How can application of the WEO consensus on PCCRC aetiology help reduce rates?

Dr Nick Burr

Clinical Research Fellow, Leeds, UK

Why is PCCRC important

- "Off the radar" for endoscopists and endoscopy services
  - miss rates are small
  - may not ever find out
- Important from a patient perspective!
- Measure of the quality of a colonoscopy service

Post-Colonoscopy CRC

The World Endoscopy Organisation Consensus Statements on Post-Colonoscopy and Post-Imaging Colorectal Cancer: recommendations on terminology, aetiology, categorisation, qualitative and quantitative review of cases.

Matthew D Rutter, Iosif Beintaris, Roland Valori, Han Mo Chiu, Douglas Corley, Miriam Cuatrecasas, Evelien Dekker, Anna Forsberg, Jola Gore-Booth, Ulrike Haug, Michal F Kaminski, Takahisa Matsuda, Gerrit Meijer, Eva Morris, Andrew A Plumb, Linda Rabeneck, Douglas Robertson, Robert E Schoen, Harminder Singh, Jill Tinmouth, Graeme Young, Silvia Sanduleanu

Gastroenterology 2018;155:909–925

'We recommend that post-colonoscopy colorectal cancer (PCCRC) be the preferred term for cancers appearing after a colonoscopy in which no cancer is diagnosed'

JAG requirement for PCCRCs

Measure	Standard	Action required
Post Colonoscopy Colorectal Cancer	Auditable Outcome	All Post Colonoscopy Colorectal Cancers (PCCRC) should be reported as adverse events and each unit should have a policy for capturing PCCRC data.

It is unclear at present whether services have taken note of this JAG standard, let alone begun addressing it

Aetiology of PCCRC

- Most evidence of PCCRC comes from big database or large case-control studies
- Good for looking at patient risk factors and broad themes
- Lack the granularity to look at specific reasons for PCCRC and endoscopy factors
- The largest individual cases study used patients from RCTs with multiple exclusion criteria - may miss up to 70% of cases

Reasons for PCCRC (Tollivoro, GIE 2019)

- Case-control study California
  - > 1000 PCCRC
- Factors associated with PCCRC
  - previous polyps
  - incomplete excision
  - failure to examine the segment
- 559 / 1206 (46%) had 1 or more risk factors

Causes of Post-colonoscopy Colorectal Cancers Based on World Endoscopy Organization System of Analysis.

Rebecca Anderson, Nicholas Burr, Roland Valori

Aims

- Route-cause-analysis of PCCRC cases
- Define causative factors
- Categorise PCCRCs using the WEO method
  - determine the strengths and limitations of the WEO methodology
- Determine what proportion of PCCRCs may be preventable
- Make recommendations of how to reduce PCCRC rates

Methods

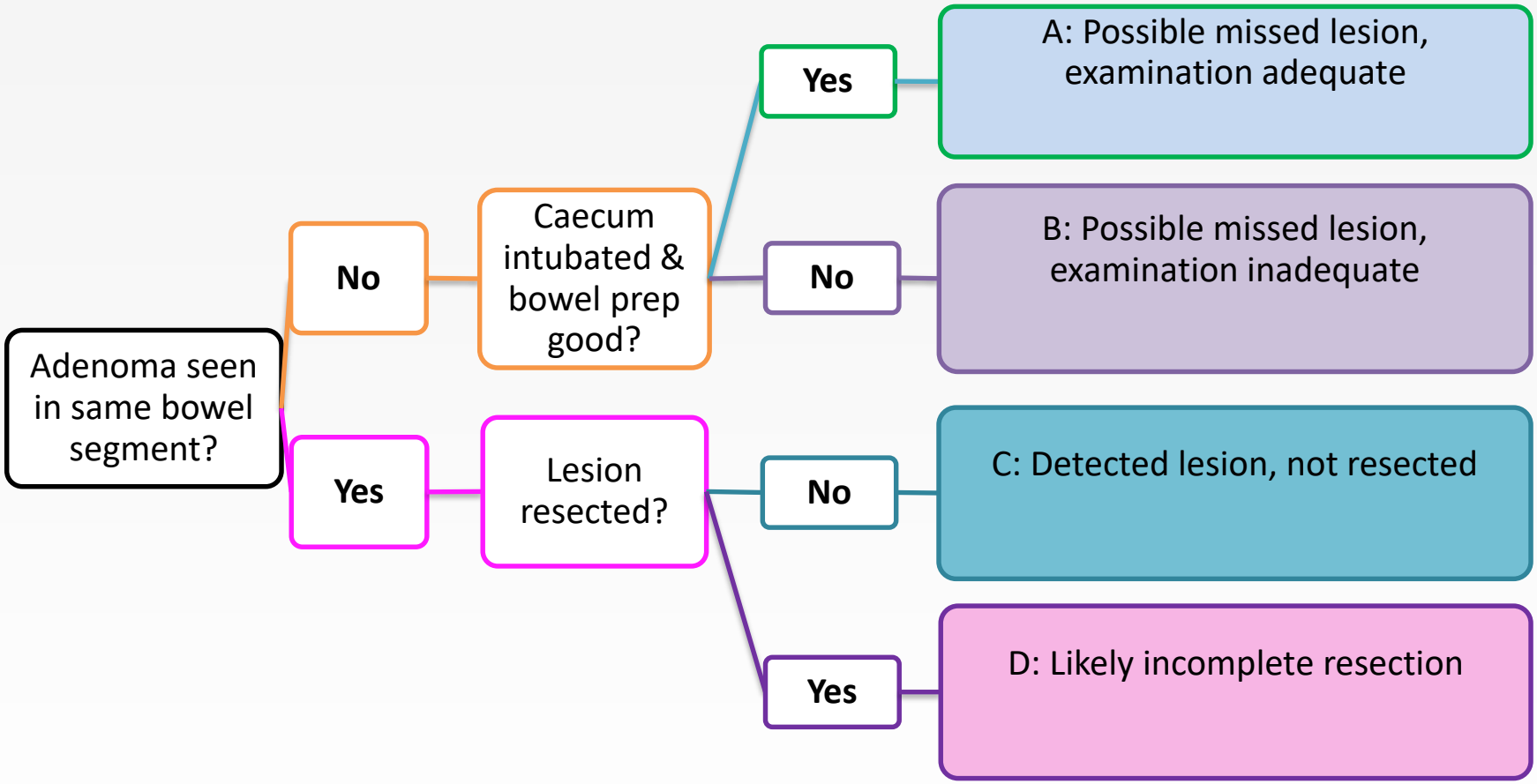
Gloucestershire Hospitals
NHS Foundation Trust

- Gloucestershire Hospitals:
  - population 628,000
  - four endoscopy sites, one group of colonoscopists
  - 6-7,000 procedures/year
  - national Bowel Cancer Screening Programme (BCSP)
  - colonoscopy training courses since 1999
  - consistently in the top 10% of PCCRC performance
- Inclusion: All adult PCCRCs (2010 to 2017)
- Exclusion: Colonoscopy within 6 months of CRC, appendiceal cancers, neuroendocrine tumors and squamous cell cancers of the anus
- Root-cause analysis based on the WEO algorithm

Gloucestershire Root Cause Analysis

- Data collection according to WEO guidelines:
  - patient characteristics
  - index colonoscopy
  - cancer details
  - management plan
  - endoscopist performance

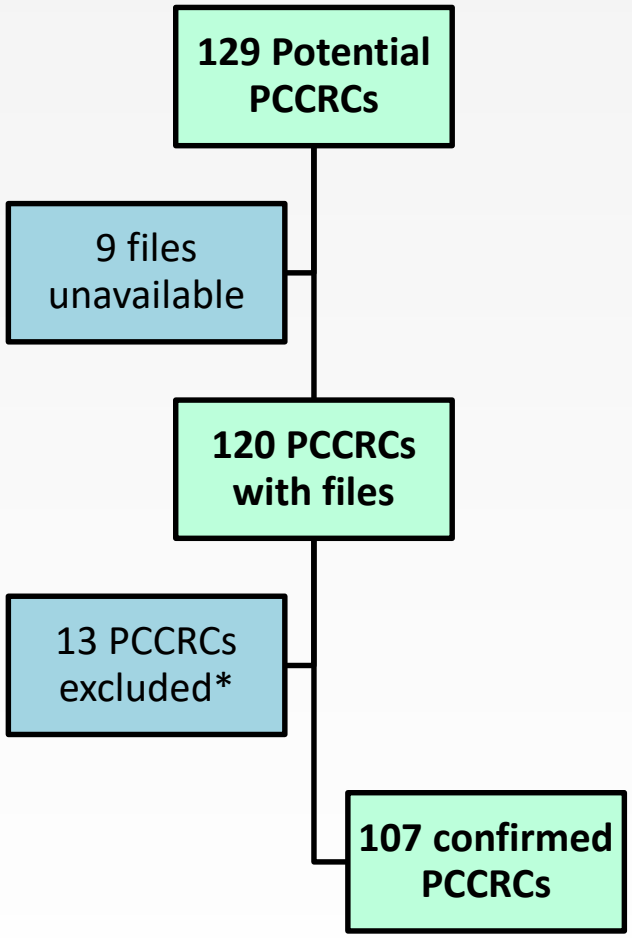
WEO categorisation of PCCRCs



Avoidability & attribution

- Unavoidable
  - small tumours (< 5mm growth per year)
  - submucosal lesions
  - patient previously declined follow up. MDT deemed surveillance not appropriate
  - all others “avoidable”
- Attribution
  - PCCRC after a negative colonoscopy (excluding small)
  - colonoscopist did not propose further investigations after inadequate colonoscopy or lesions not treated
  - recommended too long a timeframe for repeat
- Not attributable
  - repeat procedure not booked by the admin team
  - responsibility with the referring clinician

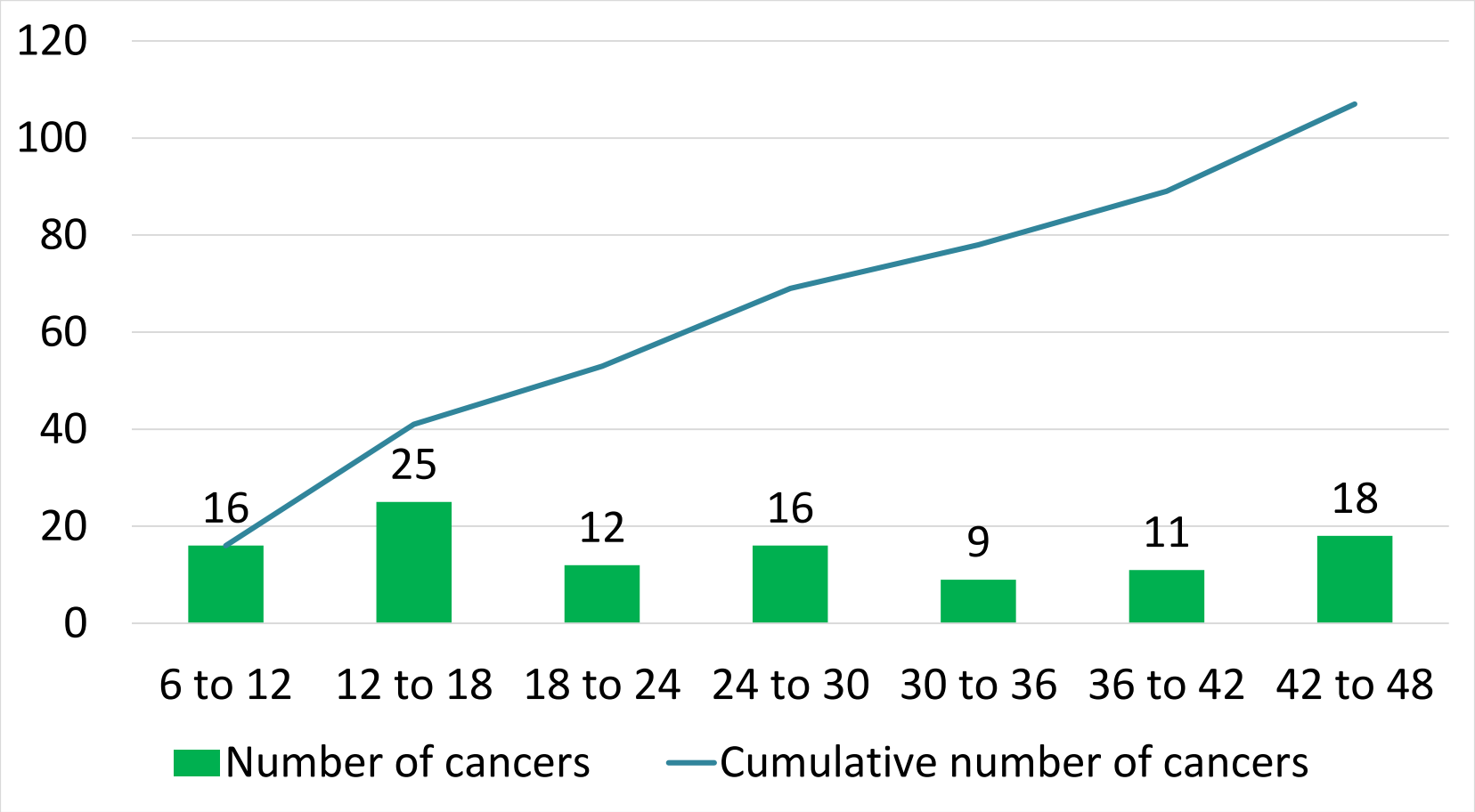
Results



- 61,110 colonoscopies between January 2006 and July 2017
- Unadjusted PCCRC-3yr rate of 4.7% (95% CI: 3.15%-6.25%).
- 129 potential PCCRCs were identified in the study period.

*Exclusion cases	
Detected cancer	1
Nodal recurrence	1
Anal SCC carcinoma	6
Appendiceal carcinoma	3
Unclear aetiology	2
Total	**13**

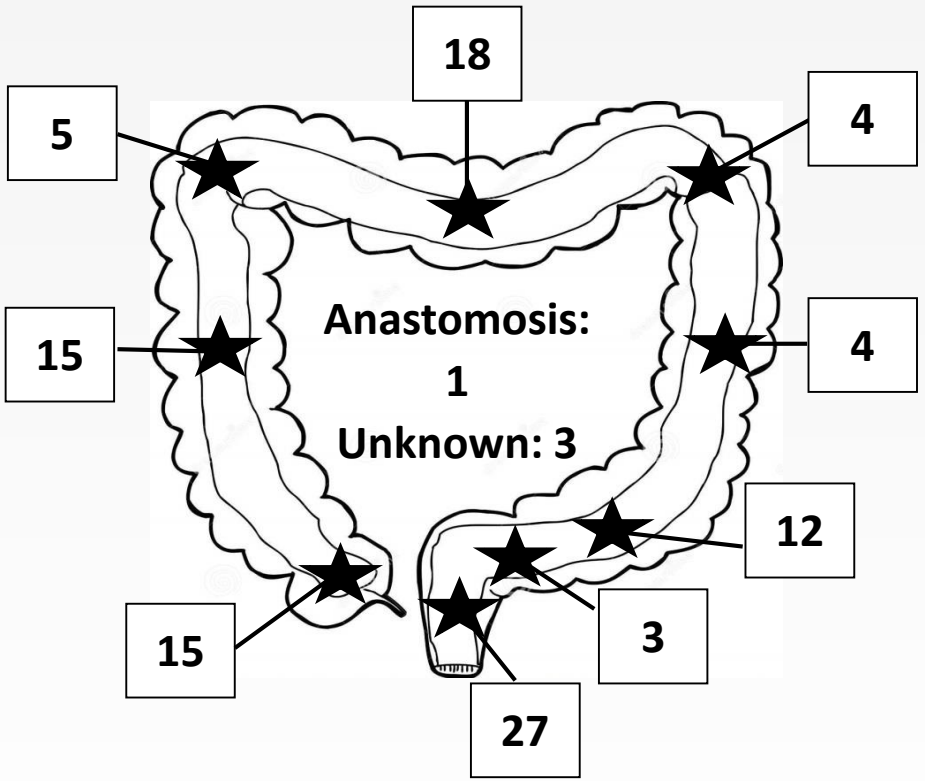
Number of PCCRCs each 6 months

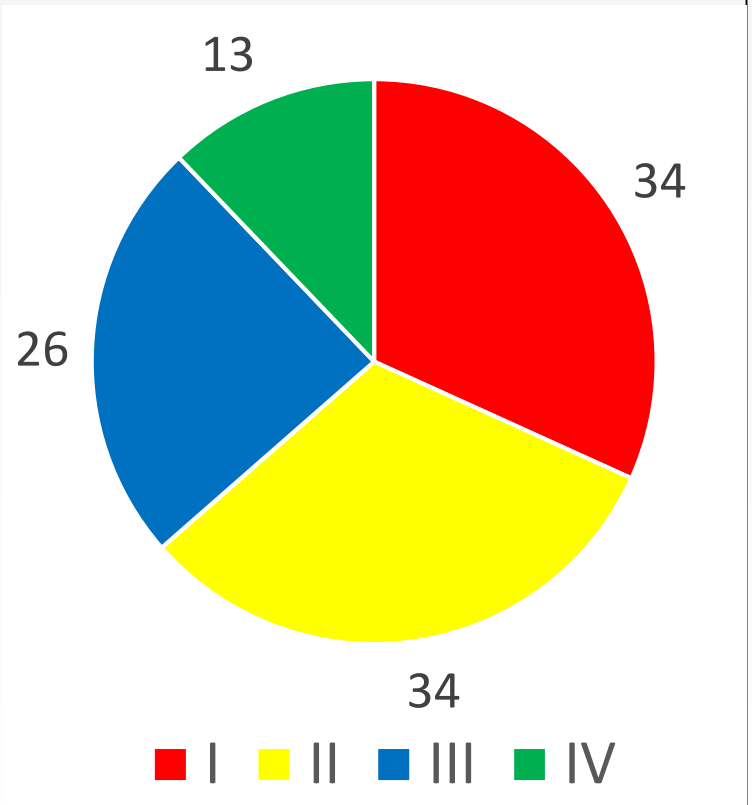


Indication for index colonoscopy

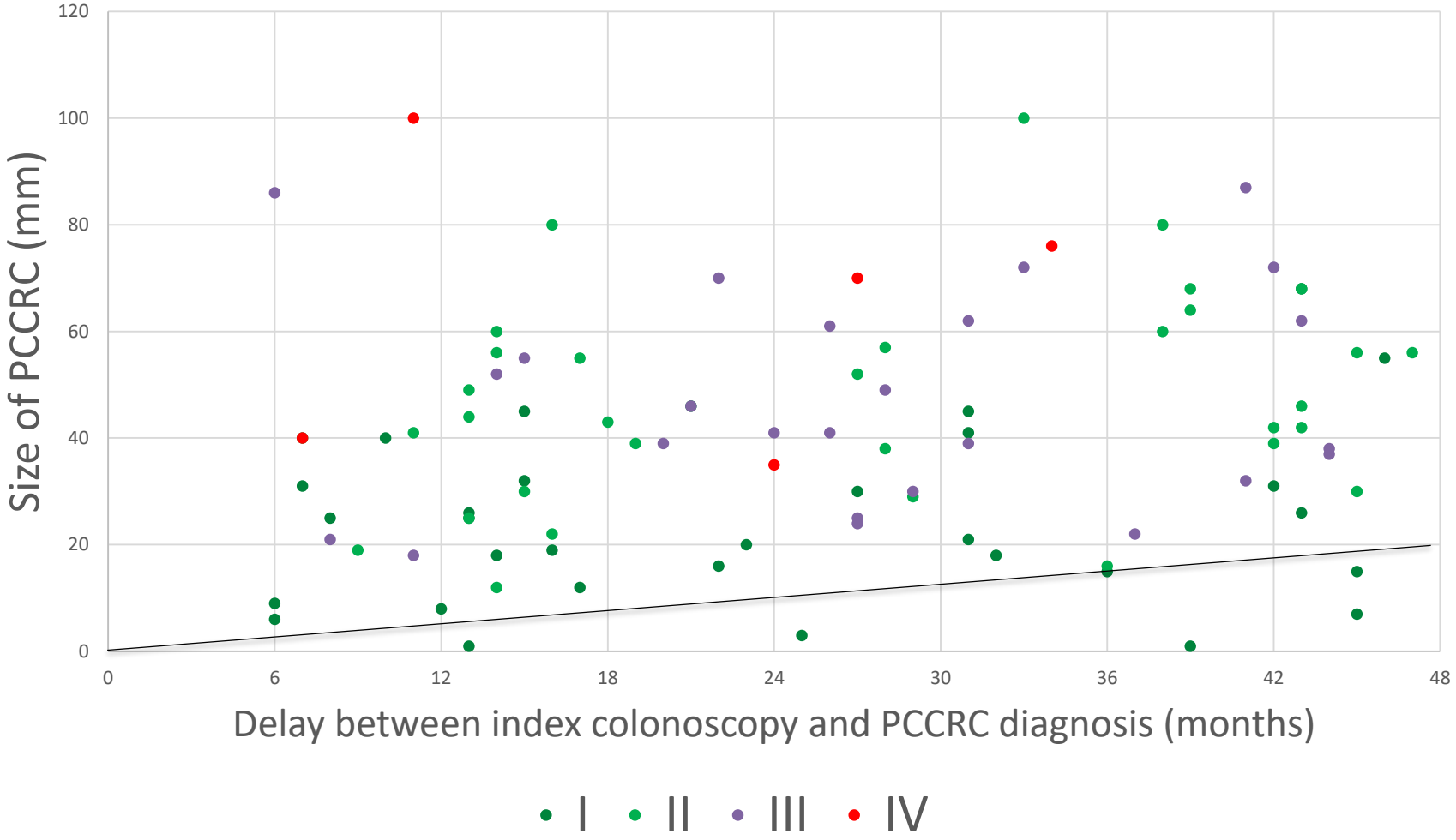
Indication	
Symptomatic	43 (40%)
Surveillance (CRC)	24 (22%)
Surveillance (polyps)	16 (15%)
Surveillance (IBD)	9 (8%)
Hereditary cancer surveillance	4 (4%)
BCSP	7 (7%)
Abnormal investigation	3 (3%)
Planned polypectomy	1 (1%)
	107

Site and stage of diagnosis

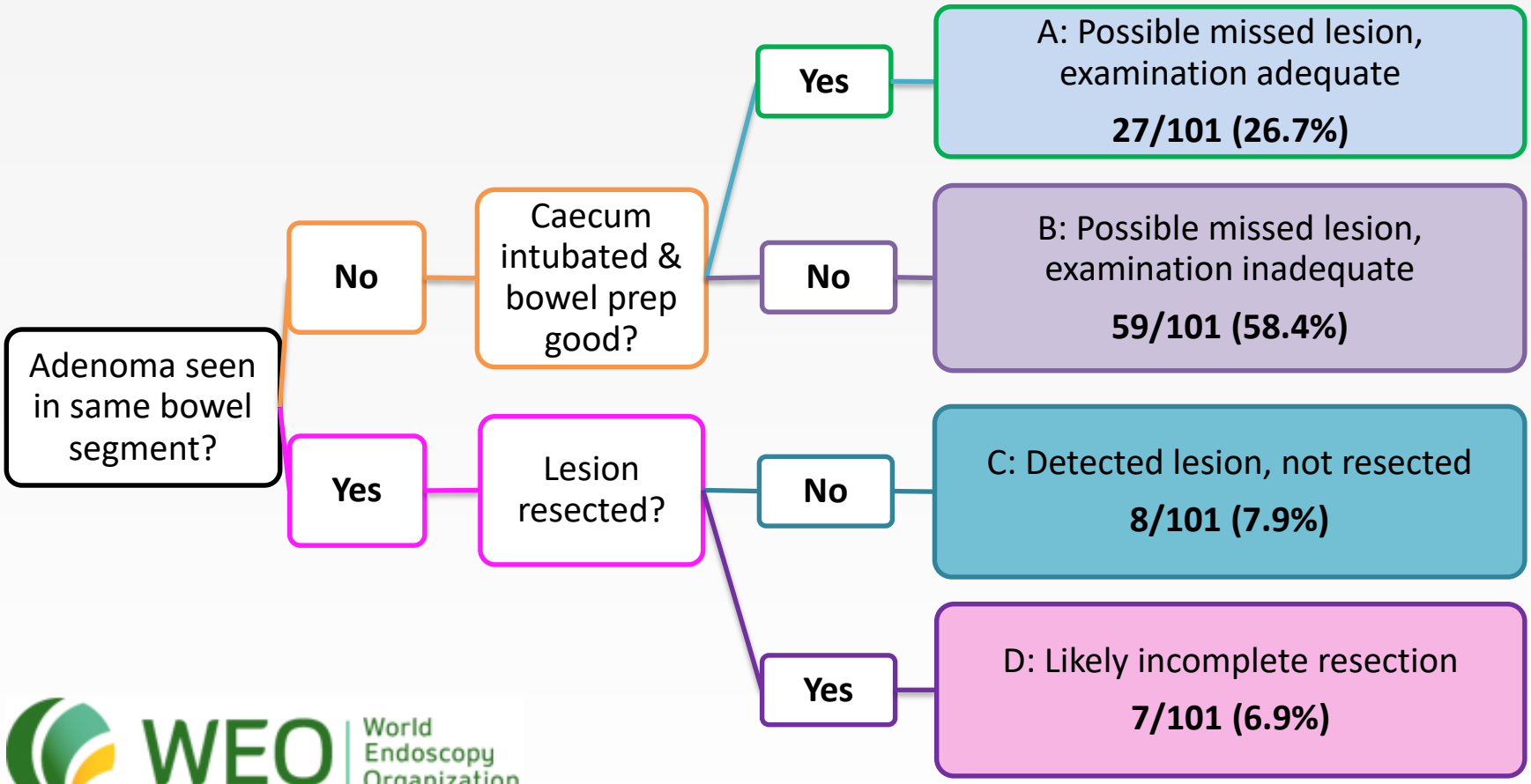




Size of PCCRC versus delay in diagnosis

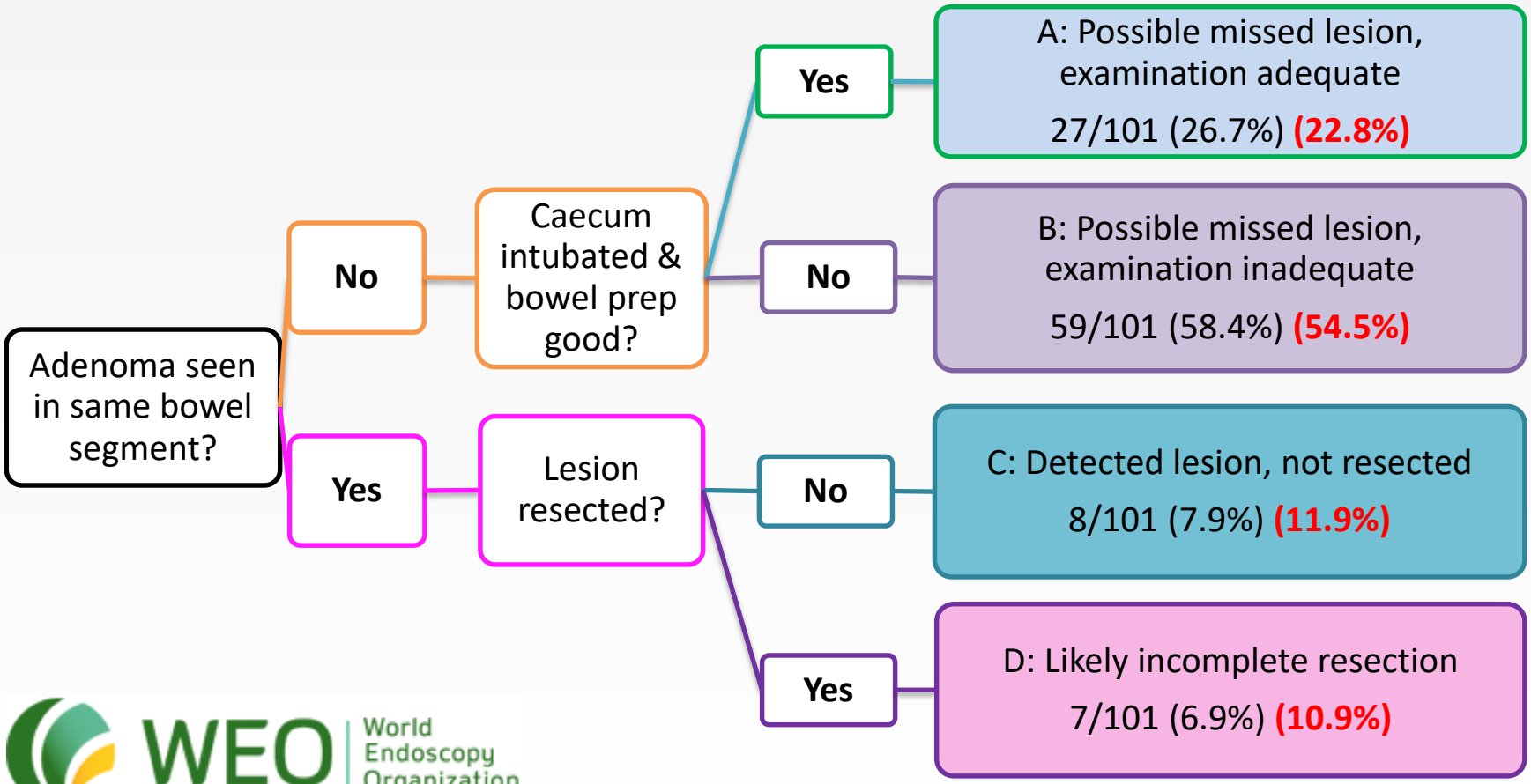


WEO categorisation of PCCRCs



WEO World Endoscopy Organization

Revised WEO categorisation of PCCRCs



WEO World Endoscopy Organization

Findings in PCCRC

- 98/107 (91.6%) reported as complete procedures
- Reasons for incompletion:
  - poor bowel preparation (2), diverticulosis (2), stricture (2), looping (1), otherwise difficult procedure (1) and patient discomfort (1)
  - 2/9 (22.2%) incomplete cases were referred for repeat colonoscopy and 4/9 (44.4%) for imaging
- Rectal/rectosigmoid cases
  - original reports/photos could not be located in 5/30 (16.7%)
  - of the remaining 25, only six (24%) had undergone retroflexion

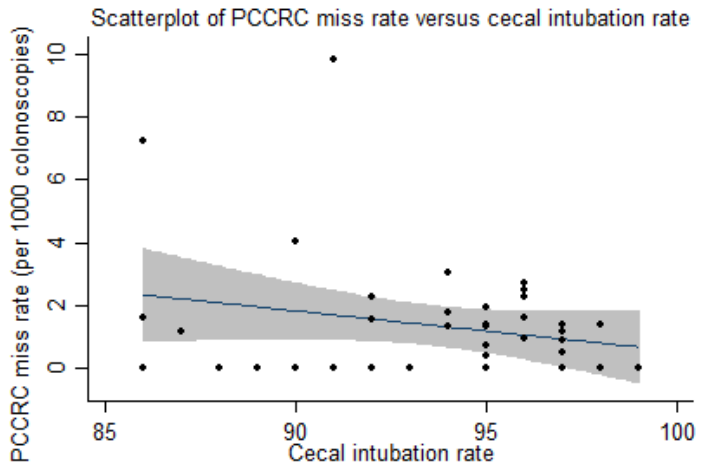
Completion & Retroflexion

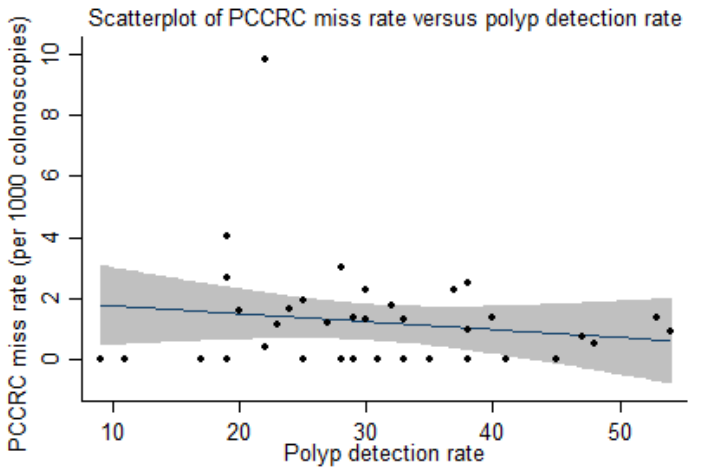
	Complete with adequate photo		
	Yes	No	Total
Proximal and including hepatic flexure	11 (31%)	24 (69%)	35
	Retroflexion done		
	Yes	No	Total
Rectum or rectosigmoid	6 (24%)	19 (76%)	25

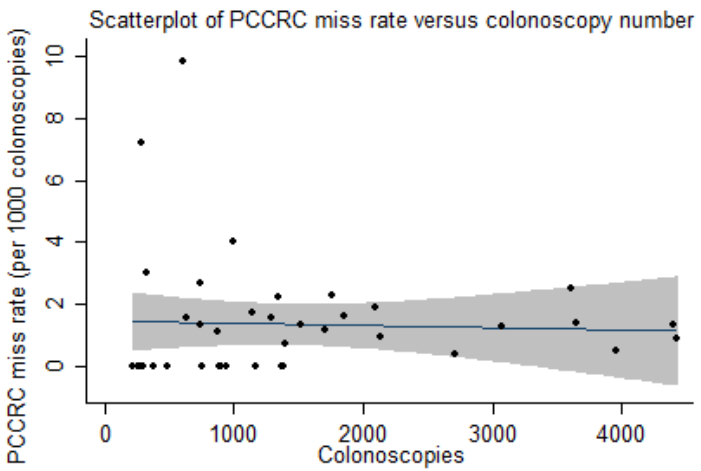
Potentially avoidable?

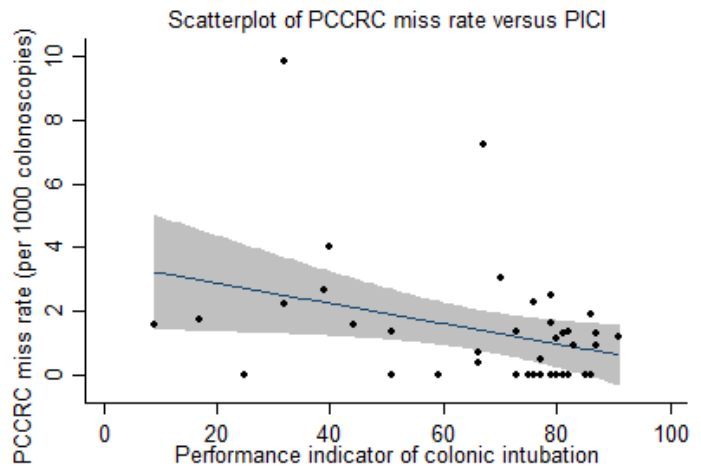
- 95/107 (88.7%) PCCRCs avoidable
- Unavoidable cases (12/107 (11.2%):
  - five small PCCRCs
  - one sub-mucosal lesion related to anastomotic recurrence
  - four cases of patient decision to not undergo further investigation
  - two cases of MDT decision to not investigate further in unwell patients

Scatterplots of technically attributable PCCRCs









Conclusions of Gloucestershire audit

- PCCRC rates are high in certain types of patients:
  - those with existing colon pathology, such as DD
  - high risk conditions: especially IBD, HNPCC, past CRC and multiple polyps
- Surveillance timeframes were often breached, especially those scheduled for six month repeat for whatever reason
  - be clear to booking team which patients are high risk

Conclusions of Gloucestershire audit

- Bowel preparation was often poor and procedures were not repeated
  - absent or unclear decision making, poor or no documentation of decisions
- Some adenomas were overlooked while endoscopists focussed on large polyps
  - early repeat to check for completeness of excision, but also missed lesions
- Photodocumentation was inadequate for procedures done many years ago so completeness of intubation could not be confirmed in many cases
  - photo document caecum and rectum

What puts patients at risk?

- Quality of the procedure
  - missed/incompletely excised lesions
- Decision making
  - after incomplete procedures/patient choice
- Patient biology
  - IBD/HNPCC/post CRC resection
- Patient characteristics
  - female/DD/high morbidity
- Administrative errors
  - surveillance not scheduled on time

Recommendations for WEO consensus

1. WEO categorisation
   - rectal retroflexion mandatory for ‘completeness’
   - small cancers might be considered unavoidable
   - additional categories – patient choice/clinical decision not to repeat and administrative issues
   - recommend adjusted rates used for benchmarking services
   - broader definition of adenoma/polyp
2. Pragmatic guide for the service
   - abbreviated audit checklist
   - we are creating one and would like the WEO panel to review with possible recommendation for its use

What is being done in Gloucester

- Identify high risk patients and book on special lists with extra time
- Have highest performers do procedures with the best technique
- Repeat for big polyps in <6 months to see what was missed (and base check)
- Standardised process and documentation if preparation inadequate
- Offering low (not that low) PDR extra-tuition with endocuff etc
- Continued clinical governance
  - photodocumentation QI project
  - complete review of IBD surveillance service
  - PCCRC QI Plan

PCCRC quality improvement plan

- Feedback general learning points to all endoscopists
  - decision making and documentation after incomplete procedures
  - importance of withdrawal technique
  - awareness of impact of fatigue on performance
- Feedback case histories to individual endoscopists
  - review performance of those with low PDR
- Establish method of identifying patients (non-IBD) at very high risk
  - flag at risk patients in the booking system
  - be very clear about surveillance interval, and that this should not be breached
  - e.g. early (<6 months) for surveillance post excision of very large polyps
  - clinical validation only for fitness to proceed, decision to repeat should not be reversed
  - book on dedicated lists with extra time +/- special techniques

Aspiration Nationally

- Grant from Bowel Cancer UK to implement a national system for identifying PCCRCs with audit tool
  - Facilitate capture of cases and encourage systematic approach to root-cause analyses
- This will generate a large body of evidence of cause of PCCRCS to aid further quality improvement measures

There is an urgent need for a WEO-endorsed abbreviated PCCRC audit tool

Bowel Cancer UK
Beating bowel cancer together

Acknowledgments

- Dr Rebecca Anderson
- Dr Roland Valori

Questions?

Discussion points

- < 5mm growth per year for attributable cancers
- Polyp definition in the algorithm
- Duty of candour
- Stripped-back audit tool