



**Looking better at the esophagus:
early detection of Squamous Cell Cancer and
Adenocarcinoma**


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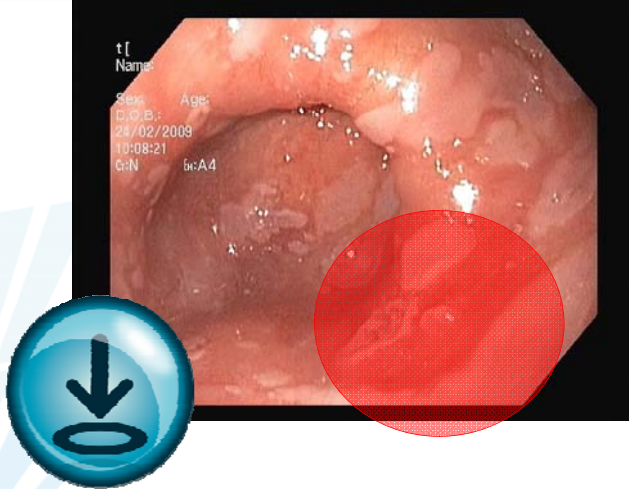




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The myth of advanced imaging






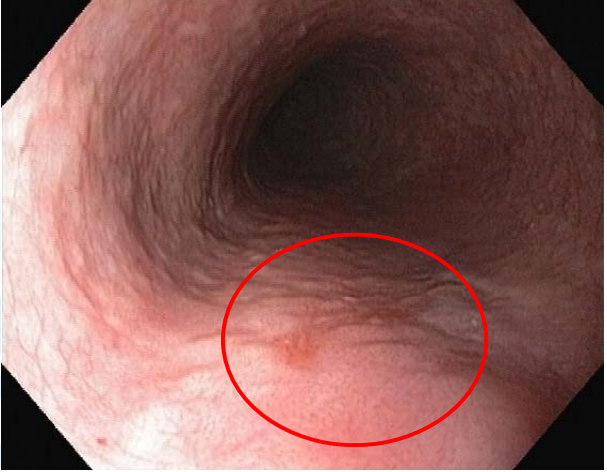


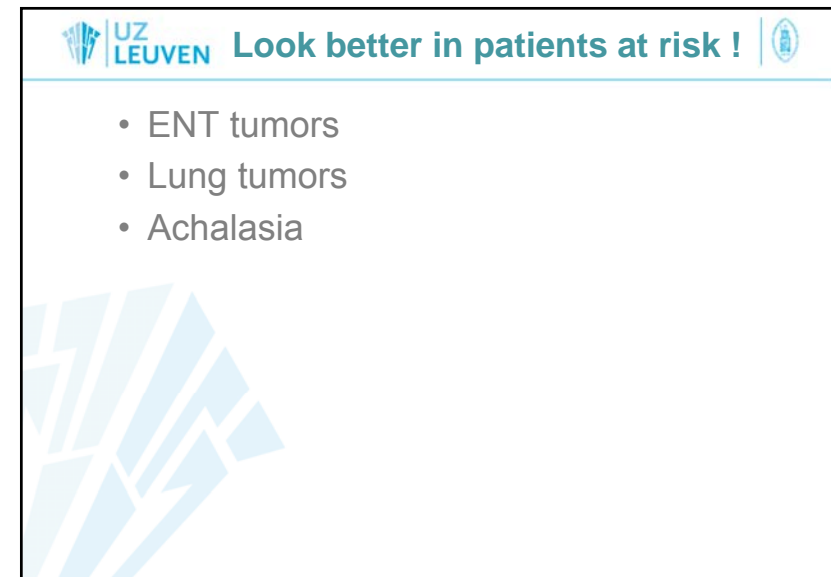
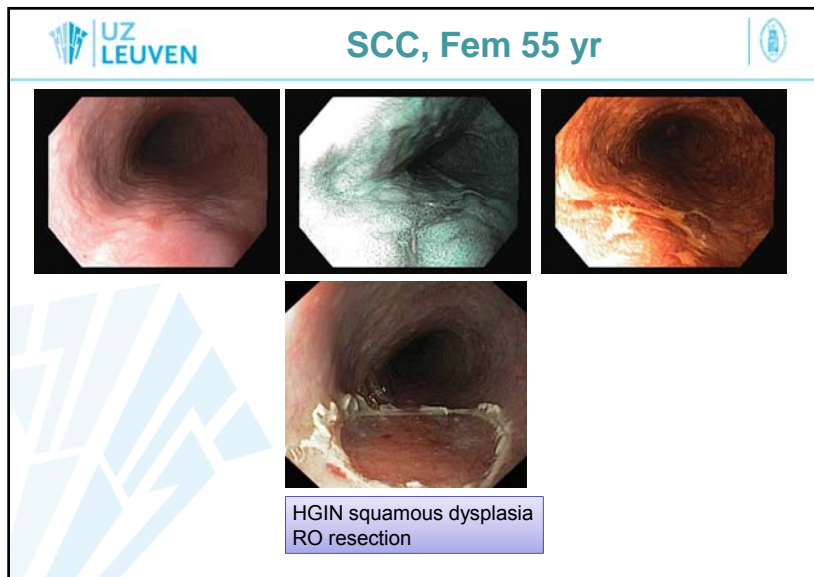
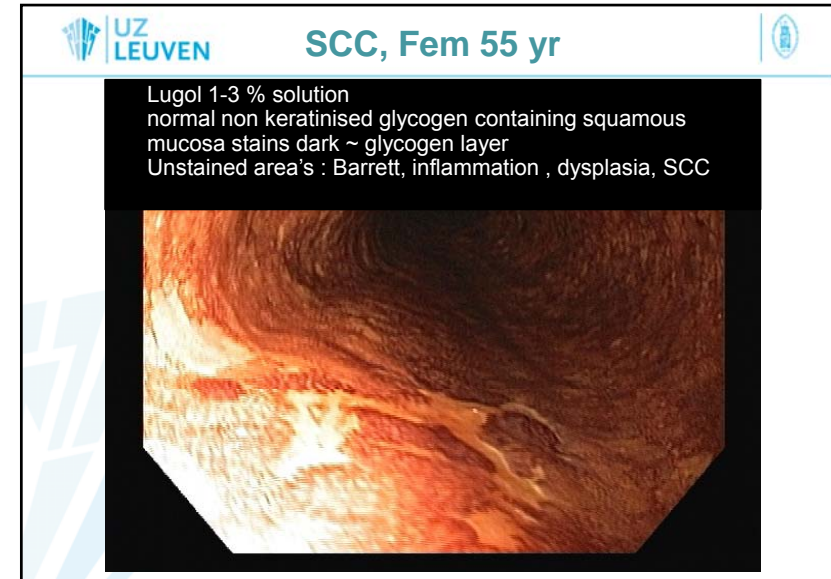
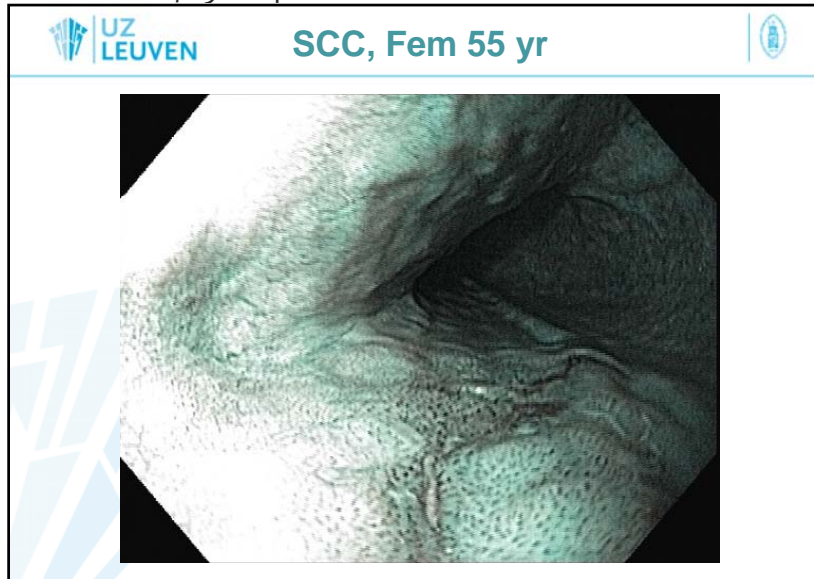
**SQUAMOUS ESOPHAGEAL
CANCER**



SCC, Fem 55 yr







CHROMO-ENDOSCOPY

- Indications Lugol :
 - screening for squamous cancer in high risk patients

326 Patients with Head and Neck cancer

↓

Standard WL endoscopy → Lugol 2%

↓

Esophageal neoplasia : 7.36 %
WL and Lugol same accuracy for advanced and invasive cancer
HGIN : 55% detected by WL <-> 100 % Lugol 2%

Hashimoto CL et al, AJG 2005 100: 275

CHROMO-ENDOSCOPY

1095 Patients with history of
1) Head and Neck cancer or Lung Cancer
2) Alcoholic pancreatitis
3) Alcoholic cirrhosis
4) Alcohol or tobacco addiction
NO esophageal symptoms

↓

Standard WL endoscopy → Lugol 2%

↓

Esophageal neoplasia : 3.2 %
20% of cancer only detected after lugol staining
HGIN : 66% only detected after lugol staining

Group 1 : cancer + dysplasia : 9.9%

Dubuc et al, Endoscopy 2006 38 690

NBI in high risk patients for SCC

Lugol as gold standard

350 High risk patients
Current or present Head and Neck cancer or Lung Cancer
Current or past SCC

↓

Experienced endoscopist
> 9 years as endoscopist
2 year NBI experience

SENSITIVITY 100 %

↓

Less Experienced endoscopist
3-5 years as endoscopist and experience with lugol
NBI observation for 2-3 months

SENSITIVITY 53 %

Ishihara et al Dis. Esophagus (2010) 23, 480-486

CHROMO-ENDOSCOPY

CONCEPT OF PAN-UPPER-ENDOSCOPY

Upper GI ENDOSCOPY + Lugol

• ENT Tumors
• Lung cancer
• Squamous esophageal cancer

Bronchoscopy

Laryngoscopy

Achalasia

Cohort of 448 achalasia patients

↓

Median 9,6 years follow-up

↓

3,3% developed cancer
0,34 % risk / year

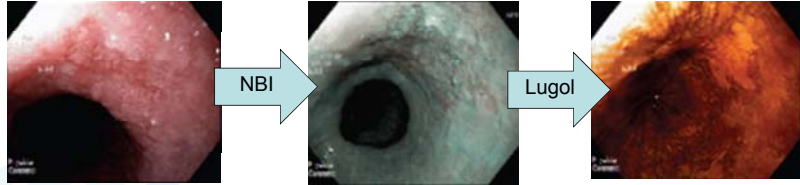
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10/15 advanced stage
5 esophageal resection

Achalasia is a risk factor for SCC, but despite endoscopic surveillance, cancer is diagnosed at an advanced stage. Efforts should be made to identify high risk groups and develop adequate surveillance strategies.

Leeuwenburgh et al AM J Gastro 2010; 105:2144-2149

Achalasia



NBI → Lugol

1/43 patients with carcinoma in situ, all detected with WL, NBI and lugol

Ide et al J Oncol, 2013;2013:736756. doi: 10.1155/2013/736756. Epub 2013 Jul 9.

BARRETT'S ESOPHAGUS

Meta-analysis NBI and Barrett

Inclusion criteria

- Prospective clinical studies and randomized controlled trials;
- published in peer-reviewed journals;
- assessment of dysplasia and/or noninvasive EAC as one of their outcomes;
- included both WLE with RB and CE (or VC) with targeted biopsies;
- extractable information regarding the diagnostic yield of WLE vs CE (or VC).

↓

14 studies with MB or IC CE/ NBI

1. advanced imaging techniques increased the diagnostic yield for detection of dysplasia or cancer by 34%
2. Virtual chromoendoscopy significantly increased the diagnostic yield by 34% and chromoendoscopy by 35%
3. There was no significant difference between virtual chromoendoscopy and chromoendoscopy.

Bashar et al Clin Gastro Hep 2013; ;11:1562-1570

UZ LEUVEN **ZOOM NBI in Barrett**


Meta-analysis of 8 studies on Zoom NBI
8 studies were selected
N = 446 patients / 2194 lesions (sites)

	Sensitivity	Specificity	Odds ratio	AUC
HGIN	0.96	0.94	342.49	0.99
SIM	0.95	0.65	37.53	0.88

"NBI with magnification is accurate with high diagnostic precision for diagnosis of HGD in Barrett's esophagus on the basis of irregular mucosal pit patterns and/or irregular microvasculature."

Mannath J et al Endoscopy 2010;42:351

UZ LEUVEN **The literature looks great !**





UZ LEUVEN **Pay attention when reading BE papers**

1. Detection \neq Characterization
2. Experts \neq Beginners
3. Studies \neq General practice

UZ LEUVEN **New NBI data : is this usefull in clinical practise**



- Multicenter cross over trial HDWL and NBI
 - Three expert referral centers
 - 48% dysplasia in 123 patients

P. Sharma et al Gut 2013

 **New NBI data : is this usefull in clinical practise** 



- What are the new findings?
 - When compared with high-definition white light endoscopy, NBI detected the same number of patients with intestinal metaplasia but with fewer biopsies.
 - NBI detected a higher proportion of areas with dysplasia.
 - Regular appearing NBI surface patterns did not harbor high-grade dysplasia/cancer.
 - The accuracy of NBI for the detection of low grade dysplasia is low.

P. Sharma et al Gut 2013

 **New NBI data : is this usefull in clinical practise** 



- How might it impact on clinical practice in the foreseeable future?
 - The use of NBI targeted biopsies may improve the efficiency of BO endoscopic screening and surveillance of BO.
 - **Biopsies could be entirely avoided in patients who have only regular appearing NBI surface patterns.**

P. Sharma et al Gut 2013

 **New NBI data : is this usefull in clinical practise** 

- Result section of the paper
 - NS difference for detected visible lesions with neoplasia but HDWL (17.1%) detected more patients with visible lesions than NBI (4.9%) !
 - NS difference for number of patients with dysplasia
 - NBI did not detect more patients with higher grades of dysplasia according to the targeted biopsies

P. Sharma et al Gut 2013

 **New NBI data : is this usefull in clinical practise** 

- Result section of the paper
 - The conclusion is based on the area based analysis showing a difference in **proportion** of lesions with any dysplasia (LGIN/HGIN/EAC)
 - 67/321 HDWL (21%) vs 81/267 (30%) (p=0.01)

CONCLUSION SHOULD BE : IF YOU ARE NOT AN EXPERT IN ADVANCED IMAGING AND DETECTING EARLY CANCER : USE HD WL AND TAKE PROPER BIOPSIES

LGIN

P. Sharma et al Gut 2013

UZ LEUVEN Meta-analysis NBI and Barrett

Meta-analysis of the effects of endoscopy with narrow band imaging in detecting dysplasia in Barrett's esophagus

J. Song, J. Zhang, J. Wang, X. Guo, S. Yu, J. Wang, Y. Liu, W. Dong
Department of Gastroenterology, Renmin Hospital of Wuhan University, Wuhan, Hubei, China

DISEASES OF THE ESOPHAGUS

Inclusion criteria

- Prospective trial
- Histology gold standard
- Description of vascular and pit pattern

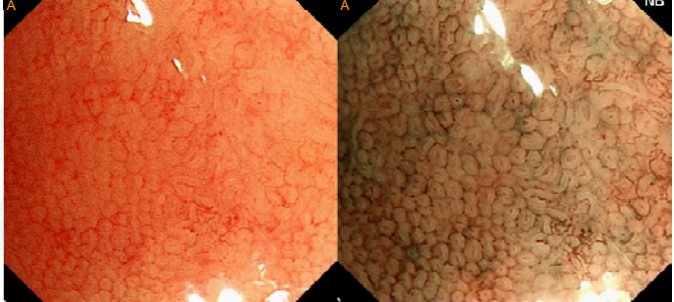
7 studies included

	Sensitivity SIM	Specificity SIM	Sensitivity HGD	Specificity HGD
Per patient	0.91	0.85	0.91	0.95
Per lesion	0.97	0.64	0.69	0.90

Song et al Dis Eso 2014 online

UZ LEUVEN NBI in Barrett's Esophagus

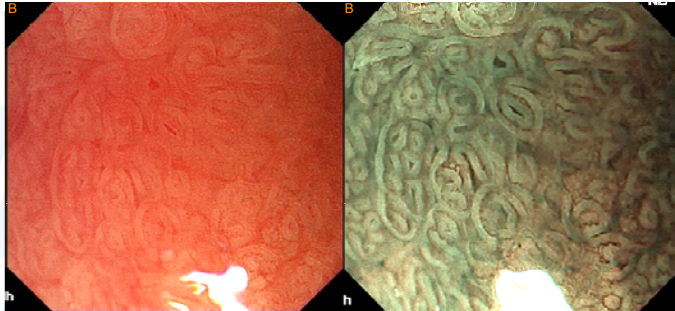
NBI Characterization of Barrett's epithelium
Simplified system



Type A: columnar glands without IM
(round pits with regular microvasculature) Singh et al Endoscopy 2008

UZ LEUVEN NBI in Barrett's Esophagus

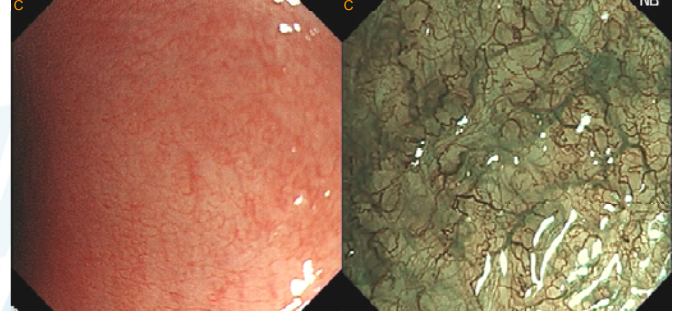
NBI Characterization of Barrett's epithelium
Simplified system



Type B: columnar glands with IM
(villous / ridge pits with regular microvasculature) Singh et al Endoscopy 2008

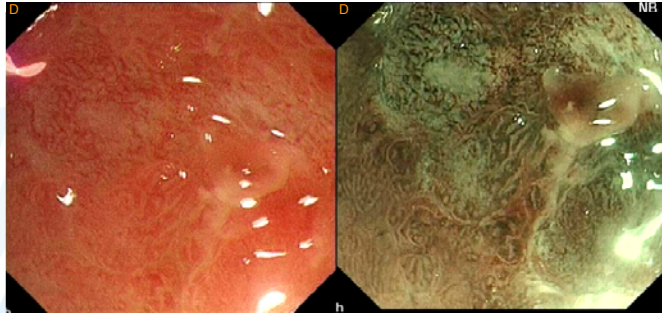
UZ LEUVEN NBI in Barrett's Esophagus

NBI Characterization of Barrett's epithelium
Simplified system



Type C: columnar glands with IM
(absent pits with regular microvasculature) Singh et al Endoscopy 2008

NBI Characterization of Barrett's epithelium Simplified system

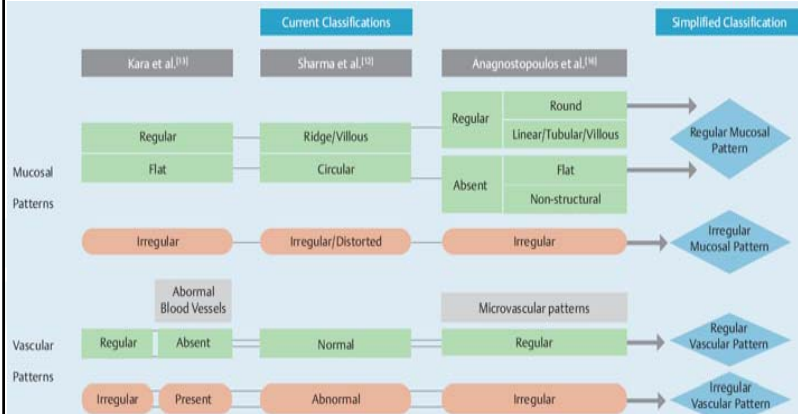


Type D: high grade dysplasia
distorted pits with irregular microvasculature Singh et al Endoscopy 2008

NBI Characterization of Barrett's epithelium Diagnostic Accuracy of a simplified system

	PPV	NPV
Type A	100 %	97%
Type B+C	88%	91%
Type D	81%	99%

Singh et al Endoscopy 2008



Singh et al Endoscopy 2011; 43: 745–751

3 experts

252 NBI images of 75 patients

- 93 SIM
- 91 LGIN
- 68 HGIN

4 non-experts

	sens	Spec
Dyspl : LGIN-CA	49%	73%
Dysplas : HGIN+CA	63%	66%

K = 0.59-0.63

	sens	Spec
Dyspl : LGIN-CA	46%	72%
Dysplas : HGIN+CA	54%	66%

K = 0.54-0.56

"the interobserver agreement was fair with suboptimal sensitivity and specificity. Significant improvements in NBI interpretation are needed prior to the routine use of NBI surface patterns for the assessment of Barrett's esophagus"

Singh et al Endoscopy 2011; 43: 745–751

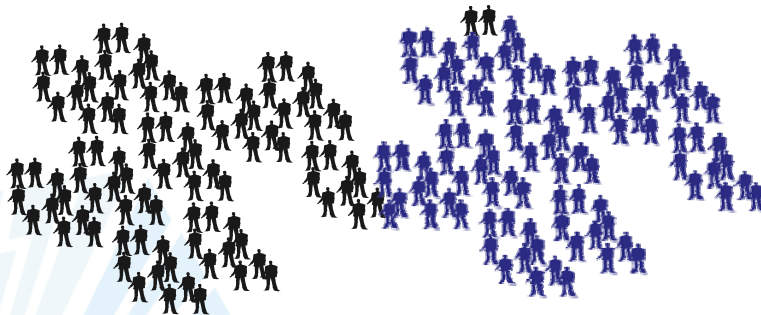
NBI for BE detection and characterisation

- NBI has good accuracy in individual studies (pooled in a meta-analysis).
- However interobserver agreement is only fair
- Can this be used in a non-expert setting ?

Advanced imaging and Barrett: selection Bias

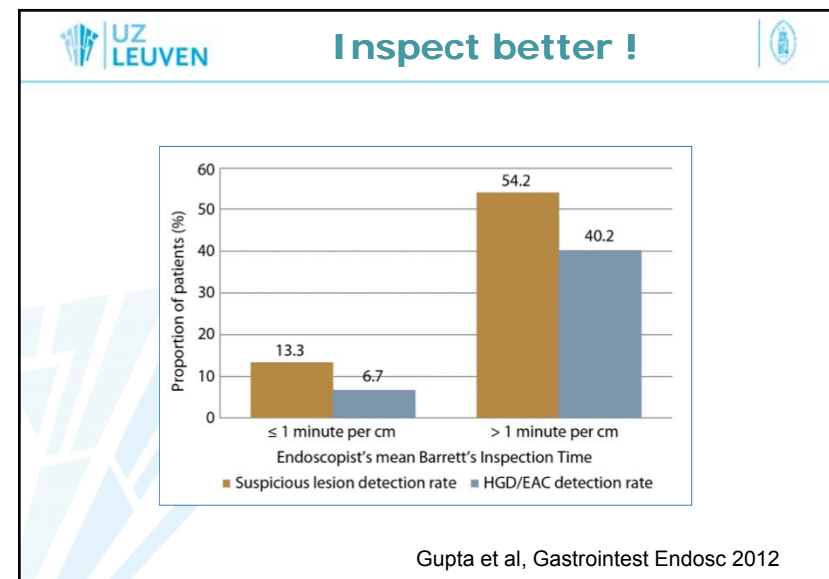
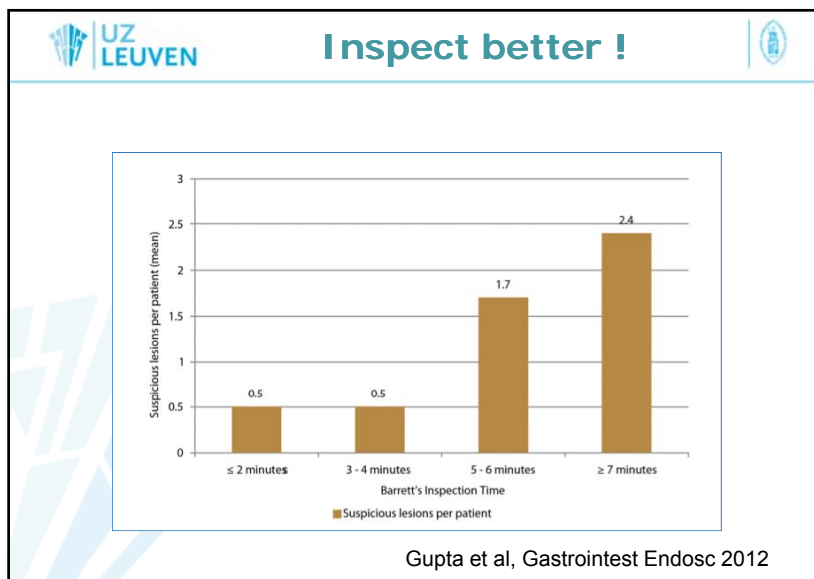
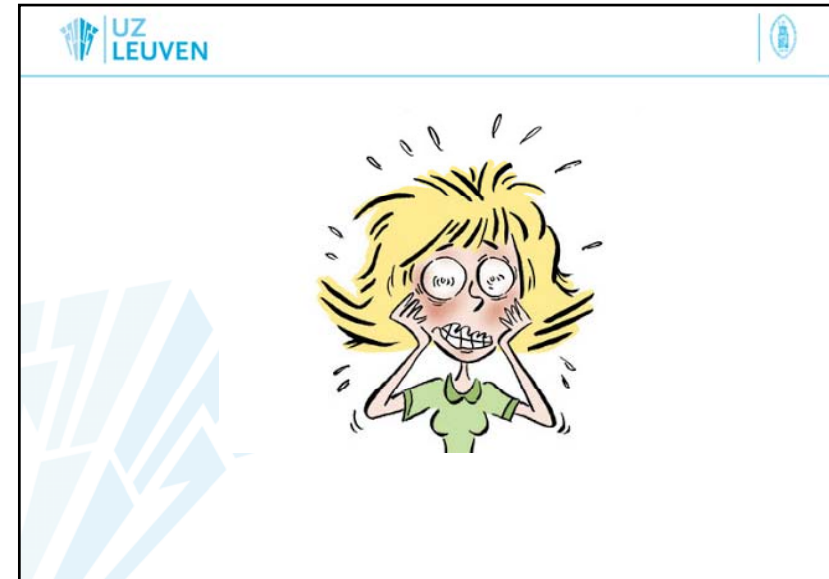
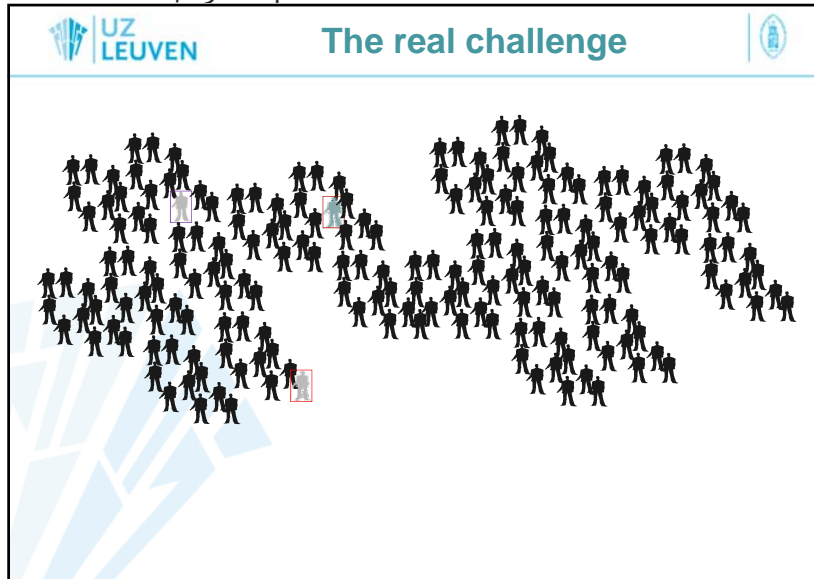
Prevalence of high grade dysplasia in advanced imaging studies			
ref	n	modality	prevalence
Kara M 2006	63	NBI zoom	58%
Kara M 2006	20	AFI+ NBI zoom	70%
Sharma 2006	51	NBI zoom	14%
Curvers 2008	84	AFI+ NBI zoom	36%
Singh 2008	109	NBI zoom	13%
Goda 2007	36	NBI zoom	11%
Anagnostopoulos	50	NBI zoom	20%
Hamamoto 2004	11	NBI zoom	0%
Wolfsen	65	NBI	57%
Sharma et al 2013	123	NBI	14%

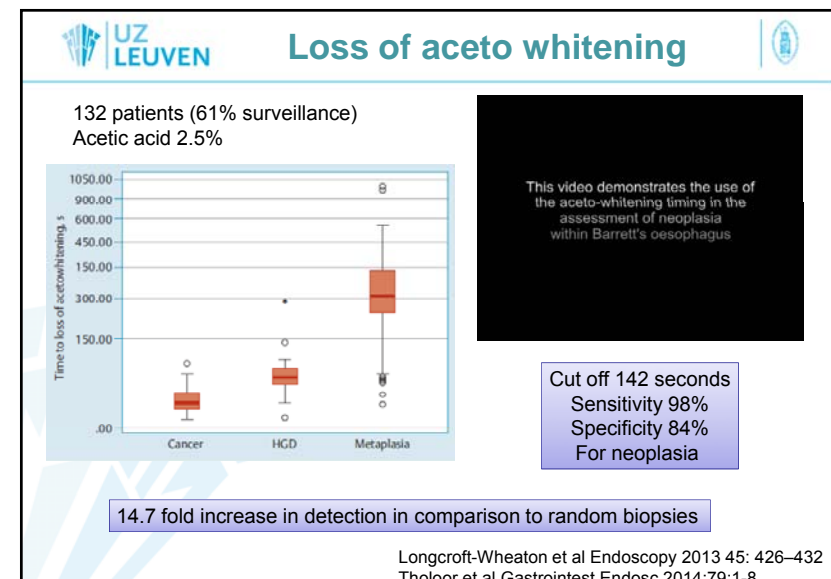
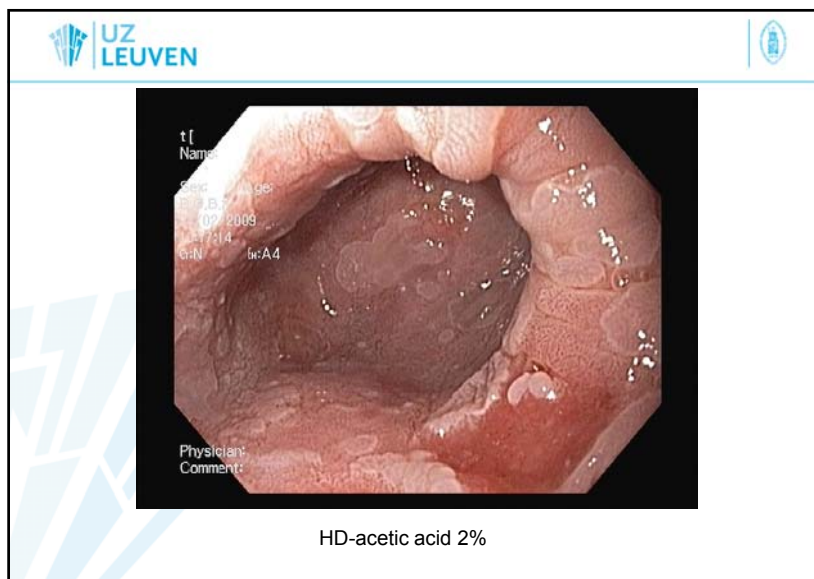
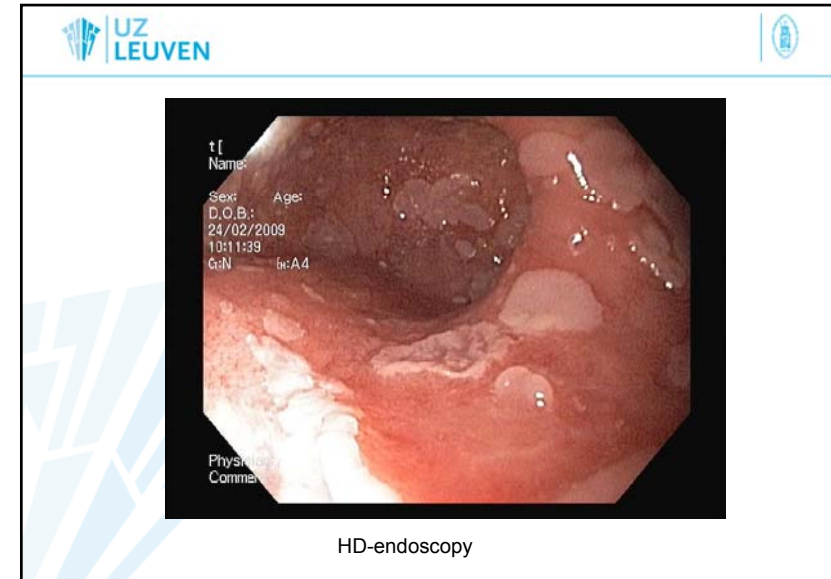
Most study populations

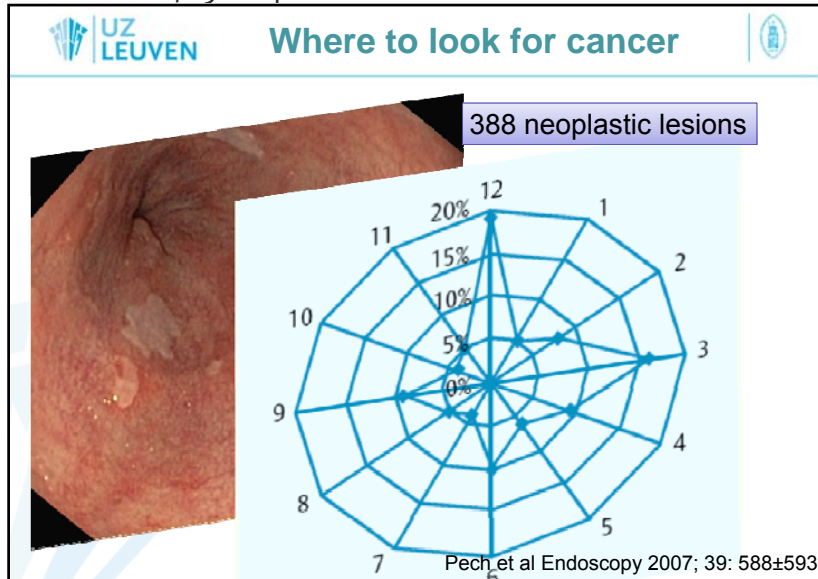


The real challenge







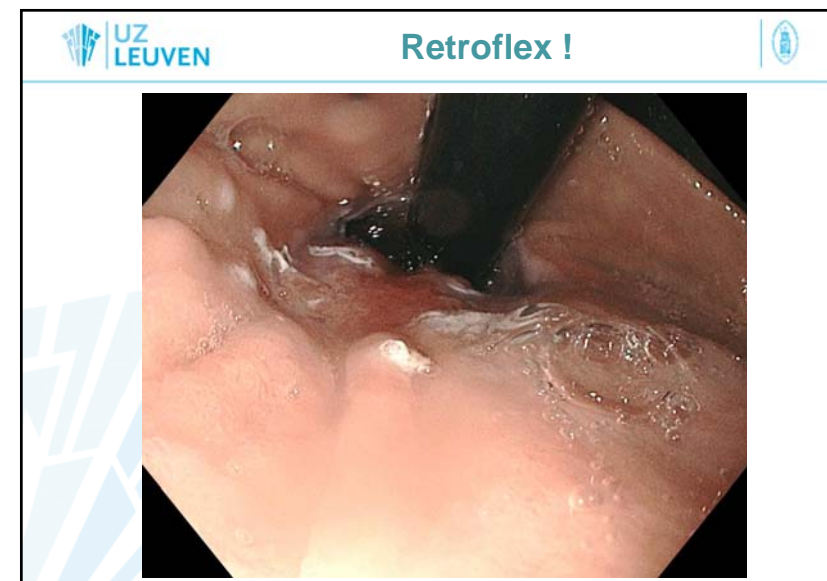
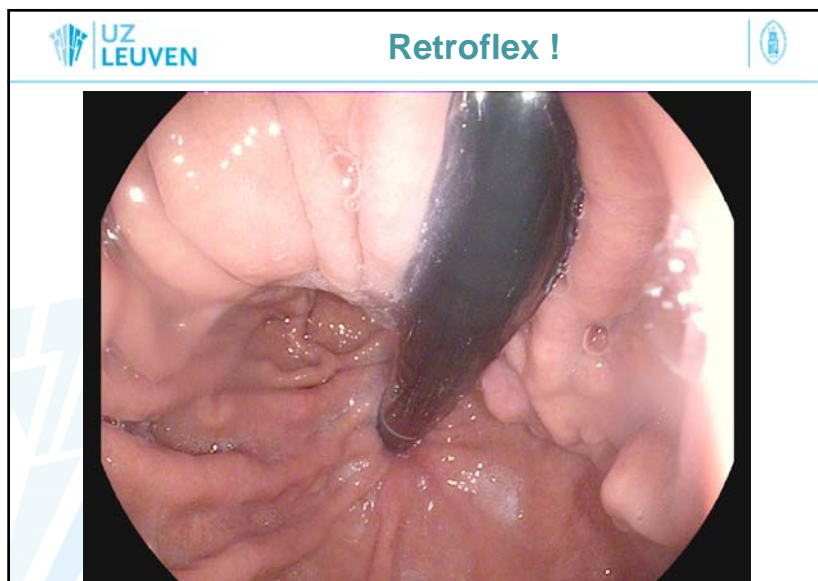


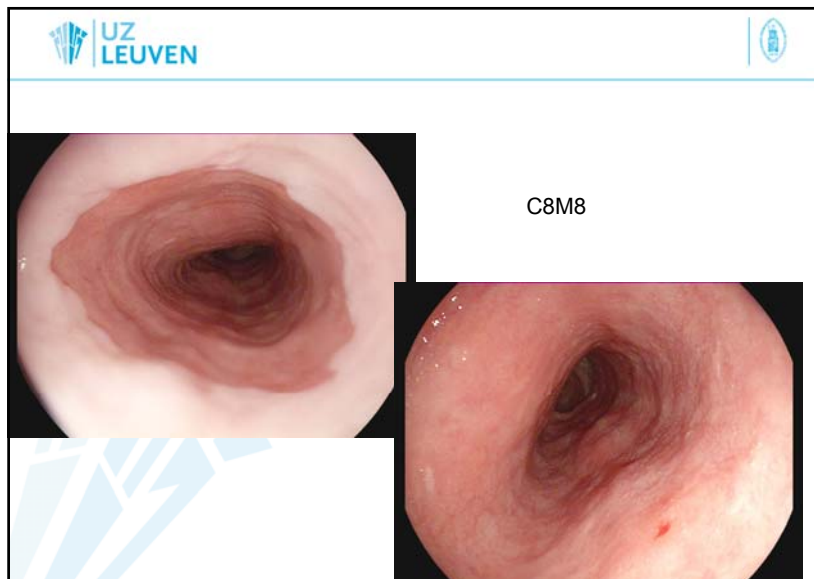
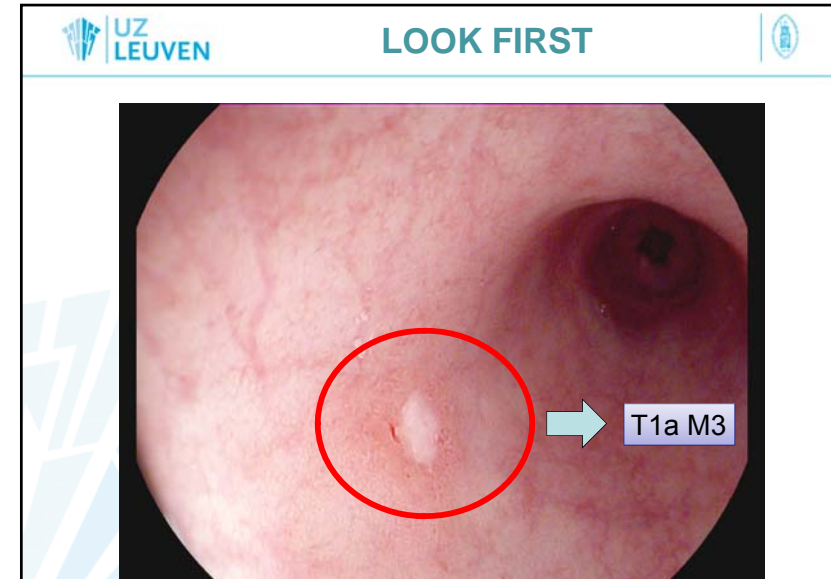
Barrett screening

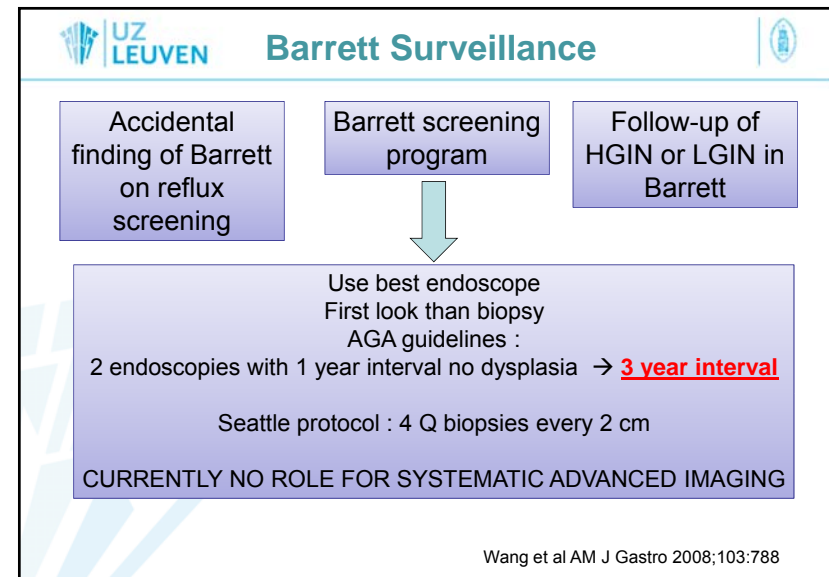
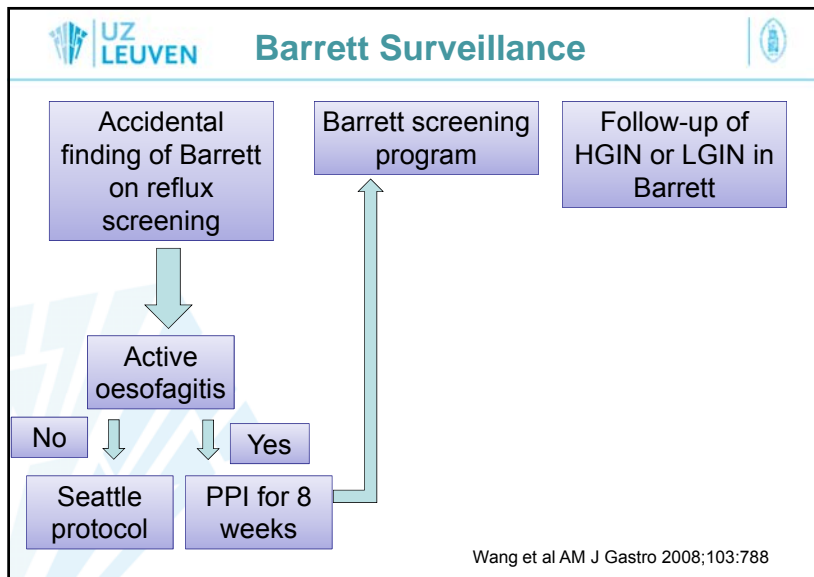
USE YOUR BEST AVAILABLE ENDOSCOPE

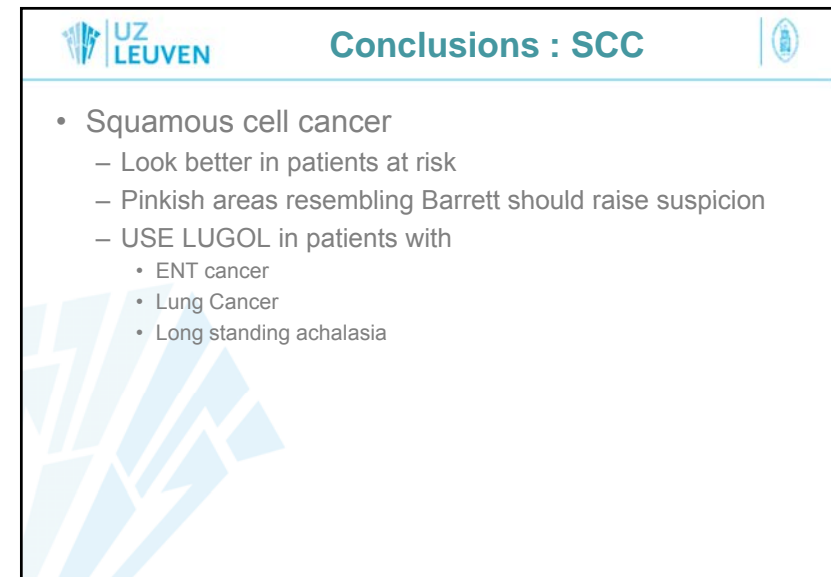
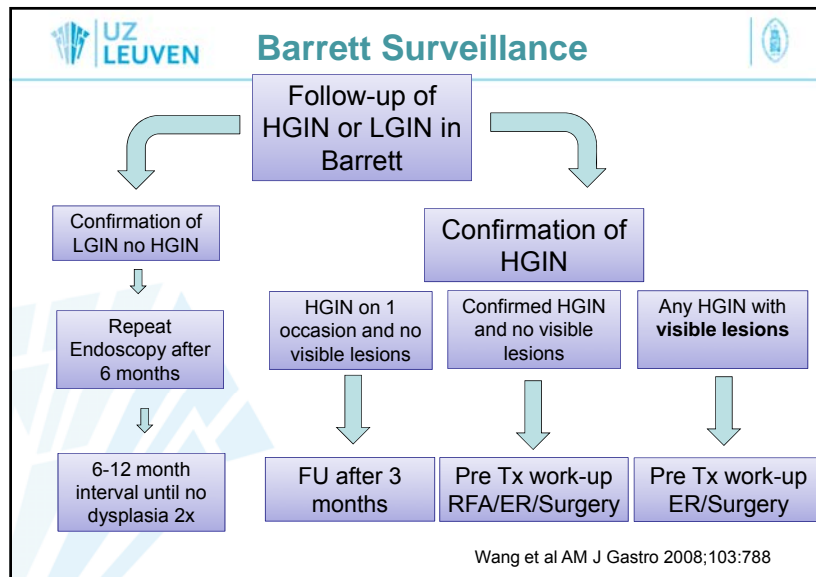
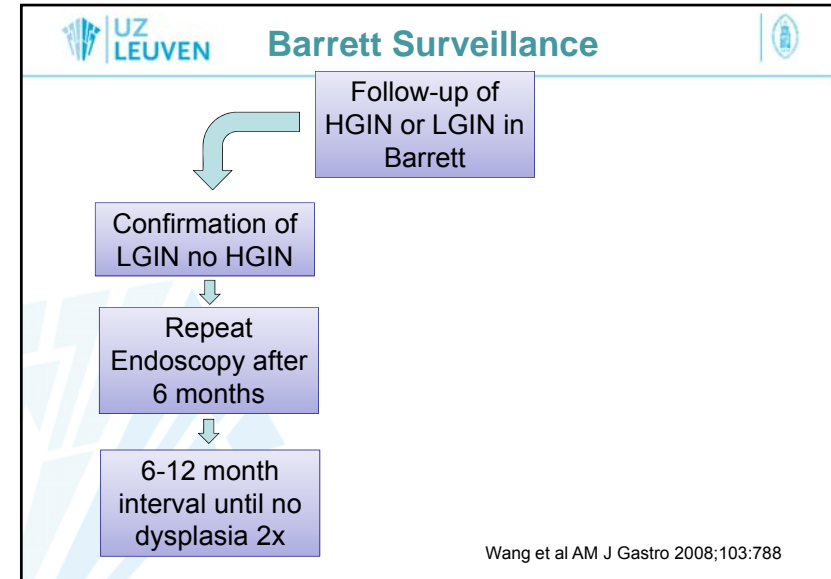
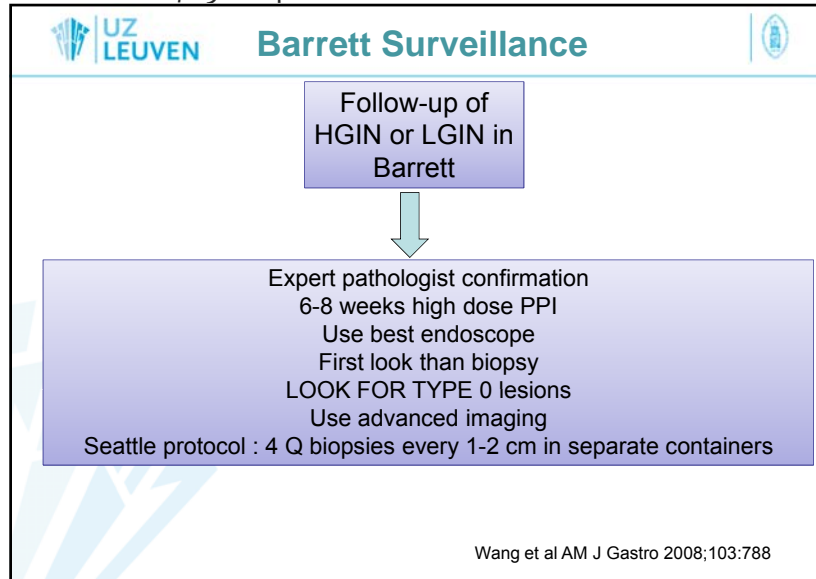
Fiberoptic	Standard high resolution endoscope	High definition endoscope

Courtesy Dr Bergman











Conclusions : Barrett



- Advanced imaging increases the diagnostic yield in experienced hands for patients referred for suspicion of neoplasia.
- There is currently insufficient data to abandon the classical Seattle protocol
- Further studies are needed to assess how detection can be improved in
 - General secondary care units
 - Low risk surveillance population



Conclusions : Barrett



- Look first well and long enough
 - Clean the esophagus
 - Retroflex
 - HD endoscopes
- Start using advanced imaging techniques to increase your diagnostic yield
- Finish with a classical Seattle protocol.