

Body Armour Guidance: Factsheet 2 – Injury Mechanisms

It is important to understand how these threats interact with the body, both with and without intervening body armour. Even if a body armour has defeated the incoming threat it may still result in the possibility of the wearer suffering injury due to a phenomenon known as behind armour blunt trauma (BABT).

Stab and Slash Injuries

Penetrating Injury – As a sharp edged or pointed weapon enters the body it can cause penetrating injury to any flesh or organ in its path. The damage will be localised to the path of the item causing the wound. A main cause of injury or death is the loss of blood.

Slash Injury – A slash injury is likely to be long and fairly shallow and is less likely to penetrate an organ. The main danger is that it may cut a major blood vessel that is near the surface e.g. the carotid artery.

Behind Armour Blunt Trauma – If body armour defeats a stab or a slash, it is unlikely that there will be sufficient kinetic energy to cause any serious BABT injury.

Ballistic Injuries – A ballistic injury is any injury caused by the impact of a ballistic projectile on the body. For the purposes of this report this injury is divided into two categories: penetrating ballistic injury and BABT.

Penetrating Ballistic Injury – Although the aim of body armour is to stop a bullet entering the body, it is worth briefly describing the effects of a bullet when it penetrates the human body. The injury mechanisms are studied in the specialist field of wound ballistics. When a bullet passes through the body it will produce a small entry wound and possibly an exit wound. However, in all probability the passage of the bullet will cause much more serious damage inside the body. If a bullet passes through body armour there will still be a penetrating injury but it will be less severe. This mechanism of ballistic injuries is described in more detail in Factsheet 3.

Behind Armour Blunt Trauma – If the armour successfully stops the bullet entering the body, there may still be an injury caused by BABT which can take various forms. The most common is relatively minor and consists of bruising, directly behind the point of impact. This is caused by the body armour being pushed at high velocity into the body beneath it. For impacts with higher kinetic energy, it is possible that other injury mechanisms could occur. These mechanisms are caused by a pressure wave being created by the impact, which is then transmitted through the armour into the body. For example, an impact over the heart could cause a sudden stopping of the heart providing the heart is at a particular phase of the cardiac cycle at the time of impact.