

INTRODUCTION

Trauma to the abdomen can be extremely difficult to assess even in a hospital setting. In the field, identifying which abdominal structure/s has been injured is less important than identifying that abdominal trauma itself has occurred.

It is therefore, of major importance to note abnormal signs associated with blood loss, and establish that abdominal injury is the probable cause, rather than being concerned with, for example, whether the source of that abdominal bleeding originates from the spleen or liver.

There may be significant intra-abdominal injury with very few, if any, initial indications of this at the time the abdomen is examined by the Paramedic at the scene.

HISTORY

Observe the mechanism of injury.

In the road traffic collision (RTC) situation, look for impact speed and severity of deceleration. Was a seat belt worn? Lap belts are particularly associated with torn or perforated abdominal structures.

In cases of stabbing and gunshot wound, what was the length of the weapon or the type of gun and the range?

ASSESSMENT

Assess and correct deficits with:

- **AIRWAY**
- **BREATHING**
- **CIRCULATION**
- **DISABILITY** (mini neurological examination)

Evaluate whether a patient is **TIME CRITICAL/POTENTIALLY TIME CRITICAL or NON-TIME CRITICAL** following criteria as per trauma emergencies guideline.

If patient is **TIME CRITICAL/POTENTIALLY TIME CRITICAL**, immobilise cervical spine if indicated (*refer to neck and back guideline*) and go to nearest suitable receiving hospital with a Hospital Alert Message.

En-route – continue patient **MANAGEMENT** (*see below*).

In **NON-TIME CRITICAL** patients, perform a more thorough patient assessment with a brief secondary survey.

Specifically assess:

- assess both chest and abdomen as many abdominal organs are covered by the lower ribs, and the lower chest margins extend over abdominal structures (e.g. liver and spleen).
- examine abdomen for external wounds, contusions, seat belt abrasions, evisceration (protruding organs).
- assess for tenderness, guarding and rigidity by **GENTLE** palpation of all four areas (quadrants) of the abdomen.
- consider the potential for pelvic injuries and gently assess lower ribs for evidence of fractures.
- shoulder tip pain may indicate pathology in the abdomen which is irritating the diaphragm and should increase suspicion of injury.

NOTE: Many patients found later to have significant **INTRA-ABDOMINAL TRAUMA** show little or no evidence of this in the early stage, so do **NOT** rule out injury if initial examination is normal.

MANAGEMENT

Follow Trauma Emergencies Guideline, remembering to:

- ensure **ABCD's** and immobilise cervical spine (*refer to neck and back guideline*).

Respiration

- administer high concentration oxygen (O₂) (*refer to oxygen protocol for administration and information*) via a non-rebreathing mask, using the stoma in laryngectomy and other neck breathing patients. High concentration O₂ should be administered routinely, whatever the oxygen saturation, in patients sustaining major trauma and long bone fracture, except for patients with chronic obstructive pulmonary disease (COPD) (*refer to COPD guideline*).
- consider assisted ventilation at a rate of 12–20 respirations per minute if any of the following are present:
 - oxygen saturation (SpO₂) is <90% on high concentration O₂
 - respiratory rate is <10 or >30bpm
 - inadequate chest expansion.

Fluid Therapy

Obtain IV access.

Current research shows little evidence to support the routine use of IV fluids in adult trauma patients. In circumstances such as penetrating chest and abdominal trauma, survival worsens with the routine use of IV fluids.¹

Fluids may raise the blood pressure, cool the blood and dilute clotting factors, worsening haemorrhage. Therefore, current thinking is that fluids should only be given when major organ perfusion is impaired.

If there is visible external blood loss greater than 500mls, fluid replacement should be commenced with a 250ml bolus of crystalloid.

Central pulse **ABSENT**, radial pulse **ABSENT** is an absolute indication for urgent fluid. If the patient has a carotid pulse but no radial pulse then other clinical factors should also be considered before decision on fluid administration.

Central pulse **PRESENT**, radial pulse **ABSENT** is a relative indication for urgent fluid depending on other indications including tissue perfusion and blood loss.

Central pulse **PRESENT**, radial pulse **PRESENT DO NOT** commence fluid replacement,² unless there are other signs of poor central tissue perfusion (e.g. altered mental state, cardiac rhythm disturbance).

Re-assess vital signs prior to further fluid administration.

DO NOT delay at scene for fluid replacement; wherever possible cannulate and give fluid **EN-ROUTE TO HOSPITAL**.

Specifically consider:

- cover exposed bowel with warmed dressings soaked in crystalloid solution.
- **DO NOT** attempt to push organs back into the abdomen.
- impaling objects, e.g. a knife must be **LEFT IN-SITU** for removal under direct vision in the operating theatre. Any **impaling objects** should be adequately secured prior to transfer to further care. If the impaling object is pulsating, then it should not be completely immobilised, but allowed to pulsate.
- consider the mechanism of injury and immobilise as per the neck and back trauma guideline.
- if pain is severe, patient may self-administer Entonox (*refer to entonox drug protocol for administration and information*) but be cautious if the injury could also affect the thoracic cavity.

- in cases of more severe pain use appropriate analgesia (*refer to pain management guidelines*) as this has been shown to improve subsequent management.

ADDITIONAL INFORMATION

The abdomen is divided within into three anatomical areas:

1. **abdominal cavity**
2. **pelvis**
3. **retro-peritoneal area.**

1. Abdominal Cavity

The abdominal cavity extends from the diaphragm to the pelvis. It contains the stomach, small intestine, large intestine, liver, gall bladder and spleen.

Remember the upper abdominal organs are partly in the lower thorax and lie under the lower ribs. Fractures of lower ribs will endanger upper abdominal structures such as the **LIVER** and **SPLEEN**.

2. Pelvis

The pelvis contains the bladder, the lower part of the large intestine and, in the female, the uterus and ovaries. The iliac artery and vein lie over the posterior part of the pelvic ring and may be torn in pelvic fractures, adding to already major bleeding.

3. Retro-peritoneal Area

The retroperitoneal area lies against the posterior abdominal wall, and contains the kidneys and ureters, pancreas, abdominal aorta, vena cava, and part of the duodenum.

These structures are attached to the posterior abdominal wall, and are often injured by the shearing forces involved in rapid deceleration.

ABDOMINAL INJURIES

Blunt

This is the most common pattern of injury seen and is related to direct blows to the abdomen or rapid deceleration.

The spleen, liver and “tethered” structures such as duodenum, small bowel and aorta are the most commonly injured.

Penetrating

Stab wounds, gunshot wounds and other penetrating injuries.

Stab Wounds

Stab injuries **MUST** be assumed to have done serious damage until proved otherwise. Damage to liver, spleen or major blood vessels may cause massive haemorrhage. Mortality from isolated abdominal stab wounds is about 1-2%.

Remember that upper abdominal stab wounds may have caused major intra-thoracic damage, if the weapon was directed upwards (*refer to thoracic trauma guideline*).

Similarly, chest stabbing injuries may also cause intra-abdominal injury.

Gunshot Wounds

Gunshot wounds (GSW) tend to cause more direct than indirect injury, due to the forces involved and the chaotic paths that bullets may take. The same rules apply to associated intra-thoracic injuries.

Key Points – Abdominal Trauma

- Abdominal trauma can be difficult to assess.
- Identifying that abdominal trauma has occurred is more important than identifying which structure/s have been injured, therefore note signs associated with blood loss.
- Observe mechanism of injury.
- Ensure **ABC**'s and immobilise cervical spine.
- Transport to the nearest appropriate facility, providing an alert message en-route.

REFERENCES

- ¹ Turner J, Nicholl J, Webber L, Cox H, Dixon S, Yates D. A randomised controlled trial of pre-hospital intravenous fluid replacement therapy in serious trauma: The NHS Health Technology Assessment Programme 4(31), 2000.
- ² Revell M, Porter K, Greaves I. Fluid Resuscitation in Prehospital trauma care: a consensus view. *Emergency Medical Journal* 2002;19(494-98).

METHODOLOGY

Refer to methodology section; see below for abdominal trauma search strategy.

Abdominal trauma search strategy

Electronic databases searched:

- Ovid
- AMED
- British Nursing Index
- Medline
- CINAHL.

Search strategy:

(Assessment OR Examination) AND (Abdomen OR Abdominal)

(Trauma OR Injury) AND (Abdomen OR Abdominal).

Additional sources searched:

Prehospital Trauma Life Support (PHTLS) – <http://www.naemt.org/PHTLS>

The American Trauma Society – <http://www.amtrauma.org>

Trauma.org – <http://www.trauma.org>

Health Canada – <http://www.hc-sc.gc.ca>

The National Guideline Clearinghouse (NGC) – <http://www.guideline.gov>

Bickley LS. *Bates' Guide to Physical Examination and History Taking*. Philadelphia: Lippincott Williams & Wilkins, 2003

Caroline NL. *Emergency Care in the Streets*. Boston, Mass: Little, Brown and Company, 1995.