

Catastrophic Bleeding Control

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Welcome



MODULE 1

Introduction



HOUSEKEEPING

- Sign in
- Health & Safety issues
- Facilities
- Mobile phones
- Smoking arrangements
- Housekeeping rules

WARNING!

This presentation contains graphic images that some may find distressing.



THE COURSE SYLLABUS

Module 1 – Introduction

Module 2 – Equipment

Module 3 – Primary survey

Module 4 – Catastrophic bleeding

Module 5 – Haemostatic dressings

Module 6 – Tourniquets

Module 7 – Top-to-toe survey

Module 8 – Environmental issues

Module 9 – Handover to the emergency services



CHANGES TO GUIDELINES

In October 2015, the European Resuscitation Council (ERC) published new guidelines in respect of the '**Control of Bleeding**'.

To summarise the guidelines for catastrophic bleeding:

- Do apply direct pressure to the wound
- Do use a haemostatic dressing or tourniquet
- Do not apply indirect pressure to proximal pressure points
- Do not elevate an extremity



HAEMOSTATIC DRESSINGS

- Haemostatic dressings contain properties that help the blood to clot (thicken) quicker
- Haemostatic dressings are commonly used to control bleeding in surgical and military settings, especially when the wound is in an area such as the neck, abdomen or groin where compression is not possible
- Not all haemostatic dressings work in the same way. Some work by accelerating the body's natural clotting mechanisms, increasing clotting factors to stop bleeding such as Quikclot and Woundclot
- Other haemostatic dressings and agents work independent of the body's clotting mechanisms such as Celox™ and Chitogauze™ via physical interaction with the blood



TORNIQUETS

- A tourniquet is a band that's wrapped tightly around a limb to stop blood loss
- Tourniquets have been used in military settings for severe external limb bleeding for many years
- The application of a tourniquet has resulted in a decrease in mortality, haemostasis (stopping of a blood flow) being achieved with an associated incidence of complications of between 4.3% and 6% only
- Therefore, a tourniquet should be used when direct wound pressure cannot control severe external bleeding in a limb

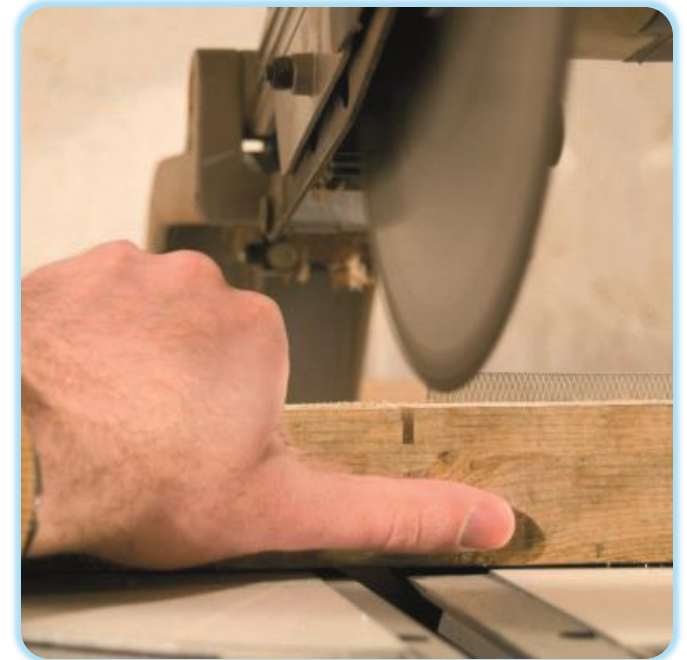


RISK ASSESSMENT OF FIRST AID NEEDS

Where the assessment identifies a high-hazard setting where there is a risk of severe blood loss through injury, then training in the use of tourniquets and haemostatic dressings is essential.

A high-hazard type of business, or activity, would include:

- | | |
|------------------------------|------------------------|
| • Use of dangerous machinery | • Agriculture |
| • Use of sharp instruments | • Working at heights |
| • Construction | • Hostile environments |
| • Forestry | |



MODULE 2

Equipment



EMPLOYERS AND FIRST AID KITS

Where it is identified that there is a risk of catastrophic external bleed injuries, a specialist haemorrhage kit is advised, which should contain a minimum of:



MODULE 3

Primary survey



PRIMARY SURVEY

- D** Dangers
- R** Response
- C** Catastrophic bleed
- A** Airway
- B** Breathing
- C** CPR for a non-breathing casualty



MODULE 4

Catastrophic bleeding



RECOGNITION

Bleeding is classified by the type of blood vessel that is damaged.

Arterial

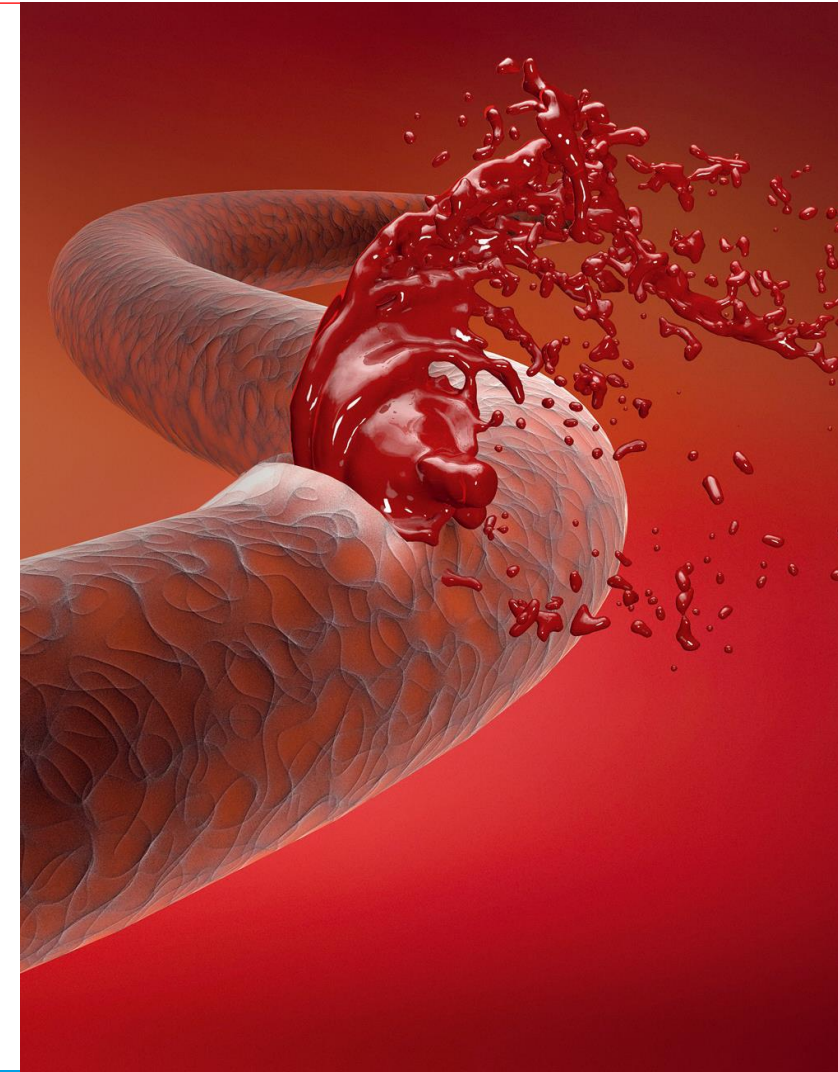
- Pumps from the wound with the heartbeat

Venous

- Gushes from the wound or pools at the site

Capillary

- Oozing at the site of injury

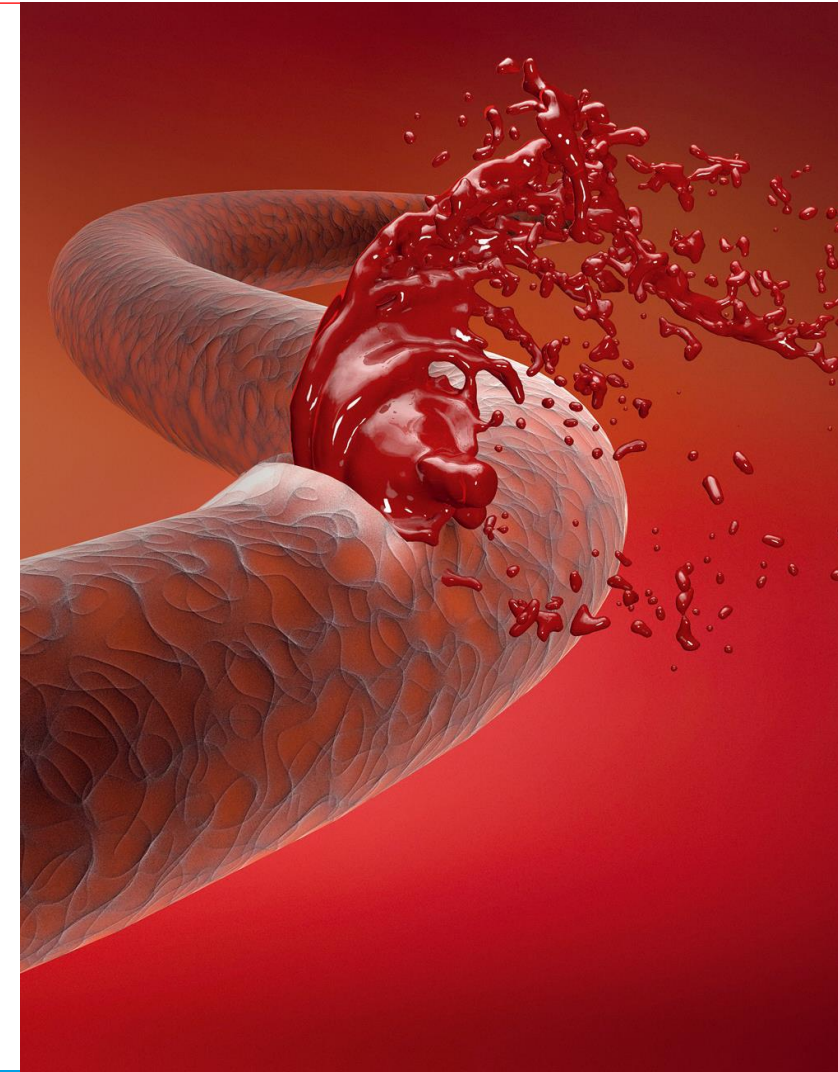


RECOGNITION

Uncontrolled bleeding has been identified as the leading cause of preventable deaths following accidental injury.

A catastrophic bleed can be as a result of:

- Multiple wounds
- Amputations
- Open fractures
- Arterial injuries



HYPOVOLAEMIA

Your aim is to stop the bleeding as quickly and as effectively as you can and to treat the casualty for shock.

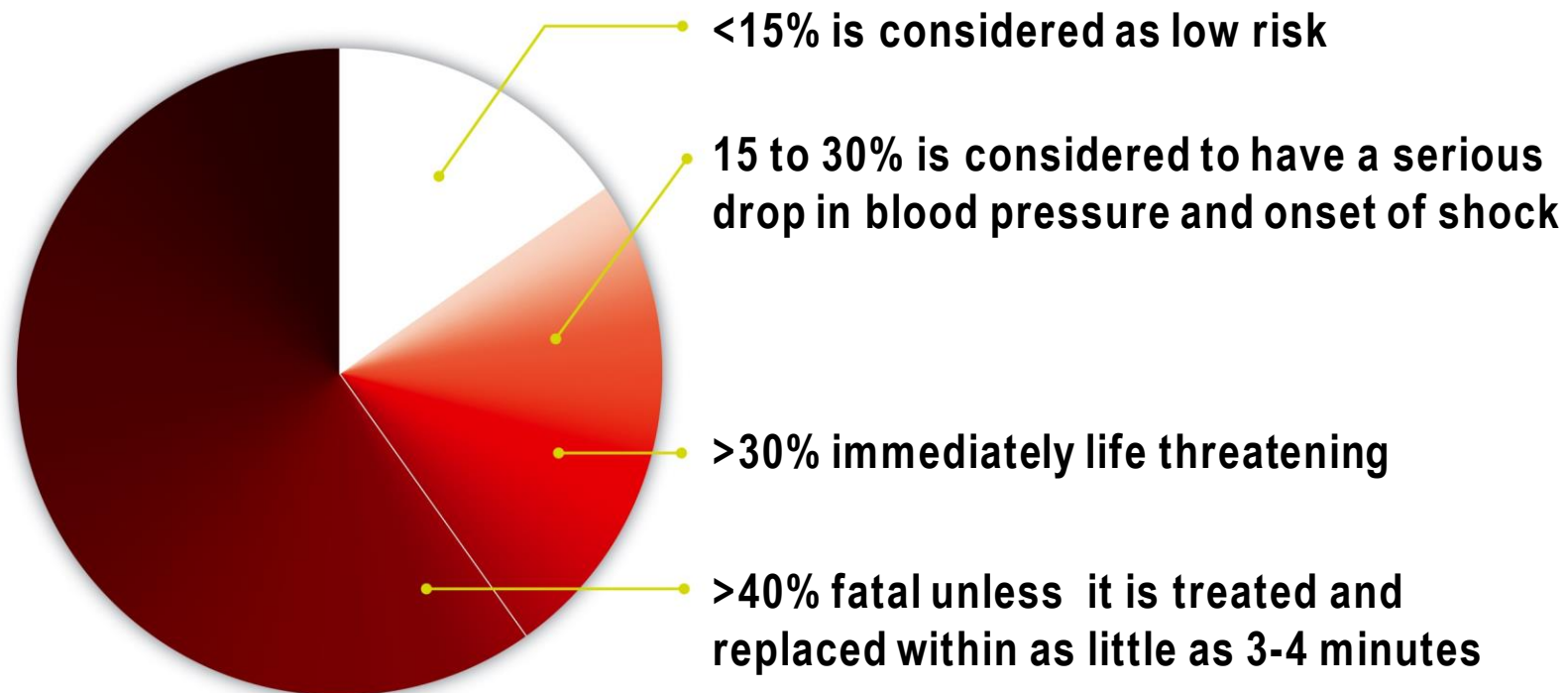
Hypovolaemia is a decrease in the volume of blood in your body, which can be due to blood loss, or loss of body fluids. Blood loss can result from external injuries, internal bleeding, or certain obstetric emergencies in childbirth.

Blood makes up about 7% of our body weight and an average adult has approximately 5 litres of blood in their body.



HYPOVOLAEMIC SHOCK

Effects of blood loss:



HYPOVOLAEMIC SHOCK RECOGNITION

Symptoms of hypovolaemic shock may include:

- | | |
|---------------|------------------------------------|
| • Anxiety | • Confusion |
| • Cold | • Rapid breathing and heart rate |
| • Paleness | • Weakness |
| • Sweating | • Decreased or absent urine output |
| • Clammy skin | • Leading to unresponsiveness |

Time is of the essence to control the catastrophic bleed. A casualty could haemorrhage up to a litre of blood every minute. After 2 minutes they could have lost up to a third of their blood volume leading to shock that they may never recover from.





HYPOVOLAEMIC SHOCK TREATMENT

- Ask a bystander to summon an ambulance
- Wear gloves
- Lay your casualty down, or sit them down to alleviate the effects of shock
- Examine the wound and find the exact point of bleeding. Be aware of embedded objects that may need to be considered. If there is something embedded, leave it in place. It could be acting as a 'plug' and helping to control the blood loss
- Clean out the wound with a dressing to find the exact point of bleeding, particularly if there is 'pooling' of the blood

Continued...





HYPOVOLAEMIC SHOCK TREATMENT (CONTINUED)

- Apply direct pressure at the point of the bleed for up to 10 minutes. Apply this pressure around the object if there is something embedded
- If direct pressure doesn't work, or resources to apply direct pressure are limited, then apply a haemostatic dressing
- If there is an amputation of a limb then consider the application of a tourniquet
- When the bleed is under control, continue with your casualty assessment to see if there are other conditions to consider with the airway as your new priority

IMPROVISED TREATMENT

Treatment if you have no tourniquet or haemostatic dressing:



- Pack the wound with unfolded sterile dressings. Use as many as it takes to pack the wound
- Apply direct pressure on this packing
- Secure this packing with a dressing or triangular bandage
- If blood seeps through this dressing, remove it and apply a new one

TOURNIQUET OR HAEMOSTATIC DRESSING?

There is no golden rule on whether a tourniquet should be used first opposed to a haemostatic dressing. However the site of injury, what you have available and the environment could be deciding factors.

You should NOT use a tourniquet on:

- The head
- The abdomen
- The neck
- The shoulders
- The groin

You should NOT pack the following wounds with haemostatic dressings:

- Open head injury
- Open chest injury



Catastrophic Bleeding Control

A 'STEPWISE' APPROACH

A stepwise approach



Direct pressure



Haemostatic dressing



Tourniquet



MODULE 5

Haemostatic dressings



WHAT IS A HAEMOSTATIC DRESSING?

- A haemostatic dressing is a medical dressing used to control blood loss by accelerating the clotting process

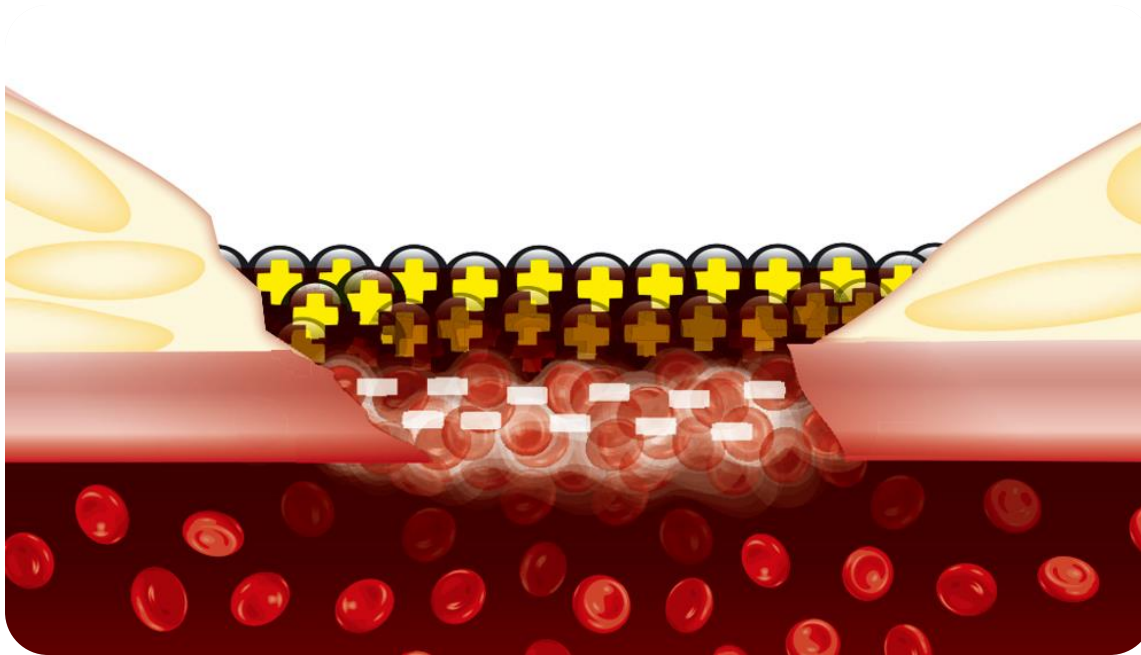
- The dressing is impregnated with a special agent that when it makes contact with a fluid (blood in this instance), it creates a gel around the point of where the blood is being lost which in essence acts as the clot, or pseudo clot

- This special agent also comes in a granular and powder form



WHAT IS A HAEMOSTATIC DRESSING?

How Celox™ works



- Chitosan absorbs fluid, swells and forms a gel
- Celox™ electrostatically attracts red blood cells and forms a gel-like plug
- Does not rely on the body's own clotting mechanism
- No heat generated
- No minerals. Residual chitosan is naturally broken down and excreted by the body

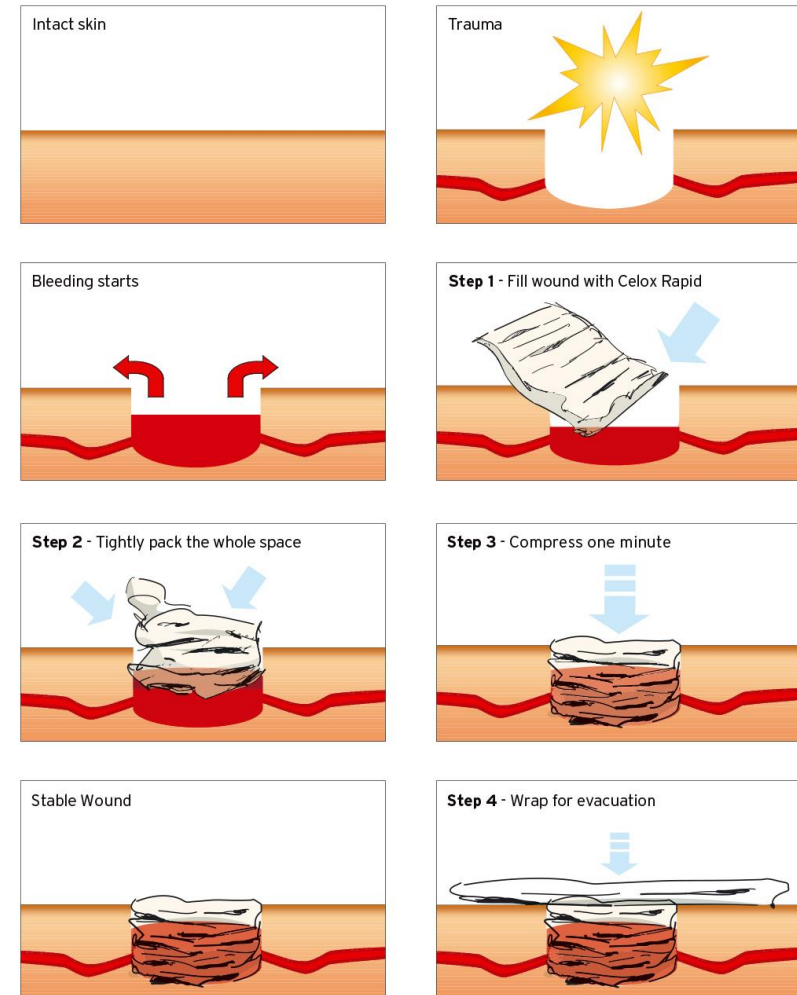
GENERAL POINTS TO REMEMBER

- Always apply direct pressure to the wound first, before applying a haemostatic dressing or haemostatic agent
- Training must be given on how to apply this type of dressing or agent
- Send the packaging with the casualty to the hospital so that they know what has been applied
- Check the expiry date on the packaging
- Do not use a haemostatic agent on an open chest wound, an open head injury, the airway, or the eyes



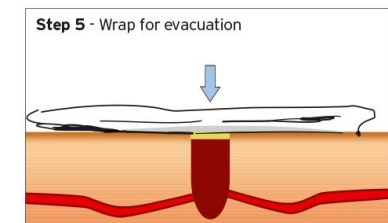
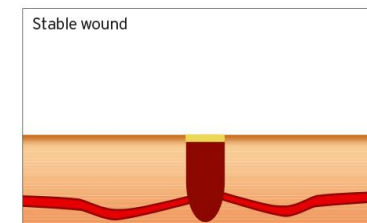
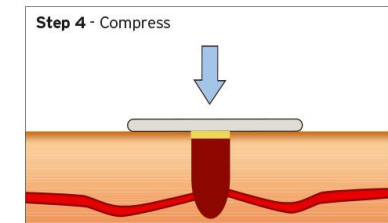
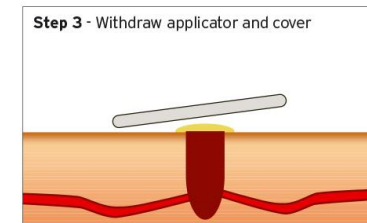
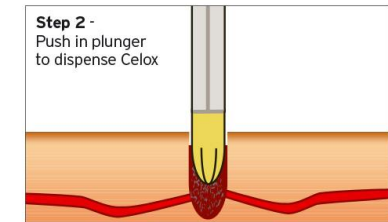
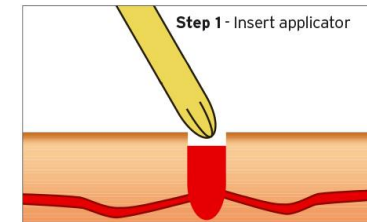
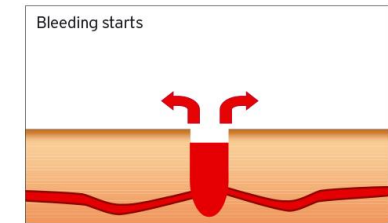
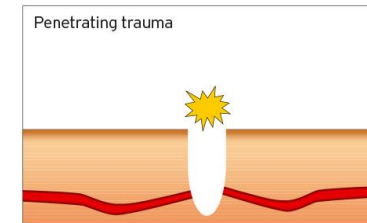
CELOX™ RAPID GAUZE

- *Trauma*
- *Bleeding starts*
- *Step 1 - Fill the wound with Celox™ Rapid*
- *Step 2 - Tightly pack the whole space*
- *Step 3 - Compress for one minute*
- *Stable wound*
- *Step 4 - Wrap for evacuation*



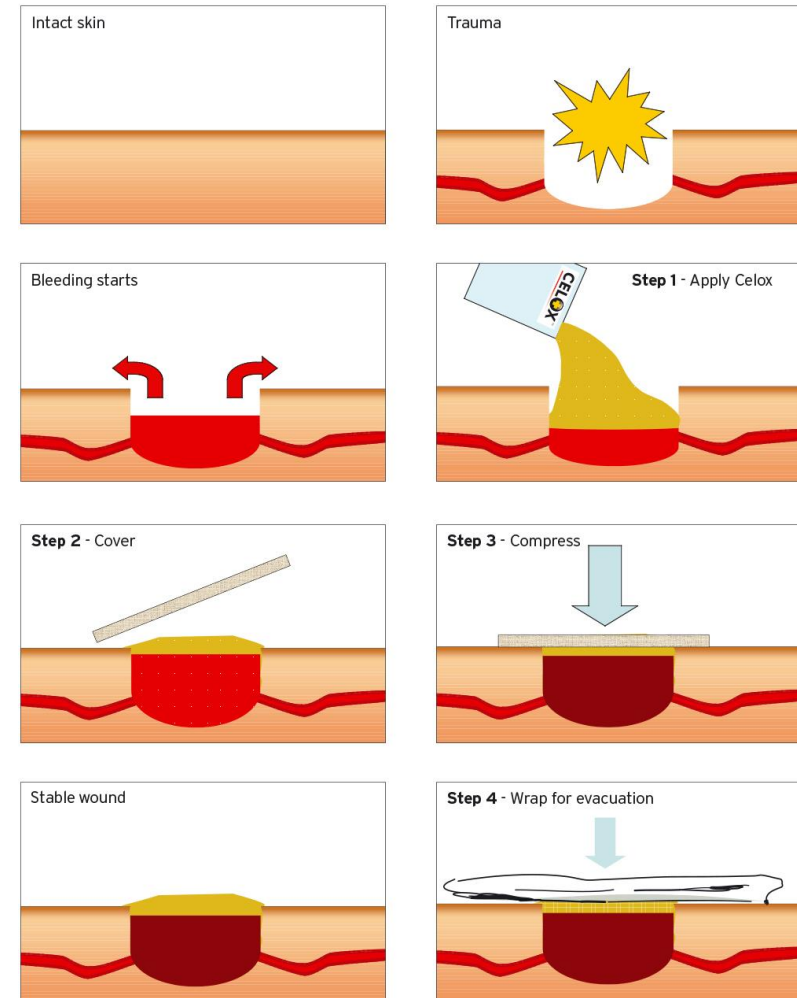
CELOX™ HAEMOSTAT APPLICATOR

- *Penetrating trauma*
- *Bleeding starts*
- *Step 1 – Insert applicator*
- *Step 2 – Push in plunger to dispense Celox™*
- *Step 3 – Withdraw applicator and cover*
- *Step 4 – Compress*
- *Stable wound*
- *Step 5 – Wrap for evacuation*



CELOX™ HAEMOSTATIC GRANULES

- *Trauma*
- *Bleeding starts*
- Step 1 – Apply Celox™
- Step 2 - Cover
- Step 3 - Compress
- *Stable wound*
- Step 4 - Wrap for evacuation



QUIKCLOT™ COMBAT GAUZE

QuikClot™ devices are impregnated with kaolin, an inorganic mineral that accelerates the body's natural clotting ability and produces no exothermic reaction.



CHITO-SAM™ 100

Chito-SAM™ 100 is a high performance 100% pure chitosan haemostatic dressing designed to stop lethal bleeding fast.

Chito-SAM™ 100 works independently of the body's normal clotting processes.

Unlike most haemostatic dressings, Chito-SAM™ 100 is made of non-woven, 100% pure, medical grade chitosan.



MODULE 6

Tourniquets



IMPORTANT FACTORS RELATING TO TOURNIQUETS

There are many tourniquets on the market and they all have their unique features and benefits.

NB:

- A windlass is part of a tourniquet that is twisted to tighten it and is then locked or tied in place to secure the tourniquet when pressure is applied
- A tourniquet should be a minimum of 1.5 inches wide and this is particularly important if you have to improvise and make your own
- Unpack the manufactured tourniquet and have it ready to use
- Apply directly to the skin and not clothing
- Make sure you write the time of application on the tourniquet. Most manufactured ones will have an area designated for this



COMPONENTS



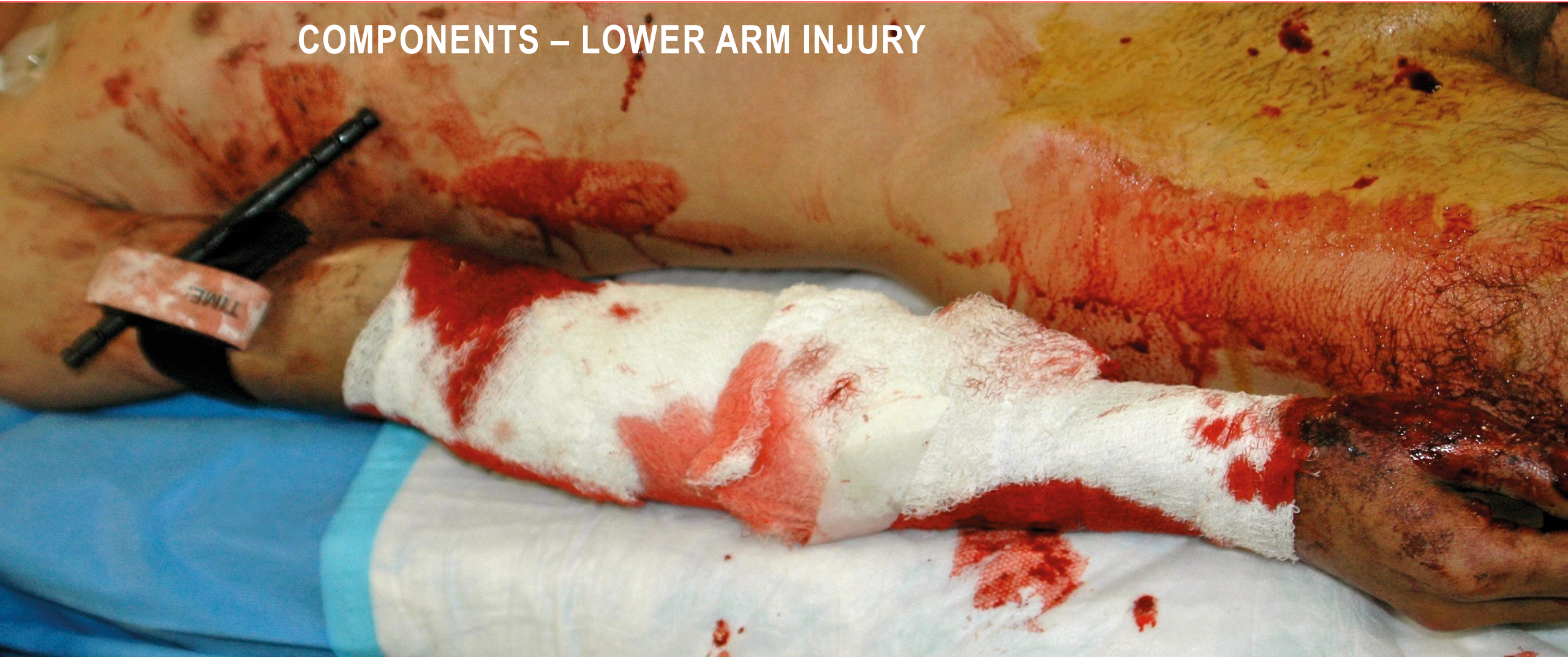
Write time of application

Windlass

A minimum width of 1.5 inches



COMPONENTS – LOWER ARM INJURY



COMPONENTS – UPPER LEG INJURY



MAT (MECHANICAL ADVANTAGE TOURNIQUET)

- One person, one hand application
- Easy release and re-application in 10 seconds or less
- New buckle - no slipping or loosening
- Can be applied to both arms and legs
- Easily applied to trapped limbs
- Appropriate for most sizes of limbs as small as 4 inches diameter and as large as 39" circumference



C-A-T™ (COMBAT APPLICATION TOURNIQUET)

- The Combat Application Tourniquet (C-A-T™) is a small and lightweight one-handed tourniquet that completely occludes arterial blood flow in an extremity
- The C-A-T™ uses a Self-Adhering Band and a Friction Adaptor Buckle to fit a wide range of extremities combined with a one-handed windlass system
- The windlass uses a free moving internal band to provide true circumferential pressure to an extremity. The windlass is then locked in place
- The C-A-T™ only requires one hand to operate the windlass



C-A-T™ (COMBAT APPLICATION TOURNIQUET)



- 1:** Apply tourniquet proximal to the bleeding site. Route the band around the limb and pass the tip through the inside slit of the buckle. Pull the band tight.



- 2:** Pass the tip through the outside slit of the buckle. The friction buckle will lock the band in place.



- 3:** Pull the band very tight and securely fasten the band back on itself.

Continued...



C-A-T™ (COMBAT APPLICATION TOURNIQUET)



4: Twist the **rod until bright red bleeding has stopped and the *distal pulse is eliminated.**



5: Place the rod inside the clip; locking it in place. **Check for bleeding and *distal pulse.** If bleeding is not controlled, consider additional tightening or applying a second tourniquet proximal side by side to the first and reassess.



6: Secure the rod inside the clip with the strap. Prepare the patient for transport and reassess. Record the time of application.



SOF-TT (SPECIAL OPERATIONS FORCES – TACTICAL TOURNIQUET)

The **SOF™ Tactical Tourniquet** is one of the top performing tourniquets currently available. It is the tourniquet of choice for many of the world's most elite and experienced warriors who have selected it for its outstanding ability to control severe bleeding, high level of reliability and ease of application.



PLACEMENT

The tourniquet should be placed above the wound on the same bone structure and distal to any joint to preserve the maximum amount of salvageable tissue.

Where access to the limb is limited, the tourniquet may need to be placed further up the limb. In these cases, a review of the first placement should be considered with a view to re-apply the tourniquet closer to the wound, prior to releasing the initial, higher placed tourniquet. This is to make sure that haemorrhage control is maintained.



PLACEMENT

WOUND ABOVE THE ELBOW

Place the tourniquet approx. two inches above the point of bleeding on the same bone structure.



PLACEMENT

WOUND BELOW THE ELBOW

Place the tourniquet approx. two inches above the point of bleeding on the same bone structure.



PLACEMENT

WOUND ABOVE THE KNEE

Place the tourniquet approx. two inches above the point of bleeding on the same bone structure.



PLACEMENT

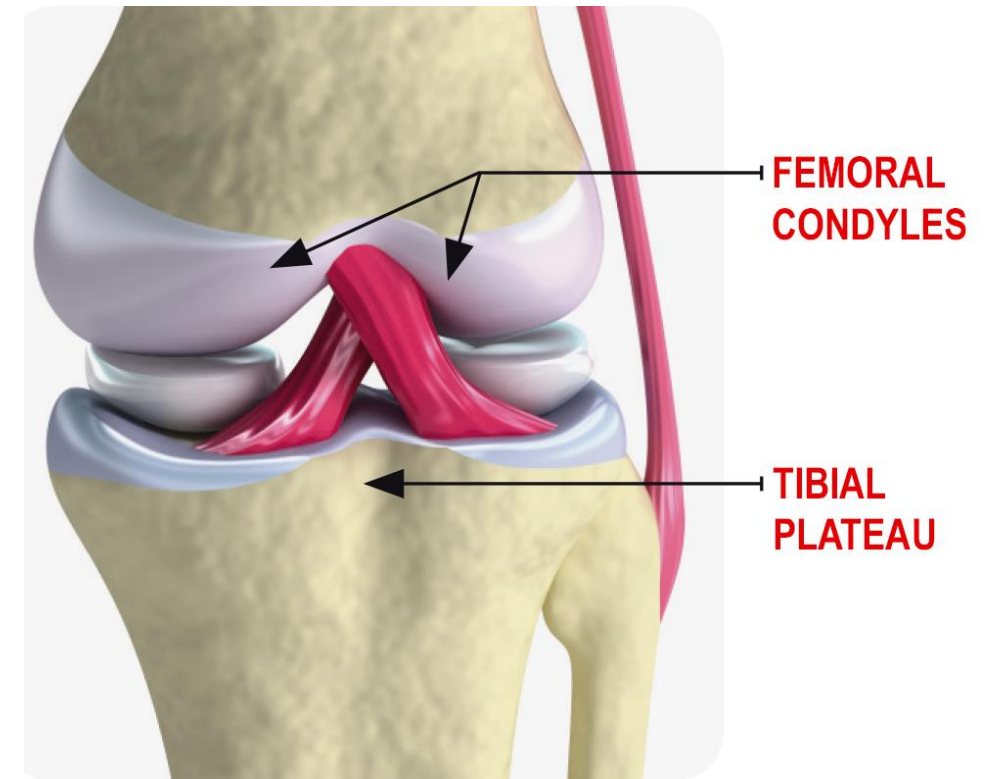
WOUND BELOW THE KNEE

Place the tourniquet approx. two inches above the point of bleeding on the same bone structure.



PLACEMENT

It is important not to go too close to the knee joint as the femoral condyles offer some protection to the artery from the tourniquet as it passes between them.

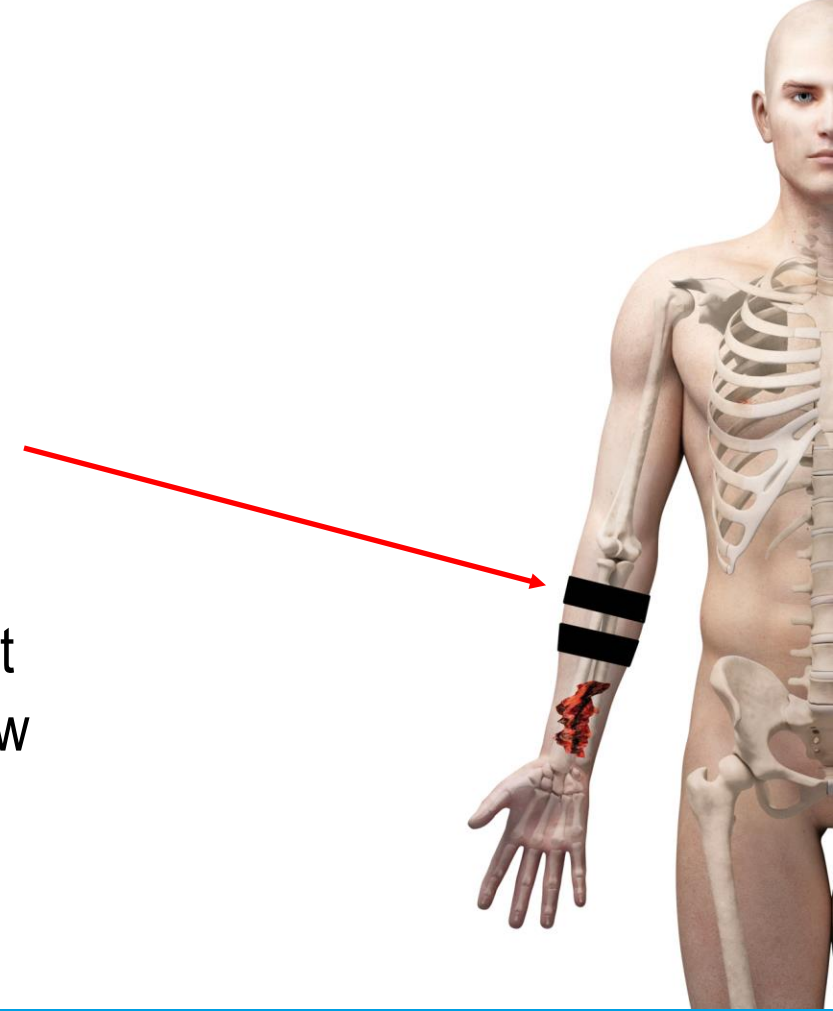


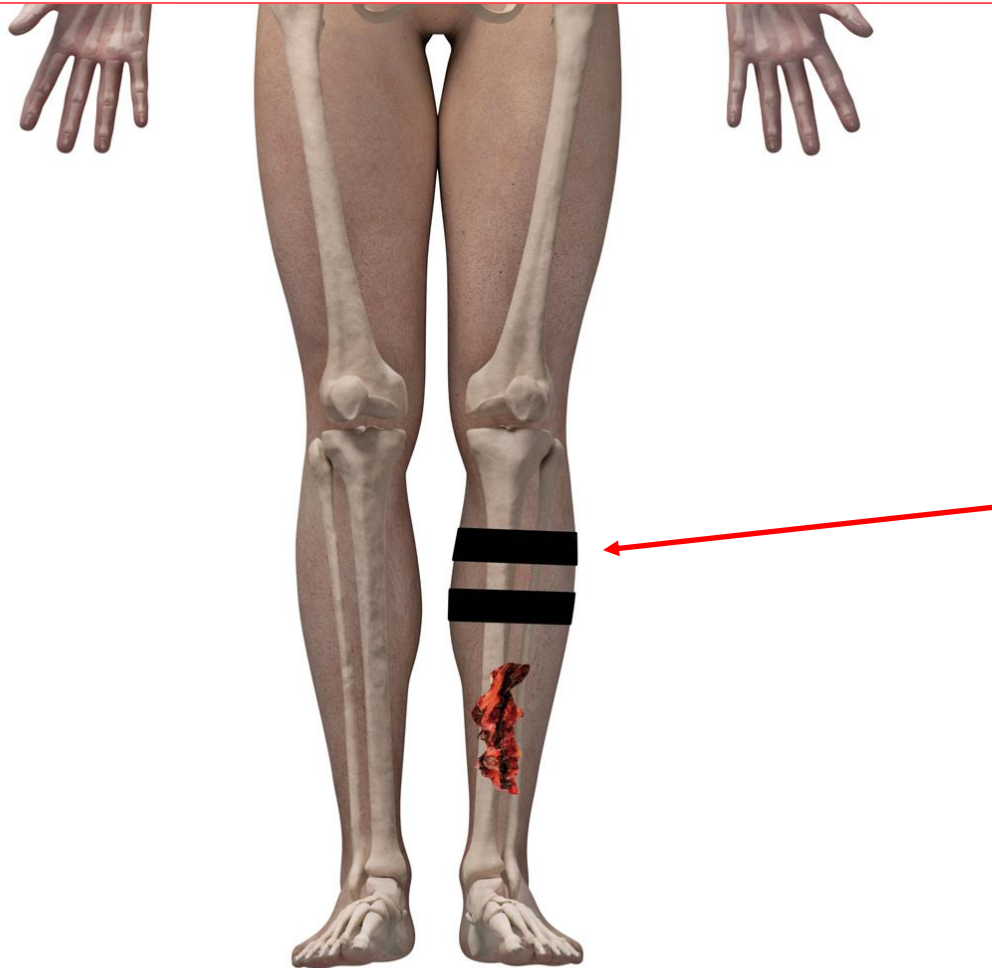
PLACEMENT OF 2 TOURNIQUETS

Use of 2 tourniquets (if appropriate) for a lower arm injury.

If the first tourniquet does not control the bleeding sufficiently, a second tourniquet should be applied above the first.

If space is restricted to apply the second tourniquet to the forearm, it should be applied above the elbow on the single bone structure.





PLACEMENT OF 2 TOURNIQUETS

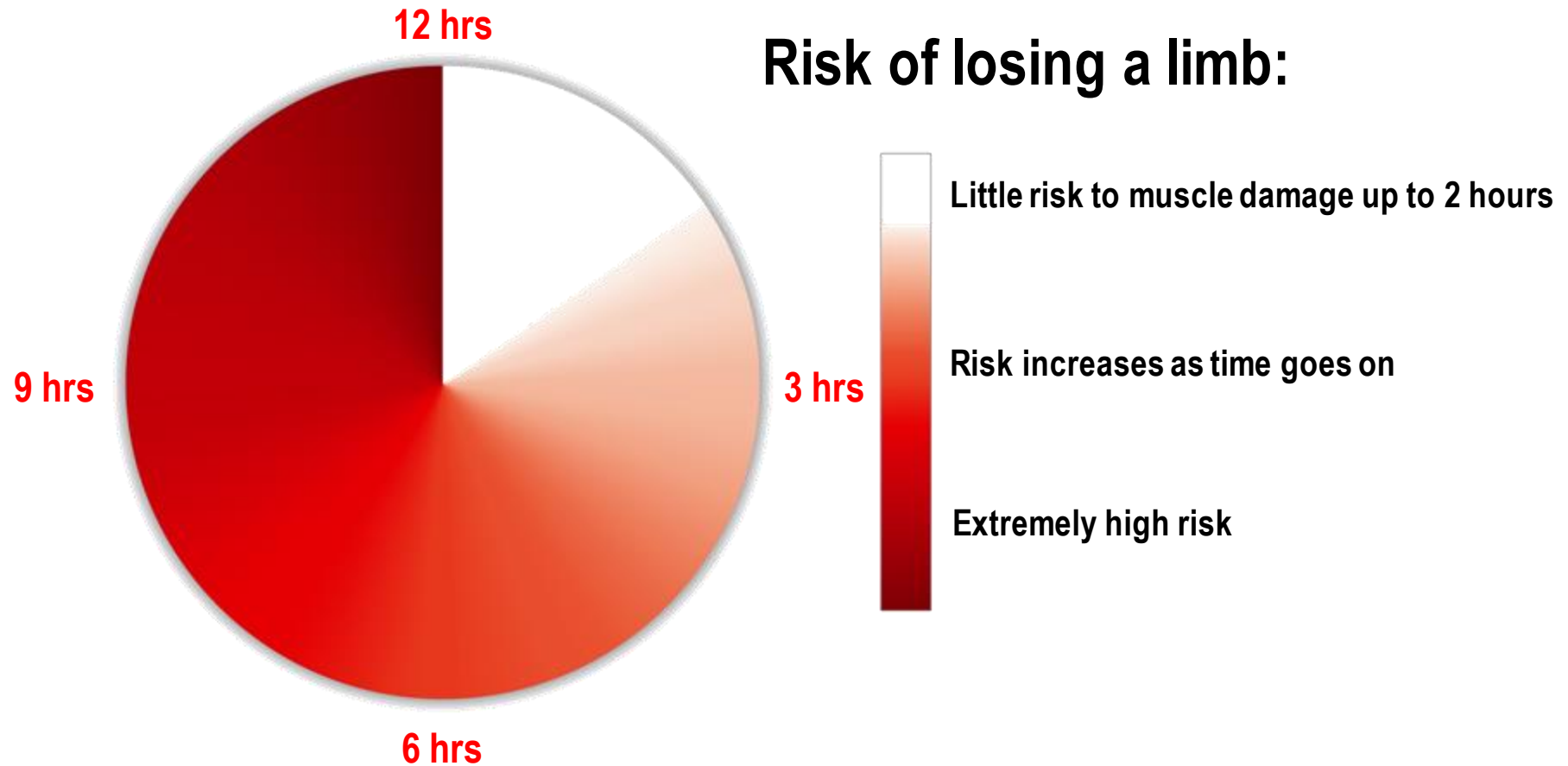
Use of 2 tourniquets (if appropriate) for a lower leg injury.

If the first tourniquet does not control the bleeding sufficiently, a second tourniquet should be applied above the first.

If space is restricted to apply the second tourniquet to the lower leg, it should be applied above the knee joint on the single bone structure.



ASSOCIATED RISKS



IMPROVISATION

- Where a manufactured tourniquet is not available, an improvised one can be equally effective
- It is important to achieve the right width of 1.5 inches, so a broad-fold bandage such as a triangular bandage would be an ideal resource. This should be folded to create a 1.5 inch wide strap and then tied off 5cms (2 inches) above the wound or joint
- **Do not use stretchy materials to make a tourniquet**
- You can also improvise a windlass. Use a metal object such as a spoon that can be used to twist the tourniquet to the correct tightness and then tie the tourniquet off



MODULE 7

Top-to-toe survey



TOP-TO-TOE SURVEY



- As soon as you have the severe bleeding under control, you should perform a top-to-toe survey starting with the airway and performing a breathing check
- If the casualty is not breathing normally, then you must commence CPR without delay
- As the term suggests, you should start at their head and work your way down to their feet looking for other injuries
- Treat the injuries appropriately and you should wear gloves throughout this survey.



TOP-TO-TOE SURVEY

Take your time. It is important to be as thorough as you can, so you can give the emergency medical personnel as much information as possible.

Remember – Always dial 999/112 or ensure that professional medical help is on the way.

Top-to-toe survey checklist:

1:
The head face
and neck.

2:
The chest and
shoulders.

3:
The spine.

4:
The abdomen.

5:
The pelvis
(visual check
only).

6:
The arms, legs
and extremities.



MODULE 8

Environmental issues

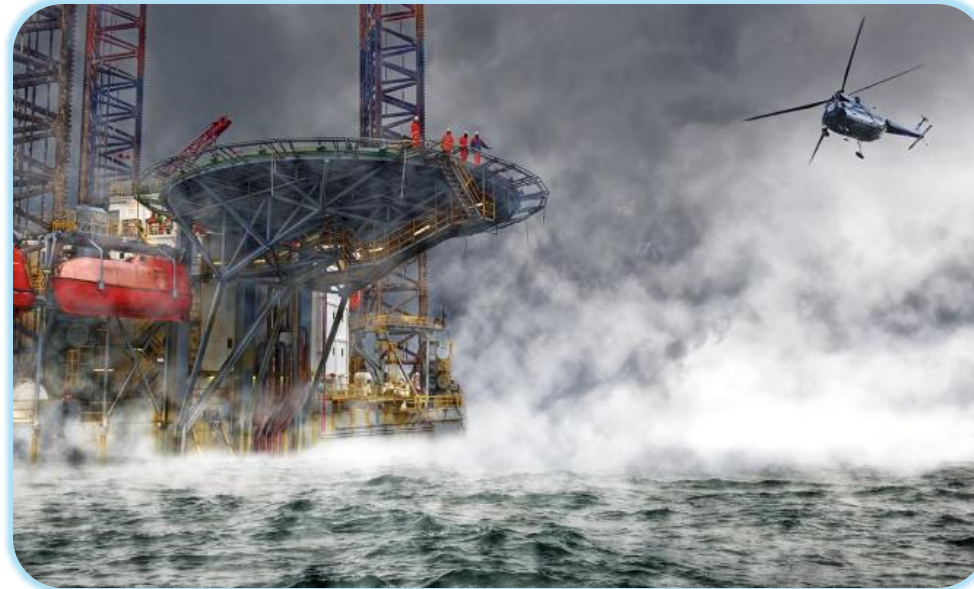


ENVIRONMENTAL FACTORS

Environmental factors will need to be assessed and monitored carefully during any First Aid scenario to ensure the safety of the rescuer and the casualty.

Some of the factors to consider would be:

- Temperature
- Weather conditions
- Lighting
- Ground conditions
- Noise
- Pollution



MODULE 9

Handover to the emergency services





HANDOVER TO THE EMERGENCY SERVICES

A trusted structure for medical professionals in any casualty handover that is worth remembering and adopting is ATMIST

A Age and other patient details

T Time of incident

M Mechanism

I Injuries sustained

S Signs

T Treatment and trends

This structure enables all members involved in the patient care, both in hospital receiving teams and those delivering the patient to that care, to work in an expected and structured fashion with a dependable format.



COURSE CLOSURE

- Any questions?

- Course evaluation

- Please check your names on the register in respect of clarity for certification purposes. The name that is shown will be printed on your certificate

- Have a safe journey home!



Catastrophic Bleeding Control

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