The NICE acute kidney injury guideline: questions still unanswered

The National Institute for Health and Care Excellence (NICE) (2013a) has released its clinical guideline on the prevention, detection and initial management of acute kidney injury to much fanfare and a groundswell of goodwill towards the success of the initiative. The guidance brings acute kidney injury management – and its well-documented deficiencies (Stewart et al, 2009) – to the heart of the patient safety agenda and, it is hoped, will catalyse improvements towards uniform, high standard care. However, it is important to cast a critical eye over the project's recommendations, its intentions and its possible unintended consequences.

The first issue to address is credibility. In terms of careful and measured treatment recommendations, NICE has great cachet. Media interest in the guideline was significant although reporting of any health-care-related story will be viewed with circumspection by the expert reader; on the BBC news website, Roberts (2013) noted the condition to be 'almost entirely preventable' and, although it 'kills up to one in every four sufferers', that 'good hydration is key'. A predictably reductive approach it might seem, until one looks at the accompanying press release from NICE (2013b), which states that the condition is 'completely preventable'.

Within the currently fraught and, at times, toxic discourse on health-care quality it is not clear how well such overstatement might serve patients at risk of and with acute kidney injury. Trying to shoe-horn simplistic and precipitate fixes into a highly heterogeneous and complex clinical problem should be resisted.

So what of the recommendations themselves?

The NICE clinical guideline largely echoes standards documents developed nationally (Lewington and Kanagasundaram, 2011) and internationally (KDIGO, 2012) with key themes including prevention, detection, diagnosis of the underlying cause and specialist renal referral. The incorporation of specific guidance on acute kidney injury in children and young people is welcome. There is little controversy in the recommendations, per se, but there are more generic considerations.

The first relates to 'skew'. Best practice recommendations are derived as much from expert opinion (Stewart et al, 2009) as from a very limited literature. The evidence-based nature of NICE recommendations means that extensive guidance is given on prevention of contrast-induced nephropathy, which has a relatively good background literature, but clear recommendations on managing nutrition, hyperkalaemia or metabolic acidosis are not so apparent.

The second consideration is 'practical application', i.e. can they be incorporated within existing clinical workflows? To illustrate the quandary, NICE recommends that those at increased risk of contrast-induced acute kidney injury but with contraindications to intravenous fluids be discussed with a nephrologist. It is not clear what the latter can offer in this case but there is a risk that the decision to proceed with the investigation will default to the remote specialist – patient unseen. Such a discussion, if needed, should take place at a much more senior level than may actually be occurring. A variety of other examples – the decision to continue an angiotensin-converting enzyme inhibitor, even the frequency of creatinine monitoring (according to 'clinical need' says the guideline) – reinforce the complexity and nuance of best practice in acute kidney injury care.

Successful implementation of NICE guidance would help address the ~30% of acute kidney injury that may be preventable (Lewington and Kanagasundaram, 2011), although poorly informed iatrogenesis must be distinguished from recognized treatment risks. Successful implementation would also help address the ~50% of cases in which care may be sub-optimal (Stewart et al, 2009) although the heavy reliance on expert opinion rather than high quality evidence must be re-emphasized. How can poor practice be best avoided while accommodating more nuanced aspects of care?

The initial response is to ask who will be delivering these recommendations. In most cases, this will be (often junior) medical trainees. Local consideration must be given to how the relevant clinical experience needed for more complex decisions can be quickly accessed. More fundamentally, there are decisions that require thought but might be deemed inappropriate for escalation – taking the frequency of creatinine monitoring of the at-risk patient as an example:

- Initial recognition of high risk must take account of 14 separate risk factors, one requiring further consideration of the many drugs with nephrotoxic potential
- High risk might need to be communicated across different shifts, teams and wards over the course of a hospital stay
- The level of risk must be adjusted according to changes in the patient's clinical condition
- An appropriate frequency of creatinine monitoring must be maintained across these changing circumstances.

Thus decision-making processes may be complex even for apparently straightforward tasks. Education must play a role but even with acute kidney injury covered on under- and postgraduate curricula, there are still serious knowledge gaps in the basics of diagnosis and management among regional junior medical staff (Muniraju et al, 2012). The effectiveness of different educational approaches must be tested but the heterogeneous nature of acute kidney injury and deficiencies in its management may reflect more fundamental problems with the delivery of health care in the context of fractured teams, more limited clinical exposure, an ageing population and increasingly complicated treatments.

Electronic clinical decision support

It is on this background that electronic clinical decision support has been mooted as a potential solution to protect patients from

clinical and organizational deficiencies in acute kidney injury care. The need for relatively simple biochemical criteria to diagnose acute kidney injury, on face value at least, lends itself to automated electronic alerts triggered when patients meet these criteria.

Systematic reviews of electronic clinical decision support for a variety of conditions have shown that it may be effective in improving care (Garg et al, 2005; Kawamoto et al, 2005), but much of the published data have not met the gold standard of the randomized trial. Even in randomized studies there is evidence of alert fatigue (Gurwitz et al, 2008), low levels of use and high levels of end-user dissatisfaction (Rousseau et al, 2003), and unintended clinical consequences involving withholding essential treatment (Strom et al, 2010).

Alerts that have improved practice may still have high rates of non-adherence, with one systematic review of medication-related clinical decision support finding override rates of 49–96% (van der Sijs et al, 2006). These overrides may be appropriate in the broader context of patient management, but not accounted for in the decision support system. Such tools may complicate patient management by forcing the end-user to interpret the solution he/she has been presented with (Rousseau et al, 2003).

Issues relevant to clinical decision support for acute kidney injury include false positive alerts (e.g. by the dialysis patient), inappropriate biochemical thresholds and the impact of mandatory responses to alerts on clinical workflow (e.g. those of non 'home team' clinicians accessing the electronic record). All might strain end-user acceptance. There appears to be a strong tendency to ignore interventions in such cases (Litzelman and Tierney, 1996).

Understanding how technologies, people and organizations dynamically interact and the importance of pre-existing attitudes may allow tailoring and integration of clinical decision support systems into existing work patterns. Failure to account for these factors may explain the limited success to date.

There are limited data on electronic clinical decision support specific to acute kidney injury. The most positive, from a Belgian single-centre intensive care study, showed that use of phone text alerts to the responsible clinician significantly improved intervention response times and rates of reversal of milder acute kidney injury (Colpaert et al, 2012). However, most alerts were triggered by modest reductions in hourly urine output suggesting that clinicians were responding to pre-renal disease rather than overt acute kidney injury. The applicability of these findings outside critical care is unclear.

Conclusions

The over-riding uncertainty about how best to apply the guideline remains. It is telling that only one research recommendation relates to implementation – the impact of early nephrologist intervention. Preliminary evidence shows that early nephrologist intervention in hospital-acquired acute kidney injury may be beneficial (Balasubramanian et al, 2011) but whether this is applicable in routine practice is not clear, with findings of sometimes poor renal advice (Stewart et al, 2009) suggesting that this might not be the panacea that one might expect.

As well as a need to define the key elements of best practice, different models of implementation of best practice must be examined: early nephrology intervention, clinical decision support-enhanced practice by non-nephrologists, catch-all processes which minimize the need for complex decision making (e.g. automated daily creatinine measurements for specific patients, standardized fluid assessment checklists).

By propelling the issue to the heart of the patient safety agenda, the guidance is a significant step forward in improving the care of those at risk of and with acute kidney injury. However, with so many unanswered questions the need to innovate, collaborate and share cannot be understated. **BJHM**

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KEY POINTS

- NICE guidance has propelled acute kidney injury to the heart of the patient safety agenda.
- Optimal templates for implementation of best practice have yet to be defined.
- Education must play a central role but may not overcome the complexity and logistical difficulties of modern medical practice.
- There is a pressing need to assess different models of care.