

QUALITY IN ENDOSCOPY

ESGE / ESDO SYMPOSIUM

COLONOSCOPY &
COLONIC NEOPLASMS

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Lecture

Title: Missed and interval carcinoma: The truth.

Session No.: 3

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Definition of 'missed and interval' CRC

- New/missed CRC (diagnostic procedures)
 - Diagnosed between 6 mths and 3 (5) years from diagnostic colonoscopy¹
- Interval CRC (screening procedures)
 - Diagnosed between the time of screening cspy and the scheduled time of surveillance cspy²

¹Bressler et al. Gastroenterology 2007

¹Shawney et al. Gastroenterology 2006

²Kaminski MF, Regula et al. NEJM, 2010

Prevalence of 'missed and interval' CRC

- New/missed CRC (diagnostic procedures)
 - 1.8% to 9.0% of diagnosed CRCs
- Interval CRC (screening procedures)
 - 9.2% of all CRCs diagnosed in the screening cohort

Singh et al. Am J Gastro 2014
Cooper GS et al. Cancer 2011
Kaminski MF, Regula et al. NEJM, 2010

Reasons for interval CRC

- Rapid growth of CRC
- Incomplete removal of polyps
- Overlooked polyp or CRC
- Failed biopsy detection

Rex DK. Clin Gastroenterol Hepatol, 2008
Rabeneck L et al. Frontline Gastroenterol, 2010

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Interval CRC biology

- Interval vs. Non-interval CRC
 - 3.5 x ↑ microsatellite instability
 - 2.5 x ↑ CpG island methylator phenotype
 - 2.5 x ↓ *KRAS* mutation
 - ↔ poor differentiation

< 30%

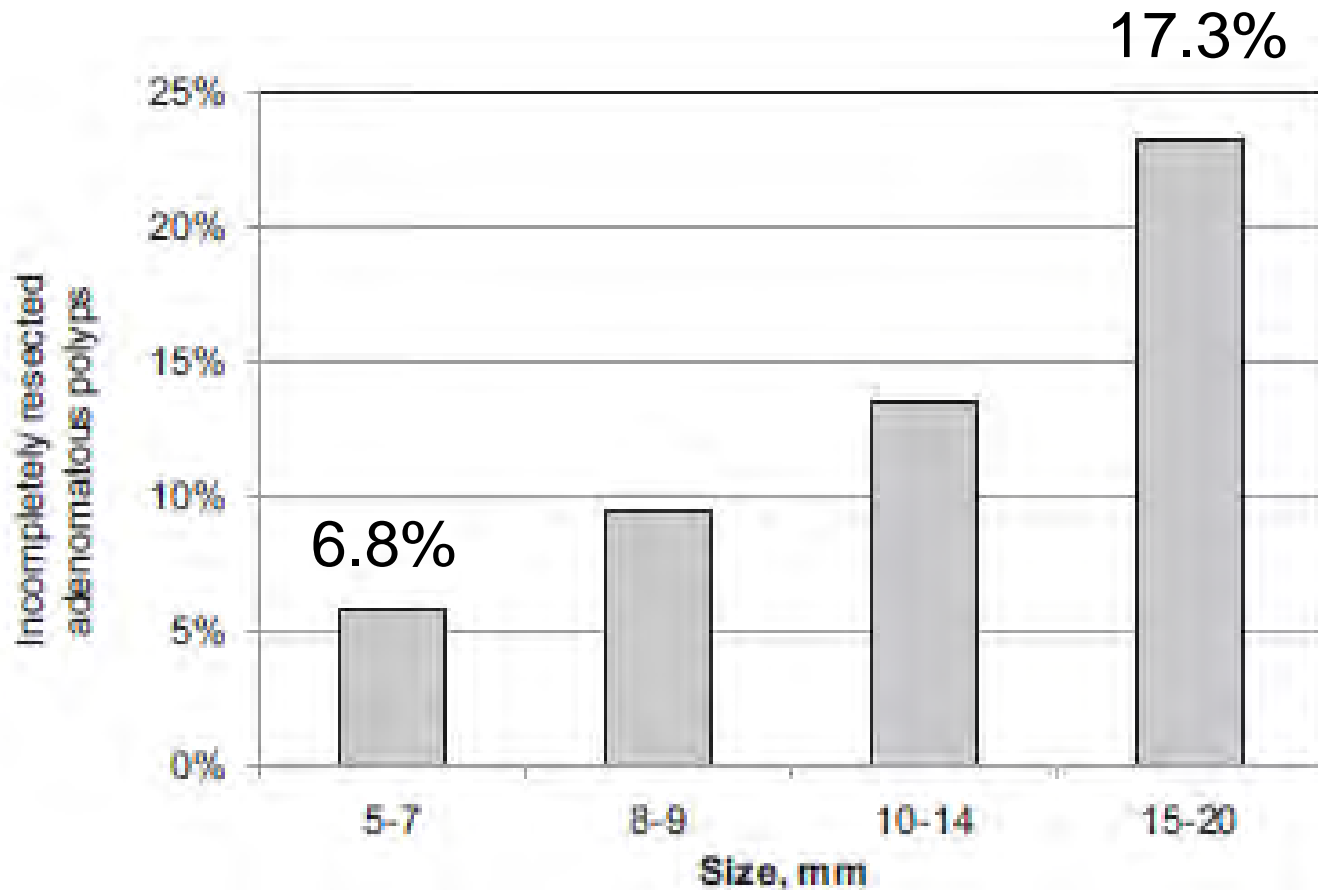
Shawney et al. Gastroenterology 2006
Arain MA et al. Am J Gastroenterol, 2010
Shaukat A, et al. Dig Dis Sci, 2012

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Rex DK. Clin Gastroenterol Hepatol, 2008
Rabeneck L et al. Frontline Gastroenterol, 2010

Incomplete removal of polyps by size



Incomplete removal of polyps

- 2.4%-26% of interval CRC located at previous polypectomy segment
- Missed synchronous lesions at previous polypectomy segment?

Pabby A et al. Gastrointest Endosc, 2005
Farrar WD et al. Clin Gastroenterol Hepatol, 2006
Kaminski, Regula et al. NEJM, 2010

Reasons for interval CRC

- Rapid growth of CRC
- Incomplete removal of polyps
- Overlooked polyp or CRC
 - Limitations of endoscopic technology
 - Inadequate bowel cleansing
 - Incomplete colonoscopy
 - Inadequate visualization of colorectal mucosa



> 50%

Limitations of endoscopic technology

- Percentage of colonic surface visualization
 - Colonoscope 140° - 87%
 - Colonoscope 170° - 92%
- Tandem cspy studies: no perfect endoscopist
- Endoscopically invisible subtle lesions?

East JE et al. Am J Gastroenterol, 2007

Rex DK et al. Gastroenterology, 1997

Rembacken et al. Lancet, 2000

Inadequate bowel cleansing

- Associated with lower detection of small and large adenomas
- Not associated with interval CRC?
 - Repeated colonoscopy before surveillance

Froehlich F et al. Gastrointest Endosc, 2005
Farrar WD et al. Clin Gastroenterol Hepatol, 2006

Incomplete colonoscopy

- Interval vs. Non-interval CRC
 - 2.5 x ↑ location in the proximal colon
- Cecal intubation rate $\geq 95\%$ vs. $< 80\%$
 - Proximal interval CRC (OR 0.72; 95%CI 0.53-0.97)
 - Distal interval CRC (OR 0.73; 95%CI 0.54-0.97)

Inadequate visualization of

ID No. :

Name :

Sex : Age :

D. O. Birth :

08/04/2010

15:12:34

SCV-96



Comment :

Inadequate visualization of

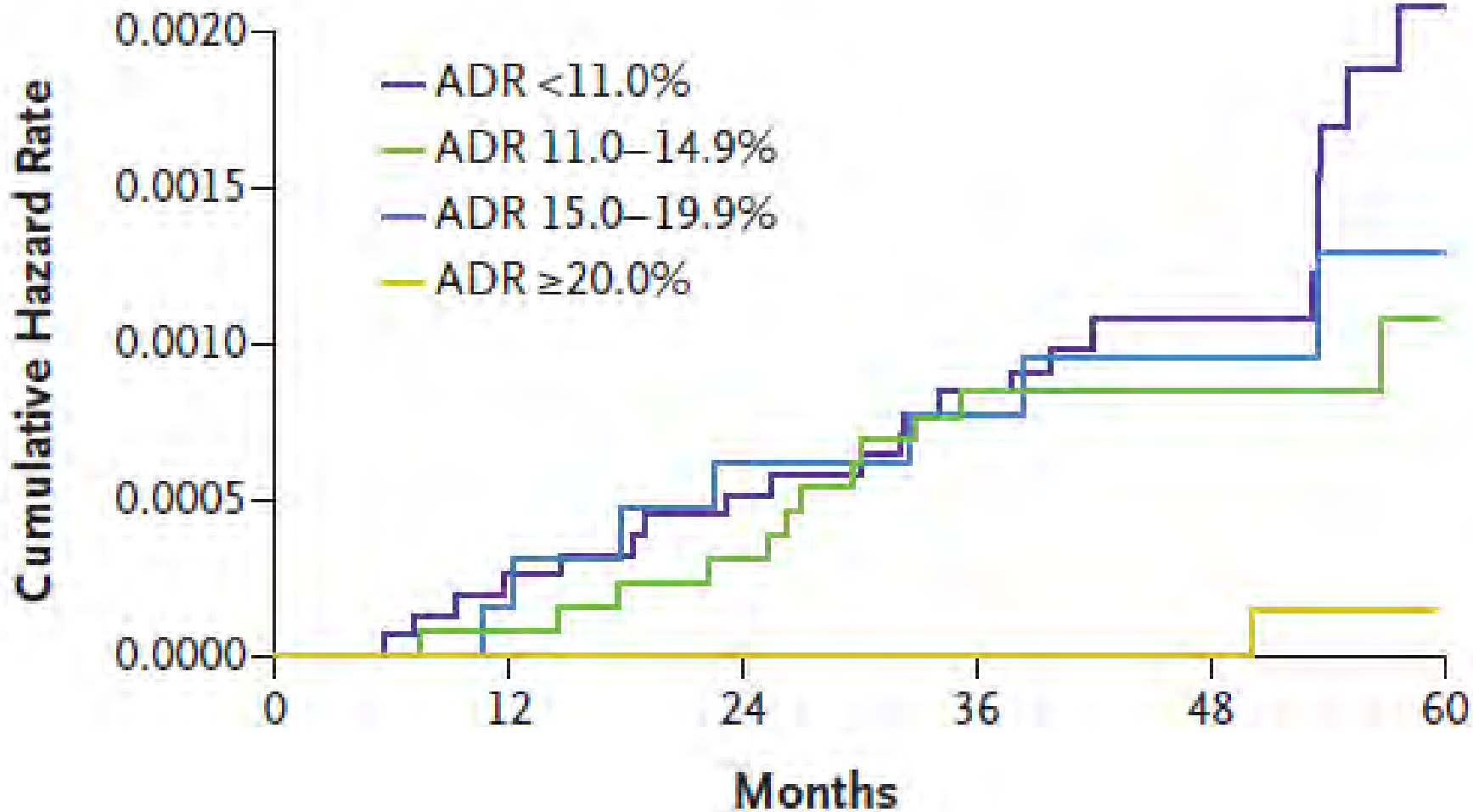


Inadequate visualization of colorectal mucosa

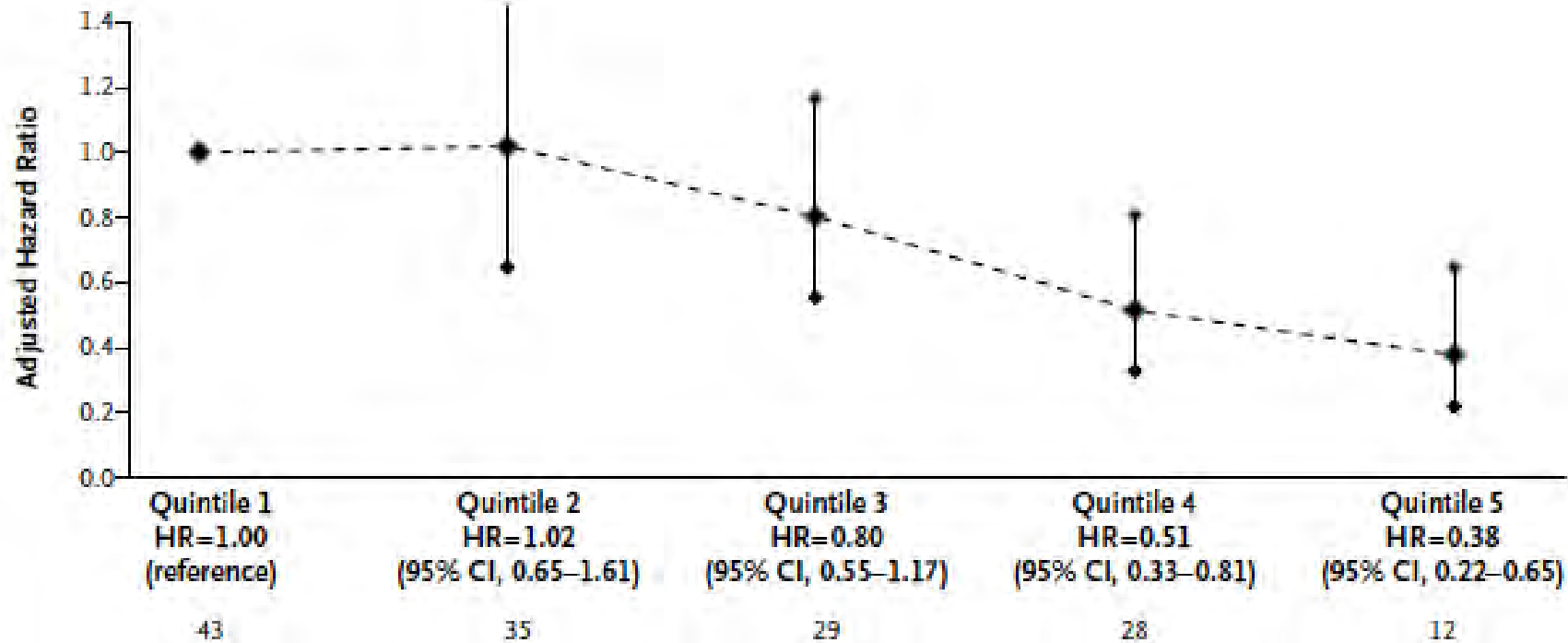
- Variation in endoscopist's ADR
- Large adenoma miss rates: 2.1-12.0%
- Endoscopist's ADR / PDR and interval CRC risk
 - ADR \geq 20% vs. $<$ 20%: 10 x reduced risk

Van Rijn et al. Am J Gastroenterol, 2006
Rabeneck L et al. Clin Gastroenterol Hepatol, 2008
Kaminski MF, Regula J, et al. NEJM, 2010

Cumulative hazard rates for interval CRC according to endoscopist's ADR



Hazard ratios for fatal CRC according to ADR quintile

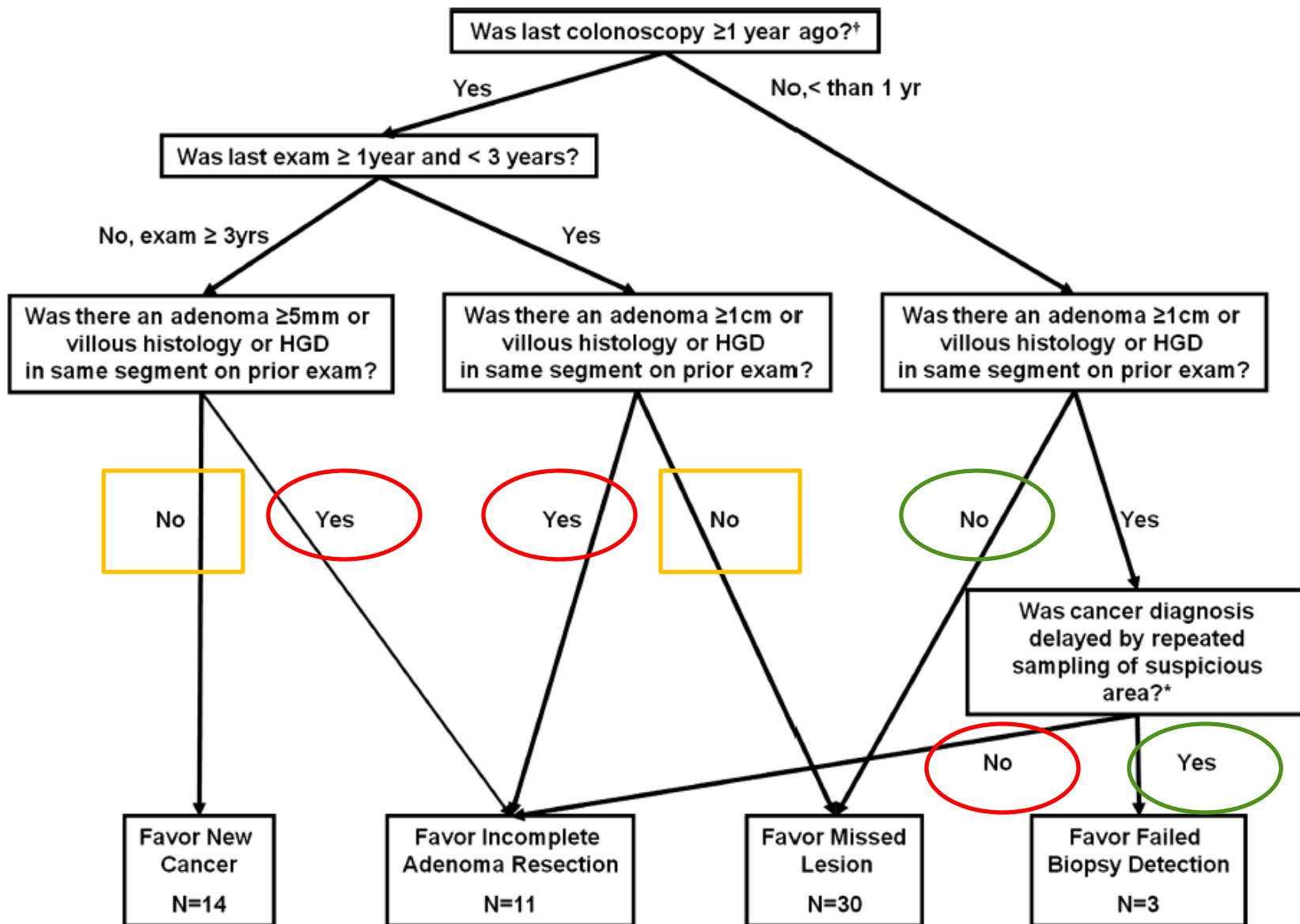




Missed and interval carcinoma

- What is the truth?

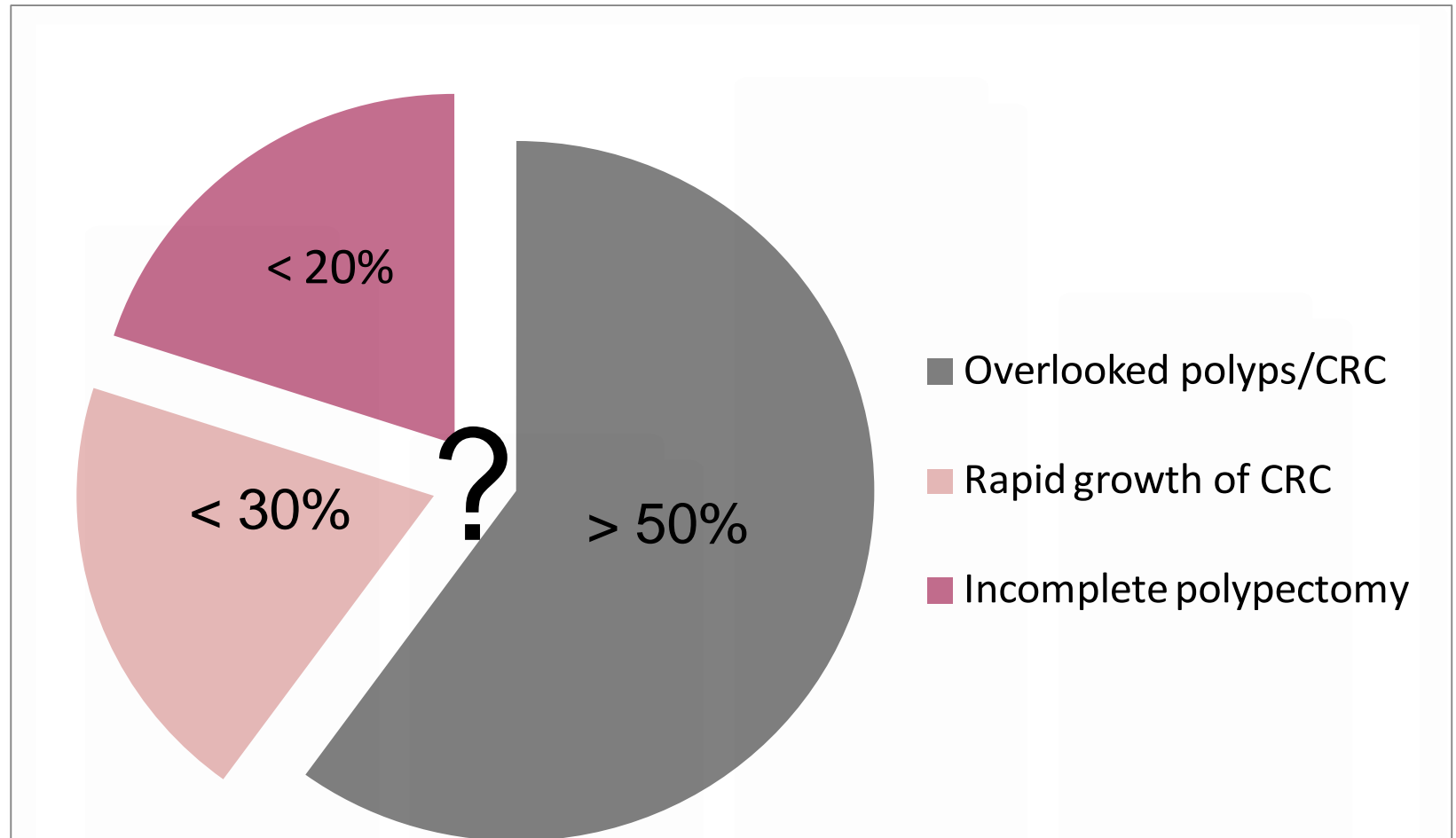
Algorithms to investigate cause of iCRC



*Mean follow-up time 4 years

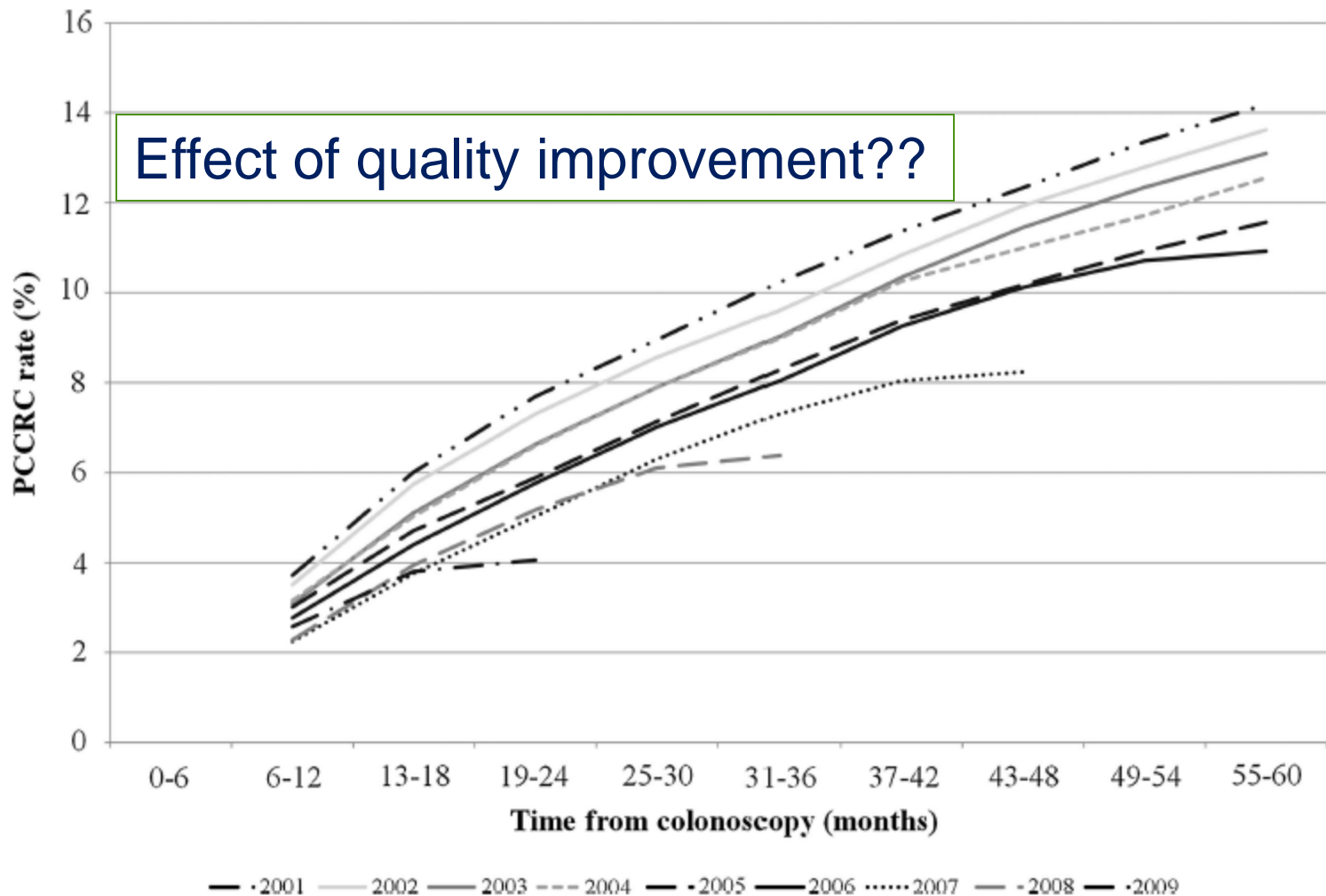
Robertson et al. Gut 2014

Reasons for interval CRC



Routine videorecording of cspy withdrawal?

Are interval CRC rates decreasing?



Outcomes of interval CRCs

- Advanced stage at diagnosis
 - Interval vs. Non-interval: OR 0.79 (95%CI 0.67-0.94)
- Survival Interval vs. Non-interval
 - Samadder: HR 0.63 (95%CI 0.49-0.81)
 - Singh: HR 0.99 (95%CI 0.84-1.17)
 - Erichsen: MRR 1.0 (95%CI 0.88-1.20)
- 5 year survival Interval vs. Detected vs. NoScope
 - 60.8% vs. 68.3% vs. 38.9%

Take home messages

- Interval CRCs

- Prevalence: 1.8% - 9.2%
 - Causes:
 - Rapid growth < 30%
 - Incomplete polyp removal < 20%
 - Overlooked polyp or CRC > 50%
- } Preventable?
- Interval CRC rates are decreasing
 - Outcomes comparable to non-interval CRCs