aci.health.nsw.gov.au

Value-based elective surgery: audit indicators

Hysterectomy, tonsillectomy (outside accepted criteria) and myringotomy with or without grommets (outside accepted criteria)

February 2024

NSW GOVERNMENT

AGENCY FOR CLINICAL INNOVATION

The information in this document should not replace a clinician's professional judgement.

Agency for Clinical Innovation

1 Reserve Road St Leonards NSW 2065 Locked Bag 2030, St Leonards NSW 1590

Phone: +61 2 9464 4666 | Email: aci-info@health.nsw.gov.au | Web: aci.health.nsw.gov.au

Further copies of this publication can be obtained from the Agency for Clinical Innovation website at aci.health.nsw.gov.au Disclaimer: Content within this publication was accurate at the time of publication.

Title	Value-based elective surgery: audit indicators - hysterectomy, tonsillectomy (outside accepted criteria) and myringotomy with or without grommets (outside accepted criteria)		
Published	February 2024		
Next review	2029		
Produced by	ACI Evidence, Dissemination and Generation		
Preferred citation	NSW Agency for Clinical Innovation. Value-based elective surgery: audit indicators - hysterectomy, tonsillectomy (outside accepted criteria) and myringotomy with or without grommets (outside accepted criteria). Sydney: ACI; 2024		
TRIM ACI/D23/4284	SHPN (ACI) 230951	ISBN 978-1-76023-689-2	ACI_8853 [02/24]

Contents

Background

The Agency for Clinical Innovation (ACI) Surgical Care Network (previously known as the ACI Surgical Services Taskforce) published a clinical practice guide on value-based surgery in December 2022 with two aims:

1. Enable more clinically appropriate procedures in public hospitals
2. Promote discussion between craft groups and NSW Health.[1]

Hysterectomy, tonsillectomy (outside accepted criteria) and myringotomy with or without grommets (outside accepted criteria) were identified as elective procedures that are potentially low value. [1]

Audit indicators for cholecystectomy – asymptomatic stone and asymptomatic hernia repair were published separately in September 2022.

The document extends the Value-based surgical care – Defining key indicators report published in September 2022 and aligns with the Value-based surgery clinical practice guide published in December 2022.

Process and outcome audit indicators are provided for hysterectomy, tonsillectomy (outside accepted criteria) and myringotomy with or without grommets (outside accepted criteria). Audit tools are provided for local use across local health districts (LHDs) and specialty health networks (SHNs) in NSW.

Scope

This document covers the process and outcome audit indicators for three elective procedures to promote value-based healthcare:

- hysterectomy
- tonsillectomy (outside accepted criteria)
- myringotomy with or with grommets (outside accepted criteria).[1]

Why and how to use the indicators

Promoting value-based care can improve the health system's overall efficiency, safety and health outcomes while maintaining or decreasing healthcare costs. [2] Low-value care is:

'…use of an intervention where evidence suggests it confers no or very little benefit to patients, or risk of harm exceeds likely benefit, or, more broadly, the added costs of the intervention do not provide proportional added benefits'. [3, 4]

Evidence suggests that audit and feedback is an effective strategy for identifying and reducing potential low-value care. [5, 6] Some of the reasons the procedures are consider potentially low-value care and should be monitored by healthcare systems are outlined in Table 1.[7]

The three procedures have also featured in the following Australian Atlas of Healthcare Variation series produced by the Australian Commission on Safety and Quality in Healthcare:

- Fourth Australian Atlas of Healthcare Variation, 2021
  - Tonsillectomy hospital admissions 17 years and under
  - Myringotomy hospital admissions 17 years and under
- Second Australian Atlas of Healthcare Variation, 2017
  - Hysterectomy hospitalisations 15 years and over Level 2
- First Australian Atlas of Healthcare Variation, 2015
  - Tonsillectomy hospital admissions 17 years and under Level 2
  - Myringotomy hospital admissions 17 years and under
  - Hysterectomy and endometrial ablation hospital admissions.[8]

Table 1: Reasons for the procedures might be considered potentially low-value care

Procedure	Why is it considered potentially low value?	Australian data
Hysterectomy	Hysterectomy may be considered low-value care when less invasive, uterine-preserving surgical procedures are not offered before surgery.[7] Studies show there is clinical variation among the approaches for hysterectomy, within jurisdictions and across surgical teams.[9] Abdominal hysterectomy is associated with the greatest variation in rates and costs between hospitals in Australia.[3] Minimally invasive approaches (vaginal and laparoscopic procedures) should be performed, whenever feasible.[10]	In 2008 the rate of hospitalisation for hysterectomy (including cancer diagnosis) in Australia was higher than many other Organisation for Economic Co-operation and Development (OECD) reporting countries. It was 1.3 times higher than New Zealand, and 1.5 times as high as the United Kingdom.[8] However, the rate decreased by 45% in NSW between 1981 and 2010-2012.[8]
Tonsillectomy (outside accepted criteria)	Tonsillectomy may be considered low-value care when performed outside of accepted indications (upper airway obstruction in children with obstructive sleep apnoea, frequent recurrent acute tonsillitis, peritonsillar abscess, suspected neoplasm, and uncommon indications with caveats).[7] It is not recommended for children with uncomplicated recurrent throat infections. Tonsillectomy is one of the most common paediatric surgeries and is associated with about 6% incidence of readmission within 30 days and considerable costs.[11]	Between 1993 and 2014, the rate of hospitalisation for tonsillectomy in those aged 17 years and under in Australia was higher than many other OECD reporting countries. It was 1.7 times higher than New Zealand, and 1.9 times as high as the United Kingdom.[12] Between 2012-13 and 2017-18, the rate of tonsillectomy hospitalisations increased by 3%.[12]

Procedure	Why is it considered potentially low value?	Australian data
Myringotomy with or without grommets (outside accepted criteria)	Myringotomy may be considered low-value care when performed in situations where watchful waiting or conservative management could effectively address the underlying condition. Myringotomy alone is ineffective in managing otitis media with effusion or acute otitis media and provides little benefit when performed without placing a middle ear ventilation tube into the tympanic membrane. Guidance recommends a three-month active observation period before intervention.[7] Otitis media in Indigenous children is characterised by earlier onset, higher frequency, greater severity, and greater persistence than in non-Indigenous children. [13] Reports suggest that some non-Indigenous children may be having myringotomy when they don't need it and that not all Aboriginal and Torres Strait Islander children who need it are receiving it.[14]	The number of hospitalisations across 314 local areas in 2017-2018 was 8.1 times higher in the area with the highest rate compared to that with the lowest rate. Although rates for Aboriginal and Torres Strait Islander children were 6% higher than the rate for other children, this is less than what would be expected if rates matched the prevalence of otitis media among Aboriginal and Torres Strait Islander children.[14]

Audit and feedback as a strategy promoting value-based care involves measuring and providing clinical performance data to healthcare providers over a specified period. It relates their performance to a comparator, such as professional standards or evidence-based targets, and provides a summary of this comparison to healthcare providers to improve patient care and outcomes.[15] Audit and feedback provide a standardised and evidence-based approach to measure the quality of healthcare intervention and encourages healthcare providers to take ownership of their performance.[16]

A Cochrane systematic review demonstrates a substantial evidence base (more than 140 randomised trials) and indicates that audit and feedback interventions can improve patient care. However, the effects are highly variable across clinical problems, settings and designs of interventions.[15] Evidence also suggests that highlighting clinical variation between actual and desired performance facilitates behaviour change in healthcare professionals and healthcare systems to address the gap.[7]

The audit indicators provided in the report can be used to:

- assist surgical and anaesthetic teams in making value-based clinical and operational decisions in surgical services
- provide direction and tools to monitor practice change.

The audit tools will capture the volume of value-based surgery based on the indications for surgery and postoperative outcomes. Further guidance on using audit and feedback is outlined in Appendix 5.

Methods

The indicators have been developed using a two-staged approach:

1. Targeted review of research evidence and Australian and international guidance
2. Feasibility testing to determine acceptability and practicality:
   - consensus-building using a modified e-Delphi process with expert panels to ensure acceptability
   - assessing if the indicators can be measured through established electronic data and record systems to ensure practicality.

A detailed overview of the methods is outlined in appendices 1, 2 and 3 for hysterectomy, tonsillectomy (outside accepted criteria) and myringotomy with or without grommets (outside accepted criteria), respectively.

Audit indicators

Table 2: Indicators for value-based hysterectomy that reached a consensus

Indicators for hysterectomy	Measure
Process	
Timely access to surgical care[7, 17]	Percentage of hysterectomy procedures performed within the time frame recommended for their clinical urgency/priority category Number of overdue patients on elective surgery waiting list for hysterectomy procedures
Outcome	
Adverse events and complications[18-21]	Percentage of patients undergoing hysterectomy who have adverse event or complications such as: • intra-operative visceral injury • bladder injury • ureter injury • urinary tract (bladder injury) • vascular injury • bowel injury • haematoma requiring intervention • haemorrhage requiring intervention • ileus requiring intervention • death.
Adverse events and complications[22]	Percentage of patients who underwent: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy.

Indicators for hysterectomy	Measure
	Other hysterectomy refers to robotic, other technically assisted, mixed method laparoscopic assisted vaginal hysterectomy for patients who experience a hospital-acquired complication.
Unplanned return to theatre[22]	Percentage of unplanned return to theatres postoperatively (e.g. for postoperative hemorrhage) in patients who underwent: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy (e.g. robotic, other technically assisted, mixed method laparoscopic assisted vaginal hysterectomy). Percentage of unplanned return to theatres postoperatively in patients not meeting accepted clinical indication for surgery who underwent: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy (e.g. robotic, other technically assisted, mixed method laparoscopic assisted vaginal hysterectomy).
Unplanned intensive care unit (ICU) admission[22, 23]	Percentage of unplanned ICU postoperatively (e.g. for postoperative hemorrhage, respiratory complications) in patients who underwent: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy (e.g. robotic, other technically assisted, mixed method laparoscopic assisted vaginal hysterectomy). Percentage of unplanned ICU postoperatively in patients not meeting accepted clinical indication for surgery who underwent: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy (e.g. robotic, other technically assisted, mixed method laparoscopic assisted vaginal hysterectomy).
30-day mortality[22, 23]	Rate of mortality at 30 days post operation in patients who underwent: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy (e.g. robotic, other technically assisted, mixed method laparoscopic assisted vaginal hysterectomy).

Table 3: Indicators for value-based tonsillectomy (outside of accepted criteria) that reached a consensus

Indicators for tonsillectomy	Measure
Outcome	
Unplanned readmission[24, 25]	Percentage of unplanned readmission to hospital post discharge in children undergoing tonsillectomy within 30 days of discharge Percentage of unplanned readmission to hospital post discharge in children who underwent tonsillectomy and were outside accepted criteria, within 30 days of discharge
Unplanned return to theatre[22]	Percentage of unplanned return to theatre postoperatively in children undergoing tonsillectomy (e.g. for postoperative haemorrhage)

Table 4: Indicators for value-based myringotomy with or without grommets (outside of accepted criteria) that reached a consensus

Indicator	Measure
Process	
Volume of myringotomy with or without grommet procedures[26-32]	Percentage of myringotomy with or without grommets performed in children for an accepted criterion: • persistent otitis media • otitis media effusion or otitis media effusion and hearing loss greater than 30 decibels and/or speech and language delay • children at risk of chronic suppurative otitis media with bilateral persistent otitis media with effusion and/or speech and language delay • acute otitis media at risk for chronic suppurative otitis media with hearing loss and/or speech and language difficulty • acute otitis media • recurrent otitis media • recurrent acute otitis media with unilateral or bilateral middle ear effusion • adenoid infection or nasal obstruction.
High-risk group, Indigenous origin[27, 28]	Percentage of children undergoing myringotomy with or without grommet procedures who identify as: • Aboriginal but not Torres Strait Islander origin • Torres Strait Islander but not Aboriginal origin • both Aboriginal and Torres Strait Islander origin • neither Aboriginal nor Torres Strait Islander origin.[5, 6]
Timely access to surgical care[7, 17]	Percentage of myringotomy with or without grommet procedures performed within the time frame recommended for their clinical urgency or priority category. Number of overdue patients on elective surgery waiting list for myringotomy with or without grommet procedures. Median and mean wait time for elective myringotomy with or without grommet procedures.
Hearing assessment[26, 27, 31, 33]	Percentage of children undergoing a myringotomy with or without grommet procedure who have had a hearing assessment, such as: • audiology assessment • hearing test by other (e.g. general practitioner, or ear, nose and throat specialist) • parent/caregiver report • tympanometry.

Indicator	Measure
Outcome	
Late complications[26, 31, 34]	Percentage of children who underwent myringotomy with or without grommet procedures who experienced late complications, such as: • refractory tube otorrhoea • tube blockage • dislocation of the tube into the middle ear cavity • persistent perforation of the tympanic membrane causing conductive hearing loss • myringosclerosis.
Length of stay[35]	Percentage of myringotomy with or without grommet procedures completed as day-stay cases
30-day mortality[22, 23]	Rate of mortality at 30 days post operation in children who underwent a myringotomy with or without grommet procedure

Limitations

The targeted review of research evidence and guidance was based on a simplified review method and may not be entirely exhaustive. The e-Delphi process also has some limitations. The expert panel selection depended on a convenience sample (recruited through the ACI Surgical Care Network) and their availability within the allocated time and at short notice. Although 40, 35 and 41 process and outcome indicators were proposed in round one of the e-Delphi for hysterectomy, tonsillectomy (outside accepted criteria) and myringotomy with or without grommets (outside accepted criteria), respectively, it is possible that important indicators have been overlooked as part of the process.

The indicators selected may also need to be adjusted and adapted to reflect the local context across NSW Health jurisdictions. Recruiting and retaining participants for the e-Delphi was also a limitation and impacted completion rates.

Appendix 1. Hysterectomy

Methods for peer-reviewed and grey literature

The indicators were developed following a targeted review of research evidence and grey literature, including Australian and international guidance, as outlined below. The full set of proposed indicators is outlined in Table 6.

Search strategy for peer-reviewed and grey literature for hysterectomy

Peer-reviewed literature

PubMed was searched on the 15 February 2023 using the following search terms: ((((((Abdominal[Title/Abstract]) OR (Vaginal[Title/Abstract])) OR (Laparoscopic assisted[Title/Abstract])) OR (Laparo-vaginal[Title/Abstract])) OR (Laparo*[Title/Abstract])) OR (Laparoscopic[Title/Abstract])) AND (Hysterectomy[MeSH Terms]) Filters: Randomized Controlled Trial, Systematic Review, from 2015-2023

Grey literature

Google was searched between 15 February 2023 and 21 February 2023 using the following search terms: “hysterectomy” and “minimally invasive” and “quality” or “surgical procedures”.

Table 5: Key guidelines for hysterectomy

Guideline and recommendation	Guideline
Less invasive, uterine-preserving surgical procedures should be offered before hysterectomy, if indicated. Should a hysterectomy be deemed necessary, minimally invasive approaches to hysterectomy should be performed, whenever feasible. Vaginal and laparoscopic procedures are considered “minimally invasive”.	Abdominal (open) hysterectomy, Safer Care Victoria, Australia[10] Hysterectomy (Committee Opinion) American College of Obstetricians and Gynaecologists[36]
Don’t offer hysterectomy to women with asymptomatic fibroids based on risk of malignancy.	Obstetrics and Gynaecology, Choosing Wisely Canada[37]
Don’t remove ovaries in premenopausal women at the time of hysterectomy without strong clinical indications.	Obstetrics and Gynaecology, Choosing Wisely Canada[37]
Don’t do any surgical intervention, including ablation, for abnormal uterine bleeding until medical management (including the progesterone intra-uterine system) has been offered and either declined or found unsuccessful.	Obstetrics and Gynaecology, Choosing Wisely Canada[37]
Hysterectomy should not be considered as a first-line treatment for hyperplasia without atypia as progesterone therapy induces histological and symptomatic remission in most women and avoids the morbidity associated with major surgery.	Royal College of Obstetricians and Gynaecologists (Recommendation 2), Choosing Wisely UK[38]

Table 6: Full list of proposed indicators for value-based hysterectomy

Indicator	Measure
Process	
Volume of hysterectomy[9, 18, 20, 21, 39, 40]	Total number of hysterectomy procedures performed: • total number of vaginal hysterectomies performed • total number of laparoscopic hysterectomies performed • total laparoscopic • subtotal laparoscopic • laparoscopically assisted vaginal hysterectomy • total number of abdominal hysterectomy procedures performed: • total • subtotal • total number of other hysterectomy procedures performed (e.g. robotic or other technically assisted).
Volume of converted procedures[9, 21]	Total number of vaginal hysterectomy procedures converted to abdominal hysterectomy Total number of laparoscopic hysterectomy procedures converted to abdominal hysterectomy Total number of other hysterectomy procedures converted to abdominal hysterectomy
Identification of potentially inappropriate referrals for surgery[7, 9, 18, 20, 39, 40]	Rate of hysterectomy procedures performed for patients not meeting the following accepted clinical indications: • fibroids causing abnormal uterine bleeding • heavy menstrual bleeding • endometriosis • prolapse • adenomyosis • dysmenorrhoea • dyspareunia • leiomyoma • adnexal mass • cervical dysplasia • malignancy. Frequency of admissions request for hysterectomy for patients not meeting accepted clinical indication that do not proceed to surgical intervention
Timely access to surgical care[7, 17]	Proportion of hysterectomy procedures performed within appropriate clinical urgency category Number of overdue patients on elective surgery waiting list for hysterectomy Median and mean wait time for elective hysterectomy

Indicator	Measure
Concurrent procedures[18, 21]	Frequency of concurrent: • prolapse procedure • incontinence procedure • adnexal procedure.
Team-based surgical care[7]	Number of potentially inappropriate referrals for which exemption to perform the procedure has been sought Number of referrals for hysterectomy that do not proceed to surgical intervention
Established communication pathways[7]	Proportion of potentially inappropriate referrals with documented communication back to referring physician
Patient co-morbidities[9, 18, 20, 41]	Proportion of patients scheduled for hysterectomy with: • diabetes • chronic obstructive pulmonary disease • hypertension.
Patient characteristics[9, 41]	Proportion of patients scheduled for hysterectomy assessed on the criteria of: • pre/post-menopausal • obesity (body mass index-BMI) • uterine size and descent • extra-uterine pathology • previous pelvic surgery • nulliparity.
Pre-operative (abnormal uterine bleeding)[39-41]	Proportion of patients undergoing hysterectomy for abnormal uterine bleeding who previously received alternative non-surgical approaches, such as: • oral hormone suppression of menstruation • levonorgestrel releasing intrauterine device. Proportion of patients undergoing hysterectomy for abnormal uterine bleeding who previously received alternative surgical approaches, such as endometrial ablation.
Peri-operative (shared decision making)[9, 40]	Proportion of patients consenting for hysterectomy who were informed about treatment options that included: • alternative treatment options • alternative surgical options • risk versus benefits of treatment options.
Intra-operative (operating time)[20, 21]	Length of operating time for patients undergoing: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy.

Indicator	Measure
Intra-operative (specialty of proceduralist)[42]	Proportion of specialist proceduralists who are: • obstetrics and gynaecology • general surgery • urology • other.
Intra-operative (grade of proceduralist)[42, 43]	Grade of surgeon or proceduralist performing the hysterectomy: • consultant • advanced surgical trainee • registrar • basic surgical trainee • surgeon • general practitioner • other.
Outcome	
Post-operative complications (short-term) [19, 21, 40]	Proportion of patients who underwent hysterectomy and developed the following short-term complications: • infection • haemorrhage or bleeding • genitourinary • blood transfusion • fistula • gastrointestinal • venous thromboembolism.
Post-operative complications (long-term) [9, 19, 20]	Proportion of patients who underwent hysterectomy and developed the following long-term complications dependant on approach of surgery: • urinary incontinence • pelvic organ prolapse • removal of ovaries • early menopause • pelvic floor dysfunction • sexual dysfunction.
Adverse events and complications[18-21]	Proportion of patients undergoing hysterectomy who have adverse event or complications, such as: • intra-operative visceral injury • bladder injury • ureter injury • urinary tract (bladder injury) • vascular injury • sequelae of bleeding

Indicator	Measure
	• transfusion • pelvic haematoma.
Adverse events and complications[22]	Proportion of patients undergoing hysterectomy who are identified with a hospital-associated complication, following a: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy.
Average length of stay[35]	Mean length of stay for an acute episode of care in patients undergoing these hysterectomy procedures: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy. Proportion of hysterectomy procedures completed as day-stay cases: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy. Proportion of hysterectomy procedures completed as overnight admissions: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy.
Unplanned readmission[25]	Rate of unplanned readmission to hospital (e.g. presentation to emergency department) within 30 days of discharge in patients who underwent: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy. Rate of unplanned readmission to hospital within 30 days of discharge in patients not meeting accepted clinical indication who underwent: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy.
Unplanned return to theatre[22]	Rate of unplanned return to theatre postoperatively (e.g. for postoperative hemorrhage) in patients undergoing: • vaginal hysterectomy

Indicator	Measure
	• laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy. Rate of unplanned return to theatre postoperatively in patients not meeting accepted clinical indication, undergoing: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy.
Unplanned ICU admission[22, 23]	Rate of unplanned ICU admission postoperatively (e.g. for postoperative hemorrhage, respiratory complications) in patients undergoing: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy. Rate of unplanned ICU admission postoperatively in patients not meeting accepted clinical indication undergoing: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy.
30-day mortality[22]	Rate of mortality at 30-days postoperatively in patients undergoing: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy. Rate of mortality at 30 days postoperatively in patients not meeting accepted clinical indication undergoing: • vaginal hysterectomy • laparoscopic hysterectomy • abdominal hysterectomy • other hysterectomy.
Patient reported experience measures (PREM) and patient reported outcome measure (PROM)	Survey results and action arising from point-of-care data capture and use of PROM and PREM via the Health Outcomes and Patient Experience platform (HOPE)

Feasibility testing

Acceptability

A two-round modified e-Delphi technique was conducted between 17 April and 12 June 2023 to reach a consensus (75%) on the indicators with 11 panel members recruited through the ACI Surgical Care Network.

Practicality

Many of the proposed process and outcome indicators measures used routinely collected health data stored in clinical and administrative data sets such as the Health Information Exchange (HIE) and the Enterprise Data Warehouse for analysis, reporting and decision support (EDWARD). These data assets can be typically accessed by LHD business intelligence and analytics units, and through the NSW Ministry of Health Activity Based Management portal.

Clinical decision making and patient preferences cannot be identified from routinely collected data; this unstructured data may form part of the narrative of the patient electronic medical record.

This three-step viability assessment was completed on the indicators that reached a consensus.

- Identification and definition of the data attributes of each indicator (e.g. cohort, numerator, denominator, etc.)
- Assessment of the availability of data attributes against sources of routinely collected health data stored in clinical and administrative data sets, and the potential extraction method (e.g. electronic data extraction from the HIE)
- Assessment of the availability of data attributes against the unstructured healthcare data, and the potential extraction method (e.g. clinical audit).

Appendix 2. Tonsillectomy (outside accepted criteria)

Methods for peer-reviewed and grey literature

The indicators were developed following a targeted review of research evidence and grey literature, including Australian and international guidance, as outlined below. The full set of proposed indicators is outlined in Table 8.

Search strategy for peer-reviewed and grey literature for tonsillectomy (outside accepted criteria)

Peer-reviewed literature

PubMed was searched on the 10 November 2022 using the following search terms (adapted from Mitchell et al., 2019).

("Tonsillitis"[MeSH] OR "Palatine Tonsil"[MeSH] OR tonsil OR adenotonsil) AND ("Surgical Procedures, Operative"[Mesh] OR surg*[tiab] OR excis*[tiab] OR extract*[tiab] OR remov*[tiab]))) OR (tonsillectom* OR tonsillectomy *or adenotonsillectom* OR adenotonsilectom* OR tonsillotom* OR tonsilotom*)) OR (tonsillectom* OR tonsilectom*OR adenotonsillectom* OR adenotonsilectom* OR tonsillotom* OR tonsilotom*)) OR (("Tonsillectomy"[Mesh]) OR "Palatine Tonsil/surgery"[Mesh]) AND ("Clinical Guideline" OR "guide*") Filters: English, from 1 January 2019 to 10 November 2022

Grey literature

Google was searched between 7 December 2022 and 9 February 2023 using the following search terms: “tonsillectomy” and “children” and “guidelines” or “surgical procedures”.

Table 7: Key guidelines for tonsillectomy

Guideline and recommendation	Guideline
Do not perform tonsillectomy for children with uncomplicated recurrent throat infections if there have been fewer than seven episodes in the past year, five episodes in each of the past two years, or three episodes in each of the last three years.	A joint position paper of the Paediatrics and Child Health Division of The Royal Australasian College of Physicians and The Australian Society of Otolaryngology, Head and Neck Surgery, [44] Choosing Wisely Canada, [45, 46] Quality indicators for the diagnosis and management of paediatric tonsillitis, Canada[47]
Do not administer perioperative antibiotics for elective tonsillectomy in children unless specific indications are present (e.g. cardiac conditions or those with a peritonsillar abscess or acute infection).	Choosing Wisely Canada[45, 46] Quality indicators for the diagnosis and management of paediatric tonsillitis, Canada[47]

Guideline and recommendation	Guideline
Do not prescribe codeine for post-tonsillectomy or adenoidectomy pain relief in children.	American Academy of Otolaryngology − Head and Neck Surgery Choosing Wisely, Canada[48]
Clinicians may recommend tonsillectomy for recurrent throat infection if appropriate criteria are met.	Quality indicators for the diagnosis and management of paediatric tonsillitis, Canada[47] A joint position paper of the Paediatrics and Child Health Division of The Royal Australasian College of Physicians and The Australian Society of Otolaryngology, Head and Neck Surgery[44]
Tonsillectomy is not recommended solely to reduce the frequency of Group A streptococcal pharyngitis (GAS).	Quality indicators for the diagnosis and management of paediatric tonsillitis, Canada[47]
Clinicians should assess the child with recurrent throat infection who does not meet appropriate tonsillectomy criteria for modifying factors that may nonetheless favour tonsillectomy. This may include but is not limited to multiple antibiotic allergies/intolerance, periodic fever, aphthous stomatitis, pharyngitis and adenitis (PFAPA) syndrome or history of peritonsillar abscess.	Quality indicators for the diagnosis and management of paediatric tonsillitis, Canada[47]
Clinicians should advocate for pain management after tonsillectomy and educate caregivers about the importance of managing and reassessing pain.	Quality indicators for the diagnosis and management of paediatric tonsillitis, Canada[47]
Clinicians should arrange for overnight inpatient monitoring of children after tonsillectomy if they are less than three years old or have severe obstructive sleep apnoea (OSA).	Quality indicators for the diagnosis and management of paediatric tonsillitis, Canada[47]
Clinicians should recommend ibuprofen or acetaminophen or both for pain control after tonsillectomy.	Quality indicators for the diagnosis and management of paediatric tonsillitis, Canada[47]
Clinicians who perform tonsillectomy should determine their rate of primary and secondary post-tonsillectomy haemorrhage at least annually.	Quality indicators for the diagnosis and management of paediatric tonsillitis, Canada[47]

Table 8: Full list of proposed indicators for value-based tonsillectomy (outside of accepted criteria)

Indicator	Measure
Process	
Volume of tonsillectomy	Total number of tonsillectomies performed in children for an accepted criterion: • recurrent throat infections[45-49] • frequent recurrent acute tonsilitis • upper airway obstruction in children with obstructive sleep apnoea • obstructive sleep apnoea[44, 47, 48] • obstructive sleep disordered breathing[48-52] • tonsillar hypertrophy[48] • periodic fever, aphthous stomatitis, pharyngitis and cervical adenitis (PFAPA)[48, 50, 51] • malignancy of tonsils[44, 47, 49, 53] • chronic tonsilitis[50] • halitosis secondary to chronic tonsilitis[48] • peritonsillar abscess complication of tonsilitis[44, 48, 54] • other (specify).
Identification of potentially inappropriate referrals for surgery	Rate of tonsillectomy for patients meeting accepted criteria[7, 47] Frequency of requests for admission for tonsillectomy for patients outside accepted criteria that do not proceed to surgical intervention[7, 47]
Shared decision making	Proportion of tonsillectomy that were informed by a shared decision-making process[47, 48]
Timely access to surgical care	Proportion of tonsillectomy performed within appropriate clinical urgency category[7] Number of overdue patients on elective surgery waiting list for tonsillectomy[7] Median and mean wait time for elective tonsillectomy[7]
Appropriate approach for tonsillectomy	Frequency of: • total or extra-capsular tonsillectomy[48, 49, 54] • partial intra-capsular tonsillectomy or tonsillotomy [48, 49, 54, 55] • adenotonsillectomy.[48]
Team-based surgical care	Number of potentially inappropriate referrals (i.e. tonsillectomy accepted criteria) for which exemption to perform the procedure has been sought[7,47, 48] Number of referrals for tonsillectomy that do not proceed to surgical intervention[7, 47]

Indicator	Measure
Established communication pathways	Proportion of potentially inappropriate referrals with documented communication back to referring physician[7, 47, 48]
Preoperative education	Proportion of patients scheduled for tonsillectomy receiving education on postoperative pain management[47, 48, 56, 57]
Perioperative	Proportion of patients undergoing tonsillectomy who received perioperative antibiotics[47-49, 52, 56-58]
Intra-operative management	Proportion of patients undergoing tonsillectomy that received a single intraoperative dose of intravenous dexamethasone[47-49, 52, 56, 57]
Postoperative management	Proportion of patients who underwent tonsillectomy meeting appropriate risk criteria who received overnight inpatient monitoring[44, 47, 48]
Postoperative management	Proportion of patients less than 12 years of age who underwent tonsillectomy and received codeine for pain relief[45, 47, 48, 59]
Outcome	
Adverse events and complications	Proportion of patients undergoing tonsillectomy who had primary and/or secondary post-tonsillectomy haemorrhage[47-49, 60]
Adverse events and complications	Proportion of patients meeting appropriate criteria undergoing tonsillectomy who experienced a hospital acquired complication[22, 48]
Average length of stay	Mean length of stay for acute episode of care in patients undergoing tonsillectomy[35] Mean length of stay for acute episode of care in patients meeting accepted criteria undergoing tonsillectomy[35] Proportion of tonsillectomy completed as day-stay cases[35] Proportion of tonsillectomy meeting accepted criteria completed as day-stay cases[35] Proportion of tonsillectomy for obstructive sleep apnoea completed as overnight-stay cases[35]
Unplanned readmission	Rate of unplanned readmission to hospital post discharge in patients undergoing tonsillectomy (e.g. presentation to emergency department within 30 days of discharge)[24, 25] Rate of unplanned readmission to hospital post discharge in patients who underwent tonsillectomy and were outside accepted criteria[25]
Unplanned return to theatre	Rate of unplanned return to theatre postoperatively in patients undergoing tonsillectomy (e.g postoperative hemorrhage) [22] Rate of unplanned return to theatre postoperatively in patients undergoing tonsillectomy outside of accepted criteria[22]

Indicator	Measure
Unplanned ICU	Rate of unplanned ICU postoperatively in patients undergoing tonsillectomy (e.g. for postoperative hemorrhage, respiratory complications) [22, 23] Rate of unplanned ICU postoperatively in patients undergoing tonsillectomy outside of accepted criteria[22, 23]
30-day mortality	Rate of mortality at 30 days postoperatively in patients undergoing tonsillectomy[22] Rate of mortality at 30 days postoperatively in patients undergoing tonsillectomy outside accepted criteria[22]
Patient reported experience measures (PREM) and patient reported outcome measure (PROM)	Survey results and action arising from point-of-care data capture and use of PROM and PREM via the Health Outcomes and Patient Experience Platform (HOPE)

Feasibility testing

Acceptability

A two-round modified e-Delphi technique was conducted between 17 April and 12 June 2023 to reach a consensus (75%) on the indicators with six panel members recruited through the ACI Surgical Care Network.

Practicality

Many of the proposed process and outcome indicator measures used routinely collected health data stored in clinical and administrative data sets such as the Health Information Exchange (HIE) and the Enterprise Data Warehouse for analysis, reporting and decision support (EDWARD). These data assets can be typically accessed by LHD business intelligence and analytics units, and through the NSW Ministry of Health Activity Based Management portal.

Clinical decision making and patient preferences cannot be identified from routine collected data; this unstructured data may form part of the narrative of the patient electronic medical record.

This three-step viability assessment was completed on the indicators that reached a consensus.

- Identification and definition of the data attributes of each indicator (e.g. cohort, numerator, denominator, etc.)
- Assessment of the availability of data attributes against sources of routinely collected health data stored in clinical and administrative data sets, and the potential extraction method (e.g. electronic data extraction from the HIE)
- Assessment of the availability of data attributes against the unstructured healthcare data, and the potential extraction method (e.g. clinical audit).

Appendix 3. Myringotomy/grommets (outside accepted criteria)

Methods for peer-reviewed and grey literature

The indicators were developed following a targeted review of research evidence and grey literature, including Australian and international guidance, as outlined below. The full set of proposed indicators is outlined in Table 10.

Search strategy for peer-reviewed and grey literature for tonsillectomy (outside accepted criteria)

Peer-review literature

PubMed was searched on 1 March 2023 using the following search terms.

((((((((("Otitis Media with Effusion"[Mesh]) OR ("Ear, Middle/secretion"[Mesh])) OR ((glue [tiab] AND ear [tiab]) OR (otitis [tiab] AND media [tiab]) OR (middle [tiab] AND ear [tiab] AND effusion* [tiab]) OR (otitis [tiab] AND effusion* [tiab]) OR (nonsuppurative [tiab] AND otitis [tiab]) OR (non [tiab] AND suppurative [tiab] AND otitis [tiab]))) OR (tympanitis [tiab] OR (serous [tiab] AND otitis [tiab]) OR (secretory [tiab] AND otitis [tiab]))) OR ((mucoid* [tiab] AND otitis [tiab]) OR (mucous [tiab] AND otitis [tiab]) OR (seromuco* [tiab] AND otitis [tiab]) OR (sero [tiab] AND muco* [tiab] AND otitis [tiab]) OR (otitis [tiab] AND serosa [tiab]))) OR ((mucoid* [tiab] AND otitis [tiab]) OR (mucous [tiab] AND otitis [tiab]) OR (seromuco* [tiab] AND otitis [tiab]) OR (sero [tiab] AND muco* [tiab] AND otitis [tiab]) OR (otitis [tiab] AND serosa [tiab]))) OR ((mucoid* [tiab] AND middle [tiab] AND ear* [tiab]) OR (mucous [tiab] AND middle [tiab] AND ear* [tiab]) OR (seromuc* [tiab] AND middle [tiab] AND ear* [tiab]))) OR ((adhesive [tiab] AND otitis [tiab]) OR (exudative [tiab] AND otitis [tiab]))) OR ((OME [tiab] OR SOM [tiab]) AND (otitis [tiab] OR ear* [tiab]))) AND ((((("Middle Ear Ventilation"[Mesh]) OR (grommet* [tiab] OR tubulation [tiab] OR (middle AND ear [tiab] AND ventilat* [tiab]))) OR ((ventilat* [tiab] OR tympanostomy [tiab] OR (middle [tiab] AND (ear [tiab] OR tympanic [tiab])) AND tube* [tiab]))) OR (ear* [tiab] AND insert* [tiab] AND tube* [tiab]))) AND (("2010/03/22"[Date - Publication] : "3000"[Date - Publication])) Filters: Randomized Controlled Trial, Systematic Review

Grey literature

Google was searched between 2 March 2023 and 13 March 2023 using the following search terms: “myringotomy”, “grommets” and “children” and “guidelines” or “surgical procedures”.

Table 9: Key guidelines for myringotomy with or without grommets

Guideline and recommendation	Guideline
Do not perform myringotomy alone as treatment for middle ear disease. Myringotomy alone is ineffective in managing otitis media with effusion or acute otitis media.	Myringotomy for middle ear disease in children or adults, Safer Care Victoria[61]
Myringotomy provides little benefit when performed without placing a middle ear ventilation tube into the tympanic membrane.	Myringotomy for middle ear disease in children or adults, Safer Care Victoria[61]
There should be an “active observation” period of middle ear disease for a period of three months before considering intervention.	Myringotomy for middle ear disease in children or adults, Safer Care Victoria[61] Clinical practice guideline: Tympanostomy tubes in children, American Academy of Otolaryngology–Head and Neck Surgery[26]
Persistent bilateral middle ear disease (longer than three months) should indicate the need for a hearing assessment.	Myringotomy for middle ear disease in children or adults, Safer Care Victoria[61] Clinical practice guideline: Tympanostomy tubes in children, American Academy of Otolaryngology–Head and Neck Surgery[26]
Any child referred to an ear, nose and throat specialist should be concurrently referred for a hearing assessment, to minimise consecutive waiting times.	Otitis media: Guidelines for Australian Aboriginal and Torres Strait Islander children: Australian Guidelines, Menzies School of Health Research[27, 28]
Don’t place tympanostomy tubes in most children for a single episode of uncomplicated otitis media with effusion of less than three months duration.	Otolaryngology, Choosing Wisely Canada[45] Myringotomy for middle ear disease in children or adults, Safer Care Victoria[61]
Don’t routinely prescribe intranasal/systemic steroids, antihistamines or decongestants for children with uncomplicated otitis media with effusion.	Otolaryngology, Choosing Wisely Canada[45]

Table 10: Proposed indicators for value-based myringotomy with or without grommets (outside of accepted criteria)

Indicator	Measure
Process	
Volume of myringotomies with or without grommets	Total number of myringotomies with or without grommets performed in children for an accepted criterion: • persistent otitis media[13, 26, 28] • otitis media effusion or otitis media effusion and hearing loss greater than 30 decibels and/or speech and language delay[27, 28] • children at risk of chronic suppurative otitis media with bilateral persistent otitis media with effusion and/or speech and language delay[27] • acute otitis media at risk for chronic suppurative otitis media with hearing loss and/or speech and language difficulty[26-28] • acute otitis media[26-29, 61] • recurrent otitis media [26-29, 61] • recurrent acute otitis media with unilateral or bilateral middle ear effusion[26, 31] • adenoid infection or nasal obstruction.[26, 31, 32]
Identification of potentially inappropriate referrals for surgery	Proportion of myringotomy with or without grommets for patients outside accepted criteria[7] Frequency of requests for admission for myringotomy with or without grommets for patients outside accepted criteria that do not proceed to surgical intervention[1]
High-risk group (Indigenous status)	Proportion of myringotomy with or without grommets that were done for patients who identify as: • Aboriginal but not Torres Strait Islander origin • Torres Strait Islander but not Aboriginal origin • both Aboriginal and Torres Strait Islander origin • neither Aboriginal nor Torres Strait Islander origin.[27, 28]
High-risk group (developmental difficulties)	Proportion of myringotomy with or without grommets that were done for patients with: • intellectual disability • learning disorder • attention-deficit hyperactivity disorder • autism spectrum disorder • syndromes (e.g. Down) or craniofacial disorders that include cognitive, speech or language delays • developmental delay.[26]

Indicator	Measure
Shared-decision making	Proportion of parents/caregivers consenting for myringotomy with or without grommets following a shared decision-making process that included discussion: • of treatment options (including non-surgical options and watch and wait) • about benefits and risks of treatment options • about values and preferences. Proportion of cases where patient decision aids were used as part of the shared decision-making process[31]
Timely access to surgical care	Proportion of myringotomy with or without grommets performed within the time frame recommended for their clinical urgency/priority category[7] Number of overdue patients on elective surgery waiting list for myringotomy with or without grommets[7] Median and mean wait time for elective myringotomy with or without grommets[7]
Surgical approach for myringotomy with or without grommets	Frequency of: • myringotomy • tympanoplasty tube (grommet) insertion • adenoidectomy and tympanoplasty • adenoidectomy and tonsillectomy • combination (e.g. myringotomy insertion and/or insertion of grommets and/or adenoidectomy and/or tonsillectomy) • insertion of short-staying grommets • insertion of long-staying grommets.[26, 32, 34, 62]
Team-based surgical care	Number of potentially inappropriate referrals (i.e. myringotomy with or without grommets, outside accepted criteria) for which exemption to perform the procedure has been sought[1] Number of referrals for myringotomy with or without grommets, outside accepted criteria that do not proceed to surgical intervention[7, 26]
Established communication pathways	Proportion of potentially inappropriate referrals with documented communication back to referring physician[7, 26]
Vaccination status	Proportion of patients scheduled for myringotomy with or without grommets receiving the pneumococcal vaccine[26, 48]
Hearing assessment	Proportion of patients scheduled for myringotomy with or without grommets with a hearing assessment, such as: • audiology assessment • hearing test by other (e.g. general practitioner or ear, nose and throat specialist) • parent/caregiver report.[26-28, 31]

Indicator	Measure
Preoperative management	Proportion of patients undergoing myringotomy with or without grommets who had a history of: • antibiotic treatment • antibiotic and steroids • antihistamines with oral decongestants • auto-inflation • watchful waiting.[26]
Preoperative education	Proportion of patients scheduled for myringotomy with or without grommets receiving education on: • expected duration of grommet function • care of the child with grommets • recommended follow-up schedule • detection of complications.[26-28, 61]
Outcome	
Postoperative management	Proportion of patients undergoing myringotomy with or without grommets who had a delay in discharge due to: • pain • fever • signs of infection • late sequelae of anaesthesia.[26]
Postoperative management (pain relief)	Proportion of patients who underwent myringotomy with or without grommets who received: • paracetamol • ibuprofen • other pain relief.[26, 31]
Postoperative management	Proportion of patients who underwent myringotomy with or without grommets who had late complications, such as: • refractory tube otorrhoea • tube blockage • dislocation of the tube into the middle ear cavity • persistent perforation of the tympanic membrane causing conductive hearing loss • myringosclerosis.[26, 31, 34]
Postoperative appointment	Proportion of patients who underwent myringotomy with or without grommets who received follow-up appointments[26]
Adverse events and complications (when in combination with tonsillectomy and/or adenoidectomy)	Proportion of patients undergoing myringotomy with or without grommets with tonsillectomy and/or adenoidectomy that have: • haemorrhage • infection.[22, 26, 44]

Indicator	Measure
Adverse events and complications	Proportion of patients meeting appropriate criteria undergoing myringotomy with or without grommets who experience a hospital acquired complication[22]
Average length of stay	Mean length of stay for acute episode of care in patients undergoing myringotomy with or without grommets[35] Mean length of stay for acute episode of care in patients meeting accepted criteria undergoing myringotomy with or without grommets[35] Proportion of myringotomy with or without grommets completed as day-stay cases[35] Proportion of myringotomy with or without grommets meeting accepted criteria completed as day-stay cases[35]
Unplanned emergency department (ED) presentation	Rate of unplanned ED presentation to hospital post discharge in patients undergoing myringotomy with or without grommets within 30 days of discharge[25] Rate of unplanned ED presentation to hospital post discharge in patients who underwent myringotomy with or without grommets and were outside accepted criteria within 30 days of discharge[25]
Unplanned readmission	Rate of unplanned readmission to hospital post discharge in patients undergoing myringotomy with or without grommets within 30 days of discharge[25] Rate of unplanned readmission to hospital post discharge in patients who underwent myringotomy with or without grommets and were outside accepted criteria within 30 days of discharge[25]
Unplanned ICU	Rate of unplanned ICU postoperatively in patients undergoing myringotomy/grommets (e.g. for postoperative haemorrhage, respiratory complications)[22, 23] Rate of unplanned ICU postoperatively in patients undergoing myringotomy/grommets outside of accepted criteria[22, 23]
30-day mortality	Rate of mortality at 30 days postoperatively in patients undergoing myringotomy with or without grommets[22, 23] Rate of mortality at 30 days postoperatively in patients undergoing myringotomy with or without grommets outside accepted criteria[22, 23]
Patient reported experience measures (PREM) and patient reported outcome measure (PROM)	Survey results and action arising from point-of-care data capture and use of PROM and PREM via the Health Outcomes and Patient Experience Platform (HOPE)

Feasibility testing

Acceptability

A two-round modified e-Delphi technique was conducted between 17 April and 14 June 2023 to reach a consensus (75%) on the indicators with five panel members recruited through the ACI Surgical Care Network.

Practicality

Many of the proposed process and outcome indicators measures used routinely collected health data stored in clinical and administrative data sets such as Health Information Exchange (HIE) and the Enterprise Data Warehouse for analysis, reporting and decision support (EDWARD). These data assets can be typically accessed by LHD business intelligence and analytics units, and through the NSW Ministry of Health Activity Based Management portal.

Clinical decision making and patient preferences cannot be identified from routine collected data; this unstructured data may form part of the narrative of the patient electronic medical record.

This three-step viability assessment was completed on the indicators that reached a consensus.

- Identification and definition of the data attributes of each indicator (e.g. cohort, numerator, denominator, etc)
- Assessment of the availability of data attributes against sources of routinely collected health data stored in clinical and administrative data sets, and the potential extraction method (e.g. electronic data extraction from the HIE)
- Assessment of the availability of data attributes against the unstructured healthcare data, and the potential extraction method (e.g. clinical audit).

Appendix 4. Sample audit tools

The following audit tools can be used to collect and collate patient level information obtained from medical record documentation and from electronic systems (e.g. Health Information Exchange, Activity Based Management portal), to assist surgical and anaesthetic teams in making value-based clinical and operational decisions in surgical services and to provide direction and tools to monitor practice change over time.

Table 11: Audit tool for hysterectomy

Hysterectomy		Data source
1.	What was the admission date? [dd/mm/yyyy]	Medical record Electronic systems
2.	What was the discharge date? [dd/mm/yyyy]	Medical record Electronic systems
3.	What was the patient's age on admission?	Medical record Electronic systems
4.	What was the clinical urgency category documented on the recommendation for admission (RFA)? • Category 1 – urgent (30 days) • Category 2 – semi-urgent (90 days) • Category 3 – non-urgent (365 days) • none documented	RFA form
5.	What date was the RFA completed? [dd/mm/yyyy]	RFA form
6.	What was the indication for surgery? • Symptomatic uterine leiomyoma • Abnormal uterine bleeding • Endometriosis • Prolapse • Heavy menstrual bleeding not responding to medical treatment or endometrial ablation • Adenomyosis • Adnexal mass • Cervical dysplasia • Large uterus due to fibroids • Adhesions • Other (specify)	RFA form Pre-admission clinic notes Correspondence from general practitioner Admission notes
7.	What date was the procedure performed? [dd/mm/yyyy]	Operation report

Hysterectomy		Data source
8.	What was the approach used for hysterectomy? • Vaginal hysterectomy • Laparoscopic hysterectomy • Abdominal hysterectomy • Other hysterectomy procedures (e.g. robotic, other technically assisted, mixed method laparoscopic assisted vaginal hysterectomy) (specify)	Operation report
9.	Was the initial surgical approach converted to an abdominal hysterectomy? • Yes • No	Operation report
10.	Were any of the following concurrent procedures performed? • Prolapse procedure • Incontinence procedure • Adnexal procedure • Other concurrent procedure (specify) • No other concurrent procedures •	Operation report
11.	Did the patient experience any of the following adverse event or complications? • Intra-operative visceral injury (e.g. bladder injury, ureter injury, urinary tract injury) • Vascular injury • Bowel injury • Haematoma requiring intervention • Haemorrhage requiring intervention • Ileus requiring intervention • Death • Other (specify)	Medical record Operation report
12.	Were there any postoperative or other hospital acquired complications (select all that apply)? • Hospital acquired pressure injury • Fall-related injury • Healthcare associated infections • Hospital acquired respiratory complications • Hospital acquired venous thromboembolism • Hospital acquired renal failure • Hospital acquired gastrointestinal bleeding • Hospital acquired medication complications • Hospital acquired delirium • Hospital acquired incontinence • Hospital acquired endocrine complications • Hospital acquired cardiac complications	Medical record Electronic systems

Hysterectomy		Data source
	• Other postoperative complications (specify) • No documented postoperative or hospital acquired complications	
13.	Was there an unplanned return to theatre postoperatively? • Yes • No	Medical record Operation report
14.	What was the reason for the return to theatre?	Medical record Operation report
15.	Was the patient admitted to the intensive care unit (ICU) for care? • Yes • No	Medical record
16.	Was this an unplanned admission to ICU postoperatively? • Yes • No	Medical record
17.	What was the reason for the ICU admission?	Medical record
18.	Did the patient die within 30 days of surgery? • Yes • No	Medical record
19.	Patient reported experience measures (PREM) and patient reported outcome measure (PROM)	Survey results and action arising from point of care data capture and use of PROM and PREM via the HOPE platform

Table 12: Audit tool for tonsillectomy

Tonsillectomy		Data source
1.	What was the admission date? [dd/mm/yyyy]	Medical record Electronic systems
2.	What was the discharge date? [dd/mm/yyyy]	Medical record Electronic systems
3.	What was the child's age on admission?	Medical record Electronic systems
4.	What is the child's sex? • Male • Female	Medical record Electronic systems
5.	What was the clinical urgency category documented on the recommendation for admission (RFA) form? • Category 1 – urgent (30 days) • Category 2 – semi-urgent (90 days) • Category 3 – non-urgent (365 days) • none documented	RFA form
6.	What date was the RFA completed? [dd/mm/yyyy]	RFA form
7.	What was the indication for surgery? • Recurrent throat infections • Frequent recurrent acute tonsilitis • Upper airway obstruction in children with obstructive sleep apnoea • Obstructive sleep apnoea • Obstructive sleep disordered breathing • Tonsillar hypertrophy • Periodic fever, aphthous stomatitis, pharyngitis and cervical adenitis (PFAPA) syndrome • Malignancy of tonsils • Chronic tonsilitis • Halitosis secondary to chronic tonsilitis • Peritonsillar abscess-complication of tonsilitis • Other (specify)	RFA form Pre-admission clinic notes Correspondence from general practitioner Admission notes
8.	What date was the procedure performed? [dd/mm/yyyy]	Operation report
9.	What was the approach used for tonsillectomy?	Operation report

Tonsillectomy		Data source
	• Total or extra-capsular • Partial intra-capsular tonsillectomy or tonsillotomy • Adenotonsillectomy • Other (specify)	
10.	Was there an unplanned return to theatre post-operatively? • Yes • No	Medical record Operation report
11.	What was the reason for the return to theatre? • Postoperative haemorrhage • Other (specify)	Medical record Operation report
12.	Was there an unplanned readmission to the same hospital/ hospital in same LHD within 30 days of discharge? • Yes • No	Medical record Electronic systems
13.	What was the reason for the readmission? • Postoperative haemorrhage • Other (specify)	Medical record
14.	Patient reported experience measures (PREM) and patient reported outcome measure (PROM)	Survey results and action arising from point-of-care data capture and use of PROM and PREM via the HOPE platform

Table 13: Audit tool for myringotomy with or without grommets

Myringotomy		Data source
1.	What was the admission date? [dd/mm/yyyy]	Medical record Electronic systems
2.	What was the discharge date? [dd/mm/yyyy]	Medical record Electronic systems
3.	What was the child's age on admission?	Medical record Electronic systems
4.	What is the child's sex? • Male • Female	Medical record Electronic systems
5.	What is the child's indigenous status? • Aboriginal but not Torres Strait islander origin • Torres Strait Islander but not Aboriginal origin • Both Aboriginal and Torres Strait Islander origin • Neither Aboriginal nor Torres Strait Islander origin	Medical record
6.	What was the clinical urgency category documented on the Recommendation for Admission (RFA) form? • Category 1 – urgent (30 days) • Category 2 – semi-urgent (90 days) • Category 3 – non-urgent (365 days) • None documented	RFA form
7.	What date was the RFA completed? [dd/mm/yyyy]	RFA form
8.	What was the indication for surgery? • Persistent otitis media • Otitis media effusion and hearing loss greater than 30 decibels and/or speech and language delay • Children at risk of chronic suppurative otitis media with bilateral persistent otitis media with effusion and/or speech and language delay • Acute otitis media at risk for chronic suppurative otitis media with hearing loss and/or speech and language difficulty • Acute otitis media • Recurrent otitis media • Recurrent otitis media with unilateral or bilateral middle ear effusion • Adenoid infection or nasal obstruction • Other (specify)	RFA form Pre-admission clinic notes Correspondence from general practitioner Admission notes

Myringotomy		Data source
9.	What date was the procedure performed? [dd/mm/yyyy]	Operation report
10.	What procedures were performed? • Myringotomy • Insertion of grommet or grommets • Adenoidectomy • Tonsillectomy • Other (specify)	Operation report
11.	Did the child have a hearing assessment preoperatively? • Yes • No • None documented	RFA form Pre-admission clinic notes Correspondence from general practitioner Admission notes
12.	If a hearing assessment was documented, was it: • An audiology assessment • A hearing test by another health professional (specify) • A parent or carer report • Other (please specify)	RFA form Pre-admission clinic notes Correspondence from general practitioner Admission notes
13.	Did the hearing assessment report hearing loss? • Yes • No • Not documented	RFA form Pre-admission clinic notes Correspondence from general practitioner Admission notes
14.	Did the child experience any of the following late complications? • Refractory tube otorrhoea • Tube blockage • Dislocation of the tube into the middle ear cavity • Persistent perforation of the tympanic membrane causing conductive hearing loss • Myringosclerosis	Medical record
15.	Did the child die within 30 days of surgery? • Yes • No	Medical record Electronic systems
16.	Patient reported experience measures (PREM) and patient reported outcome measure (PROM)	Survey results and action arising from point of care data capture and use of PROM and PREM via the HOPE platform

Appendix 5. Audit and feedback interventions

What is audit and feedback?

Audit and feedback interventions involve defining standards in a particular area of clinical care, measuring performance against those standards over a specified period and providing that performance information back to clinicians. Two groups of measures can be used to evaluate the quality and effectiveness of healthcare: process and outcome clinical indicators.

Process clinical indicators measure the performance of specific healthcare activities that are intended to improve patient care. These indicators focus on evaluating the adherence to established guidelines, recommendations, protocols and/or best practices. Process indicators help clinicians assess whether they are delivering care in a consistent and standardised manner. Examples include the percentage of patients who receive appropriate vaccinations, the rate of timely access to surgery, or compliance with venous thromboembolic prophylaxis protocols.

Outcome clinical indicators assess the results or consequences of healthcare interventions or treatments on the patient's health status. These indicators focus on measuring outcomes of care such as patient experience, mortality rates or complication rates. They provide insight into the effectiveness and impact of interventions and help identify areas for improvement.

Does audit and feedback work?

A Cochrane systematic review included more than 140 randomised trials and found that audit and feedback interventions, on average, lead to improvements in patient care. However, the effects are highly variable across clinical problems, settings and designs of interventions. [15]

Evidence also suggests that highlighting clinical variation between actual and desired performance facilitates behaviour change in healthcare professionals and healthcare systems to address the gap. [63]

What is current best practice? [64, 65]

How to conduct an audit?	• Set clear goals and objectives. • Choose/develop appropriate indicators that are: – evidence based – relevant – valid – reliable – responsive to change. • Involve healthcare professionals in the process. • Conduct audits regularly.
How to give feedback?	• Provide feedback multiple times and as soon as possible. • Deliver feedback at the health professional level. • Focus on specific behaviours.

	• Use multiple modalities (e.g. written reports, verbal feedback, electronic dashboards). • Use a combination of visual, graphical and text-based messages. • Link the visual display and summary message to minimise cognitive load. • Use clear comparators that reinforce desired behaviour change. • Tailor feedback approaches to reflect situation-specific barriers. • Establish and communicate about the credibility of the information. • Use champions or colleagues to provide feedback. • Guide reflection to minimise defensive reactions. • Encourage self-reflection before receiving feedback. • Ensure recommendations are specific about an action. • Focus on an action that is amenable to change and is under the control of the recipient. • Resonate with established goals and priorities.

References

1. NSW Agency for Clinical Innovation (ACI). Elective surgery improvement initiatives. Surgical Care Network. Sydney: ACI; 2023 [cited 24 Feb 2023]. Available from: https://aci.health.nsw.gov.au/statewide-programs/elective-surgery
2. Verkerk E, van Dulman S, Westert G, et al. Reducing low-value care: what we can learn from eight de-implementation studies in the Netherlands. BMJ Open Quality. 2022 Sep;11(3):1-9. DOI: 10.1136/bmjoq-2021-001710
3. Badgery-Parker T, Pearson S, Chalmers K, et al. Low-value care in Australian public hospitals: prevalence and trends over time. BMJ Qual Saf. 2019 Mar;2019;28(3):205-14. DOI: 10.1136/bmjqs-2018-008338
4. Scott I, Duckett S. In search of professional consensus in defining and reducing low-value care. MJA. 2015 Aug;2015:203(4):179-81. DOI: https://doi.org/10.5694/mja14.01664
5. Korenstein D, Gillespie E. Audit and Feedback-Optimizing a Strategy to Reduce Low-Value Care, A scoping review. JAMA. 2022 Sep;328(9):833-5. DOI: 10.1001/jama.2022.14173
6. Ingvarsson S, Hasson H, von Thiele Schwarz U, et al. Strategies for de-implementation of low-value care—a scoping review. Implementation Sci. 2022 Oct;17(1):73. DOI: org/10.1186/s13012-022-01247-y
7. NSW Agency for Clinical Innovation (ACI). Value-based surgery: Clinical practice guide. Sydney: ACI; 2023 [cited 24 Feb 2023]. Available from: https://aci.health.nsw.gov.au/__data/assets/pdf_file/0007/808504/ACI-Value-based-surgery-CPG.pdf
8. Australian Commision of Safety and Quality in Healthcare. Australian Atlas of Healthcare Variation 2015:3.5 Hysterectomy and endometrial ablation hospital admissions. Sydney: Australian Commission of Safety and Quality in Healthcare; 2015 [cited 24 Feb 2023]. Available from: https://www.safetyandquality.gov.au/publications-and-resources/resource-library/australian-atlas-healthcare-variation-2015-chapter-35-hysterectomy-and-endometrial-ablation-hospital-admissions
9. Aarts J, Nieboer T, Johnson N, et al. Surgical approach to hysterectomy for benign gynaecological disease. Cochrane Database Syst Rev. 2015 Aug;(8):1-131. DOI: 10.1002/14651858.CD003677.pub5
10. Safer Care Victoria (SCV). Abdominal (open) hysterectomy. Melbourne: SCV; 2020 [cited 24 Feb 2023]. Available from: https://www.safercare.vic.gov.au/clinical-guidance/non-urgent-elective-surgery/abdominal-open-hysterectomy
11. Tran A, Liew D, Horne R, et al. Cost and economic determinants of paediatric tonsillectomy. Aust Health Rev. 2022 Apr;46(2):153-62. DOI: 10.1071/AH21100
12. Australian Commission on Safety and Quality in Health Care. Australian Atlas of Healthcare Variation 2021: Tonsillectomy hospitalisations, 17 years and under. Sydney: Australian Commission on Safety and Quality in Healthcare; 2021 [cited 10 Feb 2023]. Available from: https://www.safetyandquality.gov.au/publications-and-resources/resource-library/fourth-atlas-2021-31-tonsillectomy-hospitalisations-17-years-and-under
13. Kong K, Lannigan FJ, Morris PS, et al. Ear, nose and throat surgery: All you need to know about the surgical approach to the management of middle-ear effusions in Australian Indigenous and non-Indigenous children. J Paediatr Child Health. 2017 Nov;53(11):1060-4. DOI: org/10.1111/jpc.13757
14. Australian Commission on Safety and Quality in Health Care. Australian Atlas of Healthcare Variation 2021:Myringotomy hospitalisations, 17 years and under. Sydney: Australian Commission on Safety and Quality in Health Care; 2021 [cited 28 June 2023]. Available from:

https://www.safetyandquality.gov.au/our-work/healthcare-variation/fourth-atlas-2021/ear-nose-and-throat-surgery-children-and-young-people/32-myringotomy-hospitalisations-17-years-and-under

15. Ivers N, Jamtvedt G, Flottorp S, et al. Audit and feedback: effects on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2012 Jun;6(CD000259). DOI: 10.1002/14651858.CD000259.pub3
16. Cassel C, Guest J. Choosing wisely: helping physicians and patients make smart decisions about their care. JAMA. 2012 May;307(17):1801-2. DOI: 10.1001/jama.2012.476
17. NSW Health. Building Resilience for Surgical Services in NSW. Sydney, NSW Health; 2023 [cited 28 Aug 2023]. Available from: https://www1.health.nsw.gov.au/pds/Pages/doc.aspx?dn=IB2023_004
18. Kelly E, Winick-Ng J, McClure J, et al. Hysterectomy in Ontario: A Population-Based Study of Outcomes and Complications in Minimally Invasive Compared with Abdominal Approaches. J Obstet Gynaecol Can. 2019 Aug;41(8):1168-76. DOI: 10.1016/j.jogc.2018.10.026
19. Mohammed W, Salama F, Tharwat A, et al. Vaginal hysterectomy versus laparoscopically assisted vaginal hysterectomy for large uteri between 280 and 700 g: a randomized controlled trial. Arch Gynecol Obstet. 2017 Jul;296(1):77-83. DOI: 10.1007/s00404-017-4397-6
20. Lee S, Oh S, Cho Y, et al. Comparison of vaginal hysterectomy and laparoscopic hysterectomy: a systematic review and meta-analysis. BMC Womens Health. 2019 Jun;19(1):83. DOI: 10.1186/s12905-019-0784-4
21. Deimling T, Eldridge J, Riley K, et al. Randomized controlled trial comparing operative times between standard and robot-assisted laparoscopic hysterectomy. Int J Gynaecol Obstet. 2017 Jan;136(1):64-9. DOI: 10.1002/ijgo.12001
22. Australian Commision of Safety and Quality in Healthcare. Australian Atlas of Healthcare Variation 2022: Hospital-acquired complications (HACs). Sydney: Australian Commission on Safety and Quality in Health Care; 2022 [cited 09 Feb 2023]. Available from: https://www.safetyandquality.gov.au/our-work/indicators/hospital-acquired-complications
23. Royal Australasian College of Surgeons (RACS). Surgical Audit Guide. Melbourne: Royal Australian College of Surgeons; 2021 [cited 28 Feb 2023]. Available from: https://www.surgeons.org/-/media/Project/RACS/surgeons-org/files/reports-guidelines-publications/manuals-guidelines/surgical-audit-and-peer-review-guide.pdf?rev=8c6d405564b84c5ea96e6991a9378b86&hash=F2595498AB95EE4DC227237D11875F26
24. Grant O, Harper P. Paediatric Day Case Tonsillectomy - Audit of a New Programme. Ir Med J. 2020 Apr;113(4):56. PMID: 32268049
25. Australian Institute of Health and Welfare. National Healthcare Agreement: PI 23–Unplanned hospital readmission rates, 2022. Canberra: Australian Institute of Health and Welfare; 2022 [cited 10 Feb 2023]. Available from: https://meteor.aihw.gov.au/content/742756
26. Rosenfeld R, Tunkel D, Schwartz S, et al. Clinical Practice Guideline: Tympanostomy Tubes in Children (Update). Otolaryngol Head Neck Surg. 2022 Feb;166(1_suppl):S1-S55. DOI: 10.1177/01945998211065662
27. Leach A, Morris P, Coates H, et al. Otitis media guidelines for Australian Aboriginal and Torres Strait Islander children: summary of recommendations. Med J Aust. 2021 Mar;214(5):228-33. DOI: 10.5694/mja2.50953
28. Australian Government Department of Health and Aged Care. Otitis Media Guidelines for Aboriginal and Torres Strait Islander Children. Canberra: Australian Government Department of Health and Aged Care; 2020 [cited 25 Mar 2023]. Available from: https://www.health.gov.au/sites/default/files/documents/2021/07/otitis-media-guidelines.pdf

29. Venekamp R, Mick P, Schilder A et al. Grommets (ventilation tubes) for recurrent acute otitis media in children. Cochrane Database Syst Rev 2018 May 9;5(5):CD012017. DOI: org//10.1002/14651858.CD012017

30. Gonzalez C, Arnold J, Woody E, et al. Prevention of recurrent acute otitis media: chemoprophylaxis versus tympanoplasty tubes. Lryngoscope. 1986 Dec;96(12):1330-4. PMID: 3537596

31. Wallace I, Berkman N, Lohr K, et al. Surgical treatments for otitis media with effusion: a systematic review. Pediatrics. 2014 Feb;133(2):296-311. DOI: 10.1542/peds.2013-3228

32. Hao J, Chen M, Liu B, et al. Compare two surgical Interventions for otitis media with effusion in young children. European Arch Otolaryngology. 2019 Aug;276(8):2125-31. DOI: 10.1007/s00405-019-05421-9

33. Australian Government Department of Health and Aged Care. Otitis Media Guidelines for Aboriginal and Torres Strait Islander Children Canberra: Australian Government Department of Health and Aged Care; 2020 [cited 10 Feb 2023]. Available from: https://www.health.gov.au/sites/default/files/documents/2021/07/otitis-media-guidelines.pdf

34. Goel A, Omorogbe A, Hackett A, et al. Risk Factors for Multiple Tympanostomy Tube Placements in Children: Systematic Review and Meta-Analysis. Laryngoscope. 2021 Jul;131(7):E2363-e70. DOI: 10.1002/lary.29342

35. NSW Agency for Clinical Innovation (ACI). Extended Day Only Admission Model. Sydney: ACI; 2020 [cited 25 Mar 2023]. Available from: https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/GL2020_023.pdf

36. The American College of Obstericians and Gynecologists. Hysterectomy. 2021 [cited 22 Feb 2023]. Available from: https://www.acog.org/womens-health/faqs/hysterectomy

37. Choosing Wisely Canada. Obstetrics and Gynaecology. Canada: Choosing Wisely Canada; 2021 [cited 28 Feb 2023]. Available from: https://choosingwiselycanada.org/recommendation/obstetrics-and-gynaecology/

38. Choosing Wisely UK Royal College of Obstertiricans and Gynacologists. Recommendation for Clinicians. United Kingdom: Royal College of Obstetricians and Gynaecologists UK; 2018 [cited 24 Jun 2023]. Available from: https://choosingwisely.co.uk/recommendations-archive/#1572878795413-a17b2d8d-9c4e

39. Australian Commission on Safety and Quality in Health Care. Heavy Menstrual Bleeding Clinical Care Standard. Sydney: Australian Commission on Safety and Quality in Health Care; 2017 [cited 25 Jun 2023]. Available from: https://www.safetyandquality.gov.au/standards/clinical-care-standards/heavy-menstrual-bleeding-clinical-care-standard

40. Australian Commission on Safety and Quality in Health Care. Australian Atlas of Healthcare Variation 2017: 3.1 Hysterectomy. Sydney: Australian Commission on Safety and Quality in Health Care; 2017 [cited 24 Feb 2023]. Available from: https://www.safetyandquality.gov.au/publications-and-resources/resource-library/australian-atlas-healthcare-variation-2017-31-hysterectomy-0

41. Fergusson R, Bofill Rodriguez M, Lethaby A. Endometrial resection and ablation versus hysterectomy for heavy menstrual bleeding. Cochrane Database Syst Reviews. England 2021 Feb [cited Jun 28]. Available from: https://pubmed.ncbi.nlm.nih.gov/33619722

42. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists Subspecialty training programs. Melbourne: RANZ College of Obstetricians and Gynaecologists; 2023 [cited 25 Jun 2023]. Available from: https://ranzcog.edu.au/training-topics/current-trainees-subspecialty-training/

43. Royal Australasian College of Surgeons. The SET program. Royal Australasian College of Surgeons; 2023 [cited 28 Feb 2023]. Available from: https://www.surgeons.org/Trainees/the-set-program

44. The Australian Society of Otolaryngology Head and Neck Surgery. A joint Position paper of the Paediatrics and Child Health Division of The Royal Australasian College of Physicians and The Australian Society of Otolaryngology, Head and Neck Surgery. Sydney: The Royal Australasian College of Physicians and The Australian Society of Otolaryngology Head and Neck Surgery; 2008 [cited 09 Feb 2023]. Available from: https://www.kidshealth.org.nz/sites/kidshealth/files/pdfs/Final_approved_Tonsillectomy_document-3.pdf

45. Canadian Society of Otolaryngology-Head and Neck Surgery Paediatric Otolaryngology. Nine Things Clinicians and Patients Should Question. Canada: Choosing Wisely Canada; 2020 [cited 24 Feb 2023]. Available from: https://choosingwiselycanada.org/wp-content/uploads/2021/02/PedOTO-HNS_EN-v2.pdf

46. McDonough M, Hathi K, Corsten G, et al. Choosing Wisely Canada - pediatric otolaryngology recommendations. J Otolaryngol Head Neck Surg. 2021 Oct;50(1):61. DOI: 10.1186/s40463-021-00533-x

47. Cottrell J, Yip J, Campisi P, et al. Quality indicators for the diagnosis and management of pediatric tonsillitis. Int J Pediatr Otorhinolaryngol. 2020 Dec;139:110441. DOI: 10.1016/j.ijporl.2020.110441

48. Mitchell R, Archer S, Ishman S, et al. Clinical Practice Guideline: Tonsillectomy in Children (Update) - Executive Summary. Otolaryngol Head Neck Surg. 2019 Feb;160(2):187-205. DOI: 10.1177/0194599818807917

49. Bohr C, Shermetaro C. Tonsillectomy and Adenoidectomy. StatPearls. Treasure Island (FL): StatPearls Publishing LLC; 2023 Jun. PMID: 30725627

50. Nguyen B, Quraishi H. Tonsillectomy and Adenoidectomy - Pediatric Clinics of North America. Pediatr Clin North Am. 2022 Apr;69(2):247-59. DOI: 10.1016/j.pcl.2021.12.008

51. Randall DA. Current Indications for Tonsillectomy and Adenoidectomy. J Am Board Fam Med. 2020 Nov-Dec;33(6):1025-30. DOI: 10.3122/jabfm.2020.06.200038

52. Wilkes J. Tonsillectomy in Children: AAO-HNS Updates Guideline. Am Fam Physician. 2019 Sep;100(5):316-7

53. Adil E, Medina G, Cunningham M. Pediatric Tonsil Cancer: A National and Institutional Perspective. J Pediatr. 2018 Jun;197:255-61. DOI: 10.1016/j.jpeds.2018.01.022

54. Stalfors J, Ovesen T, Bertelsen JB, et al. Comparison of clinical practice of tonsil surgery from quality register data from Sweden and Norway and one clinic in Denmark. BMJ Open. 2022 Apr;12(4):e056551-e. DOI: 10.1136/bmjopen-2021-056551

55. The Children's Hospital at Westmead. Intracapsular Tonsillectomy-Day Surgery-Clinical Practice Guideline. Sydney: Childrens Hospital Westmead 2022 [cited 24 Feb 2023]. Available from: https://www.schn.health.nsw.gov.au/_policies/pdf/2022-080.pdf

56. Windfuhr J, Toepfner N, Steffen G, et al. Clinical practice guideline: tonsillitis I. Diagnostics and nonsurgical management. Eur Arch Otorhinolaryngol. 2016 Apr;273(4):973-87. DOI: 10.1007/s00405-015-3872-6

57. Windfuhr J, Toepfner N, Steffen G, et al. Clinical practice guideline: tonsillitis II. Surgical management. Eur Arch Otorhinolaryngol. 2016 Apr;273(4):973-87. DOI: 10.1007/s00405-016-3904-x

58. Milder E, Rizzi M, Morales K, et al. Impact of a New Practice Guideline on Antibiotic Use With Pediatric Tonsillectomy. JAMA Otolaryngol Head Neck Surg. 2015;141(5):410-6. DOI: 10.1001/jamaoto.2015.95

59. Aldamluji N, Burgess A, Pogatzki-Zahn E, et al. PROSPECT guideline for tonsillectomy: systematic review and procedure-specific postoperative pain management recommendations. Anaesthesia. 2021 Jul;76(7):947-61. DOI: 10.1111/anae.15299

60. Bruaset A, Dahlstrøm M, Möller S, et al. Evaluation of day-care tonsil surgery in young children. Dan Med J. Mar 2019 Mar;66(3):A5536

61. Safer Care Victoria (SCV). Myringotomy for Middle ear disease in children or adults Safer Care Victoria. Melbourne; 2020 [cited 28 Feb 2023]. Available from: https://www.safercare.vic.gov.au/best-practice-improvement/clinical-guidance/non-urgent-elective-surgery/myringotomy-for-middle-ear-disease-in-children-or-adults

62. Klopp-Dutote N, Kolski C, Strunski V, et al. Tympanopasty tube for serous otitis media and risk of recurrences. Int J Pediatr Otorhinolaryngol. 2018 Mar;106:105-9. DOI: 10.1016/j.ijporl.2018.01.023

63. Ivers N, Sales A, Colquhoun H, et al. No more 'buisness as usual' with audit and feedback interventions: towards an agenda for a reinvigorated intervention. Implement Sci. 2014 Jan;17(9):14. DOI: 10.1186/1748-5908-9-14

64. Jamtvedt G, Flottorp S, Ivers N. Audit and Feedback as a Quality Strategy. Busse R, Klazinga N, Panteli D, et al., editors. Copenhagen (Denmark): European Observatory on Health Systems and Policies; 2019

65. Brehaut JCC HI, Eva, K. I.et al. Practice Feedback Interventions: 15 Suggestions for Optimizing Effectiveness. Ann of Intern Med. 2016 Mar;164(6):435-41. DOI: 10.7326/m15-2248