

# TRAUMA QUALITY IMPROVEMENT GUIDELINE

SEPTEMBER 2021



WASHINGTON STATE DEPARTMENT OF HEALTH  
OFFICE OF COMMUNITY HEALTH SYSTEMS  
Emergency Medical Services and Trauma Section

The Washington State Department of Health distributes this guideline on behalf of the Emergency Medical Services and Trauma Care Steering Committee to assist trauma care services with developing their trauma quality improvement program. The intent of this information is to assist trauma programs in their quality improvement efforts.

The Department of Health does not mandate the use of this guideline. The department recognizes the varying resources of different services, and approaches that work for one trauma service may not be suitable for others. The decision to use the content in this guideline depends on the independent judgment of program administrators. We recommend trauma services who choose to use this guideline consult with the department regularly for any updates to its content. The department appreciates receiving any information regarding program experience using the guideline and comments can be directed to 360-236-2874.

The content in this guideline was adapted from professional literature and the expertise of the trauma community. The guideline was reviewed, and input sought from program administrators throughout Washington state, and used that input to make changes. Both the Emergency Medical Services and Trauma Care Steering Committee and the Department of Health Office of Community Health Systems endorsed the guideline.

Washington State Department of Health  
Office of Community Health Systems  
111 Israel Road SE  
Olympia, WA 98504-7853  
Phone: 360-236-2800  
Website: [www.doh.wa.gov/hsqa/emstrauma/](http://www.doh.wa.gov/hsqa/emstrauma/)



DOH 530-247 September 2021

To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email [civil.rights@doh.wa.gov](mailto:civil.rights@doh.wa.gov).

# TABLE OF CONTENTS

<b>INTRODUCTION</b> .....	<b>3</b>
<b>CONTINUOUS QUALITY IMPROVEMENT</b> .....	<b>4</b>
<b>TRAUMA QI PLAN</b> .....	<b>5</b>
<b>RECOGNITION</b> .....	<b>6</b>
Audit Filters .....	6
Quality Measures .....	7
<b>ANALYSIS</b> .....	<b>8</b>
Levels of Review .....	8
Chart Audit Tool .....	9
<b>CORRECTION (ACTION PLAN DEVELOPMENT)</b> .....	<b>10</b>
<b>EVALUATION</b> .....	<b>11</b>
<b>DOCUMENTING THE QI PROCESS</b> .....	<b>12</b>
<b>COMMITTEES AND PEER REVIEW</b> .....	<b>13</b>
<b>UNDERTRIAGE</b> .....	<b>14</b>
<b>RESOURCES</b> .....	<b>15</b>
<b>REFERENCES</b> .....	<b>16</b>
<b>CONTRIBUTORS</b> .....	<b>17</b>
<b>APPENDICES</b> .....	<b>18</b>

## INTRODUCTION

Injured patients present unique challenges for hospitals and trauma teams. They are often unannounced and arrive at the emergency department (ED) where trauma teams may not be readily standing-by or specialty providers immediately available. It's vital that hospital trauma programs have a robust continuous quality improvement (QI) process that is capable of continuously monitoring for situations that result in care-related events. Trauma programs must also have procedures in place to continuously measure, evaluate, and improve the care provided with the goal of reducing variations and preventing adverse events. The material in this guideline will expand upon the trauma QI process and the Washington Administrative Code (WAC) [246-976-700](#) which outlines the QI expectations for designated trauma services in Washington state. This guideline and the appendix documents (toolkit) are available on the [DOH webpage](#) in their original format and can be used to support the facility QI program.

# CONTINUOUS QUALITY IMPROVEMENT

Continuous quality improvement (CQI) according to the American College of Surgeons Committee on Trauma (ACS-COT), ensures there is constant surveillance for quality events with established processes in place for monitoring, evaluating, and improving. In more detail, the Washington Trauma CQI model in Figure 1. highlights this continuous process which begins with a means of recognition to identify care events through surveillance and data collection. Following recognition, an assessment of the care provided, and an analysis of data must be performed. This is commonly referred to as levels of review. When care events are identified, a correction must be made. The correction must include the development of an action plan which may include instruction, education, mentoring, policy development, etc. Lastly, following the continuous circle, an evaluation must occur to determine if the action plan was successful and the identified event was resolved. If the event remains unresolved, the CQI process continues with a reiteration of the data analyses and a review or change of the action plan. The process is repeated until the event is resolved and resolution occurs. Resolution is often referred to as loop-closure. The outcome of the CQI process helps reduce unnecessary variation and prevents adverse events with the goal of providing safe and effective care for injured patients. A more detailed model of the Washington Trauma CQI process is in [Appendix A](#). The process and how it is implemented must be described in detail in the facility's Trauma QI Plan. Each designated trauma service is required to have a Trauma QI plan which is further defined in the following paragraphs.

---

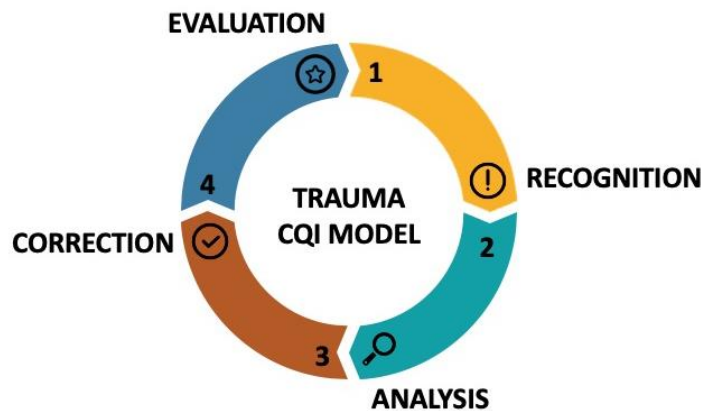
The outcome of the CQI process helps reduce unnecessary variation and prevents adverse events with the goal of providing safe and effective care for injured patients.

---

Figure 1.

## Washington Trauma Continuous Quality Improvement Process Monitoring • Evaluating • Improving

**Goal — Safe, effective care for injured patients through Continuous Quality Improvement (CQI) to reduce unnecessary variation in the process and prevent adverse events**



## TRAUMA QI PLAN

The Trauma QI Plan establishes direction and provides structure to the QI process. Each designated trauma service must have a trauma QI plan which outlines all the steps in the CQI process and meets the standards described in WAC 246-976-700(4). The plan must include:

- A process to monitor and track compliance with trauma care standards using audit filters and benchmarks
- A process to evaluate the care provided to trauma patients and to resolve identified prehospital, physician, nursing, or system issues (events).
- A process in which outcome measures are documented within the trauma QI program's written plan which must be reviewed and updated at least annually. Outcome measures must include (mortality, trauma surgeon response time, under-triage rate, ED length of stay greater than three hours for patients transferred out, missed injuries, and complications).
- A process for correcting problems and deficiencies.
- A process for problem resolution, outcome improvements, and assurance of safety. This process must be readily identifiable through methods of monitoring, reevaluation, benchmarking, and documentation.
- A process to continuously evaluate compliance with full and modified (if used) trauma team activation criteria.
- A process to have assurances from other hospital quality improvement committees, including peer review if conducted separately from the multidisciplinary trauma service committee, that resolution was achieved on trauma-related issues (events).
- A process to ensure the confidentiality of patient and provider information
- A process to communicate with and provide feedback to referring trauma services and trauma care providers.

The QI plan should be reviewed annually and approved by the Multidisciplinary Quality Improvement Committee (MTQIC). The following topics expand upon the CQI process and should be clearly defined in the QI plan. [Appendix B](#) includes an example QI plan.

## RECOGNITION

The plan must identify a reliable method of data collection that consistently obtains information in reports to help identify opportunities for improvement. Reliable methods for data collection will include the trauma registry, audit filters, performance measures, electronic medical record, and other informational systems in the hospital. The data must be current, valid, and reliable to effectively identify care events and trends.

The recognition of system and individual patient care events is a vital initial step in the CQI process. Identifying events is a responsibility of all trauma program members including the trauma program manager (TPM), trauma medical director (TMD), committee members, as well as other hospital staff. Event identification can be accomplished using audit filters, outcome/performance measures, trauma registry reports, and chart reviews. Consistent event identification can be very challenging. The use of a chart audit tool has been used with success in many trauma programs. [Appendix C](#) includes an example chart audit tool. This tool can be customized to fit the trauma program needs.

---

The recognition of system and individual patient care events is a vital initial step in the CQI process.

---

### Audit Filters

Audit filters have long been a unique component of trauma programs and provide an opportunity to alert the trauma team of a potential event and the need to review the patient's care more closely (medical record review). Monitoring the number of audit filter triggers also allows for trending and the identification of system related events. Audit filters should be developed by the TPM, TMD and MTQIC which is ultimately the approving authority. They should be reviewed annually and published in the trauma QI plan. Audit filter results should be presented to the MTQIC regularly.

Audit filters should be chosen based on program needs and be reflective of the standards of care. They should facilitate event identification and program evaluation. Audit filters are divided into two categories, non-discretionary (required) and discretionary (need-based). Nondiscretionary audit filters support the requirements in the trauma service standards WAC 246-976-700 and the trauma re-designation application. Discretionary audit filters are chosen by the facility based on trauma program needs. A list of common audit filters can be found in [Appendix D](#).

Included with each audit filter should be a short definition (bullet point or a single sentence) which will help ensure consistence of event identification and data collection especially if there is frequent turn-over in the TPM position or if multiple personnel are abstracting data for the audit filters (i.e., trauma coordinators and registrars). An example of the short definitions can be found in the example audit filter summary in [Appendix E](#).

An audit filter summary must be maintained to demonstrate the frequency of audit filter occurrences. The summary serves as an excellent tool to present updates to the MTQIC and is required in the re-designation application. The summary helps demonstrate which audit filters the facility is using and includes numerical values. The numerical values in the summary demonstrate the frequency of audit filter occurrences and aids in program evaluation. The example audit filter summary in [Appendix E](#) demonstrates the general idea with numerical values for each month of the year.

## Quality Measures

Quality measures include both outcome and performance measures. They help evaluate the trauma care provided against a measurable goal. Measures are also divided into two categories nondiscretionary and discretionary. Several nondiscretionary measures are required in accordance with WAC 246-976-700(4)(i):

- Mortality (with and without opportunities for improvement)
- Trauma surgeon response time (level I-III)
- Undertriage rate
- Emergency department length of stay greater than three hours for patients transferred
- Missed injuries
- Complications (hospital events)

These nondiscretionary measures should be implemented and monitored by each designed facility where they apply.

Discretionary quality measures are not required but are vital to the evaluation of the facility's trauma program. Discretionary measures should be based on identified areas of needed improvement, standardized care compliance, or to support the use of specific care guidelines.

Trauma programs must continually monitor quality measures and routinely present them to the MTQIC for review. Underperforming measures should be incorporated into the QI process with action plan development, evaluation, and loop-closure. An example quality measure report can be found in [Appendix F](#). The goals used in the example are based on national recommendations from the ACS-COT, state technical advisory committees, and WAC 246-976-700. Trauma programs should develop quality measures and their associated goals and benchmarks based on facility needs, research, and national and state recommendations. When there are no goal recommendations, the program should use the MTQIC and clinical expertise for guidance. It may be necessary to establish an initial goal and then revise the goal over time as the data develops and analysis occurs.



# ANALYSIS

## Levels of Review

Once an event has been identified, an analysis and determination must be done. This process is commonly referred to as the levels of review. According to the ACS-COT, the review process should have the intent to systematically review mortalities, significant complications, and process variances associated with unanticipated outcomes and determine opportunities for improvement. The process should include a review of the appropriateness and timeliness of care and opportunities for improvement (for example, errors in judgment, technique, treatment, or communication, along with delays in assessment, diagnosis, technique, or treatment) should be determined and documented.

---

Once an event has been identified, an analysis and determination must be done.

---

### The review process is comprised of four levels:

**Primary level review** – conducted by the TPM (may be delegated in some cases) on all identified patient records. This level of review verifies and validates the event and makes a determination as either (1) care appropriate or (2) needs further review. Events may be referred to higher levels of review or immediate feedback may be provided, and resolution may occur. The review process must be clearly documented.

**Secondary level review** – conducted by the TMD on all patient records either initially or as a referral from the TPM or other trauma team members. It should include a review of the medical record and any other pertinent information. Upon completion of this level of review the determination is made as either (1) care appropriate or (2) needs further review. If immediate feedback and resolution are possible, the event may be resolved. If not, it should be referred to the trauma multidisciplinary committee (tertiary level of review) and/or the peer review committee.

**Tertiary level of review** – conducted by the multidisciplinary trauma QI committee following the primary and secondary reviews. Referrals to the peer review committee are also considered a tertiary level of review. The goals of tertiary review are to evaluate the efficacy, efficiency, and safety of the care provided, provide focused education, and peer review. This case-based learning activity is critical to individual educational programs for all providers involved. The committee should make a determination on all reviewed cases. The determination should not be judgmental but more so to serve as a process for growth and development (individually, for departments, and systems). The example below provides a commonly used rate-based nomenclature for documenting and monitoring determinations from the committee.

Rating 1: routine/acceptable care management

Rating 2: acceptable management/majority of standard of care met

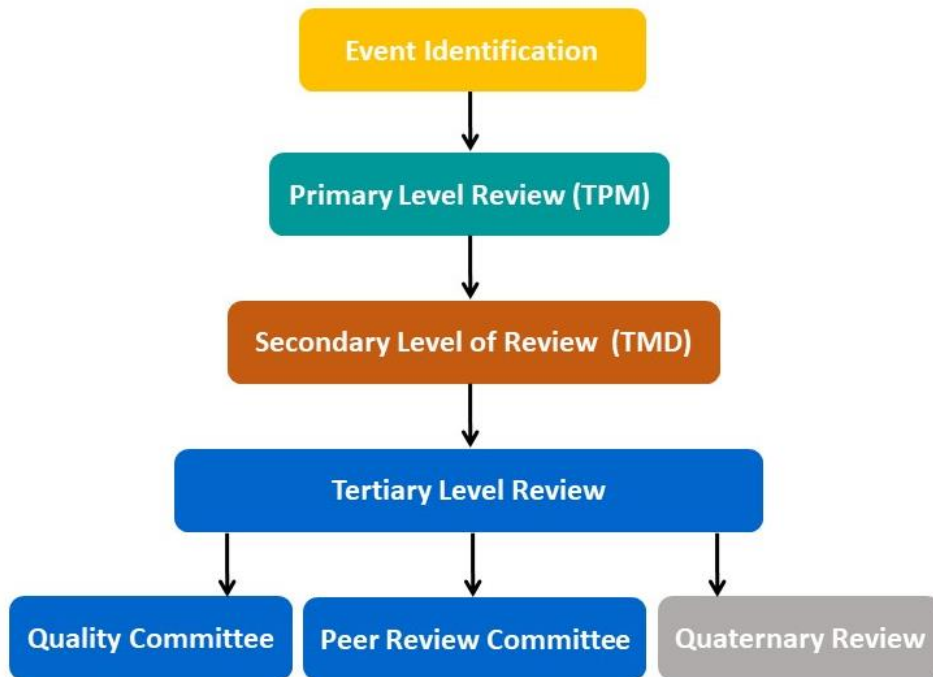
Rating 3: questionable management/opportunity for improvement

Rating 4: unacceptable management/not consistent with standards of care

**Quaternary level of review** – conducted by an external provider, organization, or regional QI committee. This level of review is not common and usually only occurs in specific circumstances. If the event involves multiple ambulance services or hospitals, it would be appropriate to present the case at the regional QI meeting as a quaternary level of review.

A flow diagram of the review process can be found in Figure 2 and in more detail in [Appendix G](#).

Figure 2. Levels of Review



## Chart Audit Tool

One of the most challenging aspects of the primary level of review is reviewing patient care records and consistently identifying events especially when they are subtle. To help ensure consistency and accuracy, a chart audit tool should be used. The chart audit tool will help guide the reviewer to ensure the most important components of the medical record are consistently reviewed and any specialty items verified. The example chart audit tool in [Appendix C](#) can be edited and customized to facilitate the review process for a specific facility.

The review process and any determinations must be documented in detail in QI related software, trauma registry, or in internal templates. If the review occurred in the MTQIC or peer review committee the meeting minutes must reflect the discussion and determinations. Detailed documentation will help facilitate a successful QI process. If a site review is part of the facility designation, the surveyors will use this documentation to help evaluate the QI process.

## CORRECTION (ACTION PLAN DEVELOPMENT)

After an event has been identified, discussed, and a determination has been made it must be corrected to ensure no future patients are impacted. The correction is often referred to as an action plan. Action plans are interventions which are intended to fix the problem. How action plans are developed should be described in the QI plan. Generally, action plans can be developed at any stage in the review process where the event can be resolved. This may include simple provider, nursing or ancillary staff issues identified in the primary or secondary levels of review where the TPM and/or the TMD identifies the event, does an analysis, makes a determination, and then develops the action plan. Larger more complex system events will require a broader multidisciplinary approach to the action plan development. These action plans are best developed in the MTQIC or peer review committees.

---

Action plans should be developed with consideration given to the acronym SMART (specific, measurable, attainable, realistic, and timely).

---

Action plans should be developed with consideration given to the acronym SMART (specific, measurable, attainable, realistic, and timely). They must be described in specific detail (who, what, where, and when). Including specifics will facilitate follow-up and overall success of the action plan. Action plan items should be assigned to a specific person who will help lead and implement the action. Making this assignment helps ensure overall success. Making the action plan measurable will help assess if the intervention was successful. Measurable action plans have a goal and a timeframe (i.e., Jim will train all ER nurses on the new trauma flow sheet by January 1, 2021). Action plans must be attainable and realistic based on the resources available. Action plans that exceed the resources of the hospital should be avoided. Lastly, action plans must be completed in a timely manner to ensure future trauma patients are not impacted by the same event. Example corrective actions may include guideline or policy development, education, counseling, peer review, external consultation, professional practice evaluation, change in provider privileges, and enhancing resources. Examples action plans are in [Appendix H](#).

## EVALUATION

The evaluation portion of the QI process evaluates the success of the action plan and determines if the event is still occurring. The evaluation portion should be measurable if possible. Similar to the action plan, the evaluation is measurable when it includes a goal and timeframe (i.e., The undertriage rate will be less than 5% by January 1, 2021). When the evaluation is measurable, it helps determine if the action plan was successful and the event was resolved. Develop and use measures as part of the evaluation whenever possible. Occasionally, the evaluation occurs but the intended measure or goal is not met. When this occurs, a decision must be made to either adjust the action plan, change the goal, or increase the time frame. The entire evaluation process and any decisions or changes made must be documented in detail to demonstrate the QI process and facilitate follow-up.

---

When the evaluation is measurable, it helps determine if the action plan was successful and the event was resolved.

---

The term “loop closure” has long been used within trauma programs to describe event resolution. It refers to the final stage of the QI process after the evaluation has determined the action plan was successful. It usually occurs weeks to months after the evaluation and involves a second look at patient care and outcomes to ensure the event has not reoccurred. Consider loop closure as a final check before the event can be considered resolved. The date loop closure is determined must be documented.

## DOCUMENTING THE QI PROCESS

The entire QI process must be clearly documented and saved in a way that makes it available for others to access in the future. The documentation details must include all the steps in the CQI process as noted in Appendix A. It must include, in detail, the recognition process (i.e., audit filter, case review), analysis (levels of review), action plan specifics, and the evaluation and whether there was resolution of the event. The best approach is to save the information in a secured share folder or drive and not on a single computer. The following are commonly used approaches to QI documentation.

The trauma registry software (Collector V5) is the recommended choice for documenting the QI process. Using the registry software ensures the information is saved and available with the patient's registry record in a secure location. It allows for the documentation from multiple levels of review and follows a standard taxonomy. Documenting following the taxonomy can be very helpful with event identification as it allows for trend analysis. Each event can be categorized based on the cause. As an example, contributing factors can be documented in the module in categories (i.e., provider, system, mortality) and then further subcategorized as causes (i.e., error in management, communication, documentation etc.). Documenting using these categories can help demonstrate areas of needed improvement where QI efforts should be directed. In addition, it includes a Notes Tab where larger amounts of text can be placed. There is also a report writing feature which allows for customized reports and the ability to analyze the data and view open events. The QI Tracking Instructions in [Appendix I](#) includes detailed information regarding each component of the module and will be helpful to review prior to implementation.

An alternative approach to documenting the QI process is in templates using external software such as Microsoft Word or Excel. System related events are generally more complex and may involve multiple patients or multiple hospital services areas. It is common to see these types of events documented externally. The analysis, action plan development, and evaluation processes are often done in the MTQIC and peer-review meetings. For this reason, it's also important to document clearly the QI discussions in the meeting minutes. The meeting minutes should be retained along with the other QI documents pertaining to the specific event in a shared-drive or folder and not a single computer hard-drive or personal folder that can be easily removed or deleted. An example QI documentation template is in [Appendix J](#).

## COMMITTEES AND PEER REVIEW

The MTQIC is the cornerstone of the facility trauma QI process. The trauma medical director (TMD) serves as the chair of the committee and is supported by the trauma program manager and trauma registry staff. The committee must have membership representation and participation from all services that are reflected in the hospital's trauma scope of care. All services provided to trauma patients must be represented on the committee. The committee meeting frequency is quarterly at a minimum. It may be necessary to meet more frequently based on trauma volume and performance related events. Committee representation, attendance standards, roles and responsibilities, and other meeting related processes must be described in the QI plan.

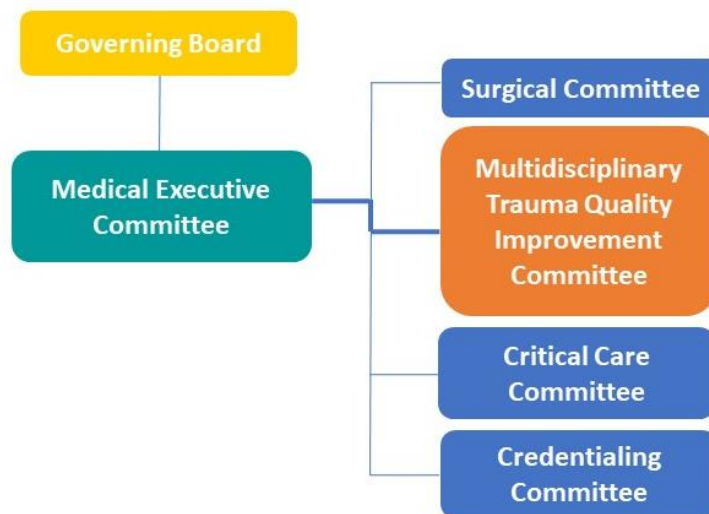
The MTQIC meeting attendance minimum standard is 50 percent. This means that all members defined in the QI plan must attend at least 50 percent of the meetings. Meeting attendance records should be evaluated regularly for compliance and shared within the meeting as a performance measure. Verification of meeting attendance is required to be submitted during the trauma designation process. An example of a meeting attendance record is in [Appendix K](#).

The MTQIC must interface with all prehospital agencies that transport patients to the hospital. Prehospital agencies should be invited to MTQIC meetings when patient events are discussed which include a prehospital component. The trauma program should support prehospital QI efforts whenever possible.

The MTQIC serves many roles but the most important role is that of the tertiary level of review with the goal of reviewing efficacy, efficiency, and safety of the care provided, provide focused education, provide peer review, and in some cases action plan develop and evaluation.

The trauma program and QI efforts transcends many services lines and departments within the organization. For that reason, the hospital must have an organizational structure that facilitates the CQI process with the MTQIC having a direct reporting relationship to the hospital's administrative team and medical executive committee that ensures adequate evaluation of all aspects of trauma care. Figure 3. demonstrates this relationship.

Figure 3. MTQIC Reporting Relationship



## UNDERTRIAGE

Trauma team activations occur based on the patient's condition and mechanism of injury in comparison to the facility's trauma team activation criteria. The criteria establish when, and under which conditions, the team will be activated. Trauma team activations occur as either modified or full with specific criteria for each. When patients meet any of the facility's trauma team activation criteria, but the team is not activated, undertriage occurs. [The State Trauma Team Activation Guideline](#) provides an example of the criteria items for both modified and full activations. Facilities designated as Levels I-IV with surgical services available, must have criteria for both full and modified activations. Levels IV or V with no surgical services for trauma patients may find it easier to have a single trauma team activation criteria, combining both the full and modified criteria items. Levels IV and V generally do not have surgical services for trauma patients and should document trauma activations in the trauma registry as a modified activation.

The core concept of the trauma program is readiness and response to injury events. Ensuring the immediate availability of trauma resources and preventing undertriage is the cornerstone of the trauma program. For that reason, there must be constant monitoring for undertriaged patients and including the undertriage rate as a performance measure. According to the ACS-COT, the recommended undertriage rate should not exceed five percent. The most accurate undertriage rate measurement is calculated manually, based on a review of the patient's medical record in comparison to the facility's trauma team activation criteria. Alternatively, there are other methods to calculate the undertriage rate based on the injury severity score (Cribari or Matrix Method). This method is quick and simple, but it can be inaccurate when used this way. Another recent approach to determining undertriage stems from research conducted by Roden-Foreman et. al. (2017) where they predict the Need for Trauma Intervention (NFTI) based on resource utilization. This method is gaining popularity and can be calculated based on trauma registry data. [Appendix L](#) further explains these methods and demonstrates example undertriage calculations.

When undertriage rates are high, above the recommended five percent, or individual patients are undertriaged, a review of the medical record(s) should occur for a root cause analysis. The review will help determine the cause and facilitate action plan development. The action plan may include prehospital/nurse/provider education or a review of the actual criteria for accuracy. All undertriaged patients should receive this initial primary review by the TPM.

## RESOURCES

- [American College of Surgeons Committee on Trauma Resources for the Optimal Care of the Injured Patient Manual](#)
- [American College of Surgeons Trauma Quality Improvement Program TQIP Best Practice Guidelines](#)
- [Trauma Outcomes Performance Improvement Course Information](#)
- [Washington State Department of Health Trauma Acute Care Guidelines](#)
- [Washington State Department of Health Trauma System Webpage](#)



## REFERENCES

- American College of Surgeons Committee on Trauma. Resources for Optimal Care of the Injured Patient, 2014 (6<sup>th</sup> edition). Chicago: American College of Surgeons, 2014.
- Eastes, L. E. (2011). Effective Loop Closure: Tips for the Trauma Program Manager. *Journal of Trauma Nursing*, 18(1), 29–33. <https://doi.org/10.1097/JTN.0b013e31820e3ec3>
- Juillard, C. J., Mock, C., Goosen, J., Joshipura, M., & Civil, I. (2009). Establishing the evidence base for trauma quality improvement: a collaborative WHO-IATSIC review. *World journal of surgery*, 33(5), 1075–1086. <https://doi.org/10.1007/s00268-009-9959-8>
- Overlake Medical Center. (2019). Plan-Do-Study-Act Trauma Case Summary. Renton, WA.
- Pidgeon, K. (2015). The Genesis of a Trauma Performance Improvement Plan. *Journal of Trauma Nursing*, 22(6), 315–320. <https://doi.org/10.1097/JTN.0000000000000166>
- Providence Sacred Heart Medical Center (2020). QA Tacking Instructions. Spokane, WA.
- Providence St. Peter Hospital. (2019). Trauma Quality Improvement Plan. Olympia, WA.
- Roden-Foreman, J. W., Rapier, N. R., Yelverton, L., & Foreman, M. L. (2017). Asking a Better Question: Development and Evaluation of the Need For Trauma Intervention (NFTI) Metric as a Novel Indicator of Major Trauma. *Journal of trauma nursing: the official journal of the Society of Trauma Nurses*, 24(3), 150–157. <https://doi.org/10.1097/JTN.0000000000000283>
- Society of Trauma Nurses. Trauma Outcomes Performance Improvement Course Manual, 2017 (2017 edition). Lexington, KY.
- Vioque, S. M., Kim, P. K., McMaster, J., Gallagher, J., Allen, S. R., Holena, D. N., Reilly, P. M., & Pascual, J. L. (2014). Classifying errors in preventable and potentially preventable trauma deaths: a 9-year review using the Joint Commission's standardized methodology. *American journal of surgery*, 208(2), 187–194. <https://doi.org/10.1016/j.amjsurg.2014.02.006>

## CONTRIBUTORS

Becky Stermer, MA, BSN, RN, CPGQ, TCRN, Trauma Program Manager, Peacehealth St. Joseph Medical Center, Bellingham, WA

Beki Hammons, RN, BSN, TCRN, Trauma Program Manager, Kadlec Regional Medical Center, Richland, WA

Cody Staub, RN, CEN, Trauma Program Manager, Kittitas Valley Healthcare, Ellensburg, WA

Denise McCurdy, RN, BSN, CEN, CLNC, Regional Nurse Manager Trauma Services Providence Sacred Heart Medical Center, Spokane, WA

Karen Kettner, MSN, RN, CEN, TCRN, Trauma Program Manager, Overlake Medical Center, Renton, WA

Leah Salmon-Conroy, RN, BSN, Trauma Program Manager, Deaconess Hospital, Spokane, WA

Mark Taylor, RN, Trauma Program Manager, Harborview Medical Center, Seattle, WA

Martin Cozart, RN, BSN, Trauma Program Manager Providence Centralia Hospital, Centralia, WA

Mike Glenn, RN, Manager, Trauma & Surgical Quality Improvement, Harborview Medical Center, Seattle, WA

Tony Bledsoe, MHPA, Trauma Designation Program Administrator, Washington State Department of Health, Tumwater, WA

Traci Stockwell, BSN, RN, Trauma Program Manager, Multicare Auburn Medical Center, Auburn, WA

Tyler Dalton Tyler Dalton, RN, CEN, Trauma Coordinator, Skagit Valley Hospital, Mount Vernon, WA

Wendy Rife, BSN, RN, CEN, SWR Trauma Program Manager, Providence St. Peter Hospital, Olympia, WA

## EDITED BY

Tim Orcutt, MSN, RN, Nurse Advisor, Washington State Department of Health, Tumwater, WA

Washington State Emergency Medical Services and Trauma Steering Committee, Hospital Technical Advisory Committee

## APPENDICES

[Appendix A – WA Trauma CQI Model](#)

[Appendix B – Quality Improvement Plan Example](#)

[Appendix C – Chart Audit Tool](#)

[Appendix D – Audit Filter Examples](#)

[Appendix E – Audit Filter Summary](#)

[Appendix F – Outcome Measure Examples](#)

[Appendix G – Levels of Review Flow Algorithm](#)

[Appendix H – Action Plan Examples](#)

[Appendix I – QI Tracking Module Instructions](#)

[Appendix J – QI Summary Template](#)

[Appendix K – MTQIC Meeting Attendance Record](#)

[Appendix L – Undertriage Calculation Methods](#)

[Appendix M – PDSA QI Example](#)

[Appendix N – Quality Improvement Case Summary Example](#)