The Red Cross Classification of War Wounds: The E.X.C.F.V.M. Scoring System

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The Red Cross classification of war wounds is based upon features of the wound, not upon weaponry. It is proposed as a new means of understanding, communicating, and gathering information about war wounds and their management. The wound score is based on the skin wounds and the presence of a cavity, fracture, vital injury, or metallic bodies in the wound. All wounds so scored can be graded according to severity and typed according to structures injured; consequently, wounds are identified by their clinical significance. A study of 247 wounds shows the feasibility of scoring wounds in the field and yields surgically relevant information about bullet and fragment wounds. The applications of the classification are to wound assessment, establishing a scientific basis to war surgery, surgical audit, and collecting wound data from the field.

The International Committee of the Red Cross (ICRC) deploys surgical teams to treat war wounded in 7 countries. The surgeons, from civilian practice, may have no previous experience of managing war wounds. Preparation for war surgery involves an understanding of wounds. Current texts contain sections on ballistics based on laboratory work [1-3] which are intended to provide a basis for understanding wound management. The most valuable information derived from these studies is that small missiles may cause large and serious wounds. Misunderstandings arise because these studies focus on bullets when, in armed conflict, the majority of wounds are actually caused by fragments from bombs, shells, or mines (Fig. 1). When undertaking war surgery, the surgeon neither knows the weapon nor finds a uniform pattern of wounding.

The surgical task presented by any wound depends on the wound severity, i.e., the degree of tissue damage and also the structure(s) that may have been injured. Recognition of this demands a clinical classification of wounds that is based on the features of the wound and not on the weaponry or the presumed velocity of the missile.

The Red Cross wound classification is a system whereby a wound is scored according to the size of the entry (E) and exit (X) wounds; whether there is a cavity (C), a fracture (F), or a vital structure injured (V); and the presence or absence of metallic foreign bodies (M). A numerical value is given, where possible, to each of E, X, C, F, V, and M after wound assessment or surgery. The scores can later be graded according to severity and typed according to the structures injured.

Scoring Wounds by the E.X.C.F.V.M. System

The wounds are scored after initial assessment or after surgery (Fig. 2).

1. E = Entry. The maximum dimension of the entry wound is measured in centimeters.
2. X = eXit. The maximum dimension of the exit wound is measured in centimeters. No exit scores X = 0. When it is not known which of two connecting wounds is entry or exit a “?” is placed between the scores.
3. C = Cavity. The wound is deemed to have a cavity if 2 fingers can be put into the wound before wound excision. This should not be confused with the phenomenon of temporary cavitation. This may be obvious before operation or assessed only after skin incision. C0 represents no wound cavity. C1 represents a wound with a cavity.
4. F = Fracture. This can be assessed clinically or radiographically. F0 represents no fracture. F1 represents a simple fracture, hole, or clinically insignificant comminution. F2 represents a fracture with clinically significant comminution.
5. V = Vital structure injured. V0 represents a wound with no vital injury. V1 represents a wound involving viscera, major blood vessels (proximal to and including popliteal and brachial vessels), or the central nervous system.
6. M = Metallic bodies (bullet or fragment) visible on x-ray. M0 represents a wound with no metallic bodies. M1 represents one metallic body. M2 represents multiple metallic bodies.

Some wounds cannot be scored on all 6 points; in such a case the size of the skin wound can be recorded on the E score and other points where possible. For example, a large wound of the anterior leg with a tibial fracture may score: E 25, X -, C -, F 2, V -, M -.

This scoring system is intended for quick and easy use in the field. Estimating the presence of a cavity by the width of 2 fingers is inelegant but simple and effective; it represents slightly more than the length of most bullets (Fig. 3). In a wound that admits 2 fingers, something other than laceration by a bullet travelling sidelong must have taken place; a C1 wound is likely to have significant tissue damage of whatever cause. With
Fig. 1. Pie chart showing the proportion of wounds caused by different weapons in an International Committee of the Red Cross hospital.

Fig. 2. An example of the admission sheet used in International Committee of the Red Cross hospitals. The wound score is at the bottom. The wound of the featured patient is seen in Figure 5.

Fig. 3. The length of a rifle bullet in relation to the width of 2 fingers.

Fig. 4. A diagramatic lower limb with 5 wounds and their example scores. Wounds 2 and 3 are grade 2.

regard to the F score, it is inevitable that some wounds fall between F1 and F2, but for simplicity this is not accurately defined. An example of clinically insignificant comminution (F1) is a wound with a comminuted fibula but with an intact tibia. A V1 score implies a more dangerous wound, a surgical task in addition to solely wound management, e.g., chest drainage or laparotomy and a requirement for primary closure. It is important that the difference between an intact bullet (M1) and a fragmented bullet (M2) is recognized because of the relationship between bullet fragmentation and wound severity [4, 5].

The scoring system is still valid without radiography; in this case the F score is judged clinically and the M score is omitted. Examples of wounds and their scores are shown diagramatically in Figure 4. Figures 5 to 8 show photographs of bullet wounds; Figures 9 and 11 show fragment wounds; their scores are indicated.

When there are multiple wounds, only the most serious two are scored. When one missile causes two wounds, e.g., by penetrating the arm and entering the chest, the two scores are linked by a bracket.

Once scored, the wound can be graded according to severity using the E, X, C and F scores, and typed according to structure by the F and V scores.

Grading a Wound from the Score

The wounds are graded 1, 2 and 3:

1. Grade 1 wounds have summed E and X scores <10 combined with C0 and F0 or F1, i.e., minimal tissue damage.