VICTORIAN SURGICAL CONSULTATIVE COUNCIL TRIENNIAL REPORT 2011–2013
VICTORIAN SURGICAL
CONSULTATIVE COUNCIL
TRIENNIAL REPORT
2011–2013
CONTENTS

INTRODUCTION 1
ACKNOWLEDGEMENTS 2
EXECUTIVE SUMMARY 3
COUNCIL MEMBERSHIP 4
OPERATION OF THE VSCC 6

Section 1: The triennium in review 9
REPORTED CASES 10
AUDITS OF MORTALITY UNDER SURGICAL CARE 13
SENTINEL EVENT PROGRAM 14
GUIDELINES AND CLINICAL PRACTICE STATEMENTS – SUMMARY 16
MAJOR PROJECTS 17
- SURGICAL OUTCOMES INFORMATION INITIATIVE 17
- SURGICAL SEMINAR PROGRAM INITIATED 18
- VICTORIAN HOSPITALS POSTOPERATIVE ORDERS FORM ADOPTED 18
- INTERN MANUAL: THE IMMEDIATE MANAGEMENT OF SURGICAL EMERGENCIES – REVISED 18

VSRC INTERACTION WITH OTHER AGENCIES 19
APPENDIX 1: INSTRUCTIONS AND VSRC FORM 1 FOR REPORTING INCIDENTS OF SURGICAL MORBIDITY 20
APPENDIX 2: POSTOPERATIVE ORDERS FORM 22
APPENDIX 3: SUMMARY OF ‘MANAGING THE DETERIORATING PATIENT’ SEMINAR 24
APPENDIX 4: SUMMARY OF THE ‘PATIENT TRANSFERS — BETWEEN HOSPITALS AND WITHIN HOSPITALS’ SEMINAR 26
APPENDIX 5: SURGICAL OUTCOMES STUDY SUMMARIES, 2011 30
- COMPLICATIONS FOLLOWING COLONOSCOPY IN VICTORIAN HOSPITALS, 1 JULY 2008 – 30 JUNE 2010 30
- COMPLICATIONS OF AV DIALYSIS FISTULAE REQUIRING RE-OPERATION IN VICTORIAN HOSPITALS, 1 JULY 2008 – 30 JUNE 2010 31
APPENDIX 6: SURGICAL OUTCOMES STUDY SUMMARIES, 2012 32
- COMPLICATIONS FOLLOWING Hysterectomy IN VICTORIAN HOSPITALS, 1 JULY 2008 – 30 JUNE 2010 32
- COMPLICATIONS FOLLOWING INGUINAL HERNIA REPAIR IN VICTORIAN HOSPITALS, 1 JULY 2009 – 30 JUNE 2011 34
- COMPLICATIONS FOLLOWING NEURAXIAL ANAESTHETICS (SPINAL, EPIDURAL) IN VICTORIAN HOSPITALS, 1 JULY 2009 – 30 JUNE 2011 36
APPENDIX 7: SURGICAL OUTCOMES STUDY SUMMARIES, 2013

- MORTALITY OF CHOLANGITIS IN VICTORIAN HOSPITALS, WITH AND WITHOUT ERCP, 1 JULY 2008 – 30 JUNE 2011

- INTRACRANIAL ANEURYSMS – MORTALITY AND COMPLICATIONS WITH ENDOVASCULAR TREATMENT OR CLIPPING, 1 JULY 2009 – 30 JUNE 2011

- LOWER LIMB AMPUTATIONS – MORTALITY AND COMPLICATION RATE COMPARING DIABETIC AND NON-DIABETIC PATIENTS IN VICTORIAN HOSPITALS, 1 JULY 2010 – 30 JUNE 2012

- PANCREATECTOMY – MORTALITY AND COMPLICATION RATE IN VICTORIAN HOSPITALS 1 JULY 2010 – 30 JUNE 2012


APPENDIX 8: PREOPERATIVE TIME-OUT CHECKLIST EXAMPLE – PROCEDURE ENDORSED BY VSAC AND RACS

Section 2: Guidelines and clinical practice statements

ACUTE CHOLANGITIS AND AVAILABILITY OF URGENT ERCP SERVICES

ACUTE MESENTERIC ISCHAEMIA

ADEQUATE DRAINAGE OF PUS

AIR EMBOLISM ASSOCIATED WITH THE USE OF HYDROGEN PEROXIDE – A WARNING

ASSISTANCE AT DIFFICULT OPERATIONS

BILE DUCT STONES – GUIDELINES FOR MANAGEMENT

CVC GUIDEWIRES ON THE LOOSE. ‘CARPE WIREM’

DIABETIC TISSUE CARE AND FEET AT RISK

ENDOVASCULAR AORTIC ANEURYSM REPAIR (EVAR) AND MESENTERIC ISCHAEMIA

FATIGUE DURING LONG OPERATIONS

FIRE IN THE OPERATING THEATRE

FLUID OVERLOAD IN HYSTEROSCOPIC SURGERY

GUIDELINE ON SURGEON RESPONSIBILITY

INTRAOCULAR LENS SELECTION – ALWAYS RE-CHECK THAT THE IMPLANT IS CORRECT

MANAGEMENT OF HEAVY RECTAL BLEEDING

MANAGEMENT OF VASCULAR INJURIES AT LAPAROSCOPY

MANAGING ‘HIGH-RISK’ PATIENTS FOR CARDIAC SURGERY

MANAGING PATIENTS AT ‘HIGH RISK’ FOR SURGERY: MAJOR SURGERY IN GENERAL

MESENTERIC ISCHAEMIA IN REPAIR OF ABDOMINAL AORTIC ANEURYSM (AAA)

NASOGASTRIC TUBE INTUBATION IN THE TREATMENT OF ILEUS OR BOWEL OBSTRUCTION

PENROSE DRAIN TUBE USE AND HAZARDS

REQUEST FOR OPERATION/PROCEDURE CHECKLIST

RETAINED FOREIGN OBJECTS AND IMAGING IN THEATRE

RUPTURED ABDOMINAL AORTIC ANEURYSM

STRESS ULCER PROPHYLAXIS IN SURGICAL PATIENTS
INTRODUCTION

The Victorian Surgical Consultative Council (VSCC) was established in October 2001 under the Health Act 1958 and now functions under the Public Health and Wellbeing Act 2008. The VSCC is the advisory body to the Minister for Health and the Department of Health and Human Services on the quality and safety of surgery in Victoria.

The council’s terms of reference are to:

• monitor, analyse and report on key areas of potentially preventable surgical mortality and morbidity within the Victorian hospital system
• liaise with other consultative councils on issues of mutual interest, including the development of appropriate systems for reporting of relevant cases by practitioners
• improve surgical practice by publication and dissemination of relevant information and practical strategies identified during deliberations of the council.
• report regularly to the Minister for Health
• respond to specific matters referred to the council by the Minister, for investigation and reporting as required.

Mr Peter L Field, MBBS, FRACS, vascular surgeon, was appointed as chair of the VSCC in February 2010 and then re-appointed in November 2011 for a three-year term to November 2014.

There are 23 members from a range of speciality fields and organisations as listed on page 8.

The VSCC is supported by the Clinical Councils Unit (CCU) within the Health Service Programs Branch, Health Service Performance and Programs Division, Victorian Department of Health and Human Services. The CCU manages and supports the work programs of the VSCC and two other ministerial consultative councils: the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) and the Victorian Consultative Council on Anaesthetic Mortality and Morbidity (VCCAMM).

Contacts:
Secretariat: vscc@health.vic.gov.au
Phone: (03) 9096 2701
Postal address: GPO Box 4923, Melbourne VIC 3001
The VSCC would like to thank:

- all the individual medical practitioners who have contributed cases on a voluntary basis
- the various health services and their clinical risk management coordinators who have contributed cases on behalf of the treating surgeon
- the Royal Australasian College of Surgeons (RACS), the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) and the Royal Australian and New Zealand College of Ophthalmologists (RANZCO) for their ongoing support
- the other Colleges of Anaesthetists (ANZCA), Emergency Medicine (ACEM) and Radiologists (RANZCR) for their interest, help and support over the past three years
- the State Coroner and Victorian Institute of Forensic Medicine (VIFM) for liaison
- the Victorian Regional Committee of the RACS and, in particular, its successive chair Mr Ian Faragher and currently Mr Robert Stunden, for their great assistance to the VSCC chair and members of this council
- the chairs of our sibling councils, Professor Jeremy Oats (Consultative Council on Obstetric and Paediatric Mortality and Morbidity, COOPMM) and Associate Professor Larry McNicol (Victorian Consultative Council on Anaesthetic Mortality and Morbidity, VCCAMM), both of whom so readily offer collaboration and guidance
- the Victorian Managed Insurance Authority (VMIA) for its interest in the VSCC, and its assistance with the February Surgical Seminars and the Victorian hospitals universal postoperative order form project
- the health services and individual public and private hospitals collaborating in the studies of events and outcomes in surgical care in Victoria
- the Department of Health and Human Services and, in particular for their ongoing support, Ms Alison McMillian, director of the Statewide Quality, Safety and Patient Experience Branch, her successors Dr Martin Lum (Acting), 2011–13, and now Health Service Programs director Ms Anna Burgess; successive managers of the Clinical Councils Unit Ms Anne-Maree Szauer 2011, Mr Deane Wilks (Acting) 2011–12, Ms Katharine Gibson (Acting) 2012–13 and Ms Vickie Veitch 2013 (ongoing); and VSCC project officers Mrs Christina Gya-Zaccaria, 2011–13, and Mrs Adelinda Botham since mid-2013
- the directors of the Victorian Audit of Surgical Mortality (VASM), Associate Professor Colin Russell, then from June 2012 Mr C Barry Beiles, and VASM project manager Ms Claudia Retegan, for their dedication to continuing strong links between VASM and the VSCC.
EXECUTIVE SUMMARY

During the three years 2011–2013, the VSCC has worked steadily to improve the already high standard of surgical care in Victoria’s hospitals. Surgeons recognise the importance of knowing our surgical results, improving patient safety and communicating professionally with patients, hospital staff and the community. During this period gynaecological surgeons and all of the private hospitals were recruited to participate in a clinical audit of their care and surgical outcomes through the Victorian Audit of Surgical Mortality (VASM), managed by the Royal Australasian College of Surgeons (RACS) and funded by the Department of Health and Human Services. Knowing and striving to improve the standard of one’s care are professional obligations for all surgeons, proceduralists and health services.

Two highlights of the VSCC triennium are the success of the preoperative ‘time-out’ checking process in sustaining the virtual elimination of incorrect operations across the state since 2008, and the introduction of our annual VSCC seminars on surgical patient safety, which are summarised in this report.

The VSCC’s surgeon members, supported by an operating room nurse, anaesthetist, pathologist and emergency department and hospital management members, represent considerable expertise, clinical and management experience spread across the surgical specialties and hospitals, both rural and urban. With the project support and facilities of the Victorian Department of Health and Human Services, and in collaboration with Fellows and Trainees of the Royal Australasian College of Surgeons (RACS), we are able to monitor surgical outcomes, advise on mandatorily reported sentinel events, and assess de-identified referred cases. The participation of surgeons themselves reporting and assessing cases, with VSCC’s promulgation of clinical improvement information to surgeons, trainee surgeons and hospital CEOs, provides a major opportunity for increase surgical awareness, safety and performance in the state’s hospitals. As such, this non-punitive approach provides a focus on learning by performance improvement to ultimately reduce preventable mortality and morbidity. We trust surgeons receive VSCC information in the constructive spirit in which it is offered.

In 2012 the Department of Health extended the monitoring of deaths during surgical care in hospital through the VASM. Many of these cases are assessed as unavoidable deaths, but in some cases there are issues requiring careful consideration and peer review to establish if the death was potentially preventable or the care improvable. VSCC reviews select de-identified case assessments and promulgates practice guides in the clinical areas that need drawing to the attention of surgeons, surgical trainees and hospital administrators. The 2013 report and recommendations of the VASM (published in August 2014) can be found at the RACS website.

As seen in this report, VSCC liaises with like-minded bodies and undertakes a number of projects. A fourth edition of the VSCC’s emergency manual for interns was prepared in November 2013 and distributed to new interns around Victoria. It guides them in the immediate management of surgical emergencies and proves popular with undergraduate medical students, too. The Victorian hospitals universal postoperative orders form, which the VSCC developed at the Coroner’s instigation, with wide consultation, has now been offered to all surgical and procedural health services and adopted by the majority including those with e-records.

The Surgical Outcomes Information Initiative (SOII) is an important subcommittee of the VSCC, chaired successively by Mr Stephen Clifforth in 2011, myself in 2012 and Associate Professor Rodney Judson in 2013. The SOII reviews administrative coding data about selected operative procedures to compare the performance of de-identified health services and private hospitals across the state. Feedback is provided to any hospital with an apparently outlying performance, inviting it to validate its data, examine the circumstances, tackle any problems, and notify the VSCC of any safety and quality improvements. The VSCC can then advise others of the risks and possible remedies.

Once again the VSCC thanks all those surgeons and health services who voluntarily report cases and events, who serve as assessors, and who contribute to their various specialty audits. The members of this consultative council work hard at meetings, studying reported cases, preparing practice guides and presenting at seminars and clinical meetings. I truly appreciate their professionalism and expert guidance.

Your continued interest and participation in the VSCC’s activities are earnestly encouraged, as is frank discussion with your peers and students about adverse events, problem areas and avenues to improvement.

Peter L Field, FRACS
Chair, Victorian Surgical Consultative Council
# COUNCIL MEMBERSHIP

Council membership as at 31 December 2013, appointed until 30 November 2014

<table>
<thead>
<tr>
<th>Member</th>
<th>Specialty</th>
<th>Nominated by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr Peter Field (Chair)</td>
<td>Vascular Surgeon</td>
<td>Melbourne Health</td>
</tr>
<tr>
<td>A/Prof. David Allen</td>
<td>Gynaecologist</td>
<td>Mercy Health</td>
</tr>
<tr>
<td>Mr Malcolm Baxter OAM</td>
<td>ORL, Head and Neck Surgeon</td>
<td>Southern Health</td>
</tr>
<tr>
<td>Mr C Barry Beiles</td>
<td>Vascular Surgeon; Director of VASM</td>
<td>Ex officio VASM; Western Health</td>
</tr>
<tr>
<td></td>
<td>(Victorian Audit of Surgical Mortality)</td>
<td></td>
</tr>
<tr>
<td>A/Prof. Wendy Brown</td>
<td>Upper GI/Bariatric Surgeon</td>
<td>Alfred Health</td>
</tr>
<tr>
<td>A/Prof. Richard Cade</td>
<td>Hepatobiliary/Upper GI/General Surgeon</td>
<td>Eastern Health</td>
</tr>
<tr>
<td>Mr Lindsay Castles</td>
<td>Breast/General Surgeon; Surgical Administrator</td>
<td>Austin Health</td>
</tr>
<tr>
<td>Mr Stephen Clifforth</td>
<td>General Surgeon</td>
<td>Western District Health</td>
</tr>
<tr>
<td>Dr Ben Connell</td>
<td>Ophthalmic Surgeon</td>
<td>RVEE Hospital; Royal Australian and New Zealand College of Ophthalmologists</td>
</tr>
<tr>
<td>A/Prof. Bruce Davis</td>
<td>Cardiothoracic Surgeon</td>
<td>Alfred Health; Australian Society of Cardiac and Thoracic Surgeons</td>
</tr>
<tr>
<td>Mr Tony Heinz</td>
<td>General Surgeon; Director of Surgery</td>
<td>Goulburn Valley Health</td>
</tr>
<tr>
<td>A/Prof. Michael Henderson</td>
<td>General Surgeon</td>
<td>Peter MacCallum Cancer Centre</td>
</tr>
<tr>
<td>A/Prof. Rodney Judson</td>
<td>General/Trauma/Head and Neck Surgeon</td>
<td>Melbourne Health</td>
</tr>
<tr>
<td>A/Prof. John Mackay</td>
<td>Colorectal Surgeon</td>
<td>Epworth Eastern</td>
</tr>
<tr>
<td>A/Prof. Ian McInnes</td>
<td>General Surgeon</td>
<td>Alfred Health</td>
</tr>
<tr>
<td>Mr Peter Mortensen</td>
<td>Urologist</td>
<td>Shepparton Hospital</td>
</tr>
<tr>
<td>Mr Michael O’Brien</td>
<td>Paediatric Urologist</td>
<td>The Royal Children’s Hospital</td>
</tr>
<tr>
<td>Mr John Owen</td>
<td>Orthopaedic Surgeon</td>
<td>Northern Health; Australian Orthopaedic Association</td>
</tr>
<tr>
<td>Dr Andrew Rosengarten</td>
<td>Emergency Physician</td>
<td>Western Health; Australasian College for Emergency Medicine</td>
</tr>
<tr>
<td>Prof. John Royle OAM</td>
<td>Vascular Surgeon</td>
<td>Austin Health; RACS</td>
</tr>
<tr>
<td>Mr Kevin Siu AM</td>
<td>Neurosurgeon</td>
<td>Melbourne Health</td>
</tr>
<tr>
<td>A/Prof. Dominic Vellar</td>
<td>General/Hepatobiliary Surgeon</td>
<td>St Vincent’s Hospital</td>
</tr>
<tr>
<td>Professor Noel Woodford</td>
<td>Forensic Pathologist</td>
<td>Victorian Institute of Forensic Medicine</td>
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</tbody>
</table>
The following council members retired during the 2011–2013 triennium:

<table>
<thead>
<tr>
<th>Member</th>
<th>Specialty</th>
<th>Retired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Heather Cleland</td>
<td>Plastic and Reconstructive Surgeon</td>
<td>2011</td>
</tr>
<tr>
<td>Dr Jane Fox</td>
<td>General/Breast Surgeon</td>
<td>2011</td>
</tr>
<tr>
<td>Ms Eleanor Hughes</td>
<td>OR Nurse Manager</td>
<td>2011</td>
</tr>
<tr>
<td>Dr Robert Rattray</td>
<td>Anaesthetist</td>
<td>2011</td>
</tr>
<tr>
<td>A/Prof. Colin Russell</td>
<td>General Surgeon; chair of VASM</td>
<td>2012</td>
</tr>
<tr>
<td>Dr Arlene Wake</td>
<td>Medical Administrator</td>
<td>2011</td>
</tr>
</tbody>
</table>

The following also attended and contributed to the VSCC by invitation:

<table>
<thead>
<tr>
<th>Member</th>
<th>Specialty</th>
<th>Nominated by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr Barry Beiles</td>
<td>Vascular Surgeon, Clinical Director, VASM</td>
<td>Western Health, ex officio – VASM 2012–13</td>
</tr>
<tr>
<td>Dr Grant Brace</td>
<td>Anaesthetist</td>
<td>Austin Health; ANZCA 2013–14</td>
</tr>
</tbody>
</table>

The VSCC thanks the former Minister for Health, The Hon. David Davis, for his encouragement of our activities, the Secretary to the Department of Health and Human Services, Dr Pradeep Philip and our branch directors during the triennium (successively Ms Alison McMillan, Dr Martin Lum and Ms Anna Burgess) and the managers of the Clinical Councils Unit (successively Ms Anne-Marie Szauer, Mr Deane Wilks, Ms Katharine Gibson and Ms Vickie Veitch). Council relies upon and greatly appreciates the work of our project officers (Mrs Christina Gya-Zaccaria and in 2013 Mrs Adelinda Botham), together with the support of collaborating staff of the Department of Health and Human Services.
OPERATION OF THE VSCC

Establishment, administration and project support
The VSCC was established in 2001 and is a prescribed consultative council under ss. 33–43 of the Public Health and Wellbeing Act. The VSCC performs its functions alongside the other two Consultative Councils on mortality and morbidity:

- the Victorian Consultative Council on Anaesthetic Mortality and Morbidity (VCCAMM)
- the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM).

Since January 2008, the reporting and initial assessment of surgical deaths passed to the Victorian Audit of Surgical Mortality (VASM, an arm of the Australian and New Zealand Audit of Surgical Mortality (ANZASM)), managed by the Royal Australasian College of Surgeons (RACS) and funded by the Department of Health and Human Services. The VSCC received de-identified cases of concern or potentially improvable care to be reviewed from the VASM. Further information on the VASM can be found at the RACS website.

The Clinical Councils Unit, Health Service Programs Branch of the Department of Health and Human Services provides secretariat and project support to the three consultative councils.

Council meetings
Council meetings occurred monthly, except in January and December, and involved discussion and planning of projects undertaken in response to priorities reported to the council. The council’s major subcommittee, the Surgical Outcomes Information Initiative (SOII), also met monthly.

In the three-year period 2011–2013, the VSCC received cases of morbidity that surgeons voluntarily reported, as well as mortality notified to the VASM and assessed as having potentially improvable care or outcomes. These cases were de-identified prior to discussion by members in the council and followed up if necessary.

The VSCC also considered surgical cases that were reported to it through the:

- Sentinel Event Program
- State Coroner’s Office and Clinical Liaison Service
- CCOPMM
- VCCAMM.
Data collection

Direct voluntary reports of significant adverse events or morbidity are received from surgeons and health services. Reports are received via a completed confidential initial report – Form 1 (in Appendix 1, and available on the VSCC website at <www.health.vic.gov.au/vscc>). Case notification can also be made by e-mail, fax or letter.

Since 2008, the VASM is notified of all deaths in surgical care, either by the surgeon or hospital team, or through the Coroner’s Office. The first-line and/or second-line assessments of select cases are again de-identified for scrutiny by the VSCC whenever an area of concern in care, an adverse event or a potentially improvable outcome is identified.

Data from the mandatory reporting of surgical sentinel events is referred to the VSCC in the form of root cause analyses made by the health services. These are considered at council meetings to provide to the department with the VSCC’s clinical opinion on the conclusions and recommendations that had resulted.

Data is received from the Victorian Admitted Episodes Dataset (VAED) on health service performance of a variety of procedures, derived from the discharge coding information held by the department. Clinical performances across the (de-identified) health services are compared to allow identification of apparent outliers in comparison with the average across the state. Individual hospitals and health services with such apparently outlying performance are then notified and invited to validate the data, look at the individual case records, identify any necessary remedial measures and respond so the VSCC may advise other hospitals of any resulting suggested safety precautions or system changes.

The VSCC has piloted with two urban and regional hospitals an avenue for easy submission of information from their existing internal hospital morbidity and mortality (M&M) programs. The reports are confidential, de-identified for the VSCC’s consideration, and aim to identify any problems and trends. They are then used to promulgate ‘alerts’ or practice guides to all surgical hospitals. These M&M programs are integral to in-hospital audit and training, receive great contemporary input from the surgeons about their patients, and represent an under-used pool of expertise and potential resource for improving patient care more generally.

Reporting

All cases notified to the VSCC are de-identified before discussion by the council members, and all such information is privileged and protected in law. The VSCC has occasionally received requests from other parties for an opinion about an identified case, but it is not possible to provide this. The quality and safety committees of various health services have continued to assist the reporting mechanism by coordinating the completion of report Form 1 (Appendix 1) and VASM case notification forms, always with the permission of the treating surgeon.

All resulting information and advice is communicated to Victoria’s surgeons, including gynaecological and ophthalmological surgeons and their trainee surgeons, CEOs and directors of surgery of health services and hospitals via regular bulletins and clinical practice guides that appear on the VSCC website and are sent to Victoria’s surgeons and trainees. This triennium has seen a change from printing and posting to emailing for their ease of distribution and hopefully better assimilation. The VASM also published case note booklets of illustrative case reports to help surgeons with their non-technical as well as technical skills in patient management through the complexities of modern hospital care.
SECTION 1:
THE TRIENNIAL IN REVIEW
REPORTED CASES

Surgical mortality

The VSCC regularly receives cases identified by VASM assessors as involving one or more areas of concern, adverse events or a potentially improvable outcome. After VSCC review, a short report is sent to the VASM staff to feed back advice to the treating/notifying surgeon who receives the VASM assessment. Signal cases or a cohort of cases allow a clinical practice statement to be developed.

These reports are received in all the surgical specialties, now including gynaecological surgery, and from all public and private surgical hospitals.

Examples of identified issues, often occurring in combination, are shown here, and were used to generate clinical practice guides. The guides issued or updated in 2011–2013 appear in Section 2 of this report and can be found at <www.health.vic.gov.au/vscc>.

Clinical management

- Inadequate clinical patient observations
- Inadequate treatment of sepsis, especially in diabetics
- Aspiration of gastric contents at induction of general anaesthesia
- Selection of patients, for example, the unfit patient and scale of operation chosen; extensive cancers operated without preoperative staging and planning; elective surgery in ASA4 patients; choice of a long or complex operation over a lesser one in compromised patients
- Scanty operation notes and consultant entries in the medical record
- Clinical handover
- Management of severe sepsis
- Delayed recognition of patient deterioration
- Malpositioned endovascular prostheses
- Need for cardiac and renal protection in revascularisation of severely ischaemic legs
- Fatal major vessel injury at laparoscopy, level of skill of laparoscopist
- Lack of appropriate nasogastric tube drainage in ileus or bowel obstruction
- Inadequate or over-zealous IV fluid therapy
- Omission of upper GI endoscopy in continued rectal bleeding
- Managing alcohol-withdrawal aggression by over-sedation rather than intubation
- End-of-life decision making and care; family involvement
- Balance of patient’s best interests with wishes of well-meaning family members in matters of treatment, transfers and referrals
Health service or system issues

- Imaging delays, delayed or absent imaging reports
- Delayed or misdiagnosis of surgical emergencies in ED or ward
- Delayed access to theatre for emergency conditions
- Inappropriate patient transfer between hospitals
- Inadequate information available to treating team at day-of-surgery admission (DOSA)
- Inadequate preoperative physician assessment of comorbidities
- Heightened risks in morbidly obese patients, emergencies and after hours
- Inadequate consultant involvement in decision making and supervising trainee operating
- Time of day and its effects on surgery
- Poor postoperative communication in shared care
- ‘General surgical conditions’ developing in ‘specialty’ ward patients
- Delayed transfer to higher care (between or within hospitals)
- Omissions in postoperative care – non-use of universal post-op orders checklist
- Danger of pressure ulcers, falls, night-time in hospital, soft-tissue injuries
- End-of-life decision making and care; family involvement
- Balance of patient’s best interests with wishes of well-meaning family members in matters of treatment, transfers and referrals
- Absence of autopsy to determine operation success or precise cause of death

Surgical morbidity

The VSCC continues to receive voluntarily reported cases of surgical morbidity including serious adverse events and ‘near misses’. The number of case reports remains small and the VSCC seeks to continue improving this information-gathering process.

An opportunity has been offered directly from the VSCC to a pilot group of hospitals to source from their existing programs of surgical ‘M&M’ review meetings such lessons and alerts that the VSCC might de-identify and promulgate to others in the interests of patient safety more widely around the state. In line with the corrective value of near-miss analysis in airline systems, we know much work is already being done by participants in hospital morbidity meetings and deserves wider acknowledgement. The lessons derived from any surgical unit M&M deliberations were asked to be sent to the VSCC for de-identification and sharing with the wider surgical community.

Incident and near-miss reports from consultant surgeons, trainees and other specialists are encouraged, either on the VSCC report – Form 1 (Appendix 1) or by email. All reports are de-identified for discussion purposes. As above, such experiences are used in the VSCC’s development of clinical practice guides.
Quality improvement opportunities considered by the VSCC

- Emergency and after-hours surgery, including scheduling of surgical emergencies
- Surgeon supervision and availability
- Early recognition and appropriate management of the deteriorating patient
- Adherence to the ‘time-out’ process to prevent wrong side/site operations and greater vigilance on surgical counts to prevent retained surgical equipment
- Standard of medical documentation (including of family consultations) and the use of electronic records
- Access to, and interpretation of, imaging reports
- Communication including clinical handover, open discussion
- A variety of clinical practice improvements relating to optimal antibiotic choice, deep vein thromboembolism prophylaxis, fluid therapy, debridement of dead and devitalised tissue

The Department of Health and Human Services will continue to work with the VSCC, health services and other key stakeholders to address these and other emerging priority areas.
AUDITS OF MORTALITY UNDER SURGICAL CARE

- Since 2008 the monitoring of mortality under surgical care was transferred from the VSCC to the VASM. The Department of Health and Human Services funds the VASM. This is now in line with mortality audit in other states, now under the bi-national body – Australian and New Zealand Audit of Surgical Mortality (ANZASM). Further information can be found at the RACS website. The VSCC looks to maintain the close relationship of our two bodies, in which the chair of each contributes to the other’s meetings and activities.

- VASM now has a high level of participation by Victorian surgeons, including gynaecological surgeons, as notifiers and as assessors of case reports. Many of the cases are assessed as unavoidable deaths, but in a small proportion there are issues requiring careful consideration and peer review, to establish if the death was preventable or the care improvable. The VSCC receives selected de-identified assessments, confirms their classification and develops and promulgates practice guides in the clinical areas that need surgeons’ closer attention (see Section 2).

- The VSCC also has a role in monitoring the quality of second-line assessments by VASM volunteers, both in the course of regular council reviewing, and in the annual audit of the assessments process that VASM conducts. This involves many council members invited to conduct another second-line assessments of a case in their specialty, with full access to the hospital files, to ensure reasonable concordance and reliability of the VASM process.

- The VSCC values the cooperation of VASM's clinical director, Mr Barry Beiles, and manager, Ms Claudia Retegan, and their staff, in providing appropriate case report material that so informs this council. In general the VASM assessments received are of high quality and diligence. The absence of adequate detail in hospital notes, in particular entries by the surgeon, and the alarmingly low rate of autopsy to establish the precise cause of death in uncertain surgical cases, continue to concern the VSCC.

- For the first time in 2014, the VASM has published a suite of recommendations arising from the review of mortality cases in the VASM annual report 2013. In future the VSCC will consider these recommendations and advise the Minister for Health and Department of Health and Human Services on priorities and strategies to address.
The Victorian Sentinel Event Program has been in place since 1 July 2001. Health services must notify the department within three days of the event being reported within their service. From the date of notification, the health service involved must investigate the event and prepare a root cause analysis within two calendar months. The report identifies causal and contributing factors, and a risk reduction action plan to prevent recurrence.

The years 2011–2013 have seen pleasingly fewer surgical sentinel events referred from the program than in the previous triennium. The VSCC’s review and surgical opinion was sought on clinical aspects of a number of events, as shown in Table 1.

Table 1: Surgical sentinel events, Victoria, 2008–2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Category of surgical sentinel event</th>
<th>Number</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>Wrong place or part</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retained material</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other catastrophic</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>2009</td>
<td>Wrong place or part</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retained material</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other catastrophic</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>2010</td>
<td>Gas embolism</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retained instruments</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other catastrophic</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wrong patient</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>2011</td>
<td>Incorrect operations – patient/site/side</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retained materials – packs/instruments/drain tubes</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other catastrophic – bleeding/fire</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>2012</td>
<td>Incorrect operations – patient/site/side</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retained materials – packs/instruments/drain tubes</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other catastrophic – laparoscopic haemorrhage</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>2013</td>
<td>Incorrect operations – patient/site/side</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retained materials – packs/instruments/drain tubes</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other catastrophic</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>
Interpretation of pattern of sentinel events, and the VSCC’s response

The dramatic reduction and sustained avoidance of incorrect operations is attributed to wide uptake of the ‘time-out’ checking process in the operating theatre. This evolved from the World Health Organization (WHO) checklist, promoted by the VSCC in 2007–08, and supported by RACS. Crucially, the whole theatre team now pauses to confirm all details of a patient before the correct anaesthetic and operation begin (see example – Appendix 8).

Retained materials after surgery varied from gauzes and packs to temporary clips or other devices, to sheaths, guidewires or drain tubes that broke or displaced inwards. In some cases, the patient’s safety had required urgent closure of the incision despite an incorrect pack count. Re-operation was needed to remove the materials, though none proved fatal or resulted in permanent impairment.

The VSCC has recommended greater vigilance by surgeons and the whole team during operations, to be aware of the well-known high-risk situations for ‘wrong counts’, to avoid the retention of temporary packs and devices, and to ensure drain tubes are secured to the skin, especially if they are later withdrawn in stages (see the clinical practice guides in Section 2).

The VSCC has recommended greater caution by laparoscopic surgeons to avoid injury to major blood vessels during the establishment of pneumoperitoneum, as the resulting aortic, iliac or caval bleeding is too often rapidly fatal (see the clinical practice guides in Section 2).
GUIDELINES AND CLINICAL PRACTICE STATEMENTS – SUMMARY

The following clinical practice statements were developed or revised, and approved and promulgated on the VSCC website, publicised in our periodic bulletins, and sent to all surgeons and surgical trainees in Victoria. The National Health and Medical Research Council (NHMRC) Register of guidelines for patient safety also lists them.

2011:
- Guideline on surgeon responsibility
- CVC guidewires on the loose
- Ruptured abdominal aortic aneurysm
- Fire in the operating theatre
- Management of vascular injuries at laparoscopy (and an amendment)
- Fatigue during long operations
- Request for operation/procedure checklist
- Assistance at difficult operations
- Fluid overload in hysteroscopic surgery

2012:
- Managing patients at ‘high risk’ for surgery: major surgery in general
- Air embolism associated with the use of hydrogen peroxide – a warning (revised)
- Acute cholangitis and availability of urgent ERCP services (revised)
- Management of heavy rectal bleeding
- Endovascular aortic aneurysm repair (EVAR)
- Managing ‘high-risk’ patients for cardiac surgery
- Adequate drainage of pus
- Retained foreign objects and imaging in theatre

2013:
- Stress ulcer prophylaxis in surgical patients
- Diabetic tissue care and feet at risk
- Acute cholangitis and availability of urgent ERCP services (revised)
- Acute mesenteric ischaemia (revised)
- Bile duct stones – guidelines for management (re-approved)
- Nasogastric tube intubation in the treatment of ileus or bowel obstruction
- Intraocular lens selection – always re-check that the implant is correct (revised)
- Mesenteric ischaemia in repair of abdominal aortic aneurysm (AAA) (revised)
- Penrose drain tube use and hazards

These clinical guides are included in Section 2. They are also available on the VSCC website.
MAJOR PROJECTS

Surgical Outcomes Information Initiative

This important subcommittee of VSCC uses existing administrative data collected by the Department of Health and Human Services for statistical analysis, enabling studies of selected surgical conditions and operations for variations in outcomes across the state. Hospitals with apparently outlying performance are invited to validate their data, investigate their results and report their conclusions and any resultant action to improve patient care and outcomes to the VSCC. The VSCC can disseminate any derived lessons to the surgical community and health service CEOs. This novel use of discharge coding in the VAED serves as a model for other states.

Discharge coding data of admissions to private hospitals is now also able to be compared, and their level of performance communicated to them for information.

The SOII subcommittee studied the following topics, summarised in Appendices 5–7:

2011:

• Complications following day colonoscopy, 2008–2010
• AV fistula revisions, 2008–2010

2012:

• Complications following hysterectomy, 2008–2010
• Complications following inguinal hernia repair, 2009–2011
• Complications following neuraxial (spinal, epidural) anaesthetics, 2009–2011

2013:

• Intracranial aneurysms mortality and complications with endovascular treatment or clipping, 2009–2011
• Pancreatectomy – mortality and complication rate in Victorian hospitals, 2010–2012

This work has enabled the VSCC to identify the state average mortality rate for each of the selected procedures as well as the mortality rate (in a de-identified manner) for each of the health services and private hospitals that have undertaken these procedures. It is pleasing to know that Victoria’s surgical outcomes are in accord with published world standards and clinical indicators.

There have been apparent performance outliers in several of these studies. Clinicians at those hospitals have inspected the medical records and resolved a variety of coding variations. Validation of coding has reduced the number of outliers, and enabled in them a variety of care and management system improvements.
Surgical Seminar Program initiated

In February 2012 and 2013, Seminars for surgeons and other hospital staff were presented jointly by VSCC, VASM, VMIA and the department, with the aim of improving awareness of the importance of clinical outcome audit. Presentations, panel discussions and questions afforded practical measures for improving surgical patient safety in both large and smaller hospitals. Themes so far have included practical advice in several of the surgical domains of Australian Commission on Safety and Quality in Health Care (ACSQHC). Nearly 200 registrants in the auditorium, and several rural centres by televised link, assessed high levels of satisfaction with the programs, which are summarised in this report (Appendices 3 and 4):

Next seminar in the series is planned for 19 February 2014: ‘Surgical Emergencies and Shared Care’

Victorian hospitals postoperative orders form adopted

This medical record page was promulgated to hospitals throughout the state as an important surgical safety measure. It was recommended by the Coroner to prompt nursing, surgical and anaesthetic staff working at several hospitals, or HMOs rotating to several hospitals, to complete these vital orders, for ready access throughout the patient’s stay. The VSCC developed a universal postoperative order form in conjunction with the VCCAMM, The Alfred and other hospitals. The form can be found at Appendix 2.

Introduced in 2010 with a workshop and instructions for its adoption, the form is a structured checklist, and complements the preoperative time out theatre checklist that is fully endorsed by the Department of Health and Human Services, the VSCC and RACS. The form’s success is its standard, recognisable and instantly accessible format between hospitals. Specific requirements of a specialty, unit, procedure or anaesthetic are catered for on the reverse side of the page.

Uptake of the form was assessed in 2013 and confirmed in the majority of Victoria’s surgical hospitals, in either paper or electronic record format.

Intern manual: The immediate management of surgical emergencies – revised

One of VSCC’s important projects is the pocket-sized intern manual that proves popular with interns and students. Now into its revised 4th edition, it was presented to all new interns each January, funded by the Department of Health and Human Services and the Post-Graduate Medical Council of Victoria as a tool to enhance patient safety and intern performance, It is also available electronically on most hospital intranets and in a PDA version.
VSCC INTERACTION WITH OTHER AGENCIES

NHMRC Guideline Developers Network
The VSCC is aligned with this body. We both seek to improve appropriateness of care, maintenance of professional knowledge and standards, and methods to monitor the uptake of guidelines. The VSCC offers an experienced clinical specialist perspective.

State Coroner
Successive Justices Coate and Gray have afforded more timely access to preliminary autopsy findings of the Coroner's pathologist, to enlighten case evaluations by the VSCC and the other clinical councils, and have referred cases, findings and advice. The VSCC's pathologist member provides liaison via the Victorian Institute of Forensic Medicine.

Commission for Hospital Improvement, Standards Australia, Avant, RACS and the Australian Commission on Safety and Quality in Health Care
These groups receive our input and support in areas of mutual clinical concern. For example, they are well equipped to explore, develop and promote risk management strategies for effective communication among healthcare professionals, handovers and disruption-related risk, and adoption of new technologies.
APPENDIX 1: INSTRUCTIONS AND VSCC FORM 1 FOR REPORTING INCIDENTS OF SURGICAL MORBIDITY

Please complete and return to:

The Chair
Surgical Consultative Council
GPO Box 4923
Melbourne 3001

Report forms may be accessed by contacting the Consultative Councils Secretariat on 9096 2701 or from the website at <www.health.vic.gov.au/vscc>.

Identifying information on this document is confidential to the chair of the consultative council. This enables the chair to contact the reporting clinician should additional information on a reported incident be required, and to provide feedback.

Subsequent review by the full council is by case number only, as all identifying information is deleted prior to the full council reviewing an individual case of surgical morbidity.

Surgical morbidity refers to injury in association with or as a result of surgery. The council encourages reports of any significant morbidity.

PLEASE COMPLETE DETAILS REQUESTED IN THE REPORTING PROFORMA OVERLEAF.
CONFIDENTIAL INITIAL REPORT – FORM 1

On receipt of this preliminary report, a member of the council may either contact you for further information or send you a more detailed form for completion (Form 2).

Date of report: ___________________________ Case no (SCC use only): ___________________________

Identifying information is confidential to council chairman

<table>
<thead>
<tr>
<th>Patient’s name:</th>
<th>Hospital/health service:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital UR no:</td>
<td>Name of person reporting:</td>
</tr>
<tr>
<td>Contact phone number of person reporting:</td>
<td>Qualification of person reporting (please circle one): Consultant  Registrar  Other</td>
</tr>
</tbody>
</table>

Event summary

<table>
<thead>
<tr>
<th>Date of admission:</th>
<th>Date of operation:</th>
</tr>
</thead>
</table>

Date of recognition of morbidity:

Type of hospital: (circle appropriate category):

<table>
<thead>
<tr>
<th>Major teaching hospital</th>
<th>Major suburban/ regional hospital</th>
<th>Country hospital</th>
<th>Private hospital</th>
<th>Other (please specify)</th>
</tr>
</thead>
</table>

Age of patient: ___________________________ Sex of patient: ___________________________

ASA risk classification: (circle appropriate category):

ASA 1  (A normal healthy patient)  ASA 2  (A patient with mild systemic disease)  ASA 3  (A patient with severe systemic disease)  ASA 4  (A patient with severe systemic disease that is a constant threat to life)  ASA 5  (A moribund patient who is not expected to survive without the operation)

Type of incident (circle appropriate categories):

MORBIDITY  Pre-operative  Operative  Post-operative

Nature of procedure:

☐ Elective  ☐ Emergency  Please specify procedure -

Nature of event (tick appropriate box):

☐ Expected  ☐ Unexpected

EVENT DETAILS

(please provide a narrative summary of the incident – use back of form if more space is required):

Opinion as to cause of incident:

Recommendation for prevention of similar incident:
APPENDIX 2: POST-OPERATIVE ORDERS FORM

Victorian hospitals postoperative orders
Surgeon and anaesthetist to complete

Alerts: Patient comorbidities and/or operative events
Please tick ☐ and list comorbidities and/or operative events
☐ Yes (see patient history for details) ☐ No
List:

Managing unit

Please tick

Patient specific reportable criteria
If left blank default to MET criteria

Standard Recovery as per hospital protocol
WARD: Every 30 minutes until stable
Then Hourly for next 4 hours
4-hourly for the next 24 hours
HR < T > RR < T >
SBP < T >

Oxygen

commence

☐ Mask
☐ NIP
Limit

SaO₂

Report <

Blood loss

Report if blood loss >

Urine output

Report <

Specific observations

Neurological (MR - ___)
Vascular (MR - ___)
Chest drain (MR - ___)

Please tick ☐ N/A = Not

Surgical care

☐ Wounds/dressings:
☐ Leave intact until review
☐ Drains type/site
☐ Suction
☐ Free drainage
☐ NGT
☐ Free drainage
☐ Aspiration /24
☐ Other

Restrictions related to this procedure

Unrestricted
☐ Restricted (see over)
☐ Head up:

Degrees

DVT prophylaxis

☐ Chemoprophylaxis documented on current medication chart
☐ Compression stockings
☐ Pneumatic calf compressors
☐ Nil

Medication prescribed per medication chart

☐ Antibiotics
☐ Steroids
☐ Regional analgesia
☐ Anticonvulsant
☐ Analgesia
☐ Antiemetics
☐ Recommend preop antiocoagulant

IV fluids

☐ As per IV fluid chart

Nutrition

☐ Full diet
☐ Nil by mouth /24 then
☐ Feeding tube
☐ TPN
☐ Oral fluids

Example MET criteria

Airway

Threatened

Resp. rate < 8 or > 36

Breathing

SpO₂ < 90% on oxygen

Circulation

Systolic BP < 90
Heart rate < 40 or > 140, as above

Neurology

Sudden fall in GCS > 2 points

Prolonged seizures

Serious concern about a patient uncontrolled pain

If in doubt as to call a Code Blue or MET

- CALL A CODE BLUE
## Specific orders

<table>
<thead>
<tr>
<th>Postoperative tests/referrals ordered</th>
<th>Please tick ✓</th>
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</thead>
<tbody>
<tr>
<td>Pathology</td>
<td></td>
</tr>
<tr>
<td>Radiology</td>
<td></td>
</tr>
<tr>
<td>Allied health</td>
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</tbody>
</table>

## Specific surgical orders

## Specific anaesthetic orders

<table>
<thead>
<tr>
<th>Completed by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designation:</td>
</tr>
<tr>
<td>Date:</td>
</tr>
<tr>
<td>Time:</td>
</tr>
</tbody>
</table>

## Day procedure discharge planning

<table>
<thead>
<tr>
<th>Please tick ✓</th>
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</thead>
</table>
APPENDIX 3: SUMMARY OF ‘MANAGING THE DETERIORATING PATIENT’ SEMINAR

The Victorian Surgical Consultative Council

‘Managing the Deteriorating Patient’ Summary of seminar: Thursday 23 February 2012

Some 200 surgeons, interns, HMOs, ED and ICU physicians, senior nursing staff, and hospital quality and safety officers took part at the Telstra Auditorium, Lonsdale Street, Melbourne, with live transmission to further interns, HMOs and nurses at nine regional hospital centres. The seminar recording is available at <www.health.vic.gov.au/vscc> or <training@vmia.vic.gov.au>.

1. Introduction to the challenges – Mr Peter Field, VSCC chair and vascular surgeon, welcomed registrants, aiming to raise awareness of the need to identify and respond early to deteriorating patients. Presentations and cases will reflect the outcomes evidence and experience of the Victorian Surgical Consultative Council (VSCC, Department of Health) and Victorian Audit of Surgical Mortality (VASM, Royal Australasian College of Surgeons). The topic has high priority with the Australian Commission on Safety and Quality in Health Care. Surgical outcomes in Victoria are generally at a world high standard to be proud of, but we strive to improve the safety of our hospitals and surgical care further.

2. Auditing clinical deterioration – a sequence of events – Prof. John Royle OAM, past president of the College of Surgeons and general surgeon, Austin Hospital, described Victoria’s audit process of surgical mortality (VASM) and the feedback provided to hospital CEOs, directors of surgery and treating surgeons. In 36% of deaths there were issues of delay in the delivery of definitive care and failure to recognise clinical deterioration, for example, with a leaking bowel anastomosis. Hospital and unit M&M meetings deserve support and attention.

3. Recognising surgical emergencies in ED or ward – Mr Tony Heinz, director of surgery at Goulburn Valley Health, used as examples: airway obstruction, breathing difficulty, shock, bleeding, and sepsis. The classic presentations are familiar, and should be recognised promptly. The VSCC’s manual for interns on surgical emergencies offers handy help. The Victorian hospitals postoperative orders Form offers a uniform coverage of care.

4. Near misses as viewed from the ICU perspective – Dr Nerina Harley, ICU director at Melbourne Health, brought expertise as chair of Epworth’s Critical Care Institute and the Department of Health’s ICU advisory committee. Scope for action before the MET call stage, the typical patients who predictably deteriorate, the RAPID program, and limitation of medical treatment were covered. Respiratory failure and oliguria are major overlooked problems.

5. Escalation and calling for help – before the MET call – A/Prof. Rodney Judson, director of surgery and the Royal Melbourne Hospital, highlighted individual and institution requirements, including the need to be prepared, alert, bold, kind and thorough. The patient must first be supported, the pathology must be recognised, and definitive treatment begun. Heed early warning features, diagnose the problem (hard from one’s bed), do something, and call early for help.

6. Observation charts, triggers and communication – Ms Anna Green, critical care liaison nurse at Western Health, presented the experience of rapid response systems, the work done by ACSQHC, the trigger-zoned observation charts and newer electronic recording of observations with inbuilt trigger calls to escalate the level of care. Low respiratory rate and sepsis are under-appreciated. Handovers between staff can be more productive. End-of-life care and communication between family and staff are other challenges.
7. **Patients and situations at risk in our public hospitals – clinical risk management perspective on medical indemnity claims** – Ms Liz Cox, VMIA clinical risk manager, presented the ‘league table’ of clinical specialties generating claims for adverse events, and the beneficial effect of open discussion by the doctor making a claim less likely. Eight priority areas for improved care are identified, high among them being shared care and medical co-management of surgical patients, rostered/shift care, hospital at night, admin, training, patient and carer communication, local cultures and norms.

8. **Practical case solutions** – The panel and audience discussed some typical patient scenarios, de-identified, including:

- meningioma in ED, classic coning, delayed relief of intracranial hypertension
- strangulated femoral hernia after knee replacement, deteriorated undiagnosed
- fulminant acute pancreatitis, under-resuscitated before interhospital transfer
- unrecognised retroperitoneal major bleed after femoral angioplasty procedure
- pulmonary embolus one day after right nephrectomy, no DVT prophylaxis given
- acute pancreatitis in ED, surgeon requested transfer to a hospital with an HDU bed, denied, then deterioration required emergency transfer to an ICU.

The registrants expressed many similar experiences, and it was generally agreed that:

- ED could rely more on clinical examination to trigger surgical referral, rather than delay for imaging results
- surgical teams could attend faster to urgent surgical referrals
- ‘general surgical conditions’ occurring in post-op ‘specialty wards’ need more alertness
- fluid balance needs better charting, and fluid resuscitation needs to be vigorous enough
- decreasing conscious state is a danger sign in cranial conditions and head injuries
- standard venous thromboprophylaxis should not be omitted lightly or overlooked
- major occult iatrogenic bleeding needs staunching, and quickly
- hospitals with major facilities need to respond to calls for help or urgent treatment from smaller hospitals. Adult Retrieval Victoria is there for such cases, not just trauma.

9. **Feedback** – Registrants provided feedback indicating their high degree of satisfaction with the seminar (> 4/5 overall). There were suggestions for more seminars, some on similar topics, and some with more clinical or with more academic/evidence bias. Some looked for more input from junior staff. All hoped for a smoother audio-visual facility at future seminars.
APPENDIX 4: SUMMARY OF THE ‘PATIENT TRANSFERS — BETWEEN HOSPITALS AND WITHIN HOSPITALS’ SEMINAR

Seminar: ‘Patient transfers — between hospitals and within hospitals’, February 2013

This is a summary of the seminar/webinar held in Melbourne on 21 February 2013, presented jointly by the Victorian Surgical Consultative Council (VSCC, Victorian Department of Health), Victorian Audit of Surgical Mortality (VASM, Royal Australasian College of Surgeons), and the Victorian Managed Insurance Authority (VMIA).

The presentations, panel discussion, de-identified case scenarios and question time raised medical and nursing staff awareness of safety factors for interhospital transfers of emergency surgical patients. The discussions also promoted better information to accompany patients moving within hospitals and offered improved techniques for surgical patient handovers between shifts or between wards.

Some 190 registrants attended at the Department of Health auditorium, 50 Lonsdale St, Melbourne, and 18 regional centres participated via teleconference and webcast. These included interns and HMOs, surgeons (rural and urban), nurse managers/educators, intensivists, anaesthetists, emergency staff, administrators, health service CEOs, and quality and safety officers. The four-hour program was approved by the College of Surgeons for one CPD/CME point per hour. Registrant feedback rated 80–90% satisfaction with the program, and many suggestions for future seminar topics were received.

Program summary

1. Introduction — clinical audit reveals the challenges

Mr Peter Field, vascular surgeon at the Royal Melbourne and Epworth hospitals and VSCC chair, explained how surgeons’ clinical outcomes are audited. Most care in Victoria is provided at a world-high standard. However, analysis of recent adverse events shows that transfers of patients may delay care, often lack essential accompanying information, and can frustrate and interrupt the continuity of care. Our community expects ready access to sophisticated surgical facilities and staff, despite budgetary constraints, and especially in emergencies. From the experienced panel of presenters, we will hear how to go about smoother transfers of patients, their information and the responsibility for them, whether between hospitals, or between departments, operating theatres and wards of a hospital. We will all take home practical advice on improving the safety of our handovers.

2. The plight of the transferring hospital

Mr Tony Heinz, director of surgery at Goulburn Valley Health and VSCC member, has a keen interest in the education of doctors, nurses and surgeons, and in improving the standard of care in our state’s hospitals. Emergency transfer of patients with time-critical conditions or trauma is facilitated by Adult Retrieval Victoria (ARV), Newborn Emergency Transport Service (NETS), Paediatric Transport Service (PETS) and Perinatal Emergency Referral Service (PERS). Remaining a challenge though, often at midnight, is the patient who is less time-critical but needing or about to need transfer to a hospital with extra facilities or staff. Clinical examples were given of delay in transfer: a diabetic with ascending cholangitis needing urgent ERCP; a smoker with pneumothorax and persistent air leak from bullae; a patient with massive rectal bleeding requiring angiography and embolisation, who soon became unfit for transfer and had subtotal colectomy instead.
Related issues include: the decision making, the patient’s agreement, the seniority and ‘selling skill’ of the requesting doctor, knowing whom to contact, patient deterioration, finding a bed, obtaining imaging, the accountability and responsibility at each ‘end’ of and during the transfer, gathering the accompanying information, imaging and test results, and later on the return transfer and follow-up. A single point of referral, teleconferencing and improved feedback are suggested. References include Victorian Quality Council (2008, 2009) and Ambulance Victoria and ARV 2011–2012 annual reports.

3. How Adult Retrieval Victoria can help

Dr Marcus Kennedy, director of Adult Retrieval Victoria and emergency physician at Monash Health, described the evolution of ARV within Ambulance Victoria, and its current activities of adult critical care advice, bed coordination, interhospital retrieval of critical adult patients, and major trauma referral and advice (adult and paediatric). The ‘single phone call’ for patient referrals is 1300 36 86 61. The major categories of ARV time-critical patient transfer are cardiac, neurological, trauma and respiratory, totalling two-thirds of the 4,000 transfers annually, of which one-quarter are metropolitan. Consultant grade medical specialist staff are available full-time to advise, often using telehealth, arrange a destination, coordinate the retrieval, equip the team and prepare for transfer (for example, IV access, intubation). Similar processes could be used for potentially deteriorating patients, given funding. Reference: ARV Annual Reports: ambulance.vic.gov.au

4. Emergency surgery access

Mr Lindsay Castles, general surgeon (breast) and medical director of The Surgery Centre, Austin Health and VSCC member, presented ways in which hospitals manage access for emergency surgery. The recent trend to a dedicated emergency theatre and staffing sounds costly but can be cost-effective, reduce time to theatre, shorten hospital stay, reduce complication rate and wastage. It requires enthusiasm, goodwill, flexibility and a total care protocol, from early assessment and management of comorbidities through to discharge planning with access to rehabilitation and special accommodation beds. It offers safer, defined work patterns, professional handovers, and good training. Eight of Melbourne’s major hospitals have introduced their own local variations on the theme of acute surgery units (ASUs), with a defined person to contact, and heightened presence in the emergency department. At Austin Health, streaming some elective surgery to a separate centre has helped to maintain elective throughput. Austin and RMH have orthopaedic streams and emergency booking systems. The Alfred’s dominant trauma load may disperse other urgent work. Box Hill’s dedicated emergency theatre replaces an elective one. Northern and Monash have eight-bed ASUs for stays < 72 hours, with a rostered dedicated emergency surgeon.

5. Patient transfer – Doing it better

Dr Lee Gruner, president of the Royal Australasian College of Medical Administrators and member of VASM, acknowledged that interhospital transfers are difficult both for the referrers and for those receiving patients. The receiving hospitals are overwhelmed with patients and reluctant to add to their numbers. The referring hospitals are desperate to ensure that patients outside their scope of practice receive appropriate care. The patient is stuck in the middle of a system that will always need to allocate priorities. Although difficulties with patient transfer will never be eliminated, there are mechanisms to address the barriers and make the process easier. Dr Gruner suggests a three-pronged approach: putting patients first, using the National Safety and Quality Health Service Standards as a guide, and building relationships between health services and hospitals.

First, putting the patient first, by discussing who needs on-site care, and who will benefit from transfer, entails high-level clinical communication and advice. Next, the National Safety and Quality Health Service Standard 6, which covers inter- and intrahospital transfers, becomes compulsory for hospital accreditation next year, requiring their policies to be documented and monitored, with patients and carers involved. When surveyed, hospitals will need to show consistent application of their transferring and receiving processes. Third, developing strong relationships with key staff at the hospital being transferred to will improve the ease of transfer.
6. Handovers from theatre set the scene

Mr Barry Beiles, vascular surgeon and clinical director of VASM and member of the VSCC, reiterated the definition of 'handover' as 'the transfer of professional responsibility and accountability for some or all aspects of care for a patient or group of patients to another person or professional group on a temporary or permanent basis'. He described surgical inpatients as most vulnerable with many pre-, intra- and post-op transitions, despite their multiple checkpoints. VASM and other studies show 14% of post-op adverse events involve communication errors, and 67% of anaesthetists failed to transfer all the essential information in the handover. By contrast with most post-op handovers, a Ferrari pit stop works well because it is taken seriously, is predictable, standardised and rehearsed, with everyone's job known but one person is always in charge. Patients are less predictable.

Good handover from theatre is a good start to post-op care if it is: both oral and written; given by both surgeon and anaesthetist; becomes standardised; and is taught, rehearsed and monitored. To help, the VSCC has developed and promulgated the *Victorian hospitals postoperative orders form*, a checklist for universal use across the state as recommended by the Coroner. It aims for consistent, accessible and legible post-op care instructions, expectations and patient observations, as well as escalation-of-care levels, with space for surgeon and anaesthetist specialised instructions for individual patients or operations. Those handing over should transmit the patient's procedure, post-op condition, expected post-op course and possible complications, and understand the experience of staff taking over the care.

Recent examples of handovers from theatre seen by VASM include: chest drain not unclamped; incorrect site of pressure after angiogram puncture; severe hypertension not reported after carotid surgery; and suffocation from haematoma after thyroid surgery. There is room for surgeon example, leading to improved handovers and understanding.

7. The trouble with handover

Ms Belinda Mitchell, risk consultant from VMIA, described VMIA’s role in tackling two major consequences of poor handover — the risk to patients and the indemnity insurance cost to health services and practitioners. Everyone in these organisations is involved. Obstetrics, emergency medicine and general surgery head the high-risk specialties, followed by orthopaedics and neurosurgery, comprising 3/4 of claims and 3/4 of claims costs annually. Case studies were presented illustrating costly claims based on inadequate handover and poor documentation. Research shows clinicians prepare poorly for handover, its importance is undervalued, and it often lacks time, a framework and consistent language. Ms Mitchell noted a cultural divide exists between the perception of senior clinicians and the reality for junior clinicians. Problems should be pre-empted by surgeon leadership, a culture of communication (talking) and evidence-based preparation for handover. Risks and claims should also be minimised by receptiveness, responsiveness, escalation of care, open discussion, and documentation (essential for one’s defence).

8. Transferring in and out of intensive care

Prof. David Pilcher, intensivist at Alfred Health and director of ANZICS’s Adult Patient Database, Monash University, presented ANZ research into the areas of ICU entry, 77,000 discharges, and inter- and intrahospital transfers. Inappropriate late-day or night-time start to elective operations adds to the risk for patients entering ICU. After-hours and weekend admission is also associated with increased mortality. ‘Delayed admission to ICU’ (> 6 hours) is associated with a 40% increased risk of death. In 2004 Victoria had about 22,000 ICU admissions, 8,800 being transfers for higher level care or because of bed shortage, and an estimated 91 deaths attributed to lack of ICU access.

Premature discharge from ICU adds 35% to the risk of mortality, and night-time discharge adds 40%, such that the percentage of after-hours discharges from ICU is now an ACHS clinical indicator. The simple request for an MR scan becomes a logistical challenge to a ventilated and monitored ICU patient, and their transport carries the highest risk. So transfer ICU patients only when benefits outweigh risks; avoid delays in ICU admission, late admission after elective surgery, and after-hours discharge from ICU.
9. Making handovers safer

A/Prof. Dominic Vellar, general surgeon (head of Upper GI/Hepatobiliary Unit) and medical reviewer for quality and risk at St Vincent’s Hospital, and member of VSCC, described how continuing changes in medical practice make successful clinical handover more important than ever before. Auditing by VSCC and VASM has shown that failures in clinical handover translate to adverse events in hospital settings. Measures have been introduced to standardise and make handover safer and more efficient. Clearly defined and well-prepared handovers maintain continuity of care.

Some recurring problems at handover were described, with clinical examples. The tools now available to make handover more seamless were shown, OSSIE and ISBAR, which may be adapted for local needs. System continuity is achieved by dedicating time, sharing information, clarifying responsibility, access to up-to-date summaries and care plans, access to the principal doctor at any given time, and introducing new team members to the handover practice. Multi-specialty care, decreased working hours and increase in shift changes present further challenges to quality of handovers. Safe handovers = safe patients.

10. Case discussions

The panel answered questions and discussed several de-identified cases. Take-home messages included: advise JMOs which patients to examine overnight; surgeons need to lead by example; don’t delay involving the consultant surgeon; identify the responsible consultant; view urgent imaging with the radiologist; teleconsulting is here; respond to deteriorating patient obs; apply the basic principles of surgery; use the post-op orders checklist; remember venous thromboprophylaxis; debride adequately; be rested and alert; involve the patient’s family; and do unto others...

The full seminar presentations, by kind permission of their authors, are available on the websites of VMIA, VSCC and VASM. The organisers wish to thank all contributors and participants, and look forward to presenting another seminar topic to benefit the quality of care and safety of our surgical patients in 2014.

VSCC Approved February 2013
APPENDIX 5: SURGICAL OUTCOMES STUDY SUMMARIES, 2011

Complications following colonoscopy in Victorian hospitals, 1 July 2008 – 30 June 2010

Summary:
This is a Surgical Outcomes Information Initiative study on behalf of the Victorian Surgical Consultative Council (VSCC), Department of Health. It aims to compare the recorded complication rate across the state’s hospitals and health services of colonoscopies and colonoscopic procedures. These procedures are done by physicians and also surgeons.

Following 325,028 colonoscopies or colonoscopic procedures, 122 complications were recorded, mainly bleeding or perforation. The state average is thus 0.038%. It was not possible to link any complications resulting in admission to a different hospital with their original treating health centre or hospital.

Fourteen hospitals (de-identified for the study) had a statistically high complication rate following same-day colonoscopy (299,502 cases, state average 0.016%). Seven hospitals (also de-identified for the study) had a statistically high complication rate following multi-day-stay colonoscopy (25,526 cases, state average 0.290%). These are shown on the accompanying tables and graphs.

The de-identified hospitals with apparently outlying performance were invited to look into the circumstances and inform the VSCC confidentially of their findings and any resulting action. Most instances proved to be codings of further procedures and not complications of the colonoscopy, or to be codings of minor, inconsequential events noted in the medical record.

Clinicians at the few remaining outlier hospitals reviewed and adjusted their internal processes. There were no major changes or precautions of which the VSCC needed to advise other hospitals in the interests of maintaining and improving the standard of surgical care across Victoria.

Conclusion: It is pleasing for Victorians to know that these surgical outcomes are generally in accord with published world standards and clinical indicators. It is not possible with current data systems, and without a unique patient identifier available, to track patients with a complication occurring beyond the initial hospital/day centre admission, or requiring readmission to the same or another hospital. The patient-controlled electronic health record (PCEHR) as currently proposed is unlikely to enable such links to be made.

VSCC Approved 2011
Complications of AV dialysis fistulae requiring re-operation in Victorian hospitals, 1 July 2008 – 30 June 2010

Summary:
This is a Surgical Outcomes Information Initiative study on behalf of the Victorian Surgical Consultative Council (VSCC), Department of Health.

It aims to compare the recorded rate of procedures to correct a complication of an arteriovenous (AV) dialysis fistula across the state's hospitals and health services. The rates are expressed in relation to the numbers of patients receiving haemodialysis at these hospitals, since it is not currently possible to link a correction procedure to the hospital where the fistula was originally formed. These procedures may be done by surgeons, nephrologists and also radiologists.

There were 6,487 patients receiving dialysis in the study period (577,799 episodes, an average of 89 per patient). Of these, 1,331 complications requiring correction were recorded, mainly thrombosis, stenosis, aneurysm or bleeding. Using this ‘surrogate method’, the state average rate of fistula complications requiring correction is thus 20.5% per two years.

Four hospitals or health services (de-identified for the study) had an apparent statistically high correction of complications rate expressed in these terms, ranging from 32.2% to 40.5%. These results are depicted on the accompanying tables and graphs.

The de-identified hospitals with apparently outlying performance were invited to look into the circumstances and inform the VSCC confidentially of their findings and any resulting action. Their clinicians’ investigations revealed the apparent variations related to differences in their dialyzing patient population, sources of referral and facilities for treating such complications. No safety improvements or precautionary measures were discerned.

Conclusion: It is pleasing for Victorians to know that these surgical outcomes are generally in accord with published world standards and clinical indicators. It is not possible with current data systems, and without a unique patient identifier available, to track individual patients with a complication occurring beyond the initial hospital admission, or requiring readmission to the same or another hospital. The patient-controlled electronic health record (PCEHR) as currently proposed is unlikely to enable such links to be made.

VSCC Approved 2011
Complications following hysterectomy in Victorian hospitals, 
1 July 2008 – 30 June 2010

Summary and highlights:

This is a Surgical Outcomes Information Initiative study on behalf of the Victorian Surgical Consultative Council (VSCC), using Department of Health administrative data and resources. It compares the outcomes recorded for hysterectomy across the state's hospitals and health services. Tables 4–6 show the discharge coding of the 13,628 hysterectomies, the state survival rate of 99.956% (mortality 0.044%), and the rates of complications.

The hysterectomies were done by gynaecologists, gynaecological oncologists and some general surgeons. Public and private hospitals had similar survival rates. Each of the six deaths was at a different hospital, with no statistical outlier performance. There was no death among the 1,953 laparoscopic hysterectomies.

Haemorrhage required return to theatre in 59 patients (0.43%, Table 5). Injury to other organs, mainly bladder and large bowel, 106 recorded injuries representing a rate of 0.78%. The injury rate in laparoscopic hysterectomies was slightly higher at 0.87%. The combined rate of haemorrhage or organ injury was thus 165/13,628 or 1.21%.

Five hospitals had statistically high haemorrhage rates, another five had high injury rates, and another two had both. The accompanying graphs include only hospitals with at least 100 admissions or at least one complication. These de-identified hospitals with apparently outlying performance are being invited to look into the circumstances and to inform the VSCC confidentially of their findings and any resulting action. The VSCC may then advise other hospitals in the interests of maintaining and improving the standard of surgical care across Victoria.

It was also noted that another three hospitals, with fewer than 20 elective hysterectomies in the two years, had complications and will be invited to consider local factors such as patient selection, surgical and nursing staff, and hospital facilities.

Among the 142,497 women giving birth in the study period, 101 hysterectomies were required (0.07%). During the same period there were also 44,784 Caesarean sections (31.43% of births).

VSCC Approved May 2012
Complications following hysterectomy in Victorian hospitals, 1 July 2008 – 30 June 2010

### Table 4: Number of deaths following hysterectomy, by hospital type

<table>
<thead>
<tr>
<th>Hospital type</th>
<th>Number of deaths</th>
<th>Number of hysterectomies</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>&lt; 5</td>
<td>Suppressed</td>
<td>0.032</td>
</tr>
<tr>
<td>Public</td>
<td>&lt; 5</td>
<td>Suppressed</td>
<td>0.054</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>13,628</td>
<td>0.044</td>
</tr>
</tbody>
</table>

Note: Significance test shows that p-value = 0.56

### Table 5: Number of patients with haemorrhage requiring return to theatre, following hysterectomy, by hospital type

<table>
<thead>
<tr>
<th>Hospital type</th>
<th>Number of haemorrhages</th>
<th>Number of hysterectomies</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>22</td>
<td>Suppressed</td>
<td>0.36</td>
</tr>
<tr>
<td>Public</td>
<td>37</td>
<td>Suppressed</td>
<td>0.50</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>13,628</td>
<td>0.43</td>
</tr>
</tbody>
</table>

Note: Significance test shows that p-value = 0.22

### Table 6: Number of injuries following hysterectomy, by hospital type

<table>
<thead>
<tr>
<th>Hospital type</th>
<th>Number of injuries</th>
<th>Number of hysterectomies</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>24</td>
<td>Suppressed</td>
<td>0.39</td>
</tr>
<tr>
<td>Public</td>
<td>82</td>
<td>Suppressed</td>
<td>1.10</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>13,628</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Note: Significance test shows that p-value < 0.001

### Table 8a: Number of hysterectomies among post-partum haemorrhage patients

<table>
<thead>
<tr>
<th>Number of hysterectomies</th>
<th>Number of haemorrhages</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>98</td>
<td>16,540</td>
<td>0.59</td>
</tr>
</tbody>
</table>

### Table 8b: Number of hysterectomies among women having Caesarean section

<table>
<thead>
<tr>
<th>Number of hysterectomies</th>
<th>Number of Caesareans</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
<td>44,784</td>
<td>0.18</td>
</tr>
</tbody>
</table>

### Table 8c: Number of hysterectomies and Caesarean sections among women giving birth

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of cases</th>
<th>Number of women giving birth</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstetric hysterectomies</td>
<td>101</td>
<td>142,497</td>
<td>0.07</td>
</tr>
<tr>
<td>Caesarean sections</td>
<td>44,784</td>
<td>142,497</td>
<td>31.43</td>
</tr>
</tbody>
</table>

### Table 13a: Number of haemorrhages requiring re-operation or injuries following hysterectomy, by operation type

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of haemorrhages or injuries</th>
<th>Number of hysterectomies</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>5</td>
<td>776</td>
<td>0.64</td>
</tr>
<tr>
<td>Benign</td>
<td>160</td>
<td>12,852</td>
<td>1.24</td>
</tr>
<tr>
<td>Total</td>
<td>165</td>
<td>13,628</td>
<td>1.21</td>
</tr>
<tr>
<td>Laparoscopic</td>
<td>25</td>
<td>1,953</td>
<td>1.28</td>
</tr>
</tbody>
</table>
Complications following inguinal hernia repair in Victorian hospitals, 1 July 2009 – 30 June 2011

Summary and highlights:

This is a Surgical Outcomes Information Initiative two-year study on behalf of the Victorian Surgical Consultative Council (VSCC), using Department of Health administrative data.

It looks at the mortality rate across the state’s (de-identified) hospitals and health services of operations to repair inguinal hernia and recurrent inguinal hernia, both open and laparoscopic. The numbers of operations, proportion of operations for recurrent hernia, and their even distribution between public and private hospitals, remained steady between the first and second years.

A total of 22,907 repairs were recorded, with no mortality following laparoscopic repair in 4,829 patients, and 16 deaths (0.089%) following open repair in 18,078 patients. The state average survival overall is thus 99.930% (mortality 0.070%). All but one of the deaths occurred in emergency admissions, typically with a strangulated hernia in a public hospital. It was not thought fruitful to seek more clinical details from the five ‘statistical outlier’ hospitals, each with few deaths.

Repair of recurrent inguinal hernia was recorded in 1,754 (7.6%) of the patients, with one death (0.057%).

It was not possible to link the recurrences with their original repairing hospitals. The proportion of recurrent hernias being repaired (7.9%) is a possible surrogate for the rate of recurrence after hernia repair. When unique patient identifiers become available, it should be possible for the dataset to track which hernias recur beyond the initial admission, and the hospital(s) involved.

VSCC Approved June 2012
Complications following inguinal hernia repair in Victorian hospitals, 1 July 2009 – 30 June 2011

Table 3: Number of deaths in repaired inguinal hernia, by hospital type

<table>
<thead>
<tr>
<th>Hospital type</th>
<th>Number of deaths</th>
<th>Number of inguinal hernia patients</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>&lt; 5</td>
<td>Suppressed</td>
<td>0.017</td>
</tr>
<tr>
<td>Public</td>
<td>Suppressed</td>
<td>Suppressed</td>
<td>0.126</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>22,907</td>
<td>0.070</td>
</tr>
</tbody>
</table>

Note: Significant difference between hospitals with p = 0.0017

Table 4: Number of repaired inguinal hernia patients, by recurrent type

<table>
<thead>
<tr>
<th>Repair type</th>
<th>Recurrent</th>
<th>Unspecified</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laparoscopic</td>
<td>394</td>
<td>4,435</td>
<td>4,829</td>
</tr>
<tr>
<td>Open</td>
<td>1,360</td>
<td>16,718</td>
<td>18,078</td>
</tr>
<tr>
<td>Total</td>
<td>1,754</td>
<td>21,153</td>
<td>22,907</td>
</tr>
</tbody>
</table>

Table 7: Number of deaths in all repaired inguinal hernia operation

<table>
<thead>
<tr>
<th>Repair type</th>
<th>Number of deaths</th>
<th>Number of repaired inguinal hernia</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laparoscopic</td>
<td>0</td>
<td>4,829</td>
<td>0.000</td>
</tr>
<tr>
<td>Open</td>
<td>16</td>
<td>18,078</td>
<td>0.089</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>22,907</td>
<td>0.070</td>
</tr>
</tbody>
</table>

Note: Significant difference between hospitals with p = 0.038
Complications following neuraxial anaesthetics (spinal, epidural) in Victorian hospitals, 1 July 2009 – 30 June 2011

Summary and highlights:
This is a Surgical Outcomes Information Initiative study on behalf of the Victorian Surgical Consultative Council (VSCC), using Department of Health administrative data. It compares the outcomes recorded for neuraxial anaesthetics (including spinal and epidural) across the state's hospitals and health services. There were 122,499 neuraxial anaesthetics, without complication in 99.494% of patients, and the types and numbers of complications coded in the other 620 patients (0.51%). There may be implications for anticoagulant care, and prompt clinical recognition, imaging and relief of cord compression.

Public and private hospitals had similar numbers of anaesthetics, with a predominance of non-obstetric patients (78%) each year. Public hospital anaesthetics showed a 0.2% increase in these years, while there was a 4.4% reduction in neuraxial anaesthetics in the private hospitals. No deaths were recorded. Hypotension recorded in some 5% of cases was regarded as an accompaniment rather than a complication. The tables and graphs include only hospitals with at least 100 admissions or at least one complication.

Serious complications during the admission included: spinal haematoma (0.057%), permanent paralysis (0.003%) and spinal abscess (0.0008%). Hospitals with such an event are invited to confirm and define the cause in each patient. Post-spinal headache (0.15%) and spinal blood patch (0.11%) frequently occur together. ‘Other complications’ (0.26%) merit further analysis, and include a number of patients with obstetric codes.

Thirteen de-identified public hospitals appeared to have significantly more complications than the state average. Of these, one did very small numbers of anaesthetics. Two of the de-identified private hospitals appeared to have significantly more complications than the state average.

These de-identified hospitals with apparently outlying performance are being invited to validate their data, look into the circumstances and inform the VSCC confidentially of their findings and any resulting action taken. The VSCC can then provide advice to other hospitals, in the interests of maintaining and improving the standard of surgical care across Victoria.

The VSCC is pleased that these results reflect a generally high standard of practice, in accord with published world standards and clinical indicators. They suggest no need to restrict the skilled use of neuraxial anaesthesia in appropriate surgical patients. Patient safety demands that epidural catheter and anticoagulant management are precisely coordinated, and that clinical staff be alert to neurological changes postoperatively that could trigger urgent MR imaging, and prompt neurosurgical spinal decompression.

VSCC Approved September 2012
Complications following neuraxial anaesthetics (spinal, epidural) in Victorian hospitals, 1 July 2009 – 30 June 2011

Table 2: Number of patients with neuraxial anaesthesia, by hospital type and procedure type

<table>
<thead>
<tr>
<th>Hospital type</th>
<th>Procedure type</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obstetric cases (coded as 92507)</td>
<td>Non-obstetric cases (coded as 92508)</td>
</tr>
<tr>
<td>Private</td>
<td>10,056</td>
<td>46,151</td>
</tr>
<tr>
<td>Public</td>
<td>16,524</td>
<td>49,768</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26,580 (22%)</strong></td>
<td><strong>95,919 (78%)</strong></td>
</tr>
</tbody>
</table>

Note: 53 cases had both an obstetric and a non-obstetric neuraxial block procedure code.

Table 4: Number of any complications of neuraxial anaesthesia

<table>
<thead>
<tr>
<th>Type of complications</th>
<th>Number of complications</th>
<th>Number of procedures</th>
<th>Complication rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any complication</td>
<td>620</td>
<td>122,499</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Complications in neuraxial anaesthesia in public hospitals 1 July 2009 – 30 June 2011

Note: Only hospitals with at least 100 admissions or at least 1 complication are included in the graph.
Mortality of cholangitis in Victorian hospitals, with and without ERCP, 1 July 2008 – 30 June 2011

Summary and highlights:

This is a Surgical Outcomes Information Initiative three-year study on behalf of the Victorian Surgical Consultative Council (VSCC), using Department of Health administrative data. The study identifies 3,756 patients admitted with a diagnosis of cholangitis, the mortality rate during the admission, how many undergo an ERCP and the mortality rate of those with cholangitis who undergo an ERCP.

The overall mortality rate of 5.8% (Table 2) testifies to the seriousness of this diagnosis. There is a significant difference in the death rate among those who have cholangitis associated with non-malignant hepatobiliary disease being 3.4% versus a death rate of 13.6% of those patients who had malignant processes of the hepatobiliary system (Table 2).

A higher proportion of the patients admitted to private hospitals had an ERCP (38.7%) versus those admitted to public hospitals (23.8%) (Table 3). There is a significant difference noted in the death rate of those patients with non-malignant cholangitis who underwent an ERCP (2%) compared with patients with non-malignant causes of cholangitis who did not have an ERCP (3.9%).

Without individual patient identifiers this study was not able to quantify the prevalence of cholangitis over the three-year period but merely the number of admissions that were recorded. It is possible that a number of patients with cholangitis would have been transferred from hospitals that do not have the facility to perform ERCP, to other hospitals that do perform ERCP; such patients would clearly be recorded twice with a diagnosis of cholangitis. Similarly it is difficult to compare the mortality rates between hospitals given the differing patient populations at hospitals with and without ERCP facilities.

Hospitals were de-identified for the study. The small number of de-identified hospitals that appeared to have a significantly high mortality rate in their patients who did not receive ERCP have been notified and invited to validate the data, review the patient records, and to inform the VSCC confidentially of their findings and any resulting actions. The VSCC may then be able to advise other hospitals and health services of the actions and recommendations obtained, with the aim of improving the standard of surgical care across Victoria.

The VSCC has a current clinical guideline on the need for prompt drainage to be achieved in patients with non-malignant cholangitis. Dramatic progression and deaths continue to occur when ERCP is delayed. Urgent transfer to a hospital with the facility for doing an urgent ERCP may be required.

VSCC Approved February 2013
Mortality of cholangitis in Victorian hospitals, with and without ERCP, 1 July 2008 – 30 June 2011

| Table 1: Number of patients with cholangitis, by hospital type and financial year |
| Hospital type | Financial year | Total |
| Private       | 269     | 257     | 259     |
| Public        | 1,030   | 968     | 973     |
| Total         | 1,299   | 1,225   | 1,232   |
|               |         |         | 3,756   |

| Table 2: Number of deaths among all patients who had cholangitis |
| Hospital type | Number of deaths | Number of cholangitis cases | Death rate (%) |
| Private hospital | 28     | 785     | 3.6   |
| Public hospital  | 189    | 2,971   | 6.4   |
| Total            | 217    | 3,756   | 5.8   |

Number of deaths among patients who had non-malignant cholangitis

| Hospital type | Number of deaths | Number of cholangitis cases | Death rate (%) |
| Private hospital | 9      | 578     | 1.6   |
| Public hospital  | 89     | 2,302   | 3.9   |
| Total            | 98     | 2,880   | 3.4   |

Number of deaths among patients who had malignant cholangitis

| Hospital type | Number of deaths | Number of cholangitis cases | Death rate (%) |
| Private hospital | 19     | 207     | 9.2   |
| Public hospital  | 100    | 669     | 14.9  |
| Total            | 119    | 876     | 13.6  |

| Table 3: Number of ERCP cases among patients who had cholangitis |
| Hospital type | Number of ERCP cases | Number of cholangitis cases | ERCP rate (%) |
| Private hospital | 304    | 785     | 38.7  |
| Public hospital  | 708    | 2,971   | 23.8  |
| Total            | 1,012  | 3,756   | 26.9  |
Table 6a: Number of deaths among patients who had cholangitis and ERCP

<table>
<thead>
<tr>
<th>Malignancy</th>
<th>Number of cholangitis cases with ERCP who died</th>
<th>Number of cholangitis cases with ERCP</th>
<th>Death rate with ERCP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-malignant cholangitis</td>
<td>15</td>
<td>741</td>
<td>2.0</td>
</tr>
<tr>
<td>Malignant cholangitis</td>
<td>17</td>
<td>271</td>
<td>6.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
<td><strong>1,012</strong></td>
<td><strong>3.2</strong></td>
</tr>
</tbody>
</table>

Note: Significant difference exists between malignant and non-malignant death rates ($z = 3.42$, $p < 0.0001$).

Mortality of cholangitis cases with ERCP
1 July 2008 – 30 June 2011

Note: Only hospitals with at least 100 admissions or at least 1 complication are included in the graph

Table 6b: Number of deaths among patients who had cholangitis but not ERCP

<table>
<thead>
<tr>
<th>Malignancy</th>
<th>Number of cholangitis cases without ERCP who died</th>
<th>Number of cholangitis cases without ERCP</th>
<th>Death rate without ERCP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-malignant cholangitis</td>
<td>83</td>
<td>2,139</td>
<td>3.9</td>
</tr>
<tr>
<td>Malignant cholangitis</td>
<td>102</td>
<td>605</td>
<td>16.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>185</strong></td>
<td><strong>2,744</strong></td>
<td><strong>6.7</strong></td>
</tr>
</tbody>
</table>

Note: Significant difference exists between malignant and non-malignant death rates ($z = 11.2$, $p < 0.0001$).

Mortality of cholangitis cases without ERCP
1 July 2008 – 30 June 2011

Note: Only hospitals with at least 100 admissions or at least 1 complication are included in the graph
Intracranial aneurysms – mortality and complications with endovascular treatment or clipping, 1 July 2009 – 30 June 2011

Summary and highlights:

This is a Surgical Outcomes Information Initiative two-year study on behalf of the Victorian Surgical Consultative Council (VSCC), using Department of Health administrative data. The study identifies 976 patients undergoing surgery in Victorian hospitals for intracranial aneurysm, compares the mortality rates for ruptured or non-ruptured aneurysm, and their rates of neurological, cerebral and other complications. Treatment by craniotomy and clipping is compared with endovascular occlusion (coiling). The state average survival rate was 92.42% including all categories.

The overall mortality rate of patients operated for ruptured cerebral aneurysm was 14.2%, compared with 0.43% for non-ruptured aneurysms, with no significant difference between the two treatment modalities (Tables 1a and 1b).

The rate of postoperative neurological and cerebral complications was 2.4% (ruptured) and 1.5% (non-ruptured) in only 19 patients, resulting in no significant difference between either the groups or the two treatment modalities (Tables 2a).

The overall rate of other postoperative complications was 34% (ruptured) and 19.8% (non-ruptured) in 265 patients, a significant difference (Table 3b). The rate for non-ruptured aneurysm was also significantly higher following an endovascular procedure (24.4%) than after craniotomy and clipping (15.5%).

Thirty patients had died among the 184 with neurological or other postoperative complications in the 506 treated ruptured aneurysms, with no significant difference between the two treatment modalities. There were no deaths associated with the 100 neurological or other postoperative complications in the 470 treated non-ruptured aneurysms.

There were 11 hospitals doing the procedures in this study, all de-identified. No hospital recorded a neurological or cerebral complication rate higher than the state average. One hospital with apparent significantly higher mortality rate than the state average was invited to validate their coding data, review the 18 patient records, and to inform the VSCC confidentially of their findings and any resulting actions. One hospital with apparent significantly higher rate of other postoperative complications than the state average was invited to validate their coding data, review the 103 patient records, and to inform the VSCC confidentially of their findings and any resulting actions.

Typically, a hospital may discover coding errors, may have treated a different spectrum of patients, for example, a greater proportion of ruptured aneurysms, or may need to improve its systems, equipment or staffing. The VSCC can then advise other hospitals and health services of such improvements and recommendations, with the aim of raising the already generally high standard of neurosurgical care across Victoria.

VSCC Approved April 2013
Intracranial aneurysms – mortality and complications with endovascular treatment or clipping, 1 July 2009 – 30 June 2011

Table 1a: Mortality rate of patients who had ruptured cerebral aneurysm

<table>
<thead>
<tr>
<th>Surgery</th>
<th>Number of deaths</th>
<th>Number of cases</th>
<th>Mortality rate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clipping</td>
<td>38</td>
<td>270</td>
<td>14.1</td>
<td>10.4–18.7</td>
</tr>
<tr>
<td>Endovascular</td>
<td>34</td>
<td>236</td>
<td>14.4</td>
<td>10.5–19.5</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>506</td>
<td>14.2</td>
<td>11.5–17.5</td>
</tr>
</tbody>
</table>

Note: There is no significant difference between clipping and endovascular aneurysm (z = 0.11, p = 0.91).

Table 1b: Mortality rate of patients who had non-ruptured cerebral aneurysm

<table>
<thead>
<tr>
<th>Surgery</th>
<th>Number of deaths</th>
<th>Number of cases</th>
<th>Mortality rate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clipping</td>
<td>&lt; 5</td>
<td>Suppressed</td>
<td>0.41</td>
<td>0.07–2.28</td>
</tr>
<tr>
<td>Endovascular</td>
<td>&lt; 5</td>
<td>Suppressed</td>
<td>0.44</td>
<td>0.08–2.47</td>
</tr>
<tr>
<td>Total</td>
<td>&lt; 5</td>
<td>470</td>
<td>0.43</td>
<td>0.12–1.54</td>
</tr>
</tbody>
</table>

Note: There is no significant difference between clipping and endovascular aneurysm (z = 0.06, p = 0.96).

Table 2a: Postoperative neurological and cerebral complication rate of patients who had ruptured cerebral aneurysm

<table>
<thead>
<tr>
<th>Surgery</th>
<th>Number of complications</th>
<th>Number of cases</th>
<th>Complication rate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clipping</td>
<td>9</td>
<td>Suppressed</td>
<td>3.3</td>
<td>1.8–6.2</td>
</tr>
<tr>
<td>Endovascular</td>
<td>&lt; 5</td>
<td>Suppressed</td>
<td>1.3</td>
<td>0.43–3.7</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>506</td>
<td>2.4</td>
<td>1.4–4.1</td>
</tr>
</tbody>
</table>

Note: There is no significant difference between clipping and endovascular aneurysm (z = 1.52, p = 0.13).

Table 3b: Other postoperative complication rate of patients who had non-ruptured cerebral aneurysm

<table>
<thead>
<tr>
<th>Surgery</th>
<th>Number of complications</th>
<th>Number of cases</th>
<th>Complication rate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clipping</td>
<td>38</td>
<td>245</td>
<td>15.51</td>
<td>11.5–20.6</td>
</tr>
<tr>
<td>Endovascular</td>
<td>55</td>
<td>225</td>
<td>24.44</td>
<td>19.3–30.5</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
<td>470</td>
<td>19.79</td>
<td>16.4–23.6</td>
</tr>
</tbody>
</table>

Note: There is significant difference between clipping and endovascular aneurysm (z = 2.43, p = 0.015).
Other post-operative complication rate
1 July 2009 – 30 June 2011

Mortality rates of patients who had procedures for cerebral aneurysm 1 July 2009 – 30 June 2011
Lower limb amputations – mortality and complication rate comparing diabetic and non-diabetic patients in Victorian hospitals, 1 July 2010 – 30 June 2012

Summary and highlights:

This is a Surgical Outcomes Information Initiative two-year study on behalf of the Victorian Surgical Consultative Council (VSCC), using Department of Health administrative data. The study identifies 3,044 patients in Victorian hospitals undergoing amputation at some level in the lower limb. It excludes amputations following trauma. Rates of mortality and complications are compared following operation for diabetic patients (1,668 = 55%) and non-diabetic (1,376 = 45%).

Public hospitals carried out the amputations in 79% of the diabetics, and 58% of the non-diabetics. The state average survival rate was 97%, there being 92 deaths overall. Diabetics recorded 3.2% mortality, not significantly different from 2.8% in non-diabetics (Table 2a).

Following major amputation near the knee, the mortality rates were 9.4% and 6.6% respectively (again no significant difference), and following amputation at toe or metatarsal level 1.7% for both groups.

There was also no significant difference in rate of wound breakdown between the diabetic and non-diabetic groups: 2.6% vs 1.7% overall; 5.3% vs 4.1% at major level; 1.9% vs 1.0% at foot level.

Haemorrhage requiring return to theatre or blood transfusion, however, was recorded at a significantly higher rate following amputation in diabetics (8.5%) compared with non-diabetics (3.5%), accounted for by the lower number of bleeds in non-major amputations (Table 4a).

General sepsis and wound infection rates were also studied, revealing significantly higher rates in diabetics overall (2.5% vs 0.9%) and at both levels of amputation, reaching 6% in major amputations above or below the knee.

Hospitals were de-identified for the study. Several de-identified hospitals appeared to have mortality or complication rates significantly higher than the state average. Their CEO and director of surgery have been notified and invited to validate the data, review their patient records, and to inform the VSCC confidentially of their findings and any resulting actions. The VSCC may then be able to advise other hospitals and health services of the actions and recommendations obtained, with the aim of improving the standard of surgical care across Victoria.

The VSCC has approved a clinical guideline on the need for surgeon involvement in diabetic foot care and foot-at-risk clinics. It reinforces surgical principles and the common presentations of diabetic feet – ischaemia and sepsis – that so often progress dramatically and lead to death or limb loss.

VSCC Approved April 2013

### Table 2a: Death rate among patients with ALL lower limb amputation

<table>
<thead>
<tr>
<th>Diabetes</th>
<th>Number of deaths</th>
<th>Number of amputations</th>
<th>Death rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>53</td>
<td>1,668</td>
<td>3.2</td>
<td>2.4–4.1</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>1,376</td>
<td>2.8</td>
<td>2.1–3.9</td>
</tr>
</tbody>
</table>

Note: No significant difference in ALL lower limb amputation death rates ($z = 0.56, p = 0.57$).

### Table 4a: Post-procedural haemorrhage rate among patients with ALL lower limb amputation

<table>
<thead>
<tr>
<th>Diabetes</th>
<th>Number of haemorrhages</th>
<th>Number of amputations</th>
<th>Complication rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>142</td>
<td>1,668</td>
<td>8.5</td>
<td>7.3–9.9</td>
</tr>
<tr>
<td>No</td>
<td>48</td>
<td>1,376</td>
<td>3.5</td>
<td>2.6–4.6</td>
</tr>
</tbody>
</table>

Note: Significant difference in ALL lower limb amputation complication rates ($z = 5.70, p < 0.001$).

### Table 5a: Sepsis or wound infection rate among patients with ALL lower limb amputation

<table>
<thead>
<tr>
<th>Diabetes</th>
<th>Number of infections</th>
<th>Number of amputations</th>
<th>Infection rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>42</td>
<td>1,668</td>
<td>2.5</td>
<td>1.9–3.4</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>1,376</td>
<td>0.9</td>
<td>0.5–1.5</td>
</tr>
</tbody>
</table>

Note: Significant difference in ALL lower limb amputation infection rates ($z = 3.43, p < 0.001$).

### Table 5b: Sepsis or wound infection rate among patients with MAJOR lower limb amputation

<table>
<thead>
<tr>
<th>Diabetes</th>
<th>Number of infections</th>
<th>Number of amputations</th>
<th>Infection rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>19</td>
<td>318</td>
<td>6.0</td>
<td>3.9–9.1</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>316</td>
<td>2.2</td>
<td>1.1–4.5</td>
</tr>
</tbody>
</table>

Note: Significant difference in MAJOR lower limb amputation infection rates ($z = 2.38, p = 0.017$).

Wound disruption in patients with lower limb amputation and diabetes 1 July 2010 – 30 June 2012

Note: Only hospitals with at least 100 admissions or at least 1 disruption are included in the graph.
Wound disruption in patients with lower limb amputation
but no diabetes 1 July 2010 – 30 June 2012

Note: Only hospitals with at least 100 admissions or at least 1 disruption are included in the graph.
Pancreatectomy – mortality and complication rate in Victorian hospitals  
1 July 2010 – 30 June 2012

Summary and highlights:
This is a Surgical Outcomes Information Initiative two-year study on behalf of the Victorian Surgical Consultative Council (VSCC), using Department of Health administrative data. The study identified 376 patients undergoing pancreatectomy or Whipple’s operation in Victorian public and private hospitals. From the hospitals’ own discharge coding of diagnoses and procedures, the study included rates of mortality, haemorrhage needing return to theatre, and biliary leak. Elective and emergency admissions were compared. The state average survival rate was 97% including all categories. All hospitals were de-identified during the study.

There were 11 postoperative deaths: three in 330 elective admissions and eight in 45 emergency admissions. The average survival in elective admissions was 99%, significantly better than in all admissions 97% (state average mortality respectively 0.91% and 2.93%).

The rate of haemorrhage requiring re-operation was 3.73%, with no significant difference between the elective group 3% (10 patients) and the emergency group 9% (four patients).

The two hospitals with apparently outlying mortality or haemorrhage rate experienced only one or two such outcomes, considered not to need further interpretation.

The recorded rate of biliary leak was 2.93%, significantly lower in the elective group 2% (seven patients) than in the emergency group 9% (four patients). One de-identified hospital with apparently outlying occurrence of biliary leak of 12.5% (in five of their 40 operations, 80% of which were elective) was invited to validate its coding data, review the five patient records, and to inform the VSCC confidentially of their findings and any resulting actions (Tables 6a and 7).

There were 23 hospitals doing at least two procedures in this study, all de-identified. VSCC notifies apparent outlier hospitals to validate their coding data, to review the patient records involved, and to inform the VSCC confidentially of their findings and any resulting actions. The VSCC may then be able to advise other hospitals and health services of the actions and recommendations obtained, with the aim of improving the already generally high standard of hepatobiliary surgical care across Victoria.

It is of interest to compare this study with the SOII study of pancreatectomy 2005–2007, in which pancreatectomy in 138 elective patients in 17 public hospitals showed four deaths (2.90%). Current mortality was noted to be improved (0.91%), with more operations in this two-year period, and an increase in hospitals performing the major operation of pancreatectomy. The improved outcome is noted to coincide with the increase in hepatobiliary surgical services performing this specialised procedure.

VSCC Approved October 2013
Pancreatectomy – mortality and complication rate in Victorian hospitals, 1 July 2010 – 30 June 2012

Table 2a: Mortality rate of patients who had pancreatectomy surgery (elective and emergency admission only)

<table>
<thead>
<tr>
<th>Admission type</th>
<th>Number of deaths</th>
<th>Number of cases</th>
<th>Mortality rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective</td>
<td>&lt; 5</td>
<td>Suppressed</td>
<td>0.91</td>
<td>0.31–2.64</td>
</tr>
<tr>
<td>Emergency</td>
<td>8</td>
<td>&lt; 50</td>
<td>17.78</td>
<td>9.3–31.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
<td><strong>375</strong></td>
<td><strong>2.93</strong></td>
<td></td>
</tr>
</tbody>
</table>

Note: There is significant difference between elective and emergency rates \( z = 6.29, p < 0.001 \).

Note: Exclude 1 case of statistical admission \( \text{EMNL} = \text{S} \)

Table 4a: Haemorrhage rate of patients who had pancreatectomy surgery (elective and emergency admission only)

<table>
<thead>
<tr>
<th>Admission type</th>
<th>Number of haemorrhages</th>
<th>Number of cases</th>
<th>Haemorrhage rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective</td>
<td>10</td>
<td>Suppressed</td>
<td>3.03</td>
<td>1.65–5.49</td>
</tr>
<tr>
<td>Emergency</td>
<td>&lt; 5</td>
<td>&lt; 50</td>
<td>8.89</td>
<td>3.51–20.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14</strong></td>
<td><strong>375</strong></td>
<td><strong>3.73</strong></td>
<td></td>
</tr>
</tbody>
</table>

Note: There is no significant difference between elective and emergency rates \( z = 1.95, p = 0.052 \).

Note: Exclude 1 case of statistical admission \( \text{EMNL} = \text{S} \)

Table 6a: Biliary leak rate of patients who had pancreatectomy surgery (elective and emergency admission only)

<table>
<thead>
<tr>
<th>Admission type</th>
<th>Number of biliary leaks</th>
<th>Number of cases</th>
<th>Biliary leak rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective</td>
<td>7</td>
<td>Suppressed</td>
<td>2.12</td>
<td>1.03–4.31</td>
</tr>
<tr>
<td>Emergency</td>
<td>&lt; 5</td>
<td>&lt; 50</td>
<td>8.89</td>
<td>3.51–20.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
<td><strong>375</strong></td>
<td><strong>2.93</strong></td>
<td></td>
</tr>
</tbody>
</table>

Note: There is significant difference between elective and emergency rates \( z = 2.53, p = 0.012 \).

Note: Exclude 1 case of statistical admission \( \text{EMNL} = \text{S} \)

Table 7: Outlier hospitals with a higher biliary leak rate in patients who had pancreatectomy surgery (all admission types)

<table>
<thead>
<tr>
<th>Hospital label</th>
<th>Number of biliary leaks</th>
<th>Number of cases</th>
<th>Biliary leak rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>5</td>
<td>&lt; 50</td>
<td>12.5</td>
<td>5.46–26.11</td>
</tr>
<tr>
<td>T9</td>
<td>&lt; 5</td>
<td>Suppressed</td>
<td>16.67</td>
<td>3.01–56.35</td>
</tr>
<tr>
<td><strong>State total</strong></td>
<td><strong>11</strong></td>
<td><strong>376</strong></td>
<td><strong>2.93</strong></td>
<td></td>
</tr>
</tbody>
</table>
Unruptured aortic aneurysm repair – endovascular and open – mortality and complication rate in Victorian hospitals, 1 July 2010 – 30 June 2012

Summary and highlights:

This is a Surgical Outcomes Information Initiative two-year study on behalf of the Victorian Surgical Consultative Council (VSCC), using Department of Health administrative data. The study identified **1,295 patients** undergoing repair of an unruptured aortic or aortoiliac aneurysm, including suprarenal aneurysms, excluding grafts to the femoral arteries, in Victorian public and private hospitals. From the hospitals’ own discharge coding of diagnoses and procedures, the study included rates of mortality, haemorrhage needing return to theatre, and renal failure needing dialysis. All hospitals were de-identified during the study.

A total of **935 endovascular** repairs and **360 open** repairs were compared. The state average survival rate was 98.3% including all categories (mortality 1.7%). Endovascular repair when performed had significantly lower mortality (10 deaths, rate 1.1%) than open repair when indicated (12 deaths, rate 3.3%) (Tables 1a, 1b and 2).

**Haemorrhage requiring return to theatre** was recorded after none of the endovascular repairs, significantly fewer than re-operations following open repair (six patients, rate 1.7%, p < 0.001) (Table 3).

**Renal failure requiring dialysis** was recorded after none of the endovascular repairs but developed following open repair in two patients (0.56%, p = 0.02) (Table 5).

**Return to theatre/angio theatre for a variety of reasons** was recorded 77 times in 66 patients, some with multiple indications, some more than once for the same indication. The main indications were lower limb ischaemia (23), mesenteric ischaemia (16), wound dehiscence or debridement (six), and ‘other’ (32, mainly in the endovascular group) (Tables 6a–c).

The variety of further procedures required following endovascular repair, often related to access artery complications, endoleaks, coronary, cerebrovascular or upper limb ischaemia, or upper GI bleeding, and one open removal of endograft. Nevertheless, endovascular repair required significantly lower overall rate of further operations (42 patients, rate 5.13%) than needed after open repair (24 patients, rate 8.06%, p = 0.046) (Table 6c).

There were 23 hospitals doing aneurysm repairs in this study, all de-identified. Four hospitals with an apparently outlying mortality or complication rate were invited to validate their coding data, to review the patient records, and to inform the VSCC confidentially of their findings and any resulting actions. The VSCC may then be able to advise other hospitals and health services of the actions and recommendations obtained, with the aim of improving the already high standard of vascular surgical care across Victoria.

VSCC acknowledges that the two methods of aortic repair are appropriate for different types of patient and aneurysm, and many factors including comorbidities influence the selection. Outcomes appear generally of a high and even standard, yet can always be improved upon. This study should be read in conjunction with the specialty's own audit, the ANZSVS Vascular Audit.

VSCC Approved October 2013
### Unruptured aortic aneurysm repair, 2010–2012

**Table 1a: Number of patients with open aortic aneurysm repair of unruptured abdominal aortic aneurysm**

<table>
<thead>
<tr>
<th>Hospital type</th>
<th>Financial year</th>
<th>2010–11</th>
<th>2011–12</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td></td>
<td>63</td>
<td>70</td>
<td>133</td>
</tr>
<tr>
<td>Public</td>
<td></td>
<td>103</td>
<td>124</td>
<td>227</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>166</td>
<td>194</td>
<td>360</td>
</tr>
</tbody>
</table>

**Table 1b: Number of patients with endovascular aortic aneurysm repair of unruptured abdominal aortic aneurysm**

<table>
<thead>
<tr>
<th>Hospital type</th>
<th>Financial year</th>
<th>2010–11</th>
<th>2011–12</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td></td>
<td>219</td>
<td>228</td>
<td>447</td>
</tr>
<tr>
<td>Public</td>
<td></td>
<td>243</td>
<td>245</td>
<td>488</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>462</td>
<td>473</td>
<td>935</td>
</tr>
</tbody>
</table>

**Table 2: Death rate among patients with unruptured abdominal aortic aneurysm repair**

<table>
<thead>
<tr>
<th>Aortic aneurysm</th>
<th>Number of deaths</th>
<th>Number of aortic aneurysms</th>
<th>Death rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open aortic</td>
<td>12</td>
<td>360</td>
<td>3.3</td>
<td>1.92–5.74</td>
</tr>
<tr>
<td>Endovascular aortic</td>
<td>10</td>
<td>935</td>
<td>1.1</td>
<td>0.58–1.96</td>
</tr>
</tbody>
</table>

Note: Significant difference in the death rate exists between open aortic and endovascular aneurysm (z = 2.82, p = 0.005).

**Table 3: Haemorrhage requiring return to theatre rate among patients with unruptured abdominal aortic aneurysm repair**

<table>
<thead>
<tr>
<th>Aortic aneurysm</th>
<th>Number of haemorrhages</th>
<th>Number of aortic aneurysms</th>
<th>Haemorrhage rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open aortic</td>
<td>6</td>
<td>360</td>
<td>1.7</td>
<td>0.77–3.59</td>
</tr>
<tr>
<td>Endovascular aortic</td>
<td>0</td>
<td>935</td>
<td>0.0</td>
<td>0–0.41</td>
</tr>
</tbody>
</table>

Note: Significant difference in the haemorrhage rate exists between open aortic and endovascular aneurysm (z = 3.96, p < 0.001).

**Table 5: Renal failure requiring dialysis rate among patients with unruptured abdominal aortic aneurysm repair**

<table>
<thead>
<tr>
<th>Aortic aneurysm</th>
<th>Number of renal failures</th>
<th>Number of aortic aneurysms</th>
<th>Renal failure rate (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open aortic</td>
<td>&lt; 5*</td>
<td>&lt; 400</td>
<td>0.56</td>
<td>0.15–2.00</td>
</tr>
<tr>
<td>Endovascular aortic</td>
<td>0</td>
<td>935</td>
<td>0.0</td>
<td>0–0.41</td>
</tr>
</tbody>
</table>

Note: Significant difference in the renal failure rate exists between open aortic and endovascular aneurysm (z = 2.29, p = 0.02).

* Excluding the dialysis procedure code returns the same number of cases (only <5 cases of post-procedural kidney failure)
Table 6a: Return-to-theatre rate of unruptured abdominal aortic aneurysm following endovascular repair

<table>
<thead>
<tr>
<th>Indication for re-operation</th>
<th>Number of patients</th>
<th>Number of re-operations</th>
<th>Number of endovascular repairs</th>
<th>Return rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower limb ischaemia</td>
<td>10</td>
<td>10</td>
<td>935</td>
<td>1.07</td>
</tr>
<tr>
<td>Mesenteric ischaemia</td>
<td>7</td>
<td>9</td>
<td>935</td>
<td>0.96</td>
</tr>
<tr>
<td>Wound dehiscence or debridement</td>
<td>2</td>
<td>3</td>
<td>935</td>
<td>0.32</td>
</tr>
<tr>
<td>Other</td>
<td>23</td>
<td>26</td>
<td>935</td>
<td>2.78</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>48</strong></td>
<td><strong>935</strong></td>
<td><strong>5.13</strong></td>
</tr>
</tbody>
</table>

Table 6b: Return-to-theatre rate of unruptured abdominal aortic aneurysm following open repair

<table>
<thead>
<tr>
<th>Indication for re-operation</th>
<th>Number of patients</th>
<th>Number of re-operations</th>
<th>Number of open repairs</th>
<th>Return rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower limb ischaemia</td>
<td>11</td>
<td>13</td>
<td>360</td>
<td>3.61</td>
</tr>
<tr>
<td>Mesenteric ischaemia</td>
<td>4</td>
<td>7</td>
<td>360</td>
<td>1.94</td>
</tr>
<tr>
<td>Wound dehiscence or debridement</td>
<td>3</td>
<td>3</td>
<td>360</td>
<td>0.83</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>6</td>
<td>6</td>
<td>360</td>
<td>1.67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
<td><strong>29</strong></td>
<td><strong>360</strong></td>
<td><strong>8.06</strong></td>
</tr>
</tbody>
</table>

Note: There is significant difference between total returns for endovascular repair (48/935 = 5.1%) and open repair (29/360 = 8.1%) (z = 1.99, p = 0.046).

Table 6c: Return-to-theatre rate for endovascular and open repair of unruptured abdominal aortic aneurysm, based on Table 6a and 6b

<table>
<thead>
<tr>
<th>Aneurysm repair*</th>
<th>Number of patients</th>
<th>Number of re-operations**</th>
<th>Total number of repairs</th>
<th>Return rate (re-operation/total repairs) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endovascular</td>
<td>42</td>
<td>48</td>
<td>935</td>
<td>5.13</td>
</tr>
<tr>
<td>Open</td>
<td>24</td>
<td>29</td>
<td>360</td>
<td>8.06</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>66</strong></td>
<td><strong>77</strong></td>
<td><strong>1,295</strong></td>
<td><strong>5.95</strong></td>
</tr>
</tbody>
</table>

Note: There is significant difference between these two rates (z = 1.99, p = 0.046).

* Some patients had multiple indications for return to theatre.
** Some patients returned more than once for the same indication.
**APPENDIX 8: PREOPERATIVE TIME-OUT CHECKLIST**

**EXAMPLE – PROCEDURE ENDORSED BY VSCC AND RACS**

```
SURGICAL / PROCEDURAL SAFETY CHECKLIST

<table>
<thead>
<tr>
<th>Team members</th>
<th>New team members introduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct patient: ID Check and ID band on</td>
<td>Checked</td>
</tr>
<tr>
<td>Confirm procedure to be performed</td>
<td>Correct</td>
</tr>
<tr>
<td>Procedure site confirmed and marked</td>
<td>Correct</td>
</tr>
<tr>
<td>Consent form</td>
<td>Complete</td>
</tr>
<tr>
<td>Alert Card</td>
<td>Checked</td>
</tr>
<tr>
<td>Allergies identified</td>
<td>Yes</td>
</tr>
<tr>
<td>Implants / prosthesis / equipment ready</td>
<td>Correct</td>
</tr>
<tr>
<td>Confirm with surgical team</td>
<td>Correct</td>
</tr>
<tr>
<td>Diagnostic images available (correct for procedure)</td>
<td>Yes and ID checked</td>
</tr>
<tr>
<td>Review of anticipated critical events e.g.: difficult airway, aspiration risk, major blood loss (&gt;500ml or 7ml/kg in children)</td>
<td>Discussed with team</td>
</tr>
<tr>
<td>Anesthesia safety check completed</td>
<td></td>
</tr>
<tr>
<td>Other checks</td>
<td></td>
</tr>
</tbody>
</table>

Signature
Name
Designation

*Adapted from the Royal Melbourne Hospital’s “Passport to Safe Surgery” (2008) and WHO Surgical Safety Checklist 1st edition (2009)*
```
SECTION 2:
GUIDELINES AND CLINICAL PRACTICE STATEMENTS

When published or promulgated, these clinical practice statements contain the disclaimer: VSCC guidelines/practice statements are intended to provide some broad statements of principle to facilitate the improvement and safety of surgical practice. They are not legally binding, nor do they provide a comprehensive analysis of every situation.
ACUTE CHOLANGITIS AND AVAILABILITY OF URGENT ERCP SERVICES

Since 2006, when this guide was originally prepared, the VSCC continues to receive reports of patients with acute cholangitis whose urgently needed common bile duct drainage has been delayed or not achieved. While ERCP is usually the preferred approach, urgent ERCP services are still seldom available at Victoria’s regional centres, even those with an elective service. Some major metropolitan hospitals with ‘full ERCP facilities’ still do not have after-hours staff, or a bed for emergency transfer of such a sick patient. Alternative methods of biliary drainage (open or transhepatic) may not be appropriate. The following points include information and recommendations that should assist surgeons confronted with similar cases.

1. Definition
Acute bacterial infection of the biliary tree usually associated with underlying biliary obstruction.

1.1 Organisms (usually polymicrobial)
- E. coli (39%), Klebsiella (54%)
- Enterobacter (34%) Enterococcus (34%)

1.2 Causes of obstruction
- Choledocholithiasis (> 70%)
- Benign strictures
- Tumours (< 15%)
- The greatest incidence of obstructions is in tertiary hospitals following biliary access/manipulation by ERCP or PTC

2. Current mortality 5–40%

2.1 Poor prognostic determinants
- Age > 70 years
- Gender – female
- Failure to respond to conservative management
- Concurrent medical problems
- Hypotension
- Acute renal failure
- Liver abscess
- Hypoalbuminaemia
- Thrombocytopenia
- Cirrhosis
- Inflammatory bowel disease
- High malignant strictures

3. Principles of management

3.1 Resuscitation and antibiotics
Biliary decompression – endoscopic (ERCP)

3.2 85–90% of patients respond to medical measures
3.2.1 Consider decompression on semi-urgent basis (48–72 hours)

3.2.2 10–15% no or minimal response
3.2.3 Patients with high risk factors
- Consider urgent decompression (24–48 hours)
Recommendations

• The principles of management of acute cholangitis involve initial aggressive resuscitation and antibiotics followed by biliary decompression.

• The most appropriate method of biliary decompression is ERCP – sphincterectomy – stenting.

• 10–15% of patients will show no or minimal response after initial measures – hypotension, renal failure, pyrexia. Plan for immediate biliary decompression.

• In patients with poor prognostic parameter (elderly patients, associated comorbidities), plan for urgent decompression (within 24–48 hours).

• 85–90% of patients will respond to initial measures. Plan for biliary decompression on semi-urgent basis (< 72 hours).

• All hospitals should have access to ERCP facilities on an urgent basis.

• Consider transferring high-risk patients to a centre with appropriate ICU facilities and expertise. Such transfer is not just a precaution, but in view of the propensity of such patients to deteriorate suddenly it is a time-critical part of their management.

Urgent ERCP facilities are available at the following institutions:

1. The Alfred
2. The Royal Melbourne Hospital
3. Austin Hospital
4. Box Hill Hospital
5. Monash Medical Centre
6. Western Hospital
7. The Royal Children’s Hospital
8. The Northern Hospital
9. St Vincent’s Hospital.

ERCP services are also available at a number of rural and regional centres. They are:

1. Ballarat Health Services (Base Campus)
2. Bendigo Hospital
3. Central Gippsland Heath Service (Sale)
4. Dandenong Hospital
5. Frankston Hospital
6. Geelong Hospital
7. Mildura Base Hospital

VSCC Approved August 2006
Revised February 2012
ACUTE MESENTERIC ISCHAEMIA

Acute mesenteric ischaemia is an uncommon but catastrophic acute surgical emergency, with cases continuing to be reported to the VSCC. It carries a high morbidity and mortality. It represents a diagnostic challenge, and therefore a high index of suspicion is required. Patients often present with a paucity of physical signs despite sudden onset of severe abdominal pain. Suspicion is raised where risk factors exist – cardiac arrhythmias, past history of thromboembolic events, thrombotic medication or elevated WCC. Bowel dies within seven hours of onset, so prompt diagnosis and aggressive management are required. If the diagnosis is suspected and there are signs of peritonitis or there is suspicion that some other urgent abdominal condition exists, urgent laparotomy is indicated. If abdominal signs are absent, urgent investigations may help to establish the diagnosis before irreversible changes occur. An experienced clinician should be involved in management early.

It is hoped that the following suggestions may help some patients to be treated successfully.

1. In a patient with symptoms of sudden severe abdominal pain, vomiting and/or diarrhoea, who on physical examination has few signs, suspect mesenteric ischaemia (bowel sounds are often present in the early stages).
2. When mesenteric ischaemia is suspected as a cause of the abdominal symptoms, obtain an urgent CT angiogram or catheter angiogram.
3. When an angiogram confirms the diagnosis, undertake a revascularisation procedure urgently. Involvement of a vascular surgeon is indicated if available.
4. When a vascular correction (embolectomy or bypass) has been performed, obviously dead bowel can be resected and the ends brought out as stomata. Bowel of doubtful viability should be returned to the abdomen and a ‘second look’ laparotomy performed within 24 hours.
5. If angiography reveals venous thrombosis or non-occlusive mesenteric ischaemia, consider the use of anticoagulants or vasodilators.

Note: Acute mesenteric ischaemia is usually due to obstruction of the superior mesenteric artery. Access to the origin of this vessel is difficult, but is not necessary. Access can be obtained beyond the transverse mesocolon, that is, distal to the origin of the middle colic artery. An arteriotomy here can enable the passage of embolectomy catheters proximally and distally, or the attachment of a vein bypass from the aorta or a common iliac artery.

VSCC Approved February 2008
Revised August 2013

Resources

ADEQUATE DRAINAGE OF PUS

An abscess is an enclosed collection of liquefied tissue, known as pus, which can occur anywhere in the body. An abscess consists of an outer fibrotic wall, and inner layer of leukocytes and a central area of necrotic debris. The morphology of the abscess wall varies depending on the duration of infection and the stage of encapsulation. In the initial phase of abscess formation a pyogenic membrane separates purulent lesions from the surrounding tissue. Granulation tissue subsequently develops at the abscess border and is eventually replaced by a fibrous capsule in chronic abscesses.¹

The abscess capsule is relatively impermeable to antibiotics and oxygen, therefore the treatment of an abscess is drainage. Drainage maybe achieved through surgical incision, or through insertion of a drain tube percutaneously. Regardless of the approach selected for drainage, it is imperative that complete drainage is achieved.

Discussion of recent cases and deaths at VSCC revealed concerns about:
- inadequate drainage of pus via CT-guided small calibre drains
- inadequate debridement of dead, devitalised or grossly infected tissue in septic patients
- use of hyperbaric therapy without adequate drainage or excision first.

It is hoped that the following guidelines will assist in the management of patients with septic collections.

1. Timing. Patients with a collection of pus should have the collection drained as a matter of urgency. Even if a treating hospital does not have facility to manage the patient postoperatively, consideration should be given to establishing drainage or debridement prior to transfer. This is particularly important for necrotising fasciitis.

2. Incision. If the collection is superficial (for example, skin, perianal, empyema), surgical incision and drainage is recommended. An adequate incision should be made, and the incision should be kept open to ensure ongoing drainage is achieved.

3. Deep collections (such as in the abdomen or pelvis) may be drained percutaneously using CT or ultrasound guidance.² The size of the drain tube used should be adequate to ensure effective drainage. The drain tube should be flushed four- to six-hourly with 10 mL sterile normal saline to ensure patency. If the patient is not responding clinically, or pus is thick, or if there is little drained, early consideration should be given for either an additional drain or open drainage.

4. Necrotising fasciitis is a gas-forming, fulminating, necrotic infection of the superficial and deep fascia, resulting in thrombosis of the subcutaneous vessels and gangrene of the underlying tissues. It is usually caused by multiple pathogens and is frequently associated with diabetes mellitus. In this situation, all necrotic tissue must be excised as a matter of urgency. Treatment should not be delayed, either by interhospital transfer or by the use of hyperbaric oxygen. There is evidence of benefit of hyperbaric oxygen only in gas gangrene, and only after adequate surgical excision has been achieved.³

5. Antibiotics are an important adjunct to surgical drainage. At the time of drainage, a specimen of pus should be sent for microscopy and culture as well as antibiotic sensitivities. The selection of an appropriate antibiotic depends on the organism grown from the pus.¹

VSCC Approved September 2012

References
Recently the Victorian Consultative Council for Anaesthetic Mortality and Morbidity (CCAMM) reviewed a case involving oxygen embolism, associated with forcible irrigation of external fixator pin sites using hydrogen peroxide. The collapse was very dramatic, but with aggressive and timely resuscitation there was a good outcome.

Two similar cases were reported in the Journal of Bone and Joint Surgery in April 2004. The Victorian Surgical Consultative Council is aware of no other cases in Victoria (personal communication – Dr Anita Boecksteiner, orthopaedic surgeon with a major interest in the correction of limb deformities and involved in the management of pin sites).


To view this article online go to <www.ejbjs.org>.

This serious complication may occur with the injection of hydrogen peroxide under pressure into a semi-confined or confined space, or even into a soft tissue space, which is rich in vascular channels. The complication has been reported under many different circumstances. For example:

- irrigation of perianal and vulval fistulae
- in the thoracic cavity
- in the posterior cranial fossa
- using large quantities of irrigation fluid in spinal surgery
- the irrigation of the medullary canals of the major long bones (tibia and femur) during joint replacement
- the forced lavage of large muscle wounds
- in some ENT surgery
- complementary therapies and irrigations.

A common thread in all reports is forcible irrigation using a syringe and therefore applying some pressure, mostly into closed areas. Using diluted hydrogen peroxide in gentle packing gauze does not seem to cause similar problems. But avoid industrial strength peroxide (up to 35%), and even household peroxide (2–3%) can be destructive. The oxidant destroys tissues as well as bacteria.

VSCC Approved October 2005
Revised April 2012

Further reading
ASSISTANCE AT DIFFICULT OPERATIONS

In many surgical disciplines, from time to time difficult cases are encountered when the help of an experienced colleague would be of benefit to both the patient and the surgeon.

1. When it is recognised that a planned elective procedure is likely to present considerable difficulties, a surgeon should consider enlisting the aid of an experienced colleague, in both planning and operating.

2. When considerable unexpected difficulties occur during the course of an operation (elective or emergency), a surgeon should similarly consider enlisting the aid of an experienced colleague.

3. When a surgeon is approached by a colleague with a request that assistance be provided with a difficult case, the surgeon should endeavour to provide that assistance.

4. When a surgeon is approached for assistance when an operation is already underway, and difficulties have been encountered, every effort should be made to provide that assistance, even though it may cause serious disruption to one’s own schedule.

5. If it is impossible for a surgeon to provide the requested assistance, an offer should be made to contact another colleague (especially in the emergency case).

6. A surgeon who is asked to provide assistance for a colleague should consider it a compliment and not a chore.

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Revised April 2011
BILE DUCT STONES – GUIDELINES FOR MANAGEMENT

There are various ways of managing bile duct stones, with the two main variables that determine management being the mode of presentation and local expertise/preference. Whilst it is therefore difficult to be prescriptive about the management of duct stones, there are guiding principles.

1. Bile duct stones suspected preoperatively

If there is a suspicion that the patient may have a stone in the bile duct, a decision needs to be made as to whether the stone should be removed preoperatively or intraoperatively (not postoperatively).

If the decision is to remove the stone preoperatively by endoscopic retrograde cholangio-pancreatography (ERCP), in some patients it is advisable to confirm the presence of the stone by magnetic resonance cholangiopancreatography (MRCP). This applies particularly if the evidence for a bile duct stone is equivocal.

Patients with malignant obstruction of the bile duct frequently have co-existent gallstones. Those patients therefore presenting with jaundice should have the cause of the jaundice established before surgery.

Where a diagnosis of bile duct stones is made preoperatively and a decision is made to remove them intraoperatively, facilities and expertise to perform the procedure laparoscopically should ideally be available.

Operative cholangiogram facilities should always be available at cholecystectomy. If the surgeon does not perform routine operative cholangiograms, then at least his indication for performing an operative cholangiogram should be liberal, such as slightly abnormal LFTs, mildly dilated duct on ultrasound, past history of acute pancreatitis.

2. Unsuspected duct stone discovered at operation

If an unsuspected duct stone is diagnosed at laparoscopic or open operation, its removal then or by ERCP postoperatively are acceptable alternatives.

In summary:

1. Common bile duct stones diagnosed preoperatively should be dealt with either preoperatively or intraoperatively. A decision to leave the stones for postoperative ERCP extraction is unacceptable.
2. Jaundiced patients should have a firm diagnosis established before surgery.
3. MRCP is a very useful and safe method of imaging the biliary tree. Where MRCP is unavailable, CT cholangiography is an alternative in non-jaundiced patients.
4. If operative cholangiography is performed selectively rather than routinely the indications should be liberal.
5. Unsuspected bile duct stones diagnosed intraoperatively may either be dealt with at surgery or by ERCP postoperatively. ERCP is facilitated by the insertion at operation of a transcystic biliary stent. Of course ERCP may not be possible in patients who have had previous gastric surgery.

VSCC Approved June 2004
Re-approved August 2013
CVC GUIDEWIRES ON THE LOOSE – ‘CARPE WIEM’

Reports of central venous catheter (CVC) guidewires ‘lost into the circulation’ at insertion continue to give concern to the VSCC. These relate mainly to faulty insertion technique, inadequate instruction and supervision of beginners, use of multiple-lumen catheters, the distractions of emergency situations and the failure to recognise a retained guidewire on the check chest x-ray after insertion.

The guidewire over which any vascular catheter is introduced must be at least twice as long as the catheter. Correct technique requires that the wire’s external end remains visible to the operator while the catheter is advanced over it. Otherwise friction of the catheter propels the wire within it into the circulation, and beneath the skin, invisible and out of reach. Then, deceptively, a second catheter lumen will still admit test fluid and return blood, and if the guidewire has been propelled fully to lie free in the vessel, even a single lumen catheter will admit syringed fluid and return blood.

The customary x-ray to check the position of the catheter tip for pressure monitoring, and the integrity of the pleura from pneumothorax, may not include a wire that has migrated into the heart or lung, to below the diaphragm, or to the periphery. Or the wire may not be recognised among other chest wires and tubes in an ICU setting. Or the x-ray may not be viewed, reported or communicated. The vagrant wire may not be discovered until an x-ray months later, or it may even migrate to present at the skin or into the heart, lung or a limb to cause deep venous thromboembolism.

Avoiding these events is simply technical: ‘Carpe wirem’ or ‘seize the wire’, requiring the inserter to grasp the external end of the guidewire when advancing the catheter over it, thus obliging withdrawal of the guidewire before flushing the lumen or infusing fluid. The trainee inserter needs to be taught and supervised safely to be sure this essential technical habit is embedded. The clinician should also view the x-ray or pressure waveforms before relying on the position of a catheter tip.

Should a guidewire be displaced or damaged, it may be retrieved by endovascular instruments with angiography, or may require open removal. Resist any temptation to pull on a knotted or jammed guidewire, for guidewires which are coiled-coils tend to break, unravel or tear the vessel wall when forcibly pulled. Seek vascular surgical help.

Guidewire handling and safe removal are integral to all vessel catheterisations and should not need an additional entry on the procedure count sheet. VSCC commends these precautions to surgeons, anaesthetists, intensivists and all trainees.

VSCC Approved January 2011
Recent cases considered by the VSCC highlight a need for better care of feet with diabetes-related complications. These complications include ischaemia, tissue loss, ulceration, infection (soft tissue or osteomyelitis), neuroarthropathy and limb loss. Amputations may be avoided by improved access to foot-at-risk clinics, specialist tele-consulting for remote areas, and recognising the urgency of two common presentations: the foot with a ‘diabetic’ ulcer, and the red hot swollen diabetic foot.

1. Ulceration and threatened tissue loss

Diabetes now affects 7% of the population (not least the Indigenous), and an estimated 15% of diabetics will develop a foot ulcer. Foot ulcers are the precursor to approximately 85% of lower limb amputations – making diabetes the most common non-trauma cause of lower limb amputations. Despite education programs and published guidelines, diabetic amputations have increased.1

Patient instruction is vital to prevent pressure and friction especially from footwear, as well as to control their diabetes, weight and smoking. Meticulous nail care, avoidance of pressure, detection and reversal of ischaemia are offered in foot-at-risk clinics, which are not always readily accessible. Surgical consultation (general, vascular, orthopaedic or plastic) is increasingly accessible for remote patients by tele-medicine. Neuropathy and deformity pose additional challenges to dressings, podiatry and to function of the leg.2

Clinical vascular assessment should precede any debridement or amputation – with imaging by vascular ultrasound or angiography, and revascularisation where possible. An ankle-brachial pressure index may be deceptively high with rigid-walled diabetic arteries.

2. Diabetic sepsis of soft tissue or bone.

Antibiotic alone seldom suffices – such sepsis should trigger suspicion of underlying tissue necrosis, needing debridement, or abscess, demanding drainage, as well. Imaging could include x-ray, CT, bone scan or MRI, but an obvious abscess or exposed dead bone call for surgical action regardless.

Ischaemia on vascular examination needs urgent imaging, as above, and concurrent reversal if feasible. Revascularisation by percutaneous angioplasty or a bypass may allow healing or could lower the level of an amputation. Several surgical specialties listed above are often involved, in addition to the endocrinologist and infectious disease advisor.3

In advanced gangrene of the foot with sepsis spreading up the leg, major amputation of the limb may be offered as a lifesaving procedure. Sequential fruitless attempts at limb salvage are to be avoided. In patients moribund with comorbidity, it may be kinder to palliate rather than operate.

The availability of foot-at-risk consultative clinics, the pattern of diabetic limb operations, and their mortality and morbidity in Victorian hospitals are proposed for study by VSCC.4

VSCC Approved February 2013

References
Bowel ischaemia may occur as a complication of AAA repair – whether repair is by an open or an endovascular technique. In this regard, a patent inferior mesenteric artery (IMA) may be of particular importance if the superior mesenteric artery (SMA) is compromised.

1. When the IMA is occluded or is a small vessel, there should be no problem with bowel viability after an endograft for AAA.

2. If the IMA is patent and a normal-sized vessel, this could be a relative contraindication for endografting for AAA.

3. If the IMA is patent and is a large vessel, this is a relative contraindication to endografting for AAA because of increased risks of gut ischaemia or endoleaks.

4. If the IMA is patent and the SMA is stenosed, the contraindication for endografting for AAA is stronger than 2 and 3 above but is still relative.

5. If the IMA is patent and both internal iliac arteries are occluded or will be occluded by the positioning of an endograft, there is a relative contraindication to endografting for AAA.

Irrespective of these circumstances, it is up to the surgeon to assess the relative risk in these cases as follows:

a. the degree of risk a patient’s comorbidities pose for an open repair of AAA

b. the risk of mesenteric ischaemia following endografting of AAA posed in 2, 3, 4 and 5 above

c. the risk of rupture if no intervention is undertaken.

Each individual patient will vary and no fixed rules can be advocated. Precise and current arterial imaging is essential. The final decision about management and its risks will be made by the surgeon and well-informed patient in consultation.

Should mesenteric ischaemia develop after endografting, it can be as difficult to diagnose as after open aortic repair, and requires urgent and vigorous management.

VSCC Approved September 2005
Revised April 2012
FATIGUE DURING LONG OPERATIONS

The Australian Council for Safety and Quality in Health Care, the Australian Medical Association and various government bodies have drawn attention to the relationship between fatigue and adverse events. Many surgical teams that currently undertake long operations on a regular basis, have an established routine for staff rest and staff changeover to prevent fatigue. When operations are performed during the night there is a disturbance of the normal circadian rhythm and fatigue is more likely to occur.

The following recommendations are designed to provide a framework to assist operating teams develop a safer routine during prolonged operations.

• Before the operation commences the senior surgeon should discuss with his/her team the stage(s) during the procedure when a break could occur. With a very prolonged procedure it may be appropriate to have more than one break.
• Staff included in the break schedule will be all staff whose concentration is required throughout the operative period — that is, surgeon, assistant surgeon, scrub nurse and anaesthetist.
• The scheduled break(s) should not be synchronous for all staff.
• An operation need not cease during the break period(s), such as an assistant surgeon may take over the operation while the senior surgeon has a break, an alternative scrub nurse may replace the initial scrub nurse while the operation continues.
• Suitable qualified staff (both nurse and doctor) should stay with the patient at all times to deal with any change in condition that may arise during a rest break.
• Any member of the operating team who feels he/she is becoming fatigued should tell the surgeon in charge so that an appropriate break can be arranged promptly.
• It is the responsibility of the senior surgeon to ensure that his/her staff have appropriate rest breaks.

VSCC Approved 2005
Revised June 2011
FIRE IN THE OPERATING THEATRE

An alarming case of burns to the tongue, pharynx and lips during a tonsillectomy was recently reported to the VSCC, when diathermy of the tonsillar fossa set fire to the laryngeal mask. Drapes were used to extinguish the flames, the mask was replaced by an endotracheal tube, haemostasis secured, steroid given, then the child was transferred by helicopter to an ICU. The management was prompt and appropriate, with a satisfactory outcome.

The mask was sent to TGA for a device incident report, and both anaesthetic and surgical consultative councils were notified.

Reports of fire in Australian hospitals are sporadic. It is estimated that in the United States 500–600 operating room fires are reported per year, with 40–50 per year expected in ANZ, about 20% involving the airway. A 2009 paper and video on airway fires in the OR is available on the ANZ College of Anaesthetists website at <www.anzca.edu.au>.

Fires require a ‘triad’ of elements: ignition source, oxidiser and fuel.

1. **Ignition source:** diathermy (electrosurgery with current conducted through the patient) is the main cause of ignition, followed by lasers.

2. **Oxidisers** in anaesthesia include oxygen and nitrous oxide.

3. **Fuels** include alcohol preps, linen, endotracheal tubes (ETTs), hair, tissue, tissue glues, bowel gas, drapes and dressings, but modern volatile anaesthetic agents are relatively non-flammable. In this case the laryngeal mask was composed of PVC, which is less flammable than some other types such as silicone.

**Commonest airway fire scenarios** are (i) **tracheostomy:** tracheal incision by diathermy without lowering oxygen saturation, the fuel being the ETT or vaporized tissue; and (ii) **tonsillectomy** (rarer): high oxygen leak around a mask or uncuffed ETT, ignited by heated cautery of tonsillar tissue, and maybe fuelled by dried packs or gauzes.

**Prevention** includes allowing flammable skin preps to dry, avoiding high oxygen levels in body cavities or nearby enclosed spaces, judicious diathermy and laser use and scabbarding of diathermy probes. Remote fires may also pose hazards in theatre such as smoke pumped through the ventilation system, or power and backup generator failure requiring operations to be completed by torchlight.

Council commends to surgeons, anaesthetists and trainees a joint alertness to the risks, prevention and emergency management of intraoperative fires.

VSCC Approved January 2011
Fluid intravasation is an important and potentially lethal complication of hysteroscopic surgery and has been reported to occur in 1–5% of cases. Hypotonic solutions such as glycine (1.5%) are widely used for operative hysteroscopy because the non-ionic nature of these fluids does not dissipate the electrosurgical current. With the advent of bipolar technology in hysteroscopic surgery, normal saline solution may be used in place of hypotonic solutions thus reducing the risks associated with acute electrolyte disturbance.

Mechanisms

Most fluid absorption occurs intraoperatively via two mechanisms: firstly through transection of blood vessels in the uterine vasculature where surgery extends into the deeper myometrium; and secondly across the walls of the endometrium. There may also be some absorption from the peritoneum where fluid has spilled into the pelvis via the fallopian tubes.

Clinical sequelae

Intravasation of hypotonic fluids may cause significant complications including fluid overload, hyponatraemia, pulmonary or cerebral oedema. If the hyponatraemia is not corrected, irreversible brain damage or even death may ensue.

Prevention

1. **Monitoring of fluid balance** is the most critical factor in preventing fluid overload. The operating team must keep meticulous track of the amount of fluid absorbed and document this. Communication between nursing staff, the operating surgeon and anaesthetist is essential. Hospitals should develop their own protocols for assessing, documenting and managing fluid intravasation at hysteroscopic surgery. Techniques relying on volume assessments are less accurate than those using weight measurements. A fluid deficit of 750 mL implies impending excessive intravasation and completion of the case should be planned. The safe limit of accurately measured fluid deficit is in the order of 1,000 mL as this volume of glycine intravasation significantly reduces serum sodium concentration. Surgery should be discontinued at this point, even if the procedure is not complete.

2. **Controlling intrauterine pressure**: Limiting uterine pressure can dramatically reduce the amount of fluid absorbed during operative hysteroscopy. The lowest intrauterine pressure possible to maintain an adequate view (40–100 mmHg) should be used. The use of continuous flow hysteroscopy with pressure-controlled pumps and unobstructed uterine outflow should facilitate this.

3. **Operative time**: Limit operating time to ≤ 1 hour. Resection of larger myomas may need to be performed in stages.

4. **Endometrial preparation** with GnRH analogues may reduce fluid absorption by thinning the endometrium thus facilitating the surgery, and reducing myoma volume and vascularity.

5. **Anaesthesia**: Consideration may be given to performing operative hysteroscopy under local or regional anaesthesia, especially in patients with other comorbidities. Early signs of acute hyponatraemia (nausea, vomiting and weakness) may be detected sooner in an awake patient and corrective measures instituted before it becomes a more serious problem.

6. **Bipolar technology**: This allows for the use of physiologic saline solutions, which reduces the risks of electrolyte abnormalities associated with hysteroscopic surgery. Meticulous fluid balance is still important, however, to avoid excessive fluid absorption and its attendant risks of pulmonary oedema or congestive cardiac failure.
Treatment

Early detection and correction of hyponatraemia and fluid overload are paramount to its effective management. Because the onset of severe symptoms can occur unpredictably, therapy must be instituted immediately. A delay in recognising acute hyponatraemia until the patient develops seizures can be fatal. The mainstays of treatment include removal of excess fluid and rapid correction of the serum sodium to physiological levels.

Firstly, it is imperative to halt the procedure immediately at the absorption threshold (1,000 mL). Asymptomatic hyponatraemia requires fluid restriction and diuretic therapy. Judicious correction of fluid and electrolyte balance will prevent morbidity. Urine output should be accurately measured with an indwelling catheter and serum electrolytes should be monitored every two to four hours until two normal values are obtained.

Symptoms of hyponatraemia do not usually occur until the serum sodium has fallen to 120–125 mmol L⁻¹. Symptomatic hyponatraemia requires aggressive management with intravenous hypertonic saline, supportive therapy and monitoring in a critical or intensive care setting.

Guideline prepared by Dr K McIlwaine
Consultant Gynaecologist
VSCC Approved July 2011

References
GUIDELINE ON SURGEON RESPONSIBILITY

Any doctor looking after a patient is responsible for looking after that patient in a manner that is in the patient’s best interests. Outside the operating theatre a surgeon’s responsibility for the patient differs little from that of other doctors.

However, in the operating theatre, the surgeon has the ultimate responsibility for the patient’s welfare. Certain tasks are obviously delegated, but ultimate responsibility remains with the surgeon. This applies particularly to ensuring that the correct patient is being operated on at the correct site and on the correct side. Risk heightens when unsupervised trainees start or close operations, or when theatre staff change over. Surgical leadership is vital at these times.

The surgeon is obliged to ensure that the correct implant is being used and that no swabs, packs or instruments are left in the patient. Where items are temporarily used in a patient during an operation, the surgeon is responsible for ensuring their removal before the end of the operation.

When an adverse event occurs during an operation it is the surgeon’s responsibility to ensure that the relatives are promptly informed and that the incident is discussed fully with them and the patient. ‘Full discussion’ may be a more helpful term to describe this, rather than ‘open disclosure’, which implies some ‘fault’ on the part of the surgeon. Often, when something goes wrong during surgery, the problem is caused by the patient’s pathology and is not of the surgeon’s doing.

When transfer of a surgical patient occurs, such as from operating theatre to ICU, or from one hospital to another, the surgeon is responsible for ensuring that all relevant information is passed to the doctor who will subsequently be looking after the patient.

Although the above may all seem self-evident, the VSCC continually sees cases of adverse events that have occurred because the surgeon has not been sufficiently vigilant or communicative. Such aids as the WHO checklist, the scrub nurse instrument and swab count, the postoperative orders form and inter-hospital transfer protocols are all designed to HELP the surgeon. They are not designed to REPLACE the surgeon. The VSCC will continue to monitor adverse events and communicate examples of them to the surgical community, with the aim of further helping the surgeon, and improving safety of the patient.

VSCC Approved January 2011
The VSCC is aware of instances in Victoria in which an incorrect intraocular lens has been implanted. A Surgical Outcomes Information Initiative (SOII) study of de-identified hospital data revealed two venues where re-operation using the correct lens had been required. VSCC communicated confidentially with those hospitals, each of which investigated and took appropriate action to avoid such events. For example, one proved vulnerable by having had more than the one selected lens present in the operating theatre.

Incorrect intraocular lens (IOL) insertion should be a ‘never event’. The important components to ensuring the correct IOL is inserted are:

1. **Dual independent IOL selection**
   
   The surgeon should document clearly in the patient file at the time of booking cataract surgery the refractive aim for the procedure and whether the IOL is monofocal or presbyopia correcting. They should select the appropriate IOL (preferably based on biometry using partial coherence interferometry) with reference to the refractive aim. Biometry should be performed on both eyes simultaneously and repeated if an asymmetric or unexpected result is obtained. Preferably, a second person (typically an orthoptist) should independently select an IOL based on the same refractive aim. Both surgeon and orthoptist should also include the IOL type including whether the IOL is spherical or toric. Any discrepancy between these two recommendations should be reviewed by the surgeon and resolved.

2. **Preoperative IOL selection**
   
   The surgeon is responsible for ensuring that the correct IOL is available prior to the anaesthetist commencing the patient’s anaesthetic.

3. **In operating room IOL**
   
   The correct IOL should be confirmed by surgeon and nursing staff by comparison with the documented recommendation.

   There should be no IOL in theatre other than the one intended for implantation. Where a toric IOL has been selected the surgeon should ensure that there has been no transcription error with principal corneal meridian input. Where a toric IOL has been selected, the printout should be available for the surgeon to confirm axis implantation.

VSCC Revised, Re-approved May 2013

**Resources**

**MANAGEMENT OF HEAVY RECTAL BLEEDING**

**Definition**

Heavy rectal bleeding is the sudden onset of heavy bright rectal blood loss, often described as massive lower GI/colonic/rectal bleeding /haemorrhage. It is characterised by the sudden passage per rectum of a large volume of blood, liquid and/or blood clots, bright red in nature, profuse with either urgent call to stool or uncontrolled evacuation of blood.

This condition is not to be confused with the more common low volume rectal/p.r./haemorrhoidal-type bleeding, the latter being most commonly related to haemorrhoids, occurring with bowel movements with blood noticed on the paper and/or the stool, and/or in the toilet bowl.

**Aetiology**

Heavy rectal bleeding is an **acute surgical emergency**. Patients often arrive in the emergency department via ambulance. Almost all (98%) cases are due to either uncomplicated diverticular disease or angiodysplasia. The other 2% includes bleeding related to colorectal cancer or polyp; Crohn's disease; after colonoscopy; after polypectomy; after resection of colon, small bowel or rectum; or following rectal injury at sigmoidoscopy or enema tube injury in a nursing home patient.

**Initial resuscitation**

Standard immediate resuscitation includes prompt blood replacement and reversal of any clotting abnormality. The site and cause of bleeding needs to be found using:

- PR examination and sigmoidoscopy to rule out an anorectal cause is mandatory
- gastroscopy to rule out an upper GI cause, especially if exsanguinating, or
- red cell isotope scan and/or mesenteric angiography to localise bleeding source.

**Management**

- All patients should immediately be referred to the on-call general surgical team, who may consult with a colorectal unit.
- If bleeding stops, then continue appropriate resuscitation and observation, meanwhile planning further investigation and management.
- If bleeding continues, the gold standard option is mesenteric angiography with localisation of the site of bleeding, then embolisation.
- If this service is not available, urgent transfer of the patient to another centre where it is available should be considered.
- If the patient is too unstable to transfer, then laparotomy by an appropriate surgical specialist is the preferred option, with resection and usually an anastomosis.

Advice from a colorectal surgeon should be considered during all stages of the management.

**VSCC Approved November 2011**
MANAGEMENT OF VASCULAR INJURIES AT LAPAROSCOPY

Reports continue to reach this Surgical Consultative Council of vascular injuries during laparoscopy, some of which proved rapidly fatal. Avoiding injury requires care, but managing it successfully takes planning, a cool head and urgent action.

Severe bleeding is a real risk to be discussed beforehand with every patient, explaining the possible need for urgent open or endovascular blood vessel repair and transfusion. Major retroperitoneal vessels are initially at risk whichever technique is used to establish the pneumoperitoneum. Pressing a thin anaesthetised patient’s abdominal wall by needle or cannula brings it very close to the aorta, cava and iliac vessels. So elevate the abdominal wall and wield sharp instruments wisely!

Vascular events at laparoscopy range from abdominal wall haematoma, bleeding mesenteric or retroperitoneal vessels, and gas embolism, to later-presenting false aneurysm, arteriovenous (AV) fistula, organ or limb ischaemia. In a 2002 survey, 21% of responding members of the Australasian Gynaecological and Endoscopic Surgery Society (AGES) had encountered a major exsanguinating injury.

Lesser injury in a haemodynamically stable patient may be clipped or even clamped and sutured laparoscopically during the procedure, without open conversion.

Major injury with bleeding recognised during or just after laparoscopy is usually treated by rapid laparotomy, controlled by direct pressure, arterial proximal clamping or venous firm packing. Frenzied attempts to clamp or suture through torrential bleeding tend to worsen the damage. Repair is then by monofilament suturing or urgently involving a surgeon with suitable vascular experience. If none is available, abdominal packing and closure (‘damage control surgery’) and judicious resuscitation are recommended before transfer to an appropriate centre. If the venue for laparoscopy is not equipped with vascular clamps, expertise, sutures and blood supplies, think ahead about whom to call or which hospital to transfer to, should the need arise.

Angiography and endovascular repair may suit ‘unapproachable’ injured vessels (for example, among dense adhesions or sepsis), false aneurysms, AV fistulae or arterial occlusions. Bypass is occasionally needed to repair injured renal, hepatic or lower limb arteries.

The mainstay of management remains prevention, and keeping sharp instrument tips well clear of the major vessels. Published world and Australian experience does not support any particular entry technique as being freer of vascular injuries. Rather, it behoves the operator to insert any sharp instrument with caution, and only after carefully examining the abdomen under anaesthetic and elevating the abdominal wall.

VSCC Approved September 2011

Resources
AGES. Survey of entry techniques and complications. AGES. ANZJOG 2002; 42: 264–266
MANAGING ‘HIGH-RISK’ PATIENTS FOR CARDIAC SURGERY

Cardiac surgeons are often presented with patients who face a ‘high risk’ for operation. It is important to identify these patients so that extra measures can be put in place to reduce the risks.

The Victorian Surgical Consultative Council (VSCC) and Victorian Audit of Surgical Mortality (VASM) have had the opportunity of reviewing the records of several patients who have had an adverse outcome from cardiac surgery. It is clear that most of the morbidity and mortality occurs in patients who would have obviously been known to be at high risk.

Many preoperative patient variables have been identified as indicating a risk of increased morbidity and mortality to undergo cardiac surgery.

These have been identified in several studies but more clearly defined in the analysis of large data banks, particularly the STS database (United States), Euro Score (Europe), and more recently the ASCTS database that has been used to create the Auscore.

Major risk factors that have been identified are:

- increasing age and very significantly after 75 years
- reduced left ventricular function: EF < 30%
- renal function impairment: eGFR60-90 o.r. 1.32; eGFR30-59 o.r. 2.85; eGFR < 30 o.r. 5.69
- re-do surgery
- diabetes mellitus
- female gender
- current smoking
- morbid obesity
- concomitant procedures
- clinical status: medical emergency or salvage procedure
- recent STEMI
- NYHA class IV.

Risk factors less well defined and not so easily quantifiable are:

- chronic airways disease
- malignancy
- peripheral vascular disease
- pulmonary embolism history
- large ‘barrel chest’.

These risks may be quantitated by applying the risk algorithms published by the above-named databases. However, they are inaccurate at the upper and lower ends of the scale.

In practice the need for surgery often outweighs the risks, and surgery is still indicated.

Therefore, it is important that these factors are recognised in the preoperative assessment so that a strategy can be created and carried out to reduce the risks.
Strategies that surgeons and cardiologists should consider are as follows:

1. Reconsider the decision to operate, considering the risks identified.
2. Postpone the operation, where possible, to enable cessation of smoking, weight reduction, better control of heart failure and diabetes mellitus, and improvement of renal function.
3. Notwithstanding the possible scheduling and logistic problems, avoid a prolonged wait for surgery where there is a risk of deterioration of the cardiac disease.
4. Allow time for a full preoperative assessment by other professionals such as the anaesthetist, intensivist, respiratory or endocrine physician.
5. Admit these patients, especially if frail or remote, to hospital at least one day prior to the surgery, to confirm operability, modulate remaining risks, complete preparation and stabilise.

VSCC Approved February 2012
MANAGING PATIENTS AT ‘HIGH RISK’ FOR SURGERY: MAJOR SURGERY IN GENERAL

The VSCC has had the opportunity of reviewing the records of patients who have had an adverse outcome as a result of their surgery. It is clear that morbidity and mortality have occurred in many patients who would obviously have been known to be at high risk. Some major risk factors are listed below. It is important that these factors are recognised in the preoperative assessment so that a strategy can be developed and employed to reduce the risk of proposed major surgery.

Strategies which should be considered are:
1. Re-assess the decision to operate considering the risks identified.
2. Postpone the operation, where possible, to enable cessation of smoking, weight reduction, better control of heart failure or diabetes mellitus, and improvement of renal function.
3. Notwithstanding, avoid a prolonged wait for surgery where there is a risk of further deterioration.
4. Allow time for a full preoperative assessment by other professionals such as the anaesthetist and a physician.
5. Admit these patients to hospital at least one day prior to surgery despite the inevitable protests of the hospital administrative staff.

Major risk factors that have been identified in various studies are:
- increasing age (particularly over 75)
- cardiac failure or myocardial ischaemia
- impaired renal function
- re-do surgery
- diabetes mellitus
- current smoking
- morbid obesity
- chronic airways disease
- uncontrolled hypertension
- malignancy
- pulmonary embolism history
- concomitant procedures
- anaesthetic status (ASA classification)
- the clinical status (emergency or salvage procedure).

There will be other major risk factors applicable in individual specialties. Major risk that cannot be ameliorated may prove unacceptable to a well-informed patient. Surgeon, anaesthetist and physician may together reassess the risks as too severe, and suggest simpler or non-operative management.

VSCC Approved February 2012
MESENTERIC ISCHAEMIA IN REPAIR OF ABDOMINAL AORTIC ANEURYSM (AAA)

Bowel ischaemia may occur as a complication of AAA repair – whether repair is by an open or an endovascular technique. In this regard, a patent inferior mesenteric artery (IMA) may be of particular importance if the superior mesenteric artery (SMA) is compromised. Current and precise vessel imaging is essential for decision making.

1. When the IMA is occluded or is a small vessel, there should be no problem with bowel viability after an endograft for AAA. At open operation, oversewing of the orifice of a small patent IMA should be safe.

2. If the IMA is patent and a normal-sized vessel, this could be a relative contraindication to endografting for AAA. At open operation, the IMA should be reimplanted using a Carrel patch technique.

3. If the IMA is patent and is a large vessel, this is a relative contraindication to endografting for AAA. At open operation, the IMA must be reimplanted.

4. If the IMA is patent and the SMA is stenosed, the contraindication to endografting for AAA is stronger than 2 and 3 above but is still relative. At open operation, the IMA will of course be reimplanted.

5. If the IMA is patent and both internal iliac arteries are occluded or will be occluded by the positioning of an endograft, there is a relative contraindication to endografting for AAA.

Irrespective of these circumstances, it is up to the surgeon to assess the relative risk in these cases as follows:

• the degree of risk a patient’s comorbidities pose for an open repair of AAA, with reimplantation of the IMA on to the graft
• the risk of mesenteric ischaemia following endografting of AAA posed in 2, 3, 4 and 5 above
• the risk of rupture if no intervention is undertaken.

Each individual patient will vary and no fixed rules can be advocated. The final decision on management will be made by the surgeon and patient in consultation.

Should mesenteric ischaemia develop after endografting, it can be as difficult to diagnose as after open aortic repair, and requires urgent and vigorous management.

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Revised April 2012
Revised August 2013
The VSCC has recently seen many poor outcomes resulting from aspiration of vomitus in surgical patients with persistent ileus or bowel obstruction who had no gastric drainage. Decompression using a nasogastric tube (NGT) is important in the management of such patients. It is also important to consider each case on its merits, as some patients may not tolerate an NGT, and vomiting may increase. Complications may occur, the patient may be worse off, and there are some contraindications. Nevertheless most patients will benefit.

Indications for nasogastric intubation (excluding enteric feeding)

(a) Persistent ileus

Patients with persistent ileus, either postoperatively or with peritonitis who are vomiting or who have painful distension of the abdomen, will benefit from NG intubation in conjunction with intravenous therapy and electrolyte correction. Intraoperative intubation as prophylaxis for postoperative ileus is not indicated.

(b) Bowel obstruction

Following clinical and x-ray or CT examination of the patient, the management may be either:

1. **Non-operative**, consisting of early NG intubation and drainage in conjunction with adequate IV fluid and electrolyte replacement, or

2. **Preparing for operation**, patients usually benefit from early preoperative NG intubation. Early liaison must be made with the anaesthetist and, if expertise or time is not available, the anaesthetist should know and may request no preoperative intubation and ‘crash induction’.

3. **Preparing for transport** by ambulance or air, patients in the above categories will benefit from NG drainage. The consequences of vomiting in restricted space or the onset of painful bowel distension can be serious.

Technique of nasogastric intubation

Each hospital will have its own protocols that should be followed, but in general:

- The procedure should be done by an experienced person – if not available, it may be worthwhile waiting until one is available or until the morning.
- Explain to the patient what is trying to be achieved – reassure that the attempt will be stopped if it is not tolerated.
- The patient should be sitting with head supported and slightly flexed, and a protective towel in place.
  - **Suction** should be available in case of gagging, vomiting and aspiration.
- It is appropriate to use a 14–16 French tube, end lubricated and no guide wire. Measure the required length, and help the patient to swallow by giving them a straw and a small amount of water. Cooling the tube to be more rigid is of doubtful benefit.
- Topical anaesthetic lignocaine 5% may help the very anxious patient, but tastes unpleasant, may impair swallowing by temporary loss of sensation, and is usually not required. Topical vasoconstrictor phenylephrine 0.5% may help by shrinking the nasal mucosa when passage is impeded by internal deformity or turbinate hypertrophy. The two agents are combined in CoPhenylcaine Forte, a preparation widely used in ORs and EDs, maximum dose in adults five squirts per nostril; use caution in children and the elderly.
- Recognise the complications such as tube coiling in the mouth, excessive pain or excessive coughing and gagging, cyanosis or the onset of acute abdominal pain. If these occur, terminate the process, and seek experienced help.
- Desist after two failed attempts. It may be appropriate to pass a soft guidewire using image intensifier control and pass a NGT over it.
- Confirm the position of the tube – most hospitals have pH paper, but if in doubt the gold standard is a chest x-ray (the tip of the tube must be below the diaphragm).
• Fix the tube in place securely by an appropriate method. Staff should check the taping regularly, as even ‘infallibly secure taping’ often fails over several days.
• Document in the clinical notes the time of placement and orders for the tube – that is, continuous open drainage, and four-hourly manual aspiration. Document appropriate intravenous therapy.

Contraindications to nasogastric intubation
Passing a nasogastric tube is contraindicated in the presence of:
• recent sinus surgery (FESS)
• fractured base of the skull or facial fracture
• oesophageal stricture, or
• oesophageal varices.
VSCC Approved August 2013

Further reading
Nasogastric tube insertion: <www.med.uottawa.ca/procedures/ng/>
Hodin, Bordianou: <www.uptodate.com/contents/nasogastric-and-nasoenteric-tubes>
PENROSE DRAIN TUBE USE AND HAZARDS

There are several clinical indications for the placement of a surgical drain, which can be largely divided into therapeutic or prophylactic reasons, including but not restricted to: (1) to remove blood/exudates/transudates and gas, thereby minimising the potential for wound infection; (2) to obliterate dead space thereby promoting more prompt wound healing; and (3) to monitor/manage postoperative anastomotic leakage.

Drains are either open or closed and the latter may drain passively or with the aid of suction. Broadly speaking it is preferable to use a closed system as it is more accurate and has a reduced risk of contamination. Drains should remain safely secured to the skin until removed.

Where an open drain is used (for example, corrugated, Penrose, Yeates drain) it is imperative that the drain is secured in a manner that prevents both premature dislodgement and retraction. Penrose drains contain latex.

Retained Penrose drains

There have been several further sentinel events recently reviewed by the Victorian Surgical Consultative Council (VSCC) involving retained Penrose drains. Retained Penrose drains were found to have occurred when either a suture was not used to secure the drain at the exit site or when the retaining suture was cut to facilitate “shortening” or staged withdrawal of the drain. In the latter cases the drain was neither re-secured nor modified (such as with a safety pin) to prevent migration. In all cases the drain was ‘assumed’ to have been removed. The retained drains were discovered between eight days and 15 months later because of persisting symptoms and, in one case, despite repeated plain x-raying. Penrose drains do not have radio-opaque markers – additional CT imaging was needed to identify the retained drain.

Following a review of these cases the VSCC makes the following recommendations:

1. The use of closed drains is preferable to open drains. Care during closure of incisions must be used to avoid tethering or damaging drains while suturing each layer.
2. Ideally, drains should be radio-opaque or have markers to facilitate easier radiological detection.
3. All drains should be secured in accordance with locally developed and approved procedures, preferably involving suturing to the patient’s skin at the exit site.
4. The Victorian hospitals postoperative orders form helps to document the placement of and postoperative management of the drain. The type of drain and length should be clearly documented in the operative notes.
5. Penrose drains should not be ‘shortened’ or withdrawn in stages. Penrose drains are soft and small, often used in the perineum or other locations that are awkward for inspection, dressing or shortening. The ‘shortening’ is hazardous.
6. If a drain is to be withdrawn in stages, it should preferably not be shortened by cutting, and should be re-secured appropriately after each withdrawal. When finally removed, its length must be checked against that documented in the operative notes.
7. Clearly document the removal of drains, intact. In the absence of clear documentation of an intact drain removal, appropriate medical imaging must be undertaken to ascertain if it (or a fragment of it) is retained, or to confirm that it is no longer present.

VSCC Approved August 2013

Further reading

REQUEST FOR OPERATION/PROCEDURE CHECKLIST

Before embarking on obtaining consent:

1. Am I the right person to obtain consent? The person informing the patient and obtaining consent should be the person advising the operation or procedure, and should be suitably experienced to explain fully the operation and its possible sequelae.

2. Is the person from whom I am obtaining consent competent to give it – that is, can the patient understand the procedure, or otherwise is the appropriate parent/agent/guardian competent to give it?

3. Is consent given freely? (without any coercion or prior medication or sedation)

4. Do I need an interpreter?

5. Will I encourage the patient to ask questions?

6. How will I confirm that the patient understands what is to be achieved by the operation?

Allow time to cover each of these important areas when obtaining consent:

1. Name and general description of the procedure in plain language

2. Why it is recommended: necessary or optional? diagnostic or therapeutic? cosmetic? experimental?

3. Alternative treatments, including not having the procedure

4. Who will actually do the procedure? If this is a trainee, by whom and how directly is the trainee supervised?

5. Expected postoperative sequence of events

6. Possible side effects and/or complications of the procedure

7. Appreciation of any material risks such as damage to the recurrent laryngeal nerve in an opera singer, or damage to the sciatic nerve in a builder

8. Possible long-term effects or consequences

9. Likely recovery time, and any out-of-pocket costs involved

10. Importantly, these aspects should be documented in the patient’s notes.

VSCC Approved 2005
Revised July 2011
RETAINED FOREIGN OBJECTS AND IMAGING IN THEATRE

The VSCC continues to see cases of retained gauzes, instruments and guidewires. It has been estimated that up to one in 1,000 operations may be complicated by a retained foreign object, and in Victoria it is the commonest reported surgical sentinel event.

While virtually every surgical site has been associated with a retained foreign object, most occur in the abdomen or chest. About two-thirds are retained surgical packs or smaller ‘gauzes’. Factors associated with retained foreign objects are well known and include:

- emergency surgery
- prolonged operating time
- multiple surgical teams
- multiple procedures
- major trauma
- intraoperative haemorrhage
- multiple nursing teams
- obesity
- distraction
- fatigue.

Clearly the prevention of retained foreign objects is by far the most sensible strategy. However, up to 15% of operative procedures are interrupted by an ‘incorrect count’. In nearly all cases, a misplaced item rather than retained item is the problem. In most cases, no harm comes to the patient (no foreign object is retained), but the increase in operating time and the frequency with which these events occur causes concern. Unfortunately when an object is retained, in two-thirds of cases the surgical count has been reported as correct. In some of these instances, the second ‘count out’ has been omitted. In some, the object, wire or drain tube has been fragmented.

Retained foreign objects remain a problem and we should aim to eradicate them.

Imaging in theatre

If the count remains incorrect or there is a possibility of a retained body, intraoperative imaging of the entire operated field is mandatory. The technology available is usually an image intensifier or a portable x-ray machine. A permanent copy of the imaging should be obtained and reviewed with a radiology consultant, preferably at the time of surgery. When the potential foreign object cannot be located, a postoperative CT scan is recommended, especially for less radio-opaque materials or fragmented gauzes.

Whenever there is a possibility of a missed or retained foreign object or more commonly an incorrect count, the surgeon as leader of the operating team needs to be absolutely certain that there is no retained foreign object. This obligation should be emphasised when inviting another member of the surgical team to ‘close the incision’.

See also: VSCC guide – ‘Retained Raytec swab’ 2009, with references

VSCC Approved August 2012
RUPTURED ABDOMINAL AORTIC ANEURYSM

When a patient suffers a rupture of an aortic aneurysm the mortality rate is still very high (32%). Diagnosis of an abdominal aortic aneurysm (AAA) before rupture is clearly preferable. With modern techniques, the mortality and morbidity of elective repair is now very low (4.3% by open operation, MVSA reference).

In the event of rupture, the greatest factor in survival is the length of time between arrival at hospital and operation. When the diagnosis is clinically obvious, unnecessary delay in the emergency department to obtain CT scans or attempt IV resuscitation is to be condemned.

In a hospital with a vascular surgery unit there will be an established protocol for urgent action for a patient with a ruptured AAA. This protocol should be activated immediately with transfer to the operating suite for laparotomy and application of an aortic clamp or insertion of an endoluminal stent, regardless of whether an ICU bed is currently available. Clearly, the availability of an experienced vascular surgeon enhances the chances of a patient’s survival. After repair is achieved, of great importance is the availability of an ICU staff accustomed to caring for patients after aneurysm surgery. This may mean post-op interhospital transfer.

Without a vascular surgery unit and ICU: It is more difficult when a patient with a ruptured abdominal aortic aneurysm arrives in the emergency department of a hospital with no vascular surgery unit, and an intensive care unit unfamiliar with managing patients after AAA surgery. There are two alternatives:

- transfer the patient to a hospital with a vascular surgery unit and a suitably experienced ICU
- operation by a general surgeon.

In a patient with stable circulation (contained rupture), transfer is preferable. Efforts to achieve stability by fluid replacement while bleeding continues are counterproductive.

In a hypotensive patient who is obviously still bleeding, transfer is likely to prove fatal. It is suggested that in these circumstances, the general surgeon should consider taking the patient to the operating theatre to put a clamp rapidly on the aorta. Immediate contact with a vascular surgeon would probably mean that a vascular surgeon could attend and meet the general surgeon within one to two hours. Once the clamp is on the aorta, fluid resuscitation can be effective. The general surgeon may complete the aortic replacement, or when the vascular surgeon arrives, the two surgeons could complete the operation together.

The patient should then immediately be transferred to a hospital with an ICU familiar with the management of AAA patients. If a vascular surgeon is not readily available, the general surgeon should complete the operation and then, on completion, transfer the patient to a hospital with an ICU as described above.

General surgeons in hospitals without a vascular surgery unit should determine, in advance, which vascular surgeon and which hospital would be most appropriate to contact should a patient with a ruptured AAA arrive in the emergency department.

VSCC Approved January 2011
Amended June 2011
STRESS ULCER PROPHYLAXIS IN SURGICAL PATIENTS

Discussion at the VSCC of recent surgical cases and deaths revealed concerns about:

- inadequate stress ulcer prophylaxis (SUP) in hospital patients
- lack of recognition of the early signs of gastrointestinal (GI) bleeding.

This guide aims to improve the care of patients prone to stress ulceration, as follows:

1. **Prophylaxis (SUP) should start** on admission, with an H2 receptor antagonist (H2RA) such as ranitidine or protein pump inhibitor (PPI) (for example, sucralfate).

2. **Prophylaxis should continue** until enteral nutrition (via the gastric rather than jejunal route) is established.

3. **If GI bleeding is identified, an urgent upper GI endoscopy** should be organised in the first instance for high-risk patients.

Gastrointestinal stress-related mucosal damage may develop as early as 24 hours after admission in the critically ill. Stress ulceration follows an imbalance in the homeostasis of the gastric mucosa. In shock, acid hypersecretion occurs, and the protective mucosal barrier is impaired by hypotension, opiates and sedatives that slow gastric emptying, and many medications such as analgesics, vasopressors and steroids used in these patients.

Clinically significant bleeding with haemodynamic instability, need for blood transfusion or surgery, occurs in some 1.5–8% of ICU patients, or up to 15% of patients without SUP.\(^1\)

The risk of clinically important bleeding from a stress ulcer is highest in patients requiring mechanical ventilation > 48 hours (odds ratio 15.6) or with thrombocytopaenia, while other factors increasing the risk include sepsis, renal or hepatic insufficiency, jejunal rather than gastric enteral feeding, glucocorticoids, anticoagulants, burns > 35%, head or spinal trauma, ICU > 1 week, or a history of peptic ulcer or upper GI bleeding.\(^2\)

Early evidence for the efficacy of SUP came from a randomised controlled trial (RCT) of 100 critically ill ICU patients receiving either antacid prophylaxis (titrated to pH > 3.5) or none.\(^3\) Subsequent RCTs confirm this, and suggest an H2RA is the drug of choice, while smaller trials have suggested equivalence of PPIs with less tachyphylaxis.

SUP is not without risk. Infectious complications may be increased, such as hospital-acquired pneumonia, perhaps related to enteral feeding with the potential for aspiration.\(^4\)

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References
