EMERGENCY CARE ALGORITHMS

These select algorithms have NOT all been specifically tailored to the Coronavirus (COVID-19) patients but to similar clinical presentations. Clinical judgement and adherence to World Health Organization (WHO) & local COVID-19 guidelines is recommended.

Full Personal Protective Equipment (PPEs) MUST be worn at ALL times by ANY staff managing any Coronavirus (COVID-19) patient. Details on our webpage.

www.emergencymedicinekenya.org/COVID19

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#FOAMed Blog: www.emergencymedicinekenya.org/foamed

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Coronavirus (COVID-19) Emergency Department Equipment Checklist

This clinical pathway is intended to supplement, rather than substitute for, professional judgment and may be changed depending upon a patient’s individual needs. Failure to comply with this pathway does not represent a breach of the standard of care.

Sample emergency department set-up for COVID 19

- Personal Protective Equipment (PPEs) for all staff
- Cardiac Monitor with Blood Pressure (BP), Pulse Rate (PR), Oxygen Saturation (SPO₂)
- Oxygen
- Nasal cannulae, simple facemask, non-rebreather mask
- Ventilator with appropriate tubing
- COVID-19 Intubation tray/trolley
  - Completely assembled BVM with viral filter and oxygen tubing
  - Macintosh direct laryngoscope with different blade sizes
  - Bougie
  - 10ml syringe
  - Tube tie
  - Sachet lubricant
  - Endotracheal tubes (appropriate size range for different patients)
  - Second generation supraglottic airway (appropriate size range for different patients)
  - Oropharyngeal airway and nasopharyngeal airway (appropriate size range for different patients)
  - Scalpel and bougie CRICO kit
  - Large bore nasogastric tube (appropriate size range for different patients)
    - Continuous waveform end-tidal CO₂ (ETCO₂) cuvette or tubing
    - Viral filter
    - Suction and in-line suction catheter
    - Cuff manometer
    - Intubation drugs - Ketamine, Rocuronium (or Succinylcholine)
- Infusion pumps/Syringe Drivers
- Resuscitation trolley
Guidelines on the use of Personal Protective Equipment (PPEs)

Donning PPE

1. Remove all personal items (jewellery, watches, cell phones, pens, etc.)
2. By visual inspection, ensure that all sizes of the PPE set are correct and the quality is appropriate
3. Undertake the procedure of putting on PPEs under the guidance and supervision of a trained observer/colleague (optional)

4. Perform hand hygiene using an alcohol-based hand sanitizer for 20 seconds
5. Put on a surgical cap (optional)
6. Put on a reinforced surgical gown

7. Put on a surgical mask or N95 mask if performing an aerosol generating procedure (Nasopharyngeal Swabbing, Nebulization, Resuscitation, Intubation/Extubation, Suctioning)
8. Place face shield

9. Put on a clean pair of gloves over the cuff of the gown

10. Have the trained observer (colleague) verify complete PPE.

11. Enter COVID-19 Ward/Area
Guidelines on the use of Personal Protective Equipment (PPEs)

**Doffing PPE**

1. Undertake the procedure of removing PPEs under the guidance and supervision of a trained observer/colleague (optional)

2. Remove gloves and perform hand hygiene using an alcohol based hand sanitizer for 20 seconds

3. Remove Gown

4. Perform hand hygiene using an alcohol based hand sanitizer for 20 seconds

5. Remove face shield

6. Remove the surgical mask/N95 mask

7. Remove surgical cap, if it was donned.

8. Perform hand hygiene using an alcohol based hand sanitizer for 20 seconds and exit the doffing area
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Risk for aerosolized virus</th>
<th>PPE recommendation</th>
<th>Additional comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubation</td>
<td>High</td>
<td>Full PPE + N95</td>
<td></td>
</tr>
<tr>
<td>Nebuliser therapy</td>
<td>High</td>
<td>Full PPE + N95</td>
<td></td>
</tr>
<tr>
<td>High-flow oxygen therapy</td>
<td>High</td>
<td>Full PPE + N95</td>
<td>Advise against in most cases</td>
</tr>
<tr>
<td>Non-invasive ventilation (CPAP or BiPAP)</td>
<td>High</td>
<td>Full PPE + N95</td>
<td>Advise against in most cases</td>
</tr>
<tr>
<td>Bag-mask ventilation</td>
<td>High</td>
<td>Full PPE + N95</td>
<td>Advise against in most cases</td>
</tr>
<tr>
<td>Care of intubated patient (suctioning, etc)</td>
<td>High</td>
<td>Full PPE + N95</td>
<td></td>
</tr>
<tr>
<td>Ventolin via puffer and spacer</td>
<td>Unclear</td>
<td>Full PPE + Face Mask</td>
<td>May be high risk – need clarification / advice</td>
</tr>
<tr>
<td>Nitrous oxide administration for procedural sedation</td>
<td>Unclear</td>
<td>Full PPE + Face Mask</td>
<td>May be high risk – need clarification / advice</td>
</tr>
<tr>
<td>Nasogastric tube insertion</td>
<td>Unclear</td>
<td>Full PPE + Face Mask</td>
<td></td>
</tr>
<tr>
<td>Intranasal medication administration (eg fentanyl) - can induce sneezing</td>
<td>Unclear / Low</td>
<td>Full PPE + Face Mask</td>
<td></td>
</tr>
<tr>
<td>Throat examination</td>
<td>High</td>
<td>Full PPE + Face Mask</td>
<td>Advise against in most cases – unlikely to change management</td>
</tr>
<tr>
<td>Removal of nasal foreign body – can induce sneezing / coughing</td>
<td>High</td>
<td>Full PPE + N95</td>
<td>Consider referral to ENT for removal under GA</td>
</tr>
<tr>
<td>Procedural sedation for non-ENT procedure (eg fracture reduction)</td>
<td>Unclear / Low</td>
<td>Full PPE + Face Mask</td>
<td></td>
</tr>
<tr>
<td>IV access</td>
<td>Unclear / Low</td>
<td>Full PPE + Face Mask</td>
<td></td>
</tr>
<tr>
<td>Capillary blood gas</td>
<td>Unclear / Low</td>
<td>Full PPE + Face Mask</td>
<td></td>
</tr>
<tr>
<td>IV insertion</td>
<td>Unclear / Low</td>
<td>Full PPE + Face Mask</td>
<td></td>
</tr>
<tr>
<td>Urine collection</td>
<td>Unclear / Low</td>
<td>Full PPE + Face Mask</td>
<td></td>
</tr>
</tbody>
</table>

Full PPE - HAND HYGIENE > GOWN > MASK > EYE-PROTECTION > HAT > HAND HYGIENE > GLOVES
# Investigation and Management of ARI due to COVID-19 at a Health Facility

This guideline has been developed to aid healthcare workers in the evaluation and management of patients with acute respiratory infections (ARI) due to unknown or known respiratory pathogens that have the potential for large-scale epidemics at a health facility. Please refer to the current MoH case definitions* for COVID-19 for what is deemed to be a suspected, probable and confirmed case of COVID-19.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Identify if the person has acute respiratory infection (ARI) e.g. cough/shortness of breath/difficulty in breathing or fever/history of fever through screening at Triage/PoE</td>
</tr>
<tr>
<td>2.</td>
<td>Does the patient meet the current Kenya MoH case definition for a suspected or probable case of COVID-19</td>
</tr>
<tr>
<td>3.</td>
<td>Implement the following actions: - Observe standard precautions* - Place facemask on the patient - Isolate the patient in a private room or a separate area - Wear appropriate personal protective equipment (PPE) – Observe contact and droplet precautions***</td>
</tr>
<tr>
<td>4.</td>
<td>Inform the county/sub-county disease surveillance coordinator or call the Emergency Operations Centre (EOC) on 719</td>
</tr>
<tr>
<td>5.</td>
<td>Is the facility trained and equipped to collect the required specimen for laboratory testing?</td>
</tr>
<tr>
<td>6.</td>
<td>Implement the following actions: - Collect the required sample as per MoH guidance while observing standard precautions - Observe standard proper specimen storage and packaging as per the MoH guidance - Label and ship the specimen to the National Influenza Centre (NIC) as per the MoH guidance - Observe appropriate procedures/consultation for management and treatment of the patient as per the MoH guidance</td>
</tr>
</tbody>
</table>

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**Case definitions for surveillance of COVID-19** (use current definitions as may change)

1. **Suspected case:** Any person with any acute respiratory illness (fever or cough or difficulty in breathing) AND at least one of the following:
   - Close contact* with a confirmed or probable case of COVID-19 in the 14 days prior to symptom onset, **OR**
   - Close contact* with an individual with a history of respiratory illness and travel to China within the last 30 days, **OR**
   - Worked or attended a health care facility in the 14 days prior to onset of symptoms where patients with hospital-associated COVID-19 have been reported

2. **Probable case:** A suspected case for whom testing for COVID-19 is inconclusive** or for whom testing was positive on a pan-coronavirus assay.

3. **Confirmed case:** A person with laboratory confirmation of COVID-19 infection, irrespective of clinical sign and symptoms

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**Standard precautions:** Hand hygiene, use personal protective equipment if possible exposure to body fluids, face protection (eye protection/mask) if any risk of splash to eyes, nose or mouth, gloves if risk to contamination to hands, gown if risk of splash to clothing.

**Contact and Droplet Precautions:** Standard precautions + surgical mask; eye protection if HCW is within 2 metres of patient; patient wears surgical mask if tolerated; separate room or 2 meters distance.

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*The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration.*
Adult COVID-19 Treatment Algorithm

This clinical pathway is intended to supplement, rather than substitute for, professional judgment and may be changed depending upon a patient’s individual needs. Failure to comply with this pathway does not represent a breach of the standard of care.

COVID-19 PCR Positive (or Suspected)
- Ensure appropriate PPEs
- Monitor, support ABCs
- Check vital signs (BP, PR, RR, SPO₂, T°C, RBS)
- SPO₂ < 94% on Room Air
- Start Oxygen. Maintain SPO₂ ≥ 94%
- Establish IV Access and send samples for FBC, UEC, LFTs, Serum lactate, HIV, D-Dimers, (MPS)
- Perform brief, targeted history, physical exam
- Give antipyretic if indicated (Paracetamol 1gm IV)
- Do a CXR and ECG
- Consider additional diagnosis e.g. Community Acquired Pneumonia (CAP), Atypical Pneumonia, Sepsis, Septic Shock, Tuberculosis, Pneumocystis Jiroveci Pneumonia (PJP), Acute Chest Syndrome (ACS), Heart Failure, Pulmonary Embolism
- Admit to an appropriate isolation unit

COVID-19 PCR Negative
- Start Dexamethasone 6mg IV/PO once daily x 10 Days
- Provide standard care as appropriate
- Consider additional diagnosis e.g. Community Acquired Pneumonia (CAP), Atypical Pneumonia, Sepsis, Septic Shock, Tuberculosis, Pneumocystis Jiroveci Pneumonia (PJP), Acute Chest Syndrome (ACS), Heart Failure, Pulmonary Embolism
- Admit to an appropriate isolation unit

Anticoagulation in COVID-19

Low Risk
- No VTE or other indication for anticoagulation
- D-dimer < 2,000 ng/mL
- Milder disease severity
- Acceptable bleeding risk with no bleeding or profound thrombocytopenia (platelets below 25×) or severe coagulopathy
- CrCl ≥ 30mL/min

Intermediate Risk**
- Very high D-dimer ≥ 2,000 ng/mL (≥ 8x ULN of BMC assay)
- Moderate to severe disease severity (i.e. PaO₂/FIO₂ ≤300, SIC score ≥4, or higher SOFA score)
- Risk of bleeding deemed too acceptable for more intensive prophylactic anticoagulation
- Thrombosis risk likely persists beyond lab findings falling below threshold
- CrCl < 30mL/min

High Risk/Full AC
- Confirmed VTE
- Established reason for therapeutic AC (Abx, prophetic valve, etc.)**
- HD/CVVH with clotting of dialysis tubing or lines resulting in repeated interruptions
- High clinical concern for DVT/PE but unstable/otherwise unable to undergo confirmatory testing
- CrCl < 30mL/min

Full Anticoagulation with Enoxaparin
- 1 mg/kg twice daily

Increased Intensity Enoxaparin Prophylaxis
- 0.5 mg/kg twice daily (with maximum dose of 70 mg twice daily for >130 kg)
- CrCl ≥ 30mL/min

Standard Intensity Enoxaparin Prophylaxis
- 40 mg once daily for BMI <40 and weight ≤220kg
- 40 mg twice daily for BMI >40 or weight >220kg
- CrCl < 30mL/min

Unfractionated SQ Heparin Prophylaxis
- 5,000 units twice daily for BMI <40 and weight ≤120kg
- 7,500 units twice daily for BMI >40 or weight >120kg

Unfractionated Heparin Infusion
- (No Bolus and Low ≤PTT Goal 45-65)
- No bolus with infusion of 8 units/kg/hr
- ICU patients at intermediate risk: Consider screen for DVT with POCUS

Consider VTE screening in patients with rapid increases in D-dimer (≥ 5-fold in 48 hours) or acutely worsening oxygenation/ increased dead space. Consider empiric anti-coagulation if low bleeding risk


The role of anticoagulation remains unknown and highly controversial. This is one general approach which could be reasonable, but treatment decisions should always be individualised.
**SAFE AIRWAY SOCIETY**

**[ADAPTED] COVID-19 AIRWAY MANAGEMENT**

1. Intensive training  
2. Early intervention  
3. Meticulous planning  
4. Vigilant infection control  
5. Efficient airway management  
6. Clear communication

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**USE A 'BUDDY CHECK' FOR CORRECT PPE FITTING**

**Planning**
- Intervene early - aim to avoid emergency intubation.  
- Negative Pressure room or Normal pressure with strict door policy.  
- Senior clinician involvement. Is Anaesthetist needed?  
- Early airway assessment documented by senior clinician.

**Prepare**
- Assemble 5-6 person Airway Team (see below).  
- Use COVID-19 Intubation Tray (see below).  
- Ensure Viral Filter and ETCO2 in ventilation circuit.  
- Share Airway Strategy. Use a dedicated COVID intubation checklist.

**PPE**
- Hand Hygiene (HH).  
- Donning: HH > Gown > Mask > Eye-protection > Hat > HH > Gloves.  
- Spotter to perform "Buddy Check" to ensure correct PPE fit.  
- Airway operator to consider double gloves.

**Pre-Ox**
- 45 degree head up position.  
- Pre-oxygenate with Non-Rebreather Mask for full 5 minutes.  
- Avoid Apnoeic Oxygenation techniques due to aerosolization risk.

**Perform**
- Modified RSI technique (1.5mg/kg IBW Roc OR 1.5mg/kg TBW Sux).  
- No ventilation prior to intubation  
- Wait 60 seconds for paralysis to take effect - avoid triggering cough.  
- Remove Non-Rebreather Mask and proceed with intubation

**Post-ETT**
- Inflate cuff BEFORE initiating ventilation and monitor cuff pressures to minimise leak.  
- Remove outer gloves [if on], dispose of airway equipment in sealed bag.  
- Doffing: Gloves > Gown > HH > Hat > Eye Protection > Mask > HH. Use a Spotter.  
- Debrief and share lessons.

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**Awake Intubation**
- Risk of aerosolization. Involve Senior Anaesthetist if this airway technique is indicated.

**Connection / Disconnection**
- Apply the viral filter directly to the ETT.  
- Only disconnect the circuit on the ventilator side of the viral filter.

**CICO Rescue**
- Scalpel-bougie technique to avoid aerosolization.

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Collaboration between Safe Airway Society + RNS ASCAR  
@SafeAirway + @Rnsascor  
v1.1 March 2020
[ADAPTED] COVID-19 AIRWAY MANAGEMENT

Team Members

- Airway Assistant
- Airway Operator #1
- Team Leader
- Runner #1
- Runner #2
- Runner #3

OUTSIDE
- Airway Trolley
- Bronchoscope
- Cardiac Arrest Trolley

ANTE ROOM (if available)
- (Airway operator #2)

COVID Intubation Tray

- Macintosh direct laryngoscope
- SGA [2nd generation]
- ETT (appropriate size range)
- Bougie / Stylet
- 10 ml syringe
- Tube tie
- Lubricant sachet
- Viral filter
- ETCO2
- NG tube (large bore)
- OPA + NPA
- Scalpel + bougie CICO kit
- In-line suction

Circuit Setup

- Patient
- ETT
- Viral Filter
- ETCO2
- Ventilator

Collaboration between Safe Airway Society + RNS ASCAR

@SafeAirway + @Rnsascar

v1.1 March 2020
Rapid Sequence Intubation/Airway Algorithm

This clinical pathway is intended to supplement, rather than substitute for, professional judgment and may be changed depending upon a patient’s individual needs. Failure to comply with this pathway does not represent a breach of the standard of care.

### Pre-oxygenation
- Spontaneously breathing patient – Position patient as below and allow at least 5 mins of spontaneous breathing with a tight-fitting non-rebreather facemask at MAXIMUM and continue until the patient stops breathing after sedation/paralysis: Avoid positive pressure ventilation
- Patient not breathing or not breathing adequately – Position patient as below with a tight-fitting non-rebreather facemask at MAXIMUM and continue until ready to intubate: Avoid positive pressure ventilation

### Position the patient
Ensure you have 360° access to the patient
- Belt/Belly Height – Head at or just above belt/belly level
- HoP up – Head of Patient up to Head of Bed
- HoB up – Head of Bed up 30°; Reverse trendelenburg in High BMI, Late Pregnancy, Spinal Immobilisation
- Face – Plane parallel to Ceiling (or just 10° tilt back) & Ear level to Sternal Notch

### Pharmacologic agents and dosages used for rapid sequence intubation

#### Sedatives

<table>
<thead>
<tr>
<th>Sedative</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ketamine (Ketamine is preferred for patients with hemodynamic instability or renal insufficiency)</td>
<td>2 mg/kg IV</td>
</tr>
<tr>
<td>Midazolam</td>
<td>0.15 to 0.2 mg/kg IV (decrease dose in elderly)</td>
</tr>
<tr>
<td>Propofol</td>
<td>1 to 2.5 mg/kg IV (decrease dose in elderly) (titrate the dose)</td>
</tr>
</tbody>
</table>

#### Neuromuscular Blocking (NMB) Agents

<table>
<thead>
<tr>
<th>NMB Agent</th>
<th>Dose</th>
<th>Onset</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Succinylcholine (depolarizing NMB)</td>
<td>1.5 mg/kg IV (adults)</td>
<td>½ to 1 min</td>
<td>6-10 min</td>
</tr>
<tr>
<td></td>
<td>2 mg/kg IV (infants)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3mg/kg IV (new-borns)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rocuronium (nondepolarizing NMB)</td>
<td>1.5mg/kg IV (shorter onset with longer duration)</td>
<td>1 min</td>
<td>20 mins</td>
</tr>
</tbody>
</table>

### Paralysis with Induction

#### IDENTIFY PREDICTORS OF DIFFICULT INTUBATION (LEMON)
- Look for external markers of difficulty of BVM and intubation
- Evaluate the 3:3:2 rule
- Mallampati score ≥ 3
- Obstruction/Obesity
- Reduced Neck Mobility

If a difficult airway is predicted, IMMEDIATELY consult a clinician experienced in airway management and intubation before proceeding.

#### MALE MASS
- Mask
- Airways (oral and nasal)
- Laryngoscopes, Laryngeal Mask Airway (LMA)
- Endotracheal tubes – Adult Males 8F, Females 7.5F; Child >1 year (Age/4) + [4(uncuffed) or 3.5(cuffed)]
- Monitoring (pulse oximetry, ECG, capnography), Magill Forceps
- Emergency drugs/trolley
- Suction, Stylet, Bougie
- Plentiful oxygen supply

#### Preparatory
- Connect patient to the ventilator. See Guideline for Initiation of Mechanical Ventilation Algorithm
- Secure tube at a depth of 3 x ET Tube size at the teeth/gums
- Check vital signs (BP, PR, RR, SPO2, T°C, RBS)
- Initiate postintubation analgesia and sedation
  - Morphine 0.1 – 0.4mg/kg/hr
  - Ketamine (analgiesic and sedative) 0.05 – 0.4mg/kg/hr
  - Midazolam 0.02 – 0.1mg/kg/hr
  - Dexamethasone 0.2 – 0.7 ug/kg/hr
- Obtain portable CXR to Confirm Depth of ET Tube NOT location

#### Pass the tube/Laryngeal Mask Airway (LMA)
- Limit attempt to < 30 seconds. Proceed down the algorithm after 30 seconds

#### 5 Point Auscultation
- Epigastrium
- Bilateral Axillae
- Bilateral Lung Bases
- Waveform Capnography
- Maintain CO2 level at 35-45mmHg

#### Insert Laryngeal Mask Airway (LMA)

**Not Successful**

- Secure mask
- Continue bag-mask ventilation
- Consider alternative airway management

**Successful**

- Secure mask
- Continue bag-mask ventilation
- Consider alternative airway management

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**EMERGENCY MEDICINE KENYA FOUNDATION**

[emergencymedicinekenya.org/COVID19](http://emergencymedicinekenya.org/COVID19)
Guidelines for Initiation of Mechanical Ventilation Algorithm

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Choose Familiar Mode

SIMV or PRVC

FiO₂ = 1.0*

*after the patient is settled, wean this down to an FiO₂ of 0.4 or a PaO₂ of 60-80 mmHg (8–10.6kPa)

Obstructive lung disease e.g. Asthma, COPD

VT 5-6 ml/kg PBW

*for Pressure Control, titrate PIP to achieve an expired VT of 5-6 ml/kg PBW

*titrate to PaO₂ of 60-80 mmHg (8–10.6kPa)

PEEP 3-4 cmH₂O

Keep PIP + PEEP < 30 cm H₂O

Rate 6-8 bpm

*titrate to allow complete expiration

Other

VT 6-8 ml/kg PBW

*for Pressure Control, titrate PIP to achieve an expired VT of 8-10 ml/kg PBW

PEEP 5 cmH₂O

* titrate to PaO₂ of 60-80 mmHg (8–10.6kPa)

Keep PIP + PEEP < 30 cm H₂O

Rate – Start at Patient’s Preintubation RR (< 30bpm)

*titrate to PaCO₂ of 35 - 45 mmHg (4.7 - 6 kPa)

Restrictive lung disease e.g. ARDS

VT 6 ml/kg PBW

*for Pressure Control, titrate PIP to achieve an expired VT of 6 ml/kg PBW

PEEP 8-10 cmH₂O

* titrate to PaO₂ of 60-80 mmHg (8–10.6kPa)

Keep PIP + PEEP < 30 cm H₂O

Rate = Start at Patient’s Preintubation RR (< 30bpm)

*titrate to PaCO₂ of 35 - 45 mmHg (4.7 - 6 kPa)

Additional Settings:

Pressure support – 8-10 cmH₂O

Inspiratory trigger – 2 cmH₂O below the set PEEP

i times – Adults 1 sec; Toddlers/Children 0.7 sec; Neonates 0.5 sec

Abbreviations: SIMV, Synchronised Intermittent Mandatory Ventilation; PRVC, Pressure Regulated Volume Control; VT, Tidal Volume; PBW, Predicted Body Weight; PEEP, Positive End Expiratory Pressure; PIP, Peak Inspiratory Pressure

The Crashing Intubated Patient (Peri-Arrest or Arrest):

DOPES then DOTTS: The first mnemonic is how to diagnose the problem and the second mnemonic is how to fix the problem:

Diagnosing the Problem:

D = Displaced Endotracheal Tube or Cuff
O = Obstructed Endotracheal Tube: Patient biting down, kink in the tube, mucus plug
P = Pneumothorax
E = Equipment Check: Follow the tubing from the ETT back to the ventilator and ensure everything is connected
S = Stacked Breaths: Auto-PEEP. Patient unable to get all the air out from their lungs before initiating the next breath. Inspiratory time is much shorter than expiratory time (I/E ratio is anywhere from 1 to 3 or 1 to 4)

Fixing the Problem (Once you commit to this, do every step even if you fix the problem with one of the earlier letters):

D = Disconnect the Patient from the Ventilator: This fixes stacked breaths by decreasing intra-thoracic pressure and improving venous return
O = Oxygen 100% Bag Valve Mask: The provider should bag the patient not anyone else because this lets you get a sense of what the potential problem is. Look, Listen, and Feel
• Look: Watch the chest rise and fall, look at ET and ensure it is the same level it was at when it was put in
• Listen: Air leaks from cuff rupture or cuff above the cords; Bilateral breath sounds; Prolonged expiratory phase
• Feel: Feel the pressure of pilot balloon of endotracheal tube, crepitus; How is the patient bagging (Hard to bag or too easy to bag)
T = Tube Position/Function: Suction catheter to ensure tube is patent; Can also use bougie if you don’t have suction catheter, but be gentle (If to aggressive can cause potential harms); Ensure the tube is at the same level it was at when it was put in
S = Sonography: You can diagnose things much faster than waiting for respiratory therapist to come to the bedside or waiting for stat portable chest x-ray to be done.

Additional Tips:

* Non-invasive ventilation is NOT RECOMMENDED if patient is NOT in a negative pressure / isolated room

Abbreviations:

SIMV, Synchronised Intermittent Mandatory Ventilation; PRVC, Pressure Regulated Volume Control; VT, Tidal Volume; PBW, Predicted Body Weight; PEEP, Positive End Expiratory Pressure; PIP, Peak Inspiratory Pressure
Post-Cardiac Arrest Care Algorithm

This clinical pathway is intended to supplement, rather than substitute for, professional judgment and may be changed depending upon a patient’s individual needs. Failure to comply with this pathway does not represent a breach of the standard of care.

Return of Spontaneous Circulation (ROSC)

- **Activate Resuscitation Team** (if not already present)
- Monitor, support ABCs. Be prepared to provide CPR and defibrillation
- Check vital signs (BP, PR, RR, SPO₂, T°C, RBS)

Optimize Ventilation and Oxygenation

- Avoid excessive ventilation.
  - Start at 10 – 12 breaths/min
  - Titrate FiO₂ to minimum necessary to maintain SPO₂ ≥ 94%. **DO NOT** aim for 100%
  - Titrate to target PETCO₂ of 35 – 45 mmHg
- Consider waveform capnography

Treat Hypotension (SBP < 90mmHg)

- **IV/IO Bolus** (if not contraindicated e.g. pulmonary oedema, renal failure): 1-2 L Ringer’s Lactate/Hartmann’s Solution
- **Vasopressor infusion if NO response to fluid bolus or fluid bolus contraindicated:**
  - Adrenaline IV Infusion: 0.1 – 0.5µg/kg/min (7-35µg/min in 70-kg adult)
  - Norepinephrine IV Infusion: 0.1 – 0.5µg/kg/min (7-35µg/min in 70-kg adult)
- **Identify and Treat reversible causes**
  - Hypoglycaemia
  - Hypovolemia
  - Hypoxia
  - Hydrogen ion (acidosis)
  - Hypo-/hyperkalaemia
  - Hypothermia
  - Tension Pneumothorax
  - Tamponade, cardiac
  - Toxins
  - Thrombosis, pulmonary
  - Thrombosis, coronary

- Get a 12-lead ECG immediately. If STEMI or Suspected Cardiac Cause of cardiac arrest – Consult an Interventional Cardiologist
- If patient is stable, transfer to Critical Care Unit (ICU/CCU) attached to a defibrillator
- For patients who are comatose after cardiac arrest (i.e., lacking meaningful response to verbal commands), temperature should be monitored continuously, and fever should be treated aggressively with a target temperature between **32°C and 36°C maintained constantly for at least 24 hours.**
### Emergency Care Checklist

*Adapted from the WHO Trauma Checklist*

This clinical pathway is intended to supplement, rather than substitute for, professional judgment and may be changed depending upon a patient’s individual needs. Failure to comply with this pathway does not represent a breach of the standard of care.

#### Immediately after primary & secondary surveys:

<table>
<thead>
<tr>
<th>Question</th>
<th>Action/Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS FURTHER AIRWAY INTERVENTION NEEDED?</td>
<td>☐ YES, DONE ☐ NO</td>
</tr>
<tr>
<td>May be needed if:</td>
<td></td>
</tr>
<tr>
<td>• GCS 8 or below</td>
<td></td>
</tr>
<tr>
<td>• Hypoxaemia or hypercarbia</td>
<td></td>
</tr>
<tr>
<td>• Respiratory distress</td>
<td></td>
</tr>
<tr>
<td>• Face, neck, chest or any severe trauma</td>
<td></td>
</tr>
<tr>
<td>IS THERE A TENSION PNEUMO-THORAX?*</td>
<td>☐ YES, CHEST DRAIN PLACED ☐ NO</td>
</tr>
<tr>
<td>IS THE PULSE OXIMETER PLACED AND FUNCTIONING?</td>
<td>☐ YES ☐ NO ☐ NOT AVAILABLE</td>
</tr>
<tr>
<td>DOES THE PATIENT NEED OXYGEN (SpO2 &lt;94%)?</td>
<td>☐ YES ☐ NO ☐ NOT AVAILABLE</td>
</tr>
<tr>
<td>LARGE-BORE IV PLACED AND FLUIDS/BLOOD TRANSFUSION STARTED?</td>
<td>☐ YES ☐ NOT INDICATED ☐ NOT AVAILABLE</td>
</tr>
<tr>
<td>HEAD-TO-TOE SURVEY FOR (AND CONTROL OF) EXTERNAL BLEEDING, INCLUDING:*</td>
<td>☐ SCALP ☐ PERINEUM ☐ BACK</td>
</tr>
<tr>
<td>ASSESS FOR PELVIC FRACTURE BY:*</td>
<td>☐ EXAM ☐ X-RAY ☐ CT-SCAN</td>
</tr>
<tr>
<td>ASSESS FOR INTERNAL BLEEDING BY:*</td>
<td>☐ EXAM ☐ ULTRASOUND (E-FAST) ☐ CT-SCAN</td>
</tr>
<tr>
<td>IS SPINAL IMMOBILIZATION NEEDED?*</td>
<td>☐ YES ☐ NOT INDICATED</td>
</tr>
<tr>
<td>RANDOM BLOOD SUGAR CHECKED</td>
<td>☐ YES ☐ NO</td>
</tr>
<tr>
<td>NEUROVASCULAR STATUS OF ALL 4 LIMBS CHECKED?*</td>
<td>☐ YES</td>
</tr>
<tr>
<td>IS THE PATIENT HYPOTHERMIC?</td>
<td>☐ YES, WARMING ☐ NO</td>
</tr>
<tr>
<td>DOES THE PATIENT NEED (IF NO CONTRAINDICATION)?</td>
<td>☐ URINARY CATHETER ☐ NASOGASTRIC TUBE ☐ CHEST DRAIN ☐ NONE INDICATED</td>
</tr>
</tbody>
</table>

*associated with trauma but not specific

#### Before TEAM leaves the patient’s bedside:

<table>
<thead>
<tr>
<th>Question</th>
<th>Action/Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAS THE PATIENT BEEN GIVEN:</td>
<td>☐ TETANUS VACCINE ☐ ANAGESICS</td>
</tr>
<tr>
<td>☐ ANTIBIOTICS ☐ NONE INDICATED</td>
<td></td>
</tr>
<tr>
<td>HAVE ALL TESTS AND IMAGING BEEN REVIEWED?</td>
<td>☐ YES ☐ NO, FOLLOW-UP PLAN IN PLACE</td>
</tr>
<tr>
<td>WHICH SERIAL EXAMINATIONS ARE NEEDED?</td>
<td>☐ NEUROLOGICAL ☐ ABDOMINAL</td>
</tr>
<tr>
<td>☐ VASCULAR ☐ NONE</td>
<td></td>
</tr>
<tr>
<td>PLAN OF CARE DISCUSSED WITH:</td>
<td>☐ PATIENT/FAMILY ☐ RECEIVING UNIT</td>
</tr>
<tr>
<td>☐ PRIMARY TEAM ☐ OTHER SPECIALIST</td>
<td></td>
</tr>
<tr>
<td>RELEVANT EMERGENCY CARE CHART OR FORM COMPLETED?</td>
<td>☐ YES ☐ NOT AVAILABLE</td>
</tr>
</tbody>
</table>
Did You Know

The Constitution of Kenya (2010) and the Health Act (2017) guarantees you the right to emergency medical treatment

All public and private health facilities have a legal duty to provide you with emergency medical treatment

Any health institution that fails to provide emergency medical treatment despite having the capacity to do so, could face conviction and fines up to Kshs. 3 Million