



NEW SOUTH WALES
INSTITUTE OF
TRAUMA AND INJURY
MANAGEMENT



The NSW Institute of Trauma and Injury Management in Conjunction
with the Trauma Department, Liverpool Hospital

ADULT TRAUMA CLINICAL PRACTICE GUIDELINES

Summary

Management of Hypovolaemic Shock in the Trauma Patient



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Important Notice

The “Management of Hypovolaemic Shock in the Trauma Patient” clinical practice guidelines are aimed at assisting clinicians in informed medical decision-making. They are not intended to replace decision-making. The authors appreciate the heterogeneity of the patient population and the signs and symptoms they may present with and the need to often modify management in light of a patient’s co-morbidities.

The guidelines are intended to provide a general guide to the management of specified injuries. The guidelines are not a definitive statement on the correct procedures, rather they constitute a general guide to be followed subject to the clinicians judgement in each case.

The information provided is based on the best available information at the time of writing, which is December 2004. These guidelines will therefore be updated every 5 years and consider new evidence as it becomes available.

These guidelines are intended for use in adults only.

All guidelines regarding pre-hospital care should be read and considered in conjunction with NSW Ambulance Service protocols.

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Algorithm:

The Management of Hypovolaemic Shock in the Trauma Patient

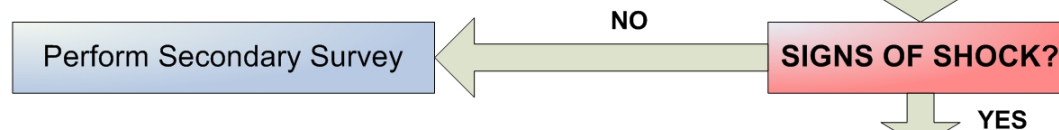
IF DEFINITIVE CARE IS NOT AVAILABLE IN YOUR FACILITY MAKE EARLY CONTACT WITH RETRIEVAL SERVICES

Primary Survey

Includes organising the trauma team, calling the surgeon and notifying blood bank. Also consider early call to Retrieval Services (MRU 1800 650 004).

<u>Airway:</u>	<u>Breathing</u>	<u>Circulation:</u>	<u>Disability:</u>	<u>Exposure Environment</u>	<u>Adjuncts:</u>
√ Protect airway, secure if unstable	√ Definitive control of airway	√ Secure venous access x 2 large bore cannula	√ Assess neurological status	√ Undress patient	√ X-ray
√ Airway adjunct as needed	√ Oxygen	√ Bloods: x-match, FBC, EUC's, Creatinine, ABG's, Blood ETOH	AVPU – Alert, Responds to Vocal/Painful stimuli, Unresponsive	√ Maintain temperature	• Chest
√ Control of c-spine	√ Bag and Mask	√ Control external bleeding			• Pelvis
					• Lateral C-spine

Remember: BP and HR will not identify all trauma patients who are in shock.
Assess: History and perfusion indices- **ABG's, base deficit, lactate, Hb and HCT**



* Diagnostic Peritoneal Aspiration (DPA). ≥10mls of frank blood = positive DPA.
** Focused Abdominal Sonography in Trauma (FAST). Free fluid = positive FAST.

Identify the Source of Haemorrhage

<u>External</u>	<u>Long Bones</u>	<u>Chest</u>	<u>Abdomen</u>	<u>Retroperitoneum</u>
• Careful visual inspection	• Careful visual inspection	• Chest X-ray	• DPA* and /or FAST**	• Pelvic X-ray

Interventions

<u>External</u>	<u>Long Bones</u>	<u>Chest</u>	<u>Abdomen</u>	<u>Retroperitoneum</u>
• Apply direct pressure • Suture lacerations	• Splint +/- reduce #	• Chest tube	• Emergency Laparotomy	• Externally stabilise pelvis • Emergency angiogram

In the presence of uncontrolled haemorrhage and a delay of greater than 30 minutes to operative haemostasis, infuse small aliquots (100-200mls) of fluid to maintain systolic blood pressure between 80-90mmHg

Summary of the Guidelines

How do you know when the patient is in hypovolaemic shock?

GUIDELINE	Level Of Evidence
<p>Blood pressure and heart rate will not identify all trauma patients who are in shock. Assessment of the trauma patient should include:</p> <ul style="list-style-type: none"> • Arterial blood gases and assessment of base deficit • Haemoglobin • Lactate • Haematocrit <p>These tests are only of value when interpreted in a series, therefore should be repeated.</p>	III-2

How do you find the sources of bleeding in a hypotensive trauma patient?

GUIDELINE	Level Of Evidence
<p>When the haemodynamically unstable patient enters the resuscitation room, a primary survey with full exposure takes place. Carefully inspect for external bleeding sources and examine the long bones. If x-ray facilities are available, a supine chest X-ray and pelvic X-ray should be obtained within 10 minutes of arrival. The CXR will identify any large haemothorax. If the pelvic X-ray shows a pelvic fracture, the remaining two sites of significant bleeding are the abdomen and the pelvic retroperitoneum. The options for assessing the abdomen are DPA and/or FAST.</p>	IV

What is the best management of the bleeding patient?

GUIDELINE	Level Of Evidence
<ul style="list-style-type: none"> ▪ Establish patent airway ▪ Ensure adequate ventilation and oxygenation ▪ Secure venous access - large bore cannula x 2 ▪ Control any external bleeding by applying direct pressure ▪ Rapidly identify patients requiring operative haemostasis ▪ Establish prompt contact with the major referral hospital and retrieval service 	III-2
<ul style="list-style-type: none"> ▪ In the presence of uncontrolled haemorrhage and a delay of greater than 30 minutes to operative haemostasis, infuse small aliquots of fluid (100-200mls) to maintain systolic blood pressure between 80-90mmHg 	II

If fluid resuscitation is indicated, what type of fluid should be given?

GUIDELINE	Level Of Evidence
<ul style="list-style-type: none"> ▪ Early use of blood, if available, remains the optimal resuscitation fluid for the hypovolaemic patient. Use with caution due to numerous complications. 	Consensus
<ul style="list-style-type: none"> ▪ Where blood is not available or delayed, Compound Sodium Lactate (Hartmanns) is the preferred alternative for the initial resuscitation of the hypovolaemic trauma patient. Caution should be exercised in the trauma patient with liver disease. ▪ 0.9% Normal Saline is also an acceptable alternative. Large volumes, however may result in metabolic acidosis 	II

What are the endpoints of fluid resuscitation in the trauma patient?

GUIDELINE	Level Of Evidence
<p>Traditional haemodynamic parameters do not adequately quantify the degree of physiological derangement in hypovolaemic trauma patients. If point of care blood gas analysis is available base deficit and lactate levels should be used to identify the magnitude of tissue oxygen debt and the adequacy of resuscitation. These tests are only of value when interpreted in a series, therefore should be repeated.</p> <p>A persistently high or increasing base deficit indicates the presence of ongoing blood loss or inadequate volume replacement.</p>	III-2
<p>In the absence of point of care blood gas analysis capability the restoration of a normal mentation, heart rate, skin perfusion and urine output and maintaining the systolic blood pressure at 80-90 mmHg serve as the end point of resuscitation.</p>	Consensus