MCAI Maternal & Childhealth Advocacy International

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**Post ceasefire plan for maternal, neonatal and paediatric hospital care in Gaza**

**1) Problems in pregnant women likely to need emergency treatment in Gaza: decisions to be made by clinicians based on individual needs and possible medication to be given (click here to see link to MCAI handbook on obstetric emergency care).**

| **Major medical or surgical problems** | **Triage category** | **Type of management** | **Suggested plan of treatment** |
|---|---|---|---|
| Previous CS for obstructed labour | 1 | Field/Renovated hospital CS after stabilisation | Consider short acting tocolysis until safe CS possible |
| 2 or more previous CS for whatever reason | 1 | Field/Renovated hospital CS after stabilisation | CS |
| 1 previous CS for parental choice | 3 | Field/Renovated hospital | Try Vaginal Birth After Caesarean section (VBAC) |
| Known to have accreta or percreta | 1 | Field/Renovated Hospital Stabilise and Medivac | |
| Previous CS via vertical incision in uterus | 1 | Field/Renovated Hospital Stabilise and Medivac | |
| Previous CS x1 for malposition | 3 | Field/Renovated hospital | Try VBAC if presentation now cephalic |
| Previous CS for macrosomia | 3 | Field/Renovated hospital | Try VBAC if scan shows no evidence macrosomia and pelvic size adequate |
| Multiple pregnancy | 2 | Field/Renovated hospital | Vaginal delivery with safe CS immediately available |
| | | | |
| *Vaginal bleeding after 28 weeks' gestation * Ideally with portable US scan to exclude placenta praevia and to identify early abruption.* | 1 | Field/Renovated hospital then Medivac after stabilisation if placenta praevia | |
| Placenta praevia suspected (painless bleeding +/- transverse lie) or proven by scan | 1 | Field/Renovated hospital then Medivac after stabilisation if placenta praevia | Blood for transfusion if available. Tranexamic acid. Consider short acting tocolysis. CS, EZIO if venous access not possible |
| Abruption with shock | 1 | Field/Renovated hospital | Blood transfusion if possible. Vaginal delivery with safe CS immediately available EZIO if venous access not possible, Oxygen if available. |
| Known to have vasa praevia | 1 | Field/Renovated hospital | CS |
| | | | |
| *Post partum haemorrhage* | 2 | Field/Renovated hospital | CABC approach (Circulation if bleeding, Airway, Circulation, Disability) |

| Major medical or surgical problems | Triage category | Type of management | Suggested plan of treatment |
|---|---|---|---|
| | 3<br>1 | | Blood transfusion and oxygen if possible, Misoprostol or ideally oxytocin IV, Tranexamic acid, Ellavi balloon tamponade if still bleeding, Intravenous antibiotics if septic: Ceftriaxone, ampicillin and metronidazole, Evacuation of products.<br>EZIO if shock and if venous access not possible.<br><br>If safely stopped<br>If bleeding continues and laparotomy needed for repair of ruptured uterus or emergency hysterectomy.<br>EZIO if venous access not possible. Blood transfusion, Tranexamic acid, oxygen if available. |
| History of previous massive PPH >1.5 litres or more than one delivery where PPH >500 ml | 2 | Field/Renovated hospital | Consider early Ellavi tamponade if >300 ml and still bleeding despite uterotonic drugs and tranexamic acid. . Cross match for possible blood transfusion |
| | | | |
| *Miscarriage* | | | |
| If bleeding continues, retained products, infection | 1 | Field/Renovated hospital | Blood transfusion, misoprostol, evacuation of products (ideally by manual vacuum aspiration), triple intravenous antibiotics |
| If bleeding and infection continue despite management above | 1 | Field/Renovated hospital | If shock EZIO if venous access not possible and oxygen if available. |
| | | | |
| Ruptured ectopic pregnancy | 1 | Stabilisation and urgent Field/Renovated hospital | Blood transfusion, autotransfusion IV if possible (ideally Haemafusion device). Urgent laparotomy, intraosseous needle into humerus (EZIO) if venous access not possible, oxygen if available. |
| | | | |
| *Severe malnutrition with growth restriction of the fetus* | 2 | Field/Renovated Hospital Stabilisation and Medivac | Especially if severe malnutrition |
| *Life threatening sepsis* | | | |
| Intrauterine fetal death present for more than 48 hours *Ideally confirmed with portable US scan | 2 or 1 if vaginal delivery not possible | Field/Renovated Hospital | Misoprostol to induce labour if possible. IV antibiotics, destructive procedure if needed for vaginal delivery. |
| Prolonged rupture of membranes greater than 24 hours because of the risk of life-threatening infection to mother and unborn baby. | 2 | Field/Renovated Hospital | Misoprostol, oxytocin<br>Intravenous antibiotics: Ceftriaxone, ampicillin and metronidazole<br>Urgent vaginal delivery |

| **Major medical or surgical problems** | **Triage category** | **Type of management** | **Suggested plan of treatment** |
|---|---|---|---|
| Intrauterine sepsis following premature rupture of membranes, intrauterine fetal death or severe sepsis post-delivery at any gestation. | 1 | Field/Renovated Hospital | Intravenous antibiotics: Ceftriaxone, ampicillin and metronidazole. If shock give oxygen if available.<br>May need emptying products from the uterus. |
| | | | |
| *Pregnancy after 28 weeks' gestation in a child <17 years of age.* | 2 | Field/Renovated Hospital<br>Medivac | As soon as possible |
| | | | |
| Persistent transverse fetal lie after 36 weeks' gestation | 1 | Field/Renovated Hospital<br>Medivac as placenta praevia possible | Consider short-acting tocolysis if available. |
| | | | |
| *Severe hypertension* with a risk of cerebral haemorrhage. BP>160/110 mm Hg. and/or *severe preeclampsia with risk of eclampsia and death*. BP elevated >140/90 and ++proteinuria and symptoms including, headaches and/or visual disturbance and/or epigastric pain. | 1 | Field/Renovated Hospital | IV cannula and intravenous hydralazine<br><br>Restricted oral and IV fluids<br><br>Subsequently oral antihypertensive (Labetalol if no history of asthma; Nifedipine or Methyl dopa)<br><br>Urinary catheter with measuring chamber on bag<br><br>**Magnesium sulphate**<br><br>Consider induction of labour with Misoprostol<br><br>Consider CS if not controlled |
| | | | |
| *Severe anaemia (Hb <7g/dl but >5g/dl).* | 2 | Field/Renovated Hospital | Intravenous iron infusion. Oral iron stopped 48 hours before and not started until at least 5 days after IV iron infusion |
| *Very severe anaemia (Hb < 5g/dl) and in 3rd trimester* | 1 | Field/Renovated hospital for stabilisation and then Medivac | Blood transfusion and Oxygen<br>Subsequent IV iron<br>Oral iron stopped 48 hours before and not started until at least 5 days after IV iron infusion |
| | | | |
| *Severe/extreme malnutrition (BMI < 16m/kg2).* | 2 | Field/Renovated hospital for stabilisation and then Medivac | Enteral oral or tube feeding with high energy food. Blood transfusion if severe anaemia or if shocked. Oxygen if available. |
| *Burns* | | | |
| | | | |
| Severe burns (>20% full or partial thickness). Also depends on site of burns | 1 | Field/Renovated hospital for stabilisation and then Medivac | Intravenous antibiotics: Ceftriaxone, ampicillin and metronidazole |

| **Major medical or surgical problems** | **Triage category** | **Type of management** | **Suggested plan of treatment** |
|---|---|---|---|
| | | | Intravenous and oral paracetamol.<br>Ketamine for dressing changes<br>Cling film for dressings plus appropriate sterile dressing materials/gauze |
| Burns of the face or neck threatening the upper airway | 1 | Field/Renovated hospital for stabilisation and then Medivac | Airway management, oxygen Intravenous antibiotics: Ceftriaxone, ampicillin and metronidazole<br>Intravenous and oral paracetamol. |
| | | | |
| *Severe trauma that could have a good outcome if advanced treatment only available outside Gaza is undertaken.* | 1 | Field/Renovated hospital for stabilisation and then Medivac<br>See Primary Trauma Care | CABC approach (Circulation if bleeding, Airway, Circulation, Disability)<br>Blood transfusion, airway management, EZIO if venous access not possible, Oxygen if available.<br>IV paracetamol or opiate or ketamine if available for pain control, Tranexamic acid if bleeding |
| Penetrating abdominal wounds and/or severe chest trauma. | 1 | Field/Renovated hospital for stabilisation and then Medivac if needed<br>See Primary Trauma Care | CABC approach Blood transfusion, Intravenous antibiotics: Ceftriaxone, ampicillin and metronidazole, Tranexamic acid, Intravenous paracetamol, opiate or ketamine as appropriate<br>EZIO if venous access not possible<br>Abdominal and chest ultrasound scans |
| *Life threatening medical conditions* | | | |
| *Malignancies (cancers)* that could have a good outcome if diagnosed correctly and managed in a specialist hospital in another country. | 2 | Field/Renovated hospital for stabilisation and then Medivac if needed | Depends on severity and potential for treatment in an international setting. |
| *Chronic medical conditions* such as heart disease, diabetes mellitus, renal impairment, chronic liver disease. | 1 or 2 | Field/Renovated hospital for stabilisation and then Medivac if needed | Depends on severity and potential for treatment in an international setting. |
| | | | |
| *Need for anaesthesia* | 1 | Field/Renovated hospital for stabilisation and then Medivac if needed for follow up care | Drugs and supplies for general and spinal anaesthesia (see below for details)<br><br>Ketamine, Lidocaine 1% and 2%<br><br>Spinal anaesthesia (Bupivacaine, spinal needles and vasopressors-phenylephrine, metaraminol, dilute nor adrenaline).<br><br>General anaesthesia (Ketamine, inhaled anaesthetic agents, propofol)<br><br>Intubation equipment including ET tubes, bag and mask systems. |

| Major medical or surgical problems | Triage category | Type of management | Suggested plan of treatment |
|---|---|---|---|
| | | | |
| *Identification of placental failure during delivery and prevention of birth asphyxia* | 1 | Clinic or Field/Renovated hospital for all deliveries if possible | Maternal and partner monitoring of fetal heart rates in the time immediately following the end of every uterine contraction.<br>Battery operated Doppler probes (rechargeable or using standard AA batteries) See link here to Ukraine program. |
| | | | |

**TRIAGE CATEGORY**

RED= 1 Needs to reach hospital care (national or international) with surgical availability, including CS, within 24 hours.
ORANGE = 2 Needs to reach hospital care (national or international) with surgical availability, including Caesarean Section, within 4 days.
GREEN = 3 Needs review at an appropriate time depending on condition.

The lists in the Table below may not be complete and any patient with a condition not listed who is at danger of dying can be considered for stabilisation and evacuation.

## Drugs, equipment and supplies for Gaza emergency humanitarian program for pregnant women and adolescent girls

### Delivery including surgical issues

Caesarean section kits
Laparotomy kits
Manual and electrical suction pumps
Rechargeable head torches
Thermal blankets: rechargeable if possible
Sutures Vicryl for skin closure and internal closures
Surgical wound dressings

Kiwi traction controlled vacuum device
Wrigley forceps
Neville Barnes forceps

IV cannulae
Micropore tape 5 centimetres x 9.1 metres for securing IV cannulae
Urinary catheter Foley 12-14FG with 10ml balloon
EZIO systems

**Battery operated ultrasound scanners plus ultrasound gel**
Pregnancy kits

**Essential emergency diagnostic laboratory supplies**
**Patient monitoring**

- Portable multi-parameter monitor: A durable, battery-operated monitor that tracks vital signs.
- Pulse oximeter: Gives rapid and continuous measurement of blood oxygen levels.

- Non-invasive blood pressure (NIBP) monitors
- Electrocardiogram (ECG)
- Temperature probe: Measures core body temperature to prevent hypothermia.
- *Capnography: Provides an accurate, real-time measure of exhaled carbon dioxide, which is a key indicator of ventilation. ONLY if affordable*

Manual Vacuum Aspiration MVA kit for managing incomplete **miscarriage**

**Post partum haemorrhage (PPH) prevention and management**

Blood for transfusion collecting bag 450ml plus 16G needle plus CPDA anticoagulant
Blood grouping and cross match kits
Intravenous iron infusion for managing severe anaemia without blood transfusion and subsequent oral iron

Intravenous cannulae 16G, 18 G and 20G + wing plus injection port: packs of 50
Urinary catheter Foley 12-14FG with 10ml balloon

Intravenous oxytocin (needs fridge)
Misoprostol 200 microgram tablets
Tranexamic acid 0.5 grammes per 5ml pack of 10 for reducing postpartum haemorrhage and other internal bleeding
*Ellavi intra-uterine tamponade balloons* (for treating and possibly preventing major PPH).

**Severe sepsis**
Digital thermometers 32 to 42°C
Contact free infrared thermometers

Chlorhexidine 1% obstetric cream for infection prevention during vaginal examinations

Gentamicin IV 80mg per 2ml ampoules
Ampicillin IV
Ceftriaxone IV
Metronidazole IV
Benzyl penicillin IV

Nasogastric tubes 8CH

**Pain control (see anaesthesia section below)**
Intravenous paracetamol 10 milligram per 1ml: 100 ml ampules
1% and 2% Lidocaine
Intravenous ketamine
Intravenous morphine

Cool-therm gel dressings for burns. (10 by 40 centimetres)

**Pre-eclampsia, severe preeclampsia and eclamptic seizures**
Urine analysis stick tests for 10 parameters including protein, blood, infection, glucose.
**Magnesium sulphate** 50 percent 10ml ampoules for eclampsia and severe preeclampsia
**Hydralazine** IV 20mg per 2ml ampoules

**Labetalol** PO: 100 mg 2 times daily then increase if necessary, in 100 to 200 mg increments until an effective dose is reached, usually 200 to 400 mg 2 times daily. If higher daily doses are required divide in 3 doses (max. 2.4 g daily). Use of Labetalol is prohibited because of a history of asthma
or
**Methyldopa** PO: 250 mg 2 or 3 times daily for 2 days, then increase, if necessary, in 250 mg increments every 2 to 3 days, until an effective dose is reached, usually around 1.5 g daily (max. 3 g daily)
Avoid use until after delivery as can cause mental health problems (depression)
**Nifedipine** orally: normal tablets and slow release.

Urinary catheter Foley 12-14FG with 10ml balloon

**Major trauma**
**CABCD approach**
See Primary Trauma Care

**Anaesthesia management** Essential equipment for general anaesthesia

**Airway management**

- Laryngoscopes: Handles and multiple sizes of Macintosh blades.
- Endotracheal tubes (ETT): A range of sizes to secure the airway.
- Laryngeal Mask Airways (LMA) or i-gels: Supraglottic airway devices that offer a less invasive alternative to ETTs.
- Oropharyngeal (Guedel) airways: To prevent airway obstruction from the tongue.
- Bag-valve mask (BVM) resuscitator: Manual ventilator for delivering breaths, essential for resuscitation.
- Suction apparatus: Both portable manual and battery-operated units, along with Yankauer suction tips, to clear the airway of blood and secretions.
- Oxygen masks

**Anaesthesia delivery**

- Draw-over vaporizer: A simple, non-electric system that administers volatile anaesthetics by drawing ambient air over the agent. This is a critical piece of equipment as it is not dependent on a compressed gas supply. (Diamedica)
- Portable robust basic anaesthetic machine (Diamedica)
- Total intravenous anaesthesia (TIVA) equipment: Infusion pumps (battery-operated) or simple, quantitative drip sets, used to deliver anaesthetic agents like propofol or ketamine intravenously.
- Oxygen supply:
    - Oxygen concentrator: Produces oxygen from ambient air, eliminating reliance on bulky and dangerous compressed gas cylinders.
    - Small, portable oxygen cylinders: For resuscitation and patient transport.

**Drugs**

- Induction agents: Ketamine is preferred for trauma patients due to their cardiovascular stability. Midazolam for co-induction. Propofol.
- Muscle relaxants: For patients requiring intubation and mechanical ventilation eg vecuronium, rocuronium, suxamethonium
- Analgesics: IV paracetamol (effective and safe), opioids (e.g., fentanyl, morphine)
- Vasopressors: Drugs like adrenaline to manage blood pressure in unstable trauma patients and with spinal anaesthesia.
- Local anaesthetics: For regional and local anaesthesia – lidocaine 1% and 2%.
- Bupivacaine 0.5% plain, Bupivacaine 0.5% heavy for spinals
- Spinal anaesthetic needles 24 G

**Equipment for regional anaesthesia**
Regional anaesthesia (e.g., nerve blocks) is often preferred in the Field/Renovated for limb injuries, as it can reduce the need for general anaesthesia and its associated resources.

- **Ultrasound machine:** Battery-operated, with appropriate sterile covers **and gel,** to provide visualization for precise and safe nerve blocks.
- **Peripheral nerve stimulator:** Can be used as an alternative to ultrasound to help locate nerves.
- **Spinal needles:** For spinal anaesthesia in lower limb and pelvic surgery.
- **Local anaesthetic drugs:** Hyperbaric bupivacaine is commonly used for spinal blocks.

**Supportive and miscellaneous equipment in critically ill patients**

- Intravenous (IV) access equipment: Cannulas, IV fluids, giving sets, and warming devices to combat hypothermia in trauma patients.
- Arrow EZ-IO Intraosseous Vascular access system
- Syringes 1,2,5,10,20,50 ml
- Fluid warmers: For trauma patients at risk of hypothermia.
- Portable ventilator: Essential for transporting intubated patients.
- Defibrillator: A portable, battery-powered defibrillator.
- Blood products and refrigeration: Portable refrigerators are necessary for storing blood products safely.
- Intravenous (IV) access equipment: Cannulas, IV fluids, giving sets, and warming devices to combat hypothermia in trauma patients.
- Thermal blankets (ideally rechargeable) Alpenheat: Heated pad plus 2 batteries and battery charger
- Medivac emergency packs
- HY2000Si HYUNDAI 2000W Petrol Inverter Generators 2000w inverter generator, pure sine wave, safe for charging medical equipment.

**Additional drugs for managing emergencies**

Adrenaline one milligram per 1ml for subcutaneous injection for resuscitation, for anaphylaxis, and as an inotrope (when diluted)
Frusemide 20 milligram per 2ml ampoules
Atropine one milligram per 1ml ampoules
GTN for peripartum cardiac failure

Hydrocortisone 100mg/ml for anaphylaxis
Chlorphenamine

Dextrose 50 percent 50ml ampules for hypoglycaemia
Blood glucose test sticks for code free glucometer

**Prevention of birth asphyxia**
Maternal monitoring of fetal heart rates of their unborn baby immediately following the end of every uterine contraction to identify changes in fetal heart rate patterns that may indicate placental problems. Please link here for its use in the war in Ukraine.

Battery operated fetal Doppler probes (rechargeable or using standard AA batteries) **plus ultrasound gel.**

**2). Main problems in newborn infants (< 4 weeks of age): decisions to be made by clinicians based on individual needs and possible medication to be given (click here to see link to MCAI handbook on neonatal emergency care: updated 2023)**

| Major medical or surgical problems | Triage category | Type of management | Suggested plan of treatment |
|---|---|---|---|
| All newborn infants | | Delivery area | Effective neonatal resuscitation by trained nurses, midwives or doctors<br>Include when appropriate delayed cord clamping (see handbook)<br>Bag and mask ventilation<br>Skin to skin care to keep warm<br>Do not separate from mothers unless too ill and needing intensive care |
| All newborn infants who are well after delivery | | Clinic or Field/Renovated hospital | Promote breast feeding<br>Promote skin to skin care for all to ensure normothermia<br>Check blood glucose |
| Newborn infants who are full term and of normal birth weights but have a medical problem suggesting infection or birth asphyxia | | Clinic of delivery or Field/Renovated Hospital. If clinic transfer to Field/Renovated Hospital<br><br>If high risk of needing future intensive care, stabilise and prepare for medical evacuation | Promote breast feeding<br>Promote skin to skin care for all to ensure normothermia<br>Check and monitor blood glucose<br><br>If suspicion of possible infection (such as prolonged rupture of membranes or severe maternal malnutrition) or if clinically breathing is impaired or fever present, provide antibiotics IV<br>Check and monitor blood oxygen saturation levels and treat with additional inspired oxygen by nasal prongs or face mask if needed (see handbook).<br><br>If birth asphyxia, monitor for hypoglycaemia and consider an anticonvulsant (such as phenobarbital if fitting). |
| *Premature birth and/or low birth weight infants* needing medical care to survive **without long-term handicap**. Above 28 weeks' gestation, not needing intubation and ventilation, but with respiratory failure needing oxygen and possible nasal CPAP if breathing deteriorates. | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced neonatal care | Intravenous antibiotics; Ceftriaxone, ampicillin and metronidazole<br>Additional inspired oxygen via nasal cannulae<br>IV fluid initially if respiratory distress<br><br>Nasogastric tube feeding with breast milk or appropriate formula milk<br>Skin to skin care by mother or close relative to prevent hypothermia. |

| **Major medical or surgical problems** | **Triage category** | **Type of management** | **Suggested plan of treatment** |
|---|---|---|---|
| | | | Incubator care if available skin to skin care not possible.<br>Nasal CPAP with humidity if respiratory distress is present.<br>Blood glucose management<br>Close oxygen monitoring and treatment |
| | | | |
| *Congenital abnormalities* that have **a good long-term outcome** following appropriate medical and/or surgical attention in a specialist international hospital. Includes some congenital heart disorders. | 2 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced neonatal care | Stabilisation to include adequate oxygenation, normal blood glucose levels, normothermia (skin to skin care) , breast feeding if possible or if baby cannot suck, nasogastric expressed breast milk, or IV fluids, antibiotics if infection suspected or obviously present. . |
| Cyanotic congenital heart disorder | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced neonatal care | If there is a possibility of transferring the baby to a facility with specialist paediatric cardiology care, the baby needs the arterial duct to be kept open while you arrange transfer.<br>• Do not give oxygen after a hyperoxia test, as it may precipitate ductal closure.<br>• Start IV prostaglandin E (PGE) (if available) to maintain ductal patency.<br>**Commence**<br>either prostaglandin E1 (PGE1) or prostaglandin E2 (PGE2) at 5 nanograms/kg/minute<br>and increase in steps of 5 nanograms/kg/minute to a maintenance dose of 10 or 20 nanograms/kg/minute. Higher doses than this have been used but cause apnoea.<br>• PGE2 can be given orally as a maintenance dose of 40-50 micrograms per kg every 2 hours. |
| *Close monitoring and treatment for hypoglycaemia* | 2 | Field/Renovated hospital | Blood testing for blood glucose levels whenever hypoglycaemia is suspected. |
| *Close monitoring and treatment for severe jaundice* | 2 | Field/Renovated hospital Transfer to medivac if jaundice does not respond especially if severe early jaundice with anaemia | Blood testing whenever severe jaundice is suspected. Phototherapy. Maintain hydration and consider antibiotics |

**3). Main problems in children; decisions to be made by clinicians based on individual needs and treatments to be given (click here for volume 1 and click here for volume 2 which are links to two MCAI handbooks on paediatric emergency care: updated 2021)**

| Major medical or surgical problems | Triage category | Type of management | Suggested plan of treatment |
|---|---|---|---|
| *Severe malnutrition (MUAC <115mm, oedema and weight for height < 3SD).*<br><br>*WHO Weight for height/length Z score charts* | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable and with good potential outcome and needing advanced paediatric care | Enteral or tube feeding of high energy food appropriate for degree of malnutrition present (click here to see Handbook 1 pages 320-356 for details).<br>Blood transfusion if severe anaemia (Hb < 5g/dl) or if shocked.<br>Oxygen if available.<br>Intravenous antibiotics: Ceftriaxone, ampicillin and metronidazole<br>KEEP WARM |
| *Severe trauma that could have a good outcome if advanced treatment, only available outside Gaza, is undertaken.* | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care<br><br>See Primary Trauma Care | CABC approach (Circulation if bleeding, Airway, Circulation, Disability)<br>Blood transfusion, airway management, EZIO if venous access not possible, Oxygen if available.<br>IV Paracetamol or Opiate or Ketamine if available.<br>Tranexamic acid if internal bleeding suspected.<br>Abdominal and chest ultrasound scans |
| Penetrating abdominal wounds and/or severe chest trauma. | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care | Blood transfusion, airway management, EZIO if venous access not possible, Oxygen if available.<br>IV Paracetamol or Opiate or Ketamine if available,. Tranexamic acid if suspected internal bleeding.<br>Intravenous antibiotics: Ceftriaxone, ampicillin and metronidazole |
| *Severe burns (>15% full or partial thickness).* Depends on site of burns Click here to Paediatric Handbook 1 pages 532-542 | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care | Intravenous antibiotics: Ceftriaxone, ampicillin and metronidazole<br>Intravenous and subsequent oral paracetamol. Ketamine for dressing changes<br>Clear plastic film for dressings plus appropriate sterile dressing materials/gauze/gel |

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|---|---|---|---|
| *Burns* of the face or neck threatening the upper airway | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care | Airway management, oxygen, |
| *Malignancies* that could have a good outcome if diagnosed correctly and managed in a specialist hospital in another country. | 2 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care | |
| *Chronic severe diarrhoea with dehydration not responding to local treatment.* (click here to see Paediatric Handbook One pages 381-385) | 1 or 2 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care | Resomal oral rehydration solution.<br>Orogastric or nasogastric tube feeding.<br>IV fluids when safe and appropriate. If shocked EZIO if venous access not possible,<br>Oxygen if shock |
| *Upper airway obstruction due to congenital abnormality.* | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care | Anaesthesia and airway and breathing management |
| *Severe anaemia (Hb <7g/dl).* | 2 | Field/Renovated hospital | Intravenous iron infusion closely monitored |
| *Very severe anaemia (Hb < 5g/dl)* | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care | Blood transfusion<br>Oxygen if needed. Appropriate nutrition by oral or tube feeding. |
| *Severe pneumonia, especially with empyema, not responding to local treatment.* | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care | Intravenous antibiotics: Ceftriaxone, ampicillin, flucloxacillin. Oxygen if needed |
| *Severe asthma* | 1-2 | Field/Renovated hospital | Metered dose inhalers salbutamol.<br>Nebulisers for salbutamol or adrenaline.<br>Oral or IV steroids<br>Oxygen if needed |
| *Severe infected upper airway: epiglottitis or severe croup or bacterial tracheitis* | 1 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and needing advanced paediatric care | Careful handling<br>Intravenous antibiotics: Ceftriaxone, ampicillin, flucloxacillin. Oxygen if needed<br>Dexamethasone or Hydrocortisone<br>IV fluid management |
| *Severe acute renal impairment* (Acute Glomerulonephritis and Nephrotic syndrome) | 1-2 | Field/Renovated hospital for stabilisation and possible Medivac if stable but with good potential outcome and | Steroids.<br>Penicillin for nephrotic syndrome<br>Fluid management |

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|---|---|---|---|
| | | needing advanced paediatric care | |

## Drugs, equipment and supplies for Gaza emergency humanitarian program for newborn infants and for children

### General neonatal care

Skin-to-skin care harnesses
Breast milk pumps
10% glucose IV fluid
Neonatal IV giving sets with calibration chambers
Umbilical venous cannula kit
Dextrose 50%  50ml ampules
Blood glucose test sticks for code-free glucometer
Urine analysis stick tests including measurements of blood, protein, glucose, ketones, infection
Accurate weighing scales for babies and children
Upper arm measurement systems for malnutrition MUAC
WHO Weight for height/length Z score charts
Accurate height measurement

### General paediatric care

Nasogastric tubes 6 to 8 FG
Dextrose 50%  50ml ampules
Blood glucose test sticks for code-free glucometer
EZIO system for emergency vascular access
Battery operated ultrasound scanners plus ultrasound gel for investigating abdominal and chest cavity problems.
Chest Xray machines
Urine analysis stick tests including measurements of blood, protein, glucose, ketones, infection

### Surgical issues

Laparotomy kit to undertake minimal surgery eg to stop bleeding before transfer.
Tranexamic acid 0.5 grammes per 5ml pack of 10 for reducing internal bleeding after major trauma; especially abdominal
Surgical wound dressings
Sutures Vicryl absorbable for internal and skin closures
Superficial wound glue.
Butterfly skin dressings

Thermal blankets  Alpenheat: Heated pad plus 2 batteries and battery charger
Rechargeable head torches
Micropore tape 5 centimetres x 9.1 metres for securing IV cannulae

**Major trauma**
**CABCD approach**
See Primary Trauma Care

**Sepsis**

Digital thermometers 32 to 42°C
Contact free infrared thermometers
Intravenous cannulae 20,22,24 and 26 FG wing plus injection port
Dexamethasone or Hydrocortisone for acute upper airway infection

Gentamicin IV 80mg per 2ml ampoules
Ampicillin IV
Ceftriaxone IV
Metronidazole IV
Benzyl Penicillin IV
Flucoxacillin oral and IV for staphylococcal infections especially common on skin

**Pain control**
Intravenous paracetamol 10 milligram per 1ml in 100 ml ampules
1% and 2% Lidocaine
Intravenous ketamine
Intravenous morphine

Cool-therm gel dressings for burns. (10 by 40 centimetres)

**Airway management**
- Laryngoscopes: Handles and multiple sizes of both Macintosh and Miller blades.
- Endotracheal tubes (ETT): A range of sizes to secure the airway.
- Laryngeal Mask Airways (LMA) or i-gels: Supraglottic airway devices that offer a less invasive alternative to ETTs.
- Oropharyngeal (Guedel) airways: To prevent airway obstruction from the tongue.
- Tracheostomy if acute upper airway obstruction
- Bag-valve mask (BVM) resuscitator: Manual ventilator for delivering breaths, essential for resuscitation.
- Suction apparatus: Both portable manual and battery-operated units, along with Yankauer suction tips, to clear the airway of blood and secretions.
- Oxygen masks

**Anaesthesia delivery**
- Draw-over vaporizer: A simple, non-electric system that administers volatile anaesthetics by drawing ambient air over the agent. This is a critical piece of equipment as it is not dependent on a compressed gas supply.(Diamedica)
- Portable robust basic anaesthetic machine (Diamedica)
- Total intravenous anaesthesia (TIVA) equipment: Infusion pumps (battery-operated) or simple, quantitative drip sets, used to deliver anaesthetic agents like propofol or ketamine intravenously.
- Oxygen supply:
    - Oxygen concentrator: Produces oxygen from ambient air, eliminating reliance on bulky and dangerous compressed gas cylinders.
    - Small, portable oxygen cylinders: For resuscitation and patient transport.

**Patient monitoring**
- Portable multi-parameter monitor: A durable, battery-operated monitor that tracks vital signs.
- Pulse oximeter: Gives rapid and continuous measurement of blood oxygen levels.
- Non-invasive blood pressure (NIBP) monitor
- Electrocardiogram (ECG)
- Temperature probe: Measures core body temperature to prevent hypothermia.

- *Capnography: Provides an accurate, real-time measure of exhaled carbon dioxide, which is a key indicator of ventilation. ONLY if affordable*

**Drugs**

- Induction agents: Ketamine is preferred for trauma patients due to their cardiovascular stability. Midazolam for co-induction. Propofol.
- Muscle relaxants: For patients requiring intubation and mechanical ventilation eg vecuronium, rocuronium, suxamethonium
- Analgesics: IV paracetamol (effective and safe), opioids (e.g., fentanyl, morphine)
- Vasopressors: Drugs like adrenaline, noradrenaline to manage blood pressure in unstable trauma patients and with spinal anaesthesia.
- Local anaesthetics: For regional and local anaesthesia. – lidocaine 1% and 2% ,
- Bupivacaine 0.5% plain, Bupivacaine 0.5% heavy for spinals
- Spinal anaesthetic needles 24 G

**Equipment for regional anaesthesia**

Regional anaesthesia (e.g., nerve blocks) is often preferred in the Field/Renovated for limb injuries, as it can reduce the need for general anaesthesia and its associated resources.

- **Ultrasound machine:** Battery-operated, with appropriate sterile covers **and gel,** to provide visualization for precise and safe nerve blocks.
- **Peripheral nerve stimulator:** Can be used as an alternative to ultrasound to help locate nerves.
- **Spinal needles:** For spinal anaesthesia in lower limb and pelvic surgery.
- **Local anaesthetic drugs:** Hyperbaric bupivacaine is commonly used for spinal blocks.

**Supportive and miscellaneous equipment**

- Intravenous (IV) access equipment: Cannulae, IV fluids, giving sets, and warming devices to combat hypothermia in trauma patients.
- Arrow EZ-IO Intraosseous Vascular access system
- Fluid warmers: For trauma patients at risk of hypothermia.
- Portable ventilator: Essential for transporting intubated patients.
- Defibrillator: A portable, battery-powered defibrillator.
- Blood products and refrigeration: Portable refrigerators are necessary for storing blood products safely.
- Thermal blankets (ideally rechargeable)
- Medivac emergency packs
- Tracheostomy kit
- HY2000Si HYUNDAI 2000W Petrol Inverter Generators 2000w inverter generator, pure sine wave, safe for charging medical equipment.

**Equipment needed for neonatal and paediatric anaesthesia emergencies to fit in bag/case**

| **AIRWAY** | **Sizing** | |
|---|---|---|
| Laryngoscope | Macintosh (curved) blades 0-4 | |
| | Miller (straight) blades 0-4 | |
| Endotracheal Tubes | 2.5- 6 cuffed & uncuffed | |
| Introducer/ stylet | Adult & paediatric (2mm / 3.5mm) | |
| Bougie | paediatric (5 Ch) | |
| Securing Strapping/ tape | | |
| Magills forceps | Adult & paediatric | |
| Bag-Valve Mask Device | Adult - 1000ml | |
| | Infant 500 ml | |

| | | |
|---|---|---|
| Face Mask for BVM | Round – 00/0/1/2<br>Anatomical range of sizes | |
| Oropharyngeal Airway | 000,00, 0,1, 2, 3, 4 | |
| Laryngeal Mask Airway | 0/ 1/ 1.5/ 2/ 2.5/ 3 | |
| Suction Catheter* | 5F, 6F, 7F, 8F, 10F, 12F | |
| Yankauer catheter tip | Adult & paediatric | |
| **OXYGEN DELIVERY DEVICES** | | |
| Simple Oxygen mask | infant, child and adult | Non-venturi, delivers 35-50% |
| Non rebreather mask/ | infant, child and adult | 60-90% |
| **IV ACCESS & SUPPLIES** | | |
| Intravenous Cannula | 18G to 24 G | |
| Strapping/ securing for IV | | |
| Fluid administration sets | 60 dropper / blood administration | |
| IO needles | EZIO systems<br>Custom made IO needle – eg. Cooke needle<br>LP needle 18G x 1.5" (SHORT) pink<br>If nothing else available use plain 21G needle | |
| Needles | 15-25G | |
| Syringes | 1,2,5,10,20,50 ml | |
| Extension sets | T-piece /Y connector – flexible/ short/ lightweight | |
| 3 way tap | | |
| **OTHER** | | |
| Scissors | | |
| Stethoscope | | |

**Additional drugs for emergency care**

Adrenaline one milligram per 1ml for subcutaneous injection for **resuscitation**, for **anaphylaxis**, and as an **inotrope (when diluted)**
Frusemide 20 milligram per 2ml ampoules
Atropine one milligram per 1ml ampoules
GTN for acute cardiac failure

Hydrocortisone 100mg/ml for anaphylaxis
Chlorphenamine for severe allergy

Dextrose 50 percent 50ml ampules (diluted appropriately) for hypoglycaemia
Blood glucose test sticks for code free glucometer