

## Trauma Forensics in Blunt and Sharp Force Injuries

### Abstract

Trauma forensics is the concept of examining trauma from a medicolegal standpoint in a given jurisdiction. Blunt and sharp force traumas are classified based on the different mechanisms of causation, which have a medicolegal significance. Adopting a standard approach to the medical evaluation of such injuries in patients would serve both the purposes of rendering appropriate treatment and the documentation and preservation of medical evidence. However, most trauma cases are seen by medical practitioners with very limited forensic knowledge and skills, and they are still expected to meet the needs of the court or the judicial mechanism in subsequent legal proceedings. Therefore, some measures, including 10 practical considerations, which are applicable in attending to blunt and sharp force traumas, would limit the risk a clinician faces in the crossfire of medicine and law.

**Keywords:** *Blunt force, injuries, medicolegal, sharp force, trauma forensics*

### Introduction

Trauma forensics is the concept of examining trauma from a medicolegal standpoint in a given jurisdiction. This article focuses on direct physical trauma. There are other kinds of injuries, such as burns by different means,<sup>[1,2]</sup> gunshot wounds, and blast/explosive injuries, which may be encountered by a medical practitioner. Although these injuries have a physical impact on the body and are of huge forensic significance, they are of a special force type that requires a considerable focus that will be beyond the expectation of regular physical trauma.<sup>[3-5]</sup> It also appears that this is the first time that these injuries will be discussed under the specific title of “Trauma Forensics.”

Injuries caused by direct physical trauma are evaluated clinically in the outpatient or emergency department of a hospital. Based on the mechanism of injury, direct physical trauma can be broadly classified as blunt force, sharp force (penetrating), and deceleration trauma.<sup>[6]</sup> The main objective is to equip an ordinary medical practitioner, who has little or no forensic training, with the required knowledge and skill to attend to trauma cases in a manner that satisfies both the medical imperatives for the patient

and medicolegal (forensic) needs that may arise from the circumstance of the injury.

When a patient presents with varying degrees and forms of injury, the physician and healthcare facility provide needed medical attention. This includes various kinds of treatment such as surgical intervention, depending on the nature of the trauma.<sup>[7]</sup> This instinctive response has been learned from years of medical training and practice, especially for surgeons. However, trauma and its mechanism of causation provide a unique insight into the world beyond clinical management. The ability to holistically appraise trauma is an essential skill required in the contemporary practice. Such capacity will not only serve the medical practitioners and their institutions but also be of a great value to the larger society in providing answers to attendant forensic questions.<sup>[8]</sup>

In regular clinical practice, trauma cases are categorised as minor or major based on a set of triage criteria for treatment.<sup>[9]</sup> In trauma forensics, such classification will not be applicable as a major trauma may have little or no forensic significance, whereas a trauma that can easily be dismissed as minor could have huge medicolegal importance.<sup>[10]</sup> It is worthy of note that the severity of injuries in trauma does not necessarily imply higher forensic relevance.<sup>[11]</sup> Therefore, in trauma forensics, medical practitioners will

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need to classify trauma in a manner that is appropriate and understandable to the justice system and that could be a pointer to the causation.

### Approach to Trauma Evaluation

In attending to trauma, some key questions need to be clarified as much as possible. It needs to be emphasised that medical practitioners, especially surgeons, owe society (in this circumstance represented by the court or relevant justice mechanism) a duty to assist in addressing the following enquiries, as much as possible, by the means of their statutory medical intervention:

- i. What kind of trauma is it?
- ii. What object(s) caused the injuries?
- iii. How did the trauma come about?
- iv. When did the injuries take place?
- v. Where did the trauma occur?
- vi. What kind of treatment has been administered to the injuries, if any?
- vii. What is the immediate impact of the injuries, if any, on the health and well-being of the patient?
- viii. What are the intermediate and long-term effects of the injury, if any?
- ix. Are there any observations or peculiarities about the injury?
- x. Who attended to or treated the injuries?

It is equally important not to mistake organic diseases for trauma. Such an omission could have a significant negative medicolegal impact. It is not unusual for a natural disease to appear as trauma and could be a source of considerable distress when dealing with a vulnerable population, especially children and the elderly.<sup>[12]</sup> Making the right call is crucial and obligatory for the surgeon and the health facility.

### Types of Trauma

An important first step in the evaluation of trauma is determining the type. Traumas include blunt force, sharp force, gunshot wounds, blast injuries, heat, cold, and electrical trauma. Recognising these injuries is not only necessary for administering the appropriate medical treatment but also for understanding the circumstances and mechanism of causation.<sup>[13]</sup> Furthermore, an accurate typing of trauma guides in evidence search, collection, documentation, and preservation for medicolegal purposes.

Meanwhile, the focus of this discussion, as indicated, will be on physical injuries broadly categorised into blunt force and sharp force trauma. It is a classification that has relevance in medicolegal considerations as it points not only to the possible instrument of causation but also to the mechanism,<sup>[14]</sup> both of which are crucial in the forensic evaluation of the injuries.

### Blunt Force Trauma

These are injuries caused by blunt impact on the body. They represent the commonest injuries of medicolegal significance.<sup>[15]</sup> Any conceivable blunt objects could cause these kinds of injuries.<sup>[16]</sup> However, medical practitioners need to be aware that blunt force injuries do not require external objects for causation. Parts of the human body such as the head, hands, fists, elbows, knees, legs, feet, etc., could be used to inflict blunt force impact either on others or self.

There are three types of blunt force injuries, viz., abrasion, bruise, and laceration.<sup>[17]</sup>

#### Abrasion

In abrasion, the outer layers of the skin are removed leaving a bare area with minimal or no bleeding. It is often the most superficial of the injuries, and with regard to medical intervention, generally minor. However, in trauma forensics, it is by no means insignificant. It could be quite revealing about the dynamics of interactions between an object or objects and the body of the patient. Abrasion tells an important story as follows:

- i. An object has come into contact with the skin
- ii. The impingement is at an angle of less than 90 degrees
- iii. There is a relative movement between the object and the body
- iv. There is friction between the object and the body.

Therefore, when a patient has abrasions, it is crucial to enquire about how they come about the injury and to document every detail provided. It is important to bear in mind that the role of the surgeon is to provide a medical assessment that could be relevant to any potential legal issues that may arise. Often, the abrasion may occur together with more severe injuries. The patient or the carer may not even be aware of the abrasion nor take cognisance of its presence. However, the abrasion may hold a significant clue to how the other associated injuries on the body may have come about. So, some of the initial steps will be to document the injuries as follows:

- Location(s) in the body with regard to a notable anatomical part
- The size of the abrasion is usually measured in two dimensions, in the widest diameters
- Any associated bruise and general appearance of the abrasion
- The direction of the force in the relative movement between the body and the object that caused the abrasion by indicating the location of the heap of the outer skin layer
- Any pattern that may be discernible on the body could offer a clue to the object of causation
- The presence or absence of any trace elements, such as soil, piece of grass, glass, hair, fibres of any kind

including clothing materials, rope, etc. These materials could turn out to be vital pieces of evidence in the overall police investigation and a potential medicolegal proceeding

- Photos of the abrasion with a ruler for a permanent capture of the injury before any medical intervention
- Any symptoms associated with the injury.

In the circumstance of violence, including sexual assault, it is necessary to examine both the alleged victim and perpetrator, where possible. The nature and distribution of abrasions could provide useful insights into the mechanism of causation. It should be borne in mind that abrasion is not always inflicted by another person but could occur passively in the routine activities of the day and may well be self-inflicted. Therefore, the medical practitioner should refrain from making a definitive determination about the origin of the abrasion from information gathered only through the history of the complaint and physical examination of the patient. In forensic cases, evidence from other investigations outside of medical evaluation often adds to creating the whole picture before a medicolegal proceeding, where all the available evidence is presented before the court.<sup>[18]</sup>

### Bruise

A bruise is also known as a contusion, but it is not uncommon to slip into some habitual tautology of “*contusional haemorrhage*.” It is best to stick with “bruise” as the meaning serves both medical and legal purposes without any substantial ambiguity. Except in occasional medical conditions where bruises can occur spontaneously or following trivial impact, it is a perfect depiction of blunt force trauma, and it is bleeding in a confined space following the rupture of small blood vessels. The commonest location of the bruise is under the skin but can also be found on mucosal surfaces and internal organs and tissues. However, for the living, the skin is the readily observable anatomical canvas for bruises.

Adult patients who are conscious and alert usually have stories to tell about how the bruises found on their bodies occurred. It is more challenging for minors who by age and stage of development are unable to tell their stories and for the elderly who are dependent on others for their care. The doctor would need to be extremely careful in such instances. It could be the last chance for child protection if a bruise is not probed further especially when the history is not consistent with the features seen on the body. In many jurisdictions, healthcare practitioners must report any suspected child abuse to the authorities for further investigation.<sup>[19]</sup> A bruise is a red flag!

Therefore, for medicolegal purposes, there is no such consideration as a “minor” bruise, especially in the circumstance of a road traffic crash, fall from height, and related blunt impact scenarios. It is a potential triage pitfall for medical doctors in emergency units, who may too

quickly assess a bruise as “minor” and discharge the patient too soon from further clinical observation. There have been instances where patients were brought back to the hospital emergency in the event of an unanticipated serious medical sequela sometimes resulting in death.<sup>[10]</sup>

Hence bruises on the body, especially located in the head and neck region, anterior chest wall, and abdomen, should trigger a detailed and diligent clinical evaluation. Where possible, it is best to observe the patient for a few hours, even if they feel “fine” and clinically stable. Not properly examining a patient involved in any form of violence and specifically looking out for evidence of blunt force trauma, including bruises, may be liable for negligence. Whenever there is a background history of trauma, it is as important to document any bruises that may be found on the body as it is to state there is no bruise seen at the time of examination. In the appropriate circumstance, especially in recent incidents, such as a road traffic crash or fall from a height, it will be pertinent to re-examine the patient after some time has elapsed under the close observation of the medical practitioner.

In the forensic medical evaluation of bruises, there should be no assumptions about the history. The presenting complaint may be on one bruise. However, during physical examination, other bruises may be found. It is necessary to enquire from the patient or the caregiver about the origin of the additional injuries and to document them accordingly. Multiple bruises on the body may not be caused by the same object or mechanism, and this information will be crucial in a future legal proceeding. It is, therefore, necessary to identify each bruise and describe the location and specific features.

The following are key forensic notes about bruises:

1. A bruise may not form immediately following blunt force trauma. Thus, the absence of a bruise at the time of seeing a patient does not rule out the occurrence of blunt force trauma. In the relevant clinical history and circumstance, the patient could be admitted overnight for observation or asked to come back the next day for re-examination. Sometimes, the bruise that was initially absent would be evident after some passage of time.
2. A bruise may be formed away from the site of direct blunt force impact. It does so through the tracking of blood from the area of impact.<sup>[20]</sup> Hence, it should not be regarded as “inconsistent with history” if, on examination, the doctor discovers no bruise at the site of impact earlier described by the patient. The seepage of blood from damaged vessels at the point of impact tracks away to cause discolouration of skin in the adjoining area or away from the point of direct impact. This phenomenon could be found in the abdomen or in the head region where the so-called “raccoon eye,” the discolouration around the eye, is not a result of trauma

to the eye but due to head injury, usually, fracture of the base of the skull.

3. Colour changes in bruises have been variously described.<sup>[21]</sup> The colour variations have been used in an attempt to date bruises.<sup>[22,23]</sup> Generally, the accuracy of such determination is questionable. Furthermore, in dark-skinned individuals, it is not applicable,<sup>[23]</sup> and bruises may altogether be overlooked.<sup>[24]</sup>
4. A bruise may reveal possible objects that may have caused it. Such “patterned” bruises are extremely useful in forensic investigation, and adequate documentation is a key to unlocking the potential of such evidence in determining the object of causation. Such information could provide the missing link in the forensic investigation.
5. Bruise, like any injury in the living, is not static. It undergoes continuous changes in the living and will need to be “frozen in time” at the point of medical evaluation. Appropriate photo documentation with a scale is mandatory in preserving the status of the injury at the time of encounter with a doctor or a health facility. It provides a useful reference in determining the nature, duration, and other observed characteristics of the bruise, which can be later reviewed by the attending doctor, other medical experts, and of course, by the court in any legal proceedings.

### Laceration

A laceration is a torn-ragged injury of tissue. The tear could be external (commonly involving the skin and subcutaneous tissue) or internal (mucosal surfaces and internal organs and tissues). The accurate designation is imperative to avoid confusion. Precious time may be spent in the court arguing whether what the surgeon wrote as a “cut” is a laceration or some other injury, especially incised wound, as discussed later. This determination may be a fact in issue in a particular proceeding. If the “cut” is not a laceration, then the grounds upon which the blunt force trauma mechanism is predicated based on the specific injury may not be sustained. Therefore, attending surgeons must be clear about the nature of the injury or otherwise describe the features seen. It is best to avoid the use of the word “cut” in describing any injury resulting in the discontinuation of tissue.

Laceration can be caused by any imaginable blunt object and incidents such as kicking, a fist, a piece of rock, a rod, a hammer, an axe, falls, road traffic crashes, etc. The mechanism of damage to the issue is either from a direct blow to the area or a tear from the stretching of the tissue. The characteristic features of the injury include ragged margins with associated bruising and an irregularly torn base. Occasionally, one may require the aid of a hand-held magnifying lens to correctly identify a laceration and differentiate it from an incision (especially on the scalp), which is a type of wound with a different mechanism of causation, which will be discussed in the next broad

category of traumatic injuries. However, the presence of a ragged and bruised margin confirms the impression. Meanwhile, like abrasion, it is of forensic significance to look for trace elements and document and process them accordingly.

In the medical evaluation of the patient, the following determinations are of forensic significance and should engage the thoughts and consultation of the surgeon:

- i. The nature of the object that may have caused the injury
- ii. The degree of applied force
- iii. The number of blunt force impacts with attendant injuries
- iv. The severity of external injuries
- v. Internal injuries may be associated with the external traumatic impact.

Photo documentation is a critical aspect of the management of lacerations.<sup>[25]</sup> It is necessary to have sets of both before and after images to show what the injury looks like before treatment and following wound care that has taken place in the medical intervention. In major lacerations where wound debridement has taken place with other required surgical interventions, it would be necessary that at follow-up reviews and wound dressing, images of the state of the injury are taken to document the course of the injury.

### Sharp Force Trauma

These are injuries caused by any objects or implements with cutting edge or pointed ends.<sup>[26]</sup> Hence, sharp force trauma could be either an incision or stab. Some objects could cause both incised injuries and stabs, and it is not unusual for a patient to present with a mixture of both types of injuries.

#### Incised wounds

These are injuries caused by objects with sharp edges such as knives, razor blades, and glass.<sup>[27]</sup> The cutting edge runs tangentially to the surface of the tissue, which in most cases involves the skin.<sup>[28,29]</sup> An incised wound is often longer than it is deep. And it could pose a fatal risk to an individual, especially where vital structures are located such as the neck and other parts of the body where some major blood vessels and nerves are situated superficially.

In trauma forensics, a key determination would be whether an incised injury is accidental or nonaccidental. The pattern of distribution of the injuries on the body and their severity may offer a useful clue.<sup>[28,29]</sup> It is not unusual for people to cut themselves accidentally with a sharp object, especially a knife, in the course of work, leisure, and other circumstances. Though accidental, it also has forensic significance, especially for health and safety at home and workplace, and would have an impact on the larger society. When a patient or a caregiver claims the injury is accidental, it is necessary to document details of how the accident occurred including the following specifics: date/time, location, occasion, type of sharp object, immediate

action taken following the injury, and any other incidents in the circumstance. When a child is allegedly afflicted by an accidental injury, it could be a pointer to poor supervision, child neglect, or abuse.<sup>[30,31]</sup> It is crucial to fully document the circumstance of the injury as the medical record could become a veritable source of information and evidence in any subsequent legal proceeding that may ensue.<sup>[32,33]</sup>

On the other hand, nonaccidental incised injury equally carries huge medicolegal importance,<sup>[32,34]</sup> and meticulous medical evaluation of any sharp force injuries is critical to the eventual determination of the manner of causation. Usually, the nonaccidental injury could be inflicted by another or through some intentional act or self-inflicted. It is not the role of the surgeon to conclude whether an injury is nonaccidental or not but rather fully document the features of the injuries that may be useful in subsequent legal proceedings towards establishing the manner of causation: accidental, homicidal, suicidal, or self-inflicted for other reasons, apart from an attempt at *felo de se*. It is within the realm of the judicial mechanism to make such a conclusion based on all the available evidence and due consideration of the circumstance. The medical evidence may only be a part of the piece of the puzzle. Therefore, it cannot be overemphasised that surgeons should refrain from making any definitive determination of the manner of injury based solely on medical evaluation. It is the duty and prerogative of the court to do so.

However, a medical evaluation of forensic importance will document the following about incised wounds as applicable:

- i. The number of injuries. It should not be stated as “multiple injuries” if more than two injuries are inflicted. Each injury should be numbered and described separately
- ii. The size of the injuries, especially the length and the best estimate of the depth of the wound, usually after subsequent surgical intervention reveals the deepness
- iii. Location of the injuries including comment on the proximity to vital structures such as blood vessels or nerves
- iv. A general assessment of the severity of the wounds
- v. The nature of medical treatment administered, including surgical intervention, where necessary
- vi. Immediate health impact on the patient and any anticipated medium- or long-term effects or disability
- vii. If any object or weapon is recovered by the police, it should be examined as a part of the injury assessment in reconstructing the injury. Where the perpetrator is unknown, pieces of evidence, such as bloodstains, hair, fingerprints, and other trace materials, from the sharp object allegedly used in causing the injuries would be relevant in the criminal investigation.<sup>[32]</sup>

Proper characterisation of the injuries will not only be of use in a potential criminal justice proceeding but also in civil

suits where damages could be awarded for an injury suffered in some circumstance. The quality of documentation and interpretation of findings based on the facts of the injuries will provide the needed elements that will be of the essence to the justice mechanism.<sup>[32,33]</sup>

### Stab injury

It is a penetrating injury that is deeper than it is wide. The objects that cause this type of injury have sharp pointed ends and commonly include daggers, regular knives, scissors, screwdrivers, bayonets, ice picks, etc.<sup>[35]</sup> The common denominator among these implements is the presence of a sharp pointed end that can penetrate the tissues with varying degrees of force. Even a minimal amount of force could cause considerable stab injury and damage to vital structures in the body.<sup>[36]</sup>

Every stab injury must be treated as a medical emergency until it could be ruled out (not only through the clinical status of the patient but also by relevant ancillary investigations) that no vital tissues have been damaged that could pose a mortal threat to the individual. The location of the stab injuries serves as a warning signal of potential damages that may have occurred and thus the necessity for urgent surgical intervention. The neck, head, chest, abdomen, and groin carry a particularly high risk for the individual and require emergency medical evaluation and intervention as may be required.

Medicolegally, the role of the surgeon, who in most cases may not have forensic training, would be to make a thorough assessment of the stab injuries as much as possible. The injuries should be documented, including the photo documentation, before treatment. Where multiple stabs are present, they must be numbered and described separately in the following characteristics:

1. The number of injuries. It is more likely that a single stab wound is accidental than a situation where there are multiple stab injuries, which may suggest homicidal or suicidal nature
2. The anatomical location of the stab injury on the surface of the body and the relationship to vital structures such as blood vessels, nerves, etc.
3. The external features of the stab injury include:
  - a. the dimension of the wound;
  - b. whether clean cut edges or the presence of any surrounding bruise and abrasion, which may be due to the impact of the hilt of the object, especially knife, with an occasional pattern of the hilt evident on the skin;
  - c. whether both ends or only one end is pointed, which may suggest that the object used may have a double- or single-edged blade;
  - d. if the knife has a single-edge blade, whether the nonpointed edge is split (the so-called fishtail appearance) or squared off;<sup>[37]</sup>

- e. whether there is a notch, usually a central one, which may give an appearance of a V-shape, which is caused by the dynamics of movement of the victim, the perpetrator, and in this case, the knife;
  - f. whether there is any other external appearance of the wound that may suggest other dynamics such as the rotational force of the object or knife used in causing the stab.<sup>[38]</sup>
4. The internal features of the stab wound include:
    - a. the depth of the injury and direction of impact, which could be determined where surgical intervention has taken place. It is a piece of information that will suggest not only the degree of force applied but also the type of object used;
    - b. the injured structures along the track of the stab;
    - c. and the extent of tissue damage caused.

The history and circumstance of the injury could direct the attention of the surgeon to other considerations such as the need to examine the clothing of the patient. The presence or absence of any defects in the clothes worn at the time of the alleged incident and their relationship to injuries found on the body may be relevant to the justice mechanism in differentiating a self-inflicted stab injury from an alleged assault.

### Ten Practical Considerations in Blunt and Sharp Force Traumas for Surgeons

1. Examine every patient who complains of trauma. If there is a background history of interpersonal violence or allegation of assault, a complete physical examination should be conducted and preferably with a chaperone of the same sex as the complainant. It is important to apply due sensitivity and empathy in attending to patients with trauma who may be in a particularly vulnerable situation. The examination may contribute to their healing or exacerbate their situation. The difference often lies in the “how” of the procedure.
2. Document fully and contemporaneously the history of the presenting complaint by the patient or caregiver, findings on physical examination, and any evidence collected in the evaluation of a patient with trauma. There is a real risk to forget important details or make an unsatisfactory write-up when the medical notes are written at a different time. Except where there is a dire emergency needing the immediate intervention of the surgeon to save a life, a crucial part of appropriate evaluation of any case of trauma is real-time documentation of the history of presenting complaints, physical examination findings, and subsequent procedures or medical treatment as applicable. The medical evaluation of trauma may provide a crucial piece of evidence to the court in addressing attendant medicolegal issues.
3. Do not dismiss any trauma as “minor.” Take a detailed history and determine the need for ancillary investigation and further evaluation based on the circumstance. When it is a case of a road traffic crash, for example, admit the patient for a varying period based on clinical parameters. Every person involved in a crash, especially when someone in the same vehicle has been seriously injured or dead, should be treated as a major incident, even when the subject has no obvious serious injury. The presence of internal injuries must be excluded before discharging the patient. A common error with huge medicolegal liability is to dismiss an injury as “minor” only for the patient to come back as an emergency and sometimes with a loss of life.<sup>[10,12]</sup>
4. When the police bring either an alleged victim or perpetrator in a case of interpersonal violence for medical examination, obtain informed consent from the subject before any medical evaluation, except if there is a valid court order. Again, it is not the role of the doctor to ascribe guilt or innocence. Every patient must be treated per the ethics of the medical profession.<sup>[36]</sup>
5. Take pictures of any injuries in a patient before treatment. However, it must be preceded by proper consent either from the patient or the next of kin, authorised family representative, or caregiver. In unconscious patients or those without known relations, the images should be taken as a part of the protocol in attending to cases of this nature to preserve some facts about the injuries in the anticipation of possible medicolegal proceedings. Once the patient regains consciousness or the next of kin or an authorised family representative is available, their wishes about the images should be respected. However, in all cases where there is an overriding court order on images being taken and preserved, it supersedes the consent or wishes of the patient or the next of kin in the circumstance.<sup>[39]</sup>
6. Many clinical services in the developing world do not have a dedicated photography unit for clinical cases and certainly do not have forensic photography expertise.<sup>[40,41]</sup> However, photos should still be taken as a routine, especially in all potential medicolegal cases. Hence, every hospital or health facility, despite limiting factors, ought to have a dedicated device for taking pictures, as indicated. It is best to avoid the use of personal cell phones, especially as these devices are usually connected to the internet with the risk of inadvertent upload and sharing of confidential information, and the risk to data protection by access to unauthorised persons.
7. Do not consider any procedure more important than saving the life of the patient in a dire emergency. Pretreatment images and other detailed evaluations may not be practicable in the circumstance. Focus on the resuscitation of the patient and applying all necessary medical interventions. Subsequently, full

documentation can be carried out at the possible nearest time following medical treatment and should include the state in which the patient presented, actions that are taken, and bases for the procedures.

8. Stay neutral in the evaluation of trauma in a patient. Except where the surgeon has witnessed the incident, there is no way of knowing whether the subject is narrating a true or false account of what happened. In medicolegal cases, it is the responsibility of the police to carry out the necessary investigation of the case in line with the police mandate. The role of the doctor is in the complete and accurate documentation of the features of the trauma seen in the patient and where required to offer any opinion on the consistency of the mechanism of causation of the observed injuries. Avoid any forms of incendiary comments that may compromise objective assessment and professionalism in all cases. The implication of unguarded remarks in medicolegal cases could be profoundly damaging to the cause of justice and the reputation of the medical practitioner.
9. Understand the laws in your jurisdiction about mandatory reporting of certain types of trauma to the local authorities, especially the police.<sup>[42]</sup> It is particularly relevant in child protection and other vulnerable groups, including the elderly who are under the care of others.
10. Avoid commenting on the “ultimate issue” in the medical records or reports, except when it is merely documenting the history of presenting complaints in the words of the subject or patient or alleged victim of trauma, which should be quoted. Therefore, it is inappropriate and prejudicial to make some remarks or conclusions such as “...*findings are consistent with rape*” in the case of allegation of sexual assault or “...*this is torture*” in the case of an extensive blunt or sharp force trauma or both. The ultimate determination lies with the judicial mechanism in the jurisdiction where the incident takes place.<sup>[41]</sup>

## Conclusions

Trauma forensics is a concept with real-life implications in the society and should be in the thoughts of medical practitioners when they encounter patients with injuries in their practice. It alerts medical doctors and other healthcare staff to think beyond medicine and carefully consider how their intervention could have wider ramifications in civil and criminal justice mechanisms. Damages for tort, nature, and magnitude of insurance claims for diseases or disabilities, other forms of compensation, and criminal procedures could be sustained by the quality of medical evidence. Hence, trauma forensics puts medical practitioners in the crossfire of medicine and the law, the survival of which is dependent on anticipation, due process and diligence, competence, and adequate knowledge of medicolegal (forensic) issues in the jurisdiction of practice.

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