Dealing with Death in Trauma

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- Epidemiology and timing of traumatic causes of death. Comparison to other hospital deaths
- Theory of death trajectory, how it differs by disease, how trauma deaths are different
- 'Bad' vs 'good' deaths—societal & cultural expectations vs medical reality
- Dealing with death: the family. How television & film inform expectations. Practical advice on breaking the worst news
- Dealing with death: the clinical team. How to debrief the team after a traumatic death
- Dealing with death: the expert. How senior staff can help their colleagues, and themselves

The real problem of humanity is the following: we have Palaeolithic emotions, medieval institutions and God-like technology.

Edward O.Wilson, debate at the Harvard Museum of Natural History, Cambridge, USA. September 2009.

Introduction

Despite significant advances in care with the development of trauma systems, networks, and designated centres within modern healthcare systems, death from a traumatic event remains common. In the UK, the 2007 National Confidential Enquiry into Perioperative Deaths (NCEPOD) report describes trauma as the fourth leading cause of death in the Western world and the leading cause of death in the first four decades of life [1]. For each traumatic death, there is an estimate of 36 life-years lost. In the US, half of all deaths occur within minutes of injury either at the scene or en route to hospital, with significant variation in mortality reported, from 35% in high-income to 63% in low-income settings [2]. A 2010 report from the National Audit Office on major trauma care in England reported 20,000 major trauma events per year resulting in 5400 deaths [3]. Although previous epidemiological studies have described trimodal death distribution (immediate death on scene, early death due to haemorrhage, and late death from organ failure), data from the largest European trauma database has challenged this [4]. The UK Trauma Audit and Research

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Network (TARN) report into 3632 deaths between 1997 and 2001 showed the majority of trauma deaths occurred soon after hospital admission without further peaks in mortality. This was roughly divided into quarters—the first 25% die within the first two-and-a-half hours after trauma, the second within the first twenty-four hours, and the third within the first week, with the remaining quarter of those who die doing so after this period.

Compared to many deaths encountered within hospital, trauma deaths are usually sudden and therefore unexpected, involve younger patients and, even as trauma systems have evolved to significantly improve care, are often unavoidable. The effect of these factors on both the family members these deaths leave behind, and the clinical staff who have cared for the deceased and may be present at death will be discussed in this chapter.

Death Trajectories

To place death from trauma in context, it is necessary to consider how it differs in comparison to other fatal disease processes. Not only is this relevant to clinicians' experience of the deaths that they encounter during paramedic, nursing and medical training, but also gives context to family and societal expectations when dealing with trauma(tic) death. One method of describing (and graphically representing) these differences is to consider theoretical trajectories of dying—what happens to patients' physical and social function over time in the last year or so preceding their death.

The concept of death trajectories was first suggested in 1968 [5]. Three different models were proposed—sudden 'surprise' death, 'expected' death (short-term and lingering), and 'entry-reentry' deaths where people slowly deteriorate with intervening intermittent hospital admissions. Several studies have since expanded upon this theoretical model using analysis of large administrative and clinical datasets [6, 7]. An analysis of a US Medicare database from 1993–1998 in older claimants who died suggested 92% of decedents were able to be categorised into one of four underlying conditions which determined their trajectories at the end of their life. These were sudden death (7%), cancer (22%) and organ system failure (16%) with the remainder due to frailty.

Figure 2.1 shows differences between theoretical death trajectories superimposed on a single chart, representing functional changes over time. Although these are represented as distinct categories, different trajectories may overlap in single patients (frail patients who die from a traumatic event for example). The progressive decline in function may be influenced to differing degrees

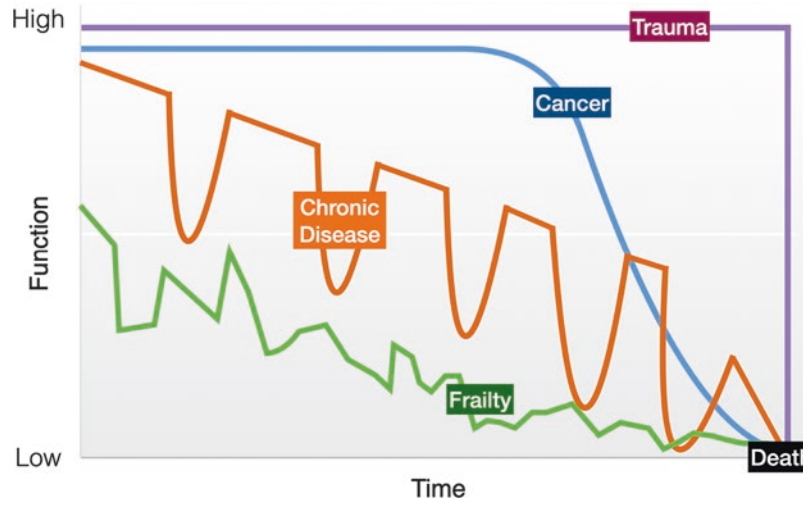

Fig. 2.1 Theoretical comparative death trajectories

by medical intervention. A functional decline from chronic disease—heart failure or chronic obstructive pulmonary disease for example—may result in reversible acute on chronic deterioration where hospitalisation provides short-term improvement. Often such patients do not return to pre-admission baseline. Such acute decrements are expected to become more frequent and move further from a pre-morbid state as the disease progresses towards death. The frailty trajectory has been described as 'prolonged dwindling' where functional decline continues irrespective of medical intervention. Such patients are unlikely to benefit from hospitalisation, where exposure to this environment may even accelerate deconditioning and do more harm than good. Patients on an incurable cancer trajectory, where the underlying disease progression can be delayed but not halted, are more likely to be able to benefit from the expertise of palliative medicine clinicians in managing their symptoms. They also, along with those with chronic disease, may have time to make autonomous decisions regarding the when, where, and how they die. For those in the final category, who die from sudden traumatic events, these opportunities are almost never available. Although death is seldom desired, it is presumed that most people, when it comes, would wish for their ultimate demise to be 'good'.

The Bad Death

As clinicians we are frequently exposed to death and the process that precedes it. What constitutes a 'bad' or 'good' death is considerably subjective. The death we may want for ourselves, our family members or our patients may not be the death they would want for themselves. Although death is inevitable, the low prevalence of advanced care planning suggests that many people are unlikely to have discussed with their families (or their doctors) how they may die. In modern healthcare systems where life expectancy continues to rise, societal expectations of a long and healthy life often preclude consideration of the alternative. This is particularly relevant for deaths related to trauma. The acute nature of the event both selects for a younger population in whom death was previously a far-away ill-considered possibility, and may remove or reduce the ability to have any influence on the process. Many deaths from trauma are likely to happen despite ongoing maximal treatment, not from limitations placed due to futility as may occur with chronic disease states. Indeed, any traumatic event that impairs consciousness or decision making removes the individual from determining what happens to them. Their dying process may then rely instead on the consensus of proxy decision makers made up of clinicians, family members, or even legal authorities.

To determine what is a 'bad' death, one should first consider the alternative. Societal expectations of death are varied and often determined by cultural or religious beliefs. For some, a 'good' death would involve the autonomy to determine where, how or even when they die. A 2016 literature review exploring themes around a good death described thirty-six studies involving interviews with clinicians, family members, and patients [8]. Eleven core themes of a good death were identified. These included being pain-free, dying with dignity, having family members present, and having control over the dying process. Deaths from sudden trauma are unlikely to meet any of these. It is more likely that sudden trauma will lead to a 'bad' death due to a variety of factors. These include:

Key Points

- **Location:** death is more likely to occur either pre-hospital (roadside or in an ambulance or helicopter), in the resuscitation bay of an emergency department (ED), or in an operating theatre or intensive care unit (ICU), rather than at home or another preferred location
- **Timing:** death may occur during or immediately after a treatment or procedure that was unlikely to change outcome, with little control over this from either the patient or clinical staff. There is often no opportunity for family and friends to 'say goodbye' or resolve any outstanding conflicts

- **Personnel:** the patient is more likely to have paramedics, nurses or doctors present, not family or friends
- **Quiet and calm:** the death is more likely to occur in a noisy environment accompanied by monitors and alarms
- **Dignity:** the aggressive nature of trauma resuscitation with exposure, cannulation and intubation does not lend itself to a dignified death
- **Cultural or spiritual needs:** although these may be able to be met after death (subject to local Coronial requirements), these are often unknown, or if known are difficult to address during resuscitative efforts

Accepting that a cost of doing everything to save a life may result in a bad death, the effects of either participating in this process (as clinicians) or being absent as a result of it (family members and friends) will be considered from different viewpoints.

Dealing with Death: The Family

The responsibilities of a clinician caring for a patient who dies from trauma do not end with the patient's death. Although resuscitative efforts may be guided by protocols, what comes after—breaking the worst news—is harder to prescribe. Although some deaths may be discussed and expected (a patient with unsurvivable brain injury in an intensive care unit for example), many trauma deaths occur outside hospitals, in resuscitation rooms, radiology suites or operating theatres. Rapid attendance of family members or friends allows little preparation for what may happen and what could be signposted in advance. The onus usually falls upon the most senior clinician present, sometimes fresh from the resuscitation, to deliver the news that a loved one has died.

Before considering what and how this process should occur, some context around societal expectation (which affects both families and clinicians, although to differing degrees) is relevant. Unless family members have either previous experience of acute traumatic death or have clinicians amongst their group, it is likely their expectations are informed by the outcomes they have been exposed to through television, film and print media. Although this assertion may seem strange on first consideration, it has been subjected to several studies examining outcomes of fictional patients in television dramas [9–12]. An analysis of 88 episodes from 4 different television medical dramas (2 each from England and the US) showed 76 cardiorespiratory arrests and 70 resuscitation attempts. Overall there was an immediate success rate of 46%, with the most common cause of arrest being secondary to trauma. Survival (or not) to discharge was usually not shown. In the real world, survival from traumatic cardiac arrest varies but rates have been reported between 0%–3.5% [13].

For patients who may survive the initial resuscitation but have incurred brain injury resulting in a reduced level of consciousness, television portrayal is even more likely to lead to false hope amongst family members [14]. A study of 64 characters who exhibited unconsciousness exceeding 24 hours duration in 9 US television dramas showed that 89% of patients made a full recovery. Of those who recovered, 86% did so fully on the day of waking. For those with traumatic cause of their coma, 89% were depicted as making a full recovery (compared to 7% in reality).

The gap between expectation and reality should be borne in mind when meeting with family members, particularly if there is uncertainty around outcome. For breaking bad news around a sudden traumatic death however, the outcome is already known. The focus should therefore be on process. Although the complete scope of communication strategies for breaking bad news is beyond this chapter, there are some factors specific to sudden traumatic death that should be considered.

Professor Peter Brindley has described the family meeting as 'the most dangerous procedure in the hospital' [15]. He goes on to discuss that communication skills are rarely innate, do not necessarily improve through years of unstructured experience and that communication training is associated with increased (clinician)

confidence, improved patient satisfaction, less anxiety and lower post-traumatic stress. The potential for poor communication to cause lasting harm should not be underestimated. In mitigation, the following points are presented for consideration as a suggested process for breaking the news of sudden death to family or friends:

Key Points

- If possible, find a small quiet private space with seating, away from busy clinical areas. Unless absolutely unavoidable, this is not a conversation for a corridor or resuscitation room
- If clothing or shoes are soiled with blood, change them before going into the room
- Do not keep family members waiting any longer than absolutely necessary
- The meeting should be led by the most senior staff member available and not delegated. Ideally, they would have been involved in the resuscitation process so are able to answer questions from their own experience. Other clinical staff should attend to support the lead and family members or for education purposes, but not in such large numbers that they overwhelm. If other staff are attending, a prebrief from the lead may be helpful, particularly if silence is to be used as a communication tool
- Begin by quickly asking who is in the room and whether anyone else is arriving imminently. Introduce all staff members briefly
- Ask the family what they know about what has happened. Incorporate this into a single-sentence summary of known events. Pause
- Tell the family that, despite the best efforts of the team, their loved one has died. Use the patient's name when you do so. Precede this with an empathic expression of sorrow that you are comfortable using. Do not use euphemisms. Use the words '*died*' or '*dead*'
- **Stop talking and wait**. It is likely that very little said beyond this point will be remembered. Sit with the family, saying nothing. This process has been described by the eminent Australian social worker Dr. Liz Crowe as 'sitting in the rubble' [16].
- Continue to wait until the family are able to ask questions; let them break the silence. Answer questions honestly and simply. If a question cannot be answered at that time, tell the family that an answer will be found (if possible) and take responsibility for providing it yourself or delegating it to someone appropriate
- Communication should be empathic, not sympathetic. It is unlikely clinicians know what family members are experiencing so expressions that suggest so should be avoided
- Once questions have been answered, explaining practicalities about what happens next may be useful if deemed appropriate. If the family wish to be with their relative, ensure that the area where the body is located is accessible and they are presented in as dignified a way as possible before taking them into the room. Any major injuries should be covered if possible. This will likely be the last memory of their loved one
- Make sure a support person remains with them or is easily accessible until they leave the hospital

Death notification in the pre-hospital domain may be more burdensome for clinicians without the resources available in a hospital to assist. Family members may already be on scene (travelling in a vehicle with the deceased for example) and may also be injured themselves. To help with this, death education curricula and tools have been developed [17, 18] and their effects studied [19], suggesting an improvement in paramedics' ability to perform these tasks. Prior to a death notification course, 84% described their training was inadequate to communicate death or help a family with their grief; this rose to 92% self-reporting that they felt better prepared after training.

The poet and civil rights activist, Maya Angelou said "*.. people will forget what you said, people will forget what you did, but people will never forget how you made them feel.*"

Although this is one of the worst days of their lives, small changes in the way death notification is conveyed may make a lasting difference. This

applies both to the family and the clinicians involved in the process.

Dealing with Death: The Clinical Team

Trauma deaths are unlike other deaths in hospital. They are less frequent, may progress rapidly, are likely to involve larger numbers of clinicians with differing experience, and, as described by trauma epidemiology, are likely to involve younger patients with few if any co-morbidities. Although traumatic deaths may be increasing, clinical exposure to in-hospital trauma deaths may be decreasing. One US study indicated that all-case deaths in emergency departments halved between 1997 and 2011 [20]. Another US study over a similar time period indicated a change in place of death from acute hospital wards to home or community settings but also reported a rise of deaths within the ICU [21]. If frequency of exposure to death and dying in certain environments is reduced, then the impact upon clinicians when they do experience or witness it may be greater.

Death in ICU is relatively common. ICU mortality varies but is reported as between 10–40% for acute admissions [22, 23] Whereas the majority of death in ICU is hastened by treatment limitation or withdrawal on the grounds of futility, trauma deaths in the prehospital setting, ED or operating theatre are more likely to occur despite ongoing resuscitation. The subtle difference of death being 'allowed' to happen due to an irreversible underlying process, compared to death occurring despite 'heroic' efforts of clinicians working together to avoid that very outcome is important. The outcome is the same; the process is very different. The effects of this distinction upon those involved should not be underestimated when participating in or leading the teams involved.

The trauma team model—where clinicians from different specialties including but not limited to emergency medicine, surgery, anaesthesia, intensive care, or paediatrics—brings together individuals with different skills at different levels of training. The team must function as a single unit with a unified goal under direction. Although the team model lends itself to some diffusion of responsibility, for adverse outcomes or where resuscitation is unsuccessful, more junior team members may feel they contributed to the patient's death, or that they could have done more. Clinical bystanders with less direct responsibility—nursing, medical and paramedical students for example—may be witnessing these events for the first time and require specific support in dealing with their distress, guilt and grief [24]. This may go unnoticed by those immersed in the resuscitation. Even a well-run trauma call proceeding in a quiet, bloody frenzy is not a 'normal' environment for many of the participants to work.

For some individuals or specialties, death may be anathema. One anaesthetic trainee rotating through the author's ICU fed back at the end of their six-month run that "I had no idea there would be so much death". To a specialist who has only worked in the ICU environment for many years, this was an interesting insight into desensitisation when death is frequent and normalised. Compared to ICU, a death in an operating theatre usually results in the team—theatre nurses, surgeon and anaesthetist—being stood down and debriefed. In ICU, the paperwork ritual is completed, the body removed, and the room cleaned ready for the next admission. The differences in mindsets of trauma team members should be considered when managing their experiences after a traumatic death.

Giving team members the opportunity to reflect on their shared experience after traumatic events may be beneficial. The process—debriefing—may be staged with a 'hot' debrief immediately after the event (if competing clinical demands allow) and then a delayed 'cold' debrief where the immediate emotional reaction may have reduced, to improve reflection on team performance. Several debriefing mechanisms have been described [25] with practical guidance available on how to conduct this in the emergency department [26]. Although there is no definitive evidence that debriefing decreases post-traumatic stress, some studies have suggested the process may help to reduce it [27–29].

The full gamut of debriefing is outside the scope of this chapter. However, as a brief summary, the following process for a 'hot' debrief (immediately after the patient's death) could be considered:

Key Points

- After the patient has died, pause. Some centres have described requesting 30–60 seconds of silence to consider what has just happened. This is respectful of the life of the person who has just died as well as the efforts of those who tried to prevent it. Request that team members do not immediately disperse unless they have urgent clinical tasks elsewhere. If the family have arrived or are present then communication with them must be prioritised
- Tie up any loose ends, delegating tasks where possible to those who were not directly involved in the event. Offer the chance to debrief to those who wish to attend, telling them it is not mandatory but may be helpful. The debrief should ideally be led by someone who has been trained to do so, or is comfortable doing so. This does not have to be the trauma team leader, and may not even be someone who was directly involved in the event
- Assemble the team in a quiet area and establish ground rules. What is discussed is confidential, participation is voluntary, anyone may leave at any time and the debrief is informal and supportive, not accusatory or to apportion blame. Explain that the debrief is to get a sense of what just happened from everyone's perspective rather and to prevent individual team members blaming themselves for the outcome
- Check in with those present. Ask directly "is everyone OK?". If not, address why first
- Begin by asking the group to run through the facts, to construct a shared mental model of what just happened
- Once the facts are agreed and established, the emotional responses can be discussed. Ask what people were thinking at various points during the resuscitation and how they felt, how they performed the tasks they were allocated and any difficulties they may have had with them
- Discussion around process should be encouraged rather than discussion around outcome. This can be best considered with 3 simple questions: What went well? What didn't go well? What would we do differently? The last question could be framed as an opportunity to learn from the event
- Close off the debrief with a summary of what has been discussed and the points, if any, to be addressed for improvement in process. If there is feeling that further debrief may be required then offer an opportunity for this to occur. The debrief leader should check in again that everyone involved are able to return to their clinical work and provide support for those who aren't.

Dealing with Death: The Expert

Finally, the effects of traumatic death upon more senior staff should be considered. There are undoubtedly expectations within organisations, specialities and even different cultures as to which qualities strong leaders should model. For some leaders, the outward expression of emotion may be considered a sign of weakness and seen as poor leadership. For some teams, evidence of their leader's humanity may be seen as a positive trait. In politics at least, perceptions around what strong leadership looks like are being challenged [30].

Some insights into the effects of death of patients upon specialists involved in their care are provided by studies in two contrasting specialties—oncology and trauma surgery. The first, a 2012 study of 20 oncologists in 3 Canadian hospitals with a range of 18 months to 30 years clinical experience described their experiences of patient death as 'desiring detachment' but 'struggling with grief' [31]. Grief was considered unprofessional, shameful, and a weakness to be hidden from others. Over half reported feelings of self-doubt and powerlessness. For most, talking to the study authors was the first time they had ever spoken about it. More importantly from the patients' perspective, half had reported their

grief had affected treatment decisions with subsequent patients. This included more aggressive chemotherapy, enrolment in experimental studies, or further surgery when palliative care may have been preferable. Their reported experience suggests that not only do doctors grieve, but also that it affects the treatment that may be offered to the next patient.

Secondly, a 2014 study in US trauma surgeons surveyed respondents for symptoms of post-traumatic stress disorder (PTSD) asking about frequencies of a variety of symptoms [32]. These included questions such as 'do you have repeat disturbing memories, thoughts or images?', 'do you avoid thinking or talking about stressful experiences?', 'do you feel distant or cut off from other people?', and 'do you feel emotionally numb?'. The authors reported that 40% of respondents described PTSD symptoms with 15% meeting formal diagnostic criteria. Risk factors for PTSD were male gender and higher frequency of on-call duties; a fifth of respondents were from a military background. The effects of occupational exposure to traumatic events reported in this study and others have led to the development of specific resources to help those affected [33]. One example—Trauma Risk Management (TRiM)—offers a peer-delivered support system to help support individuals after traumatic events within organisations, especially those working in disaster-exposed occupations where injury or death of a colleague may occur [34]. A more detailed approach to preventing and treating trauma-related mental health problems is described in the trauma-related mental health problems chapter of this textbook.

The effect of death upon surgeons has been poorly described. A 2019 systematic review on the impact of patient death found only five studies [35]. The authors concluded that surgeons carry a strong psychological burden when facing death and are more at risk than the general population from developing problems with long-lasting psychological impact. The risk of getting too close to dying patients means loss of objectivity; staying further away prevents a therapeutic relationship. Both may contribute to a progression towards burnout.

Generic advice on how one should deal with the death of a patient is difficult to provide. Each individual will develop coping mechanisms that suit their personality or management style. There are some support mechanisms described by the growing 'wellness' movement that may have some utility. These include the seeking out of peers who understand the environment in which you work and will be able to provide empathic support without judgement. Mentors may be helpful in debriefing one-on-one in either a formal or informal setting. Other factors that have been associated with improved coping mechanisms for abnormal events include autonomy in a positive work environment in which you feel your contribution is valued. Interests and activities away from work that improve work-life imbalances in favour of the latter are recommended. Self-perception around the irreplaceable importance of one's work are likely to be both wrong and harmful in the long term. The faulty vending machine sign stating 'the light inside has broken but I still work' is an unintentional warning for clinicians who fail to recognise they have a problem [36].

The early twentieth century French vascular surgeon René Leriche wrote 'Every surgeon carries about him a little cemetery, in which from time to time he goes to pray, a cemetery of bitterness and regret, of which he seeks the reason for certain of his failures'. Visiting such a place occasionally is likely to keep a clinician grounded and pragmatic; spending too much time there may be harmful. Developing life-long strategies to manage the inevitable conflict between Palaeolithic emotions and god-like technology is recommended for every clinician who deals with death, traumatic or not. This includes managing its effects on the families they also care for, members of the team they are responsible for, and checking in on colleagues who may have differing or absent coping mechanisms.

Summary

Death from a sudden traumatic event differs in a number of ways from the non-traumatic deaths with which clinicians and patients' families are likely more familiar. Not only are they likely to

occur despite aggressive treatment rather than as a result of withdrawal of it, but are more likely to involve a younger population, including children. Trauma deaths also differ in trajectory from that of other diseases. Both acuity and aggressive treatment prevent the 'good' death that many would want for themselves or their loved ones. Breaking sudden death news to family members is particularly difficult for many clinicians but empathy and a structured approach may help both parties. The effects of participating in or bearing witness to efforts to stop death from trauma should be considered on all team members, both junior and senior. Structured debriefing may help manage normal emotional responses to awful events and reduce self-blame. Repeated exposure to trauma(tic) events that end in fatality will have effects upon all staff involved to differing degrees. Individual clinicians working in such areas should develop conscious coping strategies to reduce post-traumatic stress disorder or burnout.

Questions

1. Compared to death from other causes, deaths from trauma:
   (a) Are more likely to happen in the elderly
   (b) Occur, in the majority, several weeks after hospital admission
   (c) Are almost always preventable, if the patient reaches hospital alive
   (d) Are often sudden and unexpected
2. Death trajectories:
   (a) Are theoretical models with some support from analysis of administrative and clinical databases
   (b) Hypothesise that, for chronic disease, after hospital admission the patient will always return to baseline
   (c) Suggest that frailty will always benefit from medical intervention
   (d) For trauma, have a long lead time where discussions with patients and their families allow autonomous decision making
3. Recommended methods for informing families of the sudden death of a patient include:
   (a) Use of euphemisms such as 'gone to another place' to soften the blow
   (b) Using sympathy ("I understand what you're going through right now"), not empathy
   (c) Providing as much information as possible regarding the events that led to the death and a detailed explanation of the efforts of the resuscitation team that were, unfortunately, unsuccessful
   (d) Clearly stating the patient has died after which the clinician should stop talking and wait.
4. Debriefing trauma teams after a patient's death:
   (a) Is a waste of time. Everyone is busy
   (b) Should be led by the most junior team member to provide insight into their perspective
   (c) Should begin by establishing a shared understanding of factual events before discussing emotional responses
   (d) Is mandatory for all those involved
5. Senior clinicians:
   (a) Are never affected by the death of their patients and do not experience grief
   (b) In a study of US trauma surgeons, described PTSD symptoms in 40% of respondents
   (c) With regard to surgeons, have been extensively studied to investigate the impact of patient death upon them
   (d) If affected by the death of a patients, should not seek help from others as this is a sign of weakness

Answers

1. d
2. a
3. d
4. c
5. b

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