

Best practice recommendations

Non-chemical, biological, radiological and nuclear mass fatality incidents – the pathologists' roles

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Foreword

Best practice recommendations (BPRs) published by the Royal College of Pathologists should assist pathologists in providing a high standard of care for patients. BPRs are systematically developed statements intended to assist the decisions and approach of practitioners and patients about appropriate actions for specific clinical circumstances. They are based on the best available evidence at the time the document was prepared. It may be necessary or even desirable to depart from the advice in the interests of specific patients and special circumstances. The clinical risk of departing from the BPR should be assessed and documented.

A formal revision cycle for all BPRs takes place every 5 years. The College will ask the authors of the BPR to consider whether the recommendations need to be revised. A review may be required sooner if new developments arise or changes in practice necessitate an update. A full consultation process will be undertaken if major revisions are required. If minor revisions or changes are required, a short note of the proposed changes will be placed on the College website for 2 weeks for members' attention. If members do not object to the changes, a short notice of change will be incorporated into the document and the full revised version will replace the previous version on the College website.

This BPR has been reviewed by the Professional Guidelines team. It was placed on the College website for consultation with the membership from 29 July to 26 August 2025. All comments received from the membership were addressed by the authors to the satisfaction of the Clinical Director of Quality and Safety.

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1 Introduction

Mass fatality incidents vary significantly in scale and complexity, making it impossible to devise a universal, prescriptive approach. However, common principles can guide an effective response, ensuring a structured and coordinated effort. The key to success lies in preparedness, flexibility and adherence to internationally recognised standards.

A mass fatality incident may be defined as an event resulting in a significant number of deaths that exceeds the capacity of the normal response mechanisms. The defining feature of such incidents is the overwhelming scale of loss, necessitating a coordinated effort among multiple agencies to manage victim recovery, identification and forensic investigation, while also supporting affected families and communities.

This document serves as a guide for forensic pathologists involved in mass fatality incidents, outlining best practices for a coordinated approach to the post-mortem process. It does not provide rigid instructions for conducting a mass fatality response – particularly given that each incident is unique – but instead offers a framework that ensures consistency while allowing for flexibility in response planning and execution.

The document is structured into several sections, with sections 3–6 addressing the critical elements of the process.

Section 3: Role of the group practice

This section outlines the responsibilities of forensic pathology group practices,* including preparation, familiarisation with disaster victim identification (DVI) protocols, site selection for post-mortem examinations, provision of mutual assistance and liaison with the Human Tissue Authority (HTA). It also emphasises the importance of pathologist welfare and support systems.

* Of course, Scotland and Northern Ireland work under different medico-legal systems to that of England and Wales, but nevertheless the forensic pathologists work in local groups. For simplicity, this document will refer to group practices and coroners.

Section 4: Practical aspects of the mass fatality incident – pre-autopsy phase

The initial response phase covers critical early-stage activities, such as scene visits, mortuary setup and coordination among key stakeholders. This section also introduces essential logistical considerations for efficient body recovery, storage and documentation.

Section 5: Practical aspects of the mass fatality incident – autopsy process phase

This section details the post-mortem examination process, including case allocation, radiological assessment, evidence recovery, forensic examination techniques and the necessary documentation. The importance of debriefing, handling small fragments and ensuring adherence to forensic standards is also addressed.

Section 6: Post-autopsy phase and legal proceedings

The responsibilities of forensic pathologists extend beyond the autopsy process itself. This section examines the reporting process, legal documentation, psychological support considerations and interactions with law enforcement, coroners and the judicial system. It also emphasises the need for post-mortem debriefings and early engagement with families of the deceased.

Section 7: Survivability and preventable deaths

The final section discusses the medico-legal considerations surrounding survivability assessments and the determination of preventable deaths. Of particular importance is how these considerations may require adjustment and alteration of the approach to the mass fatality autopsy process.

Throughout this document, emphasis is placed on ensuring a systematic, respectful and legally compliant approach to forensic pathology in mass fatality incidents. Incidents are commonly multinational, multicultural and multifaith, which mandates a sensitive, inclusive and adaptable approach that respects diverse legal frameworks, religious considerations and cultural practices. The guidance provided aims to assist forensic pathologists in navigating the complexities of such incidents, while maintaining scientific rigour, ethical integrity and compassion for the affected families.

Note: This document does not cover mass fatality incidents involving contaminated fatalities, i.e. chemical, biological, radiological or nuclear (CBRN) threats, as these require a different set of procedures and response mechanisms.

2 Who should conduct the post-mortem examinations?

Although this is at the discretion of the coroner/procurator fiscal, given the inevitable complexities and potential for criminal or civil liability (which may not be necessarily immediately apparent), most mass fatality incidents (see definitions above) should be conducted by Home Office-registered forensic pathologists or their Scottish/Northern Ireland counterparts. Conceivably, there may be rare circumstances in which non-forensic autopsy pathologists may be requested to assist, although this is considered to be unlikely.

Mass fatality incidents involving CBRN agents will require the cadre of CBRN-trained autopsy pathologists to undertake the post-mortem examinations.

3 Role of the group practice – preparation for an incident

In England and Wales, forensic pathology services are delivered through the group practices – a collective of forensic pathologists working within a geographical area, approved by the Home Office. In other jurisdictions, where such a system does not exist, autopsies should be conducted by locally appointed forensic pathologists, who work within the equivalent system.

Preparation for a mass fatality incident should not just fall upon the shoulders of one forensic pathologist; rather, the whole group practice (and, if necessary, mutual aid from other group practices) should be engaged in the preparation for such an incident, drawing upon the collective experience and knowledge of the individual members. It is important to state from the outset, that the group practice will, of course, not be actioning any mass fatality plan in isolation, but will be an important part of a coordinated effort involving many other agencies, both in the pre-planning and preparation stages of a mass fatality incident, conducting the incident process and engaging with the post-incident legal processes.

Agencies that will likely be involved in the overall process include local government, mortuary services, the office of the coroner or procurator fiscal, emergency services (police, ambulance, fire) and other relevant bodies, such as mass transportation authorities, military and civil defence units, public health agencies, forensic specialists and

possibly voluntary organisations (e.g. the Red Cross). Additionally, faith leaders and family liaison officers may be consulted for input into any potential process.

The following is a list of duties to be considered by the group practice in the planning of the incident.

3.1 Familiarisation with DVI – international protocols and procedures

The DVI process is a structured and internationally recognised method for the identification of victims in mass fatality incidents. This protocol, as established by Interpol, ensures a coordinated, systematic and respectful approach to identifying the deceased. DVI relies on the collection and comparison of ante-mortem and post-mortem data, utilising forensic disciplines such as odontology, fingerprint analysis and DNA profiling. The Interpol DVI Guidelines provide a standardised framework that facilitates cooperation between countries and agencies, ensuring that identification efforts adhere to best practices and maintain consistency across jurisdictions. Not uncommonly, particularly in transportation-related mass fatality incidents, the deceased may be of multiple nationalities, necessitating coordination between different legal systems, forensic protocols and repatriation procedures.

In such cases, adherence to Interpol's standardised protocols ensures that identification efforts remain systematic, transparent and legally robust, allowing for effective collaboration between forensic teams, law enforcement agencies and diplomatic representatives. The involvement of multiple nations may introduce complexities related to ante-mortem data collection, medico-legal authority and cultural or religious considerations surrounding the handling of remains. Establishing clear lines of communication and cooperation through the Interpol DVI process helps to streamline these efforts, ensuring that all deceased individuals are identified with accuracy, dignity, and sensitivity to their families' needs.

To summarise, the Interpol DVI process consists of 5 key phases, each essential to the overall success of the identification effort. These phases, outlined for convenience below, ensure a systematic and coordinated approach to DVI.

3.1.1 Phase 1 – Scene (body recovery and evidence collection)

This involves the recovery of human remains, personal effects, and evidence from the disaster site. The primary goal is to ensure proper documentation, tagging and preservation of the bodies or body parts. Each body or tissue fragment is assigned a

unique DVI number (see Figure 1) by those processing the scene to maintain the chain of custody at this early stage.

PM	Country Code	Number	Scene Reference
PM	44	0025	A

Figure 1. An example of the unique DVI numbering system critical to the process. PM refers to the case being from the remains of a deceased. Scene reference letter is useful if there is more than one area/mass fatality incident concurrently. Extracted from Interpol's [DVI guide \(Annexure 9\)](#).

3.1.2 Phase 2 – Post-mortem examination (mortuary)

In this phase, forensic pathologists and other specialists conduct detailed autopsies and examinations. Information such as fingerprints, dental records, DNA samples and distinctive marks (tattoos, scars, medical implants) is collected. DVI forms should be carefully completed during this phase (see below).

In many incidents, such as a terrorist attack that causes mass fatalities, there will be a necessity for the investigating authorities to collect evidence from the deceased (such as trace evidence, ballistic samples). The evidence collection will run in parallel with this phase of the DVI process.

See Appendices 1 and 2 for process maps and core processes.

3.1.3 Phase 3 – Ante-mortem data collection

Families and close contacts of potential victims are interviewed, and medical records, dental charts and DNA samples from personal items are gathered. This data forms the ante-mortem profile, which will be compared with post-mortem findings. Therefore, it is critical for the forensic pathologist, during phase 2, to have documented all potentially identifying features.

3.1.4 Phase 4 – Reconciliation

The ante-mortem and post-mortem data are systematically compared to identify victims, usually by a corpus known as the identification commission, under the control of the senior identification manager. The identification commission could involve a forensic pathologist (not one who is necessarily directly involved in the autopsies). A match is confirmed through consistent findings across different forensic methods. A formal identification is made once a sufficient level of certainty is achieved.

3.1.5 Phase 5 – Release of the body

Once identification is confirmed and approved by the relevant authorities, the remains are released to the family for burial or cremation.

The DVI forms ensure consistency and facilitate the smooth exchange of information between agencies and jurisdictions during mass fatality incidents.

3.2 Preparation, practice and training

Preparation and practice are key to the successful implementation of mass fatality incident plan. The following is a recommendation of some of the preparations that should be considered by the group practice.

- Attendance of the local mass fatalities planning group (usually consisting of representatives from the emergency services, local authorities, NHS).
- DVI exercises (both field exercises and simulated exercises).
- DVI training courses.
- Local planning meetings, such as formulating liaising with the local mortuary to develop standard operating procedures for such incidents.
- Planning integration with other services (i.e. meeting with representatives of the other services that forensic pathology is likely to encounter during a mass fatality incident, such as the police, mortuary management, fire service).
- Continuing professional development (CPD). DVI/mass fatality CPD should be undertaken to keep up to date. See also section 7.
- Engage with local group practices with regard to mutual aid (e.g. if the incident prevents the local group practice from responding or the local mortuary becomes unavailable or overwhelmed).

3.3 Consideration of sites for conducting mass fatality incident

When planning for the management of a mass fatality incident and determining the appropriate location for conducting post-mortem examinations, several factors must be taken into account to ensure the process is efficient, respectful and thorough. The chosen site must facilitate accurate identification, preserve the integrity of evidence, preserve the dignity of the deceased and provide a safe working environment for all involved personnel. Choosing a site to conduct the post-mortem process in a mass fatality incident requires a

multi-agency approach, although the forensic pathologists, critically, must have a major input into location planning due to their unique expertise in the requirements for conducting post-mortem examinations. This includes ensuring adequate facilities for detailed examination, appropriate environmental conditions to permit assessment (e.g. a temporary tented mortuary in winter may be too cold to safely conduct an autopsy), and the availability of essential equipment and resources for forensic analysis.

Considerations for site selection in mass fatality incidents should include the following.

3.3.1 Capacity and scalability

The facility must be able to accommodate the potential number of deceased individuals and allow for some scalability in the event that the incident exceeds initial estimates. There may be a need to consider a temporary mortuaries facility, particularly if existing facilities are insufficient for larger scale incidents.

If an existing, working mortuary is to be used as the mass fatality mortuary, it will be necessary to move all the existing deceased to another facility, as the mass fatality mortuary will inevitably not be able to accommodate routine work (for example, it would not be feasible for a family to come and do a viewing of a relative in the midst of a mass fatality incident). Therefore, a plan needs to be also made to move the existing deceased in the mass fatality mortuary to another facility.

Many mortuary facilities are incorporated into NHS hospital facilities. Although this can be advantageous, consideration should be made as to how this will impact the day-to-day running of the hospital. Clearly, the hospital that has the mass fatality mortuary may also be heavily involved in the treatment of survivors of the incident; therefore, contingency should be made for an alternative site for the mortuary process, so not to overwhelm the hospital facilities.

Planning should also be made for the use of a temporary mortuary, for those incidents that cannot be accommodated by existing facilities. The nature of the temporary mortuary requires a multi-disciplinary approach, with many agencies requiring input into its development at the planning stage. Forensic pathology input is critical to ensure correct overall mortuary design, layout and equipment design. The forensic pathologists will have to pay particular attention to a number of features of a temporary mortuary facility including, but not limited to:

- mobile equipment supply (for example PPE, instruments, specimen containers)

- autopsy tables
- flooring (health and safety)
- water supply and drainage
- power, lighting
- changing facilities
- environment – heat, cold, wind
- biohazard waste management.

3.3.2 Accessibility and proximity to the incident scene

The location should be easily accessible to emergency services, law enforcement and forensic teams to streamline the transport of remains and evidence to and from the mortuary. Parking and transport of the investigating teams to the mortuary should be considered when pre-planning a mass fatality incident.

3.3.3 Security and chain of custody

The site must be secure to prevent unauthorised access and ensure the integrity of the deceased and any associated evidence. The facility should be inaccessible to members of the public and press to preserve dignity of the deceased.

3.3.4 Infrastructure and facilities

Adequate mortuary facilities – including cold storage, examination suites and areas for forensic imaging (such as post-mortem CT) – are essential. The site should have multiple workstations within the mortuary suites, allowing for parallel examinations by forensic pathologists, DVI teams, odontologists, anthropologists and other specialists. The mortuary suites should be sufficient that parallel examination can co-exist without any degradation of the process (for example, factors such as noise and spacing for more than 1 DVI team should be considered).

3.3.5 Health and safety

Ensure compliance with occupational health and safety standards. Consideration of the psychological wellbeing of staff should also be made – for example, sites should have restrooms or an outside space available.

Consideration for nutrition should be incorporated into the health and safety assessment. Local facilities (such as a hospital canteen) could be overwhelmed by a large number of individuals taking part in a mass fatality incident. Although it is clearly not the duty of the

group practice to provide dining for an incident, the issue should be raised during the preparation phase for an incident.

3.3.6 Identification and documentation facilities

Provide dedicated areas for DVI teams to manage ante-mortem and post-mortem data collection. Ensure the facility can accommodate fingerprinting, dental examination (including space for mobile radiological equipment for orthopantomograms) and DNA analysis stations, with appropriate storage and documentation systems in place.

3.3.7 Communications

When considering a site for a mass fatality mortuary facility, communications need to be considered, particularly if large volumes of data need to be transferred from the site (such as DICOM data). Strictly speaking, this is not an issue for the group practice, although the authorities involved in setting up the mass fatality mortuary may not be aware of the volume of data that may need to be transferred between sites.

3.3.8 Viewing

The mass fatality mortuary will not be appropriate for families to come and view the deceased. Part of the planning should incorporate the consideration of the use of another site for viewings. Transportation of the deceased from the mass fatality mortuary to the viewing mortuary or other suitable location such as a funeral directors' premises should be considered.

3.4 Provision of service and mutual assistance

The group practice should provide the pathologists for the mass fatality incident. The group practice will provide a lead pathologist for the mass fatality incident (see below for roles of the lead pathologist). Large numbers of fatalities might require pathologists from other jurisdictions being invited to assist in the post-mortem examinations.

Mutual assistance – particularly in relation to the post-mortem examination(s) of a perpetrator(s) involved in a mass fatality incident like a suicide attack – should be considered by the group practice and, where necessary, facilitated by neighbouring group practice. The post-mortem examination and subsequent storage of the perpetrator's remains should be conducted at a separate location from that of the victims to maintain procedural integrity and ensure sensitivity toward the bereaved families.

During a mass fatality incident, it is likely that all the local pathologists would be engaged. Arrangements should be in place so that other suspicious death investigation work –

unrelated to the mass fatality incident – can continue. In practice, the primary forensic mortuary particularly is to be used for the incident; this means that an alternative and suitable site for non-incident forensic post-mortem examinations should be found. The group practice should put into place a contingency plan to draft in suitably qualified forensic pathologists for other areas to assist with the other suspicious death work.

3.5 Liaison with the HTA

Liaison with the HTA is likely to be necessary for temporary mortuaries only; it is unlikely to be necessary for hospital/public mortuaries where HTA licences are already in place. However, it may be of value to briefly consult with the HTA to ensure that the Human Tissue Act is being complied with. Licencing may be necessary for a temporary mortuary, or the site may become a satellite premises where licensed activity is to take place. Consideration should be given as to whether it might be necessary for 1 (or more) of the group practice members to undertake training to be a designated individual under the auspices of the Human Tissue Act.

3.6 Consideration of welfare of pathologists during a mass fatality incident

Mass fatality incidents place significant physical, mental and emotional demands on forensic pathologists. The sheer volume of cases, the complexity of injuries and the often-distressing nature of the work can contribute to fatigue, stress and psychological strain. There may be forensic pathologists who do not wish to undertake mass fatality work from the outset, and their wishes should be respected (i.e. no mass fatality incident should be mandatory for the forensic pathologist to undertake).

Choosing appropriate premises in which to undertake the post-mortem examinations can have an immediate impact on the wellbeing of the forensic pathologists (and wider staff). Access to proper facilities, including temperature-controlled environments, rest areas and nutritional support, can help sustain physical endurance and reduce the impact of stress during the incident.

The group practice, as part of their preparation, should consider the integration of occupational health strategies into mass fatality planning, ensuring that pathologists can perform their critical role effectively during the incident and also safeguarding their long-term wellbeing.

3.7 Formulate provisional plans/operating procedures

Provisional plans for a mass fatality incident should be made alongside the partner agencies, although, of course, these will necessarily need to be tailored to the event if and when it occurs. Varied scenarios should be considered and a variety of plans drawn up. These plans may be influenced by the geography/local infrastructure of an area (for example, a coastal city may include plans with regard to a mass drowning incident). Plans should be made for incidents involving different numbers of fatalities/fragmentation. Mass fatalities incidents could include:

- natural disasters (flooding, tsunami)
- transport incidents (air crash, train crash)
- terrorism/hostile acts (bombing, vehicle incident, stabbings)
- crowd-related incidents (crowd crush)
- structural failure incidents (dam collapse, building fire)
- industrial disasters (chemical leak, explosion).

More focused plans and strategies can be made with, for example, the mortuaries and the local forensic pathologists. These plans could be quite detailed and should be documented. Practice runs/desktop exercises with the local mortuary staff can also be helpful.

Mass fatality response plans should not remain static but should be periodically reviewed, tested and refined, based on lessons learned from real incidents, evolving forensic techniques and changes in local infrastructure or resources.

Rarely, the nature or location of an incident could impact upon the ability to conduct the primary plan. It would be of value to identify a secondary location for such an eventuality.

4 Practical aspects of the mass fatality incident – part 1, the pre-process phase

This section deals with the initial response by the pathology team once a mass fatality incident has been declared. The declaration of such incidents is usually made by police/coroners; it may be that the incident has already been widely reported even prior to contact with the pathologists.

4.1 Initial response

Once it has been identified that a mass fatality incident has occurred, the lead pathologist should be designated. The lead pathologist has previously been called the 'supervising pathologist' – however, this could suggest a vicarious liability for the actions of the other pathologists involved in the investigation, which should not be the case.

The lead pathologist can be selected in a variety of ways depending on local arrangements. The lead pathologist could be the individual on call for the area that day, but it is entirely up to the group practice/local pathologists how the lead pathologist is designated. If a specific pathologist is designated as the usual lead pathologist for mass fatality incidents, a backup pathologist should be identified to assume the role in their absence (e.g. if the lead pathologist is on leave or otherwise unavailable).

4.2 Lead pathologist role (initial response)

The lead pathologist should commence documentation – a set of contemporaneous notes should be produced during the incident by the lead pathologist (documenting various meetings, conversations, etc.) that pertain to the overall broader management elements of the pathological involvement in the incident (although individual pathologists should keep contemporaneous notes of their own post-mortem examinations).

The lead pathologist should make initial contact with the investigating authorities (i.e. coroner, procurator fiscal, senior identification manager [SIM] or senior investigating officer [SIO]) to outline and establish the initial approach and the pathological resources that are likely to be required. Once engagement with the investigating authorities is confirmed, contact can be made with the other pathologists who will form the core investigating team. It should also be established who will be conducting the background forensic pathology cases during the course of the incident. In the event of a suicide terrorist incident (or an incident during which the perpetrator died) causing a mass fatality incident, it may be necessary for the lead pathologist to liaise with another group practice on the autopsy of the perpetrator. An initial discussion at this stage about the handling of small body fragments, which may be derived from a suicidal terrorist (although not always), should be made.

The lead pathologist should also give initial consideration as to what other resources/assets might be necessary to assist with the mass fatality incident, although formal contact and engagement with the other agencies should be made through the SIO. Such assets may include:

- mobile radiology for PMCT
- odontology
- ballistics
- military aid to civil authorities
- Air Accident Investigation Branch
- Marine Accident Investigation Branch
- Rail Accident Investigation Branch
- anthropology
- independent expert in medical treatment (see section 7).

Of course, it may be apparent from the offset that the services of these organisations will be necessary and contact may already be underway, initiated by the investigating authorities. This will form part of a larger strategy, to be later put in place formally by the Mass Fatality Coordination Group (usually convened by the senior identification manager/coroner).

Initial consideration should be given with regard to a scene visit (see section 4.4).

In cases where there may be fragmentation of body parts, it would be advisable to establish a line of communication between the mortuary team and the local hospitals with regard to partial dismemberment of survivors of the incident.

The lead pathologist should also request from the investigating authorities, if possible, that documents such as general practice medical notes and accident and emergency notes can be made available.

Although the local pathology team will be likely consumed by the mass fatality incident, it will be necessary to ensure that there is service provision for other suspicious death cases. The lead pathologist/local pathologists should make arrangements to ensure continuity of service for other cases.

Establish whether there is a requirement for HTA involvement.

4.3 Role of other pathologists (initial response)

It is likely that the lead pathologist would start to contact other local pathologists to form the mortuary pathology team. The other pathologists should liaise with the lead pathologist

regarding availability. Consideration should be made to rearrange other duties, as far as possible.

4.4 Scene visit

The scene visit is not always necessary and may in fact, owing to health and safety reasons, not be possible. In certain rare circumstances, where feasible, consideration could be given to moving the scene to a safe location (for example, a mass fatality incident contained within a vehicle). The scene visit can form an invaluable part of the pathological investigation into a mass fatality incident. Preferably, all the pathologists conducting the post-mortem examination should visit the scene, but this may not be possible for logistical reasons, and this duty could be carried out by the lead pathologist.

The scene visit may be very useful for a number of reasons. Firstly, it is common in mass fatality situations that all the key parties investigating the incident visit the scene initially. This provides an ideal opportunity to establish the background to the incident and also to liaise with the other investigating teams – the names and contact details of all the key personnel can be established at this stage.

Examination of the scene can provide an early estimate for the resources that will be required to conduct the investigation. Deceased persons can be assessed for fragmentation and the number of injuries – clearly, the worse the fragmentation and damage, the longer the process at the mortuary may take. Formulation of a provisional estimate on how long the mortuary process may take could be given at this time, although caveats should be attached; where there is more uncertainty, perhaps such an assessment should be avoided at this time. Consideration of the other resources that might be needed can be made at this time (e.g. how many pathologists will be required, other expertise necessary).

The pathologist can also assist the investigating teams within the scene. In a suicide terrorist incident, the pathologist can help identify which deceased person(s) may be the perpetrator(s) based on the particular patterns of injury at the scene. The pathologist may also be able to comment upon evidence collection and health and safety at the scene.

Communication should be made with the crime scene manager. The crime scene manager may have useful information for the pathologist regarding the evidence, which may need to be later recovered during the mortuary process (e.g. identification of a sim card or other particular item). The pathologist may be able to advise on the approach to body recovery at the scene and how to record relevant features (such as advising on imaging).

The pathologist can also advise upon the urgency of body recovery. This may be particularly important in a scene that may continue to cause damage to the bodies (e.g. warmth accelerating decomposition, degradation by caustic substances). The pathologist may be able to advise whether local refrigeration/storage may be required at the scene or whether body extraction should be expedited.

The scene may also assist in the interpretation of the incident as a whole and may explain the pattern of injury to individuals. This information can be particularly helpful when dovetailed with the scene examination made by other experts.

Discussion of continuity of the deceased can be made at the scene. The pathologist can ensure that the DVI protocol is being commenced.

4.5 Mortuary set up

The pre-planned process (defined during planning, see section 3.7) should hopefully be engaged shortly after the event. It may not necessarily need involvement of the pathologists in the early stages, although clearly any pre-planned process may need modifying depending upon the nature of the incident.

The lead pathologist should liaise with mortuary manager in setting up the stations for the mortuary process to be conducted.

The lead pathologist should liaise with other experts (e.g. radiology, odontology, anthropology) to determine how they want to set up within the environment.

4.6 Pathology briefing and evolution of the process map

The aim of the pathology briefing is to develop a comprehensive process map. As discussed in section 3.7, much of the process may have already been established. However, tailoring the process to the live event will be necessary. A pathology briefing to discuss the process – alongside collaboration between pathologists, police, the coroner and other experts involved – should establish a definitive structured and effective mass fatality incident process.

This should take place as soon as is practicable and should involve input from as many of the pathologists involved in the case as possible. The pathology briefing informs the overall strategy for the case and should build on the pre-planned processes already set out. It may be of value for a senior police officer (SIM or SIO) or the coroner to also attend. The strategy for the pathological assessment of the case will have to accommodate the

DVI aspect of the mass fatality incident, running in parallel with the needs of the broader investigation (including a criminal investigation). The following should be considered during the pathology briefing.

4.6.1 Identify and read relevant medical literature regarding the nature of the incident

In many incidents, the pathology will be straightforward and familiar, but consulting the medical literature to refresh one's memory regarding the pathology may be useful and can inform, for example, sampling protocols.

4.6.2 Sampling advice from other experts

This dovetails with a review of the medical literature to achieve an optimum sampling protocol and general approach to the autopsy. Examples might include a discussion with neuropathology regarding which blocks of brain to take to assess cerebral oedema.

4.6.3 Consider use of radiology within the process

For mass fatality incidents, PMCT is likely to be used in most incidents.

PMCT is of critical importance when identifying the location of items, such as bullets/bomb fragments, about or within the tissues of the deceased. PMCT can be of great value in the identification process with the identification of unique medical features/implants. PMCT can also be used for dental identification, although expert odontological advice should be taken on this matter.

The PMCT can be used for the management of pathologist fatigue, by identifying which cases may require longer or shorter post-mortem examinations.

The use of PMCT with angiography (PMCTa) could be considered, depending on the nature of the incident, the availability of angiography equipment and local expertise. It may be necessary for toxicological sampling to take place prior to any such undertaking.

PMCT/PMCTa should not replace the internal examination, although it might assist in limiting some dissections (e.g. no facial dissection in the presence of facial bone catastrophic fracturing).

4.6.4 Consider clinical input

There is increasing medico-legal scrutiny in mass fatality incidents surrounding the potential for survivability and preventable deaths. Inclusion of an appropriate expert at this stage of the process may assist in discovering the relevant clinical, radiological and

pathological features that could influence later determinations of survivability (see section 7).

4.6.5 Consider interaction with the DVI search teams

This consideration is most important in cases where numerous artefacts (e.g. trace evidence fragments) are likely to be needed to be recovered from the external surface of the body. This can be a very time-consuming and labour-intensive process (e.g. a search of the head hair or clothing for small metallic fragments).

Although, ideally, the pathologist should be present when the clothing/artefacts are removed from the surface of the deceased, this can lead to the pathologist and mortuary staff becoming unnecessarily fatigued. The DVI search teams are well-trained to document and photograph the external non-pathological findings, allowing later review. The pathology team could consider splitting the autopsy into a phased approach, with no need for the pathologist to be present at the initial evidential recovery stage (see Appendix 2).

Under such circumstances, the initial phase could be conducted by appropriately trained DVI officers or counterterrorist officers, depending upon the nature of the incident. All recoveries should be photographed and the medical intervention should be left in situ. The second phase is the autopsy proper with the pathologist and APT team; all external forensic materials having already been recovered.

4.6.6 Consider the general approach to the post-mortem examination

The post-mortem examination should conform to the Code of Practice and Performance Standards for Forensic Pathology in England, Wales and Northern Ireland, or the Scottish equivalent. All external findings/injuries should be documented in the usual manner. However, in mass fatality incidents, other questions become pertinent, such as survival time and survivability (particularly in the context of timeliness of the emergency service response). Consideration should be given, therefore, to capturing additional information to answer these 2 latter questions (see section 7).

4.6.7 General documentation

For the individual autopsies, it is entirely acceptable that the pathologist uses their normal methodology to record the findings, although, owing to the DVI process running in parallel, the Interpol DVI forms will also need to be completed. It is important to allow sufficient time for the DVI officers to complete the each of the entries in the DVI forms.

All injuries and other findings should be imaged in the usual way, although each document and image should incorporate the unique DVI number.

4.6.8 Exhibiting standard

Given that multiple autopsies will be taking place at the same time and that each pathologist will be potentially conducting multiple post-mortem examinations, it is important that exhibits taken from the deceased do not get confused with others – therefore, the exhibit labelling requires careful consideration to maintain continuity and the chain of custody. Most mass fatality incidents should adopt the Interpol DVI methodology to ensure continuity of evidence.

4.6.9 Decide on histology sampling

This may be modified following consultation with the medical literature and other experts. A standard set of blocks should be considered (e.g. to ensure plentiful sampling of the lungs for blast injury assessment).

4.6.10 Decide on toxicological sampling

Some previous toxicological investigations of mass fatality incidents have been documented as controversial (e.g. victim blaming narrative, inappropriate testing on children, lack of relevance to the cause of death). However, it is important to point out that in practically all homicide investigations and many other suspicious deaths, toxicology samples are taken to form as broad an outlook on the case as possible.

The post-mortem examination is the only opportunity to acquire samples for toxicological analysis. Samples for toxicology could be taken and can be placed on hold (i.e. not processed) and preserved, until such time that assessment is judged to be necessary to examine them. In some mass fatalities incidents, such as a fire or transportation incident, of course, toxicological assessment would be mandatory.

Toxicology may also be used in some circumstances to verify/corroborate the appropriateness of medical intervention.

4.6.11 Health and safety

When conducting autopsies in a mass fatality incident, as with all post-mortem examinations, standard health and safety considerations must be addressed to protect pathologists, mortuary staff and other personnel involved in the examination process. Infection control remains a primary concern, as unidentified deceased individuals may have pre-existing infectious diseases, including tuberculosis, hepatitis or HIV,

necessitating adherence to standard precautions, such as appropriate PPE (gloves, gowns, face shields and respiratory protection).

The physical demands of handling multiple bodies over extended periods can lead to fatigue and musculoskeletal strain; adequate rest periods and rotational shifts are essential to reduce the possibility of injury. Sharps safety protocols must be rigorously followed – particularly when dealing with fragmented remains or remains that may have embedded sharp fragments – to prevent accidental injury. PMCT may be able to assist in the reduction of sharps injuries by identifying potential hazards, although it is important to remember that not all sharp items, such as some glass fragments, are detected by radiographs.

The management of biohazardous waste – including bodily fluids and contaminated instruments – must comply with the usual disposal procedures to minimise environmental and occupational risks.

4.7 Decide on the timetable

Hopefully, from the scene visit and other information, there should be an estimation of how much time may be required to complete each post-mortem examination, which can permit a timetable to be drawn up. Of course, this may have to be revisited during the process depending on how the cases evolve. In complex cases involving multiple injuries and which may require plentiful sampling, a pathologist can usually complete 2 cases per day (e.g. in the Manchester Arena bombing, the 3 stations were able to complete 6 autopsies per day).

The timetable should also take into consideration the welfare of the pathologists. Prolonged exposure to traumatic cases, coupled with the physical and cognitive demands of detailed post-mortem examinations, can lead to fatigue and an increased risk of error. Scheduling should allow for adequate rest periods between cases, ensuring that pathologists are not overburdened by an excessive caseload.

Ideally, each pathologist should remain with the same team and workstation throughout the incident, as maintaining familiarity with the environment and team dynamics enhances efficiency, coordination and overall workflow.

Forensic pathology trainees, with the permission of the SIO, SIM and coroner, should all be invited to the mass fatality incident mortuary to observe the process.

The post-mortem examinations should not take place overnight. This is too exhausting and could lead to serious errors.

4.8 Process briefing and sign off

The considerations from sections 3.7 and 4.6 should all be drawn together, with comments from all parties (police, coroner, pathologists, radiologists, other experts, DVI team, mortuary staff) also noted and, where necessary, acted upon. The process should be agreed, formally documented and signed. The process can then be issued to all in the mortuary.

A sample process is shown in Appendices 1 and 2.

4.9 Management of expectations

The initial assessment of how long process may take should be shared for the benefit of families. This may need to be altered once the process is ongoing.

5 Practical aspects of the mass fatality incident – part 2, the process commences

Once the process stage has commenced, much of the logistics and preparation are complete and each deceased individual can begin to follow their pathway through the process map. A designated victim process coordination team (organised by the Police Mortuary Operations Coordinator, part of the Police Mortuary Operations Team) should oversee how the deceased pass through the process and ensure each stage is completed.

Each pathologist should be designated a case. The pathologist should receive the allotted case documentation, including medical notes if available.

5.1 Case allocation

The order in which post-mortem examinations are conducted should be carefully planned in collaboration with law enforcement and forensic teams to ensure an efficient and methodical approach. Liaison with the police and disaster response coordinators is essential to prioritise cases based on investigative urgency, identification needs and forensic complexity.

Radiological assessment can assist in designating case order, particularly when dealing with a large number of deceased individuals. For example, cases involving extensive

fragmentation or complex injuries may require more time and forensic expertise, whereas those with fewer injuries may be completed more efficiently. Additionally, consideration should be given to pathologist fatigue, as conducting multiple examinations in succession can be physically and mentally demanding. Strategically allocating fewer complex cases to pathologists who have been working for extended periods may help maintain accuracy, efficiency and quality of examination.

5.2 Continuing role of the lead pathologist

Although the lead pathologist may be busy with their own cases during the process, the lead pathologist should take some time to ensure that the process is flowing unhindered. Brief team meetings with the other pathologists and team members between cases can identify any early difficulties that might require adjustment of the process map. Any problems that arise can be taken to the post-mortem operations coordinator so they may be resolved.

5.3 Pathology–radiology–clinical pre-autopsy conference

In mass fatality incidents where radiology is used (which likely will be most incidents), then part of the process will inevitably mandate a pathology–radiology conference; in some cases, a clinical member will be present during the pre-autopsy conference (see section 7 for further details). Here, the approach to the autopsy can be planned. Particular attention should be placed upon medical intervention (e.g. positioning of airways), recovery of missile fragments, health and safety, and limiting dissection, if appropriate.

5.4 The autopsy

All pathologists should conduct the autopsy to the agreed methodology as set out under section 4.8, as far as possible. Justify why it is deviated from, if necessary.

All pathologists are to take a record of their own case, using their own technique. The lead will take more generic notes but not document each individual case. The DVI forms should also be filled in with the assistance of the DVI officers as the process progresses.

5.5 Post-autopsy debriefing

The post-autopsy debriefing is an essential step in providing clarity and initial conclusions following an examination. This process is likely to be more constructive in cases where the deceased remain largely intact, allowing for a more comprehensive discussion. In situations involving severe disruption or disintegration of the deceased, the practicality and

depth of the debriefing may be limited. The timing of the debriefing should be documented. It is important to acknowledge that the conclusions discussed at this stage are preliminary and have not yet benefited from additional sources of information that may become available later.

Key aspects to be addressed during the debriefing include:

- opinion on the medical cause of death
- summary of injuries: an overview of observed injuries and their potential implications
- summary of natural disease: an overview of disease and its potential implications
- estimation of time of death: any early indications regarding the time of death, including relevant caveats and limitations. This estimation dovetails into considerations with regard to survivability (see below).
- recovered evidence and unrecovered materials: details of any evidence retrieved during the examination. In addition, depending upon the incident, materials such as metallic objects embedded in bone may not have been recovered from the deceased, to reduce post-mortem disruption of the body. The family should be made aware of this and be given the option of completion of removal of foreign bodies at a later stage (once the main mass fatality incident has been completed).
- identification features: notable features that aid in the identification of the deceased
- further investigations: tasks to be completed should be documented (e.g. histology, cardiac pathology). If necessary, written instructions should be provided to the police.
- body release: although this is a decision for the forensic pathologist, a declaration that there is no pathological reason to retain the deceased's body should be made (or why the body should not be released)
- body viewing: additionally, considerations for viewing the deceased should be outlined, including what relatives are likely to see and any specific instructions to guide the viewing process (e.g. restricting visibility to a severe injured area)
- provision of key paperwork: at this stage, provision of the key paperwork (e.g. tissue retention form, cause of death form) to the relevant officers (coroner's officer, police officers) could be made. Copies should be kept by the forensic pathologist.

5.6 Small fragments

Following a mass fatality incident, depending on its nature, small fragments of tissue may be recovered. In the context of, for example, a suicide bombing event, many of these fragments may be derived from the perpetrator of the incident. The small fragments of tissue in this instance, are best dealt with at a separate mortuary, away from the main incident mortuary. Depending upon the incident, small fragments of unrecognisable tissue of low volume could be managed by sensitive disposal, while other larger fragments or fragments that have recognisable structure (such as a fingertip or similar) could be subjected to DNA identification.

5.7 Completing and closing the process

Most of these processes should be undertaken by the lead pathologist. As may be expected, at the end of the process, the mortuary will require reconstituting to its original state. Because areas of the mortuary may have been retasked and the many officers and staff who worked within the mortuary during the process may have been unfamiliar with local protocols, it is important to account for all documents and materials. The main tasks include:

- mortuary tidy up
- collecting documentation and/or confirm documentation all safely held
- checking specimens all accounted for, are accompanied by the relevant paperwork and are ready to go to their relevant destinations
- ensuring completion of documents, including initial cause of death forms, tissue retention forms and other documentation (such as laboratory histology forms and toxicology request sheets)
- welfare check and psychological support: ensure staff have access to mental health resources to address stress or trauma experienced during the incident. While it is not the duty of the lead pathologist to provide this support, if concerns are raised, the lead pathologist whenever possible should, in confidence, direct the affected individual to the relevant services.
- debriefing sessions: organise post-incident debriefings to allow pathologists and staff to reflect on their experiences, share challenges and provide feedback

- report writing: ensure each pathologist completes and submits a detailed post-mortem report, including:
 - cause of death
 - identification findings (unique features, DNA matches, dental records, etc.)
 - description of injuries and evidence collected
 - observations relevant to the legal investigation (e.g. survivability, injury timelines).

5.7.1 Interaction with families – post-incident next-of-kin clinic

The legal proceedings following a mass fatality incident may take a considerable amount of time to commence, and it is not uncommon for families to raise questions that fall outside the formal legal framework. Some of these questions can be addressed in a relatively straightforward manner without jeopardising any future legal proceedings.

Families often seek clarification on the post-mortem appearance of their loved one, rather than details regarding the mechanism of death or the potential for survivability. For instance, hypostasis may be misinterpreted as bruising, or post-mortem sutures may be mistaken for an unknown surgical procedure. While some inquiries will inevitably pertain to the core medico-legal issues under investigation, others may be unrelated to the legal case but still carry significant emotional weight for the bereaved.

The stress of awaiting legal proceedings can be particularly burdensome for families, and consideration could be given to establishing a post-incident clinic where relatives have the opportunity to discuss post-mortem findings directly with the pathologist. If such a meeting were to take place, it should be carefully structured and facilitated by a family liaison officer or a similar professional to ensure appropriate support. While it is advisable that these meetings be recorded (this can be in note form, rather than digital recording), it must be clearly stated that discussions at this stage occur at an early point in the investigative process, when not all relevant information may have been fully explored or established by the investigating authorities. Consequently, any preliminary opinions expressed during these sessions may require revision as further evidence emerges. The pathologist should not be bound by statements made during these early interactions, as their conclusions may need to evolve in light of additional findings.

6 Continuing responsibilities – the legal proceedings

The post-autopsy/legal phase focuses on ensuring that all findings, evidence and documentation are prepared, preserved and presented in compliance with judicial and regulatory requirements. This phase also involves supporting legal investigations and proceedings related to the mass fatality incident.

Comprehensive post-mortem reports will, of course, be provided to the coroner and the police.

All pathologists should be available for the subsequent court proceedings in the usual manner. However, it may fall upon the lead pathologist (or other individuals designated by the court) to present the pathological findings. The lead pathologist may be asked to prepare an overview of the pathological process. Such a document should include the reasoning for all decisions regarding the type of process, sampling and general approach (hence the need for the lead pathologist to take notes from the outset, see section 4.2).

The lead pathologist should be able to provide all relevant pathological materials for collaboration with other experts.

All reports, images and evidence should be securely archived and readily accessible for future legal proceedings.

7 Survivability and preventable deaths

During previous mass fatality incidents, the issues of survivability and preventable deaths have been subject to close scrutiny. These 2 concepts are closely linked and have come under particular focus in subsequent legal proceedings. Indeed, such concerns are increasingly relevant in other non-mass fatality forensic cases, where pathologists may be asked to comment upon whether a particular approach to medical intervention could have altered the outcome.

From a medico-legal perspective, the coronial investigation is directed by law to examine how an individual came by their death. The consideration of survivability and preventable deaths is a 'what if' question, focusing on potential alternative outcomes if changes or an alternative approach had been made. Although, traditionally, coronial investigation has not explicitly addressed hypothetical or 'what if' scenarios, there is variation among coroners regarding this approach. Indeed, both the Chief Coroner and the Ministry of Justice have indicated that the current law permits consideration of such issues. Regardless, other

courts, particularly public inquiries, are likely to be especially concerned with these matters. Therefore, it is very important that the mass fatality pathological process adjusts to accommodate exploration of survivability and preventable deaths.

Understanding the implications of survivability and preventable death investigation are, therefore, key to adjusting how the post-mortem process might be altered (see section 7.6) from the outset of the investigation.

Survivability

Definition: Survivability refers to the likelihood that an individual could have survived given the nature of their injuries and the available medical interventions. It assesses whether the injuries sustained were compatible with life under optimal conditions.

Key considerations:

- the severity and extent of injuries
- whether modern trauma care, surgical procedures or critical care could have altered the outcome.

Examples:

- a severe traumatic brain injury with brainstem disruption would be considered non-survivable, as no medical intervention could have changed the outcome
- a major haemorrhage from a limb amputation, if treated rapidly with a tourniquet and surgery, might fall into the 'potentially survivable' category (see discussion below).

Preventable death

Definition: A preventable death refers to a fatality that could have been avoided with appropriate actions at the scene, during transport or in a medical facility. Unlike survivability, which assesses whether a person could have lived with optimal medical intervention, a preventable death implies an exploration of whether a systemic failure, delay or deficiency in care led to a loss of opportunity for survival.

Key considerations:

- survivability
- access to emergency care (e.g. delays in transport or lack of medical personnel)
- availability of life-saving interventions (e.g. lack of haemorrhage control, airway management)

- effectiveness of triage and resuscitation
- medical errors or missed diagnoses.

Examples:

- a person who exsanguinated from a survivable haemorrhage due to lack of timely intervention, such as the application of a tourniquet, could be classified as a preventable death
- a person, arriving in hospital, with a treatable tension pneumothorax who did not receive timely chest decompression before dying may also be considered a preventable death.

Survivability versus preventable death

Survivability: an assessment of the injuries, examining whether in ideal circumstances, has the pattern of injury led to a survivor.

Preventable death asks that, within the circumstances of the event, was death preventable, and takes into consideration age, frailty, co-morbidities, scene location and available resources.

Survivability and preventable deaths should also be defined in terms of the time since the incident. While some serious injuries could be treated in situ to enable admission to hospital, death days later may still be inevitable from a variety of incident dependant complications (e.g. hypoxic-ischaemic encephalopathy, infection, renal failure).

For most practical purposes, the aspects that are usually considered to be capable of altering outcomes are the responses of the emergency services and, if their response had been different, would their response have prevented the death of an individual.

7.1 Why is survivability assessment important?

- Improves future disaster response: Helps refine triage protocols and emergency care strategies.
- Identifies preventable deaths: Determines if systemic failures contributed to unnecessary fatalities.
- Informs legal and medico-legal investigations: Provides evidence for coroners, courts and public inquiries.

- Enhances training and resource allocation: Guides policy improvements for mass casualty management.

7.2 Considerations when assessing survivability and preventable deaths

Survivability can be influenced by, but not necessarily limited to, a number of factors such as the following.

7.2.1 Nature and severity of injuries

Fatal injuries (such as decapitation, catastrophic head trauma, or complete body destruction) are considered, of course, unsurvivable, whereas injuries that might have been survivable with medical intervention (e.g. vascular trauma) may require further analysis.

7.2.2 Environmental factors

Survivability can be influenced by secondary factors, in particular within the scene, such as extreme heat, cold or toxic exposure, which may worsen an initially non-lethal injury (e.g. immersion in cold water or exposure on a mountainside).

7.2.3 Access to medical care

If timely and adequate medical intervention could have prevented death, the injuries may be deemed potentially survivable. Conversely, if even the most advanced care would not have changed the outcome, the injuries are judged to be unsurvivable.

7.2.4 Appropriateness of medical care

Mass fatality incidents may place a considerable burden upon the local medical resources, increasing the risk of medical mishap and the availability of some critical resources, such as the availability of blood.

7.2.5 Pre-existing medical conditions

The health status of the individual prior to the incident may influence survivability. For example, an individual with significant cardiovascular disease may succumb more readily to the effects of haemorrhage, in circumstances that perfectly healthy individuals might have been able to survive.

7.3 Who assesses survivability after a mass fatality incident?

Survivability assessment following a mass fatality incident requires a multidisciplinary approach involving forensic pathologists, and medical and emergency response professionals. Some incidents will require the expertise of other experts, such as ballistics consultants or explosives experts. Once the panel of experts is populated – the preventable deaths panel – the experts should all work together in a structured manner to produce an opinion on the potential for survivability of an incident. Empanelling will almost certainly be conducted by the medico-legal overseer of the proceedings, such as the coroner or an inquiry lead.

7.4 Materials required for the assessment

A structured, evidence-based approach should be used to assess survivability. Information to be assessed should include, as far as possible, the following.

- Medical history:
 - pre-existing medical history from the general practice notes or other relevant sources
 - paramedic notes from the incident
 - triage documents
 - accident and emergency notes
 - other hospital notes.
- Background history and ante-mortem data leading up to the incident:
 - witness statements
 - video footage/local CCTV
 - these materials are often gathered and compiled by the investigating police officers – this process may take a considerable time.
- Scene assessment:
 - consider positioning and protective factors (e.g. distance from explosion)
 - distance from safety.
- Post-mortem radiology:
 - these findings will, of course, be allied with those of the post-mortem examination

- the images can be used as an effective way of demonstrating bony findings and the location of, for example, missiles to other experts
- assessment of air embolism and pneumothorax
- assessment of positioning of medical paraphernalia, such as endotracheal tubes and intraosseous needles.
- Post-mortem findings:
 - these findings will be critical to the assessment, for use not only by the pathologist, but also the other experts (e.g. for use within the abbreviated injury scale)
 - medical intervention should be carefully recorded and reviewed by the panel
 - histology can be critical in assessing some injuries (e.g. blast lung) and natural disease.
- Post-mortem toxicology:
 - as discussed above, testing of toxicology samples has previously raised concerns, although analysis may reveal whether appropriate medical intervention has been undertaken.
- Environmental and circumstantial considerations:
 - review weather conditions, fire, water exposure, chemical agents and structural hazards.

7.5 Outcome of survivability assessments

The medical literature describes a variety of different methodologies regarding the classification of survivable/preventable deaths. The WHO *Guidelines for Trauma Quality Improvement Programmes* uses the following classification:

1. preventable
2. potentially preventable
3. non-preventable
4. non-preventable, but with care that could have been improved.

Other methodologies can be developed – for example, the Manchester Arena Bombing Blast Wave Panel Inquiry used a slightly different methodology:

1. unsurvivable – injuries so severe that even if the most comprehensive and advanced medical treatment was initiated immediately after injury, survival was deemed impossible.
2. unlikely to be survivable – injuries so severe that even if the most comprehensive and advanced medical treatment was initiated immediately after injury, we would not expect that person to survive, but at that point we could not say survival was impossible.
3. Potentially survivable – injuries that could prove fatal, but the panel were aware of individuals surviving similar injuries.

Of course, it is important to point out that the methodology should also consider real-world constraints, such as rescue logistics, emergency response times and the availability of medical resources.

7.6 Modification of the mass fatality process for panel assessment

Sections 7.1–7.5 provide a brief overview of survivability and preventable deaths. This can be used to ensure that, when designing a mass fatality process map during an incident, the approach can be adapted for any future integration of a preventable death panel. Modifications may include the following.

7.6.1 Involvement of independent experts

Engaging an independent specialist, such as a consultant in emergency medicine, during the design phase of the mass fatality response ensures that considerations related to survivability and preventability are effectively integrated into the process.

During the course of an incident, local clinical teams may be unable to provide an available expert to assist in the assessment of the deceased. Therefore, it may be necessary to seek expertise from specialists outside the immediate area. Out-of-area experts may be preferable owing to their impartiality and independence from the local response teams, ensuring an objective evaluation of survivability-related concerns.

7.6.2 Clinico-pathological-radiological briefing

Before commencing a post-mortem examination, a structured briefing and planning meeting should be embedded within the autopsy process. This meeting serves to assess the potential issues of survivability and determine how they should be addressed during the examination.

For example, radiological imaging may reveal a misplaced endotracheal tube or an incorrectly positioned intraosseous cannula, both of which could be significant in evaluating the effectiveness of medical interventions. Such findings require careful documentation and focused examination during the autopsy to ensure a comprehensive assessment of the treatment provided and its impact on the outcome.

7.6.3 Advanced imaging techniques

Consider the use of contrast media during CT scanning to enhance vascular definition, which may aid in assessing survivability and determining the extent of injuries. However, at the time of writing, widespread use of this technique is not available, and it may be of limited value in instances where there is widespread vascular trauma. Vascular trauma may require evaluation using standard post-mortem techniques – advice from clinical assessors on which vessels specifically to examine will be invaluable during the clinico–pathological–radiological pre-autopsy briefing.

7.6.4 Targeted histological sampling

Ensuring appropriate histopathological sampling is undertaken based on the nature of the incident. For example, in cases involving an explosion, obtaining extensive lung histology to assess blast-related injuries.

7.6.5 Comprehensive documentation

Implementing a structured approach to documentation and data collection during mass fatality incidents to facilitate retrospective analysis.

7.6.6 Forensic photographic documentation

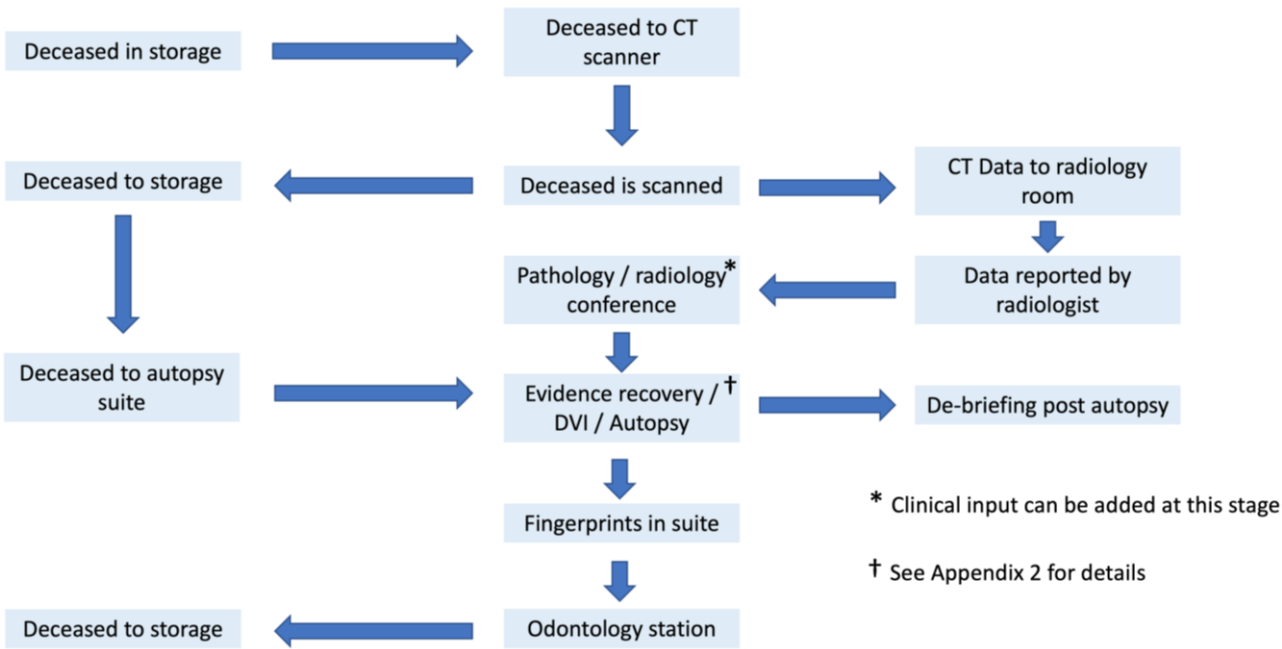
Ensuring comprehensive photographic documentation during the autopsy, highlighting important positive and negative findings. High-quality images will assist in later expert multidisciplinary reviews. Images should be taken by a forensic imaging specialist.

7.7 Continuing professional development for pathologists in survivability and preventable deaths

As discussed above, forensic pathologists play a crucial role in the assessment of survivability and determining whether deaths in mass fatality incidents were preventable. To maintain and enhance expertise in this area, ongoing CPD is important. This includes staying updated with advances in trauma medicine, resuscitation techniques and forensic radiology, ensuring that autopsy findings are satisfactorily elicited and interpreted in the context of modern medical capabilities.

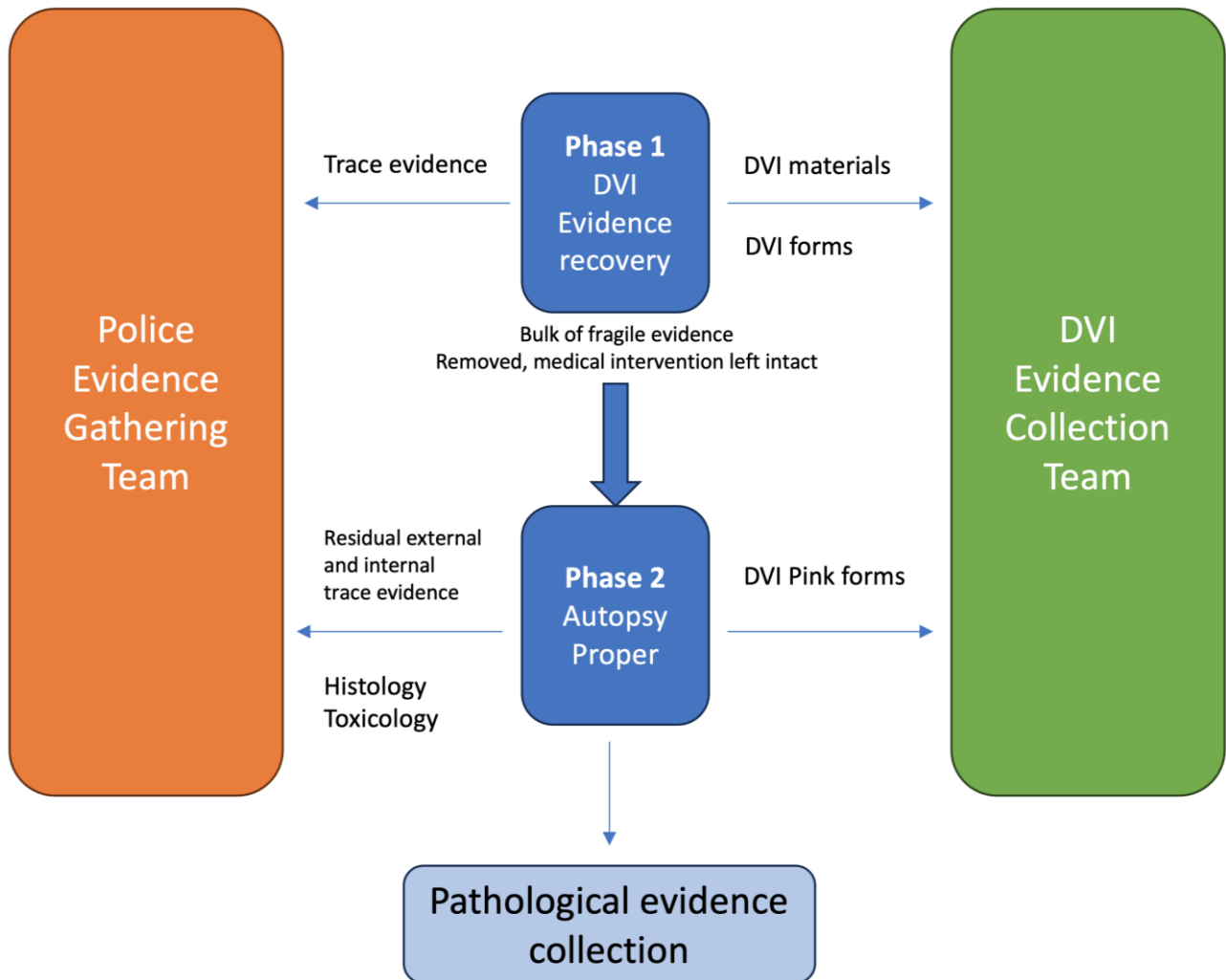
Participation in multidisciplinary training with emergency medicine specialists, intensivists and trauma surgeons can provide valuable insights into the evolving thresholds of survivability. Furthermore, training in emerging forensic imaging techniques, such as post-mortem CT angiography, enhances the ability to evaluate complex injuries. By integrating CPD into practice, forensic pathologists ensure that their assessments remain aligned with contemporary medical standards, contributing to comprehensive data collection for more accurate determinations in medicolegal investigations.

Appendix 1 The mass fatality autopsy process



Appendix 2 process

The mass fatality split core phase autopsy



Appendix 3 Further reading

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