

11 years Audit of Endoscopy Biopsy workload in Cellular Pathology:  
Are we seeing an increased proportion of Normal Biopsies?



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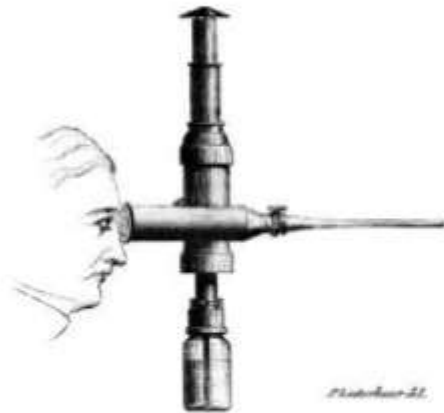
## Primitive Endoscopy



- The first endoscope was developed in 1806 by Philip Bozzini in Mainz
- "Lichtleiter" (light conductor) "for the examinations of the canals and cavities of the human body"
- However, vienna medical school disapproved this



## The first endoscope



- Use of electric light
  - a major step in the improvement of endoscopy
- The first such lights were external
- Later, smaller bulbs became available making internal light possible



## Optical fiber



- A bundle of 50,000 fibers gives effectively only a 50,000-pixel image
- Continued flexing from use breaks fibers and so loses pixels
- Eventually so many are lost that the whole bundle must be replaced



## Rod lens rigid scopes



- Previous rigid scopes
  - low light transmittance and poor image quality
- Rods of glass
  - Produced by Hopkins in 1960s
  - Filled the air-spaces between the 'little lenses' with rods of glass
  - Fitted the endoscope's tube, making them self-aligning, and no other support required
  - Easier to handle and used the maximum possible diameter

# Introduction



- 1. Endoscopic biopsies form a considerable proportion of the workload of most UK cellular pathology laboratories
- 2. Pathological diagnosis is a gold standard in the diagnosis of certain diseases such as GI cancer, coeliac disease and chronic inflammatory bowel disease.
- 3. Gastroenterologists appear to depend on histological reports as an adjunct to endoscopic assessment in most if not all examinations



- In 2002 (and revised in 2005), the Royal College of Pathologists publishes the results of its working party, 'Histopathology/Cytopathology of limited or no clinical value'.
- Application of the recommendations of the first edition of the Working Group's deliberations has shown that endoscopic biopsy and histological workload can be considerably reduced by ensuring that only appropriate biopsies are undertaken.



- In his review ‘ The effective use of gastrointestinal histopathology: guidance for endoscopic biopsy in the GI tract’ Professor Neil Shepherd mentioned that histological assessment of biopsy material is a major part of the workload of a histopathology laboratory in the UK: in large ‘district general ’ hospitals, it comprises about one quarter of the workload.(25%)





- Endoscopic practice should not be governed by the premise that an examination is not complete without a biopsy.
- If there are no indications for biopsy, especially in upper GI endoscopy, then no biopsy should be taken, unless clinically deemed necessary. (Shepherd 2014)



- This is not to deny the importance of research and the use of comprehensive biopsy protocols , such as the Sydney system of gastritis, in that type of research.



- The British Society of Gastroenterology in 2013 came up with the guidance on the indications for Diagnostic Upper GI endoscopy, Flexible sigmoidoscopy and colonoscopy.

# Guidance for biopsy practice used in endoscopy departments in the Leeds area



- Oesophageal biopsies
- When to do :
  - Diagnosis or surveillance of Barrett's (4 biopsies every 2 cm)
  - Any focal lesion or ulceration
  - When the clinical and endoscopic data suggest eosinophilic oesophagitis
- When not to do:
  - Normal oesophagus
  - Reflux oesophagitis
  - Ultrashort segment Barrett's



- Stomach Biopsies:

- **When to do:**

- any focal lesion

- Unusual appearance or high suspicion of dysplasia/malignancy (when suspecting malignancy take 8 biopsies from the lesion avoiding the ulcer base)

- **When not to do:**

- Diffuse gastritis- use CLO test to determine *Helicobacter pylori* status



- Duodenal biopsies:

- When to do :

- diagnose/exclude coeliac disease when clinically indicated( $\geq 3$  biopsies in 1 cassette)

- When not to do:

- duodenitis at endoscopy



- Colorectal biopsies

- **When to do:**

- normal colonoscopy in patients with persistent watery diarrhoea(send 2 cassettes- 3 biopsies from right and 3 from left side)
- any polyp/ other focal lesion
- patient with known or genuinely suspected IBD

- **When not to do:**

- ileal biopsies to demonstrate that ileum has been reached
- random rectal biopsies for rectal bleeding

# Examples



- No point doing routine Duodenal biopsies in a case of ‘Dyspepsia’
- It is deemed inappropriate to use histology in the biopsy of stomach in the presence of endoscopic gastritis or in the absence of endoscopic abnormalities.
- The practice of biopsying the normal or near normal stomach has not been shown to increase the demonstration of neoplasia.





- Biopsies should only be taken if it has the potential to materially influence management .

# Endoscopists



- Less experienced endoscopists are more likely to undertake unnecessary biopsies
- More experienced endoscopists have more confidence to make a positive judgement that there is no serious underlying pathology
- Can assess if a biopsy can change management
- More willing to accept a higher risk of missing something

# Future



- Newer techniques in endoscopy are going to revolutionize the concept of taking biopsies.

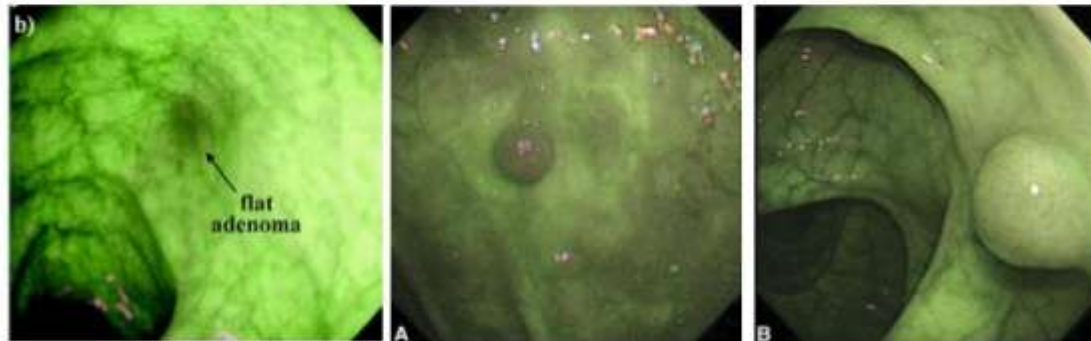


- Chromo- endoscopy



## AutoFluorescence Imaging

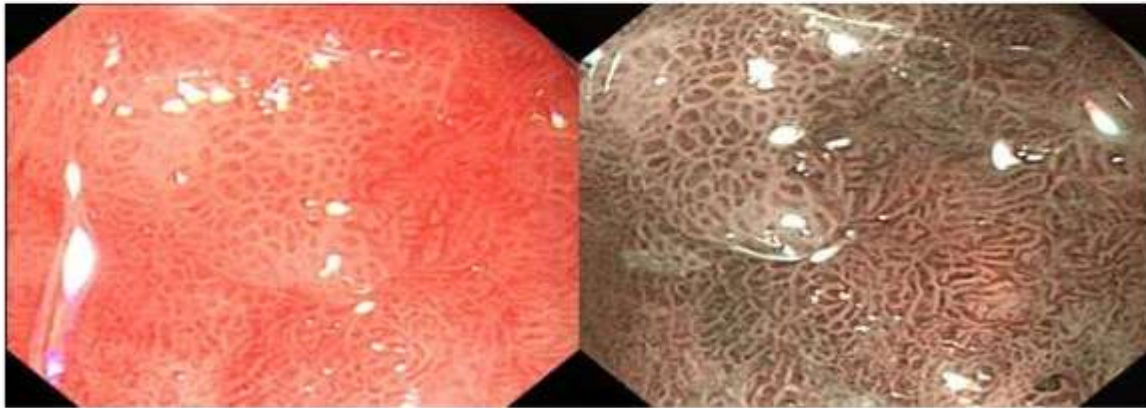
- AFI is based on the detection of natural tissue fluorescence emitted by endogenous molecules (fluorophores) such as collagen, flavins, and porphyrins
- After excitation by a short-wavelength light source, these fluorophores emit light of longer wavelengths (fluorescence)





## Narrow Band Imaging

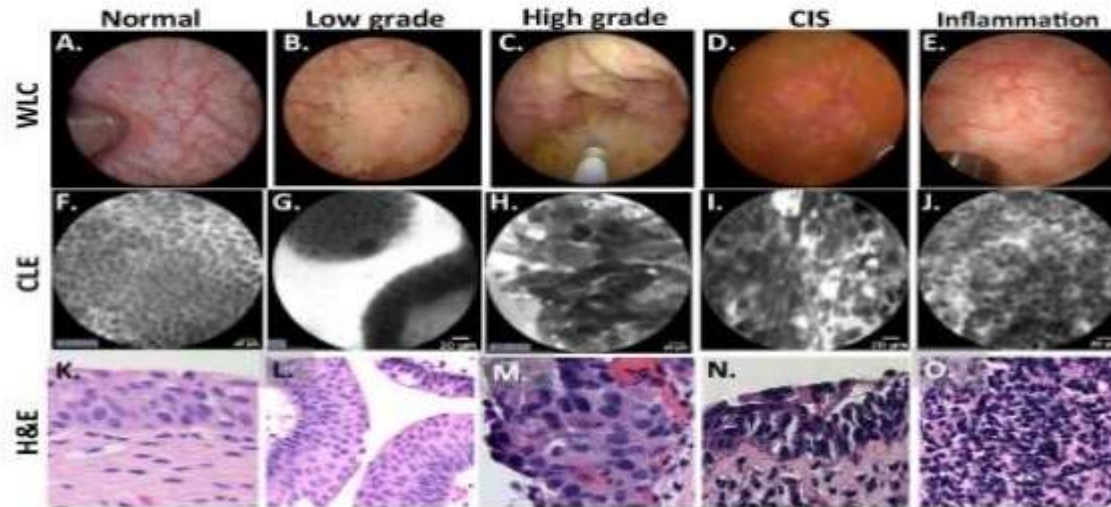
- Light of specific blue and green wavelengths is used to enhance the detail of certain aspects of the mucosal surface
- A special filter is electronically activated by a switch in the endoscope leading to the use of ambient light of wavelengths of 440 to 460 nm (blue) and 540 to 560 nm (green)





# Confocal endomicroscopy

- Obtains real time histological images
- Also known as optical biopsies





- Audit



# Objectives



- To study the number of endoscopic biopsies received in our department over a period of eleven years (2005-2015).
- To see the number of endoscopic biopsies reported as normal.
- To assess the workload of GI endoscopies.
- To assess the financial implications

# Standard



- The effective use of gastrointestinal histopathology: guidance for endoscopic biopsy in the gastrointestinal tract by Neil A Shepherd, Roland M Valori.

(published online First on 8 January 2014)

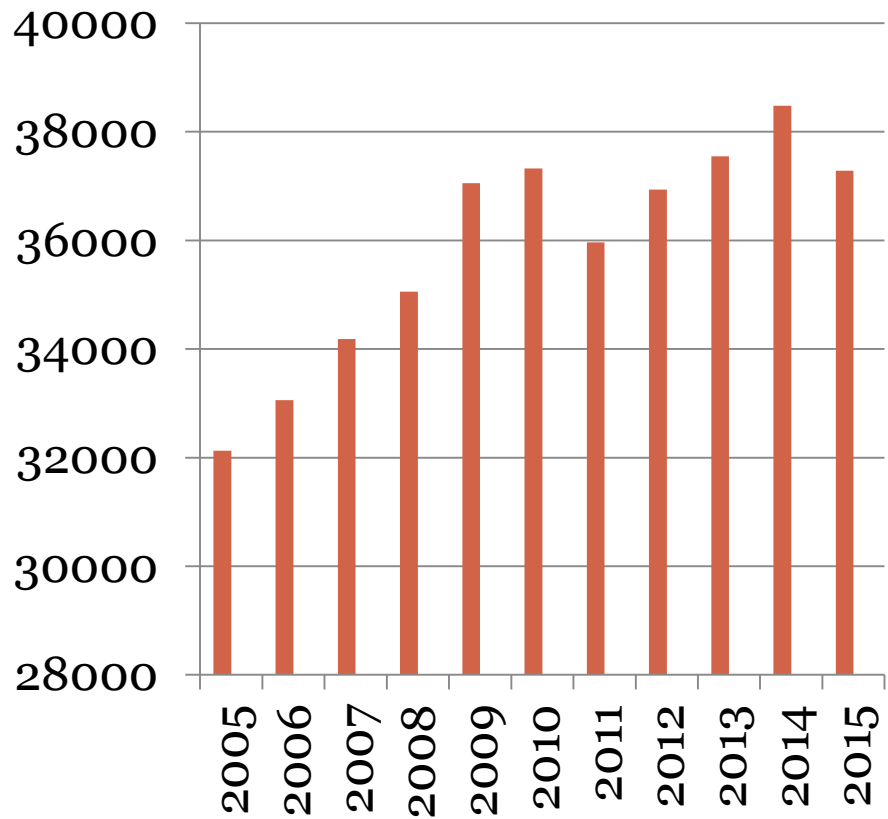
# Methodology



- Retrospective audit of all samples received in the histopathology department at Derriford Hospital from 2005 to 2015.

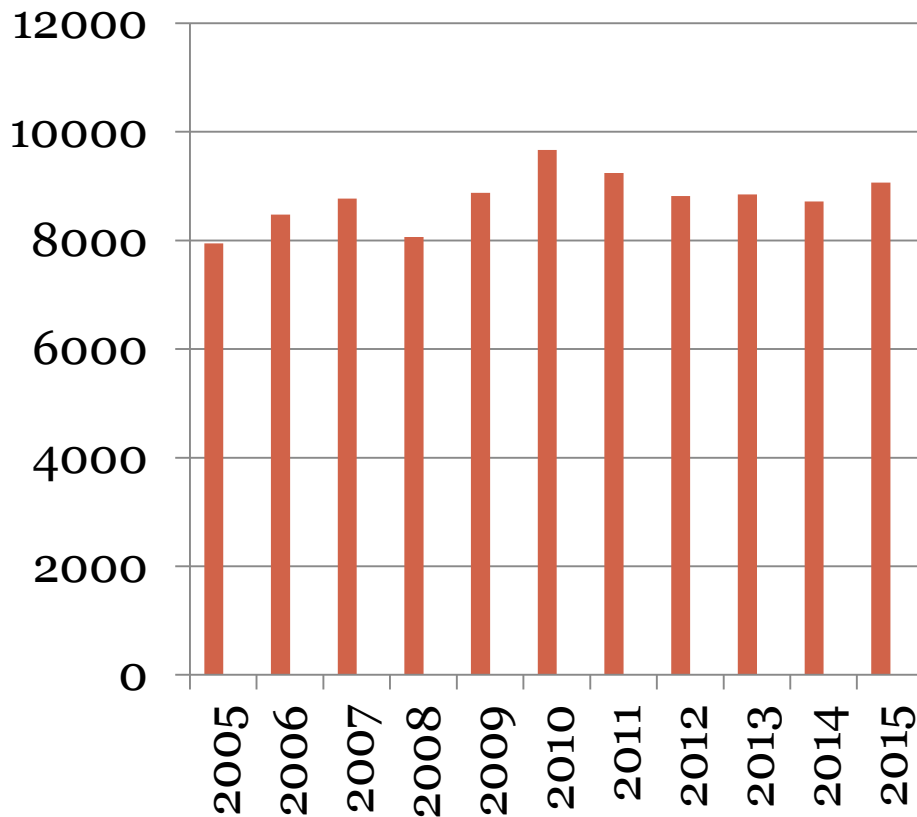


# Results



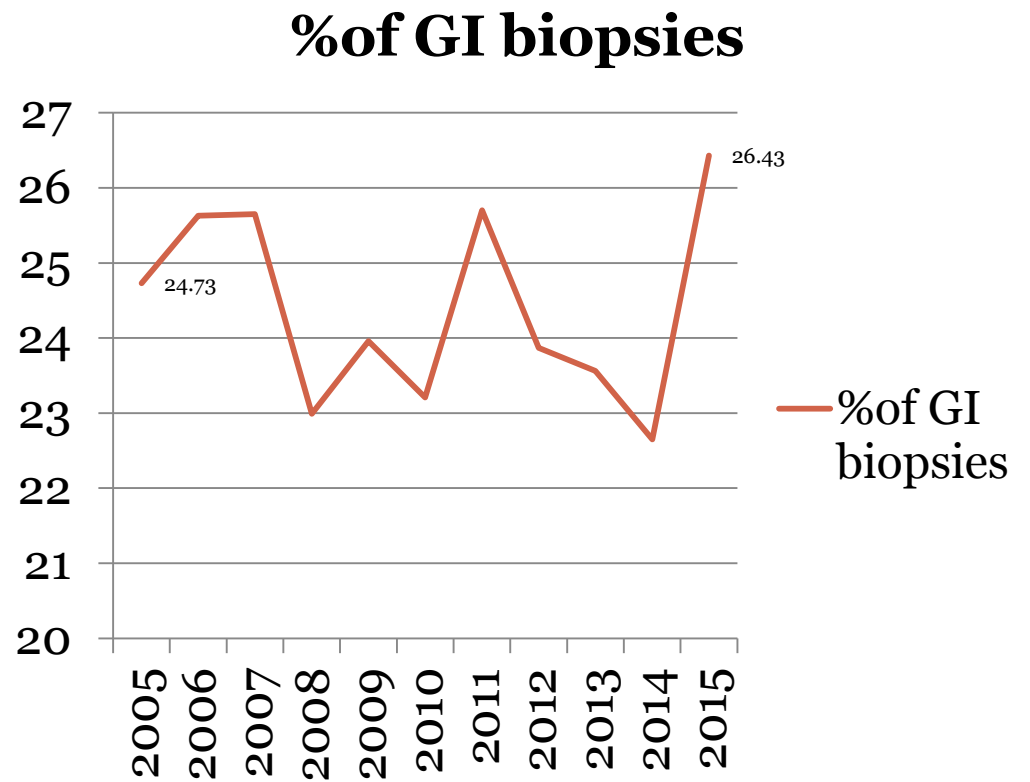
■ total samples received

year	total samples received
2005	32127
2006	33057
2007	34181
2008	35057
2009	37053
2010	37325
2011	35964
2012	36936
2013	37551
2014	38480
2015	37284

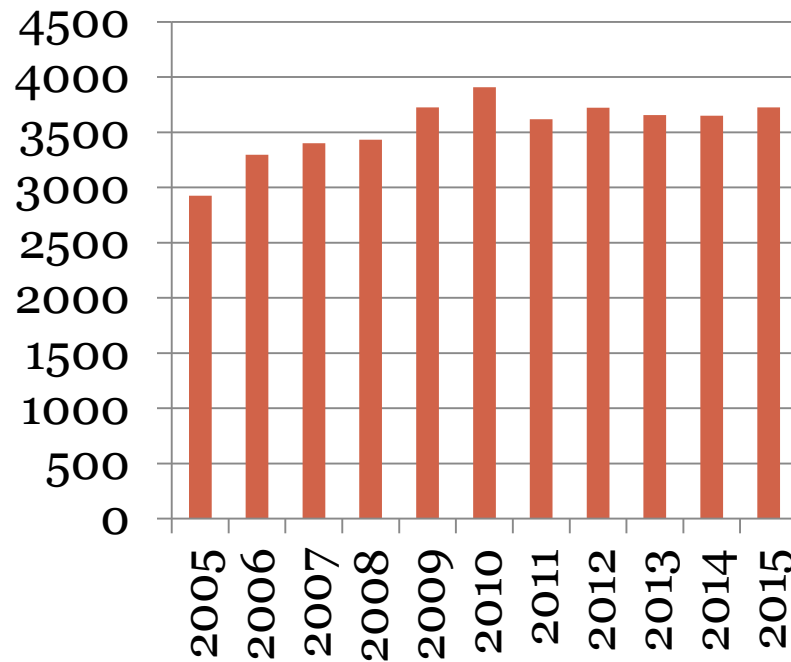


year	GI biopsies
2005	7947
2006	8474
2007	8768
2008	8062
2009	8878
2010	9664
2011	9243
2012	8817
2013	8848
2014	8719
2015	9062

year	Percentage of GI biopsies
2005	24.73
2006	25.63
2007	25.65
2008	22.99
2009	23.96
2010	23.21
2011	25.7
2012	23.87
2013	23.56
2014	22.65
2015	26.43



## no. of GI biopsies reported normal

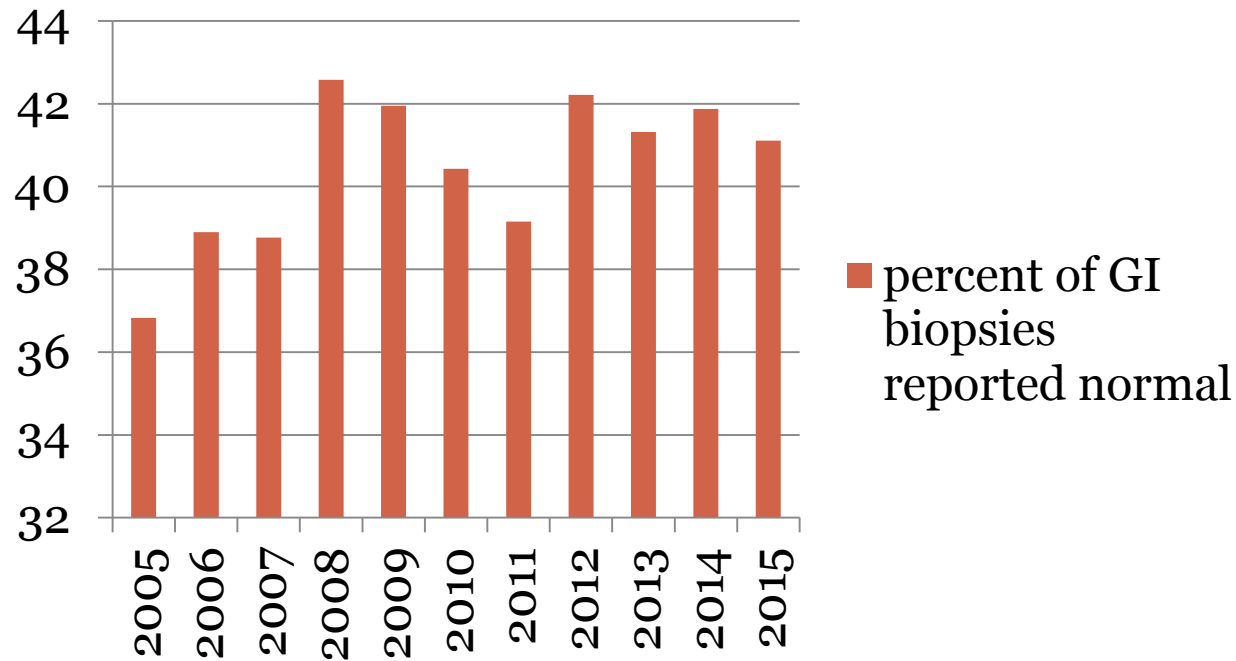


■ no. of GI biopsies reported normal

year	no. of GI biopsies reported normal
2005	2927
2006	3297
2007	3400
2008	3433
2009	3725
2010	3908
2011	3619
2012	3722
2013	3656
2014	3651
2015	3726



## percent of GI biopsies reported normal



year	percent of GI biopsies reported normal
2005	36.83
2006	38.9
2007	38.77
2008	42.58
2009	41.95
2010	40.43
2011	39.15
2012	42.21
2013	41.32
2014	41.87
2015	41.11

Total number of samples  
received in 11 years=395015



**TOTAL NUMBER OF GI BIOPSY SPECIMENS  
IN 11 YEARS= 97482**

**TOTAL NUMBER OF GI BIOPSIES REPORTED  
NORMAL =39064**



- Money spent for dealing with each GI biopsy in our department = £54.09
- Approximate cost of taking a biopsy = £110
- Average total cost per patient from procedure room to reporting = £155
- Money spent for normal GI sampling : **£6054920**  
which is approximately **£550 thousand/yr**

# Discussion



- 24% of specimens received in our department were from GI endoscopies.
- 15 percent increase in the number of GI biopsies received over 11 years
- Increasing percentage of biopsies reported normal
- There was a large reduction in the number of extra work levels requests which became most noticeable around May when we introduced the new approach to cutting levels.

# Questions



- Are we using guidance on the indications for diagnostic upper GI Endoscopy, Flexible Sigmoidoscopy and Colonoscopy produced by British Society of Gastroenterology
- Could CLO test be of help (in cases of Diffuse Gastritis\* on endoscopy) costs less than £5.00
- 40 percent of biopsies were reported normal. were all of those normal biopsies worth taking?
- Financial implications

# Suggestion for Improvement



- Draft clear cut guidance of what to and what not to biopsy.
- Use key pathology-related performance indicators.
- Adhere to the Guidance provided by BSG
- Endoscopies to be performed by experienced endoscopists
- Provide appropriate clinical details , if possible provide the endoscopy report



- Certain clinical entities like lymphocytic colitis and early coeliac disease are invisible to the endoscopist and are deemed necessary for biopsy. We hence suggest endoscopist to take biopsies when deemed necessary on the basis on clinical information, since it has a huge impact on patient management.



- No guidance is fully inclusive and clinical judgement is required to determine when an endoscopy and biopsies are required but taking into account the guidance from BSG we hope this audit helps



# Formatted Citations



- 1 Shepherd NA, Valori RM. The effective use of gastrointestinal histopathology: guidance for endoscopic biopsy in the gastrointestinal tract. *Frontline Gastroenterol* 2014;5:84–7. [Download](#)
- 2 Howat A, Boyd K, Jeffrey M, et al. *Histopathology & cytopathology of limited or no clinical value*. 2nd edn, Royal College of Pathologists, 2005.