Chapter 13
General discussion

We always hope for the easy fix: the one simple change that will erase a problem in a stroke. But few things in life work this way. Instead, success requires making a hundred small steps go right - one after the other, no slipups, no goofs, everyone pitching in. We are used to thinking of doctoring as a solitary, intellectual task. But making medicine go right is less often like making a difficult diagnosis than like making sure everyone washes their hands.
Better. Atul Gawande 2007

The advances in science and technology that enable care for very sick patients, also yield extreme complexity in modern medicine. The cardinal difficulty for healthcare providers is in the execution of care, as it is becoming nearly impossible to choose and apply the best fit for each patient out of all the available diagnostic and treatment modalities. This puts the patient at risk of suboptimal diagnostics, treatment and thus outcome. It is therefore no surprise that patient safety has become a mainstay of modern medical practice.

As described in the first chapters of this thesis,1 standardisation is a way of dealing with human error in the light of complexity. Standardisation is simplifying a management approach because this is the best approach for most patients and it decreases human error by reducing options in execution of care. Care can be standardised by the use of checklists, guidelines and working according to protocols. These tools have been shown to increase quality of care and improve patient outcome.2-8 This thesis corroborates that the use of checklist and protocols, such as cognitive aids increases quality of care by improving adherence to best practice.9 The cognitive aids that were designed and tested as part of this thesis, and that are currently used in several Dutch hospitals, have been shown to reduce failure to adhere to best practice by 70%.9 Using checklists, guidelines and protocols is a way of accepting that we are prone to human error, which creates an openness that augments the effectiveness of teamwork, situational awareness and flattens hierarchy by decreasing the autonomy of individual team members.10 Checklists, protocols and guidelines are consequently indispensable to deal with the complexity of modern medicine.

However, with evolving evidence that these tools make a difference in patient outcome, and fuelled by modern-day pressure to produce medical literature, there has been an enormous increase in the availability of different checklists, protocols and guidelines. (figure 13.1).
But in this case, as often, too much of a good thing can be a bad thing. These tools can cause patient harm if they are implemented without sound evidence. This can be due to protocol misalignment (the mismatch between the context in which the tool was developed and the context in which the tool is used) and impact misattribution (when an improved outcome is wrongly attributed to the use of the tool, but in fact secondary to another factor in the study that tested the effect of the tool). Secondly, the purpose of checklists, protocols and guidelines is to offload the brain, not to add to the cognitive load by causing confusion about which checklist to choose. Standard of care for a low complex case should not include the need of running through 8 checklists as this will create “protocol fatigue.” An overload of these tools (especially the ones with questionable clinical relevance) will cause confusion and resentment, resulting in staff just performing a tick-box exercise or disregarding the checklists altogether. This will devaluate these tools and increase the risk of worse patient outcomes secondary to non-compliance with important checklists, protocols and guidelines. It is therefore key for policymakers within a hospital to select, implement and enforce the most important checklists, protocols and guidelines (i.e. the ones that are applicable, easy to use and have proven to make a difference in patient outcome). Much as oil company Shell has been very effective in reducing the number of injuries and fatalities amongst employees by enforcing just the 12 most critical safety hazards. A study in this thesis highlights this problem. “The European Society for Cardiology and European Society for Anaesthesia guidelines on non-cardiac surgery: cardiovascular assessment and management” was revised in 2014. We looked at the implementation of this important perioperative guideline in Europe and how well anaesthetists were aware of the changes in this guideline. Both the implementation and the level of knowledge of this guideline in Europe was found to be poor. This finding is distressing as this guideline is applicable to a very large proportion of anaesthetic patients and could thus imply suboptimal care of (at least a part of) this patient.
group in Europe. So as much as checklist, protocols and guidelines are invaluable to modern day practice, it does not follow that the availability of more of these tools results in better patient outcomes.

The benefits of standardisation in other high-risk industries that are also rapidly evolving due to advances in science and technology (i.e. aviation, nuclear and oil industries) have been well documented in social, health and safety, economic and environmental contexts. In addition to the use of checklists, guidelines and protocols, these high-risk industries also standardise equipment. There are many advantages to standardising medical equipment and tools too, as is underlined by International Organisation for Standardisation (ISO). For example, the current diversity of high-risk medication labels in the Netherlands, even within the same hospital, increases the risk of medication error. In order to reduce this risk, a new national standard for high-risk medication labelling is presented in this thesis.

It must be pointed out however, that the extent to which standardisation is possible, differs between industry and patient care. Whereas processes in industry will be highly uniform, patients can need a much more individualised approach depending on, for example, age, severity of disease or associated conditions. In Greek mythology, Procrustes was an innkeeper on Mount Korydallos on the way between Athens and Eleusis. He persuaded tired travellers to spend the night. His beds, he claimed, “were the most comfortable beds the travellers would ever sleep in, as they would fit everyone perfectly.” However, after having accepted his invitation to stay, the naïve travellers were either stretched out, or their legs were cut off to fit the bed, as nobody would ever fit the bed exactly. Standardisation should thus never become a Procrustean bed; where a protocol is forced on a patient who does not fit the protocol. Therefore, checklists, protocols and guidelines only work to help experts; medical professionals who understand both the value and limitations of these tools in different patients and contexts. It is the responsibility of policymakers and departmental heads to employ highly capable staff and train them to become experts. Although the use of essential checklists, protocols and guidelines should be enforced, at the same time management should trust the competency of their staff (and thus their own quality management of staff) to deviate from protocol when this is required. Following a checklist, protocol or guideline is a means to a safe patient environment. But the ultimate goal is not to follow the protocol, but to provide excellent and safe patient care.

In order to know that you are providing safe and excellent care, you have to measure your performance. This can be done through performing audits. Clinical auditing is a cyclical process of measuring a set of outcomes against a standard of care as described in this thesis. This allows for identification of strengths and weaknesses. This is particularly important when practices change. As a consequence of the increased demand for procedural sedation task shifting is taking place in anaesthetic practice, as sedation is increasingly being performed by sedation practitioners. So, in order to know whether this practice is safe, especially with an increasingly complex case load, you have to look at outcomes. Until recently there was
no data in the Netherlands to show whether this practice was safe. With the national study of 12,000 sedation cases described in this thesis, we were able to demonstrate that current sedation practice by sedation practitioners in the Netherlands is safe. The manner by which an audit is able to subsequently improve care and patient outcome is by targeting identified weaknesses in the healthcare process. This process is also described in this thesis. By implementing several targeted interventions on deficiencies in care of a group of severely injured patients we were able to reduce mortality.

In addition to focusing on deficiencies in care, improving performance could also focus on learning from excellence. This has been shown to improve quality of care as well, but also has a more positive effect on healthcare staff than learning from mistakes and near-misses. Learning from high-quality practice gives an opportunity to see creative and innovative solutions to compensate for the variable conditions in complex modern medicine. So much is to be said for implementing a safety management system that also learns from excellence and for example, institutes Awesome and Amazing meetings alongside Morbidity and Mortality meetings.

**Future perspectives**

There is an increased interest in the use of information technology and artificial intelligence to overcome human error. Information technology has the potential to improve communication (i.e. handover summary), increase medication safety (i.e. by assisting in calculations, alerting when dose adjustments are required or important medication interactions are noted) and to increase monitoring safety (i.e. alerting abnormal vital signs or laboratory results). Artificial intelligence is capable of reviewing, coordinating and integrating data that is above human capabilities and can therefore provide decision support. Thus, where standardisation becomes a Procrustean bed we should let technology help us to individualise patient care. It is likely that artificial intelligence in the future will also allow prediction of adverse events and outcomes very early on in a patient's trajectory. Further research will have to focus on the role of these technologies in improving quality of care and safety in medicine.

So, in the end quality improvement and safety are as simple as ABC. Audit; your care, your team performance, your outcomes. Make sure you have all the Basics correct; make sure you have enough, competent staff, optimise logistics, systems that incorporate safety barriers to reduce human error and then proceed to the Clever stuff, like information technology and artificial intelligence to help us improve the care for our patients. Because “better is possible. It does not take genius. It takes diligence. It takes moral clarity. It takes ingenuity. And above all, it takes a willingness to try.”
References

15. ISO


23. “The ABC’s of quality improvement: Audit, Basics and then the Clever stuff” Richard Lyon, TOPCAT study, London Trauma Conference 2013