

RCOA
Royal College of Anaesthetists

WINTER SYMPOSIUM
3-4 December 2020

NEW DIRECTIONS
Chair: Dr Kate Tatham

TIVA versus volatile anaesthetics
Dr Ben Shelley





University of Glasgow | College of Medical, Veterinary & Life Sciences

Golden Jubilee National Hospital

**New directions:
TIVA versus volatile anaesthetics**

Dr Ben Shelley
Honorary Clinical Associate Professor
Consultant in Cardiothoracic Anaesthesia and Intensive Care

[@GJanaesresearch](#)



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Conflicts of interest

I practice TIVA...

... because I believe it works best in my hands...

... for the surgeries I do...

... for the patients I anaesthetise



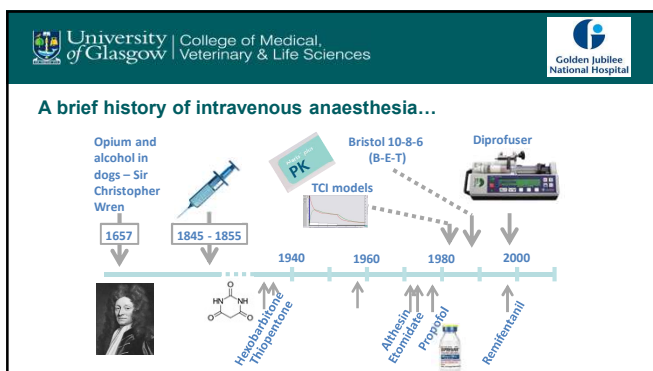
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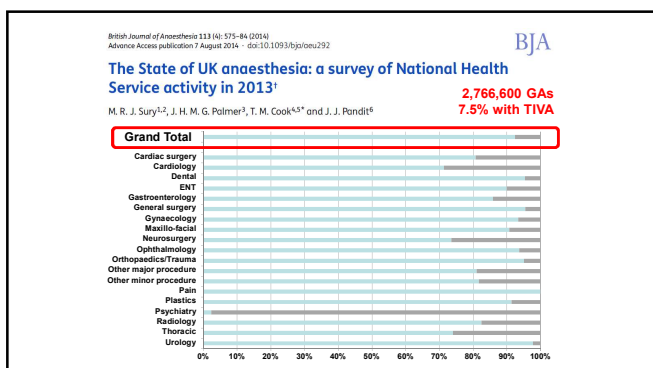
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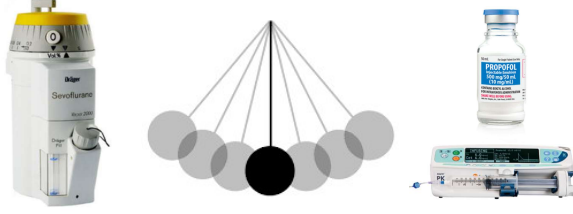





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The pendulum is swinging





What drives changes in individual practice?

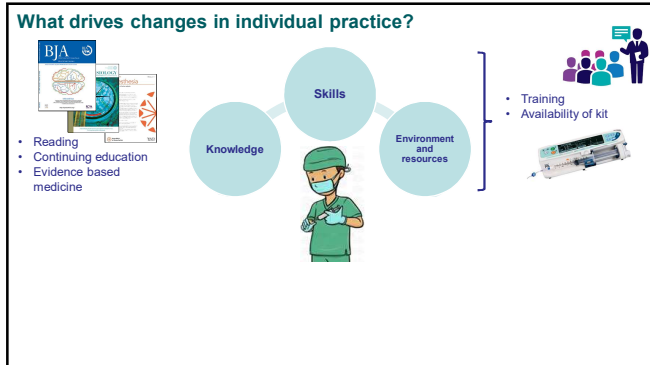


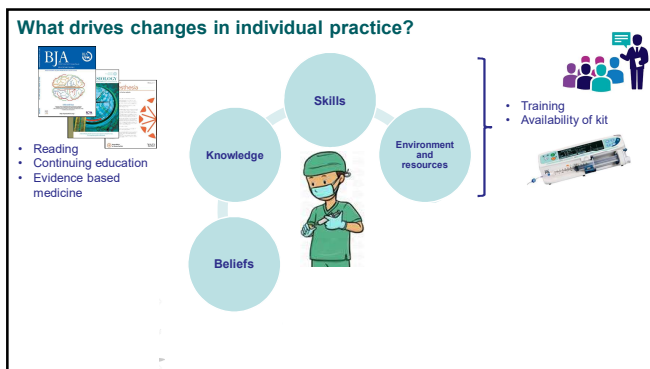
What drives changes in individual practice?

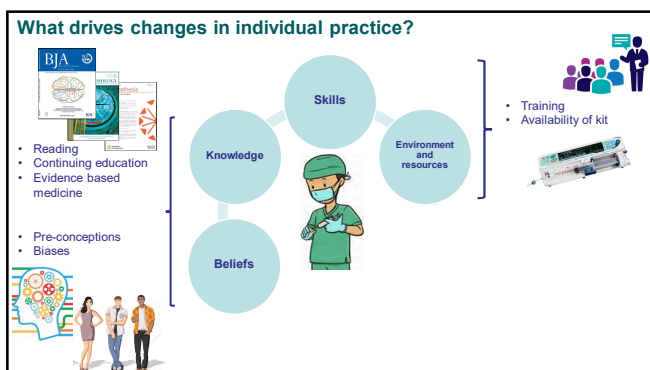



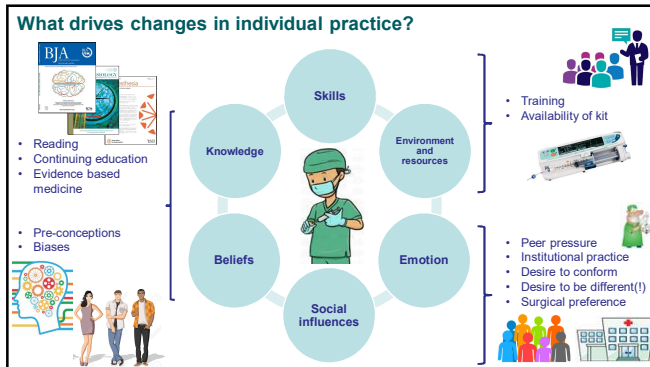
- Reading
- Continuing education
- Evidence based medicine

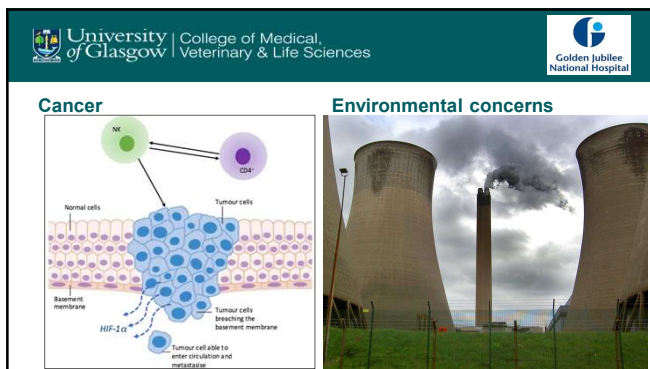



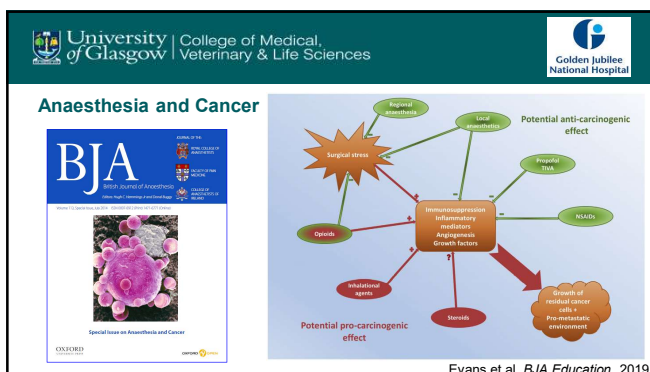


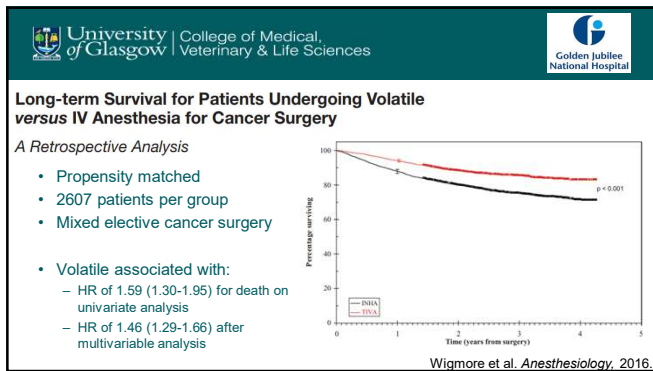


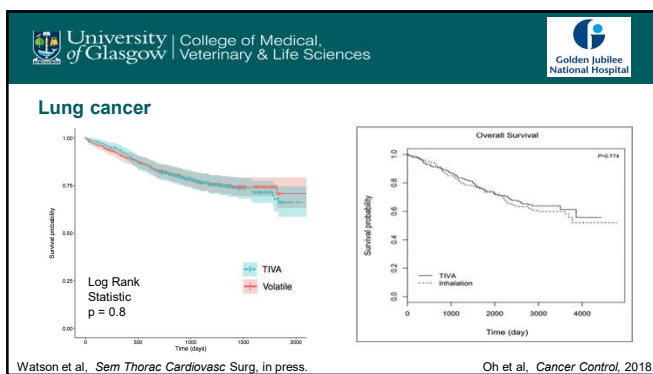


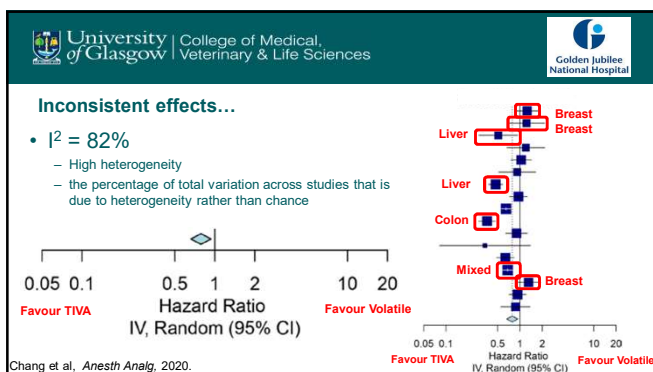












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Differential effects of sevoflurane on the metastatic potential and chemosensitivity of non-small-cell lung adenocarcinoma and renal cell carcinoma *in vitro*

| | Non-small cell lung cancer | Renal cell carcinoma |
|--------------------------------|----------------------------|----------------------|
| Cell viability | ↓ | ↑ |
| Chemosensitivity | ↑ | ↓ |
| Migration | ↔ | ↑ |
| TGF-β mediated cell signalling | ↓ | ↑ |

"Our findings indicate that sevoflurane may have different effects on the metastatic potential and chemosensitivity of different tumour types."

Ciechanowicz et al. *BJA*, 2018.

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Recurrence of breast cancer after regional or general anaesthesia: a randomised controlled trial

David J. Sessler, Lijun Pei, Yuesong Huang, Edith Fleischmann, Peter Marchand, Andrea Kurz, Douglas B. Meyer, Terje A. Meyer-Tenckhoff, Martin Grady, Bin Yu Tan, Sibby Aynd, Edward J. Meacham, David J. Sessler, on behalf of the Breast Cancer Recurrence Collaborators

2132 patients, 13 hospitals, 8 countries
Breast cancer surgery

- Propofol
- Paravertebral
- Volatile anaesthesia
- Opioid analgesia

Adjusted hazard ratio 0.92; 95% CI 0.74-1.13; log-rank p=0.84

Sessler et al. *Lancet*, 2019.

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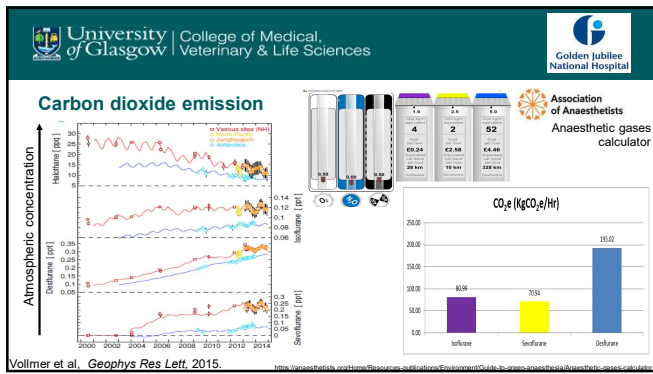
Environmental concerns

Association of Anaesthetists | RCOA | CAI

Joint Environmental Policy Statement (July 2017)

The Association, RCOA and CAI identify four priority areas for action:

- Priority 1: Position our organisations as leaders in promoting sustainable healthcare, promoting the specific contribution of anaesthesia while working with others.
- Priority 2: Commitment to providing the latest scientific evidence, education and the sharing of good practice to enable our members to minimise the environmental impact of their anaesthesia practice.
- Priority 3: Strive to continually monitor and improve the environmental sustainability of our organisations.
- Priority 4: Promote the reduction of individual and institutional wastage of financial and environmental resources in healthcare delivery.



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Total Intravenous Anesthetic Versus Inhaled Anesthetic: Pick Your Poison

Jodi D. Sherman, MD,* and Brian Barrick, MD, DDS†

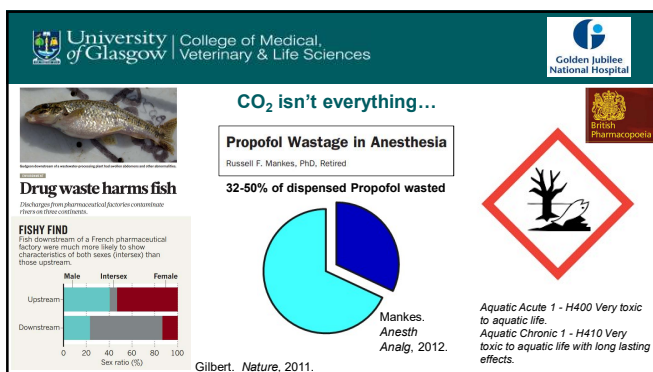
Anaesthesia 2020; 75: 451-454
doi:10.1111/j.1469-7580.2019.14853.x

Editorial

Abandoning inhalational anaesthesia

Los Angeles Times
Performing surgery on a warming planet: Can anesthesia go green?

THE TIMES
Careful choice of anaesthetic can help save planet
Hospitals switch anaesthetic gas to save planet (and money)

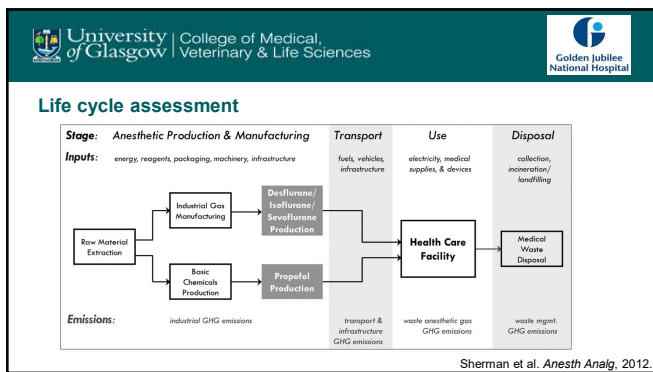


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CO₂ isn't everything...





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Even if the grass is only a little bit greener...

- Major non-cardiac surgery in the UK
~1.5 million operations per year costing £5.6 billion
- If one of these techniques:
 - Reduces hospital stay by half a day → save £170 million / year
 - Reduces 2% mortality by 0.5% → save 7500 lives

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RESEARCH ARTICLE Open Access

Propofol vs. inhalational agents to maintain general anaesthesia in ambulatory and in-patient surgery: a systematic review and meta-analysis

- 229 RCTs were included with a total of 20,991 patients

Schraag et al. *BMC Anesthesiology*, 2018.

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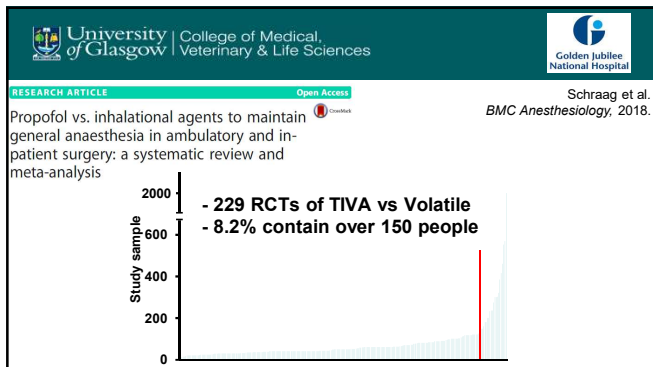
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| TIVA Better | Not different | Volatile better |
|-----------------------------|-----------------------|------------------------------|
| PONV | Haemodynamics | Time to respiratory recovery |
| Patient experience | Accidental awakenings | Time to extubation |
| Time in PACU | Agitation | Analgesic consumption |
| Pain in PACU | Time to awakening | |
| Muscle relaxant consumption | Shivering | |
| | Pain at 12 to 24h | |
| | Cognitive assessment | |
| | Mortality | |
| | Hospital LOS | |

Schraag et al. *BMC Anesthesiology*, 2018.



CLINICAL TRIALS UNIT

VITAL

VOLATILE VS TOTAL INTRAVENOUS ANAESTHESIA
FOR MAJOR NON-CARDIAC SURGERY

Funded by NIHR HTA (NIHR130573)
Sponsor: University of Warwick
Contact email: VITAL@warwick.ac.uk
Dr Joyce Yeung (j.yeung.4@warwick.ac.uk)
Dr Shaman Jhanji (Shaman.Jhanji@rmh.nhs.uk)

UK INNOVATIVE MEDICINE
CLINICAL TRIALS NETWORK

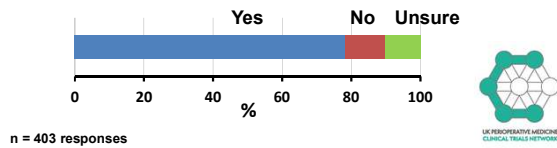
VITAL team

Co-Chief Investigators Dr Joyce Yeung – Warwick Clinical Trials Unit
Dr Shaman Jhanji – Royal Marsden / ICR

Co-applicants:
Dr Ben Shelley – POMCTN CI's scheme - Glasgow
Professor Rupert Pearce – POMCTN - QMUL
Professor Ramani Moonesinghe – PQIP - UCL
Professor Janet Dunn – Clinical Trials - Warwick
Dr Louise Hillier – Statistics - Warwick
Professor James Mason – Health Economics - Warwick
Dr Cecilia Vindrola – Qualitative methodology - UCL
Mr John Braun - PPI
Mrs Monica Jefford - PPI

POMCTN survey

If there were a trial in the future asking the research question: "is TIVA superior to volatile in terms of patient outcomes and cost effectiveness?", would you be willing to consider randomise patients?



The call

19/49 Call for Ambitious Data-enabled Trials, Health Services and Public Health Research Studies – NIHR is interested in funding studies using innovative **data-enabled designs** to answer pressing knowledge gaps for health, public health, social care evidence users, NHS patients, people with lived experience and/or policymakers.

NIHR | National Institute for Health Research

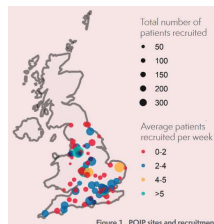
PQIP Perioperative Quality Improvement Programme

A national QI study

Systematic measurement of complications, mortality and PROMS

Year 1 – 6,378

Year 2 (to Aug 2019) – 12,152
124 hospitals



Volatile vs Total intravenous Anaesthesia for major non-cardiac surgery: A pragmatic randomised trial

Multi-centre pragmatic RCT with health economic evaluation

Primary objective:

To test whether TIVA is superior to inhalational anaesthesia....



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| | Mortality | |
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Schraag et al. *BMC Anesthesiology*. 2018.

Days alive and at home at 30 days (DAH₃₀)?

The ultimate composite outcome?

Increased with:

- delayed discharges (postoperative complications)
- discharge to a rehab facility / nursing home
- re-hospitalisation
- postoperative death



"It thus captures much of the surgical experience, integrating efficacy, quality and safety, and thus reflecting value-based care." – P Myles. *BMJ*, Open 2017

Volatile vs Total intravenous Anaesthesia for major non-cardiac surgery: A pragmatic randomised trial

Multi-centre pragmatic RCT with health economic evaluation

Primary objective:

To test whether TIVA is superior to inhalational anaesthesia in terms of days alive and at home at 30 days (DAH30), survival and quality of recovery amongst patients undergoing major non-cardiac surgery

Secondary objective:

- To evaluate safety of TIVA
- To assess cost effectiveness of TIVA



Outcome measures (*already in PQIP)

Primary outcome

- Days alive and at home at 30 days after surgery (DAH30)

Secondary outcomes

- Days alive and at home at 90 days (DAH90)
- 30-day, 90-day, 6 month mortality
- Quality of recovery after anaesthesia (QoR-15) at day 3*
- Patient satisfaction with anaesthesia (Bauer questionnaire) on day 1*
- Major perioperative complications (Postoperative morbidity survey) on day 7*
- Accidental awareness under anaesthesia (modified Brice questionnaire) on day 1, day 3, day of discharge
- Health resource use during the six months after surgery
- QoL (WHODAS, EQ-5D-5L) at baseline, at hospital discharge* and six months after surgery

Inclusion/Exclusion criteria

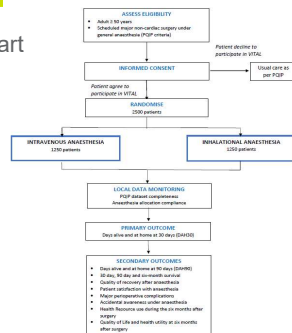
Inclusion criteria

1. Age \geq 50 years
2. Elective major non-cardiac surgery under general anaesthesia (meeting inclusion criteria of PQIP study)
3. Written informed consent for trial participation

Exclusion criteria

1. Contraindication to either TIVA or inhalational anaesthesia
2. Clinician refusal
3. Procedures where the patient is not expected to survive for 30 days
4. Previous participation in VITAL trial

Study flowchart



Hospital sites

Sample size: 2500 patients
Total number of sites: 40 NHS hospitals
PQIP participation not mandatory

Pilot Study

Target opening **April 2021**
We are looking for 10 pilot sites with solid track record
Target 2-3 patients/site/month



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FOR MAJOR NON-CARDIAC SURGERY

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