

ACTASM

Annual Report 2020



Acknowledgements

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The information contained in this report has been prepared under the auspices of the Royal Australasian College of Surgeons, Australian Capital Territory Audit of Surgical Mortality Management Committee, which is a declared quality assurance committee under the *Health Act 1993*. The Australian and New Zealand Audit of Surgical Mortality, including the Australian Capital Territory Audit of Surgical Mortality, has protection under the Commonwealth Qualified Privilege scheme under Part VC of the *Health Insurance Act 1973* (gazetted 25 July 2016).

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ACTASM Clinical Director's report

I am pleased to present the report that covers the period 2018–2019. This is my first as the Clinical Director and I would like to thank Dr John Tharion for his contribution to the establishment and growth of the audit process in the ACT over the last 10 years.

ACTASM has excellent participation by surgeons and health facilities. However, there continues to be delays in the timely completion of surgical case forms (SCFs) by a few surgeons. This is reflected in the overdue SCFs in this report. A timely audit process is essential so that self-reflection and review of the mortality occurs when it is fresh in the mind of the treating surgeon. Participation in the ANZASM process is now a mandatory component of the continuing professional development (CPD) for RACS Fellows and for registration with the Medical Board of Australia. We hope to work with the hospitals to have early notification of deaths so that the audit process can commence without any delay and engage with surgeons to facilitate early completion of the SCF.

Inter-hospital transferred patients accounted for a third of the mortalities in the reported period, with delay in transfer being identified as occurring in 20% of the mortalities. Overall clinical management issues (CMI) that were considered to be definitely preventable by assessors were higher than the national average and appear to be increasing over time. However, the proportion of cases where serious CMIs were identified was lower than the national average and appears to be trending down. Overall, there were fewer consultant-performed operations than the national average during the reporting period.

I would like to thank ACT health for the continued funding of this important quality assurance activity. I would also like to thank the ACTASM team, the members of the ACTASM committee, RACS and the surgeons for the commitment to the audit process and ultimately to the provision of safe and quality surgical care to the residents of the ACT and the surrounding regions.

Associate Professor Sivakumar Gananadha Clinical Director, ACTASM

Executive summary

Background

The Australian Capital Territory Audit of Surgical Mortality (ACTASM) is an audit process that provides independent and external peer review of care associated with surgery-related deaths within the Australian Capital Territory (ACT). ACTASM is funded by the ACT Health Directorate.

The objectives of ACTASM are to:

- encourage and support surgeons to appraise their own clinical care management
- encourage and support surgeons to appraise their peers' clinical care management
- inform, educate, facilitate change and improve practice by providing feedback about surgical deaths in the ACT.

The audit is systematic and confidential, which aims to inform and improve surgical practice with the goal of improving the quality of patient care. This report covers surgery-related deaths that occurred between 1 January 2018 and 31 December 2019, with a census date of 22 October 2020.

Findings

A total of 258 deaths were notified to ACTASM during this period, of which 147 cases from 41 consultant surgeons have undergone the full audit process (as of the census date). A further 73 cases are pending evaluation, while 38 were excluded due to being terminal care admissions.

Consistent with national trends, patients with in-hospital surgical mortality were more likely to be male (60%) and elderly (76–80 years old), with a significant proportion (78%) having at least one comorbidity and 69% being assessed as having an American Society of Anesthesiologists (ASA) grade of 4 or higher.

Patients in the ACT were more likely to be admitted as a result of transfers (compared with national trends); however, delays in these transfers were more likely to be reported when compared against national data. Consultants performed the operations in these cases less frequently than did their national colleagues (65%), while use of critical care unit facilities (74%), unplanned returns to theatre (20%), and presence of potential anaesthetic issues (11%) were all higher than the national averages. Approximately one-third of patients died with a clinically significant infection, and one-third had at least one postoperative complication.

Following assessment, 78% of cases in 2018 and 90% of cases in 2019 did not have any clinical management issues (CMIs) identified with regard to their surgical care. For the remainder, 65% of CMIs identified were considered definitely or probably preventable.

Conclusions

Improving surgeon engagement continues to be a focus for ACTASM, with emphasis being placed on the timely submission of surgical case forms (SCFs) to facilitate relevant feedback that can contribute to improved surgical practice. This report has also identified aspects in the pathway of surgical care that could be improved.

Introduction

The Australian Capital Territory Audit of Surgical Mortality (ACTASM) was established in 2010 with the goal of supporting surgeons in their continuing professional development (CPD). It has done this through the establishment of an independent peer-review process for all instances of in-hospital mortality associated with surgical care. A brief outline of this process can be viewed in Figure 1, which is expanded upon in the Methods section.

ACTASM is funded by the ACT Health Directorate and is governed by the ACTASM Management Committee, which itself falls under the governance of the Australian and New Zealand Audit of Surgical Mortality (ANZASM), a national, independent peer-review audit that seeks to identify deficiencies of care pertaining to surgical mortality. All Australian states and territories participate in ANZASM under the governance of the Royal Australasian College of Surgeons (RACS), with the exception of New South Wales (which maintain the Collaborating Hospitals' Audit of Surgical Mortality with RACS support). ACTASM is gazetted as a quality assurance activity of the Commonwealth Qualified Privilege Scheme under Part VC of the *Health Insurance Act 1973* (gazetted 25 July 2016). The purpose of the audit is to be educational in nature, providing a positive and constructive professional development process for the surgical community.

ACTASM has developed memorandums of understanding with all public and private hospitals in the ACT for audit participation. These hospitals provide tertiary surgical services to residents of the ACT and the wider southern NSW area. Surgeons in the ACT see a wide and varied range of clinical presentations, and ACTASM contributes to improving surgical care and outcomes for both the ACT and bordering NSW towns.

Figure 1: Flow diagram summarising the audit process applied by ACTASM



By utilising the data obtained by ACTASM, this report covers the clinical and demographic characteristics of surgery-related deaths that occurred between 1 January 2018 and 31 December 2019. The report explores perspectives on case management from both surgeons and assessors, and identifies areas of improvement for the ongoing professional development of surgeons, systems and processes.

Methods

Data collection

ACTASM receives notifications of in-hospital surgical deaths from public and private hospitals, and from surgeons themselves. Inclusion criteria for deaths notifiable to ACTASM are either of the following:

- any patient admitted to hospital by a surgeon, regardless of whether a procedure took place
- any hospital admission where a procedure took place that was performed by a surgeon.

Following notification of a patient death, ACTASM requests that the consultant surgeon responsible for the patient submits a surgical case form (SCF) reporting clinical, diagnostic and procedural data of the patient's final hospital admission. As part of the submission, opportunity is provided for the consultant surgeon to identify any clinical management issues (CMIs) that occurred during the course of patient care. It is also possible, at this point, for a consultant surgeon to declare a case to have been a terminal admission (i.e. the patient was palliated almost immediately upon admission, with no surgical intervention taking place). Terminal admissions are excluded from the full audit process.

When ACTASM receives an SCF, the contents are reviewed for clarity, de-identified and assigned for first-line assessment (FLA). Assessors provide initial feedback on the overall management of a case and the level of care provided. They also indicate whether there is a need for further evaluation via second-line assessment (SLA), which includes medical note review. An SLA can be requested because of insufficient information from which to reasonably evaluate a case, or because of specific questions arising from the FLA. All assessors invited to evaluate submissions are independent of the institution from which the case arose and are required to sign a declaration acknowledging the confidentiality of the process. SLAs allow for the provision of in-depth feedback to the consultant surgeon responsible for the case.

CMIs identified by surgeons or assessors as part of the audit process may be classified into 3 categories:

- *Area of consideration*: where the clinician believes areas of care could have been improved but recognises that this is debatable.
- Area of concern: where the clinician believes that areas of care should have been better.
- *Adverse event*: an unintended injury caused by patient management rather than by the disease process, which is sufficiently serious to lead to prolonged hospitalisation or to temporary or permanent disability of the patient, or which contributes to or causes death.

The collection of SCF and FLA data is facilitated through an online platform known as the <u>Fellows</u> <u>Interface</u>, to which surgeons have access. Data from SLAs are entered into the system by RACS staff using a bespoke program (Binational Audits of Surgical Mortality – ANZASM database). All data are stored securely and encrypted in the ANZASM database using Microsoft SQL Server 2016. Data subsets are scrutinised for consistency on a monthly basis.

Collaborations

RACS has existing collaborations with the Australian and New Zealand College of Anaesthetists (ANZCA) and the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) for participation in ACTASM. For any case involving gynaecological surgery, the treating surgeon is invited to participate in the audit and to voluntarily submit the case to ACTASM. Similarly, Fellows from the Royal Australian and New Zealand College of Ophthalmologists (RANZCO) and the Royal Australian and New Zealand College of Ophthalmologists (RANZCO) and the Royal Australian College of Dental Surgeons (RACDS) are invited to participate in the audit on a voluntary basis if they are associated with a patient death. Participation in ACTASM has been mandated by the Australian Orthopaedic Association (AOA) as part of its CPD program.

Data analysis

Data were extracted from the ANZASM database covering the period from 1 January 2018 through to 31 December 2019, inclusive (census date 22 October 2020). All data pertain to patient admissions to ACT hospitals.

Categorical variables are expressed as proportions. Continuous variables are expressed as means (+/- standard deviation) for normal data and medians (with 25th and 75th percentile) for non-normal data.

All data were analysed using R version 4.0.2 (1).

Results

Status of the audit

There were 258 deaths notified to ACTASM during the 2018–2019 period, of which 147 have completed the full audit process and feedback has been delivered to surgeons (Table 1). A further 73 cases are still undergoing the audit process, while 38 have been excluded (as of the census date). Improving surgeon engagement for timely submission of SCFs and expeditious completion of assessments continues to be a focus for ACTASM.

Year*	Completed	In progress	Excluded	Total
2011	79	0	27	106
2012	86	0	25	111
2013	102	0	21	123
2014	104	0	14	118
2015	111	0	26	137
2016	105	0	23	128
2017	126	6	25	157
2018	87	29	17	133
2019	60	44	21	125
TOTAL	860	79	199	1,138

Table 1: Status of ACTASM cases at census date

Note: Excluded cases comprise non-surgical, non-participant, lost to follow-up or terminal care cases. Cases in progress include SCFs and FLAs or SLAs that are awaiting completion. Non-participant cases represent those where a death may have occurred under the care of a surgeon who was not mandated to participate in the audit.

* ACTASM began official data collection in October 2010; however, this table presents data from 1 January 2011 to 31 December 2019 only.

The 147 ACTASM cases that were fully audited as of the census date were included in analyses for the remainder of this report. These cases were reported from the following surgical specialties (Table 2).

Surgical specialty	2018 n (%)	2019 n (%)
General	30 (34.5)	21 (35.0)
Neurosurgery	17 (19.5)	9 (15.0)
Orthopaedic	15 (17.2)	4 (6.7)
Vascular	11 (12.6)	7 (11.7)
Urology	6 (6.9)	2 (3.3)
Cardiothoracic	4 (4.6)	7 (11.7)
Other*	3 (3.4)	7 (11.7)
Plastic	1 (1.1)	2 (3.3)
Otolaryngology Head and Neck	0 (0.0)	1 (1.7%)

Table 2: Notifications of death according to specialty

Note: * non-surgical admission where surgical intervention took place. Data includes n = 87 cases for 2018 and n = 60 cases for 2019.

A difference in the proportion of fully audited cases for particular specialties was noted (Figure 2). This may suggest that there are particular specialties ACTASM needs to re-engage with so as to facilitate timely provision of feedback.





Note: data includes n = 87 cases for 2018 and n = 60 cases for 2019.

Patient demographics

The clinical demographics of cases reported to ACTASM are summarised in Table 3 and compared against the national dataset. Of particular note, in the ACT consultants were less likely to be present in theatre and more patients were returned to theatre. ACTASM cases were also more likely to be transferred, with delays occurring during those transfers. These data may reflect systemic issues and should be explored further.

Table 3: Clinical characteristics of cases reported to ACTASM, compared with those reported	
to ANZASM (except NSW), 2018–2019	

Area for comparison	ACTASM	ANZASM
Patient profile and case mix		
Proportion of males, females (%)	59.9, 40.1	58.1, 41.9
Median age males, females (years)	75.8, 80.1	75.5, 78.4
Maximum age (years)	98.4	104.5
Emergency admission (%)	85.0	86.0
Elective admission (%)	15.0	14.0
ASA Score ⁽²⁾ ≥4(%)	68.8	64.2
Patients with comorbidities (%)	78.2	87.9
Risk of death graded considerable or expected by treating surgeon (%)	63.8	61.1
Hospital care		
DVT prophylaxis used (%)	88.4	81.1
Treated in CCU (%)	74.1	62.2
Fluid balance issue (as rated by assessor) (%)	4.8	6.7
Patient transferred (%)	32.9	26.4
Transfer delays identified (%)	20.0	10.4
Operations		
Patients who had at least one operation (%)	78.9	81.9
Patients who did not have an operation (%)	21.1	18.1
Patients who had more than one operation (%)	24.1	22.3
Maximum number of operations per patient (n)	5.0	18.0
Consultant performed operation (%)	64.5	71.8
Patients with an unplanned return to theatre (%)	20.2	15.4
Anaesthetic issues* (%)	11.2	7.7
Operation abandoned (%)	7.2	5.6
Patient outcomes		
Patients with an identified infection (%)	33.3	32.9
Postoperative complications (%)	33.9	30.5
Clinical management issues		
Definitely preventable CMIs [#] n (%)	11/43 (25.6)	537/3047 (17.6)
Areas of concern and adverse events (% patients)	6.2	10.8

Abbreviations: ACTASM = Australian Capital Territory Audit of Surgical Mortality, ANZASM = Australian and New Zealand Audit of Surgical Mortality, ASA = American Society of Anesthesiologists, CCU = critical care unit, DVT = deep vein thrombosis. Note: * proportion of patients where a possible anaesthetic issue was identified by the treating surgeon. # Total number of CMIs across patients (multiple CMIs can occur in a single case). (2) see reference list.

For cases reported to ACTASM, the median age for males and females has not significantly altered since inception of the audit (Figure 3), and nor has the median length of stay (Figure 4).





Note: n = 860 ACTASM cases. Boxes indicate the median and interquartile range (IQR); whiskers show the range of data. Outlying (extreme) values were identified according to the IQR rule and omitted for clarity.



Figure 4: Hospital length of stay for ACTASM cases, 2011–2019

Note n = 859 ACTASM cases (data missing n = 1). Boxes indicate the median and interquartile range (IQR); whiskers show the range of data. Outlying (extreme) values are indicated with dots.

Operative details

The relatively short median length of stay may be due to the high proportion of cases that were emergency presentations. This is reflected in Figure 5, where a significant proportion of cases were deemed of high urgency (i.e. operations were immediate or within 24 hours of presentation).



Figure 5: Urgency of operation as determined by surgeon

Note: in 2018 there were 94 operations in 71 patients and in 2019 there were 62 operations in 45 patients.

In 21% of ACTASM cases, no operation was performed. This was attributed to: an active decision not to operate (58%), rapid death of the patient (10%), not a surgical problem (32%), or the operation was refused by the patient (13%). (These are not mutually exclusive.) Figure 6 shows the number of cases for which there was an active decision not to operate.



Figure 6: Proportion of ACTASM cases with an active decision not to operate, 2011–2019

Note: n = 860 ACTASM cases. Whiskers show 95% confidence intervals for the observed percentages.

Clinically significant infections

Of the cases reported to ACTASM during 2018–2019, one-third died with a clinically significant infection present. As outlined in Figure 7, the overall trend indicates a decreasing proportion of these infections were acquired during admission.



Figure 7: Proportion of infections acquired before or during admission, 2011–2019

Note: data from 258 of 860 ACTASM cases where a clinically significant infection was reported.

The types of infections (where indicated) are summarised in Table 4.

Tabl	e 4:	: T	ype of	clinical	infectior	n reported	for	ACTASM	cases,	2017–20)19

Infection	2017	2018	2019
Pneumonia, n (%)	22 (47.8)	7 (28.0)	8 (33.3)
Intra-abdominal sepsis, n (%)	11 (23.9)	2 (8.0)	10 (41.7)
Septicaemia, n (%)	7 (15.2)	10 (40.0)	4 (16.7)
Other source [^] , n (%)	6 (13.1)	6 (24.0)	2 (8.3)

Note: n = 95 ACTASM cases. Values for 2017 are included because reducing infection rates associated with surgical mortality was a recommendation of the 2017 ACTASM report. ^ Other source is a selection option on the SCF; the source of infection may or may not have been identified and listed.

Of those infections acquired during admission, the majority were acquired postoperatively (Table 5).

	2017	2018	2019					
Preoperative acquisition, n (%)	8 (34.8)	1 (9.1)	2 (18.2)					
Postoperative acquisition, n (%)	13 (56.5)	10 (90.9)	7 (63.6)					
At surgical site, n (%)	1 (4.3)	0 (0.0)	1 (9.1)					
At other invasive site, n (%)	1 (4.3)	0 (0.0)	1 (9.1)					

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rable	5: Himing	and site of	r nospital-acc	juirea infectior	15, 2017-2019

Note: n = 55 ACTASM cases. Values for 2017 are included because reducing infection rates associated with surgical mortality was a recommendation of the 2017 ACTASM report.

For 88% of cases where a clinically significant infection was present, the surgeon indicated that the antibiotic regime was appropriate. Cases where a clinically significant infection was present were also associated with lengthier admissions (15 days) and more advanced age (77 years old) than the overall ACTASM cohort.

Management of surgical care

During the 2018–2019 period, 20% of admissions had an unplanned return to theatre, 7% of admissions had an operation abandoned and 11% of admissions were reported to have had potential anaesthetic issues during the course of patient management.

In 34% of fully audited cases at least one postoperative complication was identified, the majority of which were either tissue ischaemia or anastomotic leaks. Figure 8 depicts the proportion of postoperative complications according to admission status. Until 2019, postoperative complications were more common in elective admissions.



Figure 8: Incidence of postoperative complications according to admission status, 2011–2019

Note: n = 652 ACTASM cases. Whiskers show 95% confidence intervals for the observed percentages. Data missing = 24.2% (208/860).

The following areas (Figure 9) were identified by surgeons as aspects in the pathway of care that could potentially be improved in 2018–2019.



Figure 9: Assessor-identified areas for improvement in the pathway of care, 2018–2019

Note: n = 147 ACTASM cases. Whiskers show 95% confidence intervals for the observed percentages.

The number of cases where a CMI was identified by the treating surgeon is summarised in Table 6. The rates of CMIs reported by ACTASM are broadly similar to national trends, although in 2018–2019 serious CMIs for ACT were lower than the national average. The relative proportion of cases with no, minor or serious CMIs (as determined by the treating surgeon) appears relatively unchanged over the course of the audit.

	NO	CMIS	Mino		Seriou	s CMIS	l otal ca	ases (n)
Year	ACTASM	ANZASM	ACTASM	ANZASM	ACTASM	ANZASM	ACTASM	ANZASM
2011, n (%)	52 (40.0)	2153 (42.1)	68 (52.3)	2642 (51.6)	10 (7.7)	322 (6.3)	130	5117
2012, n (%)	67 (42.1)	2346 (42.6)	85 (53.5)	2856 (51.9)	7 (4.4)	303 (5.5)	159	5505
2013, n (%)	69 (40.6)	2551 (42.5)	90 (52.9)	3138 (52.3)	11 (6.5)	313 (5.2)	170	6002
2014, n (%)	73 (41.4)	2649 (42.1)	92 (52.3)	3281 (52.2)	11 (6.3)	356 (5.7)	176	6286
2015, n (%)	79 (42.5)	2774 (42.1)	93 (50.0)	3411 (51.8)	14 (7.5)	400 (6.1)	186	6585
2016, n (%)	86 (44.3)	2727 (42.6)	100 (51.6)	3298 (51.5)	8 (4.1)	377 (5.9)	194	6402
2017, n (%)	94 (42.7)	2796 (22.1)	114 (51.8)	9451 (74.7)	12 (5.5)	400 (3.2)	220	12647
2018, n (%)	67 (42.7)	2739 (42.5)	82 (52.2)	3279 (51.0)	8 (5.1)	417 (6.5)	157	6435
2019, n (%)	54 (47.3)	2576 (43.4)	59 (51.8)	3035 (51.2)	1 (0.9)	323 (5.4)	114	5934

Table 6: ACTASM and ANZASM cases with CMIs identified by the treating surgeon, 2011-19

Abbreviations: CMI = clinical management issue. Note: a minor CMI is an area of consideration, while a serious CMI is an area of concern or an adverse event.

In contrast, a minor decreasing trend is suggested in the overall number of CMIs identified by assessors (Figure 10). The proportion of cases where CMIs were present also appears to be higher among elective cases than for emergency cases.



Figure 10: Cases with one or more CMIs identified by assessors according to admission status, 2011–2019

Note: n = 840 ACTASM cases. Abbreviations: CMI = clinical management issue Whiskers show 95% confidence intervals for the observed percentages.

The proportion of cases where serious CMIs were identified by assessors also appears to be trending downwards (Figure 11).



Figure 11: Cases with one or more serious CMIs identified by assessors, 2011–2019

Note: n = 841 ACTASM cases. Abbreviations: CMI = clinical management issue. Whiskers show 95% confidence intervals for the observed percentages.

A total of 46 CMIs were identified across 30 cases during 2018–2019 (among fully audited cases). Of these, 30 CMIs were considered definitely or probably preventable by Assessors (Table 7). There appears to be a general trend of an increasing proportion of CMIs being considered preventable over time.

	Definitely preventable	Probably preventable	Total CMIs
Year			
2011, n (%)	11 (26.8)	13 (31.7)	41
2012, n (%)	4 (11.8)	15 (44.1)	34
2013, n (%)	8 (18.6)	19 (44.2)	43
2014, n (%)	3 (7.3)	17 (41.5)	41
2015, n (%)	3 (6.1)	25 (51.0)	49
2016, n (%)	3 (8.1)	14 (37.8)	37
2017, n (%)	12 (20.3)	34 (57.6)	59
2018, n (%)	12 (30.8)	17 (43.6)	39
2019, n (%)	0 (0.0)	1 (14.3)	7

Table 7: ACTASM cases where CMIs identified by assessors were considered preventable, 2011–2019

Note: CMIs considered 'probably not' or 'definitely not' preventable not included. Abbreviations: CMI = clinical management issue

Discussion

The current report provides a snapshot of the cases reported to ACTASM for the 2018–2019 period. It summarises the demography of those patients who died while under surgical care. Importantly, the perspectives of both surgeons and assessors on how these cases were managed has been explored. Some areas for improvement have been identified.

Surgeon engagement with the audit

The data reported in Table 2 (notifications of death by specialty) and Figure 2 (fully audited cases by specialty) suggest scope for improvement in engagement with ACTASM by the ACT surgical fraternity. Timely completion of SCFs directly affects the relevance of any feedback given, as does the quality of the SCF submission. On the one hand, this is something that can be addressed by surgeons availing themselves of the self-reporting feature in the <u>Fellows Interface</u>. On the other hand, prompt notification of patient (surgical) deaths by hospitals and/or ACT Health will facilitate efficient review of cases.

Patient management

When comparing ACT data to the national dataset (Table 1) a number of concerning trends became apparent. Given the location of ACT hospitals (with respect to regional interstate hospitals), a higher rate of patient transfers is to be expected; however, transfer delays were reported at twice the national rate. Other aspects of patient care also deviate from the national average, such as decreased consultant presence in theatre, increased use of critical care unit facilities, increased unplanned returns to theatre, and increased prevalence of potential anaesthetic issues. Hospitals are encouraged to review their procedures to ensure systems are in place that optimise patient care.

When considering that a little over one-third of the reported mortalities were for General Surgery, an additional option worthy of consideration is the Australian and New Zealand Emergency Laparotomy Audit – Quality Improvement (<u>ANZELA-QI</u>). Modelled after the National Emergency Laparotomy Audit (NELA) in the UK (3), <u>ANZELA-QI</u> aims to improve surgical outcomes after emergency laparotomy by providing feedback on key performance indicators in close to real time. Positive engagement from surgeons and hospitals would be required.

Postoperative complications and CMIs

In one-third of cases, postoperative complications were reported, the most common being tissue ischaemia and anastomotic leaks. The postoperative phase was also a high-risk time for infections acquired during admission. These are issues that warrant further consideration.

Regarding the identification of CMIs, self-reporting by ACT surgeons has remained relatively consistent over time. In contrast, assessors are reporting a decreasing incidence of CMIs, although a trend is noted towards an increasing proportion of CMIs being considered preventable. Surgeons are encouraged to consider their feedback from the audit in the hope that it will contribute incrementally to improved overall surgical outcomes.

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