

OMED COLORECTAL CANCER SCREENING COMMITTEE MEETING
Saturday, May 1, DDW New Orleans, 2010
Presenter: Evelien Dekker

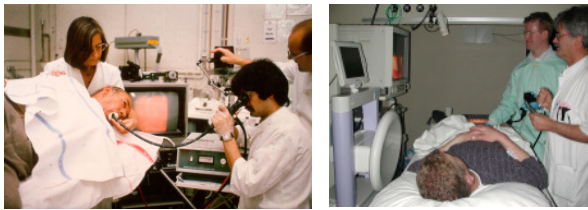
OMED CRC Screening Meeting 2010

**Do advanced endoscopic techniques
improve polyp-detection?**

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Department of Gastroenterology & Hepatology
Academic Medical Center
University of Amsterdam



1980 - 2010

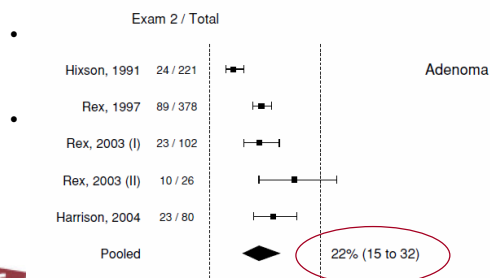


Enormous improvement in endoscopic equipment



However, we do miss polyps..

Van Rijn *et al*, Am J Gastroenterol 2006



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Efforts to reduce miss-rates:

- General measures: endoscopist and patient related (prep, inspection-time etcetc)
- Better exposure of hidden mucosa
- High-tech imaging

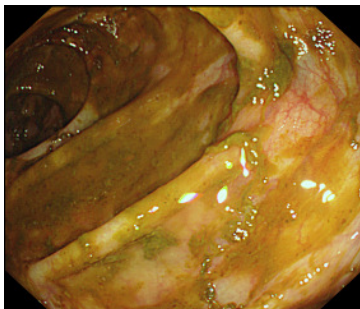


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General measures: patient and endoscopist related



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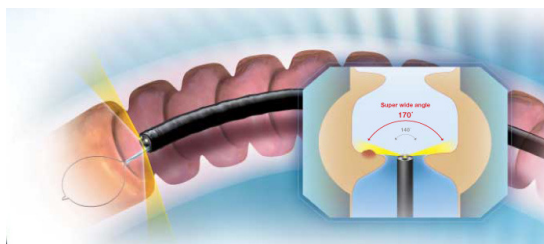


Exposure of hidden mucosa

- Wide angle endoscope
- Hood
- 3rd eye retroscope



Wide angle endoscope: $\geq 170^\circ$



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Does wide angle scope improve detection?

3 randomized trials $\geq 170^\circ$ vs 140°

- Shorter withdrawal time
- Polyp detection NOT increased



1. Rex, Am J Gastro 2003
2. Deenadayalu, Gastro 2004
3. Fatima CGH 2008

Hood



Hood

- Initially designed for mucosectomy procedures
- Better observation of mucosa behind folds and flexures
- Better visual field of colonic mucosa



Does hood improve adenoma detection?

- RCT 1: hood improved polyp detection: 39,1 % vs 49,3 %¹
- RCT 2: lower polyp detection with hood: 30,5 % vs 37,5%²
associated with shorter withdrawal time
- RCT 3: no difference in polyp detection: 42,4 % vs 43,0 %³

→ No clinically relevant increase in adenoma detection rate



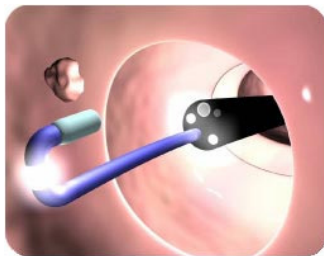
1. Kondo, Am J Gastro 2007
2. Lee, Am J Gastro 2009
3. Harada, GIE 2009

3rd eye retroscope

- Catheter-based imaging system
- Passed through working channel of endoscope
- Retroflexed view



3rd eye retroscope



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Does 3rd eye retroscope improve detection?

- 1 uncontrolled study: on withdrawal retroscope vs regular scope: increased adenoma detection rate 11%
- Multicenter study ongoing

→ No data available



Waye, GIE 2010

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- General measures: endoscopist and patient related (prep, inspection-time etcetc)
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High-tech imaging

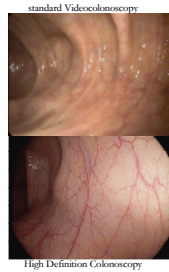
- High Resolution Endoscopy
- Chromoendoscopy
- Digital chromoendoscopy
 - NBI
 - FICE
 - i-Scan
- Auto-Fluorescence Imaging: ETMI



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High resolution and definition endoscopy

- Resolution is a function of pixel density
- High resolution CCDs can currently analyze >1000 pixels per image
- HD endoscopy possible after the adoption of technical advancements from digital broadcasting to endoscopy
- Standard analogue broadcasting systems (PAL or NTSC) generated ~480–576 scanning lines on a screen and High Def endoscopic system can now display up to 1080 scanning lines on a screen



Does HR/HD endoscopy increase polyp detection?

- One dedicated colonoscopist¹ NO
- RCT non-dedicated endoscopists² NO
- Routine practice³ Yes
- Cohort expert-center⁴ NO

1. East, APT 2008
2. Pellise, Gastro 2008
3. Buchner CGH 2010
4. Burke Dig Dis Sci 2009 Epub



Does HR/HD endoscopy increase polyp detection?

Probably not..
and same for adenoma & advanced adenoma



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Chromoendoscopy in the colon

- Contrast stains
 - Indigo-carmin (0,1 – 0,5%)
- Absorptive stains
 - Methylene blue (0,1%)



Does chromo increase adenoma detection?

- RCT Chromo vs standard colonoscopy, n=259¹ **YES?**
But: longer inspection during chromo, only > diminutive lesions
- RCT Chromo vs standard colonoscopy, n=260² **YES**
But: 2 highly experienced endoscopists
- Back-to-back, std 1st, chromo vs std 2nd, n=292³ **YES?**
But: longer inspection chromo, only > diminutive lesions
- RCT Chromo vs Hi Def, n=660⁴ **NO**
*But: high detection-rates in these screening-patients:
 ADR 1.3 vs 1.1: effect of HiDef?!*



1. Brooker, GIE 2002
 2. Hurlstone, Gut 2004
 3. LapalusEndosc 2006
 4. Kahi AmJG 2010

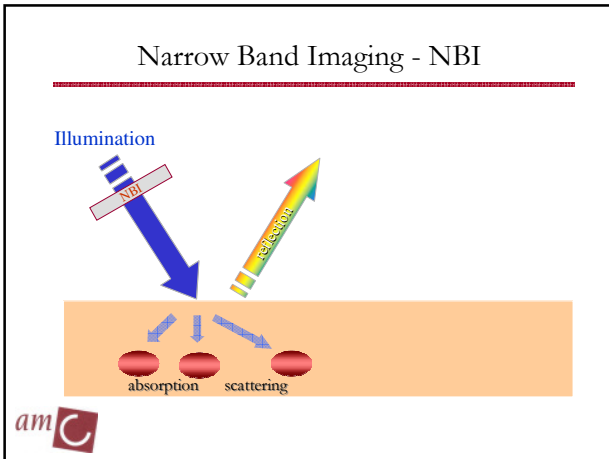
Does chromo increase adenoma detection?

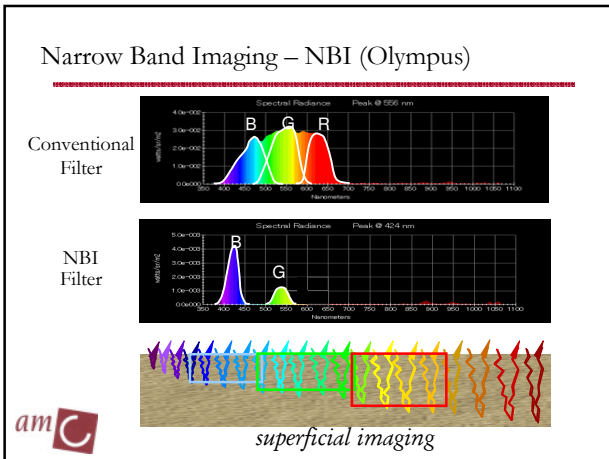
Possibly, but..

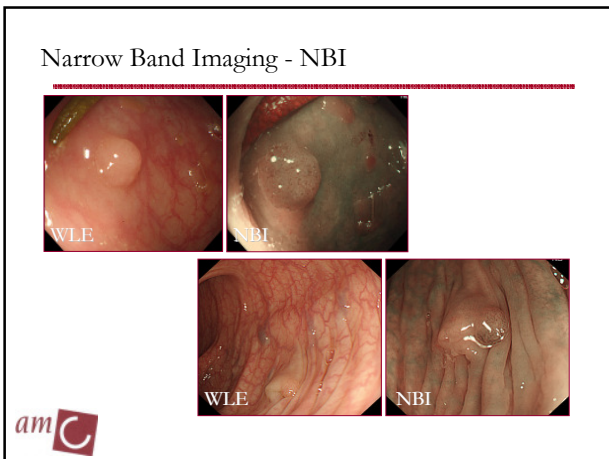
- labour intensive & time-consuming
- pools of dye & messy
- impossible to switch back & forth
- mainly diminutive lesions



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Does NBI increase adenoma **detection**?

Detection of adenomas

- 3 RCT's: → NBI equals SC^{1,2,5}
- 1 RCT (inadequate randomization): → NBI>SC³
- 1 RCT in general setting → NBI equals SC⁴
- 1 RCT in FOBT-positives → NBI equals SC⁶

NO
?

1. Adler, Gut 2008
2. Rex, Gastro 2007
3. Inoue, J Gastro 2008
4. Adler, Gastro 2009
5. Kaltenbach, Gut 2008
6. Paggi, CGH 2009

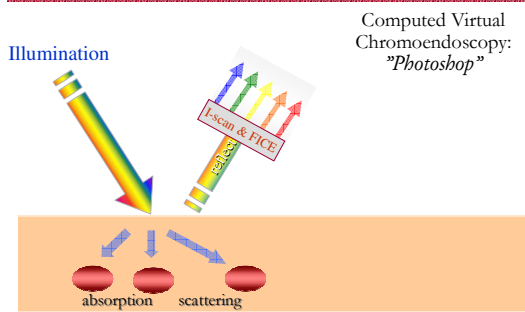


Does NBI increase adenoma **detection**?

- No, NBI equals standard colonoscopy
- Learning curve in trainees or poor adenoma detectors?



I-scan & FICE



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i-scan (Pentax) HD+ resolution above HDTV standard

i-scan SE

Surface Enhancement Detection

i-scan TE

Tissue Enhancement Characterization

i-scan TE with CE

TE + CE Characterization

amC

Does i-scan increase adenoma detection?

- i-scan for detection & classification of polyps, compared to standard 100 vs 100 pts
- Pats with ≥ 1 adenoma 38 vs 18 (sign) Yes

➔ Possibly, but only preliminary data

amC Hoffman, DDW 2009

Fujinon Intelligent ChromoEndoscopy (FICE)

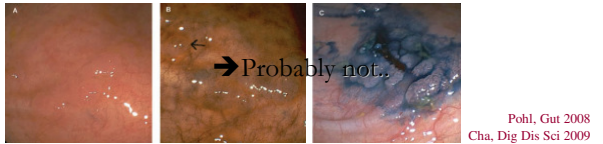
Computed Virtual Chromoendoscopy

amC

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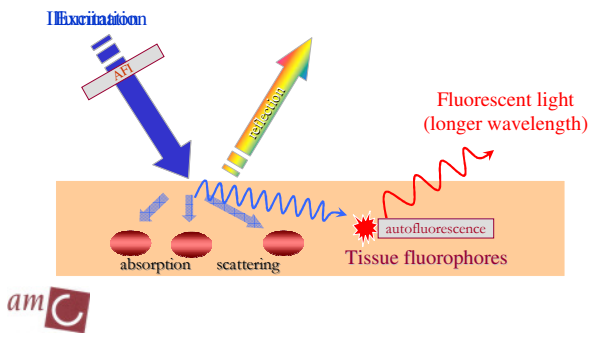
Does FICE increase adenoma detection?

- FICE vs standard & targeted chromo, 764 pts **NO**
- FICE vs WLE, 63 pats² **NO**

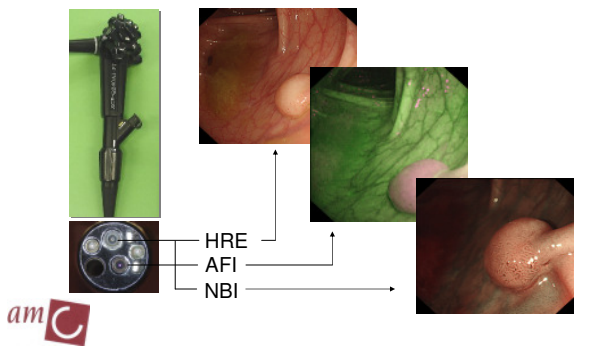


Pohl, Gut 2008
 Cha, Dig Dis Sci 2009

Autofluorescence Imaging - AFI



Endoscopic trimodal imaging – ETMI (Olympus)



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Does ETMI increase adenoma **detection**?

- AFI-standard *vs* standard-AFI, n=167 **Yes**
Only right colon, miss-rate
- AFI-HRE *vs* HRE-AFI, cross-over, n=50 **NO**

→ Sparse, conflicting data



Matsuda, Am J Gastro 2008
van den Broek, CGH 2009

Conclusions

- We miss significant abnormalities with WLE
- Improvements possible with special technology to increase field of view and the use of filters, post-processing and fluorescence
- All “improvements” need thorough scientific evaluation
- So far, none has passed “with honours”
- Don’t forget the basics *prep, time & training*



Amsterdam
Live Endoscopy
