THE WHO SURGICAL SAFETY CHECKLIST

BARRIERS AND FACILITATORS TO SUCCESSFUL IMPLEMENTATION

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TALK OUTLINE

• Effect on patient outcomes

• Barriers and facilitators

• Road to successful implementation
Surgical Safety Checklist

Before induction of anaesthesia
(with at least nurse and anaesthetist)

- Has the patient confirmed his/her identity, site, procedure, and consent?
  - Yes
- Is the site marked?
  - Yes
  - Not applicable
- Is the anaesthesia machine and medication check complete?
  - Yes
- Is the pulse oximeter on the patient and functioning?
  - Yes
- Does the patient have a:
  - Known allergy?
    - No
    - Yes
  - Difficult airway or aspiration risk?
    - No
    - Yes, and equipment/assistance available
  - Risk of >500ml blood loss (7ml/kg in children)?
    - No
    - Yes, and two IVs/central access and fluids planned

Before skin incision
(with nurse, anaesthetist and surgeon)

- Confirm all team members have introduced themselves by name and role.
- Confirm the patient’s name, procedure, and where the incision will be made.
- Has antibiotic prophylaxis been given within the last 60 minutes?
  - Yes
  - Not applicable

Anticipated Critical Events

To Surgeon:
- What are the critical or non-routine steps?
- How long will the case take?
- What is the anticipated blood loss?

To Anaesthetist:
- Are there any patient-specific concerns?

To Nursing Team:
- Has sterility (including indicator results) been confirmed?
- Are there equipment issues or any concerns?

Is essential imaging displayed?
- Yes
- Not applicable

Before patient leaves operating room
(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:
- The name of the procedure
- Completion of instrument, sponge and needle counts
- Specimen labelling (read specimen labels aloud, including patient name)
- Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:
- What are the key concerns for recovery and management of this patient?
GOAL

• Teamwork

• Communication

• Consistency of care

• Improve patient outcome

A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population

Alex B. Haynes, M.D., M.P.H., Thomas G. Weiser, M.D., M.P.H.,

8 hospitals – 8 countries
3733 patients before
3955 patients after

Complications 11% vs. 7% (P < 0.001)
Mortality 1.5% vs. 0.8% (P = 0.003)

Haynes et al, NEJM 2009
Surgical Safety Checklist

Match in PubMed

Published Papers


101 hospitals in Canada
109,341 procedures before
106,370 procedures after

Complications 3.86% vs. 3.82% (P < 0.12)
Mortality 0.71% vs. 0.65% (P = 0.13)

Urbach et al, NEJM 2014
2 hospitals in Norway
2212 procedures before
3083 procedures after

Complications  19.9% vs. 12.4% (P < 0.001)
Mortality  1.6% vs. 1.0% (P = 0.151)

Length of stay: 7.8 days vs. 7.0 days (P = 0.022)
<table>
<thead>
<tr>
<th>Postoperative complications</th>
<th>Before (n=2212)</th>
<th>After (n=2263)</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>Respiratory</td>
<td>6.4%</td>
<td>3.2%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cardiac</td>
<td>6.4%</td>
<td>4.3%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Infections</td>
<td>6.0%</td>
<td>3.4%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Wound rupture</td>
<td>1.2%</td>
<td>0.3%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Bleeding</td>
<td>2.3%</td>
<td>1.2%</td>
<td>0.008</td>
</tr>
<tr>
<td>Technical/mechanical</td>
<td>1.1%</td>
<td>0.4%</td>
<td>0.005</td>
</tr>
<tr>
<td>Unplanned re-operation</td>
<td>1.7%</td>
<td>0.6%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Other</td>
<td>2.0%</td>
<td>0.7%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
IMPLEMENTATION
STEPPED-WEDGE CLUSTER RCT

<table>
<thead>
<tr>
<th>Clusters of surgical specialties</th>
<th>Control, care as usual</th>
<th>Surgical Safety Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urology</td>
<td></td>
<td></td>
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<tr>
<td>General</td>
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<tr>
<td>Neuro</td>
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<tr>
<td>Cardio-thoracic</td>
<td></td>
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<tr>
<td>Orthopedic</td>
<td></td>
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</tbody>
</table>

**TIMELINE**

<table>
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<tr>
<th></th>
<th>Aug 2009</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan 2010</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
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<tbody>
<tr>
<td>Urology</td>
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<tr>
<td>General</td>
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<td>Neuro</td>
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<td>Cardio-thoracic</td>
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<tr>
<td>Orthopedic</td>
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</tbody>
</table>

IMPLEMENTATION

✓ Quality Improvement & Research Project
✓ Multi-disciplinary
✓ Education
  ✓ Lectures – videos – on site training – learning material available in OR
✓ Feedback and evaluation
✓ Bottom up and ‘Top down’

MORE RESEARCH
Causal Analysis of World Health Organization’s Surgical Safety Checklist Implementation Quality and Impact on Care Processes and Patient Outcomes

Secondary Analysis From a Large Stepped Wedge Cluster Randomized Controlled Trial in Norway

Arvid Steinar Haugen, MSc, PhD,* † Hilde Valen Wæhle, MSc, †§ Stian Kreken Almeland, MD, ¶||
Stig Harthug, MD, PhD, †§ Nick Sevdalis, PhD, † Geir Egil Eide, PhD, **††
Monica Wammen Nortvedt, MSc, PhD, §§ Ingrid Smith, MD, PhD, §§ and Eirik Søfteland, MD, PhD*

ONE HOSPITAL - 3 SURGICAL CLUSTERS

1398 PROCEDURES BEFORE

2304 PROCEDURES AFTER

Haugen AS, et al. Causal Analysis of World Health Organizations’s Surgical Safety Checklist
HYPOTHESIS

Structur  Process  Outcome

# HOW DOES IT WORK?

## Sign-in
**Before induction of anaesthesia**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has the patient confirmed?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Identity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Operation site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Type of procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the operation site marked?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has anaesthesia been checked and medication controlled?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the patient have:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Known allergy?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Difficult airways / risk of aspiration?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk of &gt;500 mL blood loss (&gt;7 mL/kg in children?)</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are the required diagnostic images available?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Risk of hypothermia?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Yes, and actions are planned or implemented</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Time-out
**Before starting the operation**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has everyone in the team been presented by name and function?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The surgeon, anaesthesia professional and surgical nurse have orally confirmed:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Patient's name?</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>- Planned procedure, operation site, and body side?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Is the patient correctly positioned?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are any critical events expected?</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

**Surgeon:**
- What is the expected blood loss?
- Are there any risk factors that the team should be aware of?
- Is any special equipment or additional diagnostic procedure needed?
- What is the expected duration of the operation?

**Anaesthesiologist and nurse:**
- What is the patient's ASA classification?
- Are there any special risk factors related to anaesthesia that the team should be aware of?

**Surgical nurse:**
- Instrument sterility confirmed (including indicators)?
- Are there challenges associated with use of the equipment?

## Sign-out
**Before the team leaves the operating room**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>The team reviews orally:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Which procedure has been performed?</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>- Is the number of instruments, dressings/drapes and needles correct (or not applicable)?</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>- Are biological samples correctly labeled, including the patient's identity?</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>- Have there been problems with the equipment that should be reported?</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>- What is important for postoperative treatment of this patient?</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks/ findings:**

**Which procedure has been performed?**

Date, patient name and national identifying number.

---

The checklist is not comprehensive and it may be modified to suit local practice. National Unit for Patient Safety. Draft 17 July 2009
HYPOTHERMIA PROTECTION
IMPROVED CARE PROCESSES

ANTIBIOTIC PROPHYLAXICS
IMPROVED TIMING

REDUCTION OF COMPLICATIONS

HOW IT WORKS

- Surgical Safety Checklist
- Improve work processes
- Improve patient outcome

WHAT INFLUENCE USE?

Intervention → Implementation Factors: Barriers, Facilitators → Service outcomes, Patient outcomes

Proctor et al, Adm Policy Ment Health 2011;38:65-76
Evidence vs. Implementation

MIND THE GAP
BARRIERS

• Limited implementation approach
• Imposed implementation approach
• Lack of culture for change
• Time wasting
• Repetition
• Resistance and noncompliance
• Design problems (content/structure)

BARRIERS

• Not applicable to all surgeries
• Unsuitable timing of checks
• Unintended negative effects
• Patient perceptions
• Lack of integration to preexisting processes
• Scepticism regarding the evidence base

FASCILITATORS

• Planned implementation approach
• Education/training
• Feedback on local data
• Accountability for non-compliance
• Support from hospital management

FASCILITATORS

- Leadership skills
- Senior clinical buy-in
- Integration with existing processes
- Multidisiplinary involvement
- Modifying the checklist

The Norwegian Patient Safety Programme: In Safe Hands

In Safe Hands was originally launched in 2011 as a patient safety campaign by the Norwegian Ministry of Health and Care Services. From 2014, the campaign continued as a five-year programme. The aim of the programme is to reduce patient harm.
ROAD TO SUCCESSFUL IMPLEMENTATION

✓ Ensure use of all parts
✓ Record compliance/fidelity
✓ Establish monitoring system (quality indicator)
✓ Provide feedback to CEOs, managers, clinical staff
✓ Make CEOs and managers accountable
ROAD TO SUCCESSFUL IMPLEMENTATION

✓ Establish multidisciplinary agreement
✓ Modify content with care – involve stakeholder
✓ Establish standards and writing rules
✓ Use clinical audits to ensure fidelity
✓ Record and report on care processes and clinical outcome
CHECKLIST COMPLIANCE 2013-2018
(N = 153,602)

Sign in
Time out
Sign out
Used all three checklists
“It is not the act of ticking off a checklist that reduces complications, but performance of the actions it calls for.”

Lucian L. Leap
(March 13, 2014, Editorial in NEJM)