QUALITY IN ENDOSCOPY

COLONOSCOPY & COLONIC NEOPLASMS

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Missed and interval carcinoma: The truth.

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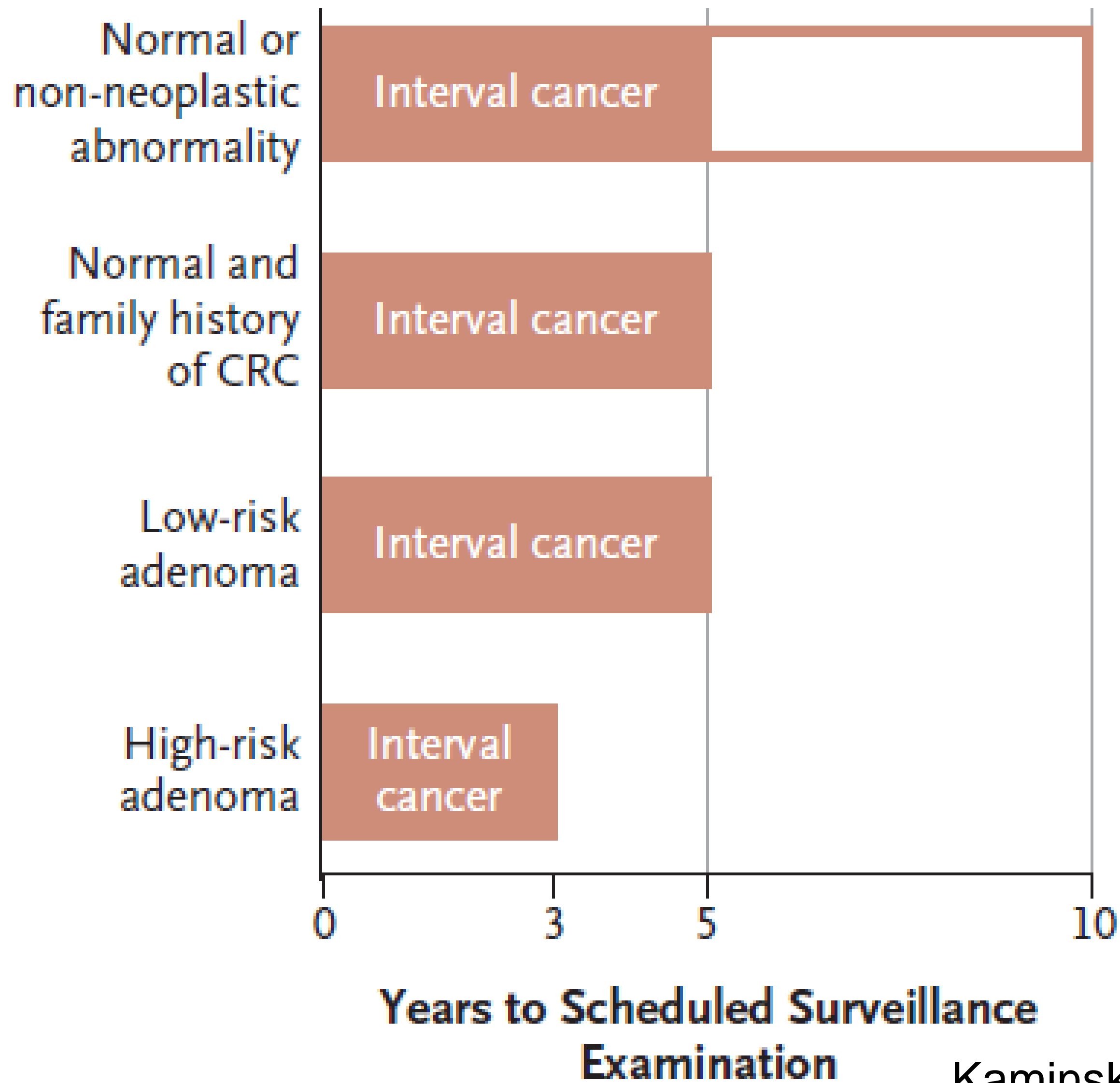
Definition of ‘missed and interval’ CRC

- New/missed CRC (diagnostic procedures)
  - Diagnosed between 6 mths and 3 (5) years from diagnostic colonoscopy[1]
- Interval CRC (screening procedures)
  - Diagnosed between the time of screening cspy and the scheduled time of surveillance cspy[2]

[1]Bressler et al. Gastroenterology 2007
[1]Shawney et al. Gastroenterology 2006
[2]Kaminski MF, Regula et al. NEJM, 2010

Interval CRC



Kaminski MF, et al. NEJM, 2010

Prevalence of 'missed and interval' CRC

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- New/missed CRC (diagnostic procedures)
  - 3.4% to 7.9% of diagnosed CRCs
- Interval CRC (screening procedures)
  - 9.2% of all CRCs diagnosed in the screening cohort

Bressler et al. Gastroenterology 2007
Cooper GS et al. Cancer 2011
Kaminski MF, Regula et al. NEJM, 2010

Reasons for interval CRC

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- Rapid growth of CRC
- Incomplete removal of polyps
- Overlooked polyp or CRC

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

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

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

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

- 2-31% 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

Rex DK. Clin Gastroenterol Hepatol, 2008
Pohl H, et al. Clin Gastroenterol Hepatol, 2010

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

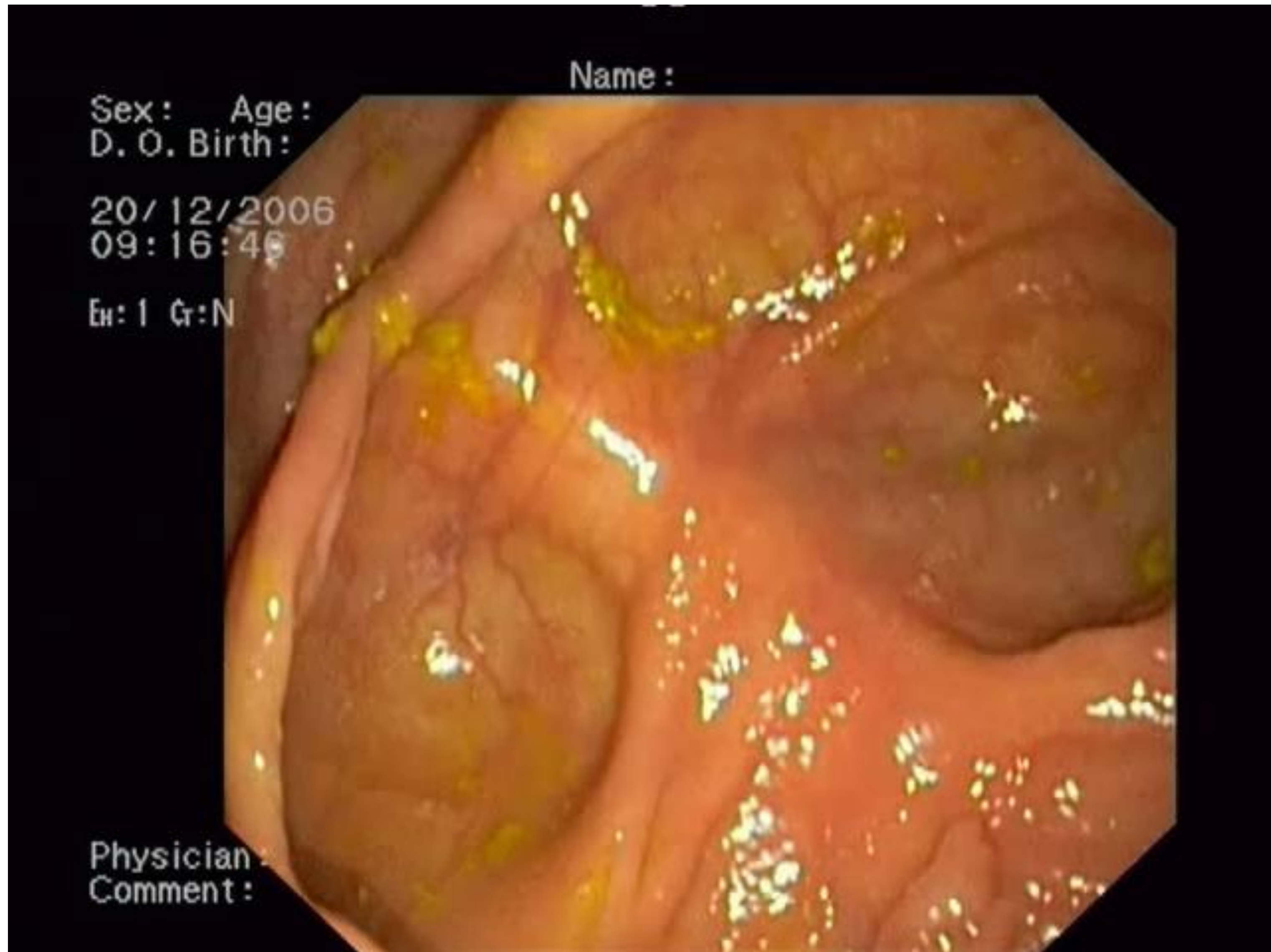
Inadequate bowel cleansing

- 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

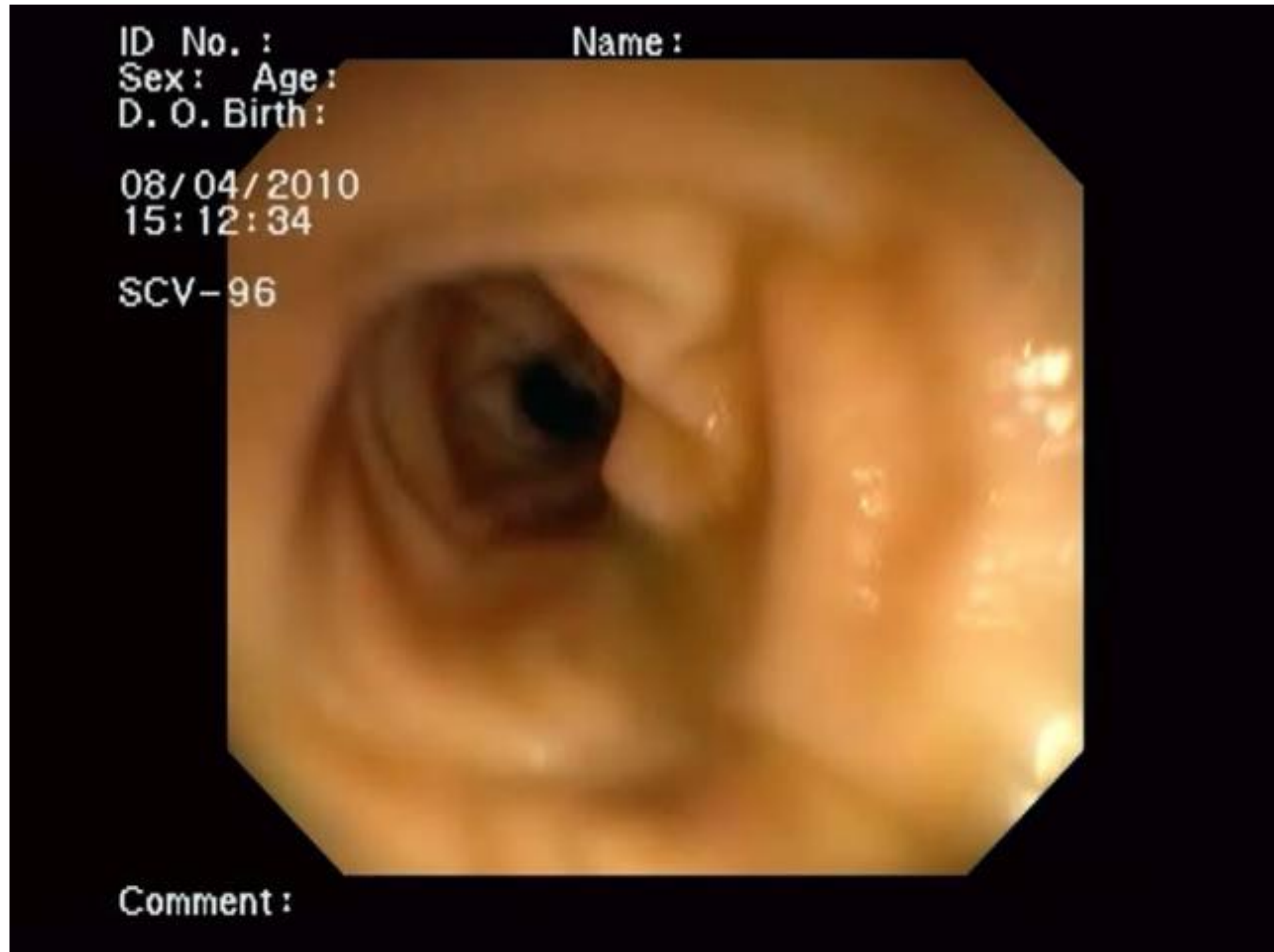


Incomplete colonoscopy

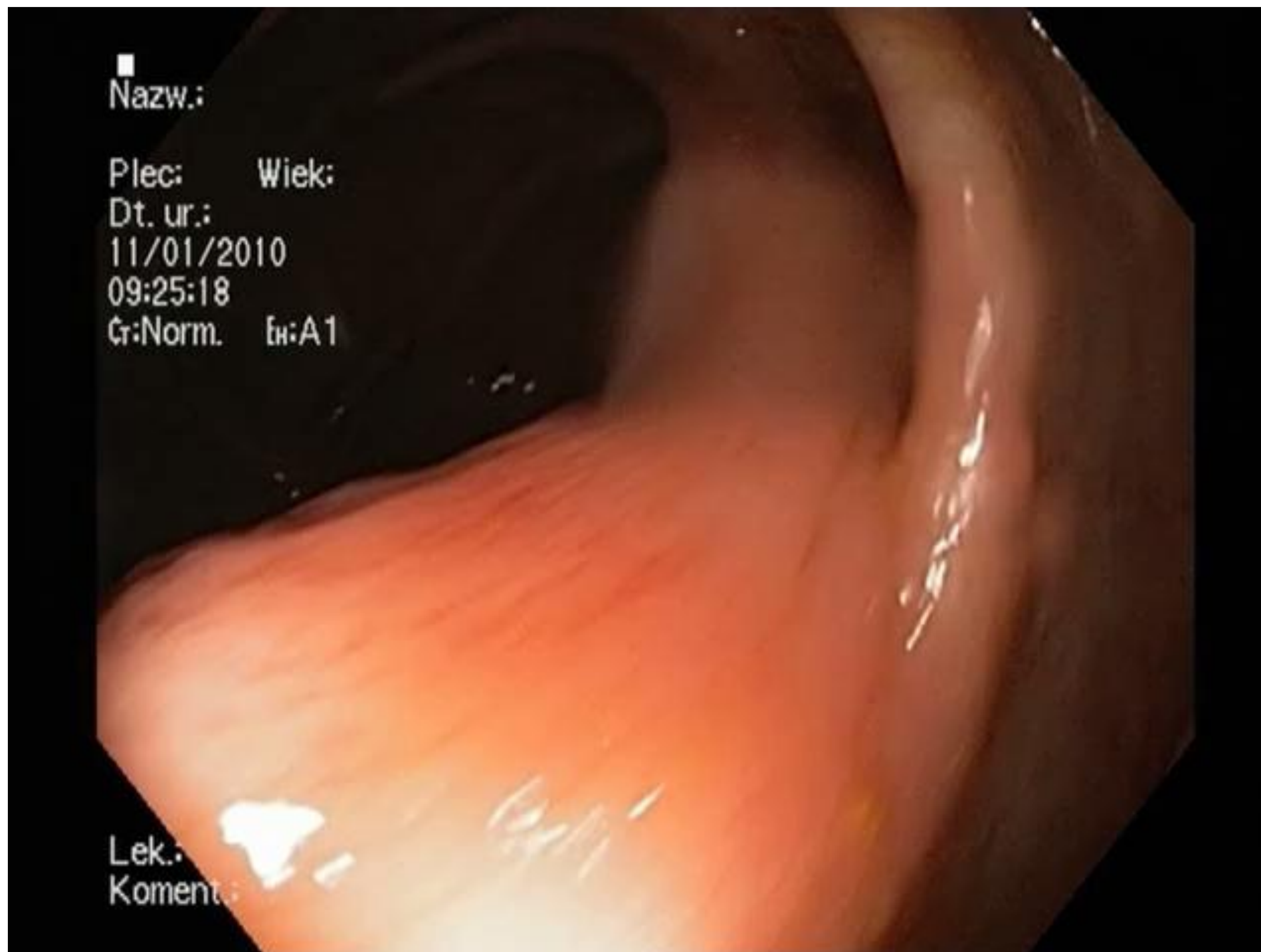
- Interval vs. Non-interval CRC
  - 2.5 x ↑ location in the proximal colon
- Ceacal intubation rate ≥95% vs. <80%
  - Proximal interval CRC (OR 0.72; 95%CI 0.53-0.97)
  - Distal interval CRC (OR 0.73; 95%CI 0.54-0.97)

Cooper GS et al. Cancer, 2011
Baxter NN et al. Gastroenterology, 2011

Inadequate visualization of colorectal mucosa



Inadequate visualization of colorectal mucosa



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Inadequate visualization of colorectal mucosa

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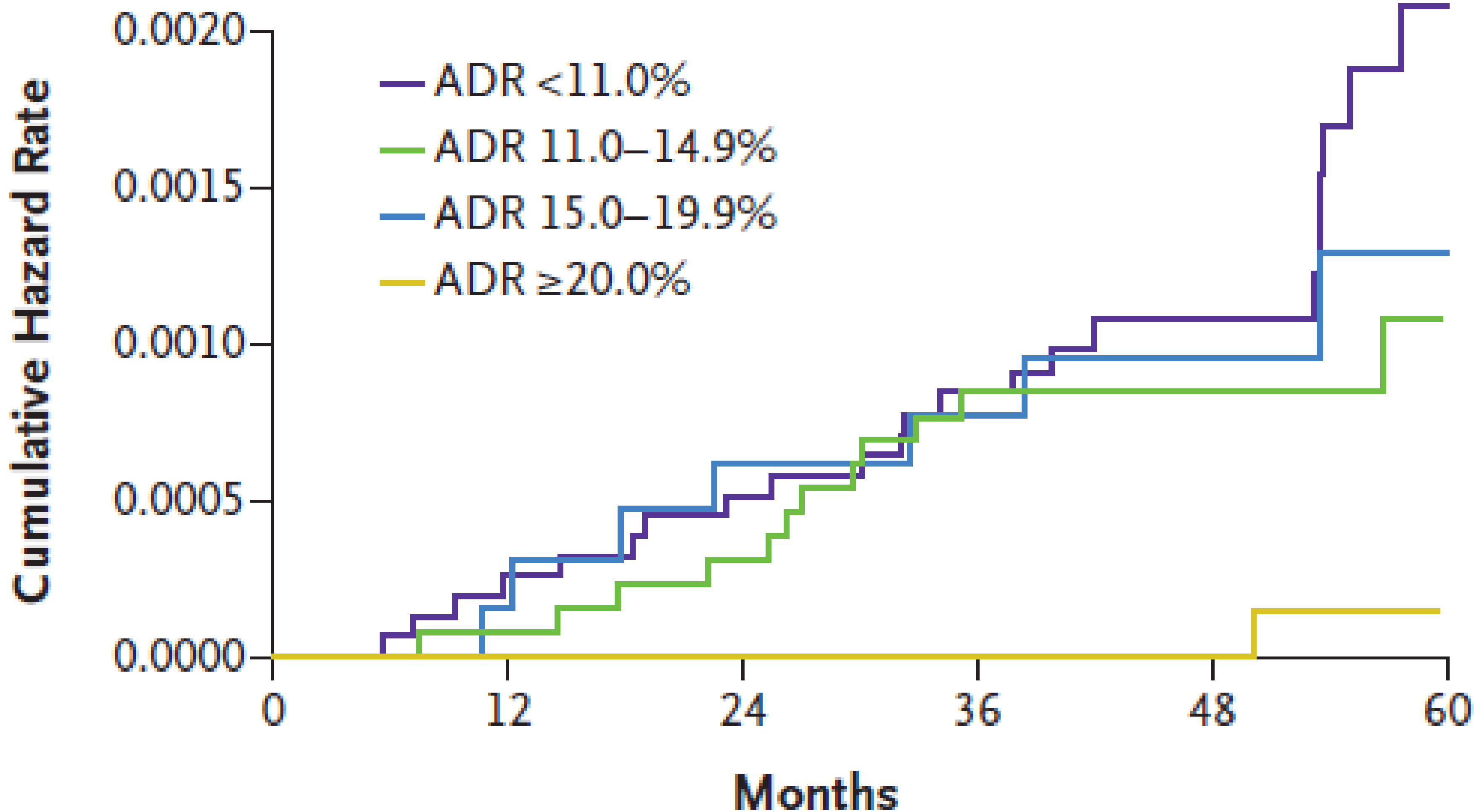
- Variation in endoscopist's ADR
- Large adenoma miss rates: 2.1-12.0%
- Endoscopist's specialty and interval CRC risk
  - Gastroenterologists < Surgeons / Other specialties
- Endoscopist's ADR / PDR and interval CRC risk
  - ADR ≥ 20% vs. <20%: 10 x reduced risk

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



Kaminski MF, Regula J, et al. NEJM, 2010

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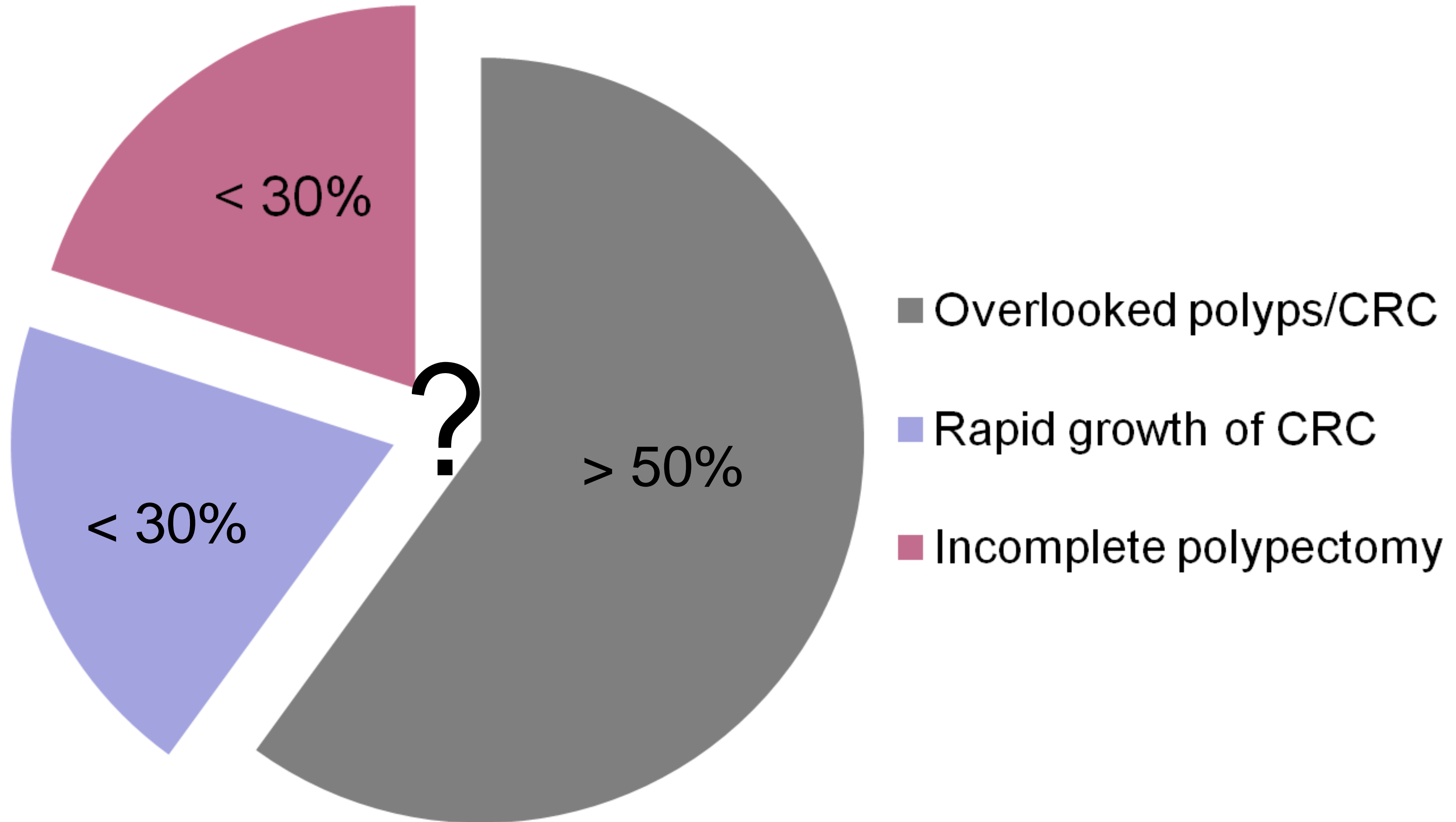
Missed and interval carcinoma

What is the truth?

Reasons for interval CRC



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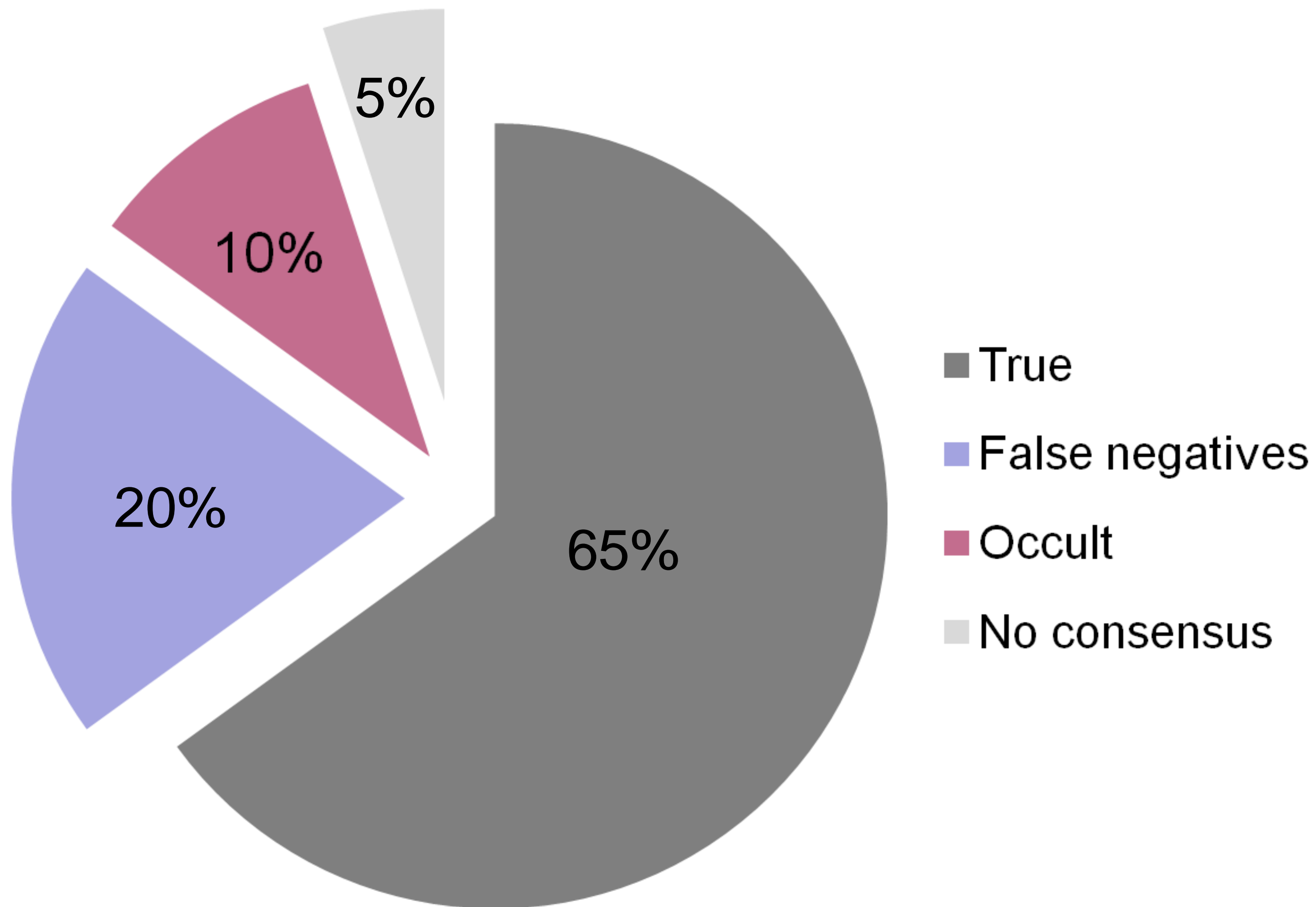
Reasons for interval breast cancer: review of mammography films



Britton PD, et al. Clin Radiol, 2000

Should we routinely video record cspy withdrawals?

- Understand interval CRC occurence
- Impact on the quality of cspy performance
  - Increased inspection time
  - Improved mucosal inspection technique
  - Improved ADR?
- Response to patients interest

Rex DK. Gastrointest Endosc, 2012