



Beware of the **Forgotten Tourniquet** During Phlebotomy and IV Insertion

By **Matthew A. Taylor**, PhD*¹ and
Elizabeth A. Mattox, MSN, MS, ARNP²

Keywords: patient safety, blood flow, IV catheter, retention, vigilance, medical error, iatrogenic injury

*Corresponding author

¹Patient Safety Authority

²Veterans Affairs Puget Sound Health Care System

Disclosure: The authors declare that they have no relevant or material financial interests.

Submitted

December 9, 2024

Accepted

December 9, 2024

Published

January 27, 2025

License

This article is published under the [Creative Commons Attribution-NonCommercial 4.0 \(CC BY-NC\)](https://creativecommons.org/licenses/by-nc/4.0/) license.

This article was previously distributed in a January 8, 2025, newsletter of the Patient Safety Authority, available at <https://conta.cc/4gGBJtA>.

Taylor MA, Mattox EA. Beware of the Forgotten Tourniquet During Phlebotomy and IV Insertion. *Patient Safety*. 2024;7(2):128211. doi:10.33940/001c.128211

Over the past several years more than a thousand event reports of staff forgetting to remove tourniquets from patients following intravenous (IV) insertion or phlebotomy were submitted to the Pennsylvania Patient Safety Reporting System (PA-PSRS). Unfortunately, this issue persists despite being identified 20 years ago in a study with PA-PSRS data.¹

Impact of Forgotten Tourniquet on the Patient. A prior study of reports submitted to PA-PSRS found that when accidental retention of a tourniquet occurred, patients often had one or more of the following symptoms: pain; numbness; tingling; skin tear; IV infiltration; delay of capillary refill; and extremity edema, temperature change, and color change.¹ An extended delay in the removal of a tourniquet can cause neurological, muscular, circulatory, and/or vascular injury.^{1,3} Additionally, prolonged retention of a tourniquet can result in inaccurate laboratory test results (e.g., potassium level or blood count), which could lead to errors in patient care and treatment.¹

Circumstances of the Events and Why Staff Forget to Remove a Tourniquet. Previous research revealed that in more than 30% of events the tourniquet was applied for more than two hours and up to as many as 24 hours.^{1,4} When the forgotten tourniquet was detected, it was most often identified by staff other than the person who applied the tourniquet¹ and in 5%–10% of the events it was recognized by the patient or family.^{1,4} According to prior studies,^{1,2,4} the forgotten tourniquet was attributed to one or more of the following factors: tourniquet was short in length, similar to skin color, and/or it was covered by other items (e.g., gown, drapes, blood pressure cuff, restraints, patient's fatty tissue); staff were distracted and/or inexperienced; communication breakdown between staff; patient had a condition or state that hindered meaningful communication (e.g., dementia, unconscious, non-English speaking, or nonverbal); a less common access site was used (e.g., foot, ankle); an alternative material was used as the tourniquet (e.g., blood pressure cuff, glove); and low lighting limited visibility.

Strategies to Reduce Risk of Staff Forgetting to Remove a Tourniquet.^{1,2,5,6}

- Implement consistent IV insertion and phlebotomy collection processes across departments.
- Use staff who have completed training and have been verified competent for collections. Staff training should be robust, address policies, and include competency verification. Consider the following when developing training and competencies:
 - Raise the bed during the procedure to increase visibility of the patient's extremity and site.
 - Ensure visibility of the tourniquet by placing it close to the insertion site.
 - Place the tourniquet in a location where it will not become hidden (e.g., covered by clothing or folds of skin). The tourniquet should go over a shirt or hospital gown sleeve whenever possible. If the tourniquet cannot be placed over a shirt sleeve, the sleeve should be rolled up, not pushed up.
 - To improve visibility, use a wide, long, and brightly colored tourniquet.
 - Release the tourniquet promptly when blood flows into the tube, following advancement of the IV catheter or removal of the needle.
 - If patient care is interrupted or if staff need to leave the bedside, remove the tourniquet.
 - If there is persistent bleeding from a puncture site, then inspect for tourniquet retention.
 - Complete the procedure, including tourniquet removal, prior to documentation.
 - Verify that the tourniquet has been removed before leaving the patient.
 - During routine patient assessments staff should inspect for tourniquet retention.

Recovery From a Forgotten Tourniquet.⁶

- Remove the tourniquet right away.
- Evaluate for neurological, muscular, circulatory, and/or vascular injury.
- Evaluate for infiltration and extravasation. If indicated, treat based on best practices.
- Notify the provider and document as appropriate.

References

1. Patient Safety Authority. Forgotten But Not Gone: Tourniquets Left on Patients. *Patient Safety Advisory*. 2005;2(2):1-4.
2. Samples C. When Tourniquets Are Left Behind. In: *TIPS Topics in Patient Safety*. Vol 5: VA National Center for Patient Safety; 2005:2-3.
3. Kaur P, Rickard C, Domer GS, Glover KR. Dangers of Peripheral Intravenous Catheterization: The Forgotten Tourniquet and Other Patient Safety Considerations. In: *Vignettes in Patient Safety-Volume 4*. Intechopen; 2019:1-22.
4. Magee MC. The Forgotten Tourniquet—An Update. *Patient Safety Advisory*. 2016;13(1):32-35.
5. Patient Safety Authority. Tourniquet Removal and Discard Process. PSA YouTube Channel. <https://www.youtube.com/watch?v=fsc6chuPBkc>. Published March 13, 2016. Accessed November 20, 2024.
6. Mattox EA. Complications of Peripheral Venous Access Devices: Prevention, Detection, and Recovery Strategies. *Crit Care Nurse*. 2017;37(2):e1-e14.

About the Authors

Matthew A. Taylor (MattTaylor@pa.gov) is a research scientist on the Data Science & Research team at the Patient Safety Authority (PSA), where he conducts research, uses data to identify patient safety concerns and trends, and develops solutions to prevent recurrence.

Elizabeth A. Mattox (eamattox@gmail.com) is a nurse practitioner who currently specializes in pulmonary medicine. She previously worked as a patient safety manager in a large, high complexity Veterans Affairs healthcare system.

