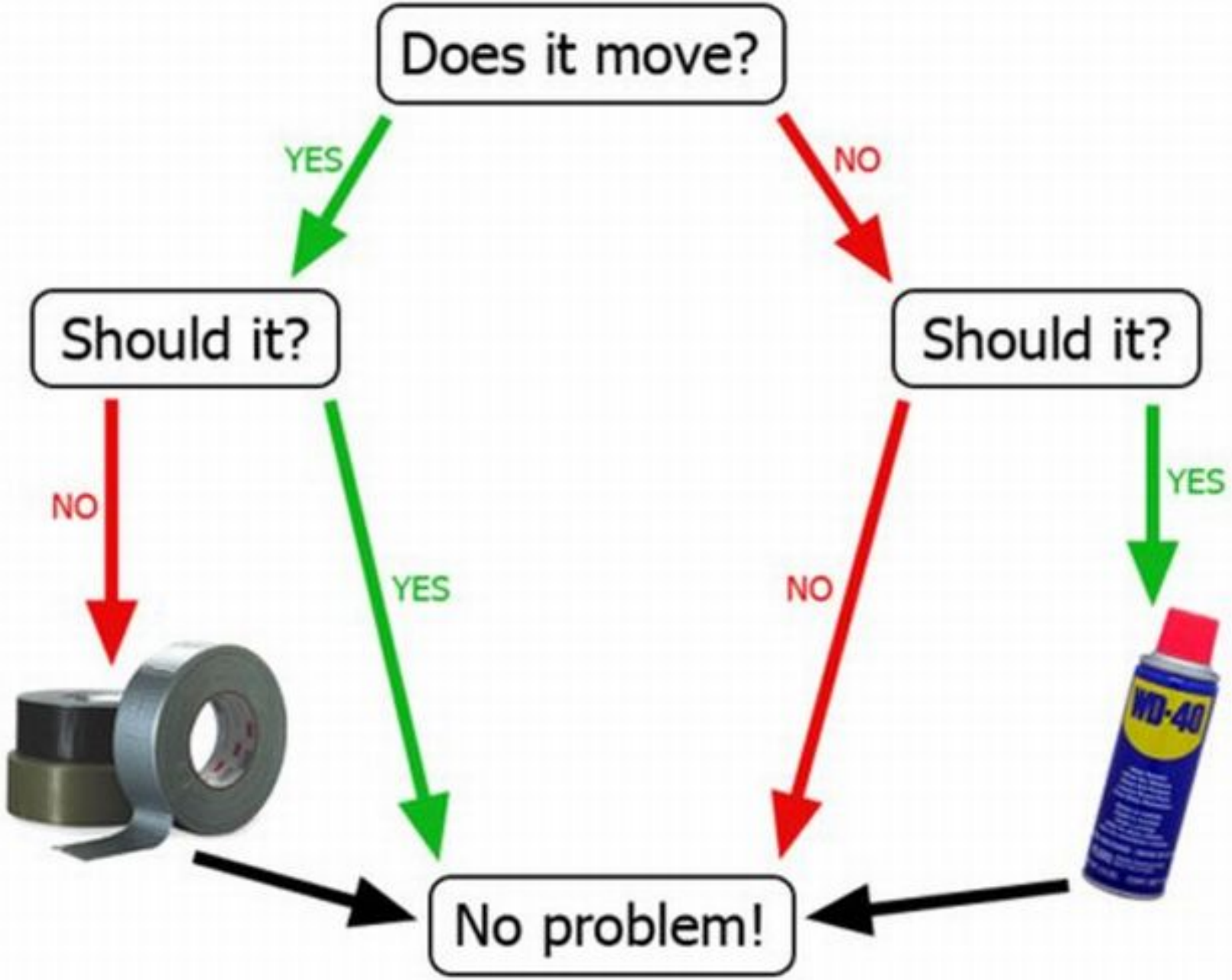
Perhaps for the rural GP it is better as a bail out tool under Plan B in DAS algorithms - can drop in the cheap Aura-i iLMAs ($5 each) and then intubate through this with the Ascope - hence ventilating and then intubating. In the absence of this, there is NO REAL alternative option at PLAN B for the rural doctor (the FastTrach iLMA is a bit hit and miss)

It doesn't have a suction port - but even the top range fibreoptic devices have piss weak suction. It does have a 'park' for the ETT which is a neat concept and not available on the more expensive fibreoptic devices that I have played with. It also has a port to allow oxygen at 2l/min and/or to squirt local anaesthetic down to topicalise the airway.

I thin this is a 'must have' along with the KingVision VL

Would need to use occasionally on elective list or sacrifice one for training purposes. If enough rural hospitals have them, can re-cycle stock between health units (including MedSTAR) if not used.

DIFFICULT AIRWAY - KIT PHOTOS



EQUIPMENT FAILURE CHECKLIST