

Misplaced Evidence, Missed Opportunities: Protocols for Handling Ballistic Evidence in Pediatric Patients

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BACKGROUND: Gun-related injury is now the number one cause of death in pediatric trauma patients. Many hospitals lack dedicated forensic nurses or updated protocols for handling ballistic evidence. Evidence not collected, handled improperly, or misplaced may deny a victim the basic human right to justice.

OBJECTIVE: This article aims to describe an initiative to highlight the importance of proper management of ballistic evidence and to educate medical providers on best practices for the documentation, handling, removal, and transfer of ballistic evidence.

METHODS: After discovering 24 “orphaned” bullets and bullet fragments in our hospital that had not been turned over to law enforcement, we sought to turn in evidence to the proper authorities and implement protocols to prevent this error in the future. New protocols were written by forensic staff, and education on new protocols was provided via in-person training, grand rounds, emails, and other collaborative initiatives.

RESULTS: Evidence was matched to police reports using the patient name and date of birth on evidence labels. The median (interquartile range [IQR]) time of lost ballistic evidence was 1,397 (903, 1604) days, with the oldest bullet removed in 2015. All bullets were successfully returned to law enforcement with a median (IQR) time from bullet discovery to collection of 78 (78, 174) days.

CONCLUSIONS: Ballistic evidence handling protocols are essential for all hospitals. Dedicated, trained forensic staff should be employed to ensure proper evidence handling.

KEY WORDS: Ballistic evidence, Forensic evidence, Forensic protocols, Gun violence, Pediatric trauma

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BACKGROUND

Gun-related injury is rapidly increasing among patients of all ages, with gun-related deaths now surpassing motor vehicle collisions as the leading cause of pediatric mortality in the United States (Bianchi, 2022; Goldstick

et al., 2022). Despite this, most forensic literature focuses on sexual assault and child abuse. Established protocols and training for collecting and preserving ballistic evidence should be standard for trauma centers. Yet many medical providers lack adequate knowledge and access to standard protocols when handling forensic and ballistic evidence (Asci et al., 2015; Masteller et al., 2014; Ozsaker et al., 2020; Pasqualone, 2015; Silva et al., 2020; Snow & Bozeman, 2010). This critical aspect of forensic medicine has been understudied, and hospitals without well-defined protocols are subject to errors and improper handling of evidence (The Joint Commission, 2021).

In addition to appropriate medical care, proper evaluation and documentation of patients with gun-related injury should include examination by a provider trained in forensics, photographic documentation of injury, collection of gunpowder or primer residue, collection of clothing, proper handling of ballistic evidence, and maintenance of an accurate chain of custody for collected evidence (Batts & Sanger, 2020; Snow & Bozeman, 2010). Though bullet removal is not always

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KEY POINTS

- Trauma providers should be educated in best practices for documenting, handling, removing, and transferring ballistic evidence.
- Very few formal training programs in nonsexual assault forensics exist.
- All hospitals should have established protocols for the handling of ballistic evidence or should update existing protocols.

medically indicated, collecting and preserving ballistic evidence in trauma patients is crucial for criminal investigations (Batts & Sanger, 2020; Butler et al., 2016; Pasqualone, 2015). Ballistic evidence can provide information about the type of firearm used, the distance of the shooter from the victim, and the entry angle of the bullet into the body and ultimately may aid in identifying suspects (Batts & Sanger, 2020; Pasqualone, 2015; Peterson et al., 2010). When handled by untrained medical personnel, evidence can be inadvertently lost, damaged, or even discarded (Batts & Sanger, 2020). Improper handling or damage to forensic evidence can hinder legal case progression and lead to negative prosecution outcomes (Filmalter et al., 2018). Proper documentation, handling, removal, and transfer of ballistic evidence are essential to providing comprehensive care to victims of gun-related injury.

OBJECTIVE

This study aims to describe an initiative to highlight the importance of proper management of ballistic evidence and to educate medical providers on best practices for the documentation, handling, removal, and transfer of ballistic evidence.

METHODS

The descriptive analysis was conducted at a single Level I American College of Surgeons (ACS)-verified, stand-alone pediatric trauma center. The sample consisted of 24 patients admitted to the hospital from 2015 to 2022 for whom ballistic evidence was found in hospital storage. Police were contacted, and the orphaned evidence was collected by the appropriate law enforcement jurisdiction. Patients undergoing foreign body removal for gun-related injury after March 2023 were included to measure project implementation success.

A brief retrospective review of patient medical records and police reports was performed to obtain patient demographics, police reports, incident-related details, forensic photographs, and operative reports. Forensic photographs consisted of nonuniform images taken by providers in the trauma bay following initial evaluation and stabilization of the patient. These data,

as well as documented communications with police, were collected and recorded in a REDCap Database. Descriptive statistics, including medians with interquartile range (IQRs), were performed using REDCap. Case outcomes following the turnover of ballistic evidence to law enforcement were not investigated.

A task force team was assembled to develop and implement protocols to prevent this error from reoccurring. The team comprised physicians, nurses, operating room staff, and local forensic experts, created new documents outlining appropriate processes for patient evaluation, documentation of forensic evidence, standard practices for operative removal of bullet fragments, and a forensic nurse job description and sample chain of custody form (see Appendix 1). Protocols were implemented in March of 2023. Training was carried out in the form of departmental meetings, formal memos, on-the-job training, and a hospital-wide grand rounds presentation given by a forensic expert.

RESULTS

During routine auditing in July 2022, ballistic evidence in the form of bullets and bullet fragments was discovered by hospital security for 24 unique patients. The evidence belonged to a cohort of predominantly male patients ($n = 19$, 79.1%) with a median (IQR) age of 16 (12.0, 16.9) years at the time of initial admission. Forensic photographs were uploaded to the patient's medical record in $n = 5$ (21.7%) cases.

The retained bullets were removed from an extremity in 58.3% ($n = 14$) of cases, multiple sites including the abdomen ($n = 6$, 25%), and thorax ($n = 2$, 8.3%). The time to removal from initial presentation had a median (IQR) of 0 (0, 21) days. During removal, best practices for bullet removal protocols (including use of rubber tipped forceps) were not followed or documented in the operative report in $n = 22$ (91.7%) of cases. All discovered bullets were turned over to law enforcement with a median (IQR) time to retrieval of 1,397 (903, 1604) days after surgical removal. The median (IQR) time from discovery of misplaced ballistic evidence to the time of retrieval by law enforcement was 78 (78, 174) days.

After review of the data and root cause analysis, it was determined that the primary reasons for improper transfer of evidence were inadequate training, lack of defined protocols, and a lack of awareness of the best practices for the documentation, handling, removal, and transfer of ballistic evidence. Additionally, the vast majority of ballistic evidence was handed over to hospital security guards following removal and not directly to local law enforcement. Protocols were created by the task force team. Training was provided to the emergency department, operating room, and trauma staff. The initiative was launched on March 1, 2023.

Since implementation 6 months prior, 100% of patients with surgically removed ballistic evidence have had turnover of evidence to law enforcement within 14 days of operation ($n = 12$). We credit the successful implementation to a multidisciplinary approach involving all related parties, including nurses, trainees, and staff from the emergency department, operating room, and surgery departments. Additionally, a formal, hospital-wide Grand Rounds presentation by a forensics expert emphasized the importance of the work, increased visibility of the new protocols, and garnered support for our ongoing project. Barriers were also encountered while implementing the new protocols, including the difficulty in educating and training night-shift staff members and the lack of funding to hire 24-hr coverage for forensic nurses.

DISCUSSION

Our study highlights the importance of appropriately collecting and preserving ballistic evidence in trauma patients and serves as an example of possible missed opportunities for justice. We determined that inadequately trained staff and lack of defined protocols were significant contributors to the inciting event. As a result, protocols for handling and documenting ballistic evidence were updated or created, and training was provided. Although established protocols for handling ballistic evidence undoubtedly exist at many large adult trauma centers, our experience and communication with several local and regional pediatric and adult centers suggest that *all hospitals* should review their institutional protocols for the handling of ballistic evidence. Protocols should be created or updated to reflect current best practices if necessary. Protocols for the collection, documentation, and preservation of forensic evidence relating to gun-related injury should be a part of every trauma center.

Forensic Nurses and Forensic Providers

Forensic nurses play a critical role in the collection and management of evidence related to gun-related injury (Koehler, 2009; McGillivray, 2005; Pasqualone, 2015). Yet, many hospitals do not employ dedicated forensic nurses; instead, many emergency department nurses or other providers perform forensic duties. However, numerous studies demonstrate that few emergency department nurses or other medical staff have received formal training in forensic documentation or feel confident in their abilities to care for patients with forensic needs correctly (Asci et al., 2015; Batts & Sanger, 2020; Hanshaw, 1994; Linnarsson et al., 2015; Pasqualone, 2015). Where possible, we advocate for hospitals to employ dedicated forensic nurses or provide comprehensive forensic training to emergency department nurses

in sexual assault, gun violence, domestic violence, and other forensic matters (Filmlalter et al., 2018; Pasqualone, 2015; Pasqualone & Michel, 2015). Improper documentation or handling of forensic evidence may hinder legal case progression and lead to negative prosecution outcomes (Batts & Sanger, 2020; Wellford et al., 2000). Proper education is necessary for nurses and other medical staff providing forensic care.

For nurses, though certifications like the Sexual Assault Nurse Examiner (SANE-P/SANE-A) exist, certifications that relate specifically to the care of victims of nonsexual violent crimes are not well known and are difficult to attain without prior forensic practice and knowledge. Such certifications are granted by the American Institute of Health Care Professionals and the Forensic Nurse Certification Board (American Institute of Health Care Professionals, 2023; Forensic Nursing Certification Board, 2021).

Aside from specialized training as a forensic pathologist, no accreditation or widespread training programs exist for physicians seeking additional experience in forensic medicine (Lord et al., 2018). Physicians seeking additional training should contact the Forensic Medicine Section of the American College of Emergency Physicians or the American Academy of Forensic Sciences for opportunities (American Academy of Forensic Sciences, 2023; American College of Emergency Physicians, 2023).

Initial Evaluation and Handling of Evidence

Forensic providers should be present during the initial evaluation of all patients with gunshot wounds. The first duty of all medical personnel is to treat and stabilize the patient medically. During this time, photographs may be taken while ensuring they do not interfere with lifesaving measures. Once the patient is stabilized, forensic providers should collect additional evidence, information, and history from the patient and emergency medical teams. The entire treatment room and everything in it should be considered a crime scene, and all evidence should be preserved. A thorough history should focus on the event's details, including the patient's location (in a vehicle, at a park, etc.) and position at the time of injury. Additional information to collect includes gun type and identifying the shooter's characteristics, such as gender, age, and race. The patient's clothing should be collected and packaged appropriately in paper bags, taking care to freeze any clothing saturated (with blood, vomit, urine, etc.) so that evidence is not destroyed by mold or mildew. Any gun residue on the patient should be swabbed. Other potentially pertinent evidence should be collected as necessary (Snow & Bozeman, 2010). Forensic photographs should be taken of all injuries, a detailed written description of injuries should be completed in the medical record, and

a diagram of findings should be made. Patients should not be “cleaned up” whenever possible until all evidence is collected.

Photographic Documentation of Injury

Photographic documentation of injuries is an essential aspect of forensic nursing practice. Photographs allow for a detailed record of the injury, including the size and location of the wound, the angle of entry and exit, and any other notable characteristics. Photographs must be taken before a patient is cleaned, as many findings can be washed away. There are subtle findings that can be captured in a photograph that can provide valuable information about the distance a shooter was from the victim. Signs such as stippling or tattooing (a halo left around the entrance wound by a close-range discharge) and bullet wipe (a gray or black ring around an entrance bullet hole) are important information to allow distance determination (Wick, 2000). Determining the distance a shooter was from a victim helps determine if someone was shot in self-defense or as an act of malice. This evidence can be used to help identify suspects and build a case. We recommend photographs be taken of each injury, including a photograph from a distance for reference purposes and close-up with and without measurement instruments. High-quality photographs can help jurors understand a crime more accurately, combat the “CSI Effect” (the effect of jurors’ perceptions of evidence due to modern crime shows), and may help to convict perpetrators of gun violence (Cole & Dioso-Villa, 2007; Ling et al., 2021). Jurors can understand a crime more accurately when they can view photographs taken in real time, as the patient appeared immediately following the act of violence.

Operative Bullet Removal Protocols

Removal of bullets is not always medically indicated. A retrospective study of pediatric gunshot wounds reported an incidence of retained bullet fragments as high as 44% (Andrade et al., 2022). However, in cases where bullet removal is necessary, a standardized protocol should be followed to ensure the preservation and integrity of ballistic evidence. The protocol should outline the appropriate documentation and packaging of forensic evidence, forensic photographs, and surgical techniques for removal of ballistic evidence. When removing a bullet or fragment, whether in the operating room or from a superficial wound in the emergency department, it is imperative to use rubber-tipped forceps or gloved fingers and not to use metal instruments (Batts & Sanger, 2020; Hanshaw, 1994; Ozsaker et al., 2020; Pasqualone, 2015). Metal forceps can damage the bullet’s surface, changing its characteristics and making it more difficult to use as evidence.

Additionally, bullets should never be dropped into a metal bowl, cleaned by operating room staff, or sent to pathology laboratories (Batts & Sanger, 2020). Removed bullets should be minimally handled, packaged immediately in a plastic specimen cup or manila evidence envelope, and submitted as forensic evidence with an intact chain of custody, and local law enforcement should be notified immediately for retrieval. Operative techniques, including the appropriate use of instruments and packaging, should be described in detail for bullet removal and documented in the patient’s electronic medical record.

Chain of Custody and Storage of Evidence

A physical copy of a chain of custody must be maintained to guarantee the integrity of the evidence (Badiye et al., 2023). An appropriate chain of custody log should include names, dates, times, and locations of every handoff from one person to another. This process establishes that only authorized individuals can access evidence (Badiye et al., 2023). Although there is no limit on the number of transfers, keeping this number as low as possible is vital. Anyone listed on the chain of custody can be subpoenaed to testify about the integrity of the chain of custody (Bergman & Martin, 2023). Chain of custody logs should be attached to any evidence and stored in a locked storage area until turned over to law enforcement to minimize the risk of tampering (Batts & Sanger, 2020). Inaccurate or incomplete chain of custody logs can hinder legal case progression and lead to negative prosecution outcomes and exclusion of evidence in court cases (Badiye et al., 2023). Occasionally, wet evidence (such as blood-soaked clothing) requires freezing for preservation (Ballou et al., 2013). If evidence requires such preservation and is separated from ballistic evidence, both pieces of evidence should have their own chain of custody attached. Each institution should work toward obtaining access to a locked freezer to preserve evidence, and the chain of custody must always be preserved.

Do Not Lose or Destroy Evidence









Proper documentation and handling of forensic evidence is imperative for criminal investigation and conviction. At every stage, handlers of evidence must ensure that it has not been compromised, contaminated, or damaged and that its chain of custody is attached and tracked. The presentation of valid forensic evidence nearly doubles the odds of a guilty verdict in criminal investigations (Ling et al., 2021). Loss of evidence can have devastating impacts on case outcomes (Filmler et al., 2018). In cases where forensic evidence is lost or mishandled, the prosecution may be forced to rely solely on witness testimony or other circumstantial evidence, which is often less reliable and more prone to error and

inconsistencies. It has been estimated that one in three eyewitnesses make an erroneous identification following a crime (Wells, 1998; Wise et al., 2014). Therefore, it is essential for forensic providers to follow established protocols for collecting, documenting, and transferring forensic evidence and to maintain the chain of custody.

CONCLUSION

This incident at our institute made it clear a lack of standardization exists for handling ballistic evidence. Emergency and trauma providers ensure the immediate care and safety of a patient who is the victim of gun violence. However, it is important to realize that the early handling and management of patients and evidence may have long-term consequences in pursuing justice in a court of law. A standardized and collaborative approach to their management, including protocols for handling evidence and training capable and educated providers, is necessary to facilitate potential future criminal investigations.

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REFERENCES

American Academy of Forensic Sciences. (2023). *American Academy of Forensic Sciences*. <https://www.aafs.org/>

American College of Emergency Physicians. (2023). *ACEP Forensic Medicine Section*. Forensic Medicine Section. <https://www.acep.org/forensicmedicine>

American Institute of Health Care Professionals. (2023). *Forensic Nurse Specialist Certification*. <https://aihcp.net/forensic-nurse-specialist-certification-program/>

Andrade, E. G., Uberoi, M., Hayes, J. M., Thornton, M., Kramer, J., & Punch, L. J. (2022). The impact of retained bullet fragments on outcomes in patients with gunshot wounds. *The American Journal of Surgery*, 223(4), 787–791. <https://doi.org/10.1016/j.amjsurg.2021.05.022>

Asci, O., Hazar, G., & Sercan, I. (2015). The approach of prehospital health care personnel working at emergency stations towards forensic cases. *Turkish Journal of Emergency Medicine*, 15(3), 131–135. <https://doi.org/10.1016/j.tjem.2015.11.007>

Badiye, A., Kapoor, N., & Menezes, R. G. (2023). Chain of custody. In *StatPearls*. StatPearls Publishing. <http://www.ncbi.nlm.nih.gov/books/NBK551677/>

Ballou, S., Stolorow, M., Taylor, M., Bamberger, P. S., Brown, L., Brown, R., Burney, Y., Davenport, D., DePalma, L., Williams, S., Jones, C., Keaton, R., Kiley, W., Latta, J., Kline, M., Lanning, K., LaPorte, G., Ledray, L. E., Nagy, R., ... Stoiloff, S. (2013). *The biological evidence preservation handbook: Best practices for evidence*

handlers; technical working group on biological evidence preservation (NIST IR 7928; p. NIST IR 7928). National Institute of Standards and Technology. <https://doi.org/10.6028/NIST.IR.7928>

Batts, J. J., & Sanger, R. M. (2020). *Collecting forensic evidence in the emergency department: A guide for lawyers, investigators, and experts* (SSRN Scholarly Paper 3542380). <https://papers.ssrn.com/abstract=3542380>

Bergman, P., & Martin, K. (2023). *What is a chain of custody for evidence?* <https://www.nolo.com/legal-encyclopedia/what-chain-custody.html>

Bianchi, D. (2022, July 5). *Preventing gun violence, the leading cause of childhood death. NICHD—Eunice Kennedy Shriver National Institute of Child Health and Human Development*. https://www.nichd.nih.gov/about/org/od/directors_corner/prev_updates/gun-violence-july2022

Butler, B., Fries, C., Panock, J., Jorden, M. A., & Melinek, J. (2016). Catching a bullet: Gunshot wound trajectory analysis used to establish body position. *Academic Forensic Pathology*, 6(4), 739–745. <https://doi.org/10.23907/2016.070>

Cole, S. A., & Dioso-Villa, R. (2007). *CSI and its effects: Media, juries, and the burden of proof* (SSRN Scholarly Paper 1023258). <https://papers.ssrn.com/abstract=1023258>

Filmalter, C. J., Heyns, T., & Ferreira, R. (2018). Forensic patients in the emergency department: Who are they and how should we care for them? *International Emergency Nursing*, 40, 33–36. <https://doi.org/10.1016/j.ienj.2017.09.007>

Forensic Nursing Certification Board. (2021). *Certification/ReCertification*. <https://goforensicnbc.org/certification>

Goldstick, J. E., Cunningham, R. M., & Carter, P. M. (2022). Current causes of death in children and adolescents in the United States. *The New England Journal of Medicine*, 386(20), 1955–1956. <https://doi.org/10.1056/NEJMc2201761>

Hanshaw, S. L. (1994). Bullet retrieval in the operating room. *Seminars in Perioperative Nursing*, 3(4), 232–236.

Koehler, S. A. (2009). Firearm evidence and the roles of the ER nurse and forensic nurse. *Journal of Forensic Nursing*, 5(1), 46–48. <https://doi.org/10.1111/j.1939-3938.2009.01030.x>

Ling, S., Kaplan, J., & Berryessa, C. M. (2021). The importance of forensic evidence for decisions on criminal guilt. *Science & Justice*, 61(2), 142–149. <https://doi.org/10.1016/j.scijus.2020.11.004>

Linnarsson, J. R., Benzein, E., & Årestedt, K. (2015). Nurses' views of forensic care in emergency departments and their attitudes, and involvement of family members. *Journal of Clinical Nursing*, 24(1–2), 266–274. <https://doi.org/10.1111/jocn.12638>

Lord, S., Ackerman, K., & Shafer, K. (2018). *EMRA fellowship guide* (2nd ed.). <https://www.emra.org/books/fellowship-guide-book/9-forensic-medicine>

Masteller, M. A., Prahlow, A., Walsh, M. M., Thomas, S. G., Wolfenbarger, R., & Prahlow, J. A. (2014). Proper handling of bullet evidence in trauma patients. *Trauma*, 16(3), 189–194. <https://doi.org/10.1177/1460408614532047>

McGillivray, B. (2005). The role of Victorian emergency nurses in the collection and preservation of forensic evidence: A review of the literature. *Accident and Emergency Nursing*, 13(2), 95–100. <https://doi.org/10.1016/j.aen.2004.09.001>

Ozsaker, E., Kaya, A., Okgun Alcan, A., Yavuz van Giersbergen, M., & Aktas, E. O. (2020). Forensic cases in the operating room: Knowledge and practices of physicians and nurses. *Journal of PeriAnesthesia Nursing*, 35(1), 38–43. <https://doi.org/10.1016/j.jopan.2019.06.010>

Pasqualone, G. A. (2015). The relationship between the forensic nurse in the emergency department and law enforcement officials. *Critical Care Nursing Quarterly*, 38(1), 36–48. <https://doi.org/10.1097/CNQ.0000000000000047>

Pasqualone, G., & Michel, C. (2015). Forensic patients hiding in full view. *Critical Care Nursing Quarterly*, 38(1), 3–16. <https://doi.org/10.1097/CNQ.0000000000000043>

Peterson, J., Sommers, I., Baskin, D., & Johnson, D. (2010). *The Role and impact of forensic evidence in the criminal justice process*.

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- National Institute of Justice. <https://www.ojp.gov/pdffiles1/nij/grants/231977.pdf>
- Silva, J. O. M., Santos, L. F. S., Dos Santos, S. M., da Silva, D. P., Santos, V. S., & de Melo, C. M. (2020). Preservation of forensic evidence by nurses in a prehospital emergency care service in Brazil. *Journal of Trauma Nursing*, 27(1), 58–62. <https://doi.org/10.1097/JTN.0000000000000483>
- Snow, A. F., & Bozeman, J. M. (2010). Role implications for nurses caring for gunshot wound victims. *Critical Care Nursing Quarterly*, 33(3), 259–264. <https://doi.org/10.1097/CNQ.0b013e3181e65fec>
- The Joint Commission. (2021). Patient safety systems. In *2023 Comprehensive Accreditation Manual for Critical Access Hospitals (CAMCAH)*. https://www.jointcommission.org/-/media/tjc/documents/standards/ps-chapters/camcah_04a_ps_all_current.pdf
- Wellford, C., Brandl, S., Bynum, T., Galeria, S., & Cronin, J. (2000). *Analysis of variables affecting the clearance of homicides: A multisite study*. U.S. Department of Justice. <https://www.ojp.gov/pdffiles1/nij/grants/181356.pdf>
- Wells, G. (1998). Eyewitness identification procedures: Recommendations for lineups and photospreads. *Law and Human Behavior*, 22(6), 603–647. <https://doi.org/10.1023/A:1025750605807>
- Wick, J. M. (2000). Don't destroy the evidence! *AORN Journal*, 72(5), 807–818, 820–827; quiz 828–830, 833–836. [https://doi.org/10.1016/s0001-2092\(06\)62013-9](https://doi.org/10.1016/s0001-2092(06)62013-9)
- Wise, R. A., Sartori, G., Magnussen, S., & Safer, M. A. (2014). An examination of the causes and solutions to eyewitness error. *Frontiers in Psychology*, 5, 102. <https://doi.org/10.3389/fpsyg.2014.00102>

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APPENDIX 1**Forensic Nursing Protocol for Evaluation and Documentation of Patients With Gunshot Wounds**

1. Retrieve the Forensic Folder and bring it to the trauma bay.
2. Prioritize lifesaving and stabilization measures before proceeding with collection of evidence.
3. When clinically appropriate, take photo documentation of the patient while they are being treated in the trauma bay.
4. Collect and preserve any available clothing (even if cut away by trauma providers, or brought in from the scene).
5. Avoid cutting through bullet holes or existing rips/tears when removing clothing.
6. Package each article of clothing separately, placing one item per bag. Pairs, such as socks, can be packaged together.
7. Seal each bag with tape, sign, date, and time across the seal. Attach a patient label indicating the contents (e.g., "shirt").
8. Collect any items removed from the patient for evidence, such as bullets (or fragments) or knives, and package them in breathable paper bags. Include these individually packaged items in the larger brown bag.
9. If any items are wet, freeze them separately and create a separate chain of custody form.
10. Swab the patient's hands for gunshot residue and place the swabs in a cardboard holder.
11. Consolidate the individually packaged clothing/articles into a large brown bag. Attach white label on the outside, listing all items inside. Tape the top of the bag and sign, date, and time across the sealed tape.
12. Establish a chain of custody, documenting each packaged item on the form.
13. Capture photographs of any soot, tattooing (stippling), abrasion collars, or comet-tailed abrasions observed around or near the wounds.
14. Photograph each individual injury, including entrance/exit wounds, graze wounds, stab wounds, bruising, etc. Document as appropriate in the patient's electronic medical record.
 - a. Take a shot from a distance for perspective.
 - b. Capture a close-up shot.
 - c. Include a close-up shot with a measuring device for scale.
15. Gather a comprehensive history of the assault from social work, the patient, and the police.
16. Document the information appropriately, including:
 - a. Brief history of the assault including the distance from the gun and body position of the patient during the incident (sitting, standing, curled up, running, etc.).
 - b. Detailed record of injuries.
 - c. Total number of wounds.
 - d. List of evidence collected.
 - e. Body diagram illustrating the injuries.
 - f. Police report number and jurisdiction(s) involved.
17. Communicate with social work to obtain a police report number, which should be included on the packaged evidence, the chain of custody form, and the patient's chart.
18. Communicate with local law enforcement to arrange evidence pickup as soon as possible.

Operating Room Bullet Removal Protocol

1. Retrieve the Evidence Collection Tool Kit from the designated location, such as the OR Charge Nurse Office or a central storage area.
 - a. The Evidence Collection Tool Kit should contain the following items: chain of custody form, large white stickers for chain possession, brown paper bags, manilla envelopes, evidence seal tape, protocols, and instructions for appropriate handling of ballistic evidence. In case any of these items are missing, a different kit should be used as this could be used as evidence of a compromised kit.
2. Use rubber-tipped forceps, or gloved hands to remove the bullet from the patient. Ensure that the bullet or bullet fragments are not dropped into a metal bowl or handled with metallic instruments without rubber protection. Wrap bullet in sterile gauze and then transfer it to a manilla envelope or plastic specimen cup with a patient label.
3. Seal the manilla envelope using evidence tape. Sign, date, and time the evidence tape, with half of the information on the tape and the other half on the manilla envelope.
4. Place the sealed manilla envelope containing the bullet in a paper bag and roll down the top to secure it.

5. Use evidence tape to seal the paper bag, wrapping it around twice. Sign, date, and time the evidence tape, with half of the information on the tape and the other half on the bag.
6. Attach a large white label to the front of the bag and fill out as much information as possible. Consider involving social work to assist in obtaining additional details such as the location of the event or case report number. If available, include the police jurisdiction and police report number.
7. Complete the chain of custody paperwork:
 - a. Provide a description of the item, e.g., “1 bullet removed by Dr. Smith.”
 - b. Document each person that handled the evidence, including their name and role.
 - c. The collector is responsible for taking the item off the sterile field and completing the entire process until it is logged in the designated evidence storage area of the hospital, such as the ED’s evidence closet. Seek assistance from the Charge Nurse if required.
9. Place the completed chain of custody paperwork and the evidence collected (bullet and related materials) in the designated evidence storage area. Fill out the evidence log with patient information as required.
10. Notify the OR nurse supervisor and forensic nurses about the bullet removal and its placement in the evidence closet for their awareness and coordination.
11. Remind the surgeon or person removing the bullet to document operative details of bullet removal including that the bullet was removed per protocol and to document appropriate handoff on chain of custody form and in operative note.

Forensic Nurse Job Description and Responsibilities

Purpose: Delivers expert and technically proficient, scientifically based nursing care to victims of violent crime who present to [insert hospital name]. Performs medical/forensics exams for these patients under the supervision of a provider. Is an active participant in professional activities, such as quality improvement projects, research, in-service presentations, etc.

Essential functions: Performs the forensic/medical exam in cases of violent crimes against a patient, under the supervision of the emergency department or trauma provider.

- Evaluates the patient, recognizes urgent/emergent problems that require medical treatment prior to forensic examination.
- Obtains pertinent health history.
- Utilizes systematic method of forensic evidence collection that both protects the integrity of evidence and is appropriate for the patient’s age and history.
- Utilizes specific examination techniques as appropriate to the case, e.g., photo documentation/video of injuries, use of alternative light source.
- Maintains competence in examination and specimen collection techniques.
- Completes all required documentation.
- Provides crisis intervention and assures safety of the patient.
- Serves as a preceptor and/or resource nurse.
- Assumes leadership role in emergency situations.
- Expands focus beyond the physical needs of the patient to include psychosocial needs, spiritual needs, cultural needs, etc. and independently initiates nursing orders that reflect the above needs.
- Participates in the judicial process for the patient.

Meets the educational needs of the patient, family, and staff, utilizing principles of teaching/learning

- Utilizes appropriate resources for patient/family education.
- Completes required documentation.
- Provides for the continuous educational needs of patients and families through formal and informal methods.
- Coordinates care conferences for complex patients.
- Is available as a teacher and resource to other hospital staff.
- Utilizes research and evidence-based guidelines to enhance the teaching process and the practice environment.
- Provides teaching/learning experiences in the hospital reflecting [insert hospital name]’s mission and values.
- Utilizes creative and adaptive teaching strategies.

Delivers therapeutic, safe, and efficient care

- Maintains a clean, orderly, safe environment.

- Utilizes standard precautions.
- Maintains appropriate levels of supplies in room.
- Accepts unexpected patients expeditiously.
- Performs interventions and routinely demonstrates ability to manage time.
- Demonstrates self-starting ability.

Additional non-clinical responsibilities

- Responds to subpoenas.
- Testifies as a fact witness and/or expert witness.
- Testifies regarding chain of custody of evidence.

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Chain of Custody											
Law Enforcement Agency _____ Police Report Number: _____ Date: ___/___/___ Time: _____ hours By: _____ Form Number 1 of _____											
Evidence is any material which may be involved in the investigation of a crime or other legal matter. Items may include (but are not limited to) clothing, foreign objects, blood or body fluids, bullets, and rape kits. The chain of custody form is initiated in the hospital area where the collection takes place (such as an emergency department, clinic, or surgery). Following release of the item(s) to law enforcement personnel, the original completed form should be removed from the item(s) and placed in the patient's permanent medical record. The yellow copy should accompany the item(s). Evidence should be packaged appropriately, sealed with evidence tape, and labeled directly on the outside of the container with an evidence sticker.											
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Evidence stored: <input type="checkbox"/> At room temperature <input type="checkbox"/> Refrigerated <input type="checkbox"/> Frozen											
Items - Description of Package Contents: _____ _____ _____											
Collector / Packager: Print Name: _____ Title: _____ Hospital Location: Adale Hall Kansas Signature: _____ Date ___/___/___ Time: _____ hours Observed Collection: <input type="checkbox"/> Yes <input type="checkbox"/> No Observed By (Signature): _____											
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