MHA’s road maps provide hospitals and health systems with evidence-based recommendations and standards for the development of topic-specific prevention and quality improvement programs, and are intended to align process improvements with outcome data. Road maps reflect published literature and guidance from relevant professional organizations and regulatory agencies, as well as identified proven practices. MHA quality and patient safety committees provide expert guidance and oversight to the various road maps.

Each road map is tiered into fundamental and advanced strategies:
- **Fundamental strategies** should be prioritized for implementation, and generally have a strong evidence base in published literature in addition to being supported by multiple professional bodies and regulatory agencies.
- **Advanced strategies** should be considered in addition to fundamental strategies when there is evidence the fundamental strategies are being implemented and adhered to consistently and there is evidence that rates are not decreasing and/or the pathogenesis (morbidity/mortality among patients) has changed.

**Operational definitions** are included to assist facility teams with road map auditing and identifying whether current work meets the intention behind each road map element.

**Resources** linked within the road map include journal articles, expert recommendations, electronic order sets and other pertinent tools which organizations need to assist in implementation of best practices.

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| **General practices** | **FUNDAMENTAL**  
(check each box if “yes”)  
- Good source documents are used for verification during procedure scheduling, pre-op verification and site marking. (Ideally multiple source documents are used and cross-referenced,)  
  - Good source documents include:  
    - Provider’s clinic visit note when determination was made for the procedure  
    - Diagnostic imaging  
    - Test results  
    - Radiology and pathology reports  
- The patient’s understanding of the procedure to be performed is a verification source, but not the sole source of verification.  
- The informed consent form is a verification source, but is not the sole source of verification and should be completed using the good source documents listed above. | |
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| General practices, continued | - To avoid introducing cognitive bias during verification, patients are asked what procedure is being done and the location of the procedure (i.e., “What are you having done today and which side?”) vs. stating the procedure to be performed and asking them to confirm (i.e., “We are doing surgery on your left hip today – is that correct?”). To verify this process audits should be conducted and should 100 percent compliant.  

☐ There is a process in place for generating specimen labels.  
- The process for generating a specimen label produces only as many labels as needed.  
- Labels include, at a minimum, two patient identifiers and an anatomic source (if applicable).  
- Specimen labels are generated in close proximity to specimen procurement both in relation to physical space (i.e., label printers are in every procedure room) and time (labels are generated just prior to when they are placed on the specimen container).  
- Pathology specimen containers have visual cues to make them more recognizable in the environment (e.g., all surgical specimens have a colored lid and/or colored specimen label).  

☐ Our organization regularly monitors the effective completion of the pre-procedure and Time Out process steps through observational audits in the OR, ambulatory surgery center, or radiology.  
- Observational audits are standardized, conducted consistently for a specified time and a specified amount and timing of the data entry of the audit is also identified and followed. For example:  
  ○ Each month observational audits are performed by a department leader.  
  ○ Cath Lab – five audits/month  
  ○ Clinic – 10 audits/month  
- By the 5th of the month, designated departmental staff or Quality Dept. staff enter aggregate data into the data portal.  

☐ If audit results are below 100 percent, a plan is put in place to address identified issues.  
☐ The specimen handling work flow and specimen tracking process between the procuring procedure room and the testing facility is regularly reviewed to identify and address gaps.  
- Regularly is a specified time, for example, annually. |
### General practices, continued

**ADVANCED**
*(check each box if “yes”)*

- Our organization regularly monitors the effective completion of the pre-procedure and Time Out process steps through observational audits in anesthesia, invasive bed-side procedures, ED, cath lab, endoscopy, and clinic.
  - Observational audits are standardized, conducted consistently for a specified time and a specified amount and timing of the data entry of the audit is also identified and followed.
  - For example: Each month observational audits are performed by a department leader.
    - Cath Lab– 5 audits/month
    - Clinic– 10 audits/month
    - By the 5th of the month, designated departmental staff or Quality Dept. staff enter aggregate data into the data portal.

- Automation and health information technology (HIT) is present within the specimen management process.
  - For example:
    - The facility’s primary electronic health record (EHR) interfaces with the facility’s laboratory information system (LIS).
    - The LIS transmits accurate and timely results to the EHR and the specified provider(s).
    - The EHR transmits accurate and timely patient and order information to the LIS.
    - The EHR generates or electronically transmits a specimen requisition.
    - There is an automated labeling system (e.g., bar coding, RFID).

- According to the Agency for Healthcare Research and Quality (AHRQ) (2016), errors related to the handling of surgical specimens can lead to serious patient harm in the form of delayed and missed diagnosis as well as repeat procedures. The Specimen Management in the Operating Room gap analysis provides evidence-based recommendations for hospitals in the development of a comprehensive specimen management program. See [Specimen Management in the Operating Room](#).

### Scheduling

**FUNDAMENTAL**
*(check each box if “yes”)*

- Expectations are communicated to ordering providers that at a minimum critical components (pre-op diagnosis, procedure to be performed and procedure location) need to be completed by the person, or designee, who will be performing the procedure prior to scheduling a procedure with the facility.
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| Scheduling, continued | The facility requires that the following source documents are available at least 24 hours prior to the scheduled procedure (except for emergent, urgent and add-on cases) for the procedure to move forward:  
- Physician order with procedure and laterality/location indicated, and  
- Written requests from ordering provider for any known implant (including catheters, feeding tubes) to be used for the procedure.  
  - The written requests include, at a minimum:  
    ○ Date of surgery/procedure  
    ○ Patient  
    ○ Surgeon/proceduralist  
    ○ Laterality/site  
    ○ Implant and specifications the facility needs for ordering or pulling the implant for the case  
    ○ For intraocular lenses, also include: model number, posterior vs. anterior, diopter  
    ○ For catheters, also include: number of lumens, specific type of catheter  
    ○ For feeding tubes, also include: type of tube (e.g., gastric, gastric jejunal, jejunal)  
    ○ Best practice would be to have a hard stop in the EMR if source document is not included. | Establishing evidence based protocols/standards is a critical step in implant verification. Consider reviewing the MHA Patient Safety Alert for recommendations and guidance when developing implant protocols. [MHA Patient Safety Alert](#) |
| | The facility requires that documentation of the history and physical is available at least 24 prior to scheduled procedure (except for emergent, urgent and add-on cases) for the procedure to move forward. | |
### Pre-procedure

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| **FUNDAMENTAL**   | (check each box if “yes”)                                                                                          | • Clear communication between team members is crucial to ensuring patient safety. The WHO Surgical Safety Checklist was created to decrease errors and adverse events for surgical cases. The checklist has shown significant reduction in both morbidity and mortality and has improved patient safety via an emphasis on team communication.  
WHO Surgical Safety Checklist |
<p>|                   | □ The person performing the procedure, or designee, enters the procedure information, including procedure site, on the order for the consent (consent to read) or enters this information directly on the informed consent form. | • Time Out Surgical Checklist |
|                   | □ Prior to the procedure, the scheduled procedure is verified against source documents.               | • Site marking recommendations and guidance |
|                   | □ The facility requires that during the pre-procedure verification process the preoperative RN verifies that the procedure, including site, documented on the informed consent matches available source documents. | |
|                   | □ The informed consent form is reviewed with the patient by the person performing the procedure. | |
|                   | □ The informed consent note is part of the patient’s medical record. | |
|                   | □ There is a process in place to document and respond to any special requests of patients and families in specimen handling, testing and disposition. | |
|                   | □ For spine procedures involving levels, preoperative imaging is available for the case. | |
|                   | □ The person performing the procedure marks the procedure site with his/her initials, as applicable (see site marking recommendations) if the person performing the procedure is not in continuous attendance from the time of the consent through conducting the procedure in the OR, ambulatory surgery center or radiology. | |
|                   | □ A pre-operative team briefing or huddle process is in place. | |
|                   | - The huddle should review:                                                                                       | |
|                   |   ○ Procedure                                                                                                    | |
|                   |   ○ Relevant images                                                                                                | |
|                   |   ○ Correct implants are available for case (including type and diopter of intraocular lenses, type and number of lumens for catheters, type of feeding tube, and type of breast implants) | |
|                   |   ○ Anticipated specimens, specimen containers, and any special considerations (e.g., research specimen, forensics, patient and family wishes) | |
|                   |   ○ Other pertinent information                                                                                   | |</p>
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| Pre-procedure, continued | **ADVANCED**  
*check each box if “yes”*  
☐ The person performing the procedure marks the procedure site with his/her initials, as applicable (see site marking recommendations) if the person performing the procedure is not in continuous attendance from the time of the consent through conducting the procedure in anesthesia, invasive bed-side procedures, ED, cath lab, endoscopy, and clinic. |  |
| Procedure room structure/set-up | **FUNDAMENTAL**  
*check each box if “yes”*  
☐ There is a designated spot in the procedure room for holding specimens during the case that are not immediately sent out to the lab.  
☐ A preformatted whiteboard, or other standardized, preformatted record, is in place to track the presence, location, type and number of tucked and packed items.  
☐ Whenever possible, only the implant needed for the case is in the procedure room.  
☐ If the surgeon requests more than one option, as soon as a decision is made on the correct implant for the case, additional implants are placed out of sight in a pre-designated area.  
☐ If a cart is in the procedure room with multiple implants, ideally only the cart with the correct side implants (L vs. R) is in the room. If carts are not able to be separated (L vs. R) due to storage or other issues, left and right components are clearly separated and labeled on the cart. |  |
| Time out | **FUNDAMENTAL**  
*check each box if “yes”*  
☐ Time Outs for any invasive procedure include the person performing the procedure AND at least one other health care provider trained in the Time Out process.  
☐ The steps in the Time Out are conducted just prior to the procedure being performed.  
- Every individual element of the Time Out must have occurred for a Time Out to have been completed. At least 90 percent of scheduled surgeries should have had completed Time Outs per your audits.  
- The WHO Surgical Safety Checklist was created to decrease errors and adverse events for surgical cases. The checklist has shown significant reduction in both morbidity and mortality. The three sections of the checklist each correspond to a specific period in the normal flow of work. The Time Out occurs directly before the skin incision and assigns duties to OR team members.  
[WHO Surgical Safety Checklist](#) |  |
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| Time out, continued | ☐ All other activity ceases.  
☐ Designated staff (e.g. nurse, tech), other than the person performing the procedure verbally reads patient name, procedure and procedure site from the informed consent that has been previously verified.  
☐ Designated staff (i.e., nurse, tech), other than the person performing the procedure locates and verbally confirms visualization of the site mark, if applicable, and states where it is located.  
☐ For departments without a separate pre-procedure area where patient verification is performed (e.g., bedside, ED), during the Time Out, staff also verify patient identity with two identifiers involving the patient if able to participate.  
☐ Person performing the procedure states procedure including side/site from memory.  
☐ If the surgeon is performing a local anesthesia injection prior to related surgical procedure that they will also perform, the Time Out is conducted prior to the injection and includes both the injection and the surgical procedure verification.  
☐ If the surgeon is not in continuous attendance with the patient after the injection, two Time Outs must occur - one Time Out with at least one additional health care provider prior to the injection; one Time Out just prior to the surgical procedure with the full team. | • Discussing the fire risk score during the pre-operative time out process can improve communication between the anesthesia provider and the surgeon and further promote patient safety.  
Surgical Fires Safety Alert  
• Time Out Surgical Checklist  
• AHRQ: Improving Communication and Teamwork in the Surgical Environment  
• Closed-loop communication summary  
• Closed-loop communication exercise  
• Closed-loop communication powerpoint  
• Helium stick exercise instructions  
• Maze game instructions  
• Speaking Up white paper  
• CUS exercise instructions and script |
| For procedures involving localization of the spine | ☐ FUNDAMENTAL  
(check each box if “yes”)  
☐ Following incision and exposure of the vertebrae, a fixed anatomic structure is marked with a radiopaque instrument/marker.  
☐ Correct placement is confirmed by intraoperative imaging (unless pre-existing landmarks are obvious and sufficient).  
☐ Radiopaque instrument/marker should remain visible to surgeon throughout the case or a durable mark or marker should be placed at the correct level prior to removal of the radiopaque instrument/marker. |
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| For procedures involving localization of the spine, cont. | **ADVANCED** *(check each box if “yes”)*  
- If the surgeon is unable to get convincing accuracy with localization, there should be a mechanism of escalation to get assistance from a hospital radiologist.  
- When a radiology consultation is used, review of films should take place with the direct and simultaneous involvement of a radiologist and surgeon/proceduralist.  
- A pause is conducted before executing the procedure to identify the marked level on the image, verbalize the level and confirm against source documents. | • Establishing evidence based protocols/standards is a critical step in implant verification. Consider reviewing the MHA Patient Safety Alert for recommendations and guidance when developing implant protocols. [MHA Patient Safety Alert](#) |
| During the case | **FUNDAMENTAL** *(check each box if “yes”)*  
- Only radiopaque, counted items are used as tucked or packed items (towels must also be radiopaque if used for tucking).  
  - If radiopaque options are not available (a radiopaque option has not yet been created vs. not available in the hospital) for packing, the item has a tail or other visible indicator.  
- The surgeon verbally communicates placement, location, type and number of any item(s) placed during the procedure intended to be removed before (tucked items) or after (packed items) the end of the procedure. The circulator or scrub verbally confirms that a tucked or packed item has been placed.  
  - Placement, location, type and number of tucked or packed items are tracked on the whiteboard or tracking sheet.  
  - The organization requires that sponges/soft goods (include soft goods used for packing/tucking) are the only soft goods present in the surgical field and are the only soft goods placed in patient during or at the end of the procedure.  
- As specimens are procured, the surgeon/proceduralist verbally communicates to the team:  
  - Type of specimen/anatomic designation  
  - Handling instructions  
  - Type of testing needed for the specimen  
  - Any special needs (e.g., inked margin examination, research protocol) |
### Road map questions (if not present at your hospital or answering no, please see next column for suggested resources)

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| During the case, continued | ☐ The circulator verbally confirms (read back) the specimen and handling instructions.  
☐ Specimen containers are labeled as the specimen is placed in the container rather than before specimen is placed in container.  
☐ Procured specimens are visualized by two trained clinical professionals (e.g., scrub and circulator) at the time of procurement, labeled, and placed in the container.  
   - Staff ensures:  
      ○ Label is correct  
      ○ Label matches patient identification information  
      ○ Tissue is in container  
      ○ Correct number of specimens are in container  
      ○ Correct order has been placed  
☐ The implant is introduced to the sterile field by the circulator nurse who completes verification of the implant against source documents.  
   - Note: The vendor does not introduce the implant to the sterile field. The vendor can provide advice but any handling of the device is performed by the procedural team.  
☐ When opening the implant to the sterile field, verification of the correct implant occurs.  
   - Verification includes:  
      ○ Confirming the implant packaging against source documents, such as the implant request form  
      ○ Reading aloud the implant information from the packaging, including laterality if applicable  
      ○ Confirming implant expiration date  
      ○ Showing the packaging information to the surgeon  
<p>| ADVANCED (check each box if &quot;yes&quot;) | ☐ There is a process in place (e.g., picture/image library) for providing a reference to confirm the intactness of items identified by the organization as higher risk for breaking or retaining a component part of the item. |</p>
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| **End of case**   | **FUNDAMENTAL**  
(check each box if “yes”)  
- A standardized process, and clearly assigned responsibilities, is in place for the removal of any tucked items listed on the whiteboard or count sheet prior to the end of the procedure.  
- The surgeon team responsible for removal of tucked item(s) removes the item(s) and tracks removal.  
- A reconciliation process is in place for any discrepancies noted before, during or after the procedure.  
- An order is written by the physician for packing removal, indicating: type, number, and location of packed item(s), and instructions, including timing, or conditions that need to be met, for removal.  
- A formalized process is in place, with clearly assigned responsibility, for documenting, verifying and communicating placement and removal of throat packs, bite blocks, corneal shields, and other similar items. | |
| **Debrief**       | **FUNDAMENTAL**  
(check each box if “yes”)  
- A debrief is performed by procedure team before provider leaves the room.  
- Surgeons/proceduralists are engaged in the development of the briefing process and elements covered during the briefing process.  
- The debrief includes at minimum:  
  - The presence of packed items and plan for communication to the next phase of care is reviewed.  
  - All specimens and orders are accounted for prior to clearing and cleaning the designated specimen area.  
  - Note: Other items to consider:  
    - Verify procedure performed  
    - Pre-op diagnosis/post-op diagnosis  
    - Verification of wound class  
    - Verification of Foley catheter  
    - Verify spine level  
    - All tissue levels closed or loosely closed  
    - Opportunities for improvement verified  
    - Post-op note completion  
- A reconciliation process is in place for any specimen discrepancies noted before, during or after the procedure. | |
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| Clean sweep/room survey | **ADVANCED**  
*(check each box if “yes”)*  
- All extra unused labels are discarded prior to next case. | |
| | **FUNDAMENTAL**  
*(check each box if “yes”)*  
- The presence of packed items is communicated to the next caregiver, including verbally communicating the presence of packed items during hand-off.  
- Patients/families are educated post-procedure on expectations for removal of any items intentionally and temporarily retained.  
- Responsibility is assigned to communicate the presence of packed materials to follow-up provider for removal of packing after discharge, if applicable (e.g., discharge instructions, patient information card, flag in EHR). | |
| Recovery/PACU | **ADVANCED**  
*(check each box if “yes”)*  
- A standardized process, and clear accountability, is in place for removal of the item post-procedure. *For example: A flag is placed in the medical record, visible across departments, and is present until the packing is removed.*  
  - Orders/instructions for removal of packed items are made available to staff responsible for removal of items prior to discharge (i.e., readily accessible to staff in EHR).  
  - Responsibility is assigned to document the presence of packed items and communicate this information during handoff from post-procedure staff to the floor, if applicable.  
  - Responsibility is assigned to communicate the presence of packed materials to follow-up provider for removal of packing after discharge, if applicable (e.g., discharge instructions, patient information card, flag in EHR).  
  - For example: A flag is placed in the medical record, visible across departments, and is present until the packing is removed. | |