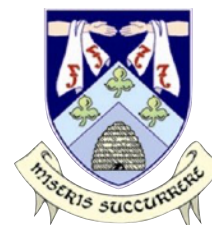


COVID 19

Critical Care Protocols

Beaumont Hospital

Updated 06/04/2020



Index

Guiding Principles

Daily Checks
Daily Goals

Lab Samples

Standard Orders

Intubation

- ICU/Theatre
- Radiology

Extubation

- ICU
- Theatre
- Radiology

Ventilation

- Hypoxia
- Recruitment Manoeuvre
- Troubleshooting

Proning

Head Turn
Supination

Sedation

Haemodynamics

ACLS

- Ward
- ICU
- Prone

Intrahospital Transport

- Ward to ICU
- ICU to theatre/radiology

Nutrition

Support for Staff

Protocols compiled by Dr Ruth Aoibheann O’Leary and Dr Bryan Reidy on behalf of the Department of Anaesthesia and Critical Care Medicine, Beaumont Hospital.

Aim of patient management is to optimise length of ICU stay to facilitate admission of maximum possible number of patients during the pandemic

OVERALL PRINCIPLES

- Use appropriate PPE
- Lung protective ventilation
- Negative fluid balance
- Optimise supportive care
- Deliver interventions in clusters

ANTI-MICROBIAL TREATMENT

- Prescribe antibiotics for all COVID-19 confirmed/suspected patients
- Send urinary antigens for legionella and pneumococcus
- Stop atypical cover if negative

CONSULT RCSI GUIDELINES

IMAGING

- CXR: Admission CXR after line and ETT placement. No routine CXRs.
- CT: No clear role

COVID DIAGNOSTICS

- Nasopharyngeal swab 1st line
- Consider tracheal aspirate if negative swab and high clinical suspicion

RENAL REPLACEMENT

- Consider in electrolyte disturbance, refractory acidosis and fluid overload
- Discuss with ICU consultant

SEDATION

- Reduce sedation as oxygenation improves
- Sedation breaks every day
- Use physical restraints if needed to facilitate sedation wean

SEE SEDATION GUIDELINE

DISEASE COURSE

- May show rapid improvement but beware of deterioration after initial improvement
- Delayed CVS collapse and HLH reported
- If profound septic shock look for alternative diagnosis/additional pathogens

ROUTINE CARE

- Ensure patients receive all routine ICU care:
 - Mouth care; stress ulcer prophylaxis; DVT prophylaxis
- Maintain enteral nutrition

SEE STANDARD ORDERS & FAST HUGS

VENTILATION

- Early intubation of all patients admitted to ICU
- Lung protective ventilation: Vt 6ml/kg IBW; PPlat <30cmH2O; pH >7.2; SpO2 >90%; Match PEEP:FiO2 using table
- Permissive hypercapnoea if pH >7.2
- Prone positioning for 16/24hrs for at least 3 consecutive days
- Neuromuscular blockade only if required
- Tidal volumes >6ml/kg acceptable during spontaneous breathing trial

SEE VENTILATION GUIDELINE

REFRACTORY HYPOXAEMIA

- Early prone ventilation
- Sedation
- Consider nitric oxide
- Consider neuromuscular blockade
- Recruitment manoeuvre
- ECMO referral

SEE PRONING AND VENTILATION GUIDELINES

VENTILATORY WEAN

- Consider tracheostomy at day 6

HAEMODYNAMIC MANAGEMENT

- Noradrenaline first line vasopressor
- Once Noradrenaline >25mcg/min consider vasopressin, hydrocortisone 50mg every 6hrs
- Consider ECG, Troponin and TTE if deterioration
- If cardiogenic shock consider inotropes

SEE HAEMODYNAMICS GUIDELINE



Make sure that every patient gets **Fast Hugs in Bed Please** at least once per day

Fluid therapy and feeding

Analgesia, antiemetics

Sedation and Spontaneous breathing trial

Thromboprophylaxis

Head up position (30-45 degrees) if intubated

Ulcer prophylaxis (if not enterally fed)

Glucose control (5-10mmol/L)

Skin/eye care and suctioning

Indwelling catheters - are they needed?

Nasogastric tube

Bowel cares

Environment (e.g. temperature control, appropriate surroundings in delirium)

De-escalation (e.g. end of life issues, treatments no longer needed)

Psychosocial support (for patient, family and staff)

Ref Dr Chris Nickson <https://litfl.com/fast-hugs-in-bed-please/>

Date: ___/___/___

Circle Yes/No as appropriate

Insert addressograph here

	Daily Review	Daily Plan
CVS	MAP >65mmHg Yes No Sinus rhythm Yes No Vasopressors Yes No Noradrenaline ___mcg/min Vasopressin ___units/hr Adrenaline ___mcg/min	MAP target: ___mmHg Vasopressor Wean: Yes No Noradrenaline Yes No Vasopressin Yes No Adrenaline Yes No
Resp	Mode _____ P/F ratio _____ PEEP _____ Sputum character _____ pPeak <30cmH2O Yes No X-ray Yes No Suitable for wean Yes No	SpO2 target _____% Weaning plan: Yes No PSV Yes No Wean PEEP Yes No Extubation Yes No X-ray tomorrow Yes No
Neuro	GCS ___/15 ICP _____ EVD output ___ml/hr	ICP target _____
Sedation	Continuous sedation Yes No Sedation break in last 24hrs Yes No Physical restraints Yes No	Target RASS _____ Wean sedation Yes No Sedation break Yes No Mobilise Yes No
GI	Enteral nutrition Yes No Target feed met Yes No Laxatives charted Yes No Bowel motions _____/day Ulcer prophylaxis Yes No	NPO Yes No Enteral nutrition Yes No TPN Yes No Prokinetics Yes No Change laxatives Yes No
Renal	Adequate u/o Yes No Balance last 24hrs _____ CRRT Yes No CRRT required Yes No	Fluid balance goal for next 24hrs: Negative _____L Positive _____L Continue CRRT Yes No
Micro	Antimicrobials Yes No _____ New culture results Yes No _____	Antibx change Yes No _____ Septic screen Yes No
Invasive Devices	CVC Yes No Vascath Yes No Date inserted ___/___ Drain output ___ml/hr	Change CVC Yes No Change Vascath Yes No Remove CVC Yes No Remove Vascath Yes No Remove drain Yes No
Skin Care	Pressure areas Yes No Surgical wounds Yes No	Foam ankle boots Yes No Tissue viability nurse consult Yes No
Other	DVT prophylaxis Yes No Family meeting Yes No Consult required Yes No	Suitable for D/C Yes No Family meeting Yes No

Signature and MCN:

COVID Sampling

Nasopharyngeal Swab - only if not sent prior to admission

Tracheal Aspirate
- if negative swab but high clinical suspicion

Arterial Blood Gas

30 mins post intubation
4 hourly unless clinical deterioration

Routine Bloods

Send **once** daily

FBC
Renal Profile
Liver Profile (incl AST)
Coagulation Screen
CRP

If on propofol:
- CK
- Triglycerides

COVID Patients only

- Ferritin
- Fibrinogen
- D-Dimers
- α 1 antitrypsin
- Cortisol

Microbiology

Do not send blood cultures at line insertion

Central and Arterial cultures
- Temperature $>38.3^{\circ}$
- Clinical suspicion of line related infection

If persistently febrile discuss sampling frequency with intensivist and microbiology.

Standard Admission Orders (all patients)			
Drug	Dilution	Concentration	Dose
Noradrenaline	3mg + 47mls 5% Dextrose (50mls) 6mg + 44mls 5% Dextrose (50mls)	60 mcg/ml 120 mcg/ml	
Morphine	60mg + 59 mls 0.9% NaCl (60mls)	1 mg/ml	
Propofol	500mg in 50ml (neat)	10 mg/ml	
Esomeprazole	40 mg / 5ml 0.9% NaCl		40mg OD
Potassium Chloride	Max rate 20mmol/hr		Target K >4mmol/L
Potassium Phosphate			
Magnesium Sulphate			Target Mg >1 mmol/L
Chlorhexidine Mouthwash			1 application QDS
Multivitamin			2 Tablet OD PO/NG
Thiamine			100mg TDS PO/NG

Thromboprophylaxis

Drug	Dose
Enoxaparin	40mg OD
	> 100 Kg
	40mg BD
Heparin	eGFR <30
	eGFR <30 + >100kg
	7500 Units BD

Additional Orders

Drug	Dilution	Concentration	Dose
Adrenaline	3mg + 47mls 5% Dextrose (50mls) 6mg + 44mls 5% Dextrose (50mls)	60 mcg/ml 120 mcg/ml	
Vasopressin	20 Units + 49mls 5% Dextrose (50mls)	0.4 Units/ml	0.6 units/hr, max 2.4 units/hr
Dobutamine	500mg + 60mls 0.9% NaCl (100mls)	5mg/ml	2.5 - 10 mcg/kg/min
Midazolam	60mg + 48 mls 0.9% NaCl (60mls)	1mg/ml	
Dexmedetomidine	1000mcg in 250mls 0.9% NaCl	4 mcg/ml	0.2-1.4 mcg/kg/hr
Atracurium	500mg in 50mls (neat)	10mg/ml	Start at 50mg/hr
Cis-atracurium	100mg in 50mls (neat)	2mg/ml	1-3mcg/kg/min
Pancuronium	Neat		60 mcg/kg 4mg
Senna			10mls OD PO
Movicol			1 Sachet TDS PRN PO
Metoclopramide			10mg TDS
Pabrinex	Ampoule 1 + 2 in 100mls 0.9% NaCl		2 ampoules TDS

INTUBATION



PPE & Plan

Prepare Equipment

Prepare for Difficulty

Perform Intubation

Post Procedure

Outside Room

Inside Room

APPLY PPE

- Hand Hygiene
- Gown
- FFP2 Mask
- Eye protection
- Hood or Scrub cap
- Visor
- Sterile gloves
- Non-sterile gloves
- Buddy Check

ALLOCATE ROLES

- Intubator/Team Leader
- Assistant/Back-up intubator
- Nurse

- Runner (outside room)

DISCUSS AIRWAY PLAN

CHECK KIT

- C-Circuit with HME filter
- Guedel airway
- Working suction
- McGrath + disposable blade
- Stylet
- Bougie
- 2 x ETT
- 20ml syringe
- iGel
- Front of neck access kit
- ETT Ties

CHECK DRUGS

- Induction agent
- Rocuronium
- Vasopressor infusion
- Fluids, giving set, 3 way tap
- Sedation

WEIGHT

ALLERGIES

CAN THE PATIENT BE WOKEN UP IF DIFFICULT AIRWAY?

PLAN A

- mRSI
- McGrath

PLAN B

- iGEL

PLAN C

- 2-handed BMV

PLAN D

- Front of Neck (Scalpel, bougie, ETT)

CONFIRM AIRWAY PLAN

APPLY MONITORS

- SpO2 probe
- ECG
- NIBP/Arterial line
- Capnography

CHECK

- IV Access
- Ventilator

AIRWAY ASSESSMENT

OPTIMISE POSITION

PREOXYGENATE

- C-circuit @ 6L/min x 5mins
- Stop O2 before intubation

INDUCTION

PERFORM INTUBATION

- Inflate cuff
- Attach ventilator

PAUSE VENT BEFORE ANY DISCONNECTION

INSERT

- Feeding tube
- CVC +/- Vascath

DISPOSAL OF CONTAMINATED EQUIPMENT

DECONTAMINATE McGRATH

REMOVE PPE

- Use doffing checklist
- Buddy system

HAND HYGIENE

CXR TO CONFIRM TUBE & LINE POSITION

TEAM DEBRIEF

PREPARE

EQUIPMENT

- Oropharyngeal airway
- Nasal Prongs
- Venturi Mask
- Yankeur Suction
- Airway Tray

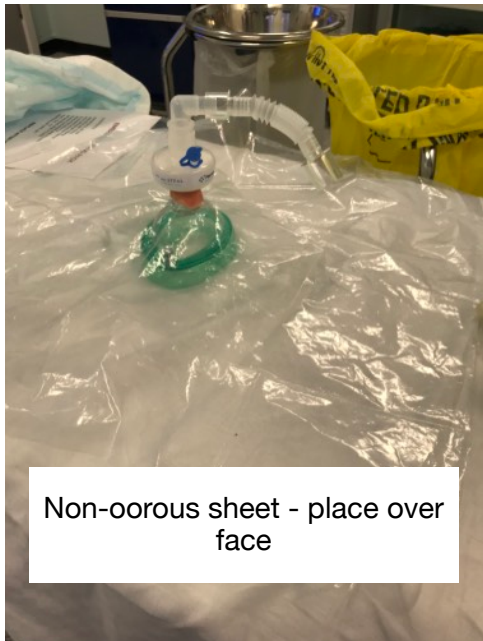
PATIENT

- Sit up 30-45°

PERSONNEL

ICU Doctor
ICU Nurse

**ALL OTHER STAFF SHOULD
LEAVE ROOM PRIOR TO
EXTUBATION**



Apply Nasal Cannula
Do not Commence gas flow

Suction oropharynx
Cover with non-porous sheet to reduce aerosolisation

Suction down ETT

FiO2 1

PRE-EXTUBATION CHECK
Fully awake and co-operative
Spontaneously breathing

**STOP OXYGEN FLOW
ALERT STAFF
REMOVE TAPES, DEFLATE CUFF
EXTUBATE**

Commence gas flow via nasal prongs @ ≤ 6 l/min

Adequate Ventilation and Oxygenation?

Apply Surgical Mask

PREPARE

EQUIPMENT

- Oropharyngeal airway
- Nasal Prongs
- Venturi Mask
- Yankeur Suction
- Nerve Stimulator
- Airway Tray
- Facemask + HME Filter + splashguard (circuit 2)

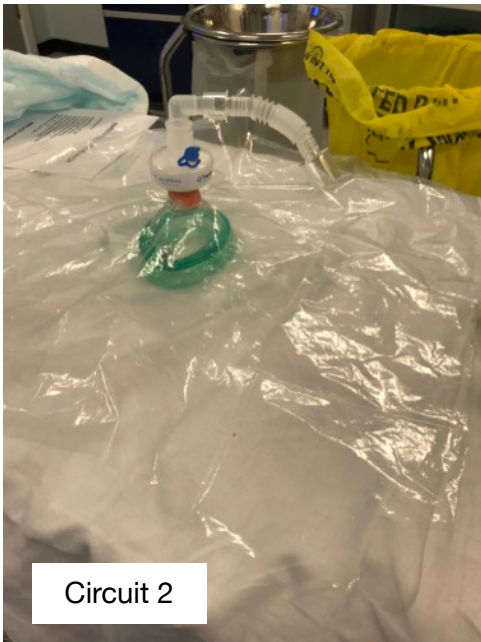
PATIENT

- Check TOF
- Sit up 30-45°

PERSONNEL

Anaesthetist(s)
Anaesthesia Nurse

ALL OTHER STAFF SHOULD LEAVE ROOM PRIOR TO EXTUBATION



Apply Nasal Cannula
Do not Commence gas flow

Suction oropharynx
Cover with non-porous sheet to reduce aerosolisation

Insert oropharyngeal airway

Reverse Neuromuscular Blockade

Stop anaesthetic agent, FiO₂ 1

PRE-EXTUBATION CHECK

Fully awake and co-operative
Spontaneously breathing
OPA removed

**STOP OXYGEN FLOW
ATTACH CO₂ TO CIRCUIT 2
ALERT STAFF
REMOVE TAPES, DEFLATE CUFF
EXTUBATE**

Apply circuit 2, commence gas flow @ $\leq 6\text{L}/\text{min}$

Adequate Ventilation and Oxygenation?

Remove Circuit, Apply Surgical Mask

Commence nasal prongs @ $\leq 6\text{L}/\text{min}$

Transfer to PACU 10 mins post extubation

PREPARE

EQUIPMENT

- Oropharyngeal airway
- Nasal Prongs
- Venturi Mask
- Yankeur Suction
- Nerve Stimulator
- Airway Tray
- Facemask + HME Filter + splashguard (circuit 2)

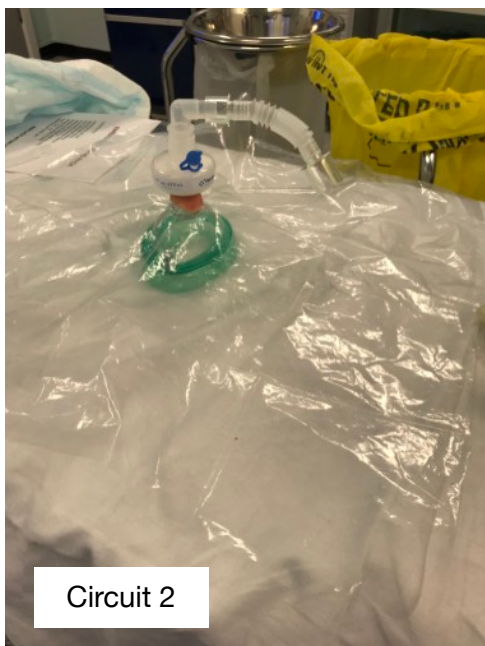
PATIENT

- Check TOF
- Sit up 30-45°

PERSONNEL

Anaesthetist(s)
Anaesthesia Nurse

ALL OTHER STAFF SHOULD LEAVE ROOM PRIOR TO EXTUBATION



Circuit 2

LEAVE ROOM VACANT FOR 12 MINS PRIOR TO CLEANING

Apply Nasal Cannula
Do not Commence gas flow

Suction oropharynx
Cover with non-porous sheet to reduce aerosolisation

Insert oropharyngeal airway

Reverse Neuromuscular Blockade

Stop anaesthetic agent, FiO₂ 1

PRE-EXTUBATION CHECK
Fully awake and co-operative
Spontaneously breathing
OPA removed

STOP OXYGEN FLOW
ATTACH CO₂ TO CIRCUIT 2
ALERT STAFF
REMOVE TAPES, DEFLATE CUFF
EXTUBATE

Apply circuit 2, commence gas flow @ ≤6l/min

Adequate Ventilation and Oxygenation?

Remove Circuit, Apply Surgical Mask

Commence nasal prongs @ ≤6L/min

Transfer to PACU 12 mins post extubation

Hypoxaemic Respiratory Failure P/F <26.6

TARGETS
Vt 6mls/kg IBW
Plat Pressure <30cmH₂O
Permissive hypercapnia if pH >7.2
pO₂ >8kPa, SpO₂ ≥90%

CONSIDER POST INTUBATION RECRUITMENT MANOEUVRE (Page 4)

VCV SIMV / PRVC
Male 430mls Female 350mls
FiO₂ 1
PEEP 10cmH₂O
Resp rate <35
I:E 1:2

PF RATIO = P_aO₂/FiO₂

Adjust FiO₂ & PEEP to SpO₂ ≥ 90%

ABG at 30 mins
4 hourly thereafter

PF ratio <26.6

PF ratio >26.6

Sedate
Prone
Consider NMBA*

Continue ventilation settings

Repeat ABG and reassess ventilation settings 4 hourly

*cis-atracurium or atracurium

Imaging
No role for daily CXR
All imaging requests to be approved by consultant intensivist



TIDAL VOLUME - 6mls/kg IDEAL BODY WEIGHT

WOMEN		
Height		Tidal Volume (mls)
cm	Feet inches	
153	5'0"	280
155	5'1"	290
158	5'2"	310
161	5'3"	320
163	5'4"	330
166	5'5"	350
168	5'6"	360
171	5'7"	370
173	5'8"	390
176	5'9"	400
178	5'10"	420
181	5'11"	430
183	6'0"	440

$45.5 \text{ kg} + (0.91 \times [\text{height cm} - 152.4])$
 $45.5 \text{ kg} + 2.3 \times (\text{height in} - 60)$

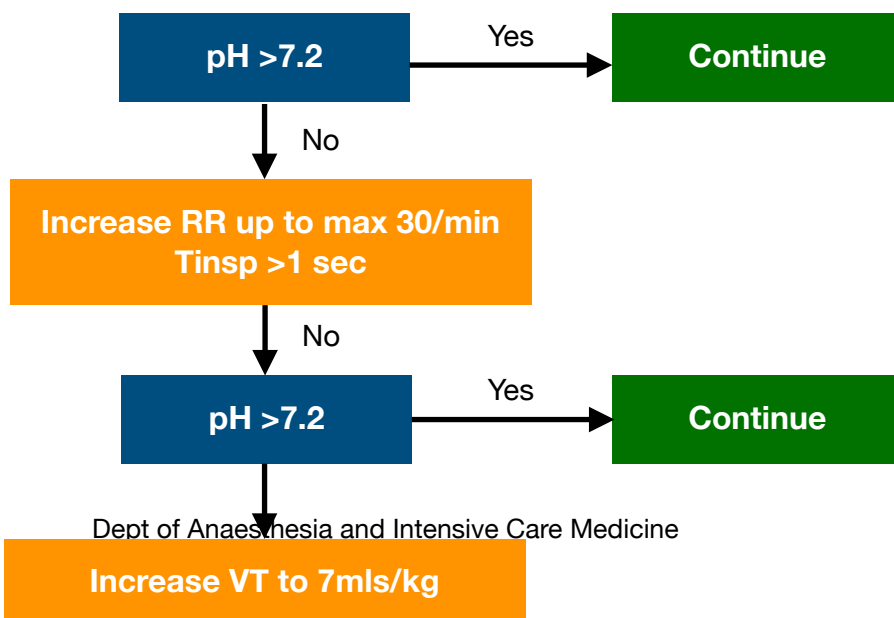
MEN		
Height		Tidal Volume (mls)
cm	Feet inches	
166	5'5"	370
168	5'6"	390
171	5'7"	400
173	5'8"	420
176	5'9"	430
178	5'10"	440
181	5'11"	460
183	6'0"	470
186	6'1"	480
188	6'2"	500
191	6'3"	510
194	6'4"	530
196	6'5"	540

$50 \text{ kg} + (0.91 \times [\text{height cm} - 152.4])$
 $50 \text{ kg} + 2.3 \times (\text{height in} - 60)$

PEEP Tables

FiO ₂	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	0.8	1
PEEP	5	8	10	12	14	14	16	16	18	20	22	22	22-24
													Consultant Decision

ADJUST RR & MINUTE VENTILATION TO pH



Worsening Hypoxia/Hypoxaemia for 5 mins
 SpO2 <88% PaO2 < 8kPa

Consider Recruitment Manoeuvre
 See page 4

Intensivist Review (when possible)

Closed Suction

Increase FiO₂ and PEEP

FiO₂	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	0.8	1
PEEP	5	8	10	12	14	14	16	16	18	20	22	22	22-24

Increase Inspiratory Time
 I:E 1:<2

Sedation
 RASS -5

Repeat ABG @ 30 mins

PF ratio <26.6

PF ratio < 20

Sedate
Consider prone position

Prone
NMBA infusion* x 48hours

ALL IMAGING REQUESTS MUST BE APPROVED BY CONSULTANT INTENSIVIST

Discuss with consultant intensivist before manoeuvre

Do not preform recruitment if:

Haemodynamically unstable
Arrhythmia
Pneumothorax
Brochopleural fistula

Bronchospasm
Intubated >10 days
Increased ICP

Adjust ventilator

FiO2 1
Reduce tidal volume 150mls
Increase pressure alarm to 55cmH20

Increase PEEP to 40cmH20 x 40 seconds

Set Peep and FiO2 as per table
Reduce alarms to baseline

Responder

Increased SpO2, PaO2
Increased compliance

Non-responder

Repeat in 4-6 hours if indicated

No further recruitment

Abort manoeuvre if: SpO2 <85% or MAP <50mmHg



Disconnection

In room

Rapid reconnection by nurse/intensivist

All non essential staff to stand as far from patient (if safe to do so)

On transfer

All non essential staff to stand as far from patient (if safe to do so)

Intensivist to reconnect as soon as possible

In CT

Intensivist to enter room

Reconnect as soon as possible

All staff to don full PPE - including FFP2 before re-entering room

High Airway Pressures

1. Check ventilator to patient for kinks/obstructions/filter saturation
2. Closed suction of ETT
3. Check tube position on CXR
4. Check for bronchospasm and treat as needed
5. Check for pneumothorax

Dyssynchrony

1. Intensivist review when feasible
2. Leak or water in circuit?
3. Closed suction of ETT
4. Adequate sedation?
5. Consider neuromuscular blockade



PREPARE	Ensure PPE correctly applied Airway and Lines staff to wear visors		Team (6) Airway - Anaesthetist/Intensivist Lines - Anaesthetic/ICU nurse Turning - 4 staff members	
	PREPARE PATIENT <ul style="list-style-type: none"> ■ Slide sheet on bed ■ Preoxygenate ■ Paralyse ■ Increase vasopressors ■ Lubricate and tape eyes, pad face ■ Remove gown & ECG dots ■ Manual aspirate of NG ■ Disconnect and cap art line, remove SpO2 probe ■ Arms against body palms in. 		PLACE PILLOWS <ul style="list-style-type: none"> ■ 1 X SHIN ■ 1-2 x HIPS (ensure genitals and catheter between legs) ■ 1-2 x CHEST 	
	PLACE SHEET OVER PATIENT <ul style="list-style-type: none"> ■ Ensure 4 corners match ■ Burrito roll edges close to patient 		CHECK CONNECTIONS <ul style="list-style-type: none"> ■ Ensure tube secured opposite side to ventilator ■ Ensure all ventilator connections secure ■ Ensure lines free 	
	REVIEW AND CONFIRM PLAN			

REVIEW AND CONFIRM PLAN

PROCEDURE	COMMAND READY - BRACE - MOVE <ul style="list-style-type: none"> ■ Move to edge of bed ■ Move 1/2 body width off bed ■ Move up so head clear of top of bed ■ Remove pillow/head-ring ■ Ensure lines and tubing free 		<ul style="list-style-type: none"> ■ Reattach monitors ■ Commence feed once stable ■ Check eyes hourly ■ Move head ring at least 2 hourly 	
	COMMAND READY - BRACE - TURN <ul style="list-style-type: none"> ■ Turn patient 90 degrees ■ Turn patient prone ■ Turn head into position (face vent on first turn, alternate daily) 		Rotate head at least every 4 hours <ul style="list-style-type: none"> ■ Contact prone team 30mins ahead of time ■ Ensure all equipment available 	
	COMMAND READY - BRACE - MOVE <ul style="list-style-type: none"> ■ Move down bed ■ Head-ring/pillow into place ■ Check head position, eyes, lines and tubes 		Turn supine after 16 hours <ul style="list-style-type: none"> ■ Stop feed 1 hour ahead of time ■ Contact prone team 30mins ahead of time 	

FOLLOW DOFFING PROTOCOL ON EXIT

PREPARE

Ensure PPE correctly applied

Airway and Lines staff to wear visors

Team (6)

- (1) Airway - Anaesthetist/Intensivist
- (2) Lines - Anaesthetic/ICU nurse
- (3-6) Turning - 4 staff members

PREPARE PATIENT

- Preoxygenate
- Paralyse
- Increase vasopressors

CHECK CONNECTIONS

- Ensure all ventilator connections secure
- Ensure lines free

REVIEW AND CONFIRM PLAN

PROCEDURE

COMMAND READY - BRACE - LIFT

- Lift shoulders off bed
- Remove pillow/headring
- Ensure lines and tubing free

COMMAND READY - BRACE - TURN

- Turn head into position (1)
- Ensure lines free

COMMAND READY - BRACE - REST

- Lower shoulders to pillow
- Head-ring/pillow into place
- Check head position, eyes, lines and tubes

- ABG 4 hourly

- Check eyes hourly

Move head ring at least 2 hourly

Rotate head at least every 4 hours

- Contact prone team 30mins ahead of time
- Ensure all equipment available

Turn supine after 16 hours

- Stop feed 1 hour ahead of time
- Contact prone team 30mins ahead of time

FOLLOW DOFFING PROTOCOL ON EXIT

PREPARE

Ensure PPE correctly applied

Airway and Lines staff to wear visors

Team (6)
Airway - Anaesthetist/Intensivist
Lines - Anaesthetic/ICU nurse
Turning - 4 staff members

PREPARE PATIENT

- Slide sheet on bed
- Preoxygenate
- Paralyse
- Increase vasopressors
- Remove gown & ECG dots
- Manual aspirate of NG
- Disconnect and cap art line, remove SpO2 probe
- Arms against body palms in.

PLACE SHEET OVER PATIENT

- Ensure 4 corners match
- Burrito roll edges close to patient

CHECK CONNECTIONS

- Ensure tube secured opposite side to ventilator
- Ensure all ventilator connections secure
- Ensure lines free

REVIEW AND CONFIRM PLAN

PROCEDURE

COMMAND READY - BRACE - MOVE

- Move to edge of bed
- Move 1/2 body width off bed
- Move up so head clear of top of bed
- Remove pillow/headring
- Ensure lines and tubing free

COMMAND READY - BRACE - TURN

- Turn patient 90 degrees
- Turn patient supine

COMMAND READY - BRACE - MOVE

- Move down bed
- Head-ring/pillow into place
- Un-tape eyes
- Check lines and tubes

- Reattach monitors
- Commence feed once stable

Prepare to prone after 8 hours

- Stop feed 1 hour ahead of time
- Contact prone team 30mins ahead of time
- Ensure all equipment available

FOLLOW DOFFING PROTOCOL ON EXIT

SUPINATION

Initial phase - deep sedation - Target RASS < -4

Propofol 100mg/hr
Morphine 5mg/hr

**Haemodynamically Stable
Improving Oxygenation**

RASS -2 - -3

Haemodynamically Unstable

add/substitute
Midazolam 5mg/hr

Daily Sedation Break

Anticipate Delirium

Quetiapine 25mg BD
Dexmedetomidine 0.2-1.4 mcg/kg/hr

Richmond Agitation and Sedation Scale (RASS)		
+4	Combative	violent, immediate danger to staff
+3	Very Agitated	Pulls or removes tube(s) or catheter(s); aggressive
+2	Agitated	Frequent non-purposeful movement, fights ventilator
+1	Restless	Anxious, apprehensive but movements not aggressive or vigorous
0	Alert & calm	
-1	Drowsy	Not fully alert, but has sustained awakening to voice (eye opening & contact ≥ 10 sec)
-2	Light sedation	Briefly awakens to voice (eye opening & contact < 10 sec)
-3	Moderate sedation	Movement or eye-opening to voice (but no eye contact)
-4	Deep sedation	No response to voice, but movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

Target MAP >65mmHg

Noradrenaline

If noradrenaline >25mcg/min then consider adding a second agent to achieve MAP

- Vasopressin
- Adrenaline

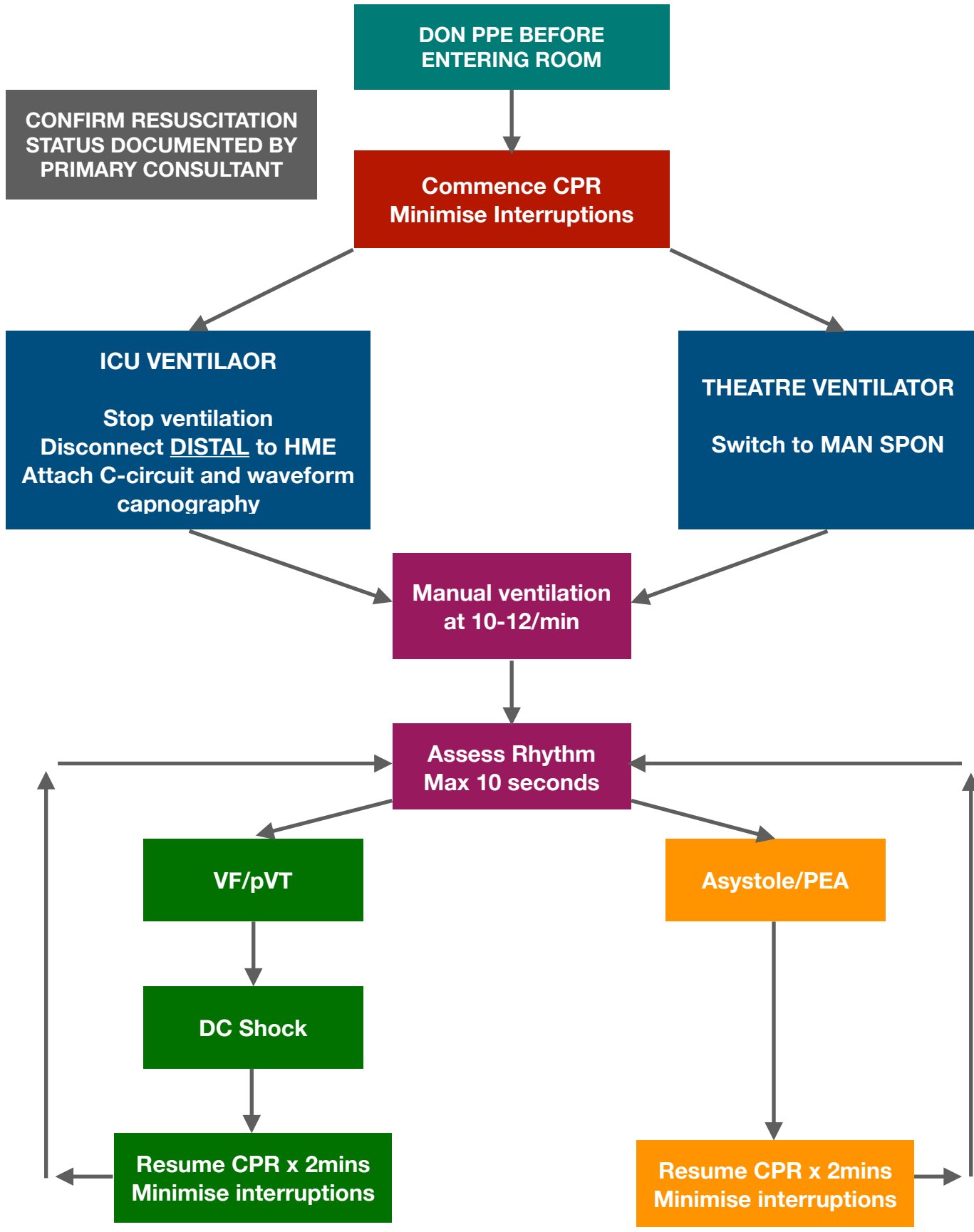
Fluids

Do not routinely prescribe maintenance fluids if tolerating NG feeds.

Aim for neutral or negative fluid balance every 24 hours - depending on renal function, measurement of perfusion and insensible losses.

Diuretics as required





Ensure high quality CPR with minimal interruptions
 Adrenaline 1mg every 3-5mins
 Amiodarone 300mg after 3rd shock
 Consider adrenaline infusion

Hypoxia	Thrombosis
Hypovolaemia	Tension PTX
Hypo/ Hyperkalaemia	Tamponade
Hypotermia	Toxins



Inside the room

1. Senior anaesthetist/intensivist
2. Physician for iv access and airway assistance (may be anaesthetics or other)
3. ICU Nurse to administer medications and energy
4. Staff nurse to do CPR (1)
5. Staff nurse to do CPR (2) – First responder(s)

In anteroom

1. Staff nurse in PPE
- They should:
- provide support if someone has to leave the room
 - be ready to get whatever the team inside needs
 - facilitate communication
 - observe for breaches in protection
 - relieve personnel inside the room to minimise risk of safety breaches when fatigued

Outside the room

1. RUNNER (staff nurse) to assist with supply/ equipment

Donning should be carried out quickly but meticulously

- If multiple individuals arrive at the same time, **priority for donning and entering the room should be given to senior anaesthetist and ICU nurse**
 - Members of the team initially staying outside the room (e.g., back-up staff nurse and runner), should **help with donning (e.g. tie gowns) and assessing for breaches**
1. Put personal items (stethoscope, jewellery, clipboard, watch, pagers) in specific bag available in COVID-19 tool bag
 2. Don PPE as per guidelines for aerosolized procedures
 3. Have member of the code blue team special to assess for breaches prior to entering room

INSIDE THE ROOM / DURING THE CODE

- First responder continues to provide CPR
- First two to enter the room: senior anaesthetist and the ICU nurse with arrest cart (unless already inside the room), unless others already present and properly protected
- ICU nurse immediately connects patient to defibrillator for rhythm analysis if not done already
- Defibrillate if indicated
- No equipment can leave the room until the end of the arrest and without appropriate handling

BEFORE LEAVING THE ROOM

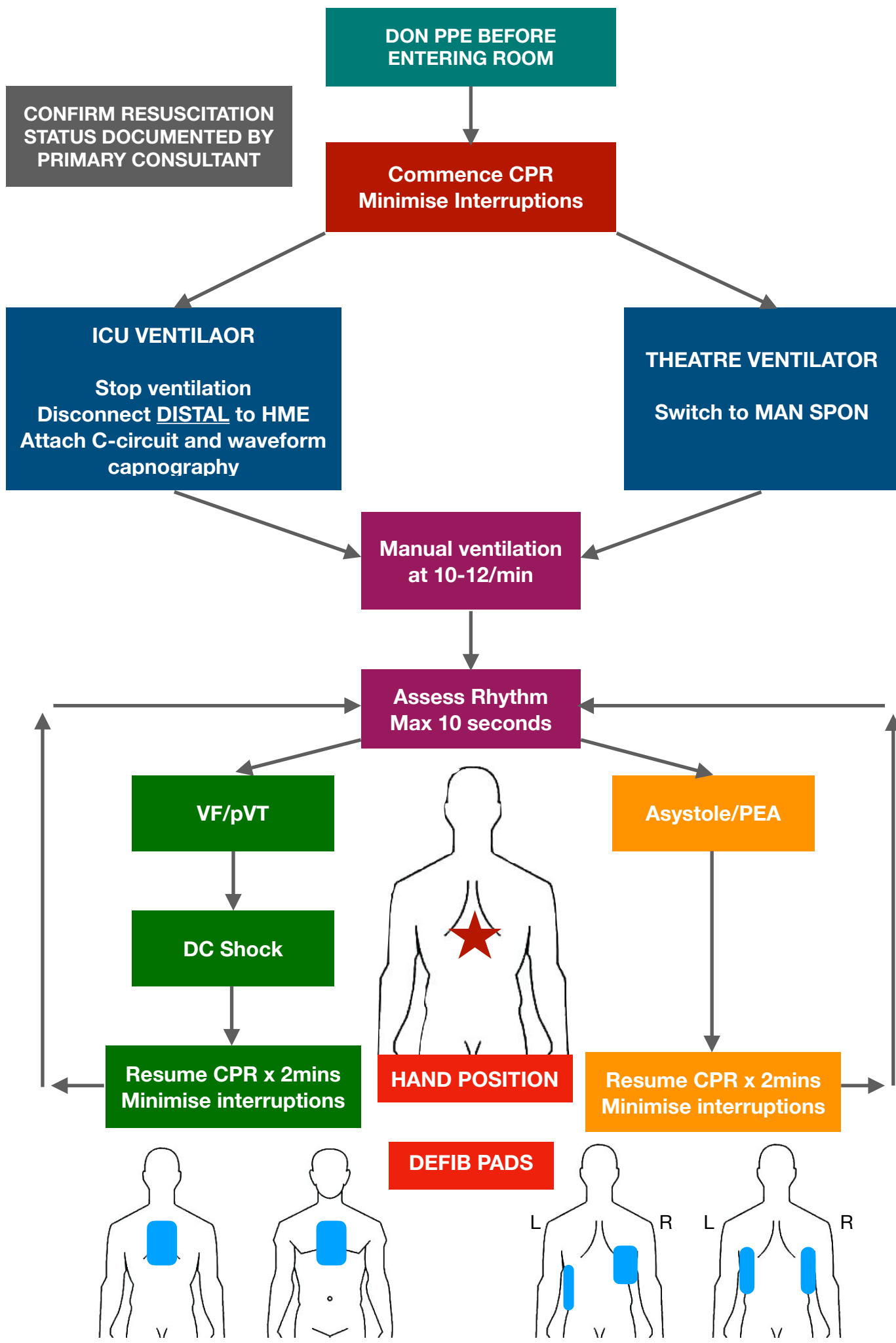
- **Plan transport** if needed. Team members who will be in contact with the patient during transport must then put on new, clean PPEs prior to transport.
- All **non-disposable equipment must be wiped, placed into a clear biohazard bag** in the room and tied
- **Disposable equipment must be discarded**
- **Put arrest record** into sleeve sheet and wipe it

DOFFING

- **DO NOT RUSH - Use doffing guidelines**
- **Anyone who is unwell, has had equipment failure, or likely self-contaminated is the first to doff and exit**



MODIFIED ACLS - PRONE



Inside the room

1. Senior anaesthetist/intensivist
2. Physician for iv access and airway assistance (may be anaesthetics or other)
3. ICU Nurse to administer medications and energy
4. Staff nurse to do CPR (1)
5. Staff nurse to do CPR (2) – First responder(s)

In anteroom

1. Staff nurse in PPE
- They should:
- provide support if someone has to leave the room
 - be ready to get whatever the team inside needs
 - facilitate communication
 - observe for breaches in protection
 - relieve personnel inside the room to minimise risk of safety breaches when fatigued

Outside the room

1. RUNNER (staff nurse) to assist with supply/ equipment

Donning should be carried out quickly but meticulously

- If multiple individuals arrive at the same time, **priority for donning and entering the room should be given to senior anaesthetist and ICU nurse**
 - Members of the team initially staying outside the room (e.g., back-up staff nurse and runner), should **help with donning (e.g. tie gowns) and assessing for breaches**
1. Put personal items (stethoscope, jewellery, clipboard, watch, pagers) in specific bag available in COVID-19 tool bag
 2. Don PPE as per guidelines for aerosolized procedures
 3. Have member of the code blue team special to assess for breaches prior to entering room

INSIDE THE ROOM / DURING THE CODE

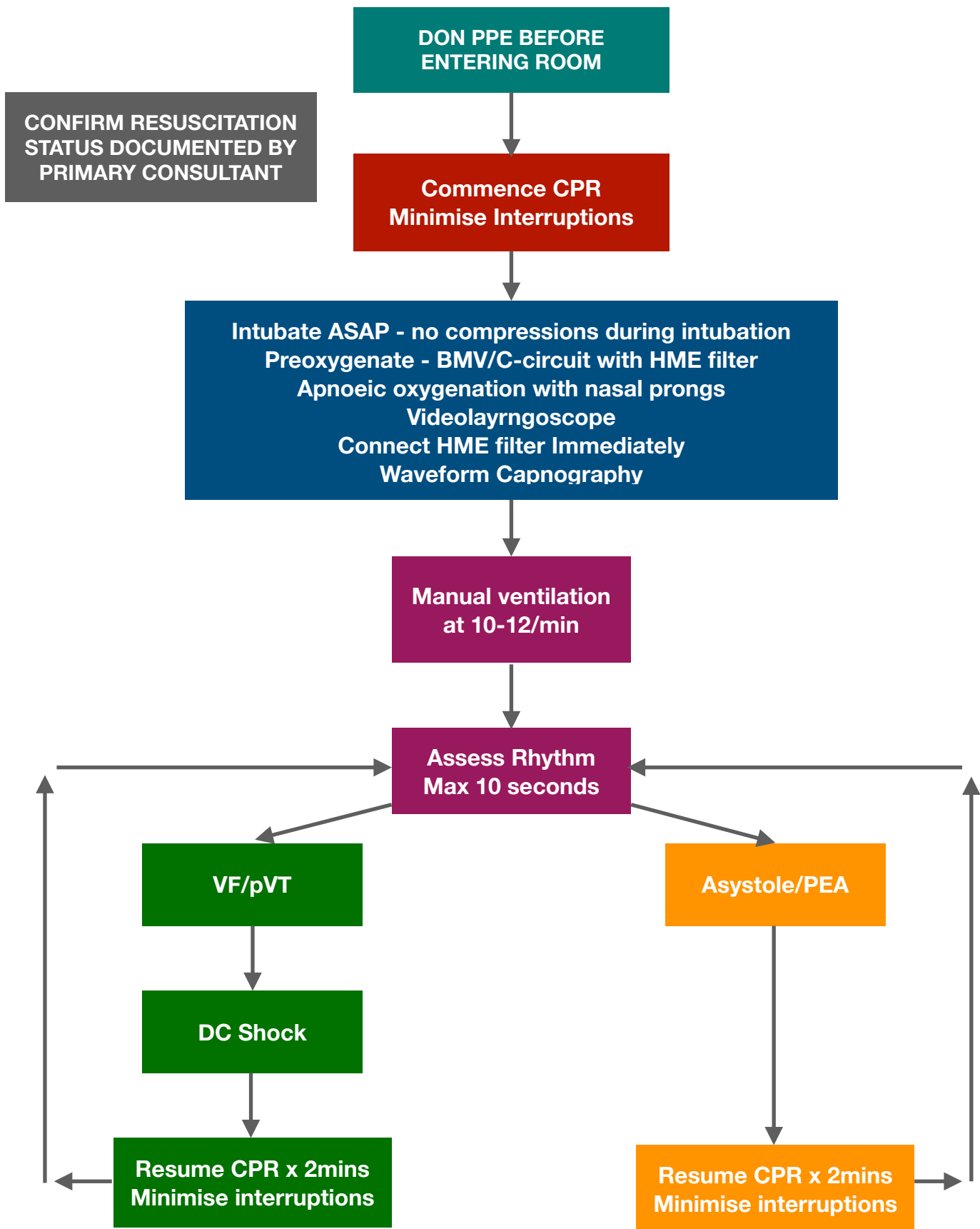
- First responder continues to provide CPR
- First two to enter the room: senior anaesthetist and the ICU nurse with arrest cart (unless already inside the room), unless others already present and properly protected
- ICU nurse immediately connects patient to defibrillator for rhythm analysis if not done already
- Defibrillate if indicated
- No equipment can leave the room until the end of the arrest and without appropriate handling

BEFORE LEAVING THE ROOM

- **Plan transport** if needed. Team members who will be in contact with the patient during transport must then put on new, clean PPEs prior to transport.
- All **non-disposable equipment must be wiped, placed into a clear biohazard bag** in the room and tied
- **Disposable equipment must be discarded**
- **Put arrest record** into sleeve sheet and wipe it

DOFFING

- **DO NOT RUSH - Use doffing guidelines**
- **Anyone who is unwell, has had equipment failure, or likely self-contaminated is the first to doff and exit**



Ensure high quality CPR with minimal interruptions
 Adrenaline 1mg every 3-5mins
 Amiodarone 300mg after 3rd shock
 Consider adrenaline infusion

Hypoxia	Thrombosis
Hypovolaemia	Tension PTX
Hypo/ Hyperkalaemia	Tamponade
Hypotermia	Toxins



Inside the room

- 1.Senior anaesthetist/intensivist
- 2.Physician for iv access and airway assistance (may be anaesthetics or other)
- 3.ICU Nurse to administer medications and energy
- 4.Staff nurse to do CPR (1)
- 5.Staff nurse to do CPR (2) – First responder(s)

In anteroom

1. Staff nurse in PPE
- They should:
- provide support if someone has to leave the room
 - be ready to get whatever the team inside needs
 - facilitate communication
 - observe for breaches in protection
 - relieve personnel inside the room to minimise risk of safety breaches when fatigued

Outside the room

1. RUNNER (staff nurse) to assist with supply/ equipment

Donning should be carried out quickly but meticulously

- If multiple individuals arrive at the same time, **priority for donning and entering the room should be given to senior anaesthetist and ICU nurse**
 - Members of the team initially staying outside the room (e.g., back-up staff nurse and runner), should **help with donning (e.g. tie gowns) and assessing for breaches**
1. Put personal items (stethoscope, jewellery, clipboard, watch, pagers) in specific bag available in COVID-19 tool bag
 2. Don PPE as per guidelines for aerosolized procedures
 3. Have member of the code blue team special to assess for breaches prior to entering room

INSIDE THE ROOM / DURING THE CODE

- First responder continues to provide CPR
- First two to enter the room: senior anaesthetist and the ICU nurse with arrest cart (unless already inside the room), unless others already present and properly protected
- ICU nurse immediately connects patient to defibrillator for rhythm analysis if not done already
- Defibrillate if indicated
- No equipment can leave the room until the end of the arrest and without appropriate handling

BEFORE LEAVING THE ROOM

- **Plan transport** if needed. Team members who will be in contact with the patient during transport must then put on new, clean PPEs prior to transport.
- All **non-disposable equipment must be wiped, placed into a clear biohazard bag** in the room and tied
- **Disposable equipment must be discarded**
- **Put arrest record** into sleeve sheet and wipe it

DOFFING

- DO NOT RUSH - Use doffing guidelines**
- Anyone who is** unwell, has had equipment failure, or likely self-contaminated is the first to doff and exit





PREPARE

Nasal Cannula at 6L/min with covering surgical mask
Consider non-rebreather with covering surgical mask
DO NOT USE HFNO OR NIV

EQUIPMENT

- Monitor from ICU
- Full O2 cylinder
- Wrap O2 cylinder in plastic bag and place on bed
- Wipe down external areas of patient's bed with 70% alcohol wipe - staff doing this should wear PPE
- Patient notes

PATIENT

- Confirm working iv access
- Attach monitor and explain process
- Cover patient with fresh sheet

PERSONNEL

- 2 staff to push bed
- 2 staff to open doors
- 1 spills officer
- 1 staff to clear route

ALL STAFF WEARING PPE

ALLOCATE AND REVIEW ROLES FOR TRANSPORT TEAM

IF ANY CONCERNS DURING TRANSFER CONTACT ICU CONSULTANT/REGISTRAR

Plan route with transport team

**CONFIRM THAT ICU ARE READY TO RECEIVE PATIENT
DO NOT LEAVE WARD UNTIL THIS IS CONFIRMED**

Designated staff must clear pathway for transport team

Keep all doors open along route
Spills officer close doors once no longer needed

In ICU all staff receiving patient wear full PPE
If transferring to isolation room close door once patient inside
Transfer directly onto ICU bed

Remove ward bed from room - immediate cleaning by cleaner wearing appropriate PPE

Porters change gown and gloves before cleaning O2 cylinder
Leave face mask on until equipment clean

Handover by ward nurse to critical care nurse

Careful doffing of PPE once out of room

PREPARE

EQUIPMENT

DO NOT ROUTINELY USE TRANSPORT VENTILATOR

- Monitoring incl EtCO2
- Infusion pumps fully charged
- Ambu-bag + filter
- Emergency Transport Bag*
- Full O2 and Air cylinder on transport trolley
- Check ventilator battery life - ensure fully charged
- Wedges for doors

*wrap in plastic before placing on bed

DRUGS

- Spare infusions
- Emergency drugs

PATIENT

- ID Band attached
- Stable for transfer?
- ETT Secure
- IV Access point identified
- Consent (if applicable)

PERSONNEL

- Intensivist
- Bedside Nurse
- Porter x 2

STAFF TO WEAR PPE 'CLEAN' RUNNER

EMERGENCY CONTACTS

HDU	4810
ICU	2769 2494
RICU	2418 2420
REC	8613

Confirm destination, route and anticipated duration

Transfer infusion pumps to bed pole

Transfer monitor block to portable screen

Consider neuromuscular blockade

PRE-DEPARTURE CHECK

- | | |
|--|--|
| <input type="checkbox"/> Patient stable | <input type="checkbox"/> Plan agreed |
| <input type="checkbox"/> ETT secure | <input type="checkbox"/> Route Cleared |
| <input type="checkbox"/> All ETT and ventilator connection points secure | <input type="checkbox"/> Ventilator unplugged and fully charged |
| <input type="checkbox"/> IV Access | <input type="checkbox"/> Consultant Intensivist and CNM informed |
| <input type="checkbox"/> Equipment checked | |

DO NOT LEAVE UNTIL RECEIVING LOCATION AVAILABLE

Runner to hold open all doors with wedges

Proceed directly to destination

If transfer to CT scanner keep patient's bed in room.

Repeat sequence for transfer back to critical care (if applicable)

Guidelines on feeding rate aims for adults not at refeeding syndrome risk, when enteral or parenteral feeding is commenced out-of-hours

ICU Enteral Nutrition (EN):

- Standard ICU feed: Nutrison Protein Plus
- For obese: Nutrison Protein Intense
- AKI/CKD/ESKD: If CVVH: Protein Plus
If no CVVH: Concentrated or Nepro HP (lowest K+ feed)

Suggested EN rate aims for ICU patients not at refeeding risk:

Start at 20ml/hr and increase as below:

Feed	Rate aim for men ml/hr				Rate aim for women ml/hr			
	Day 1	Day 2	Day 3	Day 4	Day 1	Day 2	Day 3	Day 4
Nutrison Protein Plus	20 x 12h 30 x 12h	35	45	55	20 x 12h 30 x 12h	35	40	50
Nutrison Protein	20 x 12h 30 x 12h	35	40	50	20 x 12h 30 x 12h	35	40	50
Concentrated	20 x 24h	25	30	35	20 x 24h	25	25	30
Nepro HP	20 x 24h	30	35	40	20 x 24h	25	30	35

Days 1-3: Provides ≤ 20 kcal/kg for men of ≥ 70 kg and women of ≥ 60 kg.
Day 4 gives approx. 25kcal/kg in 70kg man or 60kg woman.

ICU Parenteral Nutrition (PN):

- Standard ICU PN: Regimen G
- AKI/CKD/ESKD: If CVVH: Regimen G
If no CVVH: Regimen D

Give Cernevit IV for first 3 days.

Suggested PN rates for ICU patients not at refeeding risk:

Feed	Rate aim for normal or overweight men and women who are not at refeeding risk				Characteristics
	Day 1	Day 2	Day 3	Day 4	
Regimen G	45ml/hr	55ml/hr	65ml/hr	75 ml/hr	Lower glucose, higher nitrogen, lower fat
Regimen D	30ml/hr	35 ml/hr	40ml/hr	45ml/hr	Low electrolyte (Na, K ⁺ , PO ₄), low volume

Day 1 provides approximately 950kcal; Day 2 provides approximately 1150kcal.
Day 3 provides approximately 1350kcal; Day 4 provides approximately 1550kcal.

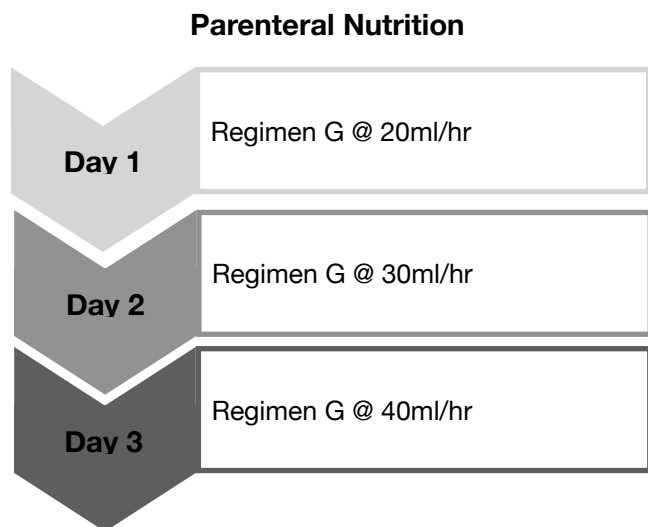
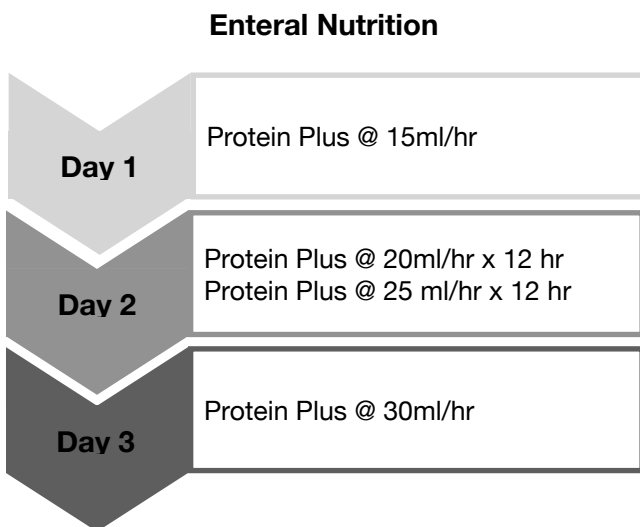
Undernourished patients are at risk of refeeding syndrome. Giving patients at risk of refeeding syndrome too much too soon can lead to:

- Hypophosphataemia
- Hypokalaemia
- Hypomagnesaemia
- Fluid balance abnormalities
- Altered Glucose Metabolism
- Vitamin Deficiency

Principles of management:

- **Start on low rate feeding and build up *gradually* (see below).**
- **Commence Pabrinex® 1&2 one pair daily IV for 3 days.**
- **Commence Berocca Performance once daily enterally, or Cernevit once daily IV if PN.**

Patients at risk of refeeding syndrome ((NICE guidelines 2006 and Friedli et al. 2018):		
Major risk factors	Minor risk factors	Very high risk factors
BMI <16 kg/m ²	BMI <18.5 kg/m ²	BMI <14kg/m ²
Unintentional weight loss >15% in 3–6 months	Unintentional weight loss >10% in 3–6 months	Unintentional weight loss >20% in 3–6 months
Little/no nutritional intake for >10 days	Little/no nutritional intake for >5 days	Little/no nutritional intake for >15 days
Low levels of K ⁺ , PO ₄ , or Mg prior to feeding	History of alcohol abuse, or drugs including chemotherapy	
Specific patient populations at high risk		
Hunger strike, severe dieting, history of bariatric surgery, short bowel syndrome, tumour patients, frail elderly patients with chronic debilitating disease		
High risk = 1 major or 2 minor risk factors Low risk = 1 minor risk factor		
Risk category	Nutrition aim	
High refeeding risk	Start at 10-15kcal/kg/24hr.	
Low refeeding risk	Start at 15-20kcal/kg/24hr.	
Very high refeeding risk e.g. anorexia nervosa	Start at 5-10kcal/kg/24hr.	



If hyperkalemia substitute Regimen D.
D1 20ml/hr, D2 25ml/hr, D3, 30ml/hr

For very high risk patients - halve the rates above



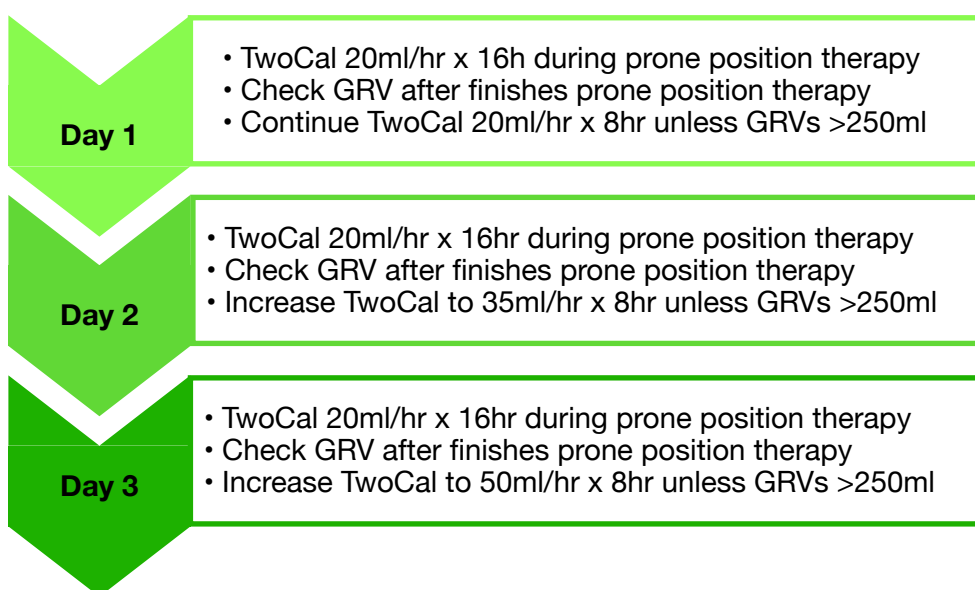
RCSI



Aims

- Commence early enteral feeding: start within 24-48h once haemodynamically stable (ESPEN 2009, ASPEN 2016, Canadian Practice Guidelines 2015).
- For medical patients with single organ failure – recommend avoid checking gastric aspirates/residual volumes (GRVs) to lessen the risk of aerosol spread (ASPEN 2016).
- Continue to check GRVs for surgical patients, MOF patients, patients who have vomited in last 24h and intestinal failure patients.
- Consider prokinetic use on a case-by-case basis if intolerance is demonstrated or expected. Prone Positioning:

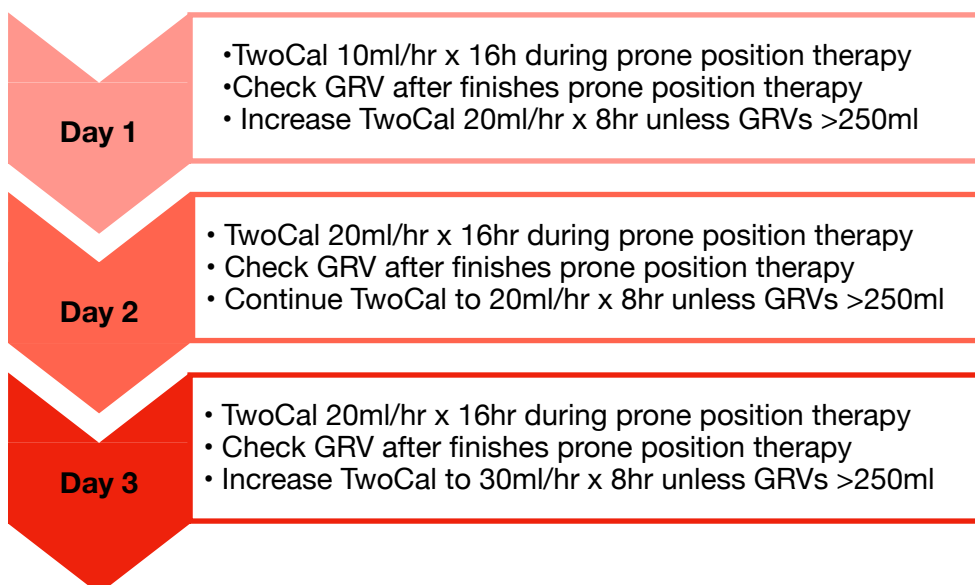
If no risk of refeeding syndrome



Note:

- Can also substitute Nutrison Concentrated for TwoCal in Figure 1.
- Day 1 gives 960kcal & 40g protein; Day 2 gives 1200kcal & 50g protein; Day 3 gives 1440kcal & 60g protein.
- Concurrent propofol infusion will give extra kcal and fat. Monitor triglyceride level.

If at **HIGH RISK** of refeeding syndrome



Note:

- Day 1 gives 640kcal & 26g protein; Day 2 gives 960kcal & 40g protein; Day 3 gives 1120kcal & 47g protein.
- Give IV Pabrinex I and II od x 3/7, and NG multivitamin od per Hospital Refeeding Syndrome Guideline.

Caring for critically ill patients can be a stressful experience for staff, particularly in new or unfamiliar environments. We have compiled some practical tips and resources to help you, and your colleagues, look after your mental and physical wellbeing during the weeks ahead.

Keep a routine - make sure you eat healthily and stay hydrated. Take your breaks. Try to exercise and get sufficient rest in between shifts.

Stay in touch with friends and family.

Check out www.gov.ie for factual updates, avoid continuously checking news sites or social media as the flow of information may be overwhelming.

Employee Assistance Counselling Service

The Employee Assistance Counselling Service is provided by the HSE to support employees at a time of difficulty in their personal or professional lives.

The service can be accessed confidentially without having to go through HR or occupational health. Between 4 and 6 sessions are provided free of charge.

The service uses trained counsellors based in numerous locations nationwide to ensure it is convenient for staff members.

Contact details and more information available on hse.ie or via QR code



YourMentalHealth.ie

Developed by the HSE yourmentalhealth.ie contains a wealth of information on all things mental health.

Resources include information on mental health conditions and how to support a friend or family member who is struggling with their mental health.

Practitioner Health Matters

The practitioner health matters programme provides support to doctors, pharmacists and dentists who are struggling with stress, anxiety, burnout or other mental health issues such as substance misuse and addiction.

The service is designed specifically to deal with healthcare providers and so is familiar with the common issues they face, and how to support them through these issues.

The service is fully confidential and free at the point of access for staff.

(01) 297-0356 confidential@practitionerhealth.ie <https://practitionerhealth.ie/>