



Meeting Title:	Executive Management Team		
Date:	27 November 2017	Agenda No	2.6
Report Title:	Safety Concerns in Cardiac Surgery		
Lead Director/ Manager:	Professor Andrew Rhodes, Medical Director		
Report Author:	[Redacted]		
Freedom of Information Act (FOIA) Status:	Restricted		
Presented for:	Update		
Executive Summary:	<p>The cardiac surgical team have had a difficult 24-month period. They first were found to have high infection rates, and subsequently high death rates from a national report. A local investigation has been completed, and confirmed that the elevated death rate was real, and therefore a response by the service was mandated.</p> <p>In tandem with the case note review of deaths, the pathways within the service have been explored, and changes implemented. This has included multi-disciplinary pathways involving the ward, Cardiac Intensive Care (CTICU), and theatres.</p> <p>This paper updates the EMT on the period after the publication of the national mortality alert so that an appraisal of the key safety metrics can be made enabling an assessment of on-going safety of the service.</p> <p>This paper concludes that: </p> <ul style="list-style-type: none"> • The mortality signal in cardiac surgery is a cause for concern. • [Redacted] • [Redacted] • There is a need to closely monitor the clinical risk in this service to ensure that the performance improves and to ensure that under close scrutiny unintended consequences do not develop. 		

Recommendation:	<ul style="list-style-type: none"> • The Executive Management Team is asked to review this report and to be assured that the quality concerns are being addressed. • The EMT is asked to comment on residual areas of concern and consider the best approach to tackle this. 		
Supports			
Trust Strategic Objective:	Data to help strengthen quality and safety work, as well as improve experience of bereaved families.		
CQC Theme:	Safe and Effective (Well Led in implementation of new framework)		
Single Oversight Framework Theme:	Safe		
Implications			
Risk:			
Legal/Regulatory:			
Resources:	There are resource implications associated with these works that are being worked through and can be discussed with this paper.		
Previously Considered by:		Date	
Equality Impact Assessment:	N/A This is in line with the principles of the Accessible Information Standard		

1.0 PURPOSE

- 1.1 To update the Executive Management Team (EMT) on the current safety concerns within cardiac surgery.
- 1.2 To allow the EMT to make an assessment as to the on-going safety of this service.

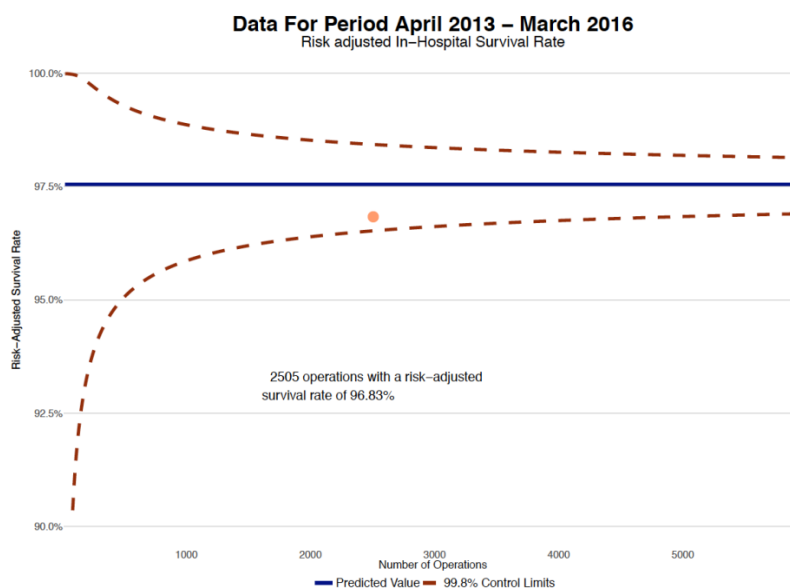
2.0 BACKGROUND

- 2.1 The cardiac surgical team have had a difficult 24-month period. They first were found to have high infection rates, and subsequently high death rates from a national report. A local investigation has been completed, and confirmed that the elevated death rate was real, and therefore a response by the service was mandated.
- 2.2 In tandem with the case note review of deaths, the pathways within the service have been explored, and changes implemented. This has included multi-disciplinary pathways involving the ward, Cardiac Intensive Care (CTICU), and theatres.
- 2.3 This paper updates the EMT on the period after the publication of the national mortality alert so that an appraisal of the key safety metrics can be made enabling an assessment of on-going safety of the service.

3.0 MORTALITY

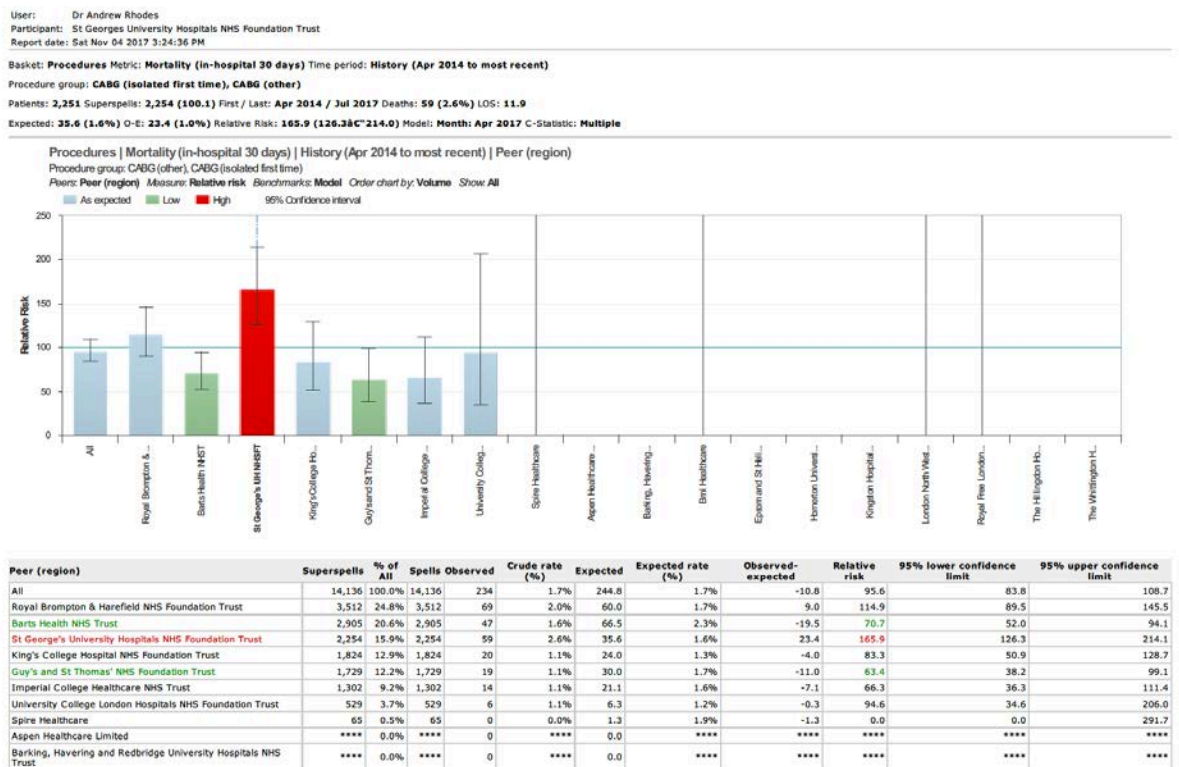
- 3.1 Analysis of data from the National Institute for Cardiovascular outcomes (NICOR) (for the period April 2013 - March 2016) revealed that St George's University Hospitals NHS Foundation Trust had a survival rate significantly lower than expected after adjustment for case-mix (>95% confidence interval limit) for cardiac surgery.

Figure 1. Funnel plot of risk adjusted survival rate for SGUH cardiac surgery from NICOR



- 3.2 In a case volume of 2,505 cases, over the three-year period, the risk-adjusted survival was 96.8% compared with a predicted survival of 98.3%.
- 3.3 These data were published by the Society for Cardiothoracic Surgery in Great Britain and Ireland's website in June 2017.
- 3.4 This mortality signal is described as an 'alert' as, when compared against all other Trusts in GB & Ireland, we have breached the 2SD / 95% confidence level. This is different to being a formal statistical outlier (defined as breaching the 3SD / 99.7% limit. This 'alert' should be treated as a formal warning that there is something not right with the current data performance - this could relate to either performance issues or data integrity.
- 3.4 **Benchmarking against other similar Trusts**
In the Dr Foster analysis from April 2014 to July 2017, SGUH benchmarks poorly against comparable trusts with a higher relative risk of death following CABG (first time) and CABG (other) surgical procedures. This is consistent with the NICOR alert albeit including an additional year's activity.

Figure 2. Benchmarking of cardiac surgical relative risk for mortality form Dr Foster



- 3.4 **More recent mortality signals**
The NICOR alert and the Dr Foster benchmark both provide insights into a historical time-window. It is important that we understand the driving factors for this mortality

signal so that we can ensure that on-going practice is optimal to ensure that current patients are as safe as they possibly could be.

All patients who died within the NICOR time-period have now been assessed by the SGUH internal mortality monitoring committee who have provided an in-depth report into the findings of these structured reviews. This report is attached as Appendix 1 to this paper.

The rates of mortality following cardiac surgery for each of the past four years is presented in the table below (Table 1).

Table 1. Absolute mortality rates for SGUH cardiac surgery (2014-17)

	2014	2015	2016	2017	Total
% Elective	2.5	1.8	2.6	1.7	2.2
% Urgent	3.7	3.5	4.4	3.6	3.8
% Emergency	39	11	15	28	21
Overall Mortality rate %	4.5	2.8	3.9	3.4	3.7
1st CABG only	1.1	1.6	1.9	1.4	1.5
1st AVR only	1.4	0.0	0.0	2.6	1.1

This analysis would suggest that the rates of death following surgery spiked in both 2014 and 2016. This would be consistent with the NICOR alert, although of note only some of the deaths in the 2016 cohort will have been included in the NICOR analysis, which is a risk for the 2018 report that will contain this signal and may therefore move the data into the 'alarm' territory.

The weakness of this 'absolute' assessment is that the data is not adjusted for the underlying severity of the patients. Risk adjusted plots, like the NICOR, are far more useful in understanding underlying risks.

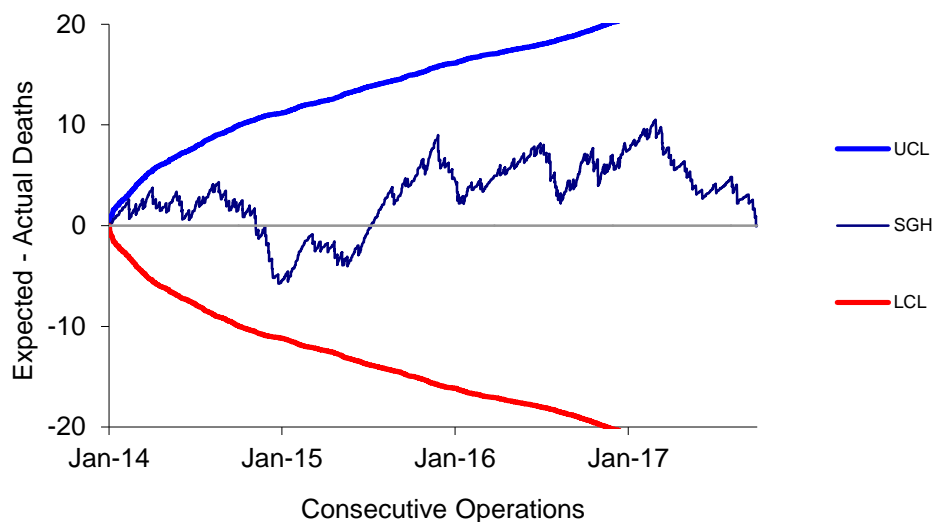
In cardiac surgery, risk assessment is made with the 'EuroSCORE'. This score assesses severity and through statistical modelling provides a prediction of outcome.

3.5 Internal risk adjusted mortality assessments

The SGUH cardiac surgery information team track the observed mortality rates against expected numbers by continuously adjusting for the EuroSCORE. This provides a mechanism for tracking mortality against an expected benchmark that better enables us to understand risk.

A more standard way of presenting this data is within a Variable Life Adjusted Display (VLAD) plot. This plots in a consecutive fashion the cases against whether a death is expected or not. A move upwards in this graph is good (less deaths than expected) and down not so good. In addition, a set of control lines are plotted so that an assessment can be made as to whether the performance is trending outside of normal variance. In this assessment, from Jan 2014 to date, there is no suggestion that the mortality is any other than expected.

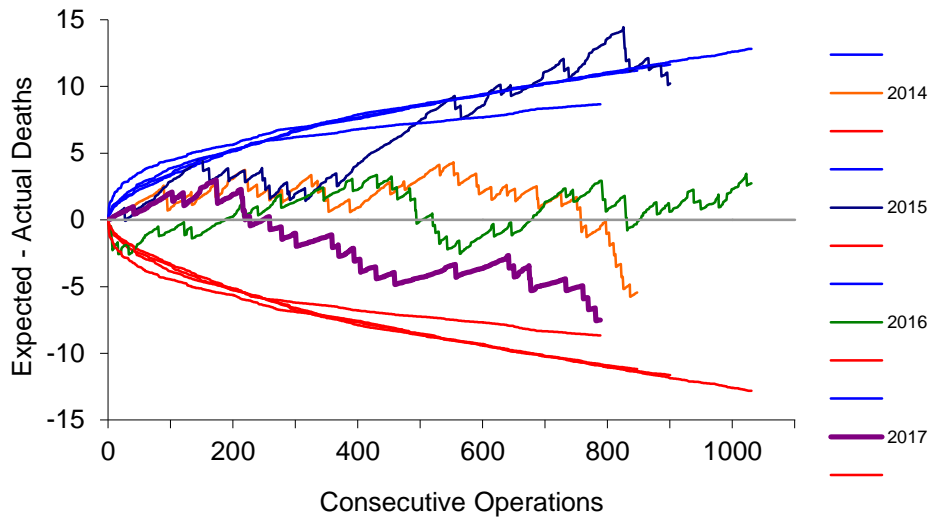
Figure 3. Standard VLAD for Calendar Years with 95% confidence intervals



To understand what has been happening this year, the data have been re-plotted in a different format (Figure 4). This graph is again a standard VLAD plot but this time plots each calendar year separately. The 2017 data seems to be moving into a part of the graph that would be of concern, although importantly has not yet crossed any of the control limits. An important limitation of this graph is that different risk adjustments have been used for 2017 than previous years as the EuroSCORE 2 model has now been implemented and we know this tends to perform differently than EuroSCORE 1. The calculated risk by the EuroSCORE II is statistically significantly lower than the risk calculated by the initial EuroSCORE, with a reduction in risk of about 50%. This decreased calculated risk for a surgical procedure will certainly have clinical consequences for the decision to perform an operation in 'high-risk' patients. As a logical consequence of the lower calculated expected risk of the

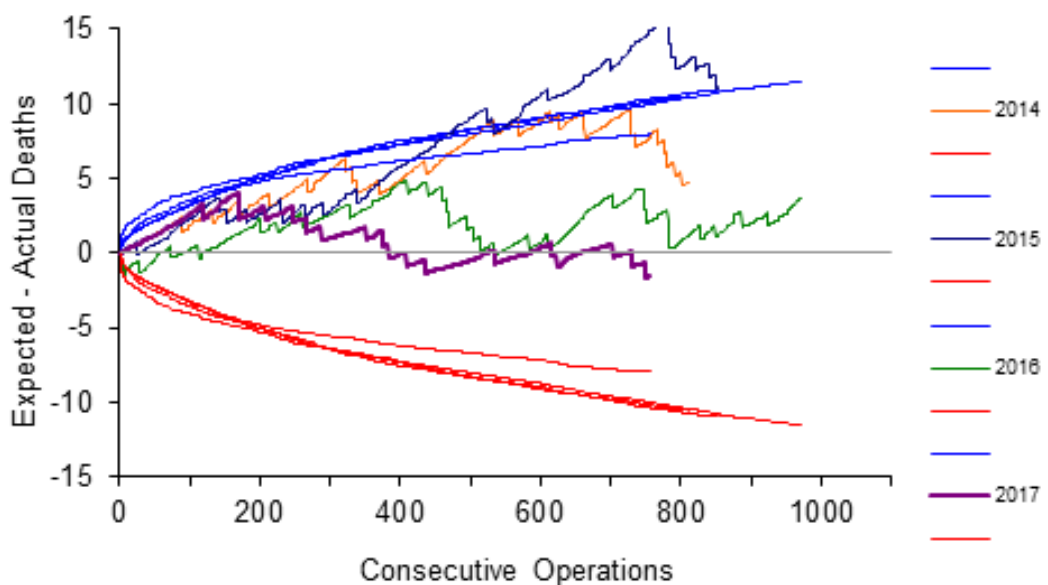
procedure the EuroSCORE II will also have an important influence on the evaluation of the results.

Figure 4. VLAD for cardiac surgical mortality (all cases) with 95% precision lines.



To further this understanding, the analysis is repeated but deliberately excluding emergency cases as they tend to be over-represented in the mortality assessments and are areas where the risk adjustment is perhaps less likely to perform well. The conclusion from this plot is that the 2017 data suggests a very minor amount of excess deaths but overall not far off what would be expected for elective and urgent cases.

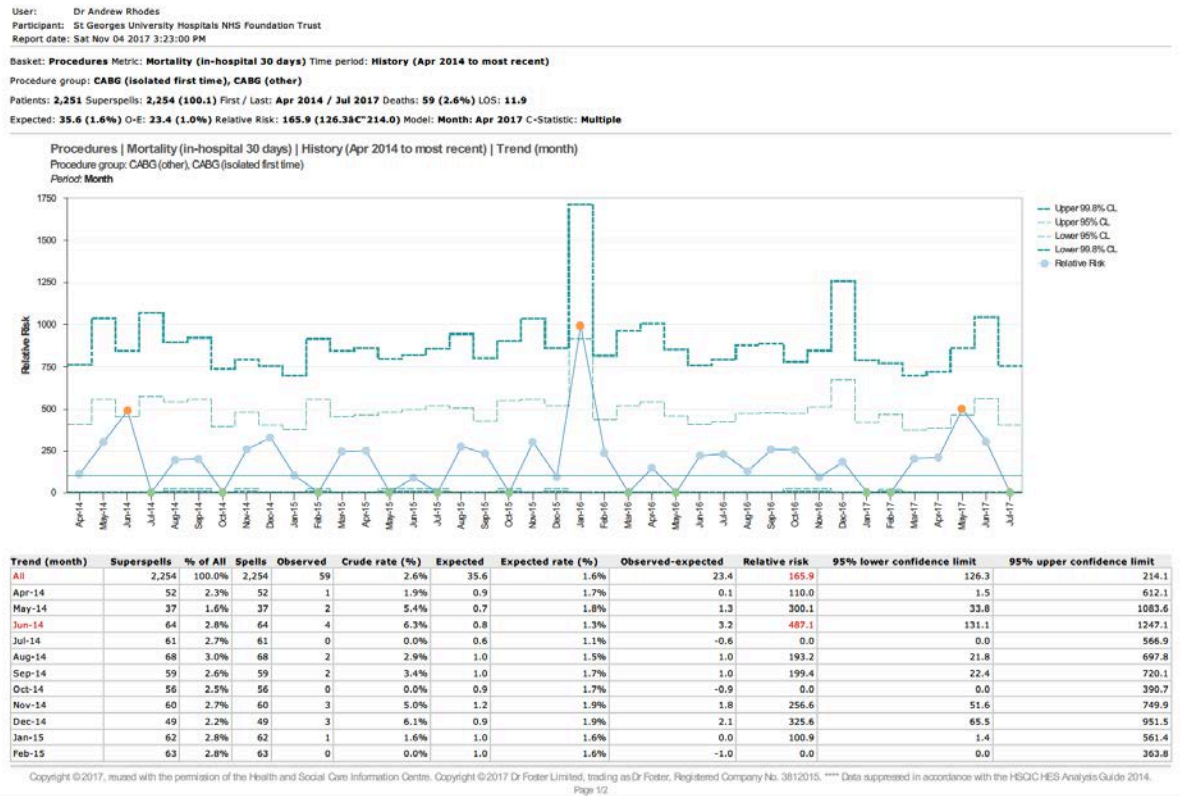
Figure 5. VLAD for cardiac surgical mortality (elective and urgent cases only) with 95% precision lines.



3.6 External assessments of mortality risk over time

The Dr Foster assessment of mortality risk over time is presented below. This suggests peaks in the mortality risk in June 2014, January 2016 and May 2017, highlighted by the orange markers on the graph.

Figure 6. Dr Foster relative risk of mortality for SGUH cardiac surgery (April 2014-July 2017)



3.7 Recent mortality signals

The mortality monitoring team at SGUH track all deaths within the hospital on a real-time basis. These reports are available in the tableau reporting system and can be filtered to speciality and consultant level.

This data is valid up until the beginning of November 2017 and demonstrates the peaks in historical mortality risk identified previously, but also a stable position more recently.

Figure 7. Real time numbers of deaths following elective cardiac surgery at SGUH.



3.8 Mortality risk summary

SGUH has had a higher than expected mortality rate following cardiac surgery from 2013 to 2017. Several steps have been actioned to understand this and to improve the position in the last six months. The current data do not suggest that the risk of death following elective / urgent cardiac surgical procedures remains higher than expected but close monitoring and continued vigilance is required.

4.0 OTHER QUALITY METRICS

4.1 Serious Incidents

There are no current serious incident (SI) investigations underway within the cardiac surgery service. There was one in June and one in September. All closed SIs have been shared with the team and the action plans have been worked through and implemented. The team have taken learning from these events and used them to improve their service.

There have been 2 never events this year, both for retained objects in theatres. There is no current investigation into a never event, and there has been team and institutional learning from these events.

Metric	June 2017	July 2017	August 2017	September 2017	October 2017
Serious Incidents (SIs)	1	0	0	1	0
Medication Related SIs	0	0	0	0	0
Moderate and above Falls	0	0	0	0	0

4.2 Key Quality Indicators

The table below presents a number of key quality indicators from June 2017 to October 2017 that can be used to assess current performance.

Metric	June 2017	July 2017	August 2017	September 2017	October 2017
Quality Observatory	82.9	90.9	89.3	86.7	90.5
EWS Audit	92.8	92.5	93.1	96.2	95
Harm Free Care	100	100	100	95.7	100
Harm Free Care (New Harms only)	100	100	100	95.7	100
MRSA - Acquisitions	1	0	0	0	0
MRSA - Bacteraemias	1	0	0	0	0
cDiff	0	0	0	0	0
MSSA	0	0	0	0	0
eColi	0	0	0	0	0
Grade 3 and 4 Pressure Ulcers	0	0	0	0	0
Grade 2 Pressure Ulcers	0	0	0	0	0
Saving Lives - Hand Hygiene	88.1	85.5	90	90.6	90.5
VTE Risk Assessment Completed (in Safety Thermometer)	89.7	90.9	76	100	100

This data would suggest that the current level of performance is not in an area of concern.

4.3 Infection Rates

The team had a significant problem with surgical site infections (SSI) and deep sternal infections two years ago. A team approach was taken to reducing this. A number of changes were made including the introduction of dedicated multi-disciplinary ward rounds that include routine attendance from senior clinicians from the Infection service.

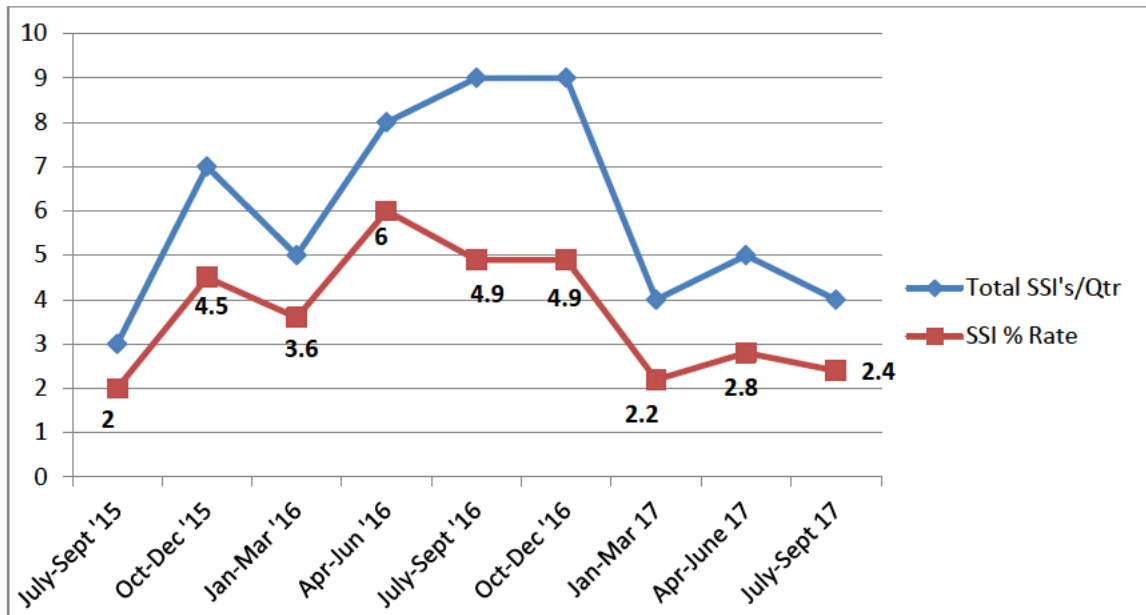
The current infection rates are shown below and in the cardiac surgery dashboard (Appendix 2), and this is the focus of continuous audit cycles.

- MRSA bacteraemia – there have been 2 MRSA bacteraemias this calendar year, one of which was fatal. There have been none recently.
- Clostridium difficile – There have been no recent Clostridium difficile infections in the team.

4.4 Quarterly Surgical Site Infection (SSI) rates for CABG surgery

The rate of surgical site infections peaked in April to June 2016 with a rate of 6 incidences for every 100 cases. The MDT have worked hard to improve their practice in this area and the rates are currently sitting at 2.4 cases / 100 procedures.

Figure 8. Incidence of SSI / 100 cases following cardiac surgery.



4.5 Hand Hygiene

Benjamin Weir ward has had poor results on hand hygiene, and PISA. The last audit in October was unfortunately failed due to 3 medical staff and one phlebotomist not washing their hands. Further work is on-going to address this.

4.6 Compliance with Veno-thromboembolic (VTE) prevention policies

The team scored consistently variably on the VTE audit, which has been addressed in part and 100% compliance has been seen for the last two months (see Cardiac Surgery Dashboard, Appendix 2). The team wish to have a prescribing pharmacist to assist with this, and other medication issues. A business case is being developed for this, and this has the support of the Clinical Director (CD).

5.0 OTHER PERFORMANCE METRICS

5.1 Complaints

There have been only four complaints in the service since June 2017, two in July and two in September, all of which are below a level to cause alarm. In the last month 100% of complaints were answered within the expected timeframes. 10.4% of complaints have been reopened but no themes were identified, and notably there were no themes relating to communication or staff attitudes.

5.2 Dress Code

The team are compliant with the new Trust dress code, including no white coats and bare below the elbows.

5.3 National Referral to Treatment (RTT) metrics

Only 9 patients are currently on the 18-week backlog. This is the lowest for more than 5 years.

6.0

[REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

7.0 **CARDIAC SURGICAL TASK FORCE**



7.1 A Task and Finish group was initiated following the NICOR alert being issued to tackle the problems within the department.

7.2 This group is executively led by the Medical Director, Chief Nurse, Human Resources Director and Chief Operating Officer.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

7.5 Those issues that affect the inpatient ward, Benjamin Weir, are being addressed through a dedicated action plan overseen by the Head of Nursing for Cardiac, Vascular and Thoracic Surgery and the Clinical Director and Care Group Lead together with input from Ward Manager, consultants and the General Manager. This action plan is overseen by the Divisional Management Team and reports into the Cardiac Surgery Taskforce.

8.0 **LEARNING FROM MORTALITY MONITORING REVIEW OF CARDIAC DEATHS**

8.1 The following themes of work arose from the structured review of historical deaths and are being addressed by the operational teams.

- Communication within and between teams
- Lack of consultant input in the post-operative period
- Lack of consultant surgical input on intensive care
- CTITU – Cardiac Surgeon relationship issues
- MDT processes need improving
- Requirement for MDT decision making for external patients

- MDT process for patients turned down by other units
- MDT process for patients turned down within the unit
- EuroSCORE / Coding sheet to be done at pre-admission
- Surgeons to agree and sign off coding ahead of NICOR submission
- Poor documentation – need to move to iClip on CTITU
- Lack of consistent operation notes – op note proforma to be done in theatre on iClip
- A multi-disciplinary pathway for high-risk patients has been agreed and implemented
- Improve methods of identifying futile care through MDT, complete DNACPR in discussion with family and patient, initiate End of Life Care (EoLC) when appropriate.
- Discharge summaries to be completed in 100% at the point of discharge

9.0 PROGRESS

- 9.1 The Team understand that they are in a period of alert, and have worked to improve the service that they deliver whilst the mortality review is ongoing. In our opinion, the quality metrics triangulate to suggest a service that is currently safe and improving, but also one that remains in a period of transition.
- 9.2 Conversely, examination of the same metrics in the past triangulated to suggest a service that was struggling.
- 9.3 Further work is required, as with any team delivering care for complex surgical interventions. The main area of focus in the next month is in improving relationships within the department.
- 9.4 Examples of key changes have included:
- Development of a high risk surgical multi-disciplinary pathway
 - Improvements in the MDT structure, function and documentation
 - Improvements in the M&M structure, content and learning function. An external chair has been temporarily placed from another service
 - Implementation of a weekly planning meeting for surgeons, management and junior staff
 - Daily documented reviews of all patients discharged from ITU by consultants
 - Daily documented consultant ward rounds
 - Better forward planning of leave, rotas, and circulation of junior staff
 - SI reports have been shared along with the conclusions and actions. Learning has been taken from them by the team to improve the safety of the service.
 - A significant focus on reducing the RTT backlog, which has been successful
 - A shared teaching programme for ward and medical staff
 - A coding sheet is now being done on admission and the team is working with clinical coders to improve the data within the service
 - Consultants to approve NICOR submissions for patients ahead of submission

10.0 CONCLUSIONS



10.1 The mortality signal in cardiac surgery is a cause for concern.

█ [Redacted text block]

█ [Redacted text block]

10.4 There is a need to closely monitor the clinical risk in this service to ensure that the performance improves and to ensure that under close scrutiny unintended consequences do not develop.

11.0 RECOMMENDATION

11.1 The Executive Management Team is asked to review this report and to be assured that the quality concerns are being addressed.

11.2 The EMT is asked to comment on residual areas of concern and consider the best approach to tackle this.

Appendix 1.

MORTALITY MONITORING GROUP REPORT ON ADULT CARDIAC SURGICAL OUTCOMES (APRIL 2013 TO MARCH 2016) AT ST GEORGE'S UNIVERSITY HOSPITAL

1.0 BACKGROUND

- 1.1 Analysis of data from the National Institute for Cardiovascular Outcomes Research (NICOR) for the period April 2013 - March 2016 revealed that St George's University Hospitals NHS Foundation Trust had a survival rate lower than expected (>95% confidence interval limit) for cardiac surgery.
- 1.2 In a case volume of 2,505 cases, the risk-adjusted survival was 96.8% compared with a predicted survival of 98.3%.
- 1.3 The predicted survival was determined using a contemporary recalibration of the logistic Euroscore risk-prediction model.
- 1.4 These data were published by the Society for Cardiothoracic Surgery in Great Britain and Ireland's website in June 2017.

2.0 AIMS.

- 2.1 This review of cases aims to provide information and data to the Division and the Cardiac Surgery Task Force to support their improvement work in this clinical area.

3.0 METHODOLOGY.

- 3.1 Case-notes review was undertaken by the clinical teams involved including cardiac surgery, anaesthesia, and intensive care. Reviews were undertaken by medical and senior nursing staff experienced in this care area. These reviews were documented on a structured judgement review form. In the specified time-period, there were 70 deaths contributing to this alert. Full notes were available for review in 66 cases. Case summaries including learning points are included below.
- 3.2 In addition to the local reviews, the mortality monitoring group reviewed all the cases independently, and collated information from the local reviews with information previously gathered on deaths following elective admission, through adverse incidents and serious incidents in this patient group. The mortality monitoring group also compared the NICOR submission data with information from the clinical notes. This was to identify any coding inaccuracies.

4.0 FINDINGS

4.1 Demographics and case mix.

48/70 patients were male; the median age of this group was 76 years (range 51 to 86 years). All patients had significant comorbidities, including 5/64 having active endocarditis and 14/64 having complex redo operations. It is likely that the risk adjustment models do not manage such severely affected patients very well and are likely to underestimate their mortality risk. 26 patients had death following elective admission, with the remainder classified as 'urgent' procedures. There were three patients included whose operation was an emergency although these patients met the NICOR criteria for 'urgent'. Of note, only 14/70 patients lived in Wandsworth or Merton, so the majority had been referred from other hospitals/areas. It is not possible to determine how much the severe case-mix has contributed to the alert.

4.2 Operations.

The mortality alert did not appear to have been driven by a single type of cardiac surgery operation. In this patient group, there were 12 patients who had major aortic surgery as their procedure or as part of multiple procedures, 6 patients with multiple valve procedures (\pm CABG), 6 patients with mitral valve replacement or repair (\pm CABG), 15 patients with aortic valve replacement (\pm CABG), and 27 patients with CABG. Importantly 14/64 had complex redo operations. There were 3 patients in this group who had either been turned down for surgery previously by an individual consultant, or by other cardiac surgery units.

4.3 Individual Surgeon Data.

All cardiac surgeons operating in this data period had mortality represented in this alert. It is important to recognise that none of the surgeons themselves are individual mortality outliers, but there is no individual surgeon with risk adjusted mortality was below average in the nationally reported data. There was no evidence that data from a single or subgroup of consultants had driven this alert.

4.4 NICOR data submitted.

The mortality monitoring group obtained the NICOR submission data from the National Audit for this data period and checked it against the clinical records. The clinical records necessary to complete the data submission to NICOR are on multiple systems including the written clinical notes, IClip, EDM, Medcon (cardiac investigations); this makes sourcing complete and consistent information challenging. In some case records, there was a pre-operative proforma which included most fields necessary to complete the Euroscore, this was not regularly or consistently used.

The mortality monitoring group learned that the NICOR data submission was performed by an employee who has been performing this role for some time; it is therefore unlikely that this alert is due to a major change in coding behaviour. Review found that the NICOR submission data was generally of very good quality. The submission appeared absolutely correct in 56/64 case records. There were eight records where there were minor data queries including three patients where peripheral arterial disease was not coded, one patient where neurological status was potentially underscored and three patients where pulmonary disease may have been

underestimated. It is not possible to determine whether amendments to these data fields would significantly affect the trust's risk-adjusted mortality position. This review did not evaluate the submission data for the entire cohort of 2505 cases over this time although the denominator data would clearly affect the final risk-adjusted benchmark.

5.0 THEMATIC FINDINGS

5.1 Case note review did not identify a single theme accounting for excess mortality but identified a number of areas where improvements could be made across all phases of care. There were notable examples where high quality care was delivered and recorded, however the more prevalent pattern of care was one where there are clear opportunities for improvement in consistency, integration / communication and shared decision making within and between teams, and documentation. This review is of cases over a long time-period up to Mar 2016 and therefore does not include more recent cases, or the impact of recent improvement work. Details of individual cases and learning are included in the case summaries, with pertinent points highlighted in bold.

5.2 Admission and Pre-Operative Management

A high proportion of cases came from local referral and specific details of decision-making / MDT discussions from other hospitals was usually absent from the clinical record. Although several local patients had a documented MDT to consider their care options, most patients had little or no documentation about MDT discussion prior to surgery. There was better documentation in the complex aortic surgery group compared to others. There was no evidence of a 'high risk' assessment pathway although the quality of documented pre-operative anaesthetic assessment was excellent.

There were three patients who had either been turned down for surgery by other Trusts or surgeons within SGUH, where the basis for change appeared to have been made by an individual rather than a MDT, and not documented. In such exceptionally high risk patients the discussion about risk was excellent in one patient but further detail would have been optimal in the other two.

Of note, patients had a good quality admission clerking by junior doctors but the majority of patients did not have evidence in their clinical record of a pre-operatively calculated Euroscore, or other mortality risk assessment. It was interesting that some of the earlier patients in this case series had a proforma with the Euroscore completed, but the majority did not or it was incomplete. Such a proforma would both help the consideration of surgical mortality risk (particularly for CABG) and also be a template to aide NICOR data entry.

There were at least four patients where the operative mortality risk was underestimated, and one patient where mortality risk was not documented on the consent form; consent was usually completed by the Registrar apart from major aortic surgery where consent was completed by the consultant.

Although most patients were clerked appropriately, there were a number of patients where documented consultant input pre-operatively was absent, and transfers in where further consultant cardiology or cardiac surgery input would have been

optimal. This included one patient transferred urgently from another hospital who had their procedure potentially delayed because of poor coordination of care and communication.

5.3 Care during a procedure and documentation

The cases were generally well managed by senior anaesthetic and surgical staff in theatre. There were three patients who died on the operation table; two with catastrophic complications of surgery which were managed appropriately (bleeding) and one with cardiogenic shock that was refractory to treatment. There were two cases where a less experienced surgeon asked the help of a senior surgeon to manage bleeding in the operation which was good practice. There were a further 9 patients who had re-sternotomy for significant post-operative bleeding; re-look was indicated in all cases and a number of patients who required several runs of bypass because of instability.

The reviewers found the operation notes were variable in detail; with different surgeons either handwriting or dictating detailed operation notes. In some cases, the operation note did not contain basic information about the procedure (such as bypass time and cross clamp time) and sometimes did not adequately detail challenges or complications during the procedure. The written operation notes for some consultant surgeons were usually completed by the registrar. There was one patient record where the operation note was not found. The reviewers identified that there were very good and detailed dictated operation notes from several surgeons that documented the date and timings of the operation, but did not include the date of dictation or date/time of placement in the clinical records; any delays would be a concern without additional documentation in the clinical record before dictation. It is not possible for reviewers to determine the time delay between operation and a dictated operation note being accessible to the clinical team managing the patient.

The clinical records reflected admission to critical care postoperatively in all cases, and usually documented an anaesthetic, rather than surgical, handover of care.

5.4 Post-operative care

It was clear from the case notes that once patients were admitted to CTICU, they were managed almost exclusively by the ITU team with, apart from the aortic cases, relatively little Consultant cardiac surgery input documented apart from in crises where re-sternotomy or further operations were considered. There were cases where the cardiac surgery registrar documented review for several days post operatively with no documented cardiac surgical consultant face-to-face review. In several cases, there is reference to a lack of coordinated care or discussions between ITU and surgical teams in the clinical records, or subsequent mortality reviews, some evidence of disagreement within and between teams that has not been resolved in real time.

As well as identifying issues of team working and coordination of care between ITU and senior cardiac surgery teams, some specific clinical themes were identified in these cases particularly bleeding, sepsis and heart failure. Bleeding complications were reasonably managed, although there was delay in identification / escalation of bleeding in one case. There were 4 patients that had deep sternal infections that

complicated post-operative progress substantially and may have contributed to mortality. There were several patients with significant infection control issues including two cases with MRSA sepsis. The reviewers were aware of considerable work to reduce septic complications since 2016. Lastly, a significant proportion of patients died with heart failure that could not be reversed or managed, especially right heart failure. The pre-operative assessment in these cases is essential and management of right heart failure should be evaluated (RV support devices / ECMO is considered at national level).

5.5 **End of life care**

The majority of these cases had active and aggressive intensive care until their death. In some cases, earlier recognition of 'end of life' should have occurred. Excellent discussions around risk, and end of life occurred in a number patients, and in one aortic case pre-operative discussion was exceptional. There may be a role for earlier involvement of palliative care teams in the complex patients and those who have been turned down for surgery.

5.6 **Discharge summaries**

The reviewers were able to identify a discharge / care summary was not completed either by ICU or cardiac surgery in > 90% of cases; this needs to be urgently addressed to ensure excellent communication between clinical teams, the GP and family.

5.7 **NICOR data submission**

The mortality monitoring group learned that a single employee inputted all the NICOR cardiac surgery data to the National audit. There was no inbuilt system in the department for surgeons to validate the data or indeed present data queries. Although there is the strength of independent data entry, it would be good to develop a pre-operative proforma to document Euroscore, and other risk factors pre-operatively, and for data validation/correction to occur in the future. The letter sent from NICOR relating to this alert specifically highlighted that the trust had opportunities previously to validate the data submitted. This does not appear to have occurred.

CASE SUMMARIES

Major aortic cases

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[REDACTED]

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CABG operations

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Appendix 2. Cardiac Surgery Dashboard (In development)

Cardiac Surgery Dashboard - (Still in development).								
Reporting to: Cardiac Surgery Task Force meetings - Date 22.11.17								
Metric No.	Metric	Trajectory					RAG Status	Commentary
			Jul-17	Aug-17	Sep-17	Oct-17		
1	Waiting lists - Number of patients waiting		105	115	119	86	●	Patients are being treated quicker which has contributed to the drop in the waiting list.
2	Backlog - Number of breaches		36	28	18	10	●	Patients on backlog continue to reduce in line with plan to meet the 92% compliance.
3	Elective length of stay		8.07				●	LOS compared to peers over 12 months - STGH elective LOS (8.07), Kings (8.4), Royal Brompton (8.49) Harefield (9.56)
4	Non- elective length of stay		13.19				●	LOS compared to peers over 12 months- STGH nonelective LOS(13.19), Kings (13.67),Royal Brompton (16.17),Harefield (16.76)
5	Theatre utilization		87	88	86	86		
6	Early warning sign	90%	93%	93%	96%	95%	●	
7	Serious incidents	0	0	0	1	0	●	
8	Serious incidents - outstanding actions	0				0		
9	Hand Hygiene	95%	85.5%	90%	91%	91%	●	
10	MRSA	0	0	0	0	0	●	
11	C Diff	0	0	0	0	0	●	
12	Pressure ulcers (grade 3)	0	0	0	0	0	●	
13	Pressure ulcers (grade 4)	0	0	0	0	0	●	
14	Benn Weir Falls	2	0	2	3	1	●	
15	Friends and Family Test	95%	97%	95%	100%	98%	●	
16	Complaints		2	0	2	0	●	
17	VTE compliance at admission and 48-hours	100%	90.9%	76%	100%	100%	●	
18	Post CT ITU discharge review	100%		69%	0	72%	●	
19	Staff vacancy rates – Benn Weir	15%	21.0%	31%	40%	33%	●	
20	Nursing Theatres							
21	SpR's							
22	SHO's							
23	No of referrals - in patients							
24	Additions to the waiting list							
25	Number of operations							
26	Number of Deaths							
27	Cardiac Surgical Site Infections							
28	Number of elective cancellations on the day of admission							
29	Cardiac Surgical Site Infections							

Data to be provided for next meeting on 18 December 2017