

THE SOCIETY OF SPORTS THERAPISTS



Sports Trauma Management 7. Circulation & Shock

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Learning outcomes

- Upon completion of this chapter, candidates should be able to demonstrate the ability to apply the principles of Immediate Care in Sport to an injured, shocked athlete.

Objectives

1. Understand the definition and causes of shock including non-haemorrhagic as well as haemorrhagic causes.
2. Develop knowledge and skills of recognising the shocked athlete.
3. Understand the areas and organs of the injured athlete that may result in haemorrhage shock.
4. Develop knowledge and skills of managing the shocked athlete.
5. Understand and deliver the concepts of balance fluid resuscitation in a shocked athlete.
6. Understand the importance of re-evaluation of the shocked athlete after any intervention.



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Shock

- Inadequate organ and tissue perfusion.
 - There is not enough appropriate fluid in the circulatory system able to sufficiently carry oxygen and nutrients to the tissues and remove waste products of metabolism.
 - The important aspects are to identify the cause and treat the cause and to help restore the circulatory volume which may in addition require fluid therapy.



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- There are two types of shock
 - Haemorrhagic Shock
 - Non-Haemorrhagic Shock



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- Non-Haemorrhagic Shock
 - Neurogenic
 - Damage to the high thoracic & spinal cord with loss of the sympathetic supply to the peripheries resulting in vasodilatation.
 - Leading to the circulating volume to be distributed to the peripheries and significantly reduce venous return to the heart.
 - Cardiogenic
 - Where the heart is failing or failed to generate adequate cardiac output, e.g. cardiac arrest.
 - Tension pneumothorax
 - Build of pressure in the lung cavity results in pressure on the myocardium & more importantly the superior and inferior vena cava restricting the return of the venous blood to the heart resulting in poor cardiac output and, if not relieved, PEA cardiac arrest.



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- Non-Haemorrhagic Shock
 - Septic
 - The overwhelming inflammatory response to the **infection** results in peripheral vasodilatation and reduced central circulation.
 - Anaphylactic
 - The overwhelming inflammatory response to the **allergen** results in peripheral vasodilatation
 - Capillary membranes too become leaky with soft tissue swelling and significant reduction in central circulation.

S – slurred speech/confusion
E – extreme shivering or mm pain
P – passing no urine in 1 day
S – severe breathlessness
I – it feels like you're going to die
S – skin mottled/discholoured

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- Haemorrhagic Shock
 - Loss of circulating volume resulting in end organ failure

	Class I	Class II	Class III	Class IV
Blood Loss (ml)	Up to 750	750-1500	1500-2000	>2000
Blood Loss (%)	Up to 15	15-30	30-40	>40%
Pulse Rate	<100	>100	>120	>140
Resp Rate	14-20	20-30	30-45	>35
BP	Normal	Normal	REDUCED	REDUCED
PP	Normal	REDUCED	REDUCED	REDUCED
Mental State	Slightly anxious	Mildly anxious	Anxious & confused	Confused & lethargic

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- Assessment of Circulation
 - Colour – Perfusion or Pale
 - Respiratory Rate – relative trend of **INCREASE**
 - Pulse Rate – relative trend of **INCREASE**
 - Blood Pressure- relative trend of **DECREASE**
 - Conscious Level – **DECREASE**

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- Management of Shock
 - SABC
 - Check presence of radial pulse (90mmHg)
 - External Haemorrhage?
 - Think **on the Floor**
 - Internal Haemorrhage?
 - Think **5 More**
 - Chest
 - Abdomen
 - Liver
 - Spleen
 - Renal
 - Pelvis #
 - Long Bones

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- **On the floor**
 - Catastrophic haemorrhage control on SAFE approach
- **Five more**
 - Chest
 - Assessed in Breathing – Massive Haemothorax
 - Abdomen
 - Liver
 - P+/ tenderness
 - R lower ribs T8-T12
 - Possible guarding
 - Spleen
 - P+/ tenderness
 - Upper L ribs T8 – T10
 - Delayed shock 4-6 hours
 - Bladder
 - Tenderness lower central quadrant
 - Below umbilicus

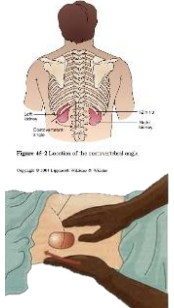
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- Renal
 - P+/ Bruising
 - Haematuria (blood in urine)
- Pelvis #
 - Shortened leg
 - P+
 - Instability
 - Urethral damage
 - Rectal bleeding
- Long Bone #
 - Alignment & P+



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- Haemorrhagic Shock
 - THINK
 - On the Floor (external)
 - Plus 5 More
 - Chest
 - Abdomen (liver, spleen, bladder)
 - Retroperitoneal (kidney)
 - Pelvis
 - Long bones



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- On field assessment
 - Heart rate – above 100 bpm
 - Colour – cyanosis indicates O₂ Saturation ≤ 85%
 - Capillary Refill Time (CRT) ≤ 2sec
 - RADIAL PULSE –
 - Blood Pressure –
 - used to think radial pulse absent indicates SBP < 90mmHg
 - RATE (relative trend of decrease v increase)
 - RHYTHM (regular v irregular)
 - VOLUME (strong, bounding v thready, weak)

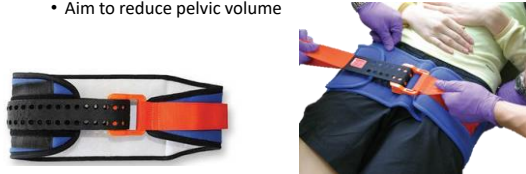
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- Management of Haemorrhagic Shock
 - Control haemorrhage & move to ED ASAP
 - If time allows
 - Get IV access (Dr)
 - 2 x large bore cannula (14-16 gauge)
 - Inserted in to anti-cubital fossa
 - Or Extra Jugular
 - Or Interosseous via EZIO
 - If blunt trauma & absent radial pulse
 - Administer crystalloid fluid (e.g. saline)
 - In aliquots of 250mls
 - Recheck radial pulse (titrated response)
 - Be cautious with the transient responder



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- For pelvic fractures
 - Bind with a SAM sling or T-Pod
 - Apply pressure **across inter-trochanteric line**
 - Not above
 - This will open the pelvis
 - Aim to reduce pelvic volume



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Key learning points

- Definition and causes of shock including non-haemorrhagic as well haemorrhagic causes
- Recognising the shocked athlete
- Potential causes for haemorrhagic shock
- Management of the shocked athlete
- Balanced fluid resuscitation in a shocked athlete
- Importance of re-evaluation of the shocked athlete after any intervention

