

ESSENTIAL TRAUMA CARE PROJECT

CHECKLISTS FOR SURVEYS OF TRAUMA CARE CAPABILITIES

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and

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GUIDE TO USASGE OF CHECKLISTS

The *Guidelines for Essential Trauma Care* represent a consensus opinion derived by an international group of trauma care providers and planners as to the trauma care services that every country should be able to provide to injured person and the related human and physical resources to needed provide these services . The *Guidelines* spell these 260 items of human and physical resources out in detail, along with explanations, definitions, and rationale for their inclusion. The following checklists are meant to be tools to assist in evaluating a country's, area's or individual institution's capabilities in comparison to those recommended by the *Guidelines*. The rationale and detailed explanations of the items in the checklists are contained in the *Guidelines*. The checklists are best used after the *Guidelines* have been read by someone undertaking or organizing the survey.

1. Types of Checklists:

The checklists are divided into two sections:

A. Brief checklist. This contains a list of the most essential, highly critical, and cost-effective items in the *Guidelines*. Some of these are listed individually. Some are listed by overall service availability, taking into account both human and physical resources. In addition, some higher-order administrative and organizational capabilities are included, as they impact significantly on the ability to provide the gamut of trauma care services. The results of the brief checklist are meant to provide an overview of capabilities, to identify gross deficiencies and discrepancies, and to assist with sensitization of stakeholders as to the need for improvements. It is not meant to be an indepth analysis on which to base such future improvements. It is anticipated that in general it would take approximately 1 hour to complete this. The items contained herein might also be used as a component of a comprehensive, general, health care review

B. Full checklist. This contains all of the 260 individual items spelled out in the *Guidelines for Essential Trauma Care*. The checklists are organized based on the levels of health care systems delineated in the *Guidelines*. These include: basic facility, general practitioner staffed hospital, specialist staffed hospital, and tertiary care facility. For explanation of these levels, the reader is referred to the *Guidelines*. It is acknowledged that these categories are continuous and the boundaries between them not solid. Modifications are to be expected based on local needs. Furthermore, each item is specified by one of several levels of priority for the given level of the health care system. These include:

- **Essential:** Should be provided at that level of the health care system by any country at any economic level. These are the most critical and most cost-effective items of trauma care. By delineating Essential, the *Guidelines* imply not only the physical presence of an item or a person with requisite skills, but rather that the item in questions is in fact available, in a timely fashion, to all who need it, without regard to ability to pay. Cost recovery schemes and charges may indeed apply, but these should not preclude a seriously injured person receiving necessary timely care if they cannot pay in advance or guarantee payment. Items that are physically present, but not uniformly available to those who need them in a timely fashion, have not met the criteria of Essential.

- **Desirable:** Items that add value, but also cost, and that are not considered as cost-effective or as high a priority at that level of the health care system, as are Essential items. It is anticipated that countries or institutions may adapt these items based on their local situations. For example, these might be changed to Essential for countries with more abundant resources (e.g. middle income environments) or for individual institutions with particularly high trauma volumes, regardless of economic level of the country.
- **Possibly Required:** In environments with poorer access to resources, some trauma treatment capabilities might need to be shifted to lower levels of the health care system in order to increase their availability. Such services usually represent only minimal increased cost, relative to the provision of such services only at higher levels of the health care system. Shifting to a lower level in the health care system would usually imply that a provider with less advanced trauma-related training and skills would be performing procedures that might otherwise be performed by more highly trained personnel. Hence, it is to be emphasized that the “PR” designation is different from the “desirable” designation. PR represents a potential necessity to increase availability of trauma care services in environments with poorer access to resources. It is anticipated that the PR designation will apply primarily to low-income countries, but not to middle-income.
- **Irrelevant:** This implies that one would not ordinarily expect this capability at the given level of the health care system, even with full availability of resources.

It is anticipated that it would take approximately one half to two days to complete this checklist, depending on the level of the health care institution.

2. *Ratings of Capabilities.* The following general categorizations are suggested:

- NA = not applicable at that level;
- 0 = absent (and should be present);
- 1 = inadequate;
- 2 = partially adequate (present, but use not assured; present, but not all the time; present, but not readily available);
- 3 = adequate (present and used appropriately).

For items that are rate 1-2, it would generally be useful to clarify why the item is not fully adequate, e.g. medication that is present most of the time, but sometimes runs out; laboratory test that is available some of the time, but the machine is broken and awaiting repairs for prolonged periods; staff is present, but when goes home at night, no one to fill in to provide an otherwise essential service; etc).

3. *Context of Usage.* Either of the Brief or the Full checklist may be used in several fashions. They may be used by personnel at a given facility for self-assessment of their own institution’s capabilities. They may also be used by a professional body in a consultative or research fashion to better understand the capabilities in their area. Finally, they may be used by governmental or regulatory agencies as part of their oversight of institutions under their jurisdiction. Usage by external bodies, whether consultative, research, or regulatory, would likely involve collating data from: interviews with administrators, interviews with clinicians, physical inspection of facilities, and perhaps review of medical records.

BRIEF ESSENTIAL TRAUMA CARE CHECKLIST

This contains a list of the most essential, highly critical, and cost-effective items in the Guidelines. Some of these are listed individually. Some are listed by overall service availability, taking into account both human and physical resources. In addition, some higher order administrative and organizational capabilities are included, as they impact significantly on the ability to provide the gamut of trauma care services. The results of the brief checklist are meant to provide an overview of capabilities, to identify gross deficiencies and discrepancies, and to assist with sensitization of stakeholders as to the need for improvements. It is not meant to be an indepth analysis on which to base such future improvements. It is anticipated that in general it would take approximately 1 hour to complete this. The items contained herein could also be used as part of comprehensive, general, health care review

For each of the following, rate the item as to whether it is:

- NA = not applicable at that level;
- 0 = absent (and should be present);
- 1 = inadequate;
- 2 = partially adequate (present, but use not assured; present, but not all the time; present, but not readily available);
- 3 = adequate (present and used appropriately).

For items that are rated 1-2, it would generally be useful to clarify why the item is not fully adequate, e.g. medication that is present most of the time, but sometimes runs out; laboratory test that is available some of the time, but the machine is broken and awaiting repairs for prolonged periods; staff is present, but when goes home at night, no one to fill in to provide an otherwise essential service; etc). Each of the following items should be available 24 hours, seven days per week, unless otherwise specified. Each is Essential at all items of the health care system, unless otherwise specified.

1. *Basic airway management* (ability to detect airway obstruction and to treat with positioning and other manual maneuvers, as well as use of suction and oral or nasal airway):

Rating	Describe any deficiency:

2. *Advanced airway management* (endotracheal intubation and/or cricothyroidotomy and/or tracheostomy on emergency basis). This is Desirable at Basic and GP staffed hospital; Essential at Specialist and Tertiary Hospitals.

Rating	Describe any deficiency:

3. Chest tubes (including ability to perform insertion procedure safely and to maintain underwater seal drainage system safely). Irrelevant at Basic Level. Essential at all hospital levels.

Rating	
	Describe any deficiency:

4. Oxygen. Desirable at Basic Level. Essential at all hospital levels.

Rating	
	Describe any deficiency:

5. External hemorrhage control (including skills, as well as at least clean, preferably sterile, bandages). Essential at all levels.

Rating	
	Describe any deficiency:

6. IV access and appropriate fluids. Desirable at Basic Level. Essential at all hospital levels.

Rating	
	Describe any deficiency:

7. Blood transfusion capabilities. Irrelevant at Basic Level, generally. Essential at all hospital levels.

Rating	
	Describe any deficiency:

8. Splinting of fractures. Essential at all levels.

Rating	
	Describe any deficiency:

9. Basic closed fracture management (external reduction, POP application). Possibly required at Basic and GP Hospital levels. Essential at Specialist and Tertiary Hospitals.

Rating	
	Describe any deficiency:

10. Wound care, including debridement and irrigation, on emergency basis. Possibly required at Basic and GP Hospital levels. Essential at Specialist and Tertiary Hospitals.

Rating	
	Describe any deficiency:

11. External fixation. Possibly required at Basic and GP Hospital levels. Essential at Specialist and Tertiary Hospitals. Required on a timely, but not 24 hour basis.

Rating	
	Describe any deficiency:

12. Internal fixation. Irrelevant at Basic level. Possibly required at GP Hospital levels. Essential at Specialist and Tertiary Hospitals. Required on a timely, but not 24 hour basis.

Rating	
	Describe any deficiency:

13. Spinal immobilization (Cervical collar; spine back board or other method to immobilize, at least temporarily, thoraco-lumbar spinal injuries). Desirable at Basic level. Essential at all hospital levels.

Rating	
	Describe any deficiency:

Items 14 – 17 refer to organizational and administrative capabilities, rather than clinical capabilities. These are more likely to be pertinent at hospitals, rather than at the basic level. However, they are pertinent for any facility that handles a substantial volume of trauma cases. Substantial is defined on a local needs basis.

14. Organized documentation of trauma cases, including ability to indicate how many trauma cases were cared for or admitted to a given institution during a specified period of time.

Rating	
	Describe any deficiency:

15. CME course certification in trauma care within past four years for all first line care providers who handle substantial numbers of trauma cases. Substantial is defined on a local needs basis. This applies to both doctors and nurses and other clinicians, as appropriate.

Rating	
	Describe any deficiency:

16. Trauma quality improvement program. This implies that trauma cases are integrated into any ongoing quality improvement mechanism, as appropriate for the volume of trauma cases at a given facility. For higher volume hospitals, this would imply a trauma registry, with risk adjustment, and identification of preventable deaths.

Rating	
	Describe any deficiency:

17. Trauma team. Clinicians with pre-assigned roles during major trauma resuscitations. This also implies some training in this regard and / or monitoring of the functioning of the pre-assigned roles. This is more likely to be applicable to institutions with multiple staff who respond to trauma resuscitations and thus is more likely to apply to hospitals, especially specialist staffed and tertiary.

Rating	
	Describe any deficiency:

FULL ESSENTIAL TRAUMA CARE CHECKLIST

This contains all of the 260 individual items spelled out in the Guidelines for Essential Trauma Care. The checklists are organized based on the levels of health care systems delineated in the *Guidelines*. These include: basic facility, general practitioner staffed hospital, specialist staffed hospital, and tertiary care facility. For explanation of these levels, the reader is referred to the *Guidelines*. It is acknowledged that these categories are continuous and the boundaries between them not solid. Modifications are to be expected based on local needs. Furthermore, each item is specified by one of several levels of priority for the given level of the health care system.

For each item in the checklist, rate the item as to whether it is:

- NA = not applicable at that level;
- 0 = absent (and should be present);
- 1 = inadequate;
- 2 = partially adequate (present, but use not assured; present, but not all the time; present, but not readily available);
- 3 = adequate (present and used appropriately).

For items that are rated 1-2, it would generally be useful to clarify why the item is not fully adequate, e.g. medication that is present most of the time, but sometimes runs out; laboratory test that is available some of the time, but the machine is broken and awaiting repairs for prolonged periods; staff is present, but when goes home at night, no one to fill in to provide an otherwise essential service; etc). Each of the following items should be available 24 hours, seven days per week, unless otherwise specified.

FULL ESSENTIAL TRAUMA CARE CHECKLIST: Basic Level

Table 1
Airway management

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Airway: knowledge & skills</i>			
Assessment of airway compromise	E		
Manual manoeuvres (chin lift, jaw thrust, recovery position, etc.)	E		
Insertion of oral or nasal airway	D		
Use of suction	D		
Assisted ventilation using bag–valve–mask	D		
Endotracheal intubation	D		
Cricothyroidotomy (with or without tracheostomy)	D		
<i>Airway: equipment & supplies</i>			
Oral or nasal airway	D		
Suction device: at least manual (bulb) or foot pump	D		
Suction device: powered: electric/pneumatic	D		
Suction tubing	D		
Yankauer or other stiff suction tip	D		
Laryngoscope	D		
Endotracheal tube	D		
Oesophageal detector device	D		
Bag–valve–mask	D		
Basic trauma pack	D		
Magill forceps	D		

¹For each item in the checklist, rate the item as to whether it is:

- NA = not applicable at that level;
- 0 = absent (and should be present);
- 1 = inadequate;
- 2 = partially adequate (present, but use not assured; present, but not all the time; present, but not readily available);
- 3 = adequate (present and used appropriately).

Table 2
Breathing – Management of respiratory distress

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Breathing: knowledge & skills</i>			
Assessment of respiratory distress and adequacy of ventilation	E		
Administration of oxygen	D		
Needle thoracostomy	D		
Three-way dressing	E		
<i>Breathing: equipment & supplies</i>			
Stethoscope	E		
Oxygen supply (cylinder, concentrator or other source)	D		
Nasal prongs, face mask, associated tubing	D		
Needle & syringe	D		
Bag–valve–mask	D		

Table 3

Circulation and shock

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Circulation: knowledge & skills</i>			
<i>Assessment and external control of haemorrhage</i>			
Assessment of shock	E		
Compression for control of haemorrhage	E		
Arterial tourniquet in extreme situations	E		
Splinting of fractures for haemorrhage control	E		
Deep interfascial packing for severe wounds (e.g. landmine)	D		
Pelvic wrap for haemorrhage control	D		
<i>Fluid resuscitation</i>			
Knowledge of fluid resuscitation	D		
Peripheral percutaneous intravenous access	D		
Peripheral cutdown access	D		
Intraosseous access for children under 5 years	D		
<i>Monitoring</i>			
Knowledge of resuscitation parameters	D		
<i>Other</i>			
Differential diagnosis of causes of shock	D		
Recognition of hypothermia	E		
External rewarming in hypothermia	E		

Table 3

Circulation and shock (continued)

<i>Circulation: equipment & supplies</i>	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Assessment and external control of haemorrhage</i>			
Clock or watch with second hand	E		
Stethoscope	E		
Blood pressure (BP) cuff	E		
Gauze and bandages	E		
Arterial tourniquet in extreme situations	E		
<i>Fluid resuscitation</i>			
Crystalloid	D		
Colloids	D		
Intravenous infusion set (lines and cannulas)	D		
Intraosseous needle or equivalent	D		
<i>Monitoring</i>			
Stethoscope	E		
Blood pressure (BP) cuff	E		
Urinary catheter	D		
Laboratory facilities for haemoglobin or haematocrit	D		
<i>Other</i>			
Nasogastric (NG) tube	D		
Thermometer	E		
Weighing scale for children	D		

Table 4
Head injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Recognize altered consciousness; lateralizing signs, pupils	E		
Maintain normotension and oxygenation to prevent secondary brain injury	D		
Avoid overhydration in the presence of raised ICP ¹ (with normal BP)	D		

¹ICP: Intracranial pressure

Table 5
Neck injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Recognize platysmal penetration	D		
External pressure for bleeding	E		
Packing, balloon tamponade for bleeding	D		

Table 6
Chest injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Adequate pain control for chest injuries/rib fractures	D		

Table 7
Abdominal injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Clinical assessment	E		

Table 8
Extremity injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Recognition of neurovascular compromise; disability-prone injuries	E		
Basic immobilization (sling, splint)	E		
Spine board	D		
Wrapping of pelvic fractures for haemorrhage control	E		
Closed reduction	PR		
Hand injury: assessment and basic splinting	E		
X-ray	D		
Proper management of immobilized patient to prevent complications	D		

Table 9
Spinal injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Assessment – recognition of presence or risk of spinal injury	E		
Immobilization: C-collar, backboard	D		
Monitoring of neurological function	E		
Maintain normotension and oxygenation to prevent secondary neurological injury	D		
Holistic approach to prevention of complications – especially pressure sores and urinary retention/infection	D		

Table 10
Burns and wounds

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
<i>Burns</i>			
Assessment of depth and extent	E		
Sterile dressings	D		
Clean dressings	E		
Topical antibiotic dressings	D		
<i>Wounds</i>			
Assess wounds for potential mortality and disability	E		
Non-surgical management: clean and dress	E		
Minor surgical: clean, suture	PR		
Tetanus prophylaxis (toxoid, antiserum)	D ¹		

¹ Tetanus prophylaxis should be essential at any basic facility at which there is refrigeration.

Table 11
Rehabilitation

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
PT/OT ¹ for recovery of extremity injuries	D		
Psychological counselling	D		

¹ PT/OT: physiotherapy/occupational therapy

Table 12

Pain control and medicines.

The entire table may be used for an indepth review of medication availability. However, as a briefer alternative, a general sense of medication availability may also be obtained, as it pertains to trauma care. For example:

Are any medications required to be purchased by patients or relatives (as opposed to being supplied and charged for later)?

Do any medications run out in the hospital pharmacy, at which times patients or relatives need to purchase them from private pharmacies and bring them to hospital?

Are any of the above, medications that are needed for emergency trauma care, such as IV fluids or anesthetics?

Are any of the above, medications that are needed for urgent trauma care, such as antibiotics?

Do any of the above considerations create barriers to patients receiving the medications needed for trauma care?

Table 12
Pain control and medicines

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Anaesthesia (WHO EML² section 1)</i>			
lidocaine (or equivalent)	D		
oxygen	D		
diazepam (or equivalent)	D		
atropine	D		
<i>Pain, fever, inflammation (WHO EML section 2)</i>			
morphine (or equivalent)	D		
codeine (or equivalent)	D		
acetylsalicylic acid	E		
ibuprofen (or equivalent)	D		
paracetamol (acetaminophen)	E		
<i>Anaphylaxis (WHO EML section 3)</i>			
dexamethasone, hydrocortisone (or other equivalent steroid)	D		
epinephrine	D		
<i>Poisoning (WHO EML section 4)</i>			
naloxone	D		
<i>Anticonvulsants (WHO EML section 5)</i>			
phenobarbital	D		
phenytoin	D		
magnesium sulphate	D		
<i>Infections (WHO EML section 6)</i>			
amoxicillin/ampicillin	D		
amoxicillin & clavulanic acid (C) ²	D		
benzylpenicillin	D		
chloramphenicol	D		
ciprofloxacin (or equivalent)	D		
cloxacillin (or equivalent)	D		
gentamicin (or equivalent)	D		
metronidazole	D		
sulfamethoxazole & trimethoprim (or equivalent)	D		

Pain control and medicines (continued)

<i>Blood products and plasma expanders (WHO EML section 11)</i>			
dextran 70, polygeline (or equivalent)	D		
<i>Skin diseases: topical applications (WHO EML section 13)</i>			
sulfadiazine	D		
<i>Antiseptics and disinfectants (WHO EML section 15)</i>			
antiseptics: chlorhexidine, ethanol, polyvidone or equivalent	E		
disinfectants: chlorine base compound, chloroxylenol, glutaral or equivalent	D		
<i>Diuretics (WHO EML section 16)</i>			
furosemide (or equivalent)	D		
mannitol (C)	D		
<i>Fluid and electrolyte balance (WHO EML section 26)</i>			
glucose solution (5%, 50%)	D		
normal saline solution (0.9% isotonic)	D		
glucose with sodium chloride (4% glucose, 0.18% NaCl)	D		
Ringer's lactate solution (or equivalent)	D		
potassium chloride solution	D		

¹ EML: WHO's *Model list of essential medicines* (WHO, 2002)

² C: WHO's *Complementary model list*

Table 13

Diagnosis and monitoring

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
<i>Monitoring</i>			
Stethoscope	E		
Blood pressure cuff	E		
Torch (flashlight)	E		
Thermometer	E		
Foetal stethoscope	D		
Urinary catheter with collection bag	D		
<i>Radiological investigations</i>			
Plain films	D		
<i>Laboratory tests</i>			
Haemoglobin/haematocrit	D		
<i>Other</i>			
Paediatric length-based (Broselow) tape	D		
Otoscope	D		
Ophthalmoscope	D		

Table 14

Safety for health care personnel

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Safety for health care personnel</i>			
Training in universal precautions	E		
Gloves	E		
Goggles	E		
Sharps disposal	E		
Biological waste disposal	E		
Gowns	D		
Post-exposure prophylaxis for HIV	D		

FULL ESSENTIAL TRAUMA CARE CHECKLIST: GP Hospital Level

Table 1
Airway management

	<i>EsTC Designation</i>	<i>Rating¹</i>	<i>Describe any deficiency</i>
<i>Airway: knowledge & skills</i>			
Assessment of airway compromise	E		
Manual manoeuvres (chin lift, jaw thrust, recovery position, etc.)	E		
Insertion of oral or nasal airway	E		
Use of suction	E		
Assisted ventilation using bag–valve–mask	E		
Endotracheal intubation	D		
Cricothyroidotomy (with or without tracheostomy)	D		
<i>Airway: equipment & supplies</i>			
Oral or nasal airway	E		
Suction device: at least manual (bulb) or foot pump	E		
Suction device: powered: electric/pneumatic	D		
Suction tubing	E		
Yankauer or other stiff suction tip	E		
Laryngoscope	D		
Endotracheal tube	D		
Oesophageal detector device	D		
Bag–valve–mask	D		
Basic trauma pack	E		
Magill forceps	D		
Capnography	D		
Other advanced airway equipment	D		

¹For each item in the checklist, rate the item as to whether it is:

- NA = not applicable at that level;
- 0 = absent (and should be present);
- 1 = inadequate;
- 2 = partially adequate (present, but use not assured; present, but not all the time; present, but not readily available);
- 3 = adequate (present and used appropriately).

Table 2

Breathing – Management of respiratory distress

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Breathing: knowledge & skills</i>			
Assessment of respiratory distress and adequacy of ventilation	E		
Administration of oxygen	E		
Needle thoracostomy	E		
Chest tube insertion	E		
Three-way dressing	E		
<i>Breathing: equipment & supplies</i>			
Stethoscope	E		
Oxygen supply (cylinder, concentrator or other source)	E		
Nasal prongs, face mask, associated tubing	E		
Needle & syringe	E		
Chest tubes	E		
Underwater seal bottle (or equivalent)	E		
Pulse oximetry	D		
Arterial blood gas measurements	D		
Bag–valve–mask	E		

Table 3

Circulation and shock

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Circulation: knowledge & skills</i>			
<i>Assessment and external control of haemorrhage</i>			
Assessment of shock	E		
Compression for control of haemorrhage	E		
Arterial tourniquet in extreme situations	E		
Splinting of fractures for haemorrhage control	E		
Deep interfascial packing for severe wounds (e.g. landmine)	E		
Pelvic wrap for haemorrhage control	E		
<i>Fluid resuscitation</i>			
Knowledge of fluid resuscitation	E		
Peripheral percutaneous intravenous access	E		
Peripheral cutdown access	E		
Central venous access for fluid administration	D		
Intraosseous access for children under 5 years	D		
Transfusion knowledge and skills	E		
<i>Monitoring</i>			
Knowledge of resuscitation parameters	E		
More advanced monitoring (central venous pressure)	D		
<i>Other</i>			
Differential diagnosis of causes of shock	E		
Use of pressors in neurogenic (spinal) shock	D		
Use of fluids and antibiotics for septic shock	E		
Recognition of hypothermia	E		
External rewarming in hypothermia	E		
Use of warmed fluids	D		
Knowledge of core rewarming	D		

Table 3

Circulation and shock (continued)

<i>Circulation: equipment & supplies</i>	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Assessment and external control of haemorrhage</i>			
Clock or watch with second hand	E		
Stethoscope	E		
Blood pressure (BP) cuff	E		
Gauze and bandages	E		
Arterial tourniquet in extreme situations	E		
<i>Fluid resuscitation</i>			
Crystalloid	E		
Colloids	D		
Blood transfusion capabilities	E		
Intravenous infusion set (lines and cannulas)	E		
Intraosseous needle or equivalent	D		
Central venous lines	D		
<i>Monitoring</i>			
Stethoscope	E		
Blood pressure (BP) cuff	E		
Urinary catheter	E		
Electronic cardiac monitoring	D		
Monitoring of central venous pressure	D		
Laboratory facilities for haemoglobin or haematocrit	E		
Laboratory facilities for electrolytes, lactate and arterial blood gases	D		
<i>Other</i>			
Pressors (for neurogenic/spinal shock)	D		
Nasogastric (NG) tube	E		
Thermometer	E		
Fluid warmers	D		
Weighing scale for children	E		

Table 4
Head injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Recognize altered consciousness; lateralizing signs, pupils	E		
Maintain normotension and oxygenation to prevent secondary brain injury	E		
Avoid overhydration in the presence of raised ICP ¹ (with normal BP)	E		
CT ² scans	D		
Burr holes (skill plus drill or other suitable equipment)	PR		
<i>Surgical treatment of open depressed skull fractures</i>	PR		
Maintenance of requirements for protein and calories	E		

¹ICP: Intracranial pressure

²CT: Computerized axial tomography

Table 5
Neck injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Recognize platysmal penetration	E		
External pressure for bleeding	E		
Packing, balloon tamponade for bleeding	D		
Surgical skills to explore neck	PR		

Table 6
Chest injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Autotransfusion from chest tubes	D		
Adequate pain control for chest injuries/rib fractures	E		
Respiratory therapy for chest injuries/rib fractures	E		
Rib block or intrapleural block	PR		

Table 7

Abdominal injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Clinical assessment	E		
Diagnostic peritoneal lavage (DPL)	D		
Ultrasonography	D		
Skills and equipment for intermediate laparotomy	PR		

Table 8

Extremity injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Recognition of neurovascular compromise; disability-prone injuries	E		
Basic immobilization (sling, splint)	E		
Spine board	E		
Wrapping of pelvic fractures for haemorrhage control	E		
Skin traction	PR		
Closed reduction	PR		
Skeletal traction	PR		
Operative wound management	PR		
External fixation (or its functional equivalent: pins & plaster)	PR		
Tendon repair	PR		
Hand injury: assessment and basic splinting	E		
Hands: debride, fix	PR		
Measurement of compartment pressures	D		
Fasciotomy for compartment syndrome	PR		
Amputation	PR		
X-ray	D		
Portable X-ray	D		
Proper management of immobilized patient to prevent complications	E		

Table 9
Spinal injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Assessment – recognition of presence or risk of spinal injury	E		
Immobilization: C-collar, backboard	E		
Monitoring of neurological function	E		
Maintain normotension and oxygenation to prevent secondary neurological injury	E		
Holistic approach to prevention of complications – especially pressure sores and urinary retention/infection	E		
CT ¹ scan	D		
Non-surgical management of spinal injury (as indicated)	PR		

¹CT: Computerized axial tomography

Table 10
Burns and wounds

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
<i>Burns</i>			
Assessment of depth and extent	E		
Sterile dressings	E		
Topical antibiotic dressings	E		
Debridement	PR		
Escharotomy	PR		
Skin graft	PR		
Physiotherapy and splints to prevent contractures in burn wounds	E		
<i>Wounds</i>			
Assess wounds for potential mortality and disability	E		
Non-surgical management: clean and dress	E		
Minor surgical: clean, suture	E		
Major surgical debridement and repair	PR		
Tetanus prophylaxis (toxoid, antiserum)	E		

Table 11
Rehabilitation

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
PT/OT ¹ for recovery of extremity injuries	E		
Psychological counselling	E		
Specialized rehabilitative nursing	I		
Discharge planning	E		

¹ PT/OT: physiotherapy/occupational therapy

Table 12
Pain control and medicines.

The entire table may be used for an indepth review of medication availability. However, as a briefer alternative, a general sense of medication availability may also be obtained, as it pertains to trauma care. For example:

Are any medications required to be purchased by patients or relatives (as opposed to being supplied and charged for later)?

Do any medications run out in the hospital pharmacy, at which times patients or relatives need to purchase them from private pharmacies and bring them to hospital?

Are any of the above, medications that are needed for emergency trauma care, such as IV fluids or anesthetics?

Are any of the above, medications that are needed for urgent trauma care, such as antibiotics?

Do any of the above considerations create barriers to patients receiving the medications needed for trauma care?

Table 12

Pain control and medicines

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Anaesthesia (WHO EML² section 1)</i>			
bupivacaine (or equivalent)	D		
general anaesthetic (ether, halothane or equivalent)	D		
ketamine	D		
lidocaine (or equivalent)	E		
nitrous oxide	D		
oxygen	E		
thiopental (or equivalent)	D		
diazepam (or equivalent)	E		
atropine	D		
<i>Pain, fever, inflammation (WHO EML section 2)</i>			
morphine (or equivalent)	E		
codeine (or equivalent)	E		
acetylsalicylic acid	E		
ibuprofen (or equivalent)	D		
paracetamol (acetaminophen)	E		
<i>Anaphylaxis (WHO EML section 3)</i>			
dexamethasone, hydrocortisone (or other equivalent steroid)	E		
epinephrine	E		
<i>Poisoning (WHO EML section 4)</i>			
naloxone	E		
<i>Anticonvulsants (WHO EML section 5)</i>			
phenobarbital	E		
phenytoin	E		
magnesium sulphate	E		
<i>Infections (WHO EML section 6)</i>			
amoxicillin/ampicillin	E		
amoxicillin & clavulanic acid (C) ²	D		
amphotericin	D		
benzylpenicillin	E		
ceftazidime (C)	D		
ceftriaxone (C)	D		

Pain control and medicines (continued)

chloramphenicol	E		
ciprofloxacin (or equivalent)	D		
clindamycin (C)	D		
cloxacillin (or equivalent)	E		
fluconazole (or equivalent)	D		
gentamicin (or equivalent)	E		
imipenem & cilastin (C)	D		
levofloxacin (C)	D		
metronidazole	E		
sulfamethoxazole & trimethoprim (or equivalent)	E		
<i>Medicines affecting the blood (section 10)</i>			
heparin	D		
warfarin (or equivalent)	D		
<i>Blood products and plasma expanders (WHO EML section 11)</i>			
dextran 70, polygeline (or equivalent)	D		
factor IX concentrate (C)	D		
factor VIII concentrate (C)	D		
<i>Cardiovascular disorders (WHO EML section 12)</i>			
dopamine	D		
epinephrine (C)	D		
<i>Skin diseases: topical applications (WHO EML section 13)</i>			
sulfadiazine	E		
<i>Antiseptics and disinfectants (WHO EML section 15)</i>			
antiseptics: chlorhexidine, ethanol, polyvidone or equivalent	E		
disinfectants: chlorine base compound, chloroxylenol, glutaral or equivalent	E		
<i>Diuretics (WHO EML section 16)</i>			
furosemide (or equivalent)	E		
mannitol (C)	D		

Pain control and medicines (continued)

<i>Gastrointestinal disorders (WHO EML section 17)</i>			
aluminium hydroxide	E		
cimetidine (or equivalent)	D		
magnesium hydroxide	E		
<i>Hormone disorders (WHO EML section 18)</i>			
insulin	E		
<i>Muscle relaxants (WHO EML section 20)</i>			
alcuronium, suxamethonium or equivalent	D		
neostigmine (or equivalent)	D		
vecuronium (C)	D		
<i>Fluid and electrolyte balance (WHO EML section 26)</i>			
glucose solution (5%, 50%)	E		
normal saline solution (0.9% isotonic)	E		
glucose with sodium chloride (4% glucose, 0.18% NaCl)	D		
Ringer's lactate solution (or equivalent)	E		
potassium chloride solution	D		
<i>Vitamins and minerals (WHO EML section 27)</i>			
Calcium chloride/gluconate (C)	D		

¹ EML: WHO's *Model list of essential medicines* (WHO, 2002)

² C: WHO's *Complementary model list*

Table 13

Diagnosis and monitoring

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
<i>Monitoring</i>			
Stethoscope	E		
Blood pressure cuff	E		
Torch (flashlight)	E		
Thermometer	E		
Foetal stethoscope	E		
Urinary catheter with collection bag	E		
Electronic cardiac monitoring	D		
Pulse oximetry	D		
Central venous pressure monitoring	D		
<i>Radiological investigations</i>			
Plain films	D		
Portable plain films	D		
Ultrasound for trauma (haemoperitoneum)	D		
CT ¹	D		
<i>Laboratory tests</i>			
Haemoglobin/haematocrit	E		
Glucose	E		
Gram stain	D		
Bacterial cultures	D		
Electrolytes (Na, K, Cl, CO ₂ , BUN ² , creatinine)	D		
Arterial blood gas measurements	D		
<i>Other</i>			
Paediatric length-based (Broselow) tape	D		
Otoscope	E		
Ophthalmoscope	D		
Compartment pressure measurement	D		

¹CT: Computerized axial tomography; ²BUN: blood urea nitrogen

Table 14

Safety for health care personnel

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Safety for health care personnel</i>			
Training in universal precautions	E		
Gloves	E		
Goggles	E		
Sharps disposal	E		
Biological waste disposal	E		
Gowns	E		
Post-exposure prophylaxis for HIV	D		

FULL ESSENTIAL TRAUMA CARE CHECKLIST: Specialist Hospital and Tertiary Care Levels

Most items have the same designations for both levels.

Where these are different, the two levels are indicated as specialist / tertiary.

Table 1

Airway management

	<i>EsTC Designation</i>	<i>Rating¹</i>	<i>Describe any deficiency</i>
<i>Airway: knowledge & skills</i>			
Assessment of airway compromise	E		
Manual manoeuvres (chin lift, jaw thrust, recovery position, etc.)	E		
Insertion of oral or nasal airway	E		
Use of suction	E		
Assisted ventilation using bag–valve–mask	E		
Endotracheal intubation	E		
Cricothyroidotomy (with or without tracheostomy)	E		
<i>Airway: equipment & supplies</i>			
Oral or nasal airway	E		
Suction device: at least manual (bulb) or foot pump	E		
Suction device: powered: electric/pneumatic	D		
Suction tubing	E		
Yankauer or other stiff suction tip	E		
Laryngoscope	E		
Endotracheal tube	E		
Oesophageal detector device	E		
Bag–valve–mask	E		
Basic trauma pack	E		
Magill forceps	E		
Capnography	D		
Other advanced airway equipment	D		

¹For each item in the checklist, rate the item as to whether it is:

- NA = not applicable at that level;
- 0 = absent (and should be present);
- 1 = inadequate;
- 2 = partially adequate (present, but use not assured; present, but not all the time; present, but not readily available);
- 3 = adequate (present and used appropriately).

Table 2

Breathing – Management of respiratory distress

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Breathing: knowledge & skills</i>			
Assessment of respiratory distress and adequacy of ventilation	E		
Administration of oxygen	E		
Needle thoracostomy	E		
Chest tube insertion	E		
Three-way dressing	E		
<i>Breathing: equipment & supplies</i>			
Stethoscope	E		
Oxygen supply (cylinder, concentrator or other source)	E		
Nasal prongs, face mask, associated tubing	E		
Needle & syringe	E		
Chest tubes	E		
Underwater seal bottle (or equivalent)	E		
Pulse oximetry	D		
Arterial blood gas measurements	D		
Bag–valve–mask	E		
Mechanical ventilator	D		

Table 3

Circulation and shock

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Circulation: knowledge & skills</i>			
<i>Assessment and external control of haemorrhage</i>			
Assessment of shock	E		
Compression for control of haemorrhage	E		
Arterial tourniquet in extreme situations	E		
Splinting of fractures for haemorrhage control	E		
Deep interfascial packing for severe wounds (e.g. landmine)	E		
Pelvic wrap for haemorrhage control	E		
<i>Fluid resuscitation</i>			
Knowledge of fluid resuscitation	E		
Peripheral percutaneous intravenous access	E		
Peripheral cutdown access	E		
Central venous access for fluid administration	E		
Intraosseous access for children under 5 years	E		
Transfusion knowledge and skills	E		
<i>Monitoring</i>			
Knowledge of resuscitation parameters	E		
More advanced monitoring (central venous pressure)	D		
More advanced monitoring (right heart)	D		
<i>Other</i>			
Differential diagnosis of causes of shock	E		
Use of pressors in neurogenic (spinal) shock	D		
Use of fluids and antibiotics for septic shock	E		
Recognition of hypothermia	E		
External rewarming in hypothermia	E		
Use of warmed fluids	E		
Knowledge of core rewarming	E		

Table 3

Circulation and shock (continued)

<i>Circulation: equipment & supplies</i>	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Assessment and external control of haemorrhage</i>			
Clock or watch with second hand	E		
Stethoscope	E		
Blood pressure (BP) cuff	E		
Gauze and bandages	E		
Arterial tourniquet in extreme situations	E		
<i>Fluid resuscitation</i>			
Crystalloid	E		
Colloids	D		
Blood transfusion capabilities	E		
Intravenous infusion set (lines and cannulas)	E		
Intraosseous needle or equivalent	E		
Central venous lines	E		
<i>Monitoring</i>			
Stethoscope	E		
Blood pressure (BP) cuff	E		
Urinary catheter	E		
Electronic cardiac monitoring	D		
Monitoring of central venous pressure	D		
Right-heart catheterization	D		
Laboratory facilities for haemoglobin or haematocrit	E		
Laboratory facilities for electrolytes, lactate and arterial blood gases	D		
<i>Other</i>			
Pressors (for neurogenic/spinal shock)	D		
Nasogastric (NG) tube	E		
Thermometer	E		
Fluid warmers	D		
Weighing scale for children	E		

Table 4
Head injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Recognize altered consciousness; lateralizing signs, pupils	E		
Full compliance with AANS ¹ guidelines for head injury	D		
Maintain normotension and oxygenation to prevent secondary brain injury	E		
Avoid overhydration in the presence of raised ICP ² (with normal BP)	E		
Monitoring and treatment of raised ICP	D		
CT ³ scans	D		
Burr holes (skill plus drill or other suitable equipment)	D / E		
More advanced neurosurgical procedures	PR / D		
Surgical treatment of open depressed skull fractures	D / E		
Surgical treatment of closed depressed skull fractures	PR / D		
Maintenance of requirements for protein and calories	E		

¹AANS: American Association of Neurological Surgeons

²ICP: Intracranial pressure

³CT: Computerized axial tomography

Table 5
Neck injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Recognize platysmal penetration	E		
External pressure for bleeding	E		
Packing, balloon tamponade for bleeding	D		
Contrast radiography, endoscopy	D / E		
Angiography	D		
Surgical skills to explore neck	E		

Table 6
Chest injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Autotransfusion from chest tubes	D		
Adequate pain control for chest injuries/rib fractures	E		
Respiratory therapy for chest injuries/rib fractures	E		
Rib block or intrapleural block	E		
Epidural analgesia	D		
Skills and equipment for intermediate thoracotomy	D / E		
Skills and equipment for advanced thoracotomy	I / D		

Table 7
Abdominal injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Clinical assessment	E		
Diagnostic peritoneal lavage (DPL)	E		
Ultrasonography	D		
CT ¹ scan	D		
Skills and equipment for intermediate laparotomy	E		
Skills and equipment for advanced laparotomy	E		

¹CT: Computerized axial tomography

Table 8
Extremity injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Recognition of neurovascular compromise; disability-prone injuries	E		
Basic immobilization (sling, splint)	E		
Spine board	E		
Wrapping of pelvic fractures for haemorrhage control	E		
Skin traction	E		
Closed reduction	E		
Skeletal traction	E		
Operative wound management	E		
External fixation (or its functional equivalent: pins & plaster)	E		
Internal fixation	E		
Tendon repair	E		
Hand injury: assessment and basic splinting	E		
Hands: debride, fix	E		
Measurement of compartment pressures	D / E		
Fasciotomy for compartment syndrome	D / E		
Amputation	E		
X-ray	E		
Portable X-ray	D / E		
Image intensification	D		
Proper management of immobilized patient to prevent complications	E		

Table 9
Spinal injury

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
Assessment – recognition of presence or risk of spinal injury	E		
Immobilization: C-collar, backboard	E		
Monitoring of neurological function	E		
Assessment by International Classification System	D / E		
Maintain normotension and oxygenation to prevent secondary neurological injury	E		
Holistic approach to prevention of complications – especially pressure sores and urinary retention/infection	E		
CT ¹ scan	D		
MRI ²	D		
Full compliance with AANS ³ guidelines	D		
Non-surgical management of spinal injury (as indicated)	E		
Surgical treatment of spinal injury	PR / E		
Surgical treatment of neurological deterioration in the presence of spinal cord compression	PR / E		

¹CT: Computerized axial tomography

²MRI: Magnetic resonance imaging

³AANS: American Association of Neurological Surgeons

Table 10

Burns and wounds

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
<i>Burns</i>			
Assessment of depth and extent	E		
Sterile dressings	E		
Topical antibiotic dressings	E		
Debridement	E		
Escharotomy	E		
Skin graft	E		
Early excision and grafting	D		
Physiotherapy and splints to prevent contractures in burn wounds	E		
Reconstructive surgery	D / E		
<i>Wounds</i>			
Assess wounds for potential mortality and disability	E		
Non-surgical management: clean and dress	E		
Minor surgical: clean, suture	E		
Major surgical debridement and repair	E		
Tetanus prophylaxis (toxoid, antiserum)	E		

Table 11

Rehabilitation

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
PT/OT ¹ for recovery of extremity injuries	E		
Full spectrum of physiotherapy	D		
Full spectrum of occupational therapy	D		
Prosthetics	D / E		
Psychological counselling	E		
Neuropsychology for cognitive dysfunction	D		
Speech pathology	D		
Physical medicine and rehabilitation specialist-level care	D		
<i>Electromyography</i>	D		
Specialized rehabilitative nursing	D		
Discharge planning	E		

¹ PT/OT: physiotherapy/occupational therapy

Table 12

Pain control and medicines.

The entire table may be used for an indepth review of medication availability. However, as a briefer alternative, a general sense of medication availability may also be obtained, as it pertains to trauma care. For example:

Are any medications required to be purchased by patients or relatives (as opposed to being supplied and charged for later)?

Do any medications run out in the hospital pharmacy, at which times patients or relatives need to purchase them from private pharmacies and bring them to hospital?

Are any of the above, medications that are needed for emergency trauma care, such as IV fluids or anesthetics?

Are any of the above, medications that are needed for urgent trauma care, such as antibiotics?

Do any of the above considerations create barriers to patients receiving the medications needed for trauma care?

Table 12

Pain control and medicines

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Anaesthesia (WHO EML² section 1)</i>			
bupivacaine (or equivalent)	E		
general anaesthetic (ether, halothane or equivalent)	E		
ketamine	E		
lidocaine (or equivalent)	E		
nitrous oxide	E		
oxygen	E		
thiopental (or equivalent)	E		
diazepam (or equivalent)	E		
atropine	E		
<i>Pain, fever, inflammation (WHO EML section 2)</i>			
morphine (or equivalent)	E		
codeine (or equivalent)	E		
acetylsalicylic acid	E		
ibuprofen (or equivalent)	E		
paracetamol (acetaminophen)	E		
<i>Anaphylaxis (WHO EML section 3)</i>			
dexamethasone, hydrocortisone (or other equivalent steroid)	E		
epinephrine	E		
<i>Poisoning (WHO EML section 4)</i>			
naloxone	E		
<i>Anticonvulsants (WHO EML section 5)</i>			
phenobarbital	E		
phenytoin	E		
magnesium sulphate	E		
<i>Infections (WHO EML section 6)</i>			
amoxicillin/ampicillin	E		
amoxicillin & clavulanic acid (C) ²	D		
amphotericin	E		
benzylpenicillin	E		
ceftazidime (C)	D		
ceftriaxone (C)	D		

Pain control and medicines (continued)

chloramphenicol	E		
ciprofloxacin (or equivalent)	E		
clindamycin (C)	D		
cloxacillin (or equivalent)	E		
fluconazole (or equivalent)	E		
gentamicin (or equivalent)	E		
imipenem & cilastin (C)	D		
levofloxacin (C)	D		
metronidazole	E		
sulfamethoxazole & trimethoprim (or equivalent)	E		
<i>Medicines affecting the blood (section 10)</i>			
heparin	E		
warfarin (or equivalent)	E		
<i>Blood products and plasma expanders (WHO EML section 11)</i>			
dextran 70, polygeline (or equivalent)	D		
factor IX concentrate (C)	D		
factor VIII concentrate (C)	D		
<i>Cardiovascular disorders (WHO EML section 12)</i>			
dopamine	D		
epinephrine (C)	D		
<i>Skin diseases: topical applications (WHO EML section 13)</i>			
sulfadiazine	E		
<i>Antiseptics and disinfectants (WHO EML section 15)</i>			
antiseptics: chlorhexidine, ethanol, polyvidone or equivalent	E		
disinfectants: chlorine base compound, chloroxylenol, glutaral or equivalent	E		
<i>Diuretics (WHO EML section 16)</i>			
furosemide (or equivalent)	E		
mannitol (C)	D		

Pain control and medicines (continued)

<i>Gastrointestinal disorders (WHO EML section 17)</i>			
aluminium hydroxide	E		
cimetidine (or equivalent)	E		
magnesium hydroxide	E		
<i>Hormone disorders (WHO EML section 18)</i>			
insulin	E		
<i>Muscle relaxants (WHO EML section 20)</i>			
alcuronium, suxamethonium or equivalent	E		
neostigmine (or equivalent)	E		
vecuronium (C)	D		
<i>Fluid and electrolyte balance (WHO EML section 26)</i>			
glucose solution (5%, 50%)	E		
normal saline solution (0.9% isotonic)	E		
glucose with sodium chloride (4% glucose, 0.18% NaCl)	D		
Ringer's lactate solution (or equivalent)	E		
potassium chloride solution	E		
<i>Vitamins and minerals (WHO EML section 27)</i>			
Calcium chloride/gluconate (C)	D		

¹ EML: WHO's *Model list of essential medicines* (WHO, 2002)

² C: WHO's *Complementary model list*

Table 13: Diagnosis and monitoring

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Resources</i>			
<i>Monitoring</i>			
Stethoscope	E		
Blood pressure cuff	E		
Torch (flashlight)	E		
Thermometer	E		
Foetal stethoscope	E		
Urinary catheter with collection bag	E		
Electronic cardiac monitoring	D		
Pulse oximetry	D		
Central venous pressure monitoring	D		
Right heart catheterization	D		
Intracranial pressure monitoring	D		
<i>Radiological investigations</i>			
Plain films	E		
Portable plain films	D / E		
Contrast radiography (barium / gastrograffin)	D		
Ultrasound for trauma (haemoperitoneum)	D		
CT ¹	D		
Angiography	D		
Image intensification/fluoroscopy	D		
MRI ²	D		
Nuclear medicine	D		
<i>Laboratory tests</i>			
Haemoglobin/haematocrit	E		
Glucose	E		
Gram stain	E		
Bacterial cultures	D / E		
Electrolytes (Na, K, Cl, CO ₂ , BUN ³ , creatinine)	D		
Arterial blood gas measurements	D		
Serum lactate	D		
<i>Other</i>			
Paediatric length-based (Broselow) tape	D		
Otoscope	E		
Ophthalmoscope	E		
Compartment pressure measurement	D / E		

¹CT: Computerized axial tomography; ²MRI: Magnetic resonance imaging; ³BUN: blood urea nitrogen

Table 14

Safety for health care personnel

	<i>EsTC Designation</i>	<i>Rating</i>	<i>Describe any deficiency</i>
<i>Safety for health care personnel</i>			
Training in universal precautions	E		
Gloves	E		
Goggles	E		
Sharps disposal	E		
Biological waste disposal	E		
Gowns	E		
Post-exposure prophylaxis for HIV	D		