

## Time Out – Informing best practice in using surgical checklists. A Rapid Review

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### Executive Summary

#### Objective

To inform the development of best practice around the use of “time out” or “surgical pause” in surgical checklists by addressing:

- Part A. The elements of best practice using time out
- Part B. Implementation considerations for time out (including: mode, responsibilities, barriers, facilitators and propositions)

#### Search Strategy

A high quality Cochrane systematic review was identified from a preliminary scoping search. Reference and database search was performed according to the inclusion criteria listed in Table 1 of the Full review. Only the most up-to-date literature was included in the review.

#### Results

Five documents were identified from reference mining and targeted database searching. This included:

- Two moderate to high quality systematic reviews [2, 3],
- Two World Health Organisation publications [4, 5] and,
- One quality and productivity example published by the National Patient Safety Agency [6] on the World Health Organisation Surgical Safety Checklist.

The WHO guidelines for safe surgery (2009) defines a “time out” or “surgical pause” as a brief, less than one minute pause in operating-room activity immediately before incision, at which time all members of the operating team verbally confirm the identity of the patient, the operative site and the procedure to be performed. It is a means of ensuring clear communication among team members and avoiding ‘wrong-site’ or ‘wrong-patient’ errors. [4]

From literature, the World Health Organisation Surgical Safety Checklist and Joint Commission’s Universal Protocol was implemented and adopted globally and includes time out as one of its components. Therefore, the most up to date versions of the World Health Organisation guidelines for safe surgery and implementation manual for WHO Surgical Safety Checklist have been included in this review. [4, 5]

#### Conclusions

##### *The elements of time out*

Time out is a necessary component of the WHO Surgical Safety Checklist (SSC) and Joint Commission Universal Protocol (UP). A formal pause or preoperative briefing (i.e. time out) is a necessary component of the WHO Surgical Safety Checklist (SSC) and Joint Commission Universal Protocol (UP). [2] Therefore it was not always possible to decouple the information around the implementation of time out per se from other components of the checklist or its entirety.

Time out is performed immediately before incision, involving all members of the operating team. Elements of time out include the confirmation of name and role of team members, patient’s identity, surgical site and procedure, the review of anticipated critical events, confirmation that prophylactic antibiotics have been administered ≤60 min before incision is made or that antibiotics are not indicated, and confirmation that all essential imaging results for the correct patient are displayed in the operating room. Checks must be documented. Time out may be performed using a checklist, whiteboard or verbally. It is important that staff responsibilities are clearly defined – whether the responsibility for conducting time out is of a single person or a shared responsibility between the operating room team.

### *Implementation considerations*

It was not possible to decouple the implementation of time out from the implementation of the rest of the safety checklist for which it has been described in the included literature. The four categories of barriers to implementation of safety checklists (for which time out is a component) were:

1. Confusion regarding how to properly use the checklist,
2. Pragmatic challenges to efficient workflow,
3. Access to resources, and
4. Individual beliefs and attitudes.

Key components of successful checklist implementation include enlisting support from institutional leaders, training staff on using the checklist, adapting the checklist to incorporate staff feedback, avoiding the duplication of information, and a positive change in attitudes/culture that enforces teamwork.

The sustained use of surgical checklists is more successful if physicians are actively engaged and leading implementation; as well as being involved in tailoring the checklist to their context and encouraging them to reflect on and evaluate the implementation process enables greater participation and ownership.

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# Time Out – Informing best practice in using surgical checklists. A Rapid Review

## Full Review

### Objectives

To inform the development the best practice around the use of “time out” or “surgical pause” in surgical checklists by addressing:

- Part A. The elements of time out
- Part B. Implementation considerations for time out (including: mode, responsibilities, barriers, facilitators and propositions)

### Search strategy

Table 1. Search strategy that was agreed upon *a priori*

Setting	Include: Surgery Exclude: All other settings
Intervention	Include: Time out in surgical checklists
Outcomes	Include: Systematic reviews, Evidence-based guidelines Exclude: Individual studies, studies that did not explicitly mention “time out” as a component to the checklist or intervention of interest
Search terms	Terms related to “time out” in surgery
Databases	Cochrane Database of Systematic Reviews; Australian Safety and Efficacy Register of New Interventional Procedures – Surgical (ASERNIP-S), Kings Fund, The Health Foundation, Agency for Healthcare Research and Quality (AHRQ), Healthcare Improvement Scotland, National Institute for Health and Care Excellence (NICE)
Dates	Only the most up-to-date literature will be included

## Results

During a preliminary scoping search a high quality Cochrane systematic review [1] that included all interventions for reducing wrong-site surgery and clinical procedures was identified. From this review, we were able to identify synthesised literature that included time out in surgical checklists as an intervention for the purpose of this review. Reference mining and database searching resulted in two moderate to high quality systematic reviews [2, 3], two World Health Organisation (WHO) publications [4, 5] and one quality and productivity example published by the National Patient Safety Agency [6] on the WHO Surgical Safety Checklist to be identified.

From literature, the WHO Surgical Safety Checklist (SSC) and Joint Commission’s Universal Protocol (UP) are being implemented and adopted globally and include time out as one of its components. Therefore, the most up to date versions of the WHO guidelines for safe surgery and implementation manual for WHO Surgical Safety Checklist have also been included in this review. [4, 5]

### Part A. The elements of time out

#### *What is time out?*

The WHO guidelines for safe surgery (2009) defines a **“time out” or “surgical pause”** is a brief, **less than one minute pause** in operating-room activity **immediately before incision**, at which time **all members of the operating team verbally confirm** the **identity** of the patient, the **operative site** and the **procedure** to be performed. It is a means of ensuring clear communication among team members and avoiding ‘wrong-site’ or ‘wrong-patient’ errors. [4]

Time out is also the final step of the Universal Protocol three-step process in which each step is complementary and adds redundancy to the practice of confirming the correct patient, site and procedure. It is highly recommended that as a final safety check, the operating team should conduct a time out before the incision is made. [4]

#### *What is involved in time out?*

The WHO guidelines for safe surgery (2009) [4] details the elements of the time out according to the publication included in the Appendix of the guidelines. Data from this publication is also presented in Table 2.

Table 2. Elements/components of time out

### When is time out performed

Immediately before the incision is made [4,5].

### Who is involved

Entire operating team (i.e. nurses, surgeons, anesthesia professionals, and any others participating in the care of the patient) [2,4]

### Elements of time out [4]

- Confirmation that all the team members have been introduced by name and role
  - Confirmation of patient's identity, surgical site and procedure
    - Surgeon states:
      - Patient's name
      - Procedure to be performed
      - Side and site of operation
    - Nurse and anaesthetist confirms information is correct
  - Review of anticipated critical events
    - Surgeon reviews critical and unexpected steps, operative duration, and anticipated blood loss
    - Anaesthesia staff review concerns specific to patient
    - Nursing staff review confirmation of sterility, equipment availability, and other concerns
  - Confirmation that prophylactic antibiotics have been administered  $\leq 60$  min before incision is made or that antibiotics are not indicated
  - Confirmation that all essential imaging results for the correct patient are displayed in the operating room
  - Checks must be documented
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## Part B. Implementation considerations (mode, responsibilities, barriers, facilitators, propositions)

### How is it implemented?

A formal pause or preoperative briefing (i.e. time out) is a necessary component of the WHO Surgical Safety Checklist (SSC) and Joint Commission Universal Protocol (UP). [2] Therefore it was not always possible to decouple the information around the implementation of time out *per se* from other components of the checklist or its entirety.

In order to implement the Checklist (which includes time out) during surgery, a single person must be made responsible for performing the safety checks on the list. This designated Checklist coordinator will often be a circulating nurse, but it can be any clinician participating in the operation. The Checklist divides the operation into three phases, each corresponding to a specific time period in the normal flow of a procedure:

1. The period before induction of anaesthesia. Before induction of anaesthesia, the person coordinating the Checklist will verbally review with the anaesthetist and patient (when possible) that patient identity has been confirmed, that the procedure and site are correct and that consent for surgery has been given.
2. The period after induction and before surgical incision.
3. The period during or immediately after wound closure but before removing the patient from the operating room.

In each phase, the Checklist coordinator must be permitted to confirm that the team has completed its tasks before it proceeds onward. All steps should be checked verbally with the appropriate team member to ensure that the key actions have been performed.

Table 3 summarises the mode of implementation and responsibilities for carrying out the time out section of checklists/protocols.

Table 3. Mode of implementation and responsibilities of conducting time out

#### Mode of implementation

##### ➤ Checklists [2]

A study included in a systematic review reportedly implemented a time out checklist after a root cause analysis following an incident. The systematic review further reported that in keeping with WHO recommendations, checklists were tailored and implemented differently for a wide variety of contexts. It remains unclear whether posters, paper tick boxes or electronic medical records perform better.

##### ➤ Interactive whiteboards [3]

A study included in another systematic review used an environmental redesign strategy in the form of interactive whiteboards for the 'timeout' section.

##### ➤ Verbal [5]

The team confirms out loud that they are performing the correct operation on the correct patient and site and then verbally review with one another, in turn, the critical elements of their plans for the operation, using the checklist for guidance.

#### Responsibilities

From the literature identified, two different ways of assigning responsibilities have been described.

##### ➤ Shared responsibility of the operating room team [2]

Surgical chiefs were local champions, and one nurse champion was paired with each surgeon champion. An included study reportedly divided the responsibility for leading the time out phase among all team members, and identified key speaking points.

##### ➤ Single person responsibility [5]

A single person must be made responsible for performing the safety checks on the list. This designated checklist coordinator will often be a circulating nurse, but it can be any clinician participating in the operation.

Unfortunately the literature identified does not decouple the implementation of time out from implementation of the rest of the safety checklist for which it has been described. Tables 4 describe the barriers and facilitators for the implementation of safety checklists in surgery.

Literature also suggests that the sustained use of surgical checklists is more successful when physicians are actively engaged and leading implementation. Involving clinicians in tailoring the checklist to their context and encouraging them to reflect on and evaluate the implementation process enables greater participation and ownership. [3] This is further described in Table 5.

Table 4. Barriers and facilitators to the implementation (of the WHO Surgical Safety Checklist or Joint Commissions Universal Protocol for which time out is a specific component)

### Barriers to the implementation of surgical checklists

Categories of barriers to implementation include: [2]

- Confusion regarding how to properly use the checklist, e.g.
  - proper timing of time out
  - responsibilities of team members
- Pragmatic challenges to efficient workflow
  - extra time required especially during emergency procedures
  - duplication of safety checks already routinely performed
  - engagement of staff in other pre-operative tasks
- Access to resources
  - inconsistent access to antibiotics and batteries
  - (site) marking materials not available
- Individual beliefs and attitudes of participating, particularly surgeons
  - surgeon resistance to changing habits
  - awkwardness of self-introductions
  - steep interpersonal hierarchy
- Concerns over legal responsibility for complications

### Facilitators of the implementation of surgical checklists

Facilitators to implementation include [2,6]

- Enlisting support from institutional leaders [2,6]
- Training staff on using the checklist [2]
- Adapting the checklist to incorporate staff feedback [2]
- Avoiding the duplication of information already routinely collected [2]
- Positive change in attitudes/culture that enforces teamwork [2,6]

Table 5. Propositions for the sustained use and implementation success of surgical safety checklists.

### Propositions for the successful implementation of surgical safety checklists

In an explanatory model for implementation (see Appendix), Gillespie and Marshall (2015) concluded, and this is also mentioned by other sources [2,5], that the sustained use of surgical checklists is more successful when:

- Physicians are actively engaged and leading implementation. [3]
  - sustained use of surgical checklists is discipline-specific and is more likely to occur when medical staff are actively engaged and leading the process of implementation
- Clinicians are involved in tailoring the checklist to their context and encouraging them to reflect on and evaluate the implementation process enables greater participation and ownership. [3]
  - WHO website encourages organisations to ‘customise the checklist for the setting as necessary, but do not remove safety steps just because you are unable to accomplish them’ and emphasises that ‘It should take no more than a minute to complete each section of the checklist’ (i.e., 3 min in total). [2]
  - Surgeons, anaesthetists, and nurses should be involved in the modification process, and the resulting Checklist trialed in simulated and real-life situations in order to ensure its functionality. [5]
  - The principles used in the development of the Checklist can be applied to its modification: *Focused, Brief, Actionable, Verbal, Collaborative, Tested* [5]

## Conclusions

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### *The elements of time out*

Time out is a necessary component of the WHO Surgical Safety Checklist (SSC) and Joint Commission Universal Protocol (UP). It is performed immediately before incision, involving all members of the operating team. Elements of time out include the confirmation of name and role of team members, patient's identity, surgical site and procedure, the review of anticipated critical events, confirmation that prophylactic antibiotics have been administered  $\leq 60$  min before incision is made or that antibiotics are not indicated, and confirmation that all essential imaging results for the correct patient are displayed in the operating room. Checks must be documented. Time out may be performed using a checklist, whiteboard or verbally. It is important that staff responsibilities are clearly defined – whether the responsibility for conducting time out is of a single person or a shared responsibility between the operating room team.

### *Implementation considerations*

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The sustained use of surgical checklists is more successful if physicians are actively engaged and leading implementation; as well as being involved in tailoring the checklist to their context and encouraging them to reflect on and evaluate the implementation process enables greater participation and ownership.

## Limitations

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A limitation of this review is the targeted search strategy where only the most up-to-date synthesised data was included. This excluded other published literature such as individual studies and quality improvement projects. The high quality systematic review [3] also states the lack of robust descriptions of intervention methods and implementation strategies was its major limitation.

It was not always possible to decouple implementation strategies for time out from rest of the components to the checklist from the included literature, hence it was difficult to report implementation considerations for the use of time out *per se*.

## References

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- 1) Algie CM, Mahar RK, Wasiak J, Batty L, Gruen RL, Mahar PD. Interventions for reducing wrong-site surgery and invasive clinical procedures. Cochrane Database of Systematic Reviews 2015, Issue 3
- 2) Treadwell JR, Lucas S, Tsou AY. Surgical checklists: a systematic review of impacts and implementation. *BMJ Qual Saf.* 2014; 23[4]:299–318
- 3) Gillespie BM and Marshall A. Implementation of safety checklists in surgery: a realist synthesis of evidence. *Implementation Science* (2015) 10:137
- 4) World Health Organisation. WHO guidelines for safe surgery (2009): Safe surgery saves lives. Geneva.
- 5) World Health Organisation. Implementation Manual. WHO Surgical Safety Checklist 2009. Geneva
- 6) National Patient Safety Agency. The WHO Surgical Safety Checklist: to reduce harm by consistent use of best practice. Publication type: Quality and productivity example. NHS Evidence.

## Appendix

Figure 1. Explanatory model for implementation and sustainment of checklists in surgery (pp 10; Gillespie and Marshall, 2015 [3])

