The adaption and implementation of the WHO Surgical Safety Checklist for dental procedures

S. Wright,*[1] T. C. Ucer[1] and G. Crofts[1]

Key points

- Increases patient safety.
- Discusses how the checklist mitigates human error.
- Encourages team working.
- Discusses governance and record keeping.

Objective The objective of this study is to systematically adapt the WHO Surgical Safety Checklist for use in dentistry. **Study design** Expert consensus panel. **Setting, materials and methods** Using the 'WHO adaptation guidance', the WHO Surgical Safety Checklist was assessed and adapted by an expert panel using the Delphi technique. The newly developed checklist was piloted on a sample of 40 patients who were referred for the placement of dental implants at an implant referral centre. **Results** The WHO Dental Safe Surgery Checklist was developed. **Conclusions** This study presents an adaptation of the WHO Surgical Safety Checklist for use in dentistry. The whole practice team needs to be trained on the use of the WHO checklist (as per the WHO implementation guidelines). It needs systematic implementation, for every episode of dental surgery including dental extractions, minor oral surgery (MOS) and implant surgery, as part of a culture that is centred around patient safety. If appropriately implemented, this checklist could be a valuable safety barrier to mitigate the potential consequences of human error.

Background

The Institute of Medicine 1999 report *To err is human*[1] highlighted that, as clinicians we will all commit unintentional errors. The impact of these errors is usually non-existent, or may simply cause a minor inconvenience.[2] Although most errors do not lead to an adverse event or outcome, they reduce the safety margins, and in healthcare errors may lead to unintended or even catastrophic consequences.

Since the publication of *To err is human*, research attention has focused on patient safety, leading to the conclusion that checklists are an effective and practical tool for creating a safer healthcare environment.[3] In addition, checklists can promote better quality of care while reducing stress levels and increasing job satisfaction.

Checklists have been long used in the aviation industry and are being increasingly relied upon in medicine, however, dentistry is lagging behind in the attention paid to patient safety,[4] and the use of checklists has not been adopted widely.[5]

[1]School of Health Sciences, University of Salford.
*Correspondence to: S. Wright
Email: portsunlight@btinternet.com

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Surgical checklists may reduce errors for many reasons: they ensure that all critical tasks are carried out; encourage a non-hierarchical team-based approach; enhance communication; identify potential errors and near misses early; anticipate potential complications; reduce omissions; and ensure that all equipment and products are available and in working order. Effective implementation requires a full understanding of the purpose of the checklist, training on its use, engagement and commitment by clinical leaders and the support and endorsement of the whole clinic team.[6]

The most widely accepted surgical safety checklist, intended to minimise complications and ensure patient safety, is the WHO (World Health Organisation) Surgical Safety Checklist, launched in 2009.[7] The checklist identifies three phases of an operation, each corresponding to a specific period in the workflow: before the induction of anaesthesia ('sign in'); before the incision of the skin ('time out'); and before the patient leaves the operating room ('sign out'). In each phase, a checklist coordinator must confirm that the surgery team has completed the listed tasks before it proceeds with the operation.

This checklist has been extensively tested in many areas of medicine and surgery,[5] demonstrating improvements in urgent surgery,[8] safety attitudes,[9] patient safety,[10] and error prevention.[11]

Despite these benefits, the dental team needs to engage with, and recognise, the value of using a checklist. The critical test for the usefulness of a checklist is the functionality and compatibility with task execution. Although the WHO Surgical Safety Checklist is intended to be 'nearly universally applicable – useful in all environments and types of surgery', the ability to modify and adapt the checklist to ensure it is relevant to the specific surgical discipline of dentistry is essential for the successful application of this tool in this field.[5]

This ability to adapt the checklist is acknowledged by WHO, in their 'Adaption Guide',[12] detailing that, although it is not necessary to replicate the process of broad consultation that was employed in creating the original checklist, it is necessary that any adaptations to the checklist, be developed and piloted to ensure functionality.

To date, there are no studies that describe how to adapt the WHO Surgical Safety Checklist for the dental setting, however, NHS England offers a toolkit and recommendations in the form of NatSSIPs[13] (National Safety Standards for Invasive Procedures) and LocSSIPs[14](Local Safety Standards for Invasive Procedures). These recommend the use of the

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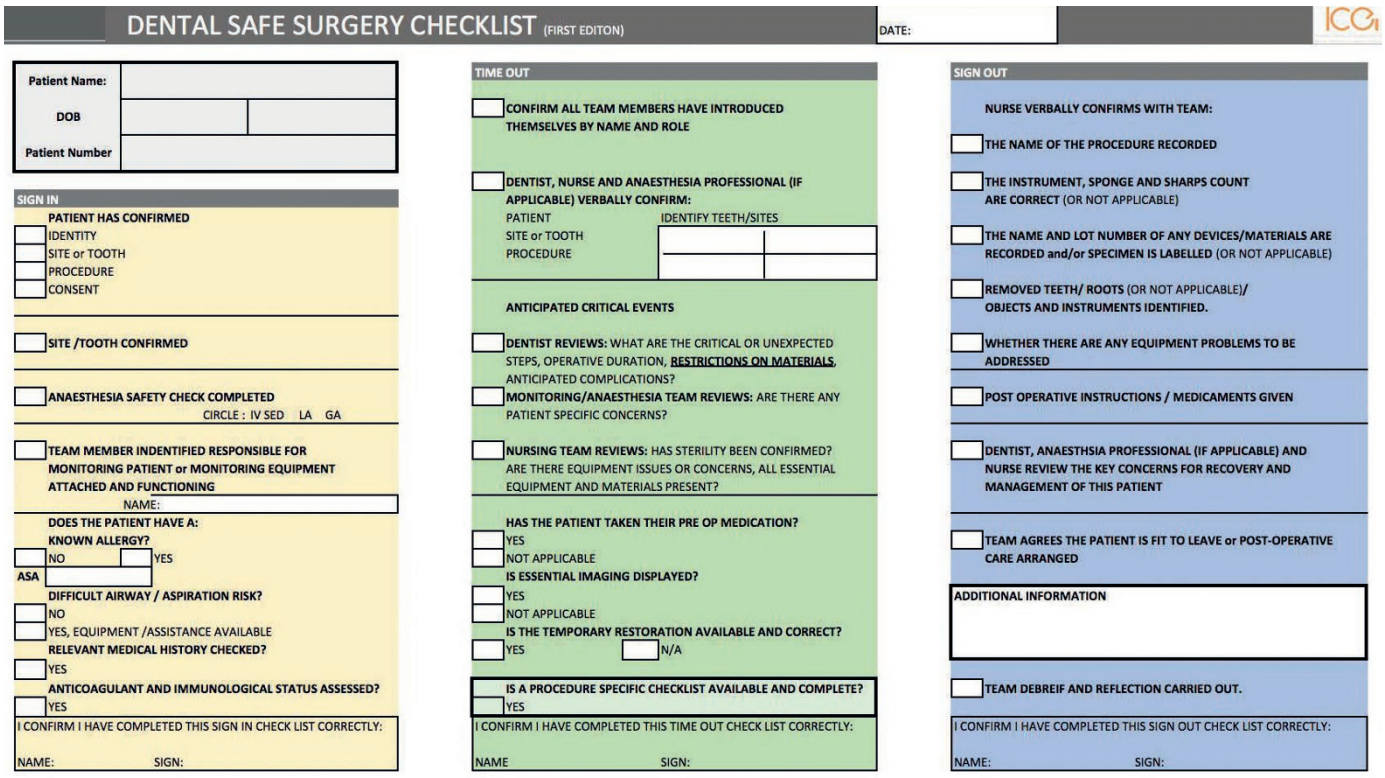

Fig. 1 Dental Safe Surgery Checklist. Adapted with permission of the World Health Organisation, based on the WHO Surgical Safety Checklist, http://www.who.int/patientsafety/safesurgery/en © World Health Organization 2009. All rights reserved

WHO checklist as part of a toolkit that also involves education, training and reporting.

The aim of this study is to systematically adapt the WHO Surgical Safety Checklist for use in dentistry and develop a Dental Safe Surgery Checklist.

Materials and methods:

Study design

Using the 'WHO adaptation guidance', the WHO Surgical Safety Checklist was assessed and adapted by an expert panel using the Delphi technique. Consensus was required between members of the expert group to inform the development and validity of the checklist.[15] The checklist was therefore deemed to include all the necessary checks, and did not include anything that is not required.

Following the initial adaptation, the content validity of the checklist was determined by each panel member independently rating the relevance of each question using the 4-point Likert scale (1 = not relevant, 2 = somewhat relevant, 3 = relevant, 4 = very relevant).

Face validity was assessed by the same panel members for clarity, ability for the target audience to answer the questions, relevance of the question/item to the checklist purpose, to check what the item is intended to check, layout and style.

Setting

The expert panel consisted of 15 dentists. One of these is an oral surgeon, one is on an oral surgery training programme, two limit their practice to oral surgery and dental implantology, and 11 general dental practitioners. Two members of the panel work in a private hospital, one in an NHS hospital and the remainder in primary care practices. No ethical approval was required as this was a service development limited to the involvement of clinicians.

Intervention

The newly developed checklist was piloted on a sample of 20 patients who were referred for the placement of dental implants at an implant referral centre. The clinical team was educated on the use of the WHO Surgical Safety Checklist and were asked to complete the checklist for all dental extraction procedures, oral surgery (MOS) procedures and surgical implant dentistry.

Feedback on the implementation of the checklist, face validity and content was relayed to an expert panel, and any modifications were agreed using the Delphi technique.

The checklist was piloted for a further 20 patients, and the feedback collected and analysed by the same methodology. This cycle was repeated until the members of the expert panel had concluded that the checklist could not be improved.

Main outcome

The responses from an expert panel were collated and piloted to develop the Dental Safe Surgery Checklist.

Results

Data collection

Following the initial adaption of the WHO Surgical Safety Checklist, two cycles of evaluation and piloting were necessary to adapt the checklist for use in the dental setting.

Results

Figure 1 displays the final Dental Safe Surgery Checklist.

Discussion

Errors are inextricably linked to human behaviour.[16] The first and significant step in improving patient safety is changing our

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attitude to error, acknowledging that errors will happen and to try to prevent them from happening. A recent study concluded that dental practitioners make on average two errors per day, and that 1.4% of these errors lead to an adverse event where the patient could potentially be harmed.[16]

The safest systems do not rely upon the practitioner avoiding making errors, but have a series of safety barriers that prevent errors occurring, and/or identify the error to mitigate the consequence. Checklists have been demonstrated to be an effective safety barrier in this regard.[17]

Furthermore, it is well demonstrated for healthcare workers that improving safety is more about managing the latent risks, rather than a radical change and reform of practice.[17] These hidden risks can often be exposed with the systematic use of a checklist, ensuring continuous attention to detail, particularly under stressful conditions.[18]

The National Safety Standards for Invasive Procedures list the never-events in dentistry as 'Wrong site surgery, wrong implant/prosthesis, and retained foreign object post-procedure.'[13] While some never events are reported, there is at least anecdotal evidence that most are not. In between 2012 and 2014 there were 43 reported never-events, all were wrong site surgery.[19] The aetiology of these never-events has been linked to human error, and it is highly recommended that checklists are implemented to prevent their occurrence. A recent systematic review that assessed the effectiveness of patient safety tools concluded 'the only interventions in dentistry that reduce or minimise adverse events are surgical safety checklists'.[20]

Checklists are routinely used in the hospital and secondary care setting, where it is recognised that effective leadership,[21] specific policy and procedure,[22] and monitoring and measuring compliance leads to a strong patient safety culture. However, we do not currently have evidence that this level of rigor is widespread in primary care, where it is up to individual practitioners and dental team members to introduce the concept of human factors into their practice, and to implement checklists.

The effective implementation of checklists is critical to their value. They should be used for every case, not just for complex cases or when there is more time. They must be implemented systematically and simply seen as part of the procedure.[23] A recurrent theme in the successful implementation of checklists is that of a team-based approach, with all members engaging with the process.[5]

While the use of a checklist is undisputable as a safety barrier, its value can be limited by failure to use the tool appropriately and to regard it as an additional burden, with studies demonstrating items being skipped, not performing the checks properly or in full, rushing the checklist, or allowing interruptions.[5]

A study in an oral surgery hospital setting demonstrated positive feedback from the dental team, high levels of compliance and limited evidence of improved patient care from the implementation of an adapted WHO Surgical Safety Checklist.[24] This study was a review of critical incidents, and therefore did not detail the adaption process, the methodology of their piloting or the final checklist.

The wide adoption of the WHO Surgical Safety Checklist by over 3,000 hospitals and to many areas of surgery, suggests that it is a practical, inexpensive tool that has positive effects on patient safety.[5] It conforms to the guidelines of a 'checklist not taking more than a minute to complete' (three minutes in total for all sections), and can be used simply by displaying on walls or being printed.

Conclusions

Implications for practice

This study presents an adaptation of the WHO Surgical Safety Checklist for use in dentistry.

The whole practice team needs to be trained on the use of the WHO checklist (as per the WHO implementation guidelines).[25] It needs systematic implementation, for every episode of dental surgery including dental extractions, MOS and implant surgery, as part of a culture that is centred around patient safety.

If appropriately implemented, this checklist could be a valuable safety barrier to mitigate the potential consequences of human error.

Implications for research

There are many studies that demonstrate the positive effect of the introduction of an adapted WHO Surgical Safety Checklist.[26] A prospective study investigating the effect of implementing the Dental Safe Surgery Checklist on patient safety could further demonstrate the potential benefits of this human factors-based tool.

Furthermore, a checklist like this should be constantly evolving. Including opinions of both the patient and the wider members of the dental team into this evolution, may further the development of this Dental Safe Surgery Checklist.

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