

## ASK! Preoperative Safety Checklist Protocol in Interventional Spine Procedures: A Quality Improvement Study Thirty Month Follow-up

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### Abstract

Medical errors can have devastating consequences for patients. Therefore, it is crucial to prevent sentinel and wrong-side events in order to ensure patient safety. One effective tool for achieving this goal is the World Health Organization (WHO) Surgical Safety Checklist, which can be used in conjunction with a pre-procedural, multidisciplinary checklist and physician-led time-out. In a QI project that focused on interventional pain procedures, a pre-procedural, multidisciplinary checklist and physician-led time-out were implemented. Over a period of 30 months and 5,017 procedures, no near misses or incidents were recorded. These preliminary results suggest that the use of multi-disciplinary checklists and attending-led time outs can significantly improve patient safety in interventional pain procedures.

**Keywords:** World Health Organization; Surgical Safety; Pain; Rehabilitation; Anesthesiologist.

### Synopsis

Medical errors can have profound consequences for patients and may occur at various stages of medical care, ranging from diagnosis to intervention. Sentinel and wrong-side events can have dire consequences for both patients and physicians, which can erode trust in medical professionals. The use of standardized checklists serves as an additional safeguard

against such mistakes. In 2003, The Joint Commission implemented the Universal Protocol, and in 2008, the World Health Organization (WHO) developed the Surgical Safety Checklist [1]. Multiple studies have shown that implementing these checklists reduces the frequency of sentinel events and wrong-side surgical mistakes. This study reports on a busy interventional pain practice that successfully implemented the WHO preoperative checklist with a pre-procedure

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timeout. During this period, 5,017 procedures were performed, and there were no sentinel or wrong-side events, demonstrating the substantial efficacy of implementing these measures.

## Introduction

Medical errors represent a significant threat to patient care and can occur at various stages of medical treatment. As such, it is crucial to implement standardized protocols to

mitigate these risks. In 2003, The Joint Commission implemented the Universal Protocol, which comprises three key steps: conducting a pre-procedural verification process, marking the procedure site, and performing a pre-procedure time-out [1]. Additionally, the World Health Organization (WHO) Surgical Safety Checklist (Figure 1), developed in 2008, aims to improve patient safety by preventing wrong-site surgeries, near misses, and other surgical "never events"[2].

The image shows the WHO Surgical Safety Checklist (First Edition) with three main sections: 'Before induction of anaesthesia', 'Before skin incision', and 'Before patient leaves operating room'. Each section contains a list of items to be checked, with checkboxes for each. The 'Before induction of anaesthesia' section includes 'SIGN IN' (Patient confirmed, Site marked, Anaesthesia safety check, Pulse oximeter), 'DOES PATIENT HAVE A: KNOWN ALLERGY?', 'DIFFICULT AIRWAY/ASPIRATION RISK?', and 'RISE OF SPINAL BLOOD LOSS'. The 'Before skin incision' section includes 'TIME OUT' (Team introductions, Verbal confirmations, Anticipated critical events, Antibiotic prophylaxis, Essential imaging) and 'SIGN OUT' (Team verbal confirmation, Name and counts, Specimen labeling, Equipment problems, Key concerns). The 'Before patient leaves operating room' section includes 'SIGN OUT' (Team verbal confirmation, Name and counts, Specimen labeling, Equipment problems, Key concerns). A note at the bottom states: 'THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.'

**Figure 1:** World Health Organization (WHO) Surgical Safety Checklist. Source:

<https://www.who.int/teams/integrated-healthservices/patient-safety/research/safe-surgery/tool-and-resources>.

Wrong site nerve blocks (WSNB) are classified as sentinel events for interventional pain providers and anesthesiologists. These events are associated with unique risk factors, such as changes in patient position during the procedure (e.g., obtaining consent for a

popliteal block while the patient is supine, but performing the procedure with the patient in the prone position). A study conducted by Henshaw et al.,[3] found that prior to implementing a standardized checklist, four WSNB events occurred out of 10,123 procedures performed. After

implementing the checklist, zero WSNB events occurred out of 35,890 procedures performed. Another safeguard against adverse events is a pre-procedural time-out. [4] implemented pre-incision timeouts in 4,453 procedures and found zero clinical discrepancies and zero wrong-site events.

To the best of our knowledge, no prior study has investigated the efficacy of using a pre-procedural, multidisciplinary checklist with a physician-led time-out for interventional pain procedures. To address this gap in the literature, Doctors initiated a quality improvement (QI) project at the Johns Hopkins Greenspring Station Ambulatory Surgical Center (ASC) and Johns Hopkins Knoll North ASC from August 1, 2020 through February 1, 2023. Our objectives included data collection on wrong-site, wrong-procedure, and/or wrong-patient pain procedures, and the implementation of a pre-procedural checklist and a 30-second pre-procedural time-out.

## Methods

This is a prospective QI study that assesses every interventional spine procedure performed by a Physical Medicine and Rehabilitation (PM&R) spine specialist at Johns Hopkins Greenspring Station ASC and Johns Hopkins Knoll North ASC from August 1, 2020, through February 1, 2023. Prior to each procedure, a medical assistant initiated the sign-in process by collecting patient demographic information and relevant medical/surgical history.

The information was then used by each member of the multidisciplinary team,

including the charge nurse, interventional spine fellow, radiology technician, and anesthesiologist (when applicable), to create their own checklist. In the pre-operative room, the attending physician used a sterile marker to mark the patient's skin to reflect procedural laterality at the approximate procedure site. In the procedure suite, a standard time-out was performed in which the attending physician stated the laterality of the procedure, acknowledged the skin marking on the patient, and asked each member of the team for confirmation. After all team members agreed, the procedure began. The study documented the number of wrong-site events or near misses over a 30-month period.

## Result

From August 1, 2020, through February 1, 2023, a total of 5,017 interventional spine procedures were completed using the measures described in the methods section. These include the use of interdisciplinary team checklists, laterality marking by the attending physician, a standard time-out, and the ASK protocol.

These measures were applied to every case, and there were no near misses or incidents recorded during this period. In the five years preceding this study and the implementation of these measures, there were two wrong-site procedures and one near miss reported by the same physician at the same ASCs.

## Discussion

This study provides evidence that utilizing multidisciplinary checklists and a

preprocedural timeout can effectively prevent wrong side events and near misses in a busy interventional pain practice. While the WHO procedural checklist serves as a fundamental tool, the key to its success lies in the ability to customize it to meet procedure-specific needs. This pain practice was able to make modifications specific to its procedures. The addition of a pre-procedural time-out and checklist further enhanced patient safety and optimized practice efficiency.

The concerns around time-out non-compliance and lack of awareness of its importance highlight the need for ongoing education and training on patient safety protocols, such as the Universal Protocol and the WHO Surgical Safety Checklist [5].

It is crucial for all healthcare professionals to understand the rationale behind these protocols and their role in preventing adverse events [6].

In addition, promoting a culture of collaboration and open communication within the healthcare team can improve compliance and ensure that all team members are aware of the steps involved in optimizing patient safety during procedures. Regular audits and feedback on performance can also reinforce the importance of these protocols and drive continuous improvement in patient safety practices.

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## Conclusion

The preliminary data collected in this study shows promising results in improving patient safety in interventional pain procedures by using multi-disciplinary checklists and attending-led time outs. However, as the study acknowledges, further research is needed to establish comprehensive recommendations and protocols for this specific practice.

To help establish causality, randomized controlled trials (RCTs) can provide valuable data in determining the effectiveness of interventions in healthcare by comparing outcomes between two groups. In the case of interventional pain procedures, RCTs can be designed to further test the effectiveness of multi-disciplinary checklists and attending-led time outs in reducing errors and improving patient safety. These trials can also help to identify any potential barriers to implementing these measures in practice, such as time constraints or resistance from team members.

Overall, there remains a need to establish evidence-based recommendations and protocols for interventional pain procedures.

The implementation of comprehensive safety measures can ultimately improve patient outcomes and foster a culture of collaboration and safety for interventional pain practices.

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