Preventing Wrong-Site Surgery Through Implementation of Evidenced-Based Best Practices

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Objectives

• Recognize that wrong-site surgery events continue to be a threat to patient safety
• Describe how the Patient Safety Authority identifies wrong-site surgery events
• Identify the factors that contribute to wrong-site surgery events
• Describe some evidence-based best practices that prevent wrong-site surgery
• Explain how implementation and compliance of best practices can eliminate wrong-site surgery events
A Threat to Patient Safety

• Joint Commission - Sentinel Event

• National Quality Forum - “Serious Preventable Events”

• Centers for Medicare & Medicaid Services - Non-Coverage Determination

• World Health Organization Patient Safety Alliance - Patient Safety Goal
Approximately one wrong-site surgery is reported each week in Pennsylvania.
Pennsylvania Patient Safety Authority Wrong-Site Surgery Reports by Academic Year n=731

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Top Three Wrong-Site Events in Pennsylvania (n=731)

Note: Data reflects events reported from June 2004 through December 2016

- **Anesthetic blocks**: 191 - 26%
- **Wrong-Level Spinal Procedures**: 95 - 13%
- **Pain Management Procedures**: 85 - 12%

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Frequency of WSS Events in ASFs

• About 30% of all WSS events reported to the Authority between July 2005 through June 2016 were reported by Pennsylvania ambulatory surgical facilities.
  – About 17 events reported annually
  • 1.4 events reported monthly
Number of ASF WSS Events Reported through PA-PSRS by Academic Year
Percentage of Overall WSS Events Reported by ASFs
WSS Events Reported 2010-2016

- **59% - Wrong-Side Procedures**
  - Blocks by anesthesiologists and surgeons
  - Pain management injections
  - Eye procedures

- **32% - Wrong-Site Procedures**
  - Excisions/biopsies
  - Pain injections
  - Hand procedures
    - (i.e., incisions)
  - Spinal level procedures

- **9% - Wrong Procedures**
  - Tonsillectomy
  - Hand procedures
    - (e.g., Carpal tunnel release)

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What is Wrong-Site Surgery?

Wrong body part
Wrong side
Wrong patient
Wrong procedure

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Definition

Procedure begins when:

• tissue punctured
• incision made
• instrument inserted into a tissue cavity or organ

Wrong-site surgery also occurs if a procedure begins at the wrong site and is then corrected
Definition Includes

Procedures in the operating room area

- Area where preoperative anesthetic blocks given
- Area where postoperative pain management anesthetic blocks given
Definition Excludes

Insertion of incorrect implants (e.g., left/right)

- it must be the correct type of implant

Incorrect interpretation of anatomical structures when verification by radiography is not tenable

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Common Contributing Factors

Inaccurate information

- Schedule, consent, history and physical, diagnostic report(s)/image(s)

No verification of documents or site marking

Local anesthesia given without conducting a time-out

Patient positioning conceals surgical mark

Proper time-out not completed
Causes of Wrong-Site Surgery

Acting on the basis of misinformation

What prevents it?

*Redundant verification of all information*

Having a misperception of the patient’s situation.

What prevents it?

*Referencing an accurate and visible site marking*
Implementing Best Practices

Preoperative verification and reconciliation

Site marking

Time-out

Intraoperative verification for ureteral stents, ribs and vertebrae
Preoperative Verification

Verification of all relevant documents (schedule, history and physical, and consent)

Include the site/side on the schedule

Require two identifiers in the active voice

Obtain separate verification by nurse and surgeon

Ensure all documents are available in the OR
OR schedule lists operation as **right** knee arthroscopy. OR consent and H&P [history and physical] state **left** knee arthroscopy. Patient identified left knee as site of surgery. The left knee was marked. Time-out documentation indicated left knee as site of surgery. Arthroscopy performed on the right knee.
Incorrect paperwork [identified] in pre-op during the verification process. Pre-op physician orders state [right shoulder surgery]. Patient is scheduled to have [right knee meniscectomy]. Call placed to preadmission testing to have paperwork corrected prior to surgery.
Site Marking

Represents the patient’s voice
Agrees with patient and all information
  • schedule, consent, history & physical

Is a standardized site marked with the provider’s initials

Is referenced before anesthesia block

Is visible in prepped and draped field

Is confirmed by intraoperative imaging
  • Vertebrae, ribs, or ureters
The patient consented to the removal of a *left heel bone spur* and a *right bunionectomy*. He had identical pathologies in both feet. The patient was identified, the time-out was done, and the surgical sites were marked appropriately with the patient supine. The patient was turned prone, removing the site markings from the visual field, and the procedures were performed in the reverse.
Patient consented for repair of right inguinal hernia. The Universal Protocol was completed for the right side. The time-out was completed for the right. . . . The patient was marked preoperatively by the surgeon, but the marking was not visible after draping was completed. The surgery proceeded as usual until the surgeon asked for a left-side mesh. At that time, it was noted they were doing a left inguinal hernia.
Confirmation Bias

• Patient was placed in pre-op holding area for placement of right femoral nerve block before right ankle surgery. Equipment was brought into the holding area and happened to be placed in an orientation consistent with performing a left femoral nerve block (ultrasound on patient’s right side). Anesthesiologist was standing on patient’s left side when time-out was performed with CRNA. CRNA left to obtain sedation while anesthesiologist drew up medications necessary for block on counter behind patient. After drawing up drugs, anesthesiologist proceeded to prep and drape the wrong side. Block was performed without incident. Following completion of block, the patient’s covers (which were covering from thigh down) were pulled back to assess adequacy of block when surgical signature was noted on the contralateral ankle.
Time-out

Stop all activity
Do a separate time-out for regional and local anesthetics
Do a time-out after patient is prepped and draped
Demonstrate site mark during time-out
Engage and empower OR team to “speak-up”
Use intraoperative imaging
The anesthesia provider identified the patient, introduced herself, did the H&P [history and physical], then went over the anesthetic plan with the patient: a block with IV [intravenous] sedation. The provider obtained the patient’s consent and asked what side was to have surgery. The **patient said—and pointed to—his right shoulder.** The provider then prepared to place the IV. . . . The provider asked again what side was having surgery. The **patient said right.** The provider then [went somewhere] to gather the ultrasound and the items needed to place the block. When she returned, the patient’s **left shoulder was out of the gown and his right shoulder was in the gown.** The provider **proceeded to prep the left shoulder** while discussing how the block worked with the patient’s companion. At that point, the provider’s supervisor arrived. The provider **put her gloves on and proceeded to block the wrong shoulder.**
A [patient] was admitted for right knee arthroscopy. Patient properly identified; site properly marked; and patient brought to OR. Physician elevated the left leg for the procedure. Nurse prepped and draped the knee. During the timeout, no one recognized that the wrong leg had been prepared. The procedure was performed on the incorrect leg.
Scheduled for release of trigger finger; consent indicated same; site marked by surgeon; . . . during prep, site mark washed off with alcohol; MD proceeded to do a carpal tunnel, then realized he was to do trigger finger; MD told staff he was thinking about a patient he had done previous day; MD said the time-out was done.
Surgery was scheduled and consent obtained for repair of a right hip fracture. The patient marked the site, and team verification “pause” occurred. However, the patient was positioned with the left hip draped and prepped, and the surgery proceeded. After the incision, the error was realized. The incision was sutured and the patient repositioned, and surgery resumed on the right hip.
Intraoperative Verification

North American Spine Society Recommendations:

• Identify spine or rib with immobile marker

• Verify location by imaging studies

• Ensure official real-time reading by surgeon and radiologist
An intraoperative fluoroscopy was used to localize the incision over C5-6. Fluoroscopy revealed that needle was at C4-5, so dissection was carried further distally to the presumed C5-6 level. The procedure was completed. However, a follow-up x-ray revealed that the site was C6-7.
Nothing is Absolute

Asking the patient or surgeon may not always prevent a wrong-side error.

Marking the patient may not always prevent a wrong-side error.

Doing a time-out may not always prevent a wrong-side error.
The surgeon marked the patient’s surgical site in the preoperative area immediately after checking the patient’s history and physical, the operative consent, and confirming with the patient. The patient then called the nurse over to the bedside and stated “she marked the wrong side.”
Collaborations

Southeastern Pennsylvania (2008)
- 30 facilities participated
- 73% reduction in reported WSS events

Elsewhere in Pennsylvania (2010-2012)
- 19 facilities participated
- No WSS events in any operating room for one year

PA-Hospital Engagement Network
- 2011 -2014
- 26 hospital and 2 ambulatory surgical centers participated

PA Society of Anesthesiologists
- Ongoing

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Evidence-Based Principles

Principles for Reliable Performance of Correct-Site Surgery

The following principles for reliable performance of correct-site surgery, identified by the Pennsylvania Patient Safety Authority during its Preventing Wrong-Site Surgery Project, should be consistently followed:

1. The correct site of the operation should be specified when the procedure is scheduled.
2. The correct operation and site should be noted on the record of the history and physical examination.
3. The correct operation and site should be specified on the informed consent.
4. Anyone reviewing the schedule, consent, history and physical examination, or reports documenting the diagnosis, should check for discrepancies among all these parts of the patient’s record and reconcile any discrepancies with the surgeon when noted.
5. The surgeon should have supporting information uniquely found in the office records at the surgical facility on the day of surgery.
6. All information that should be used to support the correct patient, operation, and site, including the patient’s or family’s verbal understanding, should be verified by the nurse, anesthesia provider, and surgeon before the patient enters the operating room (OR).
7. All verbal verification should be done using questions that require an active response of specific information, rather than a passive agreement.
8. Patient identification should always require two unique patient identifiers.
9. Any discrepancies in the information should be resolved by the surgeon, based on primary sources of information, before the patient enters the OR.
10. The site should be marked by a healthcare professional familiar with the facility’s marking policy, with the accuracy confirmed both by all the relevant information and by an alert patient or parent surrogate if the patient is a minor or mentally incapacitated.
11. The site should be marked by the provider’s initials.
12. All information that should be used to support the correct patient, operation, and site, including the patient’s or family’s verbal understanding, should be verified by the surgical team upon entering the patient in the OR.
13. Separate time-outs should be done for procedures, including anesthetic blocks, with the person performing that procedure.
14. All nonsterile personnel should stop during the time-out.
15. The site mark should be visible and accessible in the prepared and draped field during the time-out.
16. Verification of information during the time-out should require an active communication of specific information, rather than a passive agreement, and verified against the relevant documents.
17. All members of the operating team should verbally verify that their understanding matches the information in the relevant documents.
18. The surgeon should specifically encourage operating team members to speak up if concerned during the time-out.
19. Operating team members who have concerns should not agree to the information given in the time-out if their concerns have not been addressed.
20. Any concerns should be resolved by the surgeon, based on primary sources of information, to the satisfaction of all members of the operating team before proceeding.
21. Verification of spinal level, I.D. registration level, or other to be sterilized should require radiological confirmation, using a stable marker and readings by both a radiologist and the surgeon.

Revised December 2011

More information is available online at http://www.patientsafetyauthority.org.


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http://www.patientsafetyauthority.org/EducationalTools/PatientSafetyTools/PWSS/Pages/principles.aspx
# Evidence-Based Principles

<table>
<thead>
<tr>
<th>Evidence-based Principle</th>
<th>Possible Percentage for WSS Prevention</th>
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<tbody>
<tr>
<td>1. The correct site of the operation should be specified when the procedure is scheduled.</td>
<td>37%</td>
</tr>
<tr>
<td>2. The correct operation and site should be noted on the record of the history and physical examination.</td>
<td>45%</td>
</tr>
<tr>
<td>3. The correct operation and site should be specified on the informed consent.</td>
<td>35%</td>
</tr>
<tr>
<td>4. Anyone reviewing the schedule, consent, history and physical examination, or reports documenting the diagnosis, should check for discrepancies among all those parts of the patient’s record and reconcile any discrepancies with the surgeon when noted.</td>
<td>2%</td>
</tr>
<tr>
<td>5. The surgeon should bring copies of supporting information uniquely found in the office records to the surgical facility the day of surgery.</td>
<td>10%</td>
</tr>
<tr>
<td>6. All information that should be used to support the correct patient, operation, and site, including the patient’s or family’s verbal understanding, should be verified by the nurse and surgeon before the patient enters the operating room.</td>
<td>72%</td>
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<td>7. All verbal verification should be done using questions that require an active response of specific information, rather than a passive agreement.</td>
<td>2%</td>
</tr>
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<td>8. Patient identification should always require two unique patient identifiers.</td>
<td>1%</td>
</tr>
<tr>
<td>9. Any discrepancies in the information should be resolved by the surgeon, based on primary sources of information, before the patient enters the OR.</td>
<td>6%</td>
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<tr>
<td>10. The site should be marked by a healthcare professional familiar with the facility’s marking policy, with the accuracy confirmed both by all the relevant information and by an alert patient, or patient surrogate if the patient is a minor or mentally incapacitated.</td>
<td>58%</td>
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<td>11. The site should be marked by the provider’s initials.</td>
<td>55%</td>
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<td>12. All information that should be used to support the correct patient, operation, and site, including the patient’s or family’s verbal understanding, should be verified by the circulating nurse upon taking the patient to the OR.</td>
<td>66%</td>
</tr>
<tr>
<td>13. Separate formal time-outs should be done for separate procedures, including anesthetic blocks, with the person performing that procedure.</td>
<td>40%</td>
</tr>
<tr>
<td>14. All non-critical activities should stop during the time out.</td>
<td>65%</td>
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<tr>
<td>15. The site mark should be visible and referenced in the prepped and draped field during the time-out.</td>
<td>70%</td>
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<tr>
<td>16. Verification of information during the time-out should require an active communication of specific information, rather than a passive agreement, and be verified against the relevant documents.</td>
<td>26%</td>
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<td>17. All members of the operating team should verbally verify that their understanding matches the information in the relevant documents.</td>
<td>72%</td>
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<tr>
<td>18. The surgeon should specifically encourage operating team members to speak up if concerned during the time-out.</td>
<td>40%</td>
</tr>
<tr>
<td>19. Operating team members who have concerns should not agree to the information given in the time-out if their concerns have not been addressed.</td>
<td>65%</td>
</tr>
<tr>
<td>20. Any concerns should be resolved by the surgeon, based on primary sources of information, to the satisfaction of all members of the operating team before proceeding.</td>
<td>70%</td>
</tr>
<tr>
<td>21. Verification of spinal level, rib resection level, or ureter stented should require radiological confirmation, using a stable marker and readings by both a radiologist and the surgeon.</td>
<td>72%</td>
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Additional Suggested Orthopedic Practices

• To minimize the risk of a wrong-site anesthesia block, mark the operative site before the anesthesiologist does the block.

• Make the site marking as close to the incision as possible and reference it during the positioning of the extremity, the application of any tourniquet, and the prepping and draping of the operative site, as well as during the final time-out just prior to the incision. This appears to be especially important for hand procedures, where the entire hand is in the operative field.

• Do a separate time-out for any injection not done in continuity with the incision, such as a preoperative intra-articular injection of the knee.

• Have the surgeon state the procedure and site, rather than agree to the stated procedure and site, to minimize the risks of automated behavior.

• When doing separate procedures on the same patient, do separate time-outs immediately before each procedure instead of a single time-out referencing the multiple procedures and sites.
Preventing Wrong-Site Surgery

All critical *documents agree* before going into the operating room.

Site *marking is accurate* and always visible.

*Surgeon is engaged* in the time-out.
The Goal...

Getting to Zero!

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Questions?
References

• Clarke, JR. Quarterly Update on Preventing Wrong-Site Surgery Pa Patient Saf Advis 2012 Mar;9(1):28-34.
• Clarke, JR. Quarterly Update to Preventing Wrong Site Surgery. Pa Patient Saf Advis 2012 Sep;9(3):111-112.
References


• Clarke, JR. Quarterly Update on Wrong-Site Surgery: Trying to Hold the Gains Pa Patient Saf Advis 2013 Jun;10(2):76-81
References

• Clarke, JR. Quarterly Update on Wrong-Site Surgery: How to Do an Effective Time-Out in the Dark Pa Patient Saf Advis 2014 Jun;11(2):88-92
• You can reference the Preventing Wrong Site Surgery Educational Tools at http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/PWSS/Pages/home.aspx

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Thank You!

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