



## Audit

# Near misses in bladder cancer – an airline safety approach to urology

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**Introduction:** Traditionally, surgical audit has identified and highlighted the incidence of adverse events complicating a patient's care. The airline industry has taken this concept a step further back by identifying and studying near misses, *i.e.* events that have the potential to do harm. We have applied this approach to patients with known or suspected bladder cancer.

**Patients and Methods:** A prospective study was performed by two urology firms on all patients with known or suspected bladder cancer over a 3-week period. Patients presented to either a central (hub) hospital, or to an associated (spoke) hospital. Four stages in bladder cancer care were considered: (i) diagnostic or check flexible cystoscopy; (ii) admission to hospital prior to TURBT; (iii) peri-operative period; and (iv) first out-patient consultation. A separate proforma, comprising various aspects of management was used for each of these stages of care. If any one criterion was not met, the episode was recorded as a near miss. Near misses were classified as due to capacity limitations in the system, clerical error, equipment failure, clinical error and patient failure.

**Results:** A total of 115 completed episodes were recorded. A near miss was recorded in 65 (56.5%) of all episodes. Capacity limitations accounted for 54%, clinical error for 23%, clerical error for 16%, patient failure for 5% and equipment failure for 2% of all recorded near misses. Of particular note is that near misses relating to diagnosis were more common at the spoke hospital, delayed referral from GPs accounted for more than 25% of clinical error, diagnosis of 5 new bladder tumours was delayed and availability of upper tract imaging was a problem at all phases of patient management.

**Conclusions:** Near misses are very common in the management of patients with bladder cancer, and their identification should provide a useful framework for identifying potential areas for improvement in patient care.

**Key words:** Bladder cancer – Airline safety approach – Audit – Management of care

A number of factors are believed to be important in the safety of a healthcare system. Any patient is subject to a continuum of potential hazards ranging from the apparently trivial to near misses and full-blown adverse events. Under-reporting of adverse events is estimated to

range from 50–96% annually<sup>1–3</sup> and the US Institute of Medicine estimates that each year 44,000–98,000 people die as a result of medical errors.<sup>4</sup> In England, a recent pilot study by the National Patient Safety Agency (NPSA) identified 27,000 adverse events over a 9-month study

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period.<sup>5</sup> Reducing error, therefore, is central to improving quality and this is emphasised to all doctors in UK General Medical Council guidelines.<sup>6</sup>

Traditionally, surgical audit has centred on studies of adverse events. The nuclear power industry, petrochemical processing, steel production, military operations and aviation industries, however, have taken this concept a step back by identifying and studying near misses, *i.e.* an event that has the potential to do harm. Many of these industries have systems for reporting near misses. These same processes can be applied to healthcare provision.

We have applied 'the airline approach' to patients with known or suspected bladder cancer in an attempt to quantify the size of this potential hazard in our department. In this study, a 'near miss' was defined as any event that could have led to harm. We hoped to identify events that could be prevented by a change in practice.

### Patients and Methods

A prospective study was performed by two urology firms on all patients with known or suspected bladder cancer over a 3-week period during August 2000. Patients presented to either the central (hub) hospital, or to an associated (spoke) hospital. The patient's hospital journey was divided into four stages: (i) diagnostic or check flexible cystoscopy; (ii) admission to hospital prior to a transurethral resection of bladder tumour (TURBT); (iii) operative and peri-operative period; and (iv) first out-patient consultation following surgery.

A separate proforma, comprising various aspects of management, was used for each of these stages of care. Each completed proforma was regarded as an episode. If any one criterion was not met, the episode was recorded as a near miss (Table 1). Near misses were further classified as those due to capacity limitations in the system, clerical error, equipment failure, clinical error and patient failure.

### Results

For the whole study period, we recorded 115 completed episodes. Overall, we found 65/115 (57%) of all episodes were associated with a near miss

#### *Diagnostic or check flexible cystoscopy*

A total of 59 flexible cystoscopies were performed during the study period. They included 12 check and 38 diagnostic flexible cystoscopies at the associated (spoke) hospital and 9 diagnostic flexible cystoscopies at the central (hub) hospital. For the associated hospital, 28/38 (74%) of the diagnostic flexible cystoscopies were for

macroscopic haematuria and 10/38 (26%) were for microscopic haematuria. All of the cystoscopies at the central hospital group were part of the investigation of macroscopic haematuria.

In the macroscopic haematuria group attending the associated hospital, there was a delay in 25/28 (89%) patients with a median delay of 6 weeks (range, 5–22 weeks). New bladder tumours were identified in three of this subset of 25 delayed patients. Of the 9 patients seen in the central hospital, there was delay in 3/9 (33%) with a median delay of 4 weeks (range, 5–6 weeks). New bladder tumours were seen in 1/3 (33%) of this subset of 3 delayed patients.

In the microscopic haematuria group, there was a delay in 6/10 (60%) patients with a median delay of 15 weeks (range, 14–17 weeks). New bladder tumours were identified in 1/6 (17%) of this subset of 6 delayed patients.

For the check flexible cystoscopy group, we identified a delay in 5/12 (42%). Of the 5 delayed patients, 1/5 (20%) was found to have a tumour recurrence. Tumour recurrences were found in 2/7 (29%) of the remaining 7/12 (58%) without a delay.

Based on our criteria for a near miss (Table 1), further analysis identified a greater than 2-week delay from GP referral in 12/47 (25.5%) of all new referrals with haematuria, 6/59 (10%) of patients did not attend their appointments and in 4/59 (6.7%) of cases no medical notes were available.

Two or more near misses during a single episode were seen in 18/59 (30%) of all patients referred for flexible cystoscopy.

#### *Admission to hospital prior to TURBT*

For this part of the study, a total of 18 in-patient episodes was recorded. Based on our criteria (Table 1), we identified a near miss in 12/18 (67%) of these in-patient episodes.

We found that 9/18 (50%) of patients being admitted for a TURBT experienced delays of greater than 3 weeks from diagnosis. The median delay was 8 weeks (range, 6–16 weeks). When we considered the delay since the onset of symptoms, we found 6/18 (33%) of patients experienced delays of greater than 8 weeks with a median delay of 19 weeks (range, 13–30 weeks).

According to our study criteria (Table 1), the remaining near misses consisted of no imaging in 4/18 (22%), imaging report only in 3/18 (17%), ultrasound scan only in 2/18 (11%), missing notes in 2/18 (18%) and late admissions after 16:00 in 3/18 (17%) of all episodes. Only one patient was cancelled due to lack of theatre time and all patients had been pre-assessed. Re-assuringly, no check cystoscopy had to wait more than 8 weeks beyond scheduled time for their procedure.

Table 1 Criteria for a near miss

Diagnostic or cheek flexible cystoscopy
• > 4-week delay since referral for macroscopic haematuria
• > 12-week delay since referral for microscopic haematuria
• > 2-week delay since GP referral
• > 4-week delay from scheduled appointment for surveillance check cystoscopy
• Incomplete or missing medical notes
• Patient non-attendance for appointment
Admission to hospital prior to TURBT
• > 8-week delay since symptoms if a new patient
• > 3-week delay for stage T1, carcinoma <i>in situ</i> (CIS) or grade 3 tumours
• > 8-week delay from scheduled appointment for surveillance cystoscopy
• Absent or unavailable upper tract imaging or medical notes
• No pre-assessment
• Admission after 16:00
• Cancelled procedure due to bed shortage or patient non-attendance
Operative and peri-operative period
• Adverse anaesthetic events
• Absent or unavailable X-rays
• Absence of TED stockings
• Poor visualisation and/or obturator kick
• Recovery or catheter problems
First out-patient consultation
• > 4-week delay since surgery
• Non-administration of intravesical mitomycin
• Absence of documented examination under anaesthetic
• Absence of histology report
• Absence of muscle in specimen
• Incorrect TNM classification
• Absent or incomplete imaging (if not present at operation)

Overall, a single near miss was identified in 12/18 (67%) of cases and 2 or more near misses were identified in 5/18 (28%) of all recorded episodes for this part of the study.

#### Operative and peri-operative period

We recorded a total of 21 episodes for this part of the study. Based on our study criteria (Table 1), the near misses consisted of no X-rays in theatre in 6/21 (29%) of cases, no graduated compression device (TEDS) in 1/21 (5%) of cases, poor visualisation in 1/21 (5%) of cases, obturator kick in 1/21 (5%) of cases and catheter problems

Table 2 Summary of recorded near misses

	Capacity limitation	Clinical error	Clerical error	Patient failure
Diagnostic or check flexible cystoscopy	39/59	12/47	4/59	6/59
Admission to hospital prior to TURBT	13/18	6/18	5/18	0/18
Operative and peri-operative period	0/21	5/21	6/21	0/21
First out-patient consultation	2/17	7/17	0/17	0/17

in 1/21 (5%) of the recorded episodes. There were no adverse anaesthetic events but one patient needed to return to theatre to control bleeding and one other developed a urethral haematoma.

Overall, a single near miss was identified in 8/21 (38%) of cases and two or more near misses were found in 2/21 (10%) of all recorded episodes for this part of the study.

#### First out-patient consultation

A total of 17 episodes were recorded during the 3-week study period relating to the first out-patient review. There was a total of 5/17 (30%) near misses consisting of no post-operative mitomycin I/ 1 7 (6%), no record of an examination under anaesthetic 1/17 (6%), no muscle in specimen 1/17 (6%), delay of greater than 4 weeks since surgery 2/17 (12%), and no upper tract imaging 4/17 (24%). Histology was available on all patients and all had the correct TNM classification. Two or more near misses were present in 3/17 (18%).

For the entire study, we found capacity limitations accounted for 54% of near misses, clerical error 16%, equipment failure 2%, clinical error 23% and patient failure 6%. The distribution of near misses has been summarised in Table 2.

#### Discussion

This study clearly demonstrates that near misses are common, and can present at all stages of a patient's investigation, diagnosis, treatment and subsequent recovery. In our series, near misses were most often due to a delay in diagnosis and treatment, clinical error (although much of this could be attributed to a delayed referral from primary care), clerical error and patient failure.

Our definitions of delay constituting a near miss in this study are based on UK Government guidelines. This study was performed before the introduction of the 2-week wait rule. This rule stipulates that all urgent cancer referrals must be seen within 2 weeks from the point of referral.<sup>7</sup> These guidelines also suggest that no patient diagnosed with cancer should have to wait more than 4 weeks from the point of diagnosis to definitive treatment. Based on these guidelines, we found that 89% of our

patients presenting with macroscopic haematuria and 60% of patients of microscopic haematuria had a delayed diagnosis. In each of these groups, there were 12% and 17% of cases, respectively, diagnosed with a new cancer. Similarly, 50% of patients diagnosed with a new cancer had a delay in excess of 3 weeks from diagnosis before they underwent their definitive treatment.

Over 50% of our recorded near misses were due to capacity limitations and this figure could well be significantly higher if we assume similar constraints exist in primary care to account for delayed referrals to hospital specialists. These capacity limitations are unlikely to change in the short-term. We must, therefore, find ways to improve performance within existing resources. As in industry, this will only be possible by the continuous process of rigorous audit and review of internal processes. It is only once we have systems in place that enable us to review, improve and monitor effectively any changes implemented that we might see improvement in outcome for patients.

The same processes can be applied to help reduce near misses due to clerical error. They accounted for 16% of total near misses and much of the aetiology surrounding their occurrence relates to internal departmental and hospital processes.

Clinical error accounted for 23% of all recorded near misses. Although 12/30 (40%) of these being due to delayed referral from primary health care (Table 2), this figure is too high and must be addressed. Improved education and training will undoubtedly help reduce this figure; however, despite this, some degree of clinical error will always exist. These events need to be regarded as learning opportunities and not simply as a means of apportioning blame. It is only when we are able to accept and learn from such mistakes within an open culture of error reporting that we might further improve performance and the quality of the health care provided.

There is certainly a strong impetus for change emerging since the introduction of clinical governance. Some specialities have already established systems for the reporting of critical incidents and near misses.<sup>8</sup> Also, whereas previously chief executives were solely responsible for the budgetary control of a hospital, it is now within their remit to ensure that the services their trust provides is of sufficient quality. The UK Department of Health has recognised these responsibilities<sup>9-11</sup> and the UK Government has introduced regulatory agencies such as the National

Patient Safety Agency (NPSA)<sup>5</sup> to address some of these issues. In this new age of critical self-appraisal, we cannot justify the existence of this degree of potential risk to patient safety and outcome. We must, therefore, constantly aim to improve; perhaps our emphasis should be more focused towards identifying near misses prior to the occurrence of an adverse event.

## Conclusions

This study has demonstrated a near-miss rate that is comparable to previous published series and has highlighted some important shortfalls within our department. As a direct result of this study, we have created a new specialist haematuria clinic at the associated hospital, our 5-day (Monday–Friday) ward has been converted to a 7-day-a-week ward to help alleviate some of the capacity limitations, and a new consultant has been appointed to the service to improve some of the difficulties we have identified. Furthermore, we have also allocated a single consultant to audit bladder cancer. These organisational changes and this injection of resources shows clearly the power of audit in effecting change.

## References

1. Leape LL. Error in medicine. *JAMA* 1994; **272**: 1151–7.
2. Institute of Medicine. *To Err is Human; Building a Safer Health System*. Washington, DC: National Academic Press, 1999.
3. Brennan T, Leape LL, Laird N, Herbert L, Localio AR, Lawthers AG *et al*. Incidence of adverse events and negligence in hospitalised patients. *N Engl J Med* 1991; **324**: 370–6.
4. Helmreich RL. On error management: lessons from aviation. *BMJ* 1999; **320**: 781–5.
5. Department of Health. *Doing Less Harm – National Patient Safety Agency*. London: Department of Health, 2002; <www.npsa.org.uk>.
6. General Medical Council. *Good Medical Practice*. London: General Medical Council, 1995; <www.gmc-uk.org>.
7. Department of Health. *The NHS Cancer Plan – A Plan for Investment, A Plan for Reform*. London: Department of Health, 2001; <www.doh.gov.uk/cancer/cancerplan.html>.
8. The Royal College of Anaesthetists. Critical incident reporting 2001. *R Coll Anaesth Bull* 2001; **9**: 413–4 <www.rcoa.ac.uk/critincident/ciweb.html>.
9. Department of Health. *A Commitment to Quality, A Quest for Excellence*. London: Department of Health, 2001; <www.doh.gov.uk>.
10. Department of Health. *Building a Safer NHS for Patients*. London: Department of Health, 2001; <www.doh.gov.uk/buildsafens>.
11. Health and Safety Executive. *HSG65 – Successful Health and Safety Management*. London: Health and Safety Executive <www.hse.gov.uk>.