WESTERN SYDNEY UNIVERSITY

SURGICAL INNOVATION
TRG WEBINAR
MARCH 6 2024

Professor Neil Merrett

Discipline of Surgery, School of Medicine, Western Sydney University, Sydney, NSW, Australia

Chair: NSW State Surgical Care Network

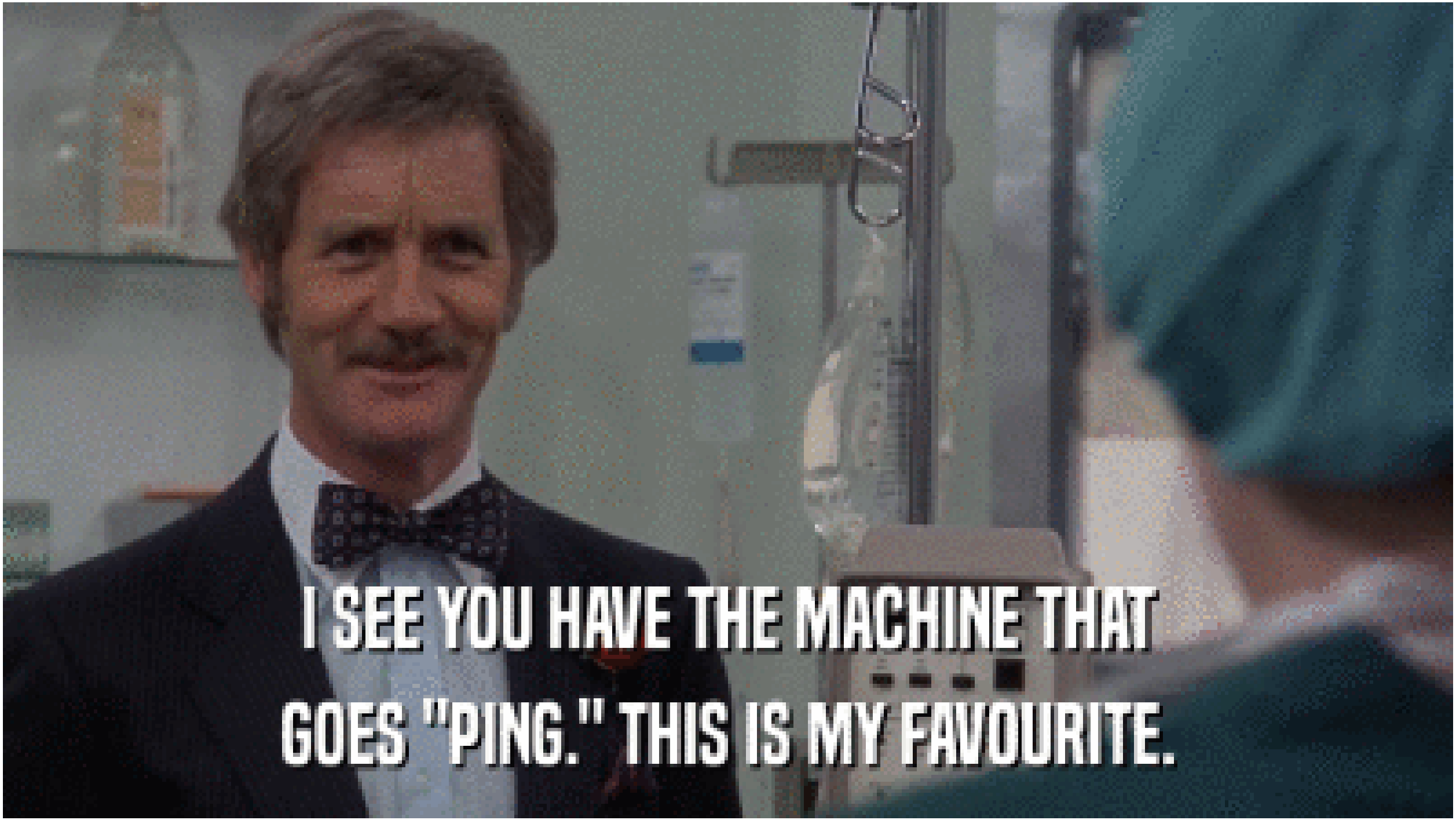
Chair: NSW Surgical Care Governance Taskforce

Director Surgery SWSLHD

NSW GOVERNMENT AGENCY FOR CLINICAL INNOVATION

NSW GOVERNMENT

SURGICAL INNOVATION : WHAT IS IT?

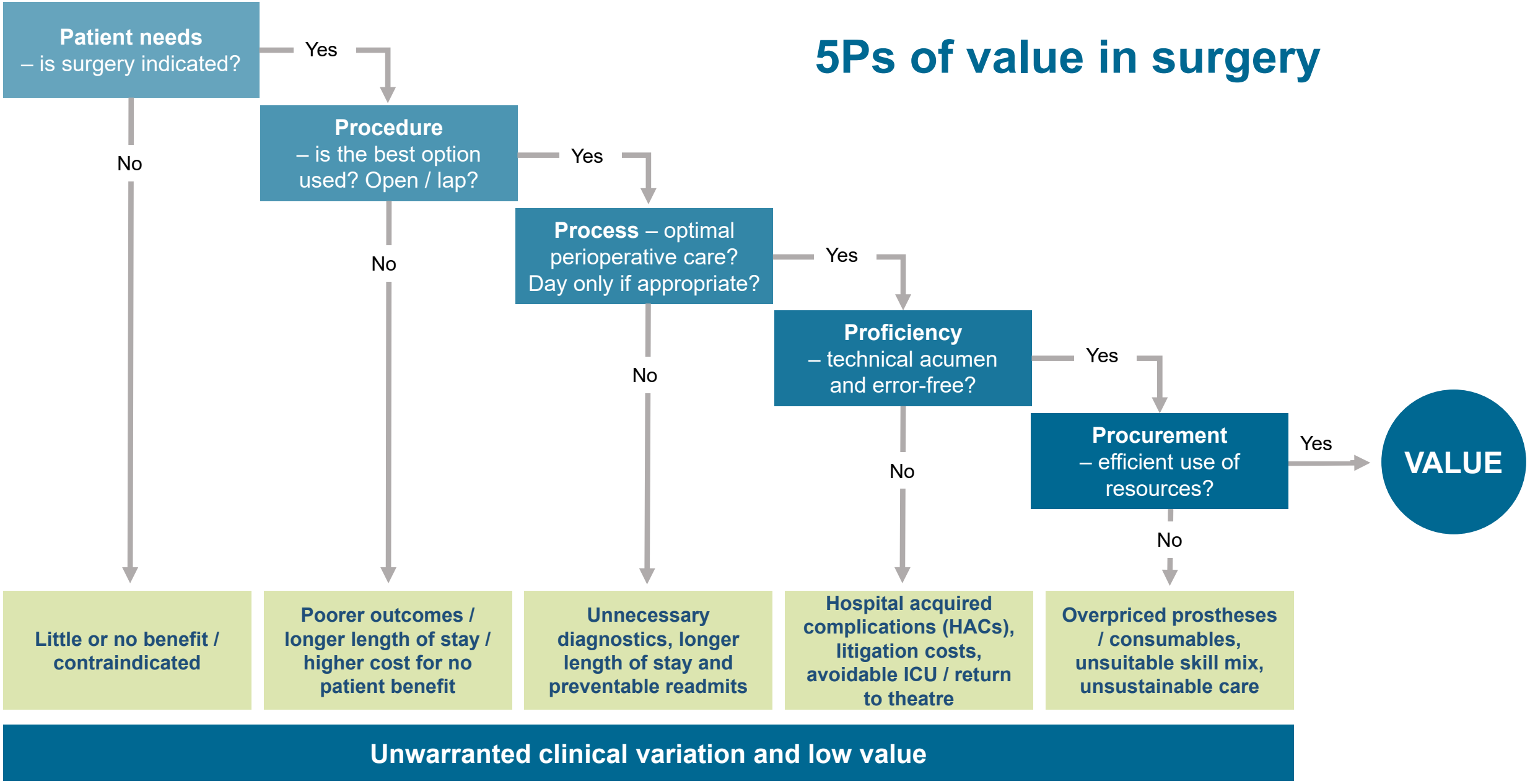

I SEE YOU HAVE THE MACHINE THAT
GOES "PING." THIS IS MY FAVOURITE.

SURGICAL INNOVATION WITHOUT NEW TECH OR BUILDINGS ISN'T SEXY

- Review of the entire model of care
- Review of surgical processes

- NOT just a new piece of technology which too often is bolted onto existing frameworks
- New technology must be assessed for value and opportunity cost

5Ps of value in surgery



Value Based Care (VBC)

- Why surgery?
- Total NSW health budget for 2023/4 was $31 billion (26% of total state budget)
- Surgery costs between $@6 billion (about 20% of total)
- Surgery is ideal specialty to institute VBC as inputs and outputs may be more predictable and measurable
- It is not about rationing or restricting activity – it is about putting the patient first and foremost
- It is about quality, efficiency, cost and satisfaction

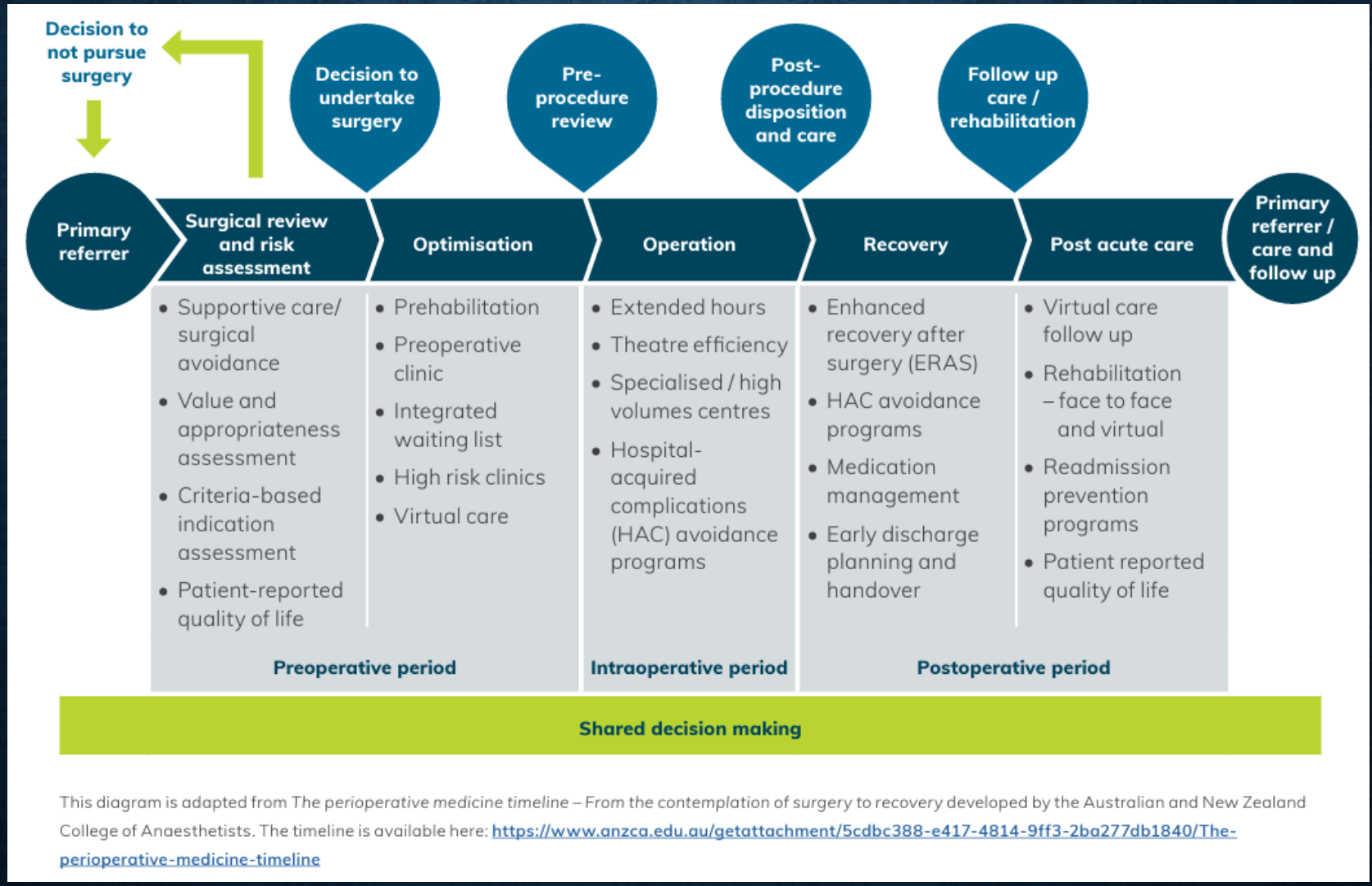
- Win for patients ; clinicians ; facilities

Value Based Care: Clinical Aspects

- Identify procedures or circumstances where
  - Benefits are non existent or illusory
  - Risk is greater than the benefit
  - Benefit is low compared to the cost
- Opportunity cost
  - Patients who would benefit delayed by inappropriate use in others
  - Beneficial procedures not funded
  - equipment
- Variations in outcomes and delivery
  - Equity in use of procedures based on socioeconomic /geographical location
  - Equity in outcomes based on socioeconomic or geographical reason
- Variations in resource use
  - Variations in use of day surgery/ ERAS/ equipment use (RCI)

  - ONE PATIENTS EXTRA STAY IS ANOTHER PATIENTS EXTRA DELAY

The surgical pathway



This diagram is adapted from *The perioperative medicine timeline – From the contemplation of surgery to recovery* developed by the Australian and New Zealand College of Anaesthetists. The timeline is available here: https://www.anzca.edu.au/getattachment/5cdbc388-e417-4814-9ff3-2ba277db1840/The-perioperative-medicine-timeline

PROCESS REVIEWS

- 50% of surgery performed is unplanned, but most facilities do not have dedicated theatres beyond emergency
- Emergency theatres (true emergencies, ASU, etc)
- Semi-acute theatres (trauma, abscess, catch and release9witnin 10 days)
- Planned

Estimates of low-value care from financial year 2010–2011 to 2016–2017 for 14 procedures with most episodes involving low-value care (narrower definition) in 2016–2017.

High cost, high frequency
• Repair of minimally symptomatic inguinal hernia
• CT abdomen as first line for diagnosis of appendicitis*
• Inappropriate indication algorithms / guidelines for upper GI endoscopy
High cost, low frequency
• Second look endoscopy after endoscopic submucosal dissection for gastric neoplasms
• Early ERCP in acute gallstone pancreatitis in the absence of cholangitis
• Outcomes following robotic surgery are comparable to those following laparoscopic surgery
• Use of colorectal stenting seems to have no advantage over surgery in long-term outcomes
Low cost, high frequency
• Single dose prophylactic antibiotics for hernia repair
• Use of surgical face masks
• Routine drain placement after elective laparoscopic cholecystectomy (needs more evidence)
Low cost. low frequency
• Post-operative constipating agents post anal sphincter repair
• Abdominal drainage after gastrectomy for gastric cancer
• Referral to secondary care for uncomplicated diverticulitis

Tim Badgery-Parker et al. BMJ Qual Saf 2019;28:205-214

BMJ Quality & Safety

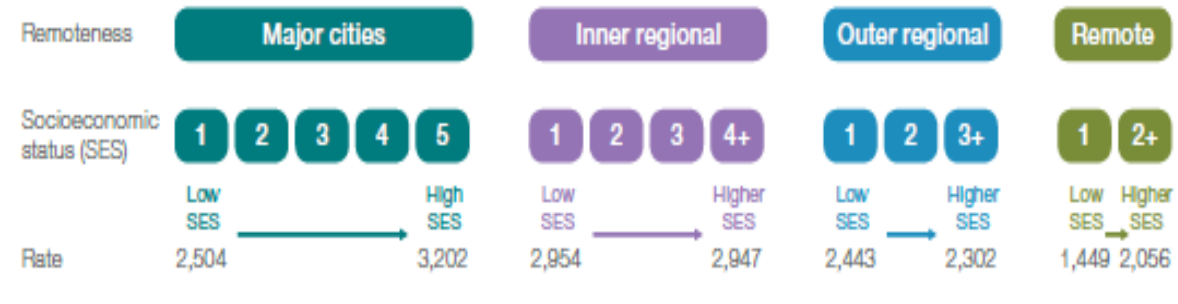
CLINICAL MEASURES OF PROCEDURES

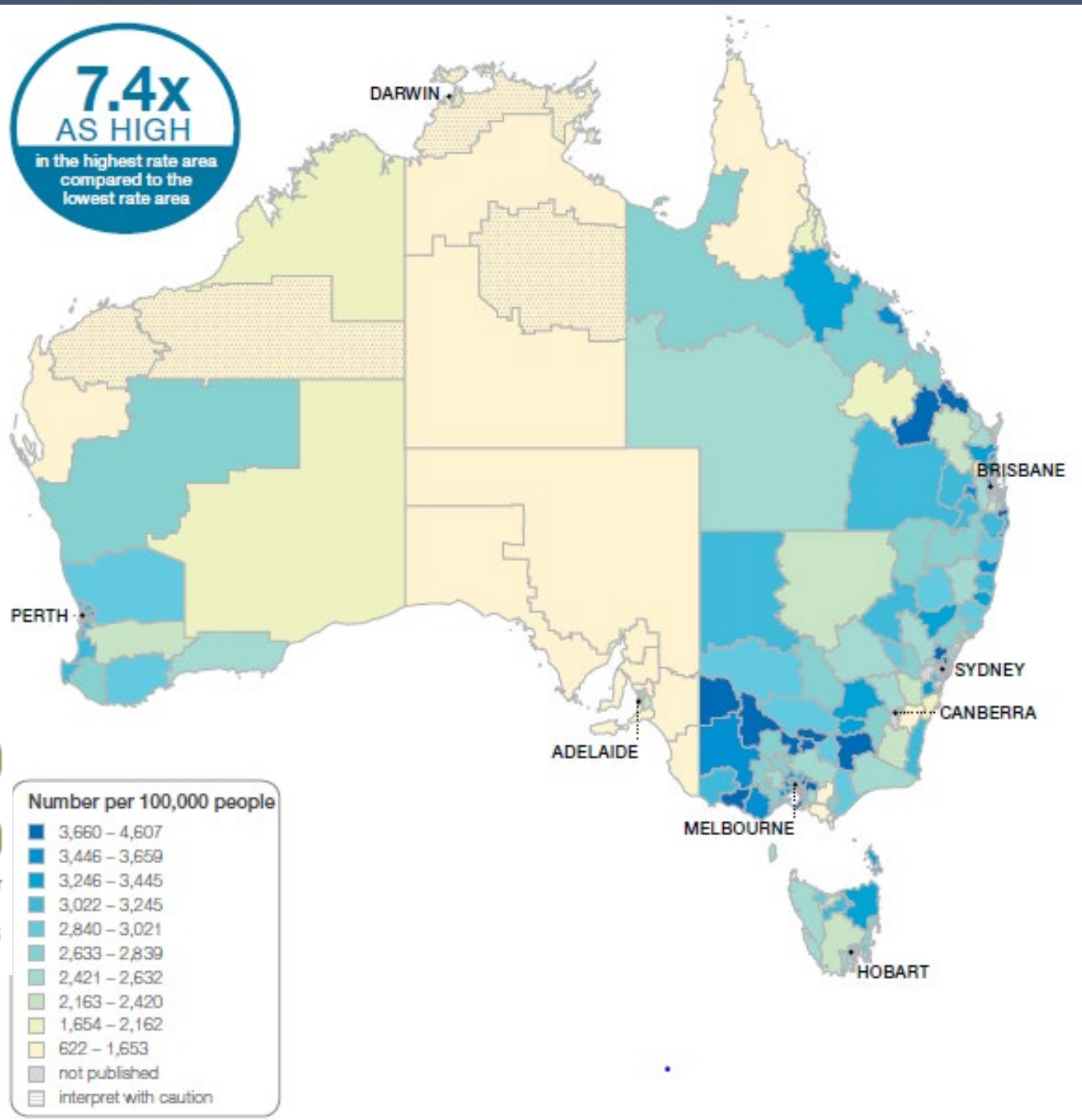
- Equity,
- effectiveness,
- efficiency,
- Variations in care,
- appropriate cohorts
- Use of clinical Guideline
- Opportunity cost
  - Procedure
  - capital

- Examples of areas for review
  - Spinal surgery
  - Asymptomatic gallstones/hernia
  - Fractured ankles/shoulders
  - Hysterectomy for bleeding (ablative and Cx therapies)

Clinical Variations

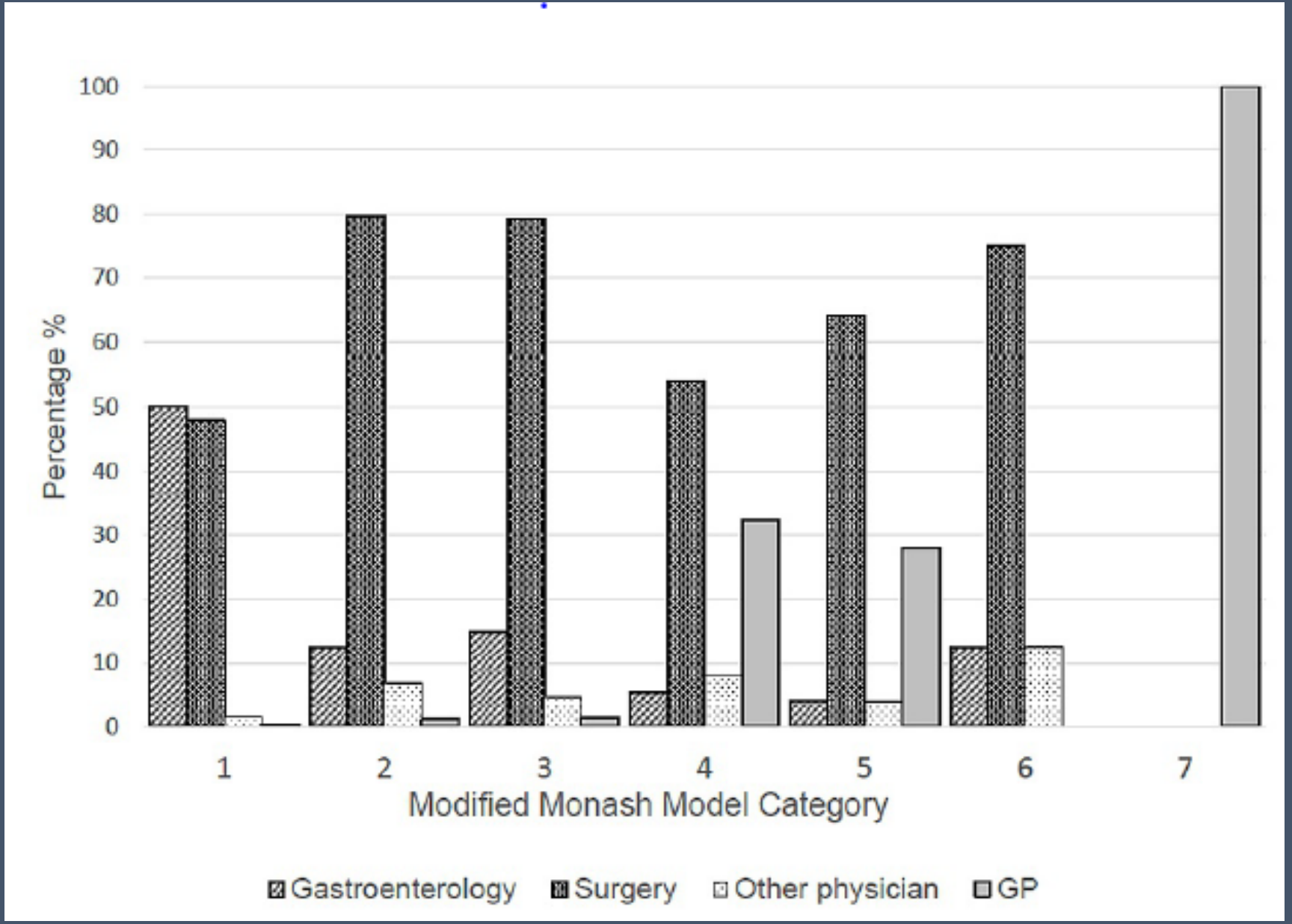
- Distribution of colonoscopy per 100,000 population



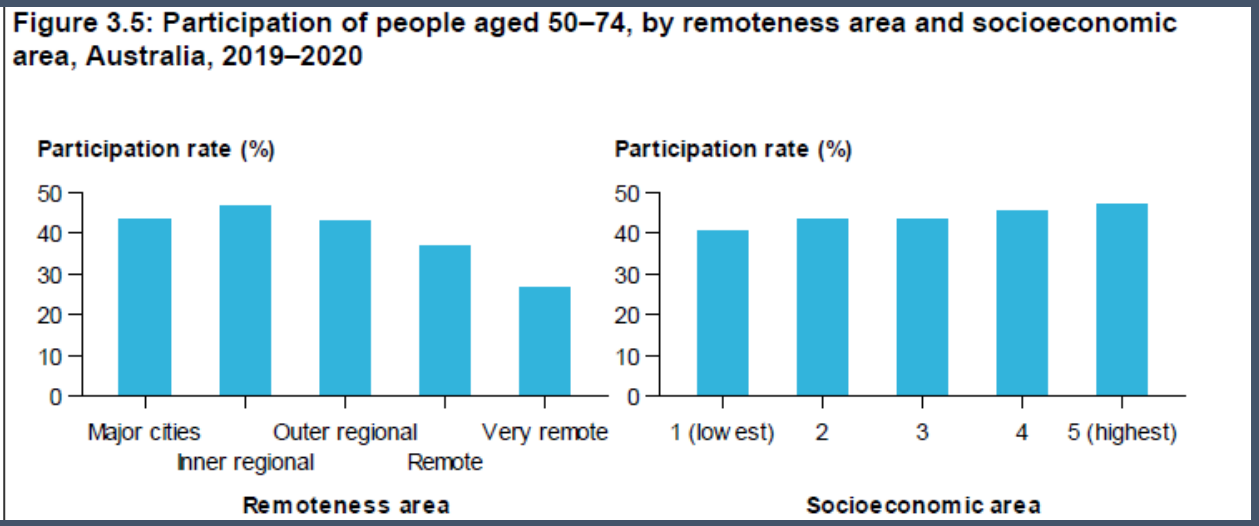


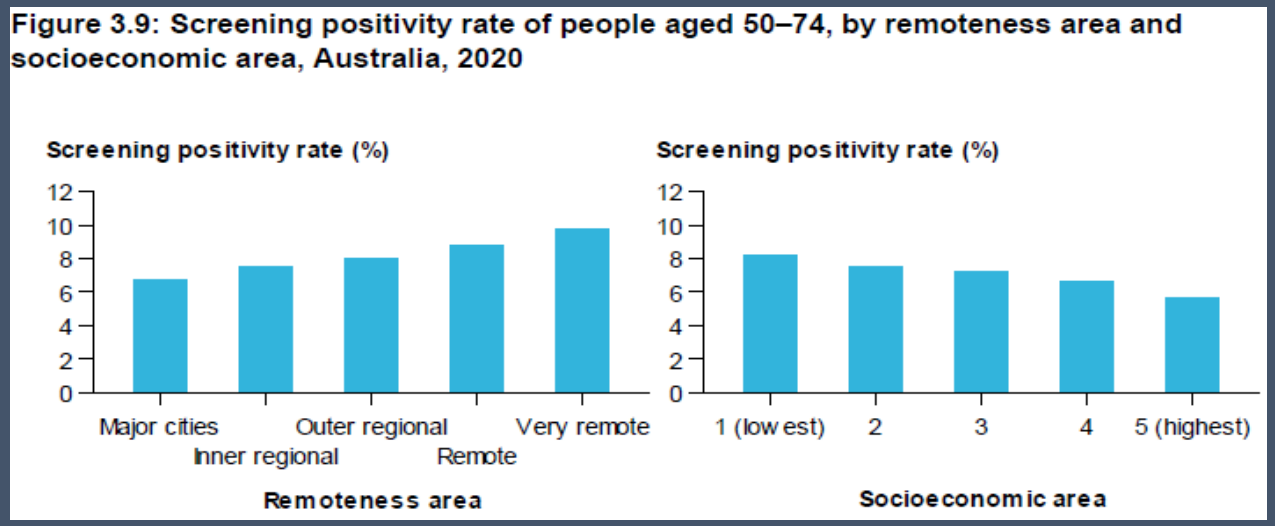
Distribution by specialty and location

- Outside of metro regions, mostly surgeon led endoscopy



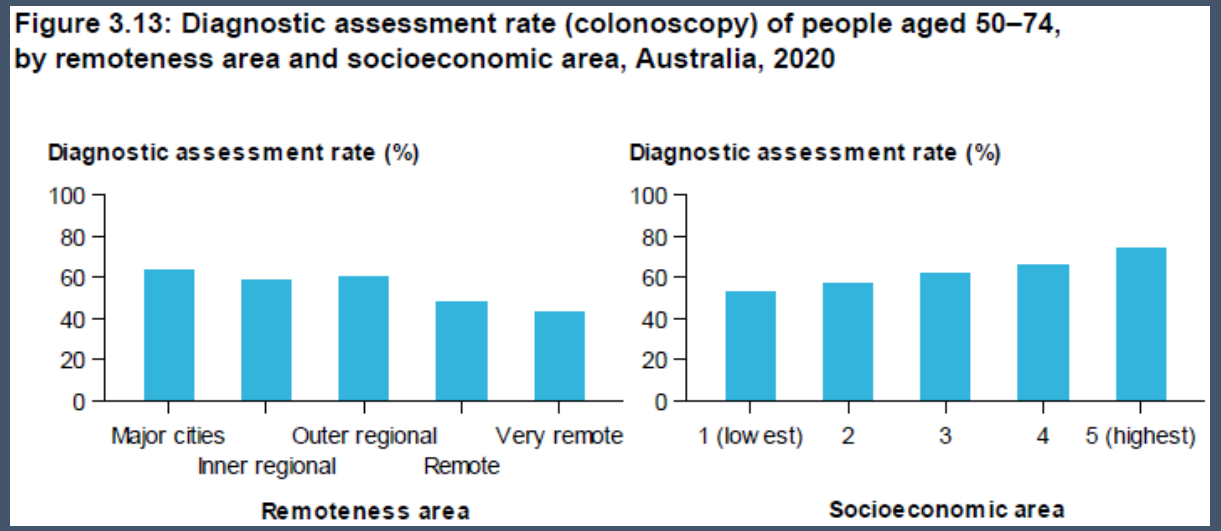
Variation in care: Equity issues



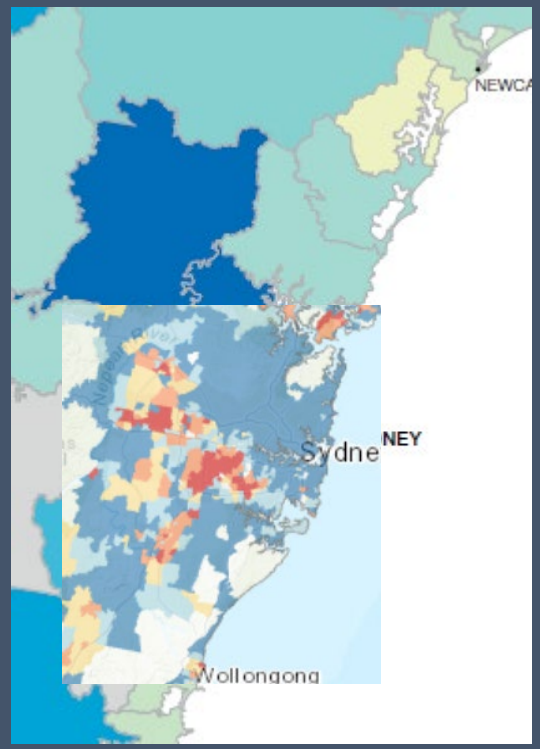


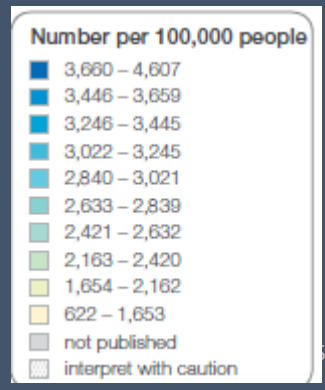
Regional and rural / LOTE / indigenous/ socioeconomic disadvantage

- More likely to have cancer and positive tests
- Less likely to participate
- If they do more likely to be positive
- Less likely to have colonoscopy



Colonoscopy: variation of care





- NHMRC guidelines are now implemented by medicare, but not audited or operationalised yet
- UK audit of surveillance colonoscopy for polyps:
- **60% not clinically indicated by guidelines**

Lowest rate areas				Highest rate areas			
SA3	State	Rate	Hospitalisations	SA3	State	Rate	Hospitalisations
Woden Valley	ACT	622	244	Hawkesbury	NSW	4,607	1,227
Tuggeranong	ACT	656	586	Shepparton	Vic	4,579	3,332
Weston Creek	ACT	673	187	Eastern Suburbs - North	NSW	4,547	6,530
South Canberra	ACT	724	227	Campaspe	Vic	4,534	2,193
Baw Baw	Vic	878	543	Mornington Peninsula	Vic	4,357	9,265
Barkly	NT	952*	48	Richmond - Windsor	NSW	4,241	1,638
Eyre Peninsula and South West	SA	1,117	782	Rouse Hill - McGraths Hill	NSW	4,195	1,281
Far North	Qld	1,172	342	Moira	Vic	4,142	1,572
Murray and Mallee	SA	1,179	1,149	Monash	Vic	4,139	8,316
Port Douglas - Daintree	Qld	1,184	175	Frankston	Vic	4,112	6,312
Playford	SA	1,186	1,039	Yarra Ranges	Vic	4,036	7,019
Outback - North and East	SA	1,193	350	Stonnington - East	Vic	4,035	1,876
Limestone Coast	SA	1,194	1,017	Whitehorse - East	Vic	4,021	2,949

Guidelines for surveillance

FIRST COLONOSCOPIC SURVEILLANCE INTERVAL AFTER POLYPECTOMY

A. Conventional adenomas* only

Current colonoscopy findings		Conventional adenoma <10mm		Conventional adenoma ≥10mm[d,e]	
		HGD and/or villosity		HGD and/or villosity	
		No	Yes	No	Yes
Total number of conventional adenomas	1–2	10Y[a,b,c]	5Y	3Y	3Y
	3–4	5Y	3Y	3Y	1Y
	5–9	3Y	1Y	1Y	1Y
	≥10	1Y	1Y	1Y	1Y

B. Clinically significant serrated polyps** only

Current colonoscopy findings		Advanced serrated polyp (≥10mm, dysplasia or TSA)	
		No	Yes
Number of clinically significant serrated polyps	1–2	5Y	3Y
	3–4	3Y	1Y
	≥5	1Y	

C. Clinically significant serrated polyps and synchronous conventional adenomas

Current colonoscopy findings		Low-risk conventional adenomas		High-risk conventional adenomas	
		Advanced serrated polyp (≥10mm, dysplasia or TSA)		Advanced serrated polyp (≥10mm, dysplasia or TSA)	
		No	Yes	No	Yes
Total number of polyps (clinically significant serrated polyps and conventional adenomas)	2	5Y	3Y	3Y	3Y
	3–4	3Y	3Y	1Y	1Y
	5–9	3Y	1Y	1Y	1Y
	≥10	1Y	1Y	1Y	1Y

*Conventional adenoma and **clinically significant serrated polyps terms are defined below.
Tables A, B and C correlate with 3, 9a and 9b, respectively, in the guidelines.

These tables are intended to support clinical judgment and are derived from the *Clinical practice guidelines for surveillance colonoscopy*. A free interactive platform to support use of these guidelines is available at: www.intright.com.

- Justification for timing
- Clinical justification for combined procedure
- Other guideline developed for colonoscopy indications

Combined Gastroscopy and Colonoscopy

- Internationally, rates of inappropriate gastroscopy requesting ranging from 7.5% to 54%.
- UK (2018) inappropriate gastroscopy one of top 5 (Cost and number) interventions that offer little benefit.
- 2016-17 15% of gastroscopies aged 55 under were determined as low value increasing 8% per year (NSW)
- **Not recommended for screening yet 60% of colonoscopies included a gastroscopy on same day** (AIHW and NSW MOH)

ENDOSCOPY

- Increasing access for at risk populations
- Decreasing inappropriate care (opportunity cost)

- Cost neutral/or offset

- Operationalisation of clinically recommended guidelines

TONSILLECTOMY

- Described by celsus 50ad
- Rare prior to 1915
- Estimated that by 1948, 1/3 of all operations performed since 1923 were tonsillectomies
- **"a prophylactic ritual carried out for no particular reason with no particular result"**

(Medical Research Council, Epidemics in Schools ... by the School Epidemics Committee (London: His Majesty's Stationery Office, 1938), 118-25, 285;

ASOHNS/RACP 2008

The indications for tonsillectomy/adenotonsillectomy are:

- 1. Upper Airway Obstruction in Children with Obstructive Sleep Apnoea [OSA]
- 2. Frequent Recurrent Acute Tonsillitis (Paradise criteria)
- 3. Peritonsillar Abscess
- 4. Suspected Neoplasm
- 5. Uncommon indications

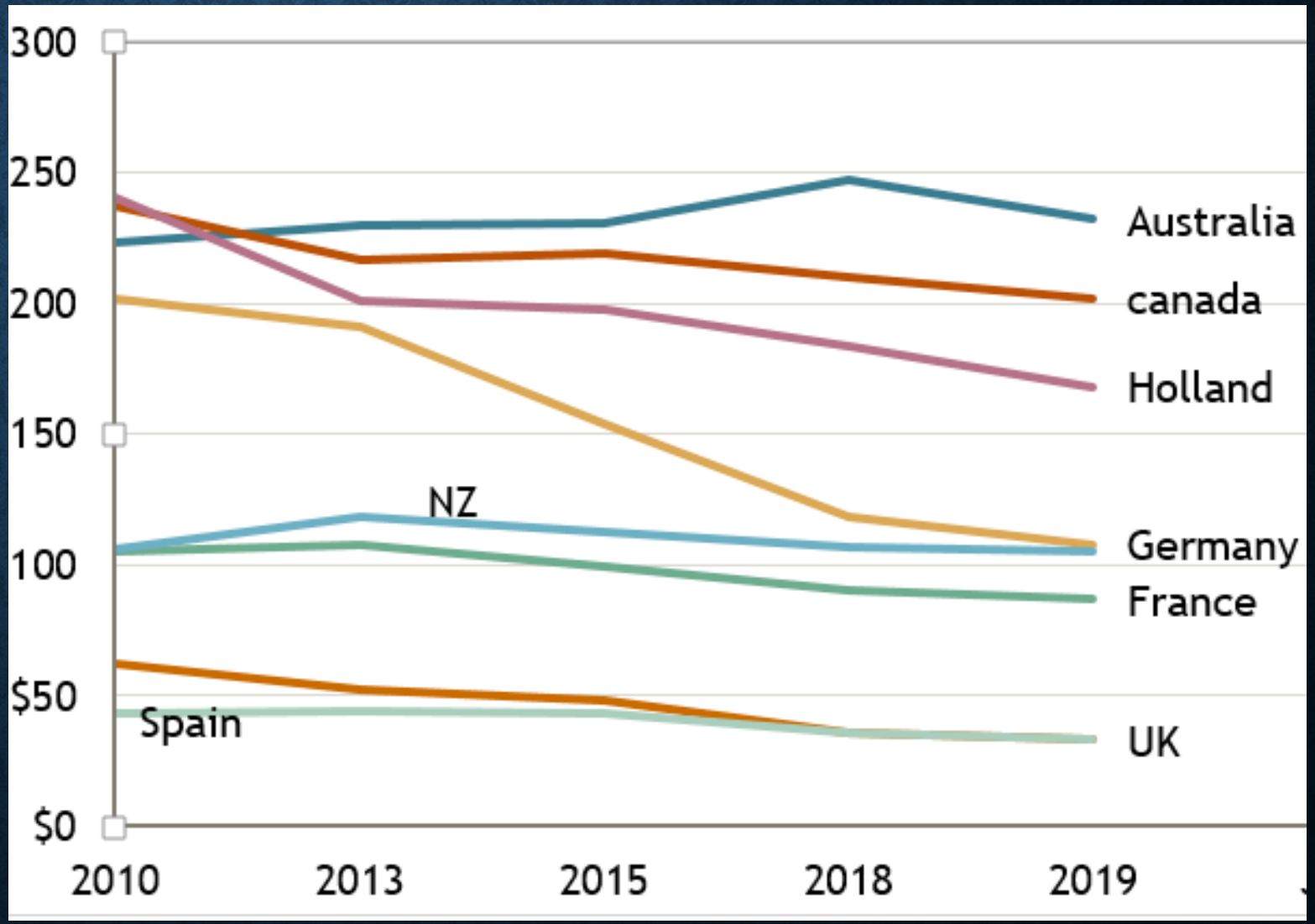
- The incidence of adenotonsillectomy in Australia and New Zealand for OSA alone is significantly below that expected. The analysis suggests that only 10-15% of children who could benefit from adenotonsillectomy are being treated.

COMPARATIVE RATES (OECD)

- Australia sl increase
- Most other less and decreasing
- Yet 2008 says we are not doing enough?
- German studies 2019 25% for OSA

Rate /100,000

- UK 2020 guidelines and US 2019 guidelines identical



Note: Germany introduced Paradise Criteira 2015

GUIDELINE COMPLIANCE
OPERATIONALIZATION AND LOW VALUE

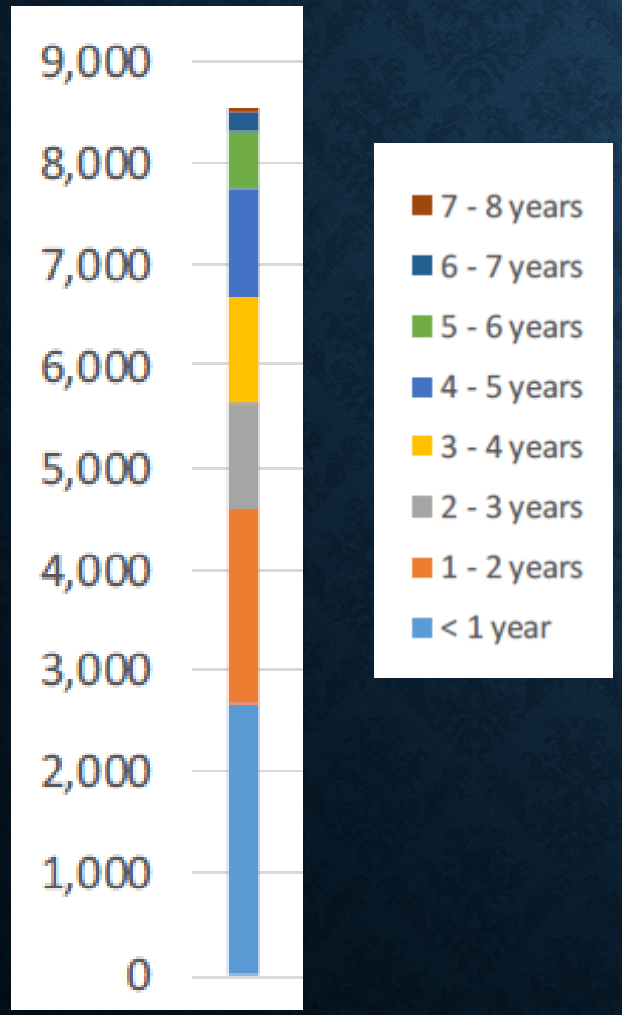
- **Simultaneous underuse and overuse**
- Sumilo 2019; 1.6 million children 735 GP practices over 10 years.
  - 15700 with evidence based indication for tonsillectomy (paradise criteria)
  - **Tonsillectomy performed in 2600 (13.6%)**
- However 18300 children from the practices underwent tonsillectomy over the time frame
  - **86% did not have an evidence based indication.**

- Conclusion: In UK, few children with evidence-based indications undergo tonsillectomy & seven in eight of those who do are unlikely to benefit.

- Aus data (Hibbert 2019) 25% of those with recurrent tonsillitis meeting criteria not referred for tonsillectomy

ACCESS: OPD WAITS: ENT

	Patients on waitlist (n)	Change since start of FY (approx.)	Longest wait (yrs)	Unbooked urgents (n)	Overdue patients (n)	Overdue (%)
Ear Nose and Throat	8,542	654	7.3	3	6,716	79%



- 48% waiting more than 2 years for appointment
- 22% more than 4 years
- surgical median wait times NSW 300 days

- If they have waited 3 years do they still need surgery

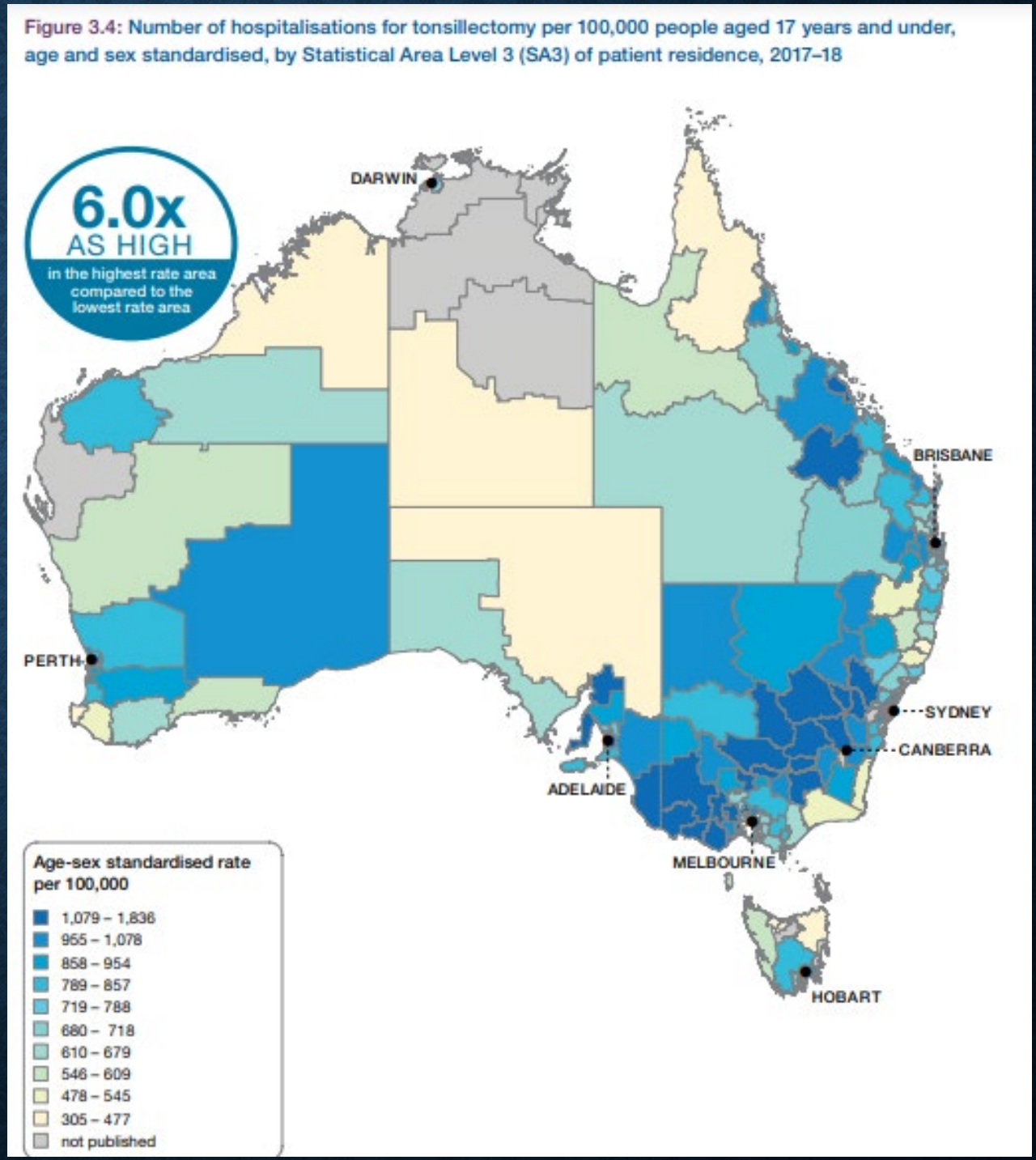
- "The art of medicine consists of amusing the patient while nature cures the disease."

Voltaire

REGIONAL VARIATION

ACSQHC AUST HEALTHCARE ATLAS 4TH ED 2021

- 2017-18. 42,509 tonsillectomies,
  - Rate of 750/100 000 of under 17yo
  - Rates increased by 3% over 5 years
- Median Waiting times for operation over 300 days
- Rates higher in inner regional over other regions
- Not associated with hospital access (larger inner city had lower rates)
- variation in rate
  - influenced by GP referral practices
  - surgeon attitudes regarding the disease threshold



SUMMARY; TONSILS

- Rate of tonsillectomy higher than comparable OECD and increasing rather than decreasing
- Evidence of
  - large variation of care
  - Wrong cohorts are being operated on and those requiring not prioritised
  - existing guidelines being ignored
- No longitudinal data indicating indication for tonsillectomy
- Australian guidelines 17 years old but indications have changed

- Is watchful waiting better than surgery

CASE STUDIES

LOS VARIATION AND DAY CASE

Hernias

Recommendations

- **Most patients with inguinal or umbilical hernia can be managed as day patients.**
- There are patient satisfaction and financial incentives to maximise day surgery rates without posing risks for suitable patients.
- The method of hernia repair will not generally affect the decision whether to manage the patient as a day patient or plan for an overnight stay.
- Good preoperative assessment, planning and informing the patient has the potential to improve same-day surgery discharge rates.
- **The target rate for hospitals should be between 70 to 80% patients as same-day cases.**
- Patients with complex hernias and comorbidities will generally benefit from an overnight stay, or at least be considered for such.
- **Asymptomatic and small hernias should be risk assessed as to the need for surgery**

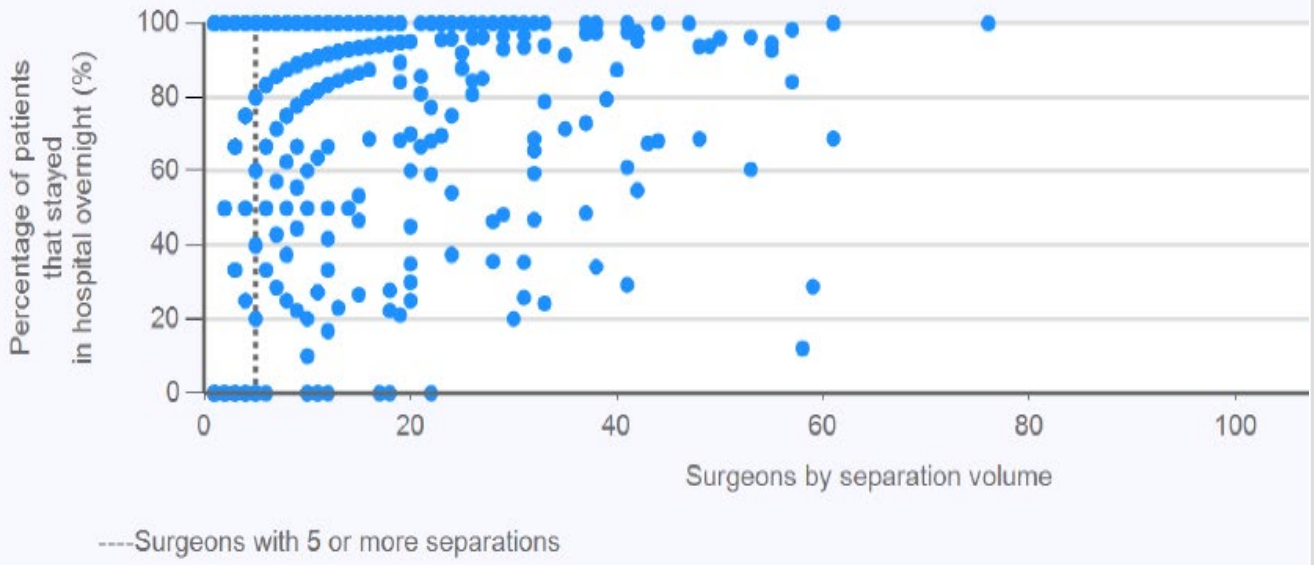
Pre covid 2018/19

uk guidelines 90%

AUS Private day stay 19%

NSW Public day stay 28%

Figure 14: Percentage of patients that stayed in hospital overnight



In 81% of the hospital separations the patient stayed in hospital for at least one night.

For the 526 surgeons who performed at least five procedures:

- 265 (50%) had all of their patients stay in hospital overnight

Repair of Hernia

ANDRG = G10B - Hernia Interventions, Minor Complexity

LHD/SHN	ALOS (days)	RSI	RCI	Volume	NSW ALOS	NSW RSI	NSW RCI
SVH	1.70	1.19	1.15	121	1.3	1.0	1.0
SES	1.46	0.97	1.02	497	1.3	1.0	1.0
SWS	**1.44**	**1.03**	**0.99**	**962**	**1.3**	**1.0**	**1.0**
NBM	1.40	1.05	1.12	335	1.3	1.0	1.0
SYD	1.40	0.98	0.92	589	1.3	1.0	1.0
IS	1.36	0.97	1.12	380	1.3	1.0	1.0
HNE	1.32	1.03	0.95	1,050	1.3	1.0	1.0
NS	1.32	0.97	1.01	304	1.3	1.0	1.0
MUR	1.30	0.94	0.88	196	1.3	1.0	1.0
WS	1.29	1.04	1.04	680	1.3	1.0	1.0
WNSW	1.27	0.94	0.90	377	1.3	1.0	1.0
NNSW	1.27	0.97	1.02	581	1.3	1.0	1.0
CC	1.26	0.94	1.04	432	1.3	1.0	1.0
MNC	1.25	0.98	1.06	249	1.3	1.0	1.0
SCHN	1.15	1.00	1.00	433	1.3	1.0	1.0
FW	1.14	1.00	1.30	28	1.3	1.0	1.0
SNSW	1.14	1.01	1.02	352	1.3	1.0	1.0

2018/19 public hospitals

DRG	episodes	% same day	% one night	% multi night	multi night episodes
Hernia Procedures W/O CC	9036	28.6	56.3	15.1	1365

Lap chole: clinical variation in use

International Variation

- lap cholecystectomy rate/ 100,000 people
  - US 275
  - AUS 216
  - Canada 202
  - Germany 197
  - Denmark 133
  - UK 125
  - NZ 116

Day case Lap cholecystectomy

1997 : 51% lap chole performed as day case USA
1997 : 0.8% UK

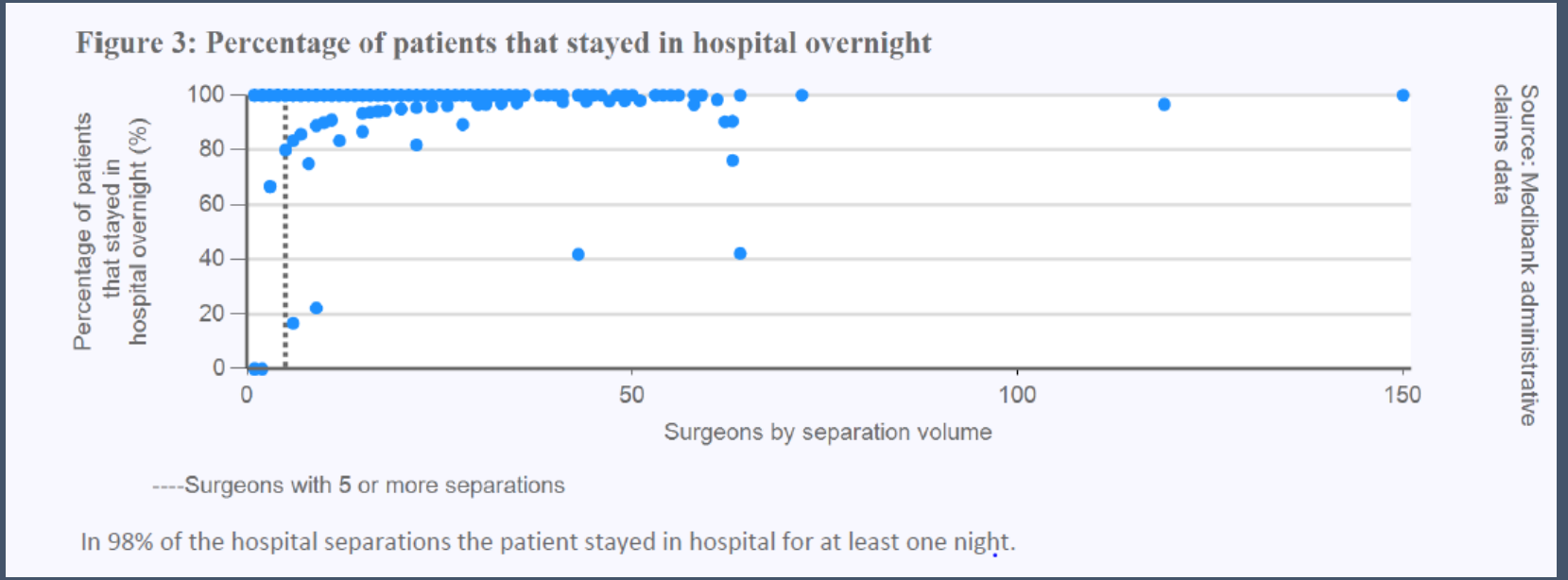
Whether or not LC could safely be performed as an outpatient procedure was once a subject of controversy, but it has been regularly performed as outpatient surgery in uncomplicated gallstone disease in the United States, showing that it is a safe procedure with similar morbidity rates to standard

Lillemoe KD, Yeo C et al (J GASTROINTEST SURG 1999;3:44-49.)

2012 : 50% UK
2019 : 75% UK benchmark

Day case Lap chole Australia 2018: 2%

- AUS Private cases 2018



- LOS for Lap chole 2018-19 NSW Public

DRG	episodes	% same day	% one night	% multi night	multi night episodes
Laparoscopic Cholecystectomy W/O Closed CDE W/O Cat or Sev CC	7570	4.0	55.7	40.3	3050
Hernia Procedures W/O CC	9036	28.6	56.3	15.1	1365

Same Date Surgery

- Targets based on the British Association of Day Surgery (BADS) benchmark have been established for these 5 DRGs and related IPCs.

DRG	IPC	Procedure	NSW same date (May 2023)	BADS benchmark
G10B	007	Inguinal hernia	39%	90%
H08B	002	Cholecystectomy (elective)	24%	75%
D11Z	012	Tonsillectomy (adults and paediatrics)	23%	90%
D10Z	011	Septoplasty	52%	95%
DO6Z	185	Functional Endoscopic Sinus Surgery (FESS)	41%	95%

SYSTEMS CHANGES TO IMPROVE DAY CASE

- All planned cholecystectomy/inguinal/femoral /umbilical/epigastric hernia procedures
- Default position is same date surgery **unless** an approved clinical justification is recorded and approved
- Patients should be placed on AM lists or first on list if major cases
- Procedure only lists established
- Minimise day cases on pm lists/ pm half day
- Adoption of existing LHD protocols

“there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things. Because the innovator has as enemies, all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new.

This coolness arises from fear….. and the incredulity of men, who do not readily believe in new things until they have had a long experience of them.”

Niccoli Machiavelli : “The Prince”

- Questions?