Firearms-related crime scenes

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Author:	DCI Matt Markham – November 2015
Force/Organisation:	NABIS – West Midlands Police
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Contact details:	nabis@west-midlands.pnn.police.uk 0121 626 7114
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This revised advice has been produced and approved by the NABIS and the National Criminal Use of Firearms Group. It has been approved by NCOCC and VPP portfolio lead. The operational implementation of all guidance and strategy will require operational choices to be made at local level in order to achieve the appropriate police response and this document should be used in conjunction with other existing Authorised Professional Practice (APP) produced by the College of Policing. It will be updated and re-published as necessary.

Any queries relating to this document should be directed to either the author detailed above or the Head of Knowledge and Communications at NABIS on 0121 626 7114

1. Firearms-related crime scenes

Key points

- **A forensic strategy should be applied to each firearms-related crime scene.**
- **All scenes (including apparent suicide/self-inflicted injury) should be approached with an investigative mind-set from the start.**
- **All scenes should be secured promptly.**
- **Where it is not possible to secure a scene, eg, due to ongoing danger, the location should be recorded as precisely as circumstances allow.**
- **In the case of an 'active shooter' incident, follow relevant guidance, including the College of Policing (2010) guidance 'Stay Safe at Firearms Incidents'.**
- **Scene photographs should be taken of any motor vehicle windows that have been shot at before doors are closed or vehicles removed. This will prevent loss of evidence if the glass falls out.**
- **The cordon should encompass the target (or site of the target if already removed), the location, or possible location from where any shots were fired. It should then extend beyond these features to such a point where it is unlikely that ballistic material will have travelled and to any exit routes of offenders.**
- **Forensic experts can assist in scene interpretation.**
- **SIOs must ensure a clear strategy to reconcile the processes behind making weapons safe, recording the condition of the firearm, recovering trace evidence and packaging it.**
- **Securing and preserving gunshot residue.**

1.1. Identifying the crime scene

Each crime scene will offer unique opportunities to prevent and detect crime and should be approached with an investigative mind-set. The following list illustrates potential scenes but is not exhaustive and SIOs/police responders should remain open-minded.

- Any place where a victim has sustained a firearms-related injury.
- Any place where the victim is found or has been to prior to being found.
- Any place where a firearm has been criminally discharged.
- Any place where a firearm believed to have been used in crime is discovered.
- Any person who is the victim of a firearms-related injury or an attempt to cause injury.
- Any person who has had physical contact with a person involved in recent firearm criminality as either an offender or a victim.

- Any place/vehicle where a person involved in recent firearm criminality has been.
- Any firearm/ammunition/ammunition components believed to have been used or linked to crime.
- Any object damaged through the criminal discharge of a firearm.
- The scene of any alleged suicide involving the use of firearms.
- The scene of any alleged self-inflicted/accidental firearms injury.
- Any police vehicle or ambulance used to transport victims, witnesses, suspects.
- Any location where a firearm or ammunition has been unlawfully manufactured, converted or test fired.

Any of the above may be collocated or exist in isolation. Where they are collocated, consideration should be given to applying a forensic strategy to each one, in addition to an overarching strategy for the whole scene.

1.1.1. Securing a crime scene

A firearms-related incident will, in most cases, be declared a critical incident. Initial responders and their supervisors should draw upon whatever resources are needed to manage such a serious and complex incident.

Where, owing to an ongoing situation and in the interests of safety, a scene cannot be immediately secured and preserved, then steps should be taken to recover and record evidence, enabling full forensics recovery later. This may be achieved through an officer's body camera, photography, air support video, or other CCTV. Where possible, officers should request that precise location details are recorded on an incident log. This should contain as much detail as possible, for example, house numbers, road junctions, lamppost numbers and other landmarks.

Where an 'active shooter' may still be at the scene refer to Police responders and the College of Policing (2010) Stay Safe at Firearms Incidents, and respond accordingly.

Determining the parameters of a firearms-related crime scene and the extent of any cordon can be difficult. Most shootings occur at a relatively close range but ballistic material can travel some considerable distance.

The target of the shooting may be easy to identify from which responders might be able to establish a general trajectory. Any cordon should go beyond the target and as far as is reasonable. For example, it might stop at a brick wall where there is no likelihood of ballistic material having travelled any further.

Determining the position of the cordon in the other direction, back from the target to the location from where the firearm was discharged, is sometimes more difficult. Officers should work back from the target following the general trajectory. They should look for signs of firearm discharge such as spent cartridges that may have been ejected from a weapon. Revolvers and most shotguns do not eject cartridges. In the absence of ballistic evidence, officers will need to rely on other indications, such as footprints, damaged fencing, flattened grass or witness accounts. The cordon should encompass the location from where shots were likely to have been discharged and extend to any possible entry/exit routes.

When securing a crime scene, consideration should be given to the likelihood of vehicles, for example, ambulances, carrying off ballistic material (such as bullet fragments) picked up by tyres. Where possible, officers should undertake a visual inspection of a vehicle's tyres before it leaves a scene and also the path the vehicle will take.

Where a firearms scene involves shooting at a motor vehicle, it offers forensic scientists the chance to interpret and reconstruct the events of the shooting. Where vehicles have been shot at, it is likely that the windows will have been smashed. Vehicle glass is most likely to be tempered meaning that it is extremely fragile when shattered. Any movement of the vehicle is likely to lead to glass falling out making it impossible to identify the bullet/projectile entry point and therefore frustrating any attempt to reconstruct the events (DeFrance and Rosati 2009: pp 32–33). Where possible, photographs should be taken before vehicles are moved or doors are closed. Photographs should include the use of a scale.

Before removing a vehicle from a crime scene, the position of movable fittings inside, such as seats, headrests and steering wheels, should be recorded (and if possible fixed/marked) to prevent changes occurring during transportation. This will aid any subsequent reconstruction.

1.2. Interpretation of firearms-related crime scenes

It is recommended that a forensic firearms expert is called to all scenes of firearms-related injury/homicide. Where available, they should be called to all shooting incidents, particularly those believed to be or suspected of being a precursor event linked to ongoing tensions or threat to life investigations.

A forensic firearms expert has better knowledge of what and where to look for evidence which might otherwise be overlooked. This makes interpreting the scene and challenging or

confirming suspect/victim accounts easier at an earlier stage. A forensic firearms expert is able to help an SIO to:

- establish the number and type of firearms that have been used
- establish the trajectory of the projectiles
- identify where the shots may have been fired from, allowing more focused trace evidence recovery attempts
- interpret damage caused.

Thorough examination and interpretation of a scene might provide vital evidence to promptly identify suspects/offenders and ultimately prevent further offences.

1.3. Recovery of weapons that have been used in crime

There are generally four steps to consider when recovering a firearm believed to have been used in crime:

1. Making safe.
2. Recording the condition of the firearm.
3. Recovering trace evidence.
4. Packaging.

Steps 1, 2 and 3 may take place in a different sequence to that outlined above or as part of a combined process. It may also be desirable to leave out step 3 at the scene and complete it later at an ISO 17025 accredited laboratory.

It is absolutely essential that the SIO, in consultation with a forensic firearms expert and/or police firearms expert and crime scene investigators, takes time to plan the best strategy for dealing with the firearm in the context of the overarching scene. This strategy must be recorded.

1.4. Forensic recovery considerations

There are a number of things that can make the investigation of a firearms-related crime scene difficult. This may be because it is situated within an area or community where there are ongoing hostilities between groups and individuals or hostilities towards the police. There may be challenges owing to the weather or physical geography. Police activity may be subject to scrutiny and reporting by the media and also by the public using mobile devices. Whatever the challenges, it must still be acknowledged that the process of selecting what

within a scene is relevant or not, referred to as the recognition and recovery stage, is one of the most important stages of any firearms investigation. It is acknowledged that this process of selecting what is relevant is 'most efficient and effective when it takes place at the scene, where the potential evidence exists in the context in which it was produced' *(*UNODC 2009: p 13), rather than the alternative of hurriedly collecting as much potential evidence as possible and then later trying to establish its relevance away from the scene. SIOs should, therefore, where possible, not rush or allow themselves to be rushed to close down a scene, whatever the pressures/difficulties.

Consideration must be given to forensic recovery of all suspected firearms, component parts, ammunition, and discharged ballistic material which is linked or believed to be linked to crime. Officer, staff and public safety cannot be compromised during this process. Therefore, recovery must be undertaken with the support, guidance and supervision of suitably trained firearms experts and/or a forensic firearms expert who can help ensure all activity is safe while not compromising potential forensic evidence.

SIOs have a number of choices depending on the circumstances of the situation.

- Where the immediate safety of officers and others is the overriding concern or the situation is otherwise too dangerous to leave a weapon in place or to take the time to process the scene in a more methodical manner (eg, risk of further shootings or shootings are ongoing), it may be necessary to permit a degree of handling of the weapon. This will prevent it being accidentally discharged, allow staff to work in proximity to it, or immediately recover and remove it.
- It may be appropriate to allow a forensic officer to swab/fingerprint certain parts of the weapon at the scene before the weapon is made safe. This must be done under the close supervision of a firearms expert to prevent any unintentional discharge. The benefit will be the securing of trace evidence that might otherwise be disrupted or destroyed during handling to make it safe.
- It may be appropriate to leave the firearm untouched and process the surrounding scene first to reduce the chances of cross-contamination from people entering the scene to deal with the weapon. This approach should be undertaken with caution, and precautions should be taken on advice from a firearms expert, eg, working outside any potential line of fire should the weapon discharge, or placing of ballistic shields between the weapon and officers/staff.
- Some forces may have the capability to remove a weapon from the scene in a ballistic bag, with a clean forensic liner. This allows it to be made safe in a controlled environment and for trace evidence to be recovered.

1.5. Recording the condition of a firearm

It is vital that the condition of the firearm is carefully recorded, both for immediate investigative purposes and subsequent criminal proceedings. A forensic firearms expert is often the best person to do this, particularly where the incident involves rarely encountered, adapted or reactivated firearms. A police firearms officer may, however, also be able to fulfil this role. SIOs should consider who is going to be able to provide the best evidence in court.

A complete record of the condition of a firearm may provide evidence about the intent of a suspect, details of shots fired and the capability of the weapon to cause harm, etc. SIOs need to be aware of, and consider, the potential loss or disruption of trace evidence during this process and whether it is best done at the scene or at an ISO 17025 accredited laboratory.

Although firearms officers and/or forensic firearms experts should be aware of what to record, it is useful for an SIO to be mindful of the following (non-exhaustive) considerations:

- As far as can be observed, a detailed description of the firearm, including the apparent type/make/calibre.
- Photography of the weapon.
- Does the weapon have safety catches/devices? What position are they in?
- Does a revolver have a double or single action? What position is the hammer set?
- Is there a round in the breech?
- In the case of revolvers, is there a round in the chamber aligned with the barrel? Consider marking this chamber.
- If there is a round in the breech (or chamber aligned to the barrel in the case of revolvers), is it live or spent?
- Is the firearm loaded with additional rounds? In the case of detachable magazines, it is not desirable to remove the rounds from the magazine. This can be done at the laboratory at a later stage. In the case of integral magazines, each round should be removed and recorded as spent or unspent. If it was necessary to cycle the rounds through the firearm action to remove them, this must be recorded.
- In the case of revolvers, each additional round must be removed and its condition, (spent/unspent) along with its position in relation to the top chamber (aligned to the barrel) must be recorded.

1.5.1. Crown Prosecution Service

The CPS guidance on firearms sets out clear guidelines on the information required by the CPS to provide a charging decision and undertake prosecution.

CPS prosecutors will not accept guilty pleas unless there is formal evidence as to the nature of the firearm.

In remand cases/applications, the lawyer giving advice will apply the threshold test and may have to rely on the opinion of a firearms expert (firearms officer or force armourer) or a preliminary report from a forensic service provider as to the nature of the firearm. In such cases, the prosecutor will identify via an MGFSP form the additional forensic issues that need addressing, including the full classification of the weapon and any relevant timescales.

Whenever a person has been charged with an indictable only offence, CPS will require a report from a forensic service provider in respect of all firearms, weapons, component parts and ammunition. It will always be necessary to determine the category of such items. The prosecutor and the police should identify other relevant forensic lines of enquiry which may include:

- fingerprint analysis
- DNA testing
- forensic discharge residue (FDR) on clothing and swabs
- ballistics
- compatibility of firearm with any ammunition recovered
- nature of any ‘noxious liquid, gas or other thing’
- serial number recovery (chemical etching, etc.)
- proof mark, manufacturing mark and user mark analysis (identification of supply chain and time line/point of diversion to criminality)
- NABIS submission and analysis.

Some of these enquiries can be carried out independently of the tests needed to classify the item, eg, ballistics analysis need not delay submission of a report to the police/CPS about classification.

1.6. Packaging of firearms

Firearms and ammunition must never be packaged together.

Any round recovered from the breech, or in the case of a revolver, the chamber aligned to the barrel, must be exhibited and packaged separately.

A detachable magazine containing rounds can be packaged as one exhibit. It is usually possible to ascertain the number of rounds within a detachable magazine by way of a visual inspection without removing each round. This number should be recorded. If the rounds do have to be removed to establish the number, then they can still be exhibited and packaged as one exhibit. The fact that they were removed must be recorded.

All rounds removed from an integral magazine can be packaged as one exhibit

In the case of a revolver, all other rounds removed from the chamber not aligned to the barrel can be packaged as one exhibit. The number of live and spent rounds relative to the chamber aligned to the barrel must be recorded.

Once unloaded, the firearm can be packaged and exhibited.

Forensic firearms experts/police forensic investigators can offer advice on the best method of packaging. In cases where the firearm will require trace evidence recovery, the packaging should minimise frictional contact with the contents. Cardboard boxes with a clear window and plastic ties are available for this purpose.

The packaging should be clean and sterile if trace evidence recovery is likely to include DNA.

1.7. Trace evidence from firearms

Swabs from inside the barrel to check for gunshot residue (GSR) may provide the evidence that a weapon has been recently fired. In the interests of safety, it is unlikely that such swabs will ever be taken before a weapon has been confirmed safe by a suitably qualified expert. Evidence of recent firing may be useful in relation to home-made, deactivated and antique firearms reportedly being held as curiosities or ornaments.

SIOs may also wish to consider having the inside components or areas swabbed for DNA. Advice should first be sought from NABIS, to ensure that dismantling the weapon for this purpose will not compromise their subsequent examination of it. It should also be undertaken under the supervision of a firearms expert with knowledge of the particular weapon so as to not cause any damage to it.

1.8. Other ballistic material

Associated ballistic material recovered from a crime scene can help investigators in the following ways. If found lodged in a victim or object, it may help a forensic expert better interpret the scene and the events that unfolded.

- Plastic wadding – may possibly identify if a shotgun was shortened (and potentially could be matched with any recovered weapon), provide evidence of the gauge of the gun used and the make/type of cartridge fired.
- Fibre wadding – the gauge of the weapon used.
- Shotgun shot – if found, can provide an indication of the type of cartridge used.
- Spent shotgun cartridge – this can provide important details of the weapon used and links to other crimes. It may also provide trace evidence opportunities.
- Bullet/bullet fragments – these can provide details of the weapon used and potential links to other crimes. They may also provide trace evidence opportunities, particularly in respect of unidentified, but injured, victims.
- Spent bullet cartridge cases – these can provide important details of the weapon used and links to other crimes. They may also provide trace evidence opportunities.

Consideration should also be given to ‘enabling tools’ and ‘indicative accessories’ such as ammunition, reloading press, dies, other tooling, cleaning materials, commercial documentation and postal packaging linking back to a supplier or an importation which may identify previous or additional supplies.

1.9. Gunshot residue

Gunshot residue (GSR), sometimes also referred to as firearm discharge residue (FDR), may be able to provide important evidence that a person has been in proximity, both in terms of time and spatially, to a firearms discharge. When a firearm discharge takes place, chemical particles are released from the weapon. These may be invisible to the naked eye but can shower the person firing the weapon and, those nearby.

For this reason, additional consideration should be given to cross-contamination relating to GSR. An SIO should consider the risks of bringing GSR into a scene, but also the risk of moving it from one place, or item, to another.

Research into GSR and reconstructing crime scenes, eg, linking the gun to a shooter, is still developing. Early evidence suggests how it can be used to assist in crime investigations.

For example, taking a sample from a deceased person and/or their clothing may provide some additional assistance in helping an SIO determine, with the help of a forensic firearms

expert, whether the incident was a suicide or a homicide, given the likely close proximity from which the weapon is likely to have been fired in the case of the former. Interpretation might, however, be difficult given that most firearms-related homicides occur at very close range. It would perhaps be unusual/improbable for a firearms-related suicide victim not to have any GSR on them, their hands or their clothing, suggesting that they had been shot from a distance. There is also evidence that GSR is likely to show greater persistence in suicide cases owing to the lack of post-incident movement (Chang et al 2013: p 10).

There is a range of evidence that shows the ability of GSR, like other types of trace evidence, to be transferred from person to person, object to object (French, Morgan and Davey 2014; French and Morgan 2015; and Berk et al 2007). While there is no general consensus to the amounts of GSR that can be passed, or of the longevity of the transfer process before there are no more particles left, it does present SIOs with some important considerations to be made. It needs to be borne in mind, for example, that a handshake with a shooter soon after a shooting incident will transfer GSR to the hands of another, and the handing over of a recently fired weapon will do likewise. Indeed, it has been found that GSR can be 'deposited on the hands of an individual who was standing in close proximity of a discharge, but who has not fired the weapon' *(*French and Morgan 2015: p 17). These and many more conceivable scenarios, eg, cross-contamination from firearms officers handling other weapons, might be sufficient to cast doubt in the mind of any jury member, or perhaps lead to a miscarriage of justice.

The ability of GSR to persist on a person's body is unclear. Equally, the amounts that can be expected to be found can 'vary unpredictably' (Chang et al 2013: p 10). Studies have shown, however, that it is likely to be more persistent on a person's hair and clothing than their hands and face (Chang et al 2013: p 10). Recent, unpublished research from the University of Portsmouth has found that there appears to be a greater degree of persistence and/or an increased ability to recover GSR from the inside of a person's eyelids when a gel stick-type swab is used.

Notwithstanding the unpredictability of the presentation of GSR, it has been established that most loss of GSR has been found to occur during the first two hours after a weapon is fired (Chang et al 2013: p 10). This makes it important, therefore, that samples of GSR are secured and preserved as soon as possible from as many surfaces and subjects that may have been in contact with the shooter or firearm (French, Morgan, and Davy 2013: p 59).

Where a firearms-related suspect is arrested, and GSR samples are likely to be required, this will need to be completed promptly. As time passes, the amount of GSR is likely to diminish and naturally falls off. Consideration should be given to placing clean bags over

each hand, secured by elastic bands around the wrists, until the hands can be swabbed. If there is likely to be a delay in swabbing a suspect's hands, then consideration should be given to placing them in a dry cell where they will not be able to wash their hands prior to swabs being taken.

As well as general swabs for GSR, consideration should be given to using a gel stick swab on the suspect's eyelids and taking hair combings given that there is evidence that GSR shows greater persistence in these areas.

A suspect's clothing should also be removed carefully, item by item, while they stand on a sheet to ensure any debris falling off is caught and can be exhibited/examined later if needed.

1.9.1. Gunshot residue and firearms officers

It is likely that most firearms incidents will necessitate the attendance of police firearms officers. This in itself also has the potential to make the interpretation of GSR found at a scene more complex and weaken its evidential value if not handled carefully.

Firearms officers and/or their vehicles should not be used to transport firearms-related suspects as they are likely to be a source of GSR (Berk et al 2007). In the case of suspected cross-contamination from a firearms officer to a suspect/scene, some forces may have already referenced the profile of GSR emitted from the weapons that their officers use. This can be compared against that found on a crime scene/suspect. Where no record exists, it is possible for a forensic firearms expert to obtain this in a controlled way. This may of course still be of limited value, given that through the course of their duty, firearms officers may pick up other GSR from, for example, other weapons they are called to recover/make safe, or from suspects they encounter.

As some forces use armed officers across a range of frontline policing activity, there are going to be increased chances that they contaminate items during non-firearms-related policing, such as arrests or searches under s18 PACE. This could be problematic, particularly if the owners of these items become suspects in future firearms-related matters.

If GSR is likely to play an important evidential part in an investigation, accepting that this may not be known at the time, an SIO will want to ensure the actions of all firearms officers at the scene and any contact they may have had with suspects/victims etc. is clearly and accurately recorded. They may also wish to explore the extent of any previous contact the suspect or scene has had with firearms officers.