OXCOG

OXCOG.CO.UK

Quality Improvement, Audit & Research for MRCOG Part 2

MRCOG Part 2 Online Revision Course

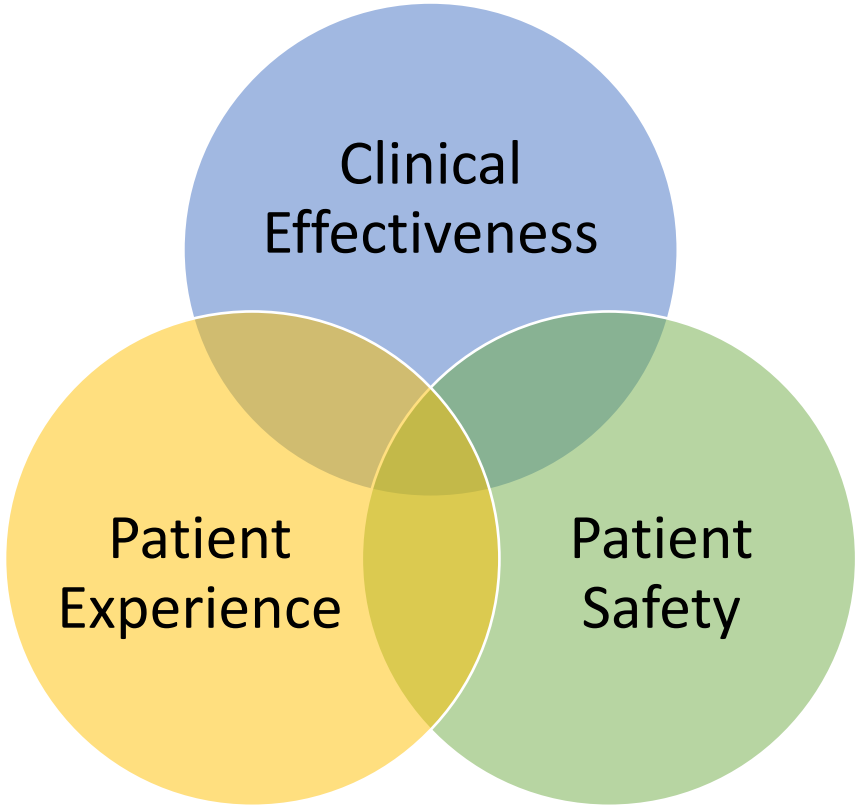
Miss Kit Robertson – Consultant in Obstetrics and Maternal-Fetal Medicine, Oxford University Hospitals

Aims & Objectives

- Cover the MRCOG syllabus requirements related to quality improvement, audit and research including:
  - QI methodologies including clinical audit
  - Research methodologies
  - Evidence based practice
    - How clinical standards and guidelines are produced
    - Levels of evidence

Potential SBA/EMQ

Quality



- Department of Health, 2008. High quality care for all: NHS next stage review – Lord Darzi
- No single definition of quality improvement

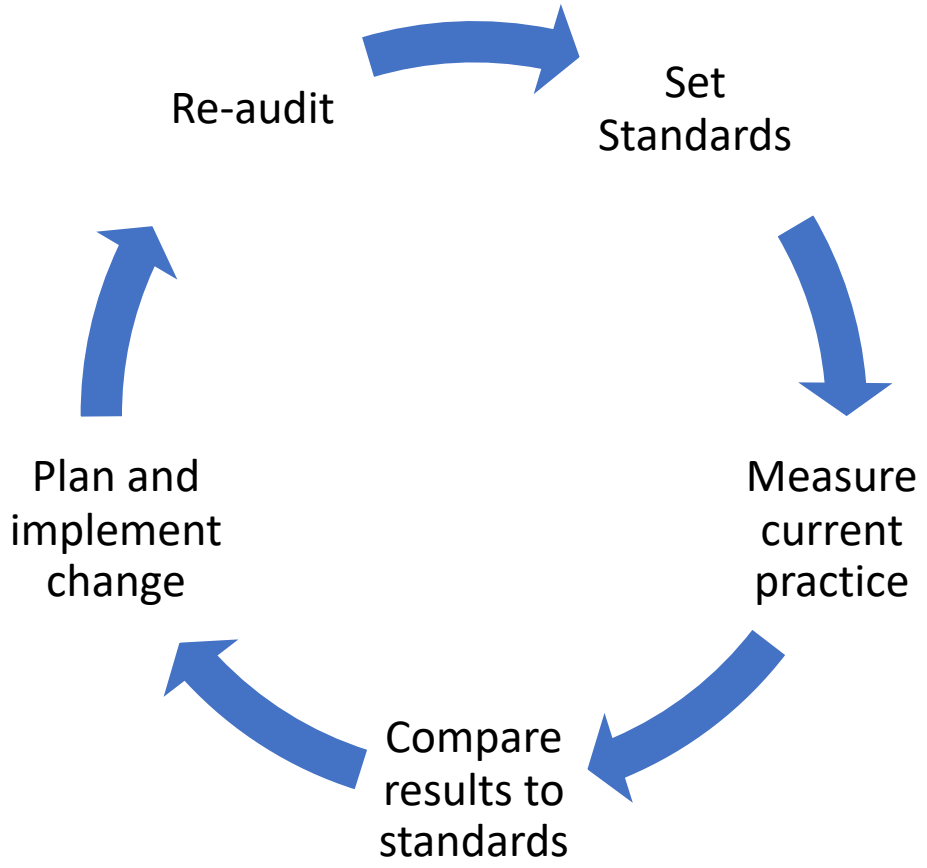
Quality Improvement Tools

Tools to measure care against agreed standards	
Clinical audit	Checks clinical care meets defined quality standards
Statistical process control	Measures quality within predefined parameters
Performance benchmarking	Measures quality against peers or national targets
Tools to understand the cause of the problem	
Process mapping	Maps the patient journey for quality improvement opportunities
Root cause analysis	Systematically uncovers the causes of events affecting quality
Tools to plan and test improvement projects	
Model for improvement	Decides upon, test and refines quality improvements
Plan do study act	Introduces and tests potential quality improvements on a small scale
Lean six sigma	Eliminates waste and redirects resources for quality and efficiency
Tools to promote change in practice	
Technological innovations	Automates processes and systems for care quality improvement
Decision trees	Improves the quality and consistency of processes in healthcare
Communication tools	Improves quality of care through structured information exchange

Clinical Audit

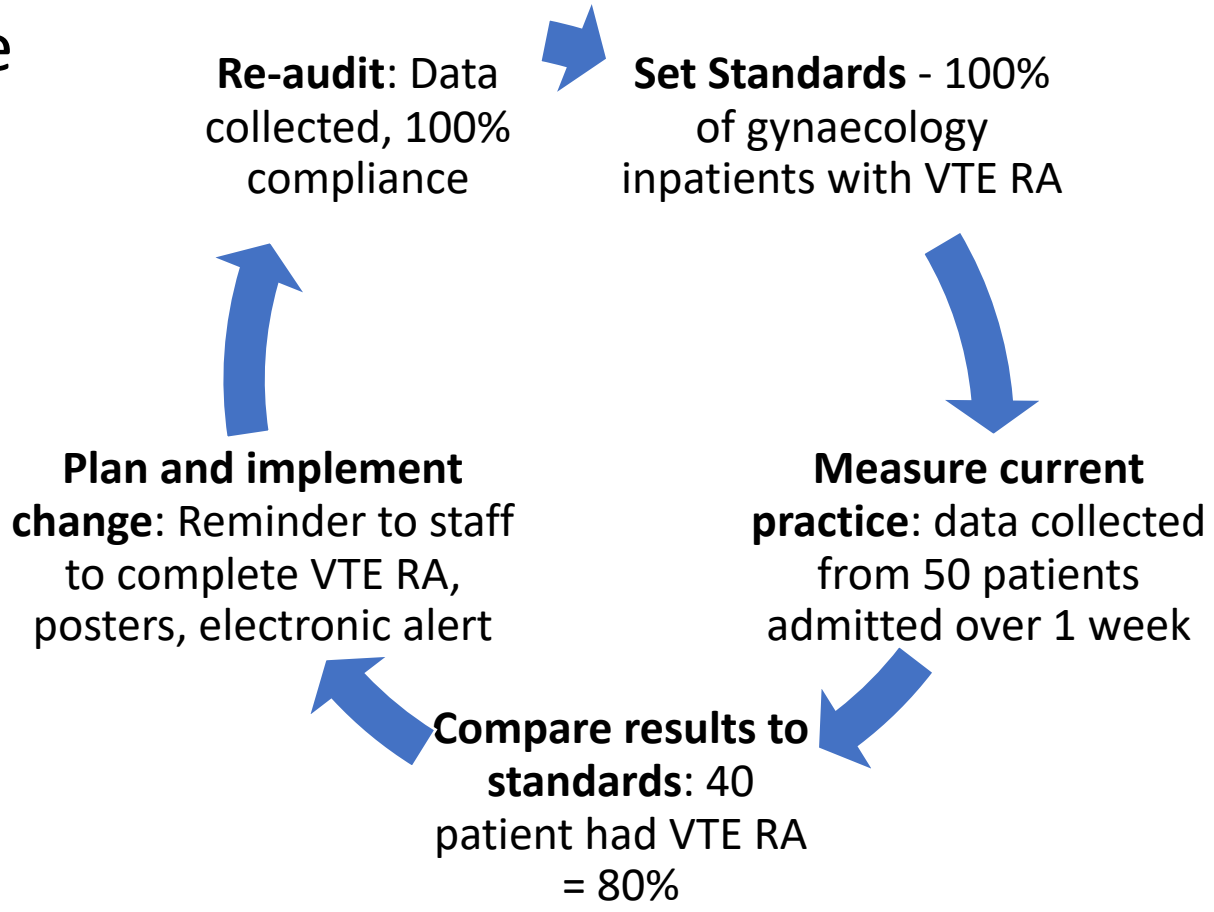
Used To:	Check clinical care meets defined quality standards and monitor improvements to address shortfalls identified.
Most effective:	For ensuring compliance with specific clinical standards and driving clinical care improvement.
Pre-requisites:	• Evidence based clinical standards drawn from best practice • Audit proforma comprised of measures derived from the standards • Clearly defined population of patients or sample from population
Overview:	Quality improvement cycle that involves measurement of the effectiveness of healthcare against agreed and proven standards for high quality, and taking action to bring practice in line with these standards so as to improve the quality of care and health outcomes
How to use it:	• Audit cycle • Can be retrospective but increasingly prospective • Sharing actions with relevant workforce

Audit Cycle


Set Standards
Measure current practice
Compare results to standards
Plan and implement change
Re-audit

Case Example – Clinical Audit

- VTE compliance



Statistical Process Control

Used For:	Measure and control process quality against predefined parameters.
Most effective:	When a process requires monitoring and control to maximise its full potential for optimum quality of care.
Pre-requisites:	A process requiring monitoring and control, and stakeholders.
Overview:	Statistical process control (SPC) is a method of quality improvement using statistics to monitor and control a process, ensuring that it operates at its full potential. SPC can be applied to any process within which outputs can be measured. SPC involves: • Control charts • A focus on continuous improvement • The design of experiments SPC highlights the degree of variation from required outputs and enables the measurement of the impact of any experimental process change made for improvement.
How to use it:	An upper control limit and a lower control limit are set using standard deviations from historical mean or baseline measurements Outputs are charted for variation in quality Analysis of variation enables the identification of shortfalls against the baseline Shortfalls require targeted investigation, process adjustment, and continued monitoring

Case Example – Statistical Process Control

LABOUR WARD Maternity Dashboard

CLINICAL INDICATOR	Goal	Red flag	Measure	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT
Births annual (monthly)	5000 (<420)	>440	Births	429	400	414	419	441	418	420	439	465
Instrumental deliveries	10-15%	<5% or >20%	Forceps+ventouse	10	16	9	11	23	13	12	17	22
Caesarean sections	<20%	>23%	% of total births	24	18	15	21	20	13	16	25	26
Maternal Morbidity												
Eclampsia	< 4 in 2months	> 6 in 2months	Number of women	1	0	0	1	0	0	0	0	0
Admission to ITU	"	"	"	1	0	0	0	1	0	0	0	1
Blood transfusion >4 units	"	"	"	5	0	1	0	5	1	1	6	8
Postpartum hysterectomy	"	"	"	0	0	0	0	0	0	0	0	0
Neonatal Morbidity												
Meconium aspiration	<3 per month	>4 per month	Number of neonate	1	0	0	0	3	0	0	2	1
HIE Grades 2 & 3	"	"	"	1	0	0	0	2	0	0	3	3
Serious Incidents												
Second stage C/S	<0.5%	>1%	% of total births	0.3	0	0	0	0.5	0	0.2	0.6	1.0
Massive PPH>2L	<5 per month	>7 per month		5	0	1	0	5	1	2	7	8
Shoulder dystocia	<6 per month	> 10 per month		0	7	2	0	9	4	0	5	6
3rd & 4th degree tear	<6 per month	>10 per month		5	3	8	6	11	9	6	12	10
Stillbirths	<2 per month	>4 per month		2	0	0	0	2	0	3	1	1

Performance benchmarking

Used For:	Drive quality improvement by raising awareness of local and national performance targets, and finding and sharing best practice.
Most effective:	When local and national performance targets are established and given organisational importance as drivers for quality improvement.
Pre-requisites:	Local and national performance targets, and data collection routines for monitoring and sharing systems and processes.
Overview:	Performance indicators are used as part of a benchmarking process to raise awareness of required standards and act as drivers for quality improvement. Healthcare organisations and their departments strive to meet standards imposed, and those performing well demonstrate models of best practice which can be shared, becoming the benchmark against which performance is compared.
How to use it:	Performance may be monitored through provision of data, or evidence of compliance with standards, to an external agency publishing league tables, which can also drive quality improvement as organisations aim for lead positions. Key performance indicators (KPIs) and benchmarking are also used within healthcare organisations to compare activity across different departments or units, unearthing and sharing best practice locally to drive quality improvement.

Case Example – Performance benchmarking

- Maternal medicine network KPIs
  - Set by NHS England
  - Regional data collection
  - Identifying units with good practice
  - Raising standards across network

5.3 Key performance indicators

Outcomes and equalities

- Rate of maternal mortality and unscheduled admission to ICU with pulmonary oedema due to fluid overload, unrecognised heart disease, acute kidney injury secondary to HELLP (haemolysis, elevated liver enzymes and low platelet count) or acute fatty liver of pregnancy.
- Stillbirths, early neonatal deaths and neonatal unit admissions in women with maternal conditions of sufficient severity to trigger referral for advice or delivery to the MMC.
- All outcome and process indicators analysed and presented according to ethnicity and deprivation defined by IMD.
- Equality of access – ie are women across ethnicities referred to/seen by MMC at an equitable rate?

Process indicators

- Standardised care pathways for all common conditions implemented across MMN footprint.
- Percentage of women in high risk group who are referred for (i) care (ii) opinion to an MMC who have an MDT-produced plan for (as appropriate) antenatal, intrapartum, postpartum contraception care in their notes.
- Are guidelines/standard operating procedures (SOPs) in place across all EDs for identification/referral of red-flag symptoms and who to contact?

Pre-conception

- Access to pre-pregnancy advice in place for all women with chronic conditions?

Acute management

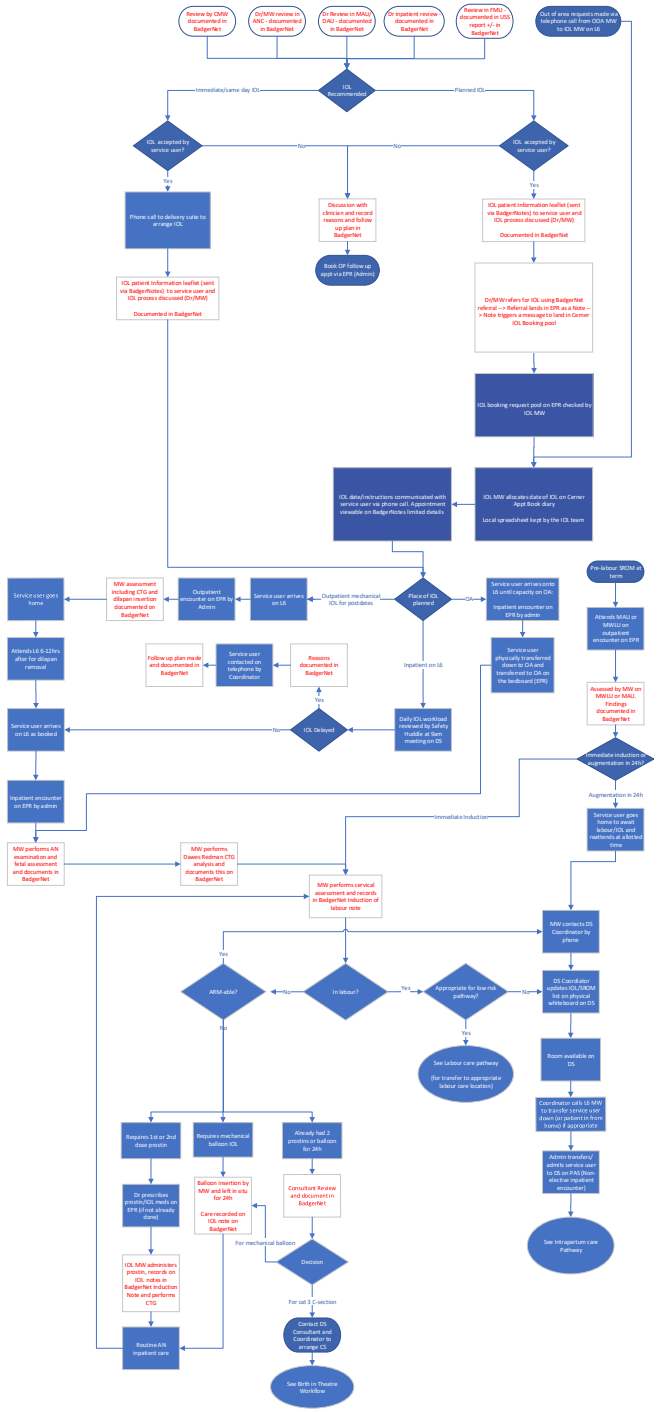
- In all units to demonstrate effective communication between named link physician for maternity and link obstetrician for acute medicine:
  - 1. Proportion of women who are pregnant or <6 weeks postpartum admitted through ED where admission discussed with obstetrician/obstetric physician (from case notes)
  - 2. Proportion of women who are pregnant or <6 weeks postpartum and who have a CT pulmonary angiogram who have evidence of discussion with consultant obstetrician or obstetric physician.

Process mapping

Used For:	Map the journey of people who use the services (‘patient’) to identify quality improvement opportunities.
Most effective:	When the ‘patient’ journey is complex with associated inefficiencies.
Pre-requisites:	A ‘patient’ journey and stakeholders.
Overview:	• Reviewing and mapping the whole ‘patient’ journey enables the identification of inefficiencies and opportunities for improvement • Illustrates unnecessary steps, duplication, discrepancies, and variation
How to use it:	• Start with high level process map – work towards more detailed map • Set out exactly what happens in practice, as opposed to what those involved think happens • Barriers to safe, effective care are identified and process changes can be discussed, agreed and designed out of the system • Process mapping promotes staff ownership of each stage of the process • Stakeholder input to avoid the ripple effect, whereby a change to one stage of a process adversely affects another stage

Case Example – Process mapping

- Transitioning to full electronic maternity record
  - Mapping entire patient pathway for e.g. Induction of labour
  - Identifying documentation duplication
  - Streamlining process



Root cause analysis

Used For:	Uncover the physical, human and latent causes of events affecting quality.
Most effective:	When events affecting quality, are noted and analysis is required to identify the root causes of events, for improvement.
Pre-requisites:	Events affecting quality and stakeholders.
Overview:	Root cause analysis (RCA) is a structured process, often used as a reactive method, to identify causes after an adverse event has occurred, or as an investigative tool to identify causes after clinical audit findings demonstrate shortfalls in the quality of care
How to use it:	• A tool often used in RCA is the fishbone cause and effect diagram • The fishbone diagram helps identify a broad range of possible causes behind an issue or problem and the associated effects, known as care/ service delivery problems (C/SDPs) • With each line of enquiry identified it is helpful to ask 'Why does this happen?' five times, known as 'The Five Whys Technique', to explore causes and remedial actions

Case Example – Root cause analysis

- Never event – retained swab

Model for improvement

Used For:	Decide upon measurable quality improvements required and test and refine them on a small scale, prior to wholesale implementation.
Most effective:	When a procedure, process or system needs changing, or a new procedure, process or system is to be introduced, for measurable quality improvement.
Pre-requisites:	A procedure, process or system which needs changing, or a new procedure, process or system to be introduced for measurable quality improvement and a small cohort of associated stakeholders.
Overview:	The model for improvement accelerates improvements in the quality of healthcare processes and outcomes, via two phases: 1. Three fundamental questions, asked and addressed in any order, to define required changes and measures of improvement 2. The plan, do, study, act (PDSA) cycle to test changes in live settings and determine improvements

Case Example - Model for improvement

- Surgical site infection bundle
  - Aim: Reduce infection after CS
  - Measure: reduced attendance with wound infection
  - Change: structured protocol of measures to reduce infection (glove changes during op, tissue glue instead of dressing, dissolvable sutures)

Plan do study act (PDSA)

Used For:	Introduce and test potential quality improvements and refine them on a small scale, prior to wholesale implementation.
Most effective:	When a procedure, process or system needs changing, or a new procedure, process or system is to be introduced.
Pre-requisites:	A procedure, process or system which needs changing, or a new procedure, process or system to be introduced and a small cohort of associated stakeholders.
Overview:	Plan, do, study, act (PDSA) cycles test changes to assess their impact, ensuring new ideas improve quality before implementation on a wider scale. Making changes to processes can give unexpected results, so it is safer and more efficient to test quality improvements on a small scale before wholesale implementation.
How to use it:	A procedure, process or system which needs changing, or a new procedure, process or system to be introduced is developed (plan), implemented for a specific timeframe on a small scale with a minimal cohort of stakeholders (do), evaluated (study) and adjusted (act), with repeated PDSA cycles, until it is fit for purpose and wholesale implementation.

Case Example - Plan do study act (PDSA)

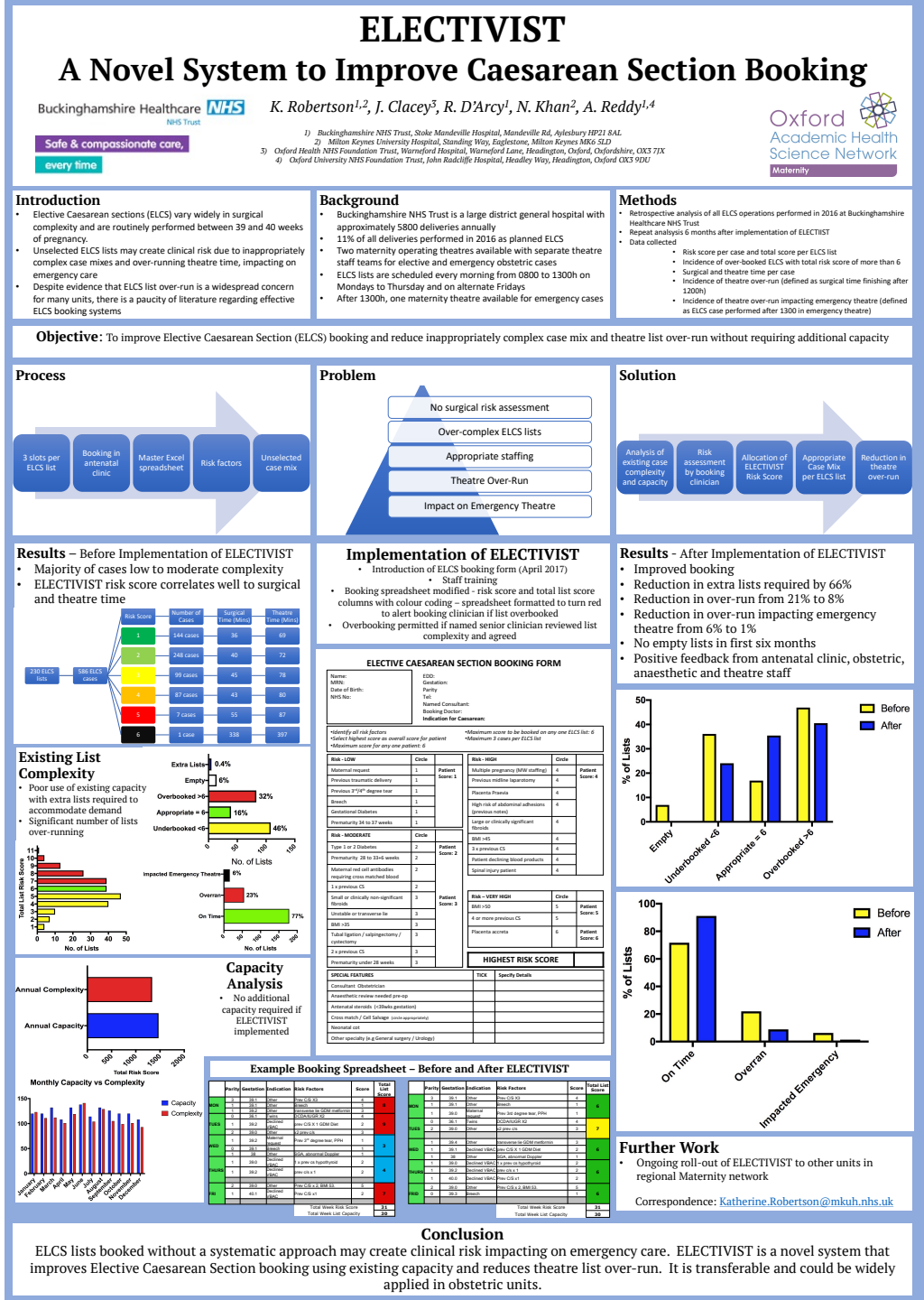
- Surgical site infection bundle to reduce CS wound infection
  - PDSA1: Change to dissolvable sutures at ELCS
  - PDSA2: Introduction of glove changes during op at ELCS
  - PDSA 3: Tissue glue instead of dressing at ELCS
  - Wholesale implementation of SSI bundle for all CS

Lean/Six sigma

Used For:	Analyse healthcare systems to eliminate waste and redirect resources towards a more efficient, improved and consistent quality of care.
Most effective:	When healthcare systems are inefficient, wasteful and inconsistent in quality of care.
Pre-requisites:	A procedure, process or system which needs changing to become more efficient and consistent and associated stakeholders.
Overview:	• Lean seeks to improve flow in the value stream and eliminate waste using process mapping. • Six sigma uses the framework Define, measure, analyse, improve and control (DMAIC), with statistical tools, to uncover and understand root causes of variation and reduce them. • Rapid transformational improvement results, with cost savings.

Case Example - Lean/Six sigma

- ELECTIVIST
  - Problem: ELCS lists overrunning
  - Process mapping pathway
  - DMAIC
    - **Define**: overrun
    - **Measure**: overrun
    - **Analyse**: Case mix
    - **Improve**: Novel booking system with scoring
    - **Control**: Detailed monitoring of booking and overrun, sharing with stakeholders



Technological innovations

Used For:	Automate processes and systems to increase reliability, reduce human error and variation in care, for quality improvement.
Most effective:	When processes and systems require automation for reliability, ultimately saving resources.
Pre-requisites:	Processes and systems which require reliability and reduced variation, stakeholders such as clinicians, information governance and IT specialists.
Overview:	Technological innovations automate processes and systems, offer reliability, reduce human error, and variation in care, and thus drive quality improvement
How to use it:	• Focused on the telehealth, telemedicine and telecare sectors • Technologies concerned with health and wellbeing are accessed by people remotely, or provided for them at a distance, which reduces time absorbed through routine appointments • More flexible and empowered self-care arrangements, improving quality of life and healthcare experience

Case Example - Technological innovations

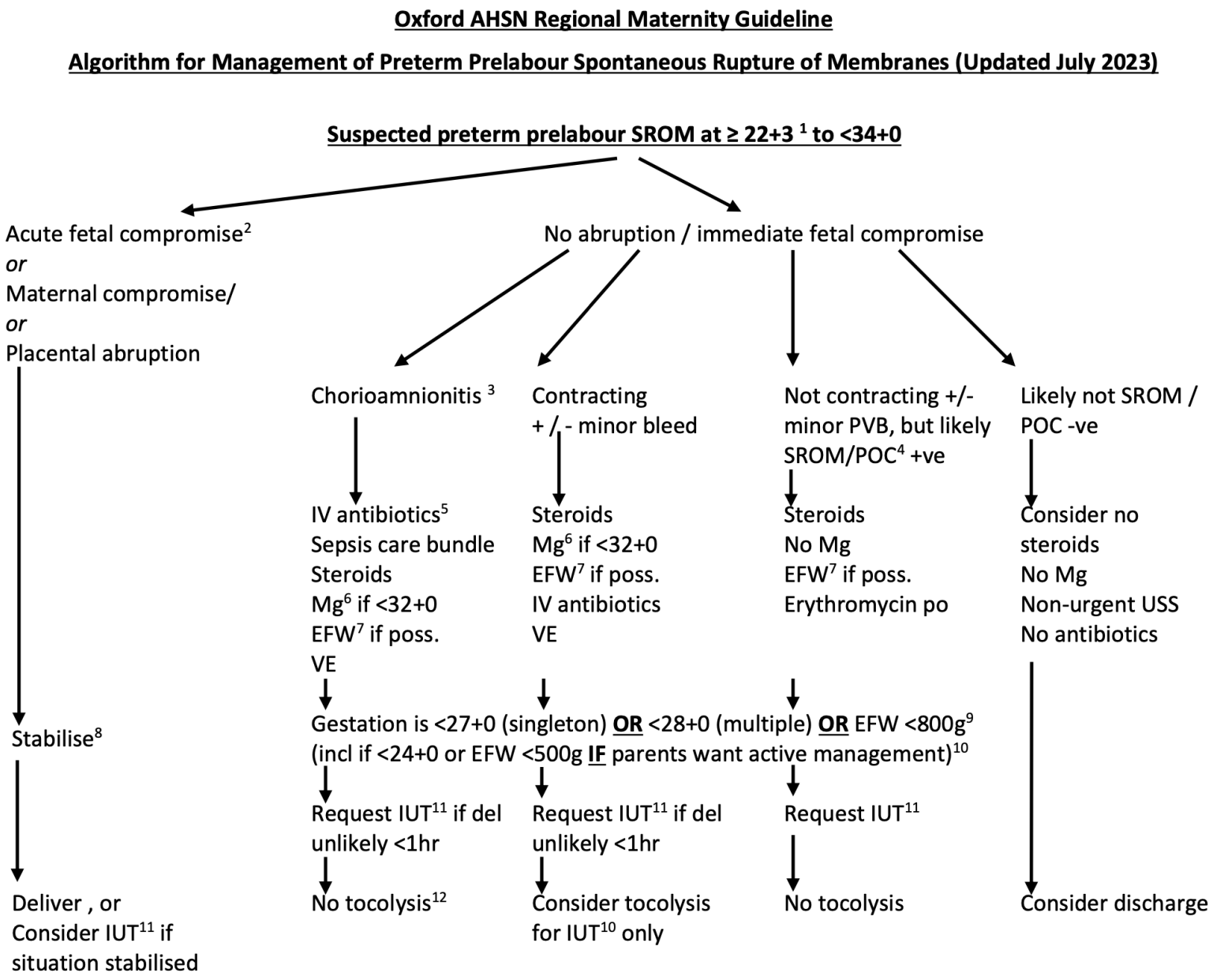
- GDM Healthcare App
  - Remote monitoring of patient blood glucose
  - Patient uploads readings
  - Clinicians can check and action remotely

Decision Trees

Used For:	Improve the quality and consistency of processes in healthcare.
Most effective:	When decisions around healthcare options require consistency of approach.
Pre-requisites:	A healthcare pathway and stakeholders.
Overview:	A decision tree is a flowchart whereby each intersection represents a test and each branch represents the outcome of the test, designed by stakeholders of a multidisciplinary team to improve quality and consistency of decisions taken throughout a process.
How to use it:	• Useful when choices for treatment are uncertain, providing clear choices such as diagnostics, referrals, medication and next steps, involving established algorithms and healthcare criteria • Identifies the most favourable treatment options, and may also include the risks and benefits of each treatment and the potential sequence of events where risks are realised, improving the quality of care.

Case Example - Decision Trees

- Preterm labour flowchart
  - Aids decision making in whether to deliver or arrange in utero transfer in extremely preterm babies at risk of preterm labour



Communication tools

Used For:	Improve the quality of care through the structured exchange of essential information.
Most effective:	When essential information requires rapid transfer.
Pre-requisites:	Essential information data set and stakeholders.
Overview:	Clear communication in healthcare is essential and carefully designed tools can help ensure comprehensive, complete and consistent communication to improve the quality of care.
How to use it:	• Improves the consistency of exchange of essential information between clinicians, and between clinicians and patients and their relatives and carers • May include patient healthcare records, patient information leaflets and guidance, structured patient consultations, active listening techniques and prompts to encourage patients to ask questions about their care

Case Example - Communication tools

- SBAR

Handover SBAR Tool for Women's Services – please attach in the woman's notes

Transfer/Handover Tool

S
SITUATION

Transferring from _____ to _____

Reason for admission/transfer? _____

What's happening now? _____

Concerns _____

Name of woman: _____

DOB: _____

Case note number: _____

NHS number: _____

B
BACKGROUND

Parity _____ EDD _____ Gestation _____ Days after birth _____ Blood Group _____

A
ASSESSMENT

R
RECOMMENDATION

Plan of care:

Outstanding investigations:

SBAR given by (sign and print name) _____

SBAR received by (sign and print name) _____ Date and time _____

Quality Improvement - Example EMQ

	Answer Option
A	Clinical Audit
B	Statistical Process Control
C	Performance benchmarking
D	Process mapping
E	Root cause analysis
F	Model for improvement
G	Plan Do Study Act
H	Lean Six Sigma
I	Technological innovation
J	Decision Tree
K	Communication Tool

- *For each scenario described below, choose the single most appropriate option from the above list. Each option may be used once, more than once or not at all.*

- A woman presents to the emergency department four days after an emergency Caesarean section with shortness of breath and is diagnosed with a pulmonary embolus. Despite risk factors for VTE, she was not prescribed thromboprophylaxis. An incident form is completed and you are asked to undertake a quality improvement process to understand how this can be prevented in the future.

Quality Improvement - Example EMQ

	Answer Option
A	Clinical Audit
B	Statistical Process Control
C	Performance benchmarking
D	Process mapping
E	Root cause analysis
F	Model for improvement
G	Plan Do Study Act
H	Lean Six Sigma
I	Technological innovation
J	Decision Tree
K	Communication Tool

- *For each scenario described below, choose the single most appropriate option from the above list. Each option may be used once, more than once or not at all.*

- A woman presents to the emergency department four days after an emergency Caesarean section with shortness of breath and is diagnosed with a pulmonary embolus. Despite risk factors for VTE, she was not prescribed thromboprophylaxis. An incident form is completed and you are asked to undertake a quality improvement process to understand how this can be prevented in the future.

- **Answer: E – root cause analysis**

Quality Improvement - Example EMQ

	Answer Option
A	Clinical Audit
B	Statistical Process Control
C	Performance benchmarking
D	Process mapping
E	Root cause analysis
F	Model for improvement
G	Plan Do Study Act
H	Lean Six Sigma
I	Technological innovation
J	Decision Tree
K	Communication Tool

- *For each scenario described below, choose the single most appropriate option from the above list. Each option may be used once, more than once or not at all.*

- A woman presents to the emergency department four days after an emergency Caesarean section with shortness of breath and is diagnosed with a pulmonary embolus. Despite risk factors for VTE, she was not prescribed thromboprophylaxis. During the investigation of this incident, numerous factors were identified as contributing including poor handover of care between Labour Ward and the postnatal ward. What quality improvement process could reduce the risk of this occurring again?

Quality Improvement - Example EMQ

	Answer Option
A	Clinical Audit
B	Statistical Process Control
C	Performance benchmarking
D	Process mapping
E	Root cause analysis
F	Model for improvement
G	Plan Do Study Act
H	Lean Six Sigma
I	Technological innovation
J	Decision Tree
K	Communication Tool

- *For each scenario described below, choose the single most appropriate option from the above list. Each option may be used once, more than once or not at all.*

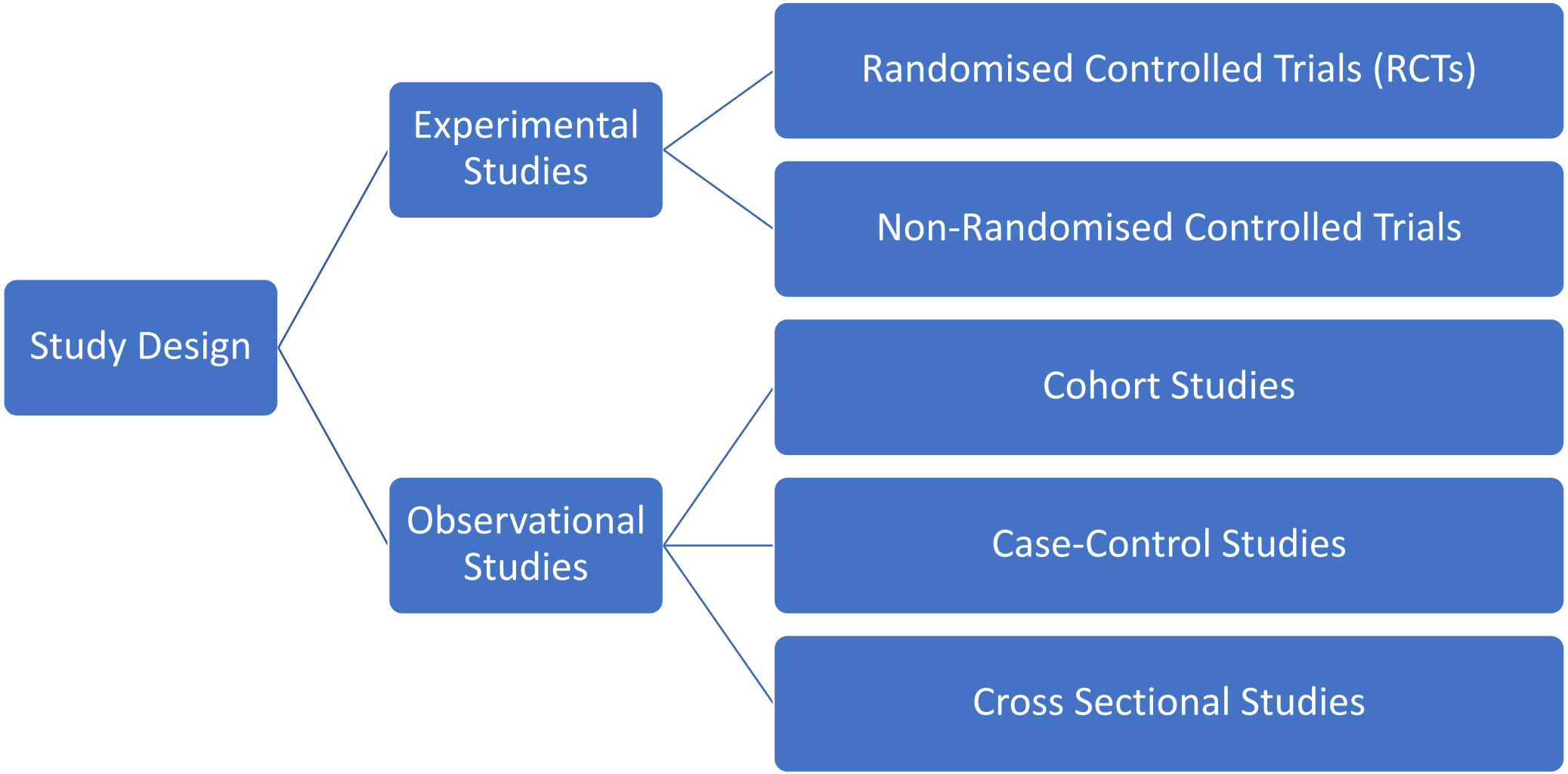
- A woman presents to the emergency department four days after an emergency Caesarean section with shortness of breath and is diagnosed with a pulmonary embolus. Despite risk factors for VTE, she was not prescribed thromboprophylaxis. During the investigation of this incident, numerous factors were identified as contributing including poor handover of care between Labour Ward and the postnatal ward. What quality improvement process could reduce the risk of this occurring again?

- **Answer: K – Communication Tool**

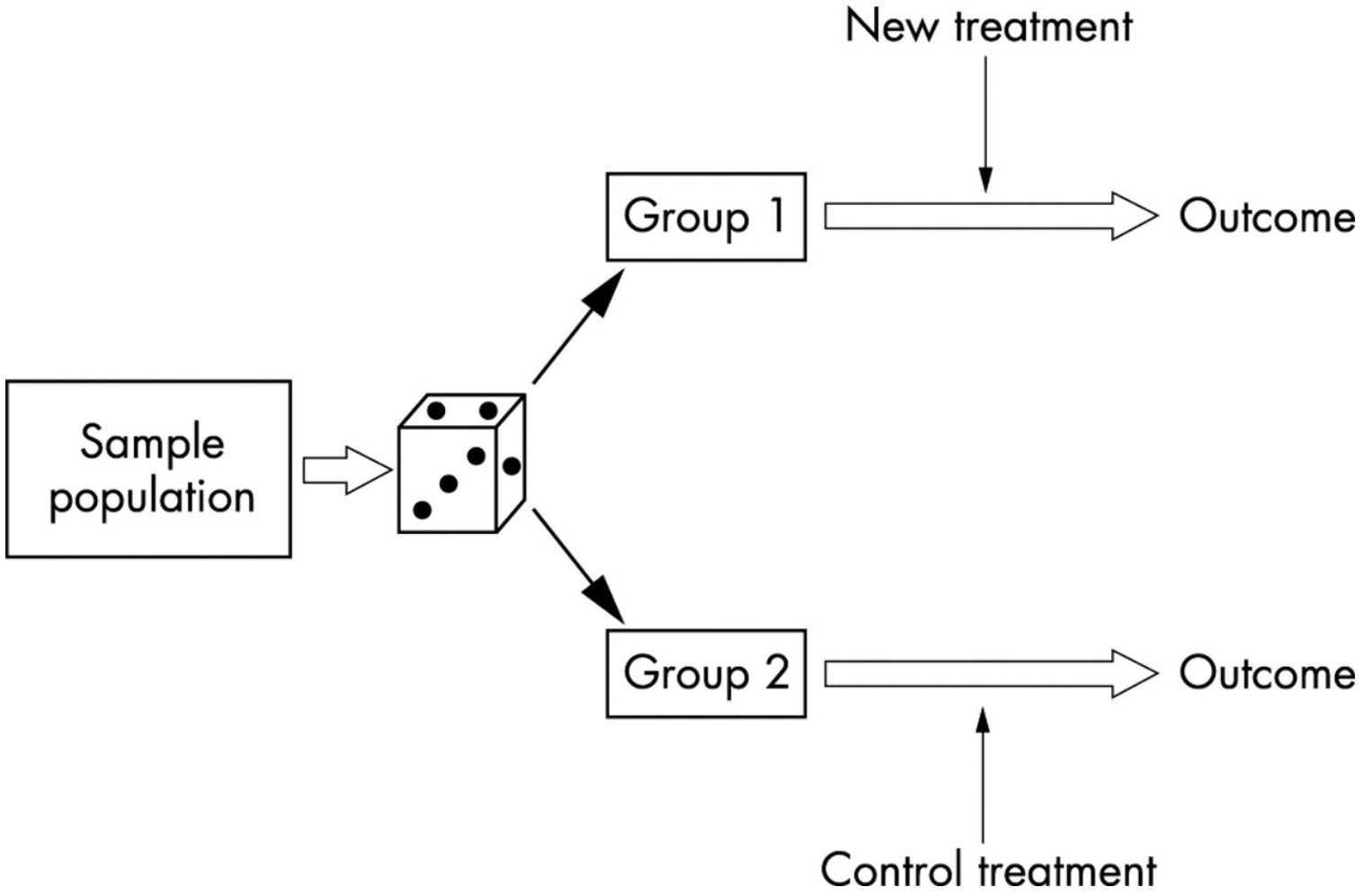
Research Methodologies

- Randomised controlled trial
- Cohort
- Case control
- Cross-sectional
- Qualitative
- Systematic review

Types of Study



Randomised Controlled Trial



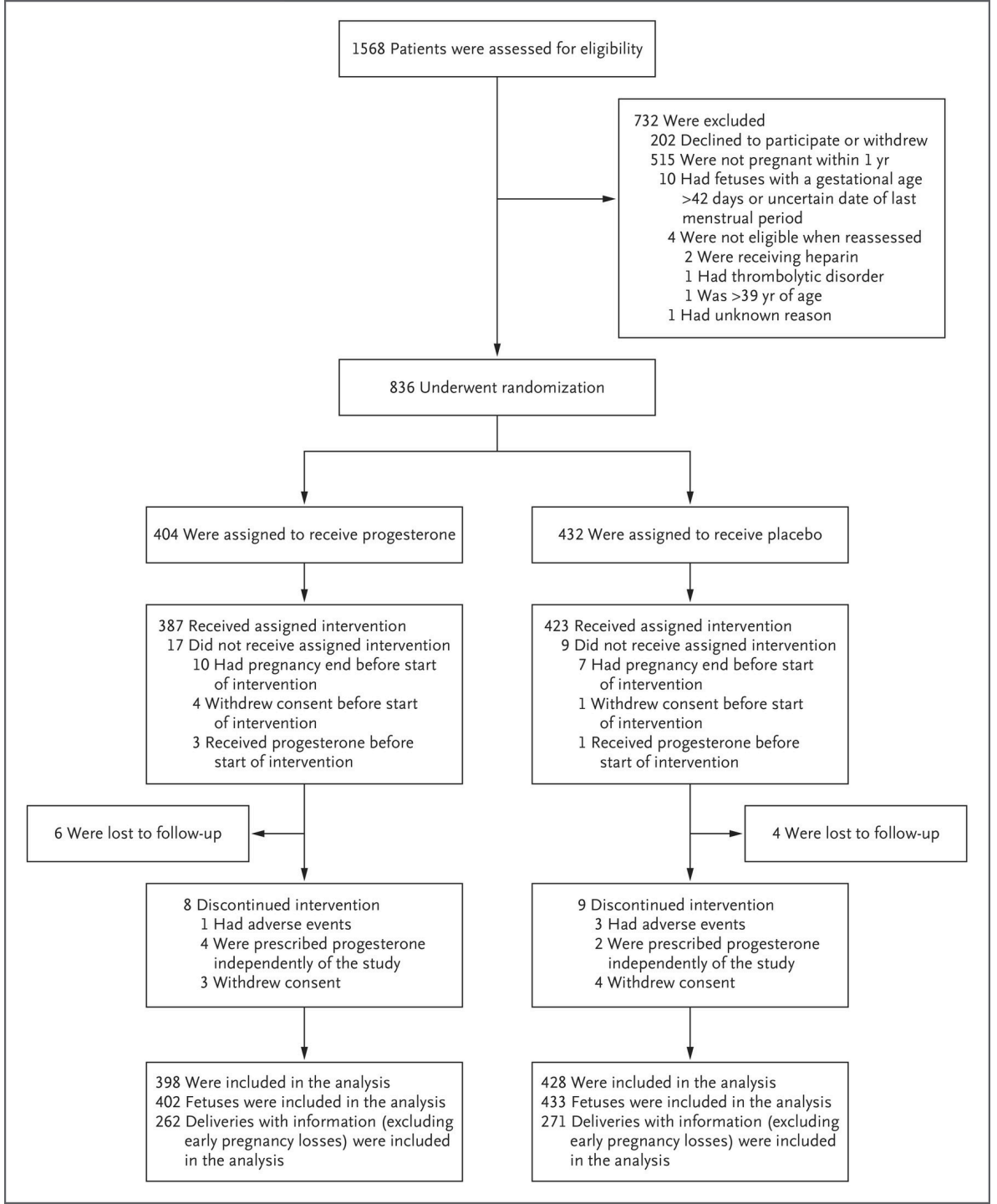
Case example - Randomised controlled trial

ORIGINAL ARTICLE

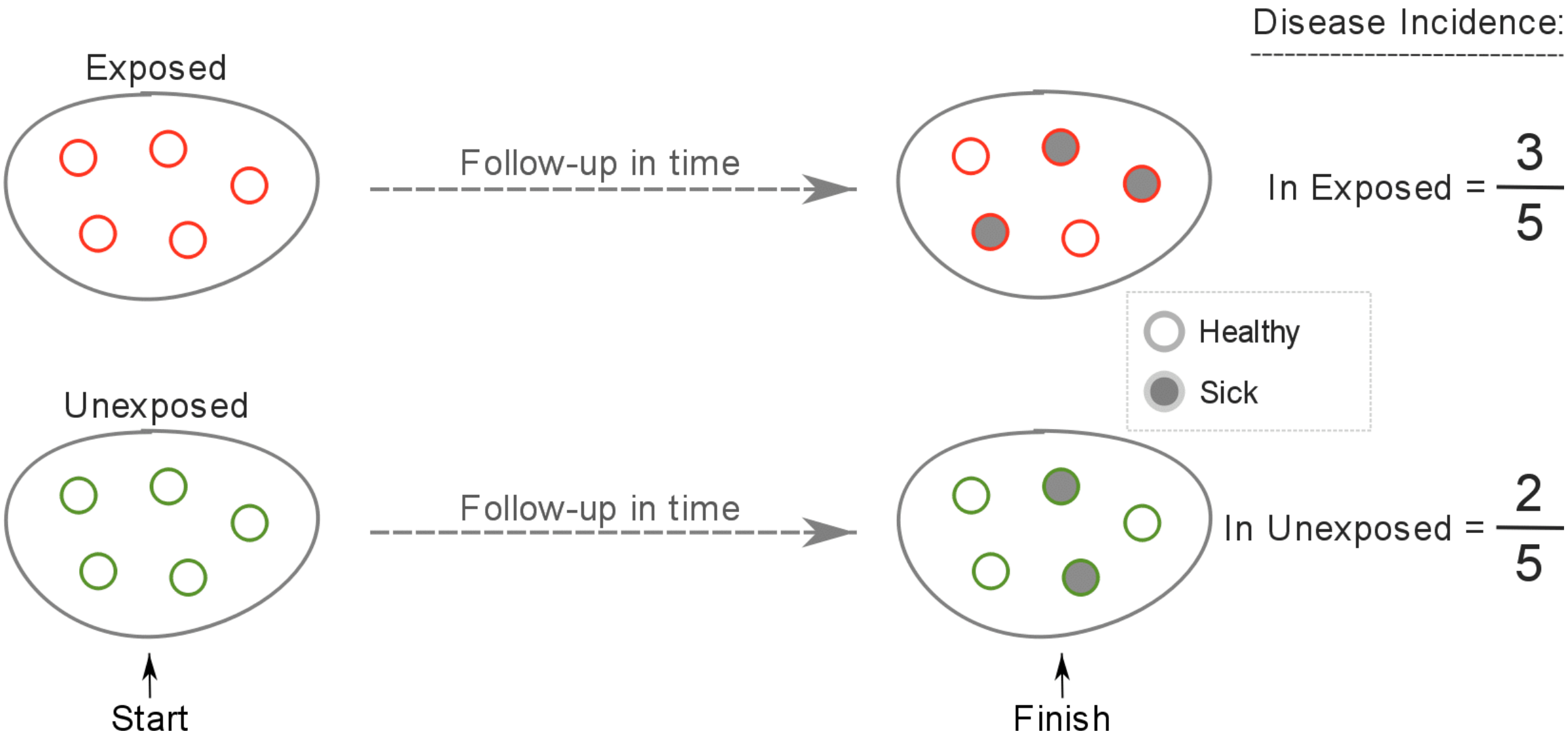
A Randomized Trial of Progesterone in Women with Recurrent Miscarriages

Arri Coomarasamy, M.B., Ch.B., M.D., Helen Williams, B.Sc., Ewa Truchanowicz, Ph.D., Paul T. Seed, M.Sc., Rachel Small, R.G.N., R.M., Siobhan Quenby, M.D., Pratima Gupta, M.D., Feroza Dawood, M.B., Ch.B., M.D., Yvonne E.M. Koot, M.D., Ruth Bender Atik, B.A., Kitty W.M. Bloemenkamp, M.D., Ph.D., Rebecca Brady, R.N.Dip., M.Sc., T.N.Dip., et al.

- **BACKGROUND:** Progesterone is essential for the maintenance of pregnancy. However, whether progesterone supplementation in the first trimester of pregnancy would increase the rate of live births among women with a history of unexplained recurrent miscarriages is uncertain.
- **METHODS:** Multicenter, double-blind, placebo-controlled, randomized trial to investigate whether treatment with progesterone would increase the rates of live births and newborn survival among women with unexplained recurrent miscarriage. Women with recurrent miscarriages were randomly assigned to receive twice-daily vaginal suppositories containing either 400 mg of micronized progesterone or matched placebo from a time soon after a positive urinary pregnancy test (and no later than 6 weeks of gestation) through 12 weeks of gestation.
- **PRIMARY OUTCOME**: live birth after 24 weeks of gestation.
- **RESULTS:** 836 women – in an intention-to-treat analysis, the rate of live births was 65.8% (262 of 398 women) in the progesterone group and 63.3% (271 of 428 women) in the placebo group (relative rate, 1.04; 95% confidence interval [CI], 0.94 to 1.15; rate difference, 2.5 percentage points; 95% CI, −4.0 to 9.0). There were no significant between-group differences in the rate of adverse events.
- **CONCLUSIONS:** Progesterone therapy in the first trimester of pregnancy did not result in a significantly higher rate of live births among women with a history of unexplained recurrent miscarriages.



Cohort Studies



Case example - Cohort Study

ULTRASOUND in Obstetrics & Gynecology

isuog

Original Paper

Perinatal outcomes of babies predicted to be large-for-gestational age by universal third-trimester ultrasound in non-diabetic pregnancies

K. Robertson, M. Viera, L. Impey

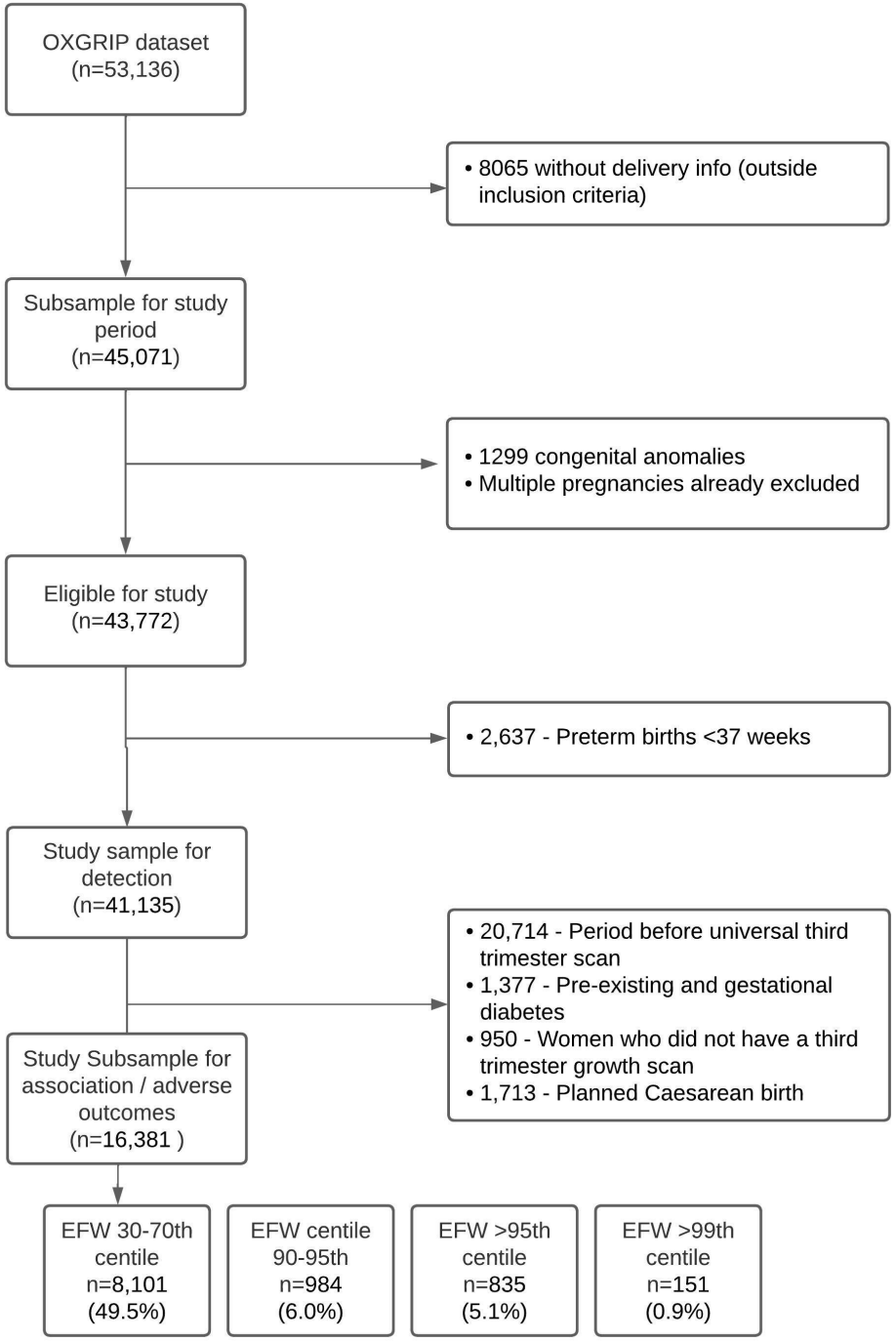
First published: 10 July 2023 | https://doi.org/10.1002/uog.26305

- Outcomes of predicted LGA babies in universal USS cohort
  - Multivariate logistic regression analysis
  - Compared to appropriately grown babies (30-70th centile)
  - Subdivided into

    EFW 90-95th centile

    EFW >95th centile

    EFW >99th centile



Case example - Cohort Study

ULTRASOUND in Obstetrics & Gynecology

isuog

Original Paper

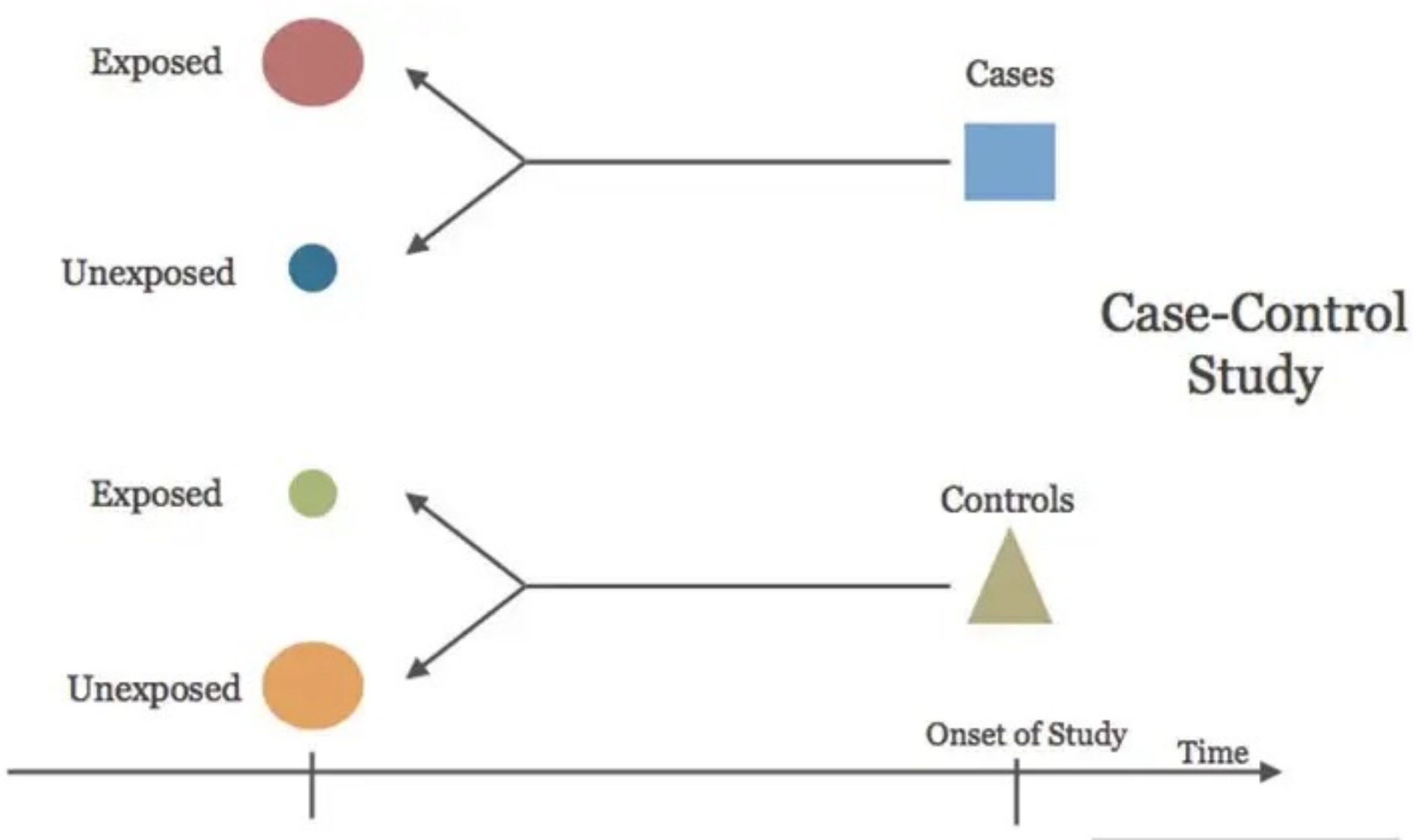
Perinatal outcomes of babies predicted to be large-for-gestational age by universal third-trimester ultrasound in non-diabetic pregnancies

K. Robertson, M. Viera, L. Impey

First published: 10 July 2023 | https://doi.org/10.1002/uog.26305

	USS 30-70	EFW 90-95		EFW >95th		EFW >99th	
		Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)
CAO1	Control	**1.33 (1.01-1.75)**	**1.35 (1.02-1.78)**	**2.12 (1.65-2.72)**	**2.18 (1.69-2.8)**	**2.17 (1.26-3.74)**	**2.33 (1.35-4.03)**
CAO2		0.66 (0.16-2.78)	0.71 (0.17-2.99)	2.34 (0.96-5.72)	**2.58 (1.05-6.34)**	2.15 (0.29-16.0)	2.58 (0.34-19.3)
IOL		**1.34 (1.16-1.55)**	**1.37 (1.18-1.59)**	**1.49 (1.28-1.74)**	**1.52 (1.30-1.92)**	**1.84 (1.32-2.57)**	**2.00 (1.42-2.83)**
OVD		**1.23 (1.04-1.45)**	**1.43 (1.19-1.71)**	**1.26 (1.05-1.50)**	**1.58 (1.30-1.92)**	1.20 (0.8-1.8)	**1.86 (1.2-2.89)**
EMCS		**1.58 (1.31-1.89)**	**1.66 (1.38-2.00)**	**2.26 (1.89-2.70)**	**2.47 (2.05-2.96)**	**2.60 (1.78-3.79)**	**3.12 (2.11-4.6)**
PPH1000		**2.01 (1.61-2.52)**	**1.85 (1.48-2.33)**	**2.52 (2.02-3.15**	**2.18 (1.74-2.75)**	**3.16 (2.02-4.94)**	**2.77 (1.75-4.38)**
Shoulder Dystocia		**3.50 (2.39-5.14)**	**3.19 (2.16-4.73)**	**5.54 (3.9-7.88)**	**4.95 (3.44-7.12)**	**5.50 (2.72-11.1)**	**4.65 (2.23-9.71)**
OASI		1.33 (0.93-1.89)	1.29 (0.9-1.84)	1.13 (0.76-1.70)	1.08 (0.71-1.64)	1.4 (0.61-3.20)	1.49 (0.64-3.44)

Case-Control Studies



Case example - Case-Control Study

BJOG An International Journal of Obstetrics and Gynaecology
Royal College of Obstetricians & Gynaecologists

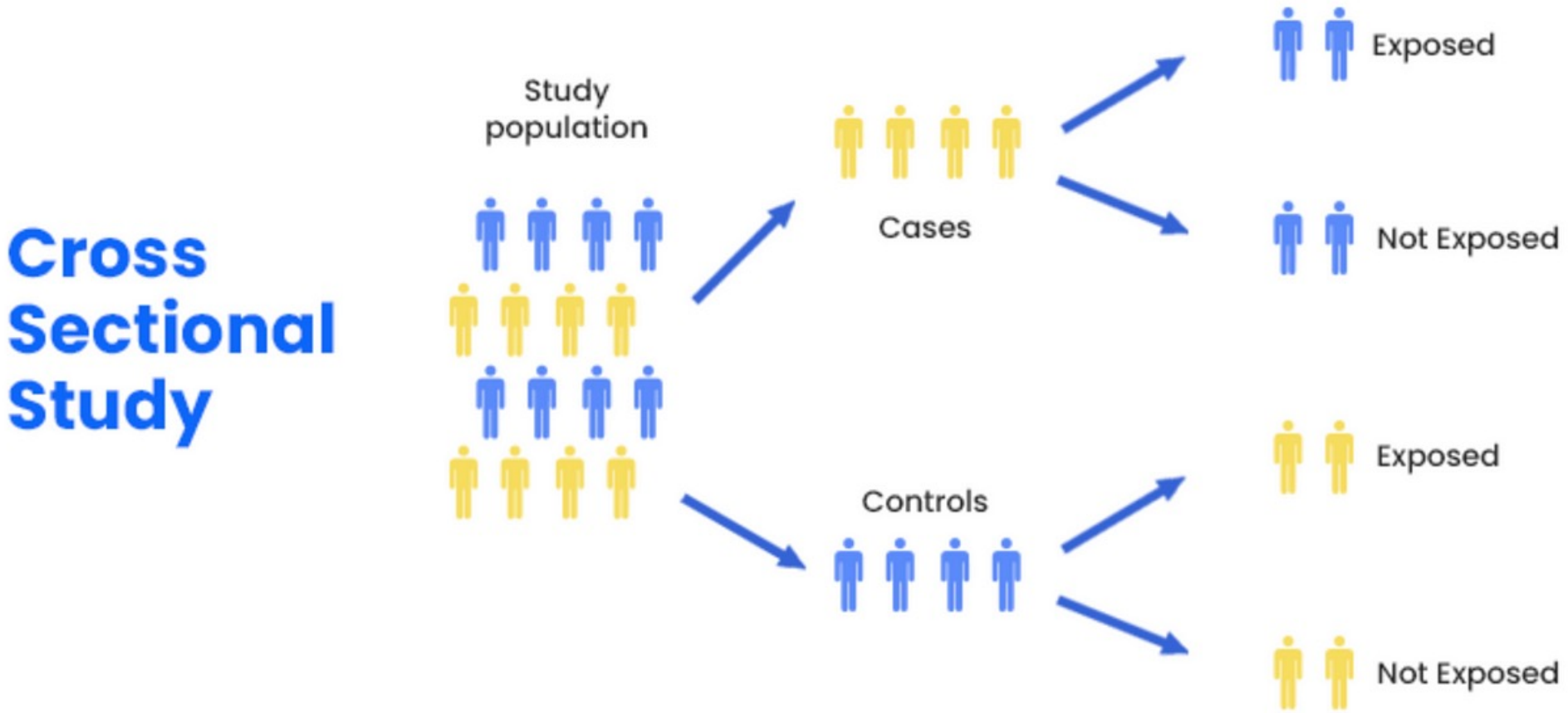
Antenatal pulmonary embolism: risk factors, management and outcomes

M Knight, UKOSS

First published: 06 February 2008 | https://doi.org/10.1111/j.1471-0528.2007.01622.x | Citations: 182

- **Abstract**
- **Objectives** To estimate the incidence of antenatal pulmonary embolism and describe the risk factors, management and outcomes.
- **Design** A national matched case–control study using the UK Obstetric Surveillance System (UKOSS).
- **Setting** All hospitals with consultant-led maternity units in the UK.
- **Participants** A total of 143 women who had an antenatal pulmonary embolism between February 2005 and August 2006. Two hundred and fifty nine matched control women.
- **Methods** Prospective case and control identification through the UKOSS monthly mailing.
- **Main outcome measures** Incidence and case fatality rates with 95% CIs. Adjusted odds ratio estimates.
- **Results** One hundred per cent of UK consultant-led obstetric units contributed data to UKOSS. A total of 143 antenatal pulmonary embolisms were reported, representing an estimated incidence of 1.3 per 10 000 maternities (95% CI 1.1–1.5). Seventy per cent of women had identifiable classical risk factors for thromboembolic disease. The main risk factors for pulmonary embolism were multiparity (adjusted odds ratio [aOR] 4.03, 95% CI 1.60–9.84) and body mass index ≥ 30 kg/m^2 (aOR 2.65, 95% CI 1.09–6.45). Nine women who had a pulmonary embolism should have received antenatal thromboprophylaxis with low-molecular-weight heparin (LMWH) according to national guidelines; only three (33%) of them did. Six women (4%) had a pulmonary embolism following antenatal prophylaxis with LMWH; three of these women (50%) were receiving lower than recommended doses. Two women had recurrent pulmonary emboli (1.4%, 95% CI 0.2–5.1%). Five women died (case fatality 3.5%, 95% CI 1.1–8.0%).
- **Conclusions** Significant severe morbidity from thromboembolic disease underlies the maternal deaths from pulmonary embolism in the UK. This study has shown some cases where thromboprophylaxis was not provided according to national guidelines, and there may be scope for further work on guideline implementation.

Cross-Sectional Studies



Case example - Cross-Sectional Study

ORIGINAL RESEARCH

Symptomatic Pelvic Organ Prolapse

Prevalence and Risk Factors in a Population-Based, Racially Diverse Cohort

Rortveit, Guri MD, PhD[1,2,3]; Brown, Jeanette S. MD[3,4]; Thom, David H. MD, PhD[5]; Van Den Eeden, Stephen K. PhD[6]; Creasman, Jennifer M. MSPH[4]; Subak, Leslee L. MD[3,4]

Author Information

Obstetrics & Gynecology 109(6):p 1396-1403, June 2007. | ***DOI:*** 10.1097/01.AOG.0000263469.68106.90

- **OBJECTIVE:**
- To estimate the prevalence of and identify risk factors associated with symptomatic pelvic organ prolapse and level of distress in racially diverse women aged older than 40 years.
- **METHODS:**
- The Reproductive Risks for Incontinence Study at Kaiser is a population-based study of 2,001 randomly selected women. Symptomatic prolapse was determined by self-report of a feeling of bulge, pressure, or protrusion or a visible bulge from the vagina. Risk factors were assessed by self-report, interview, physical examination, and record review. Distress was assessed by self-report. Multivariable logistic regression analysis was used to identify independent risk factors.
- **RESULTS:**
- Symptomatic prolapse was reported by 118 (6%) women. Almost 50% of these women reported moderate or great distress, and 35% reported that the symptoms affected at least one physical, social or sexual activity. In multivariable analysis, the risk of prolapse was significantly increased in women with one (odds ratio [OR] 2.8, 95% confidence interval [CI] 1.1–7.2), two (OR 4.1, 95% CI 1.8–9.5), and three or more (OR 5.3, 95% CI 2.3–12.3) vaginal deliveries compared with nulliparous women. Irritable bowel syndrome, constipation, and self-reported fair or poor health status were strongly associated with prolapse, with ORs of 2.8 (95% CI 1.7–4.6), 2.5 (95% CI 1.7–3.7), and 2.3 (95% CI 1.1–4.9), respectively. African-American women were significantly less likely to report symptomatic prolapse compared with white women (OR 0.4, 95% CI 0.2–0.8).
- **CONCLUSION:**
- Symptomatic prolapse is less common among African-American women and more common among women with a prior vaginal delivery, poor health status, constipation, or irritable bowel syndrome. Nearly one half of women with symptomatic prolapse are substantially bothered by their symptoms.

Qualitative Studies

Case example - Qualitative Study

Medical education and training
Original research

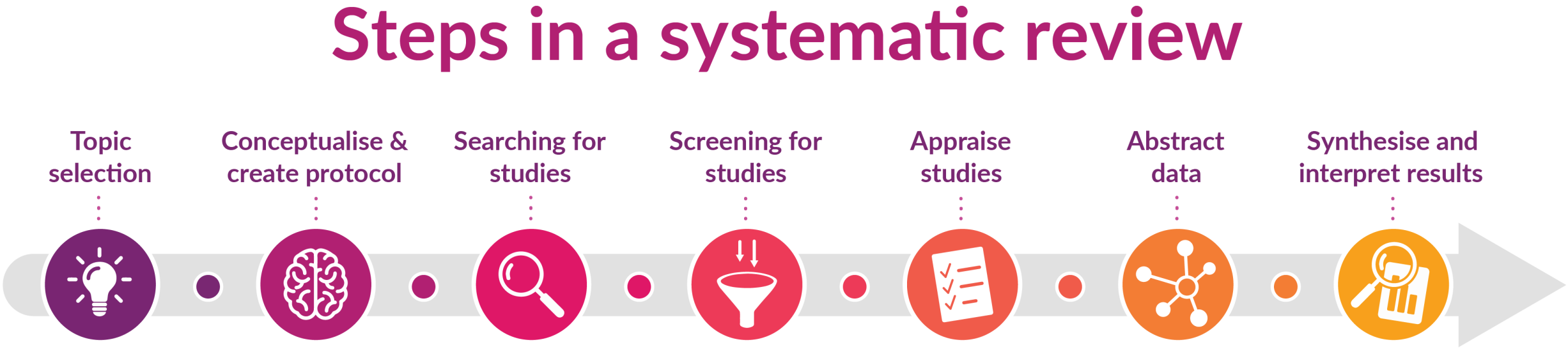
More than burnout: qualitative study on understanding attrition among senior Obstetrics and Gynaecology UK-based trainees

Rima Chakrabarti , Sharon Markless

1. Centre for Education, Faculty of Life Sciences and Medicine, King's College London, London, UK

- **Objectives** Workforce retention among UK-based Obstetrics and Gynaecology (O&G) trainees has been a particular concern for a number of years, with 30% trainees reportedly leaving specialty training. With specialty focused research being limited and tending to analyse the training programme as a whole. The aim of this study was to explain why senior O&G trainees within reach of completing training were leaving the specialty.
- **Design** Qualitative study based on Constructivist Grounded Theory methodology using semi-structured interviews. Data collection and analysis continued until theoretical saturation was achieved. The key themes were used to build an explanatory model, in the form of a concept map for attrition.
- **Setting** London.
- **Participants** Nine senior O&G trainees (ST5-7) of which six were committed to the specialty, two were not going to pursue a consultancy post once training was complete and one ex-trainee.
- **Results** Five major themes emerged from the study, of which four; 'Just get on with it', 'Just a number', 'Tick-box exercise' and 'It has not happened to me but…' were described by all participants. However, the final theme, relating to the lack of professional identity, 'I did not see myself as an Obstetrician and Gynaecologist' was only demonstrated among those who had left or were not going to pursue a consultancy post once training was complete. Potential strategies for facilitating professional identity development were focused into three areas; establishing meaningful connections, adequate support mechanisms and regional initiatives.
- **Conclusion** Previous research on attrition in the medical profession have suggested burnout and the lack of resilience as being the key factors for leaving training. However, based on this study's findings, an alternative pathway related to the lack of professional identity has been proposed for senior O&G trainees.

Systematic reviews



Case example - Systematic review

Cochrane Database of Systematic Reviews | Review - Intervention

Prenatal administration of progesterone for preventing preterm birth in women considered to be at risk of preterm birth

Jodie M Dodd, Leanne Jones, Vicki Flenady, Robert Cincotta, Caroline A Crowther
Authors' declarations of interest

Version published: 31 July 2013 Version history
https://doi.org/10.1002/14651858.CD004947.pub3

- **Background**
- Preterm birth is a major complication of pregnancy associated with perinatal mortality and morbidity. Progesterone for the prevention of preterm labour has been advocated.
- **Objectives**
- To assess the benefits and harms of progesterone for the prevention of preterm birth for women considered to be at increased risk of preterm birth and their infants.
- **Search methods**
- We searched the Cochrane Pregnancy and Childbirth Group's Trials Register (14 January 2013) and reviewed the reference list of all articles.
- **Selection criteria**
- Randomised controlled trials, in which progesterone was given for preventing preterm birth.
- **Data collection and analysis**
- Two review authors independently evaluated trials for methodological quality and extracted data.

Case example - Systematic review

Cochrane Database of Systematic Reviews | Review - Intervention

Prenatal administration of progesterone for preventing preterm birth in women considered to be at risk of preterm birth

Jodie M Dodd, Leanne Jones, Vicki Flenady, Robert Cincotta, Caroline A Crowther
Authors' declarations of interest

Version published: 31 July 2013 Version history
https://doi.org/10.1002/14651858.CD004947.pub3

- **Main results**
- Thirty-six randomised controlled trials (8523 women and 12,515 infants) were included.
- **Progesterone versus placebo for women with a past history of spontaneous preterm birth**
  Progesterone was associated with a statistically significant reduction in the risk of perinatal mortality (six studies; 1453 women; risk ratio (RR) 0.50, 95% confidence interval (CI) 0.33 to 0.75), preterm birth less than 34 weeks (five studies; 602 women; average RR 0.31, 95% CI 0.14 to 0.69), infant birthweight less than 2500 g (four studies; 692 infants; RR 0.58, 95% CI 0.42 to 0.79), use of assisted ventilation (three studies; 633 women; RR 0.40, 95% CI 0.18 to 0.90), necrotising enterocolitis (three studies; 1170 women; RR 0.30, 95% CI 0.10 to 0.89), neonatal death (six studies; 1453 women; RR 0.45, 95% CI 0.27 to 0.76), admission to neonatal intensive care unit (three studies; 389 women; RR 0.24, 95% CI 0.14 to 0.40), preterm birth less than 37 weeks (10 studies; 1750 women; average RR 0.55, 95% CI 0.42 to 0.74) and a statistically significant increase in pregnancy prolongation in weeks (one study; 148 women; mean difference (MD) 4.47, 95% CI 2.15 to 6.79). No differential effects in terms of route of administration, time of commencing therapy and dose of progesterone were observed for the majority of outcomes examined.
- **Progesterone versus placebo for women with a short cervix identified on ultrasound**
  Progesterone was associated with a statistically significant reduction in the risk of preterm birth less than 34 weeks (two studies; 438 women; RR 0.64, 95% CI 0.45 to 0.90), preterm birth at less than 28 weeks' gestation (two studies; 1115 women; RR 0.59, 95% CI 0.37 to 0.93) and increased risk of urticaria in women when compared with placebo (one study; 654 women; RR 5.03, 95% CI 1.11 to 22.78). It was not possible to assess the effect of route of progesterone administration, gestational age at commencing therapy, or total cumulative dose of medication.
- **Progesterone versus placebo for women with a multiple pregnancy**
  Progesterone was associated with no statistically significant differences for the reported outcomes.
- **Progesterone versus no treatment/placebo for women following presentation with threatened preterm labour**
  Progesterone, was associated with a statistically significant reduction in the risk of infant birthweight less than 2500 g (one study; 70 infants; RR 0.52, 95% CI 0.28 to 0.98).
- **Progesterone versus placebo for women with 'other' risk factors for preterm birth**
  Progesterone, was associated with a statistically significant reduction in the risk of infant birthweight less than 2500 g (three studies; 482 infants; RR 0.48, 95% CI 0.25 to 0.91).
- **Authors' conclusions**
- The use of progesterone is associated with benefits in infant health following administration in women considered to be at increased risk of preterm birth due either to a prior preterm birth or where a short cervix has been identified on ultrasound examination. However, there is limited information available relating to longer-term infant and childhood outcomes, the assessment of which remains a priority.
- Further trials are required to assess the optimal timing, mode of administration and dose of administration of progesterone therapy when given to women considered to be at increased risk of early birth.

Research - Example EMQ

	Answer Option
A	Randomised Controlled Trial
B	Non-Randomised Controlled Trial
C	Prospective Cohort Study
D	Retrospective Cohort Study
E	Case Control Study
F	Cross-Sectional Study
G	Qualitative Study
H	Systematic review

- *For each scenario described below, choose the single most appropriate option from the above list. Each option may be used once, more than once or not at all.*

- A woman with Stage 4 ovarian cancer is offered the opportunity to participate in a research study to test a new adjuvant chemotherapy drug. She is enrolled in the study and understands that she will receive the drug as part of her ongoing treatment and that her oncologist will monitor the response to this drug so see if it is superior to standard chemotherapy.

Research - Example EMQ

	Answer Option
A	Randomised Controlled Trial
B	Non-Randomised Controlled Trial
C	Prospective Cohort Study
D	Retrospective Cohort Study
E	Case Control Study
F	Cross-Sectional Study
G	Qualitative Study
H	Systematic review

- *For each scenario described below, choose the single most appropriate option from the above list. Each option may be used once, more than once or not at all.*

- A woman with Stage 4 ovarian cancer is offered the opportunity to participate in a research study to test a new adjuvant chemotherapy drug. She is enrolled in the study and understands that she will receive the drug as part of her ongoing treatment and that her oncologist will monitor the response to this drug so see if it is superior to standard chemotherapy.

- **Answer: B – Non Randomised Controlled Trial**

Research - Example EMQ

	Answer Option
A	Randomised Controlled Trial
B	Non-Randomised Controlled Trial
C	Prospective Cohort Study
D	Retrospective Cohort Study
E	Case Control Study
F	Cross-Sectional Study
G	Qualitative Study
H	Systematic review

- *For each scenario described below, choose the single most appropriate option from the above list. Each option may be used once, more than once or not at all.*

- During the COVID-19 pandemic, the UKOSS research group conducted a study of all pregnant women admitted to hospital with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in the UK over a three month period. Factors associated with infection were described and outcomes, including transmission of infection, for mothers and infants were measured for these women.

Research - Example EMQ

	Answer Option
A	Randomised Controlled Trial
B	Non-Randomised Controlled Trial
C	Prospective Cohort Study
D	Retrospective Cohort Study
E	Case Control Study
F	Cross-Sectional Study
G	Qualitative Study
H	Systematic review

- *For each scenario described below, choose the single most appropriate option from the above list. Each option may be used once, more than once or not at all.*

- During the COVID-19 pandemic, the UKOSS research group conducted a study of all pregnant women admitted to hospital with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in the UK over a three month period. Factors associated with infection were described and outcomes, including transmission of infection, for mothers and infants were measured for these women.

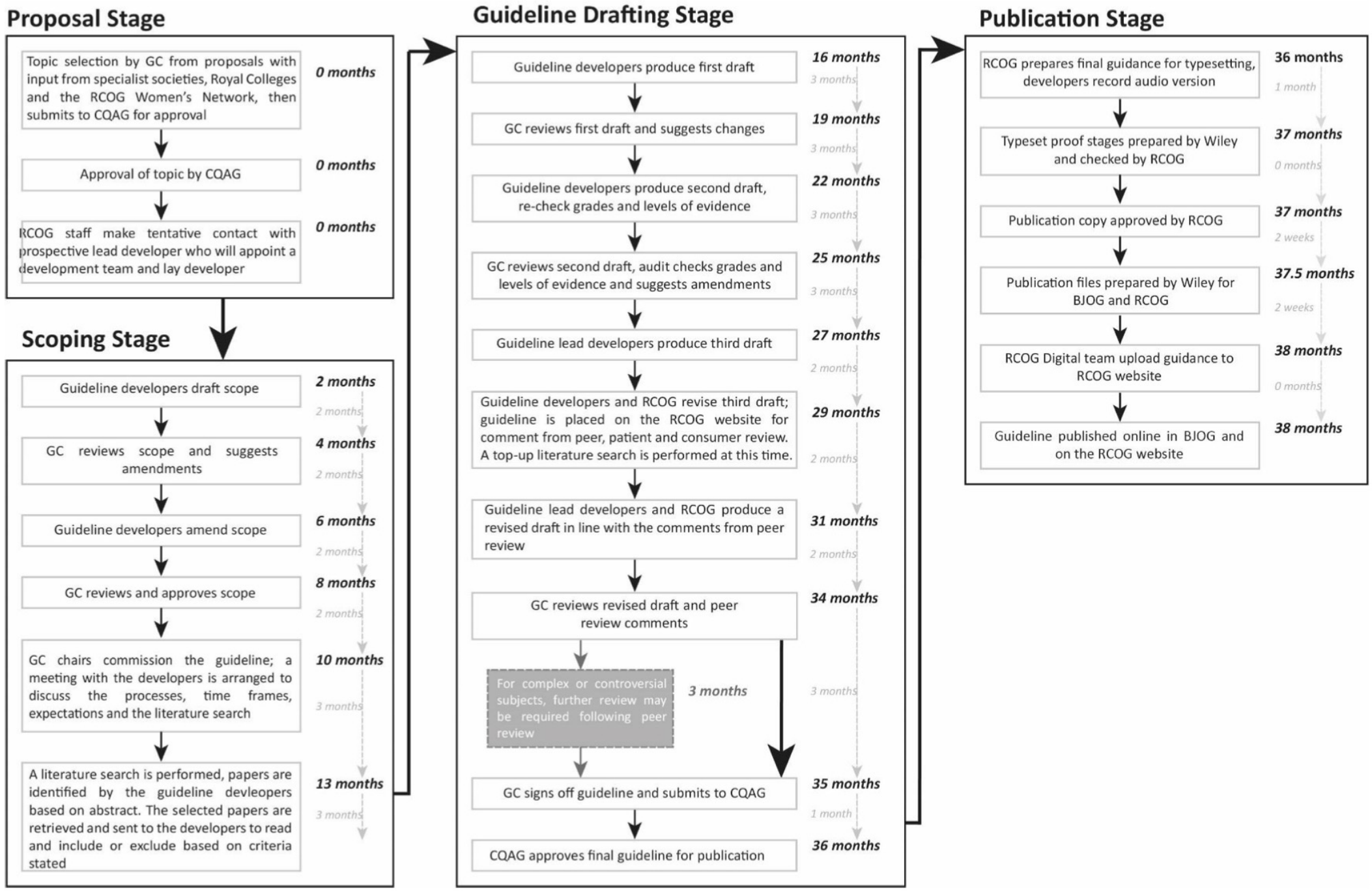
- **Answer: C – Prospective Cohort Study**

Evidence Based Practice

- Principles of evidence-based practice
- Types of clinical trial/evidence classification
- Grades of recommendation

Potential SBA/EMQ

Figure 1. Guideline development pathway



Classification of evidence levels

1++	High-quality meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a very low risk of bias
1+	Well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias
1–	Meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a high risk of bias
2++	High-quality systematic reviews of case–control or cohort studies or high-quality case–control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal
2+	Well-conducted case–control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal
2–	Case–control or cohort studies with a high risk of confounding, bias or chance and a significant risk that the relationship is not causal
3	Non-analytical studies, e.g. case reports, case series
4	Expert opinion

Grades of Recommendation

A At least one meta-analysis, systematic reviews or RCT rated as 1++, and directly applicable to the target population; or a systematic review of RCTs or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results

B A body of evidence including studies rated as 2++ directly applicable to the target population, and demonstrating overall consistency of results; or
Extrapolated evidence from studies rated as 1++ or 1+

C A body of evidence including studies rated as 2+ directly applicable to the target population, and demonstrating overall consistency of results; or
Extrapolated evidence from studies rated as 2++

D Evidence level 3 or 4; or
Extrapolated evidence from studies rated as 2+

Good Practice Points

✓ Recommended best practice based on the clinical experience of the guideline development group.*

OXCOG

OXCOG.CO.UK

Quality Improvement, Audit & Research for MRCOG Part 2

MRCOG Part 2 Online Revision Course