WEAPON EFFECTS Ballistics

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- ○ The ability to manage conflict injuries relies on an under - standing of the underlying mechanism of wounding, which - is likely to be di ff erent from that in civilian trauma. As stated, while ballistic injuries are no longer the most common cause of battlefield injur y , firearms remain a common element in all conflict. Civilian trauma practice, depending on local firearm laws, may well encompass a significant volume of gunshot wounds, although patterns of injury with war wounds may well di ff er as a result of the weapons used. An understanding of the mechanism of ballistic wounding is required to treat these wounds e ff ectively . The earliest recorded depiction of a firearm is from 1326, but firearms became ubiquitous on the battlefield during the 20 seventeenth century . Ballistic weapons all work with the same principles – an explosion is used to propel a projectile along and out of a straight tube – but have evolved considerably from rudimentary cannons to sophisticated modern-day firearms. The explosive force within a modern firearm comes from pro - pellant encased within a cartridge. The basic design of a car - tridge is shown in Figure 34.1 . - Internal ballistics describes the characteristics of a projec - tile while inside the weapon. The hammer mechanism strikes a primer at the base of the cartridge, which ignites the propel - lant. Hot gas produced by the explosion expands and forces the bullet away from the cartridge and along the bar rel. Spiral grooves, or rifling, impart spin on the bullet, which aids accu - e racy and stabilisation.

Bullet Propellant Casing Primer Figure 34.1 Diagram of basic cartridge structure.

advances in firearm design have served predominantly to improve accuracy , reliability and rate of fire. Ammunition is normally held within a magazine or belt that loads directly into the chamber of the weapon. The loading mechanism determines the rate of fire. In a semiautomatic or fully auto matic system, the recoil forces of the spent cartridge eject the cartridge while resetting the chamber and accepting a new cartridge from the magazine, such that the process may be repeated rapidly . Shotguns utilise a similar mec hanism except that a collec tion of smaller projectiles – ‘shot’ – are expelled rather than a single bullet. These smaller projectiles disperse away from one another after leaving the barrel. T he degree of dispersal is dependent on the relative length of the barrel. External ballistics describe the characteristics of a projec tile in free flight. It may be influenced by ammunition type and ambient conditions. Ammunition di ff ers widely with the most pronounced di ff erence between pistol and rifle ammunition. Rifles are expected to be accurate at ranges up to and beyond 1000 metres, while pistols are intended f or far shorter ranges. Rifle cartridges are longer and typically have a greater propor tion of propellant to projectile. The characteristics of ammuni tion that determine wound e ff ects are the size or calibre (which describes the internal diameter of the weapon barrel) and the material components

of the bullet: /uni25CF Full metal jacket ammunition has an outer coating of harder metal around a softer core. This reduces break down of the bullet along the barrel and improves accuracy , reliability and target penetration. /uni25CF Soft tip and hollow point ammunition have a degree of exposed lead that flattens and deforms on impact. These bullets have less penetrating ability but rapidly transfer en ergy to the impacted tissue and cause large wounds. WEAPON EFFECTS Ballistics

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