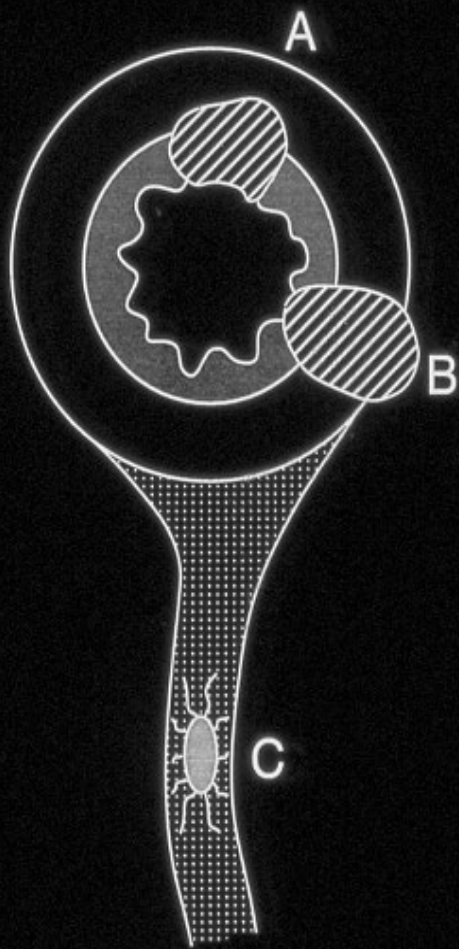


# Medicolegal Aspects of Delay in Colorectal Cancer

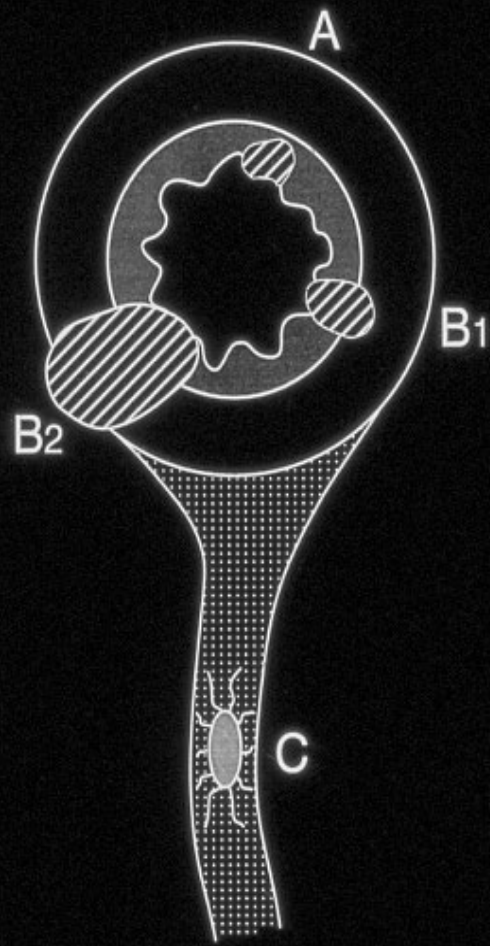
Robin Phillips  
St Mark's Hospital  
Harrow

# colorectal cancer

- men
  - lung, prostate, colorectal
- women
  - lung, breast, colorectal
- overall
  - lung, colorectal (but lung is primarily smoking related)



Dukes'

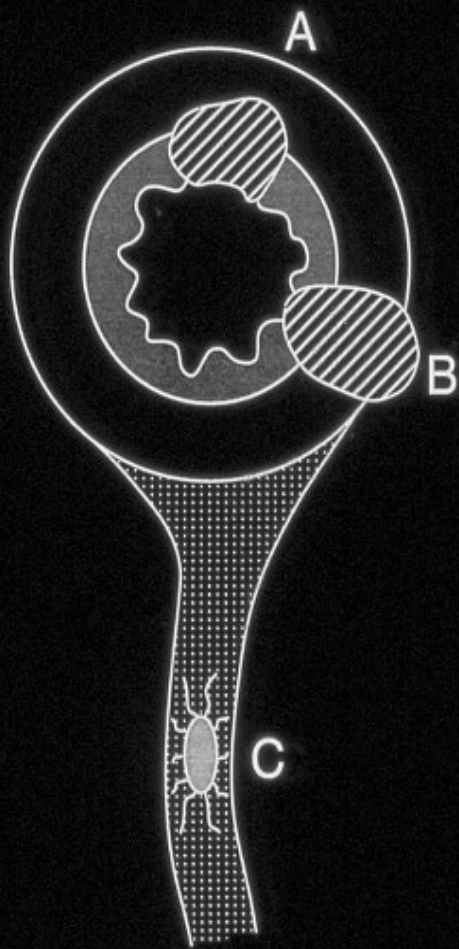


Kirklín

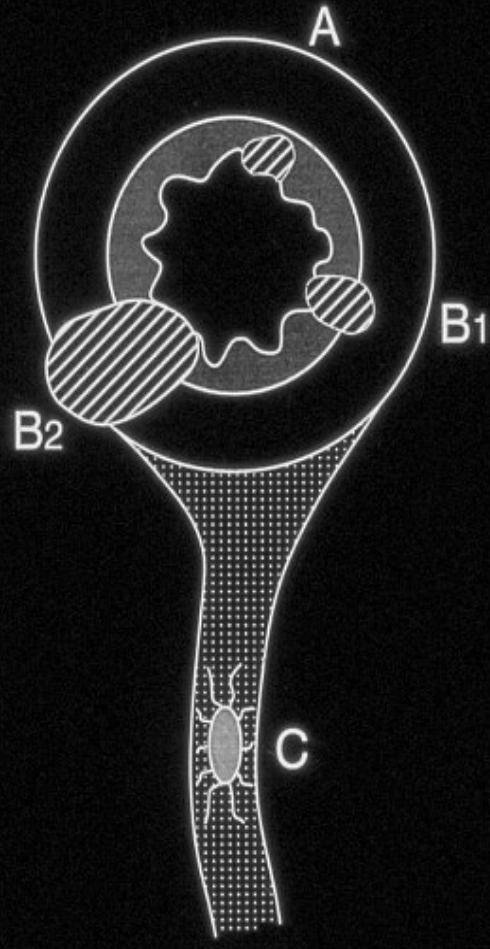
# The President's Cancer, the Dukes Classification, and Confusion.

Michael Kynakos, Arch Pathol Lab Med. 1985; 109: 1063-1066

On July 12, 1985, Ronald Reagan, President of the United States, had a right hemicolectomy for a polypoid cecal tumor. At a news conference on July 15, it was announced that the lesion was a villous adenoma that contained a moderately differentiated adenocarcinoma that had not involved blood vessels, nerves, the margins of resection, or 15 lymph nodes. The carcinoma “was confined locally within the wall of the bowel,” and “the outermost wall of the intestine was not involved with tumor”. (*The New York Times*, July 16, 1985).



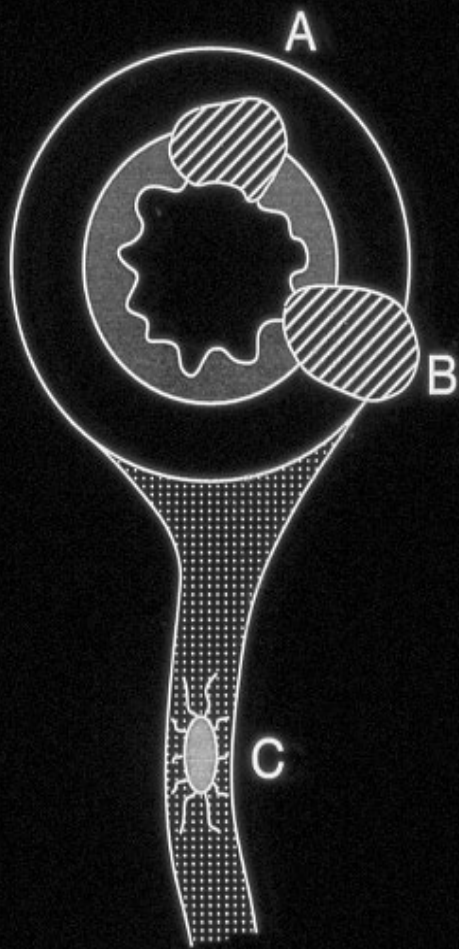
Dukes'



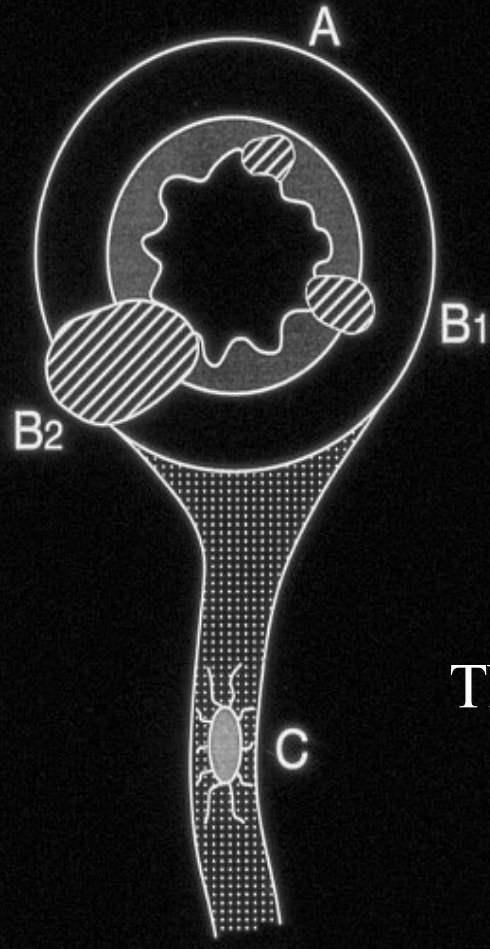
Kirklín

In response to reporters' questions about the stage of the tumour, the chief medical spokesman stated that...the President's cancer was categorised as a "Dukes B".... The following day, newspapers carried stories quoting physicians...stating.... a "50-50" chance of recurrence.

Arch Pathol Lab Med. 1985; 109: 1063-1066



Dukes'



Kirklín

TNM



what is the best way to improve your hospital's  
cancer results?

- change your pathologist!

## Will Rogers phenomenon

first pathologist

second pathologist

prognosis

A



A'



C



C'



- truly local disease
- already spread elsewhere
  - macros
  - micros (OHM)

## the role of staging

- histopathological examination of the resected specimen simply supplies a statistical estimate that OHMs are already present
- Dukes A, chance 5-10%; Dukes B, chance 25-30%; Dukes C, chance 40-45%

# the influence of pre-operative radiation therapy

- the original tumour supplies an estimate of probable OHMs
- despite radiation therapy influencing local tumour characteristics, it will do nothing as far as the original estimate of OHMs is concerned
- tumour 'down staging' can be misleading

## end points of rectal cancer surgery

- don't kill the patient on the operating table!
  - pre-operative optimisation, anaesthesia, ITU/HDU, surgical skill
- reduce local recurrence
  - surgical skill (particularly TME)
  - pre-operative chemo-DXT if threatened margin
- improve quality of life
  - permanent stoma rate, bladder and sexual function, bowel function (colonic pouch)
- long term survival
  - outwith direct surgical control; depends on screening and systemic chemotherapy

# restoration of continence

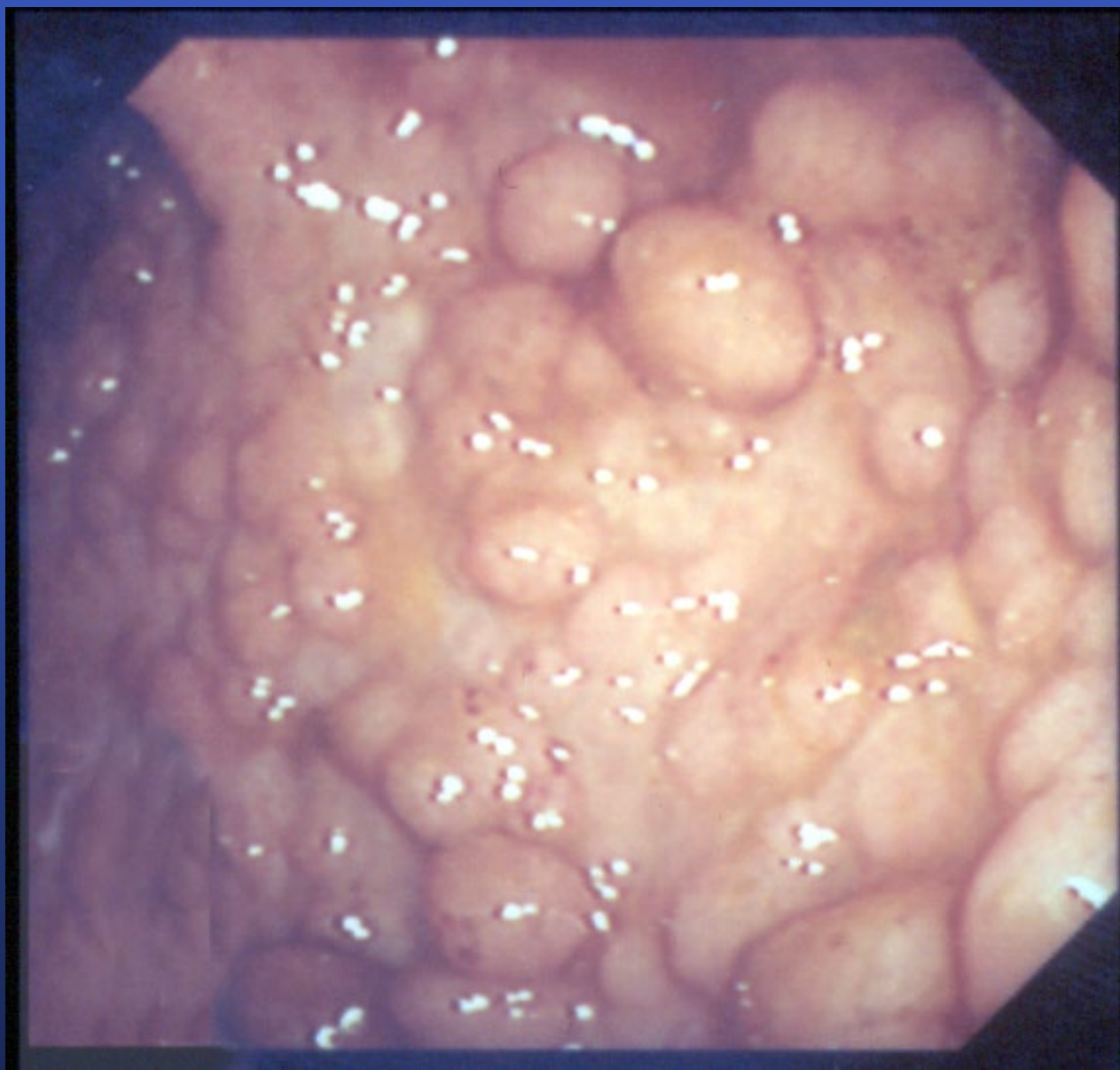
- when must the sphincter go?

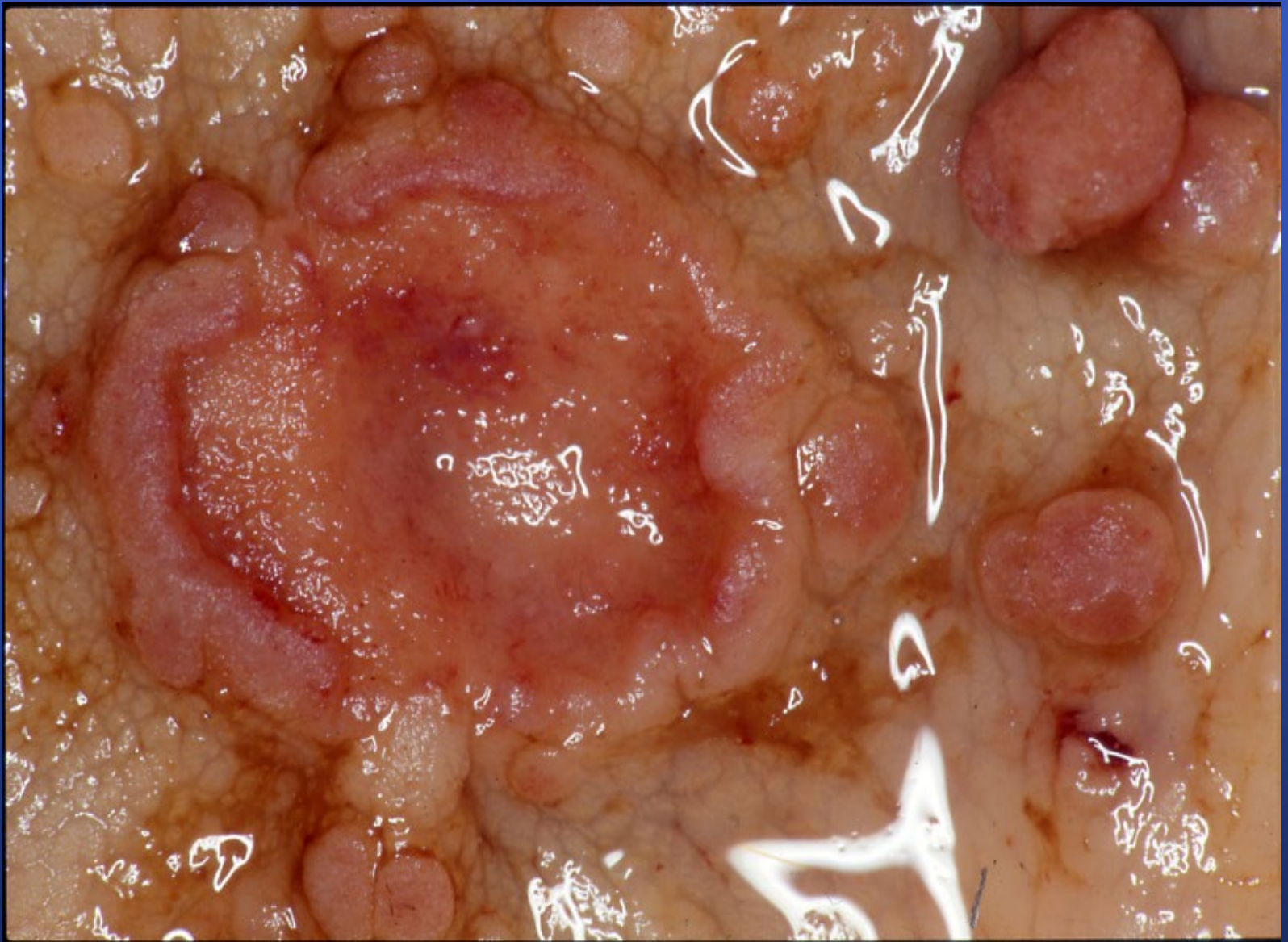
- when cancer involves it
- when it is weak
- when cost/benefit is adverse



# different cancer pathways

- ‘classical’
  - more common, the general case
  - slower
  - FAP
- accelerated (alternative)
  - Lynch syndrome
  - mismatch repair/microsatellite instability
  - better prognosis





## what is the polyp/cancer interval?

- we don't know
- knowledge is historical based on retrospective review of barium enema series that identified historical polyps that were not acted upon and which subsequently became cancerous
- suggests 8-10 years (faster with alternative pathway)
- establishes background to colonoscopy intervals (Achilles' heel missed polyps, alternative pathway, unknown unknowns)
- but FAP patients first develop 100s and sometimes thousands of polyps in their teens
- untreated, cancer on average arises in their 30s
- in that time, only one or two of 100s/1000s have become malignant

## missed polyps at endoscopy

- only landmarks are anus and caecum/terminal ileum; between is guesswork
- skill, bowel preparation, caecal intubation rate not 100% (90+%), mucosal folds, inversion in the rectum
- validated depth of insertion at flexible sigmoidoscopy (established by external magnetic endoscopic imaging)
  - sigmoid colon 24%
  - sigmoid/descending junction 36%
  - descending colon 32%
  - splenic flexure 2%
  - transverse colon 6%

# results of tandem (back to back) colonoscopy

- miss rate all polyps 22%
- 2.1% for polyps > 1cm in size
- 13% for polyps ½ - 1cm in size
- 26% for those < 0.5cm in size

Van Rijn et al Am J Gastroenterol 2006; **101**: 343-350

# what cancer delay makes a difference?

- we don't really know
- less than 6 months has not been shown to make a difference
- inherently 'the sooner the better'; but not wildfire
- 2-week wait referral implies an acceptance that delay matters

## updated 2 week wait referral

- FOB +ve
- 40 + with unexplained wt loss and abdo pain
- 50 + with unexplained rectal bleeding
- 60+ Fe def anaemia, change in bowel habit
- adult with rectal or abdominal mass
- <50 with rectal bleeding+/- abdominal pain/change in bowel habit/weight loss/Fe def

NICE February 2021



## changes

- removal of 6 weeks of symptoms before referral
- a wider spectrum of symptoms (eg wt loss and abdo pain over 40)
- removal of threshold for anaemia levels
- patients with 'low risk' symptoms will be assessed more quickly

# what delay makes a difference?

- top down approach (clinical/surgical; stage change shorter)
  - up to 6 months delay does not make a difference
  - stage change definitely makes a difference
  - ergo, stage change takes at least 6 months
  - more in tune with at least some urgency/2 week wait
- bottom up approach (oncological; stage change longer)
  - based on growth rates (tumour doubling times)
  - highly variable between tumours and over time (Gompertz equation vs exponential growth)
  - in my view, once understood, less acceptable to a Court (dealt with in more detail when considering liver metastases)

## the issue of liver metastases

- 5-year survival of surgically resected (ie macroscopic) liver metastases is under 50%
- adjuvant chemotherapy (used to mop up micrometastases) is only about 36% effective
- the estimated moment of first (microscopic) metastasis in the liver is the estimated moment of ‘incurability’

# when did the first micrometastasis arrive in the liver?

- there is no up to date information, because almost all cases are now treated with chemotherapy which will influence the ‘natural’ growth rate
- we must rely on historical data, before the chemotherapy era, to estimate the likely situation had diagnosis been earlier

# Finlay and McArdle

- 29 hepatic metastases from 15 patients
- serial CT scans of liver metastases as they grew (no chemo)
- computation of growth rates employing a growth kinetic equation (the Gompertz equation)
- considered 'occult' metastases (found on subsequent CT but not at initial laparotomy) as well as more 'obvious' cancers (found at initial laparotomy)

Br J Surg 1988; 75: 641-4

## occult tumours

- volume doubling time 86 (+/- 12) days
- median age in the liver (ie moment of incurability - Gompertz) 1.6-1.9 years = between 1 year 7.2 months and 1 year 10.8 months (exponential growth = 5.5 years)
- mean age 2.3 years = 2 years 4 months (exponential growth 7.5 years)

## 'obvious' tumours

- volume doubling time 155 (+/- 34) days
- median age (Gompertz) 3.1 years (exponential growth = 8.3 years)
- mean age in the liver 3.7 years (3 years 8.4 months - Gompertz) (exponential growth = 14 years)

## summary

- local stage guides local treatment (eg give pre-op chemo-radiotherapy with threatened margins and post-op chemo with positive nodes)
- chemotherapy and radiotherapy have additional side effects
- as a rule of thumb, stage change takes 6 months +
- delay affects stage
- stage affects outcome (survival and local recurrence)
- individuals who go on to develop liver metastases within 1.5-2 years of an alleged breach of duty were likely never curable

# anastomotic leak: known knowns

## patient factors

- serum albumin
- condition: stability, general sepsis
- disease: eg Crohn's disease, DXT

## surgeon factors

- good blood supply
- lack of tension
- appropriate anastomotic technique



# anastomotic leak: known unknowns

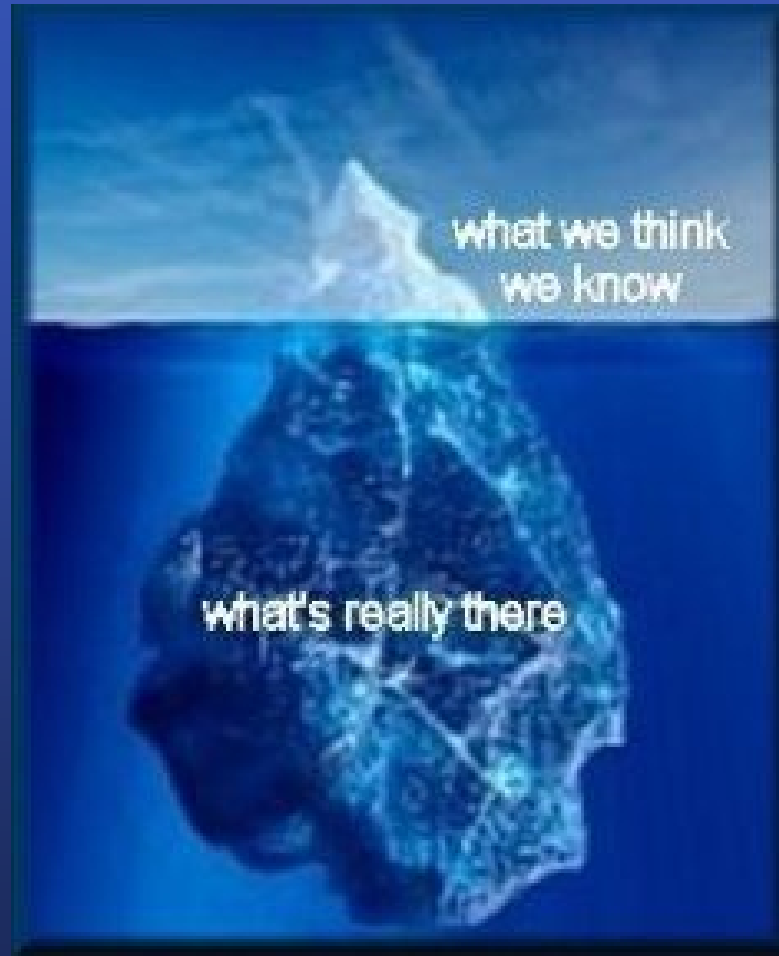
- bowel preparation
- NSAIDs
- specialisation and volume

## the lawyers' trap

- anastomotic leak is rare (often 5% or less)
- lawyers translation:
  - it is beyond reasonable doubt a properly constructed anastomosis will not leak
  - your anastomosis leaked
  - therefore it is likely that it was not properly constructed

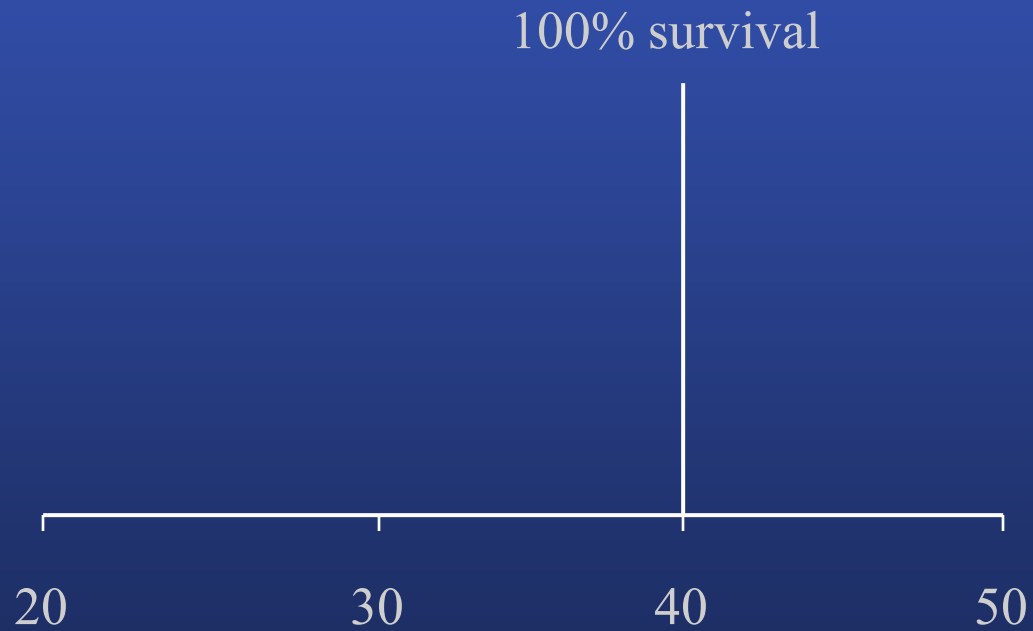
# anastomotic leak: unknown unknowns

probably now  
the majority



# the case for screening

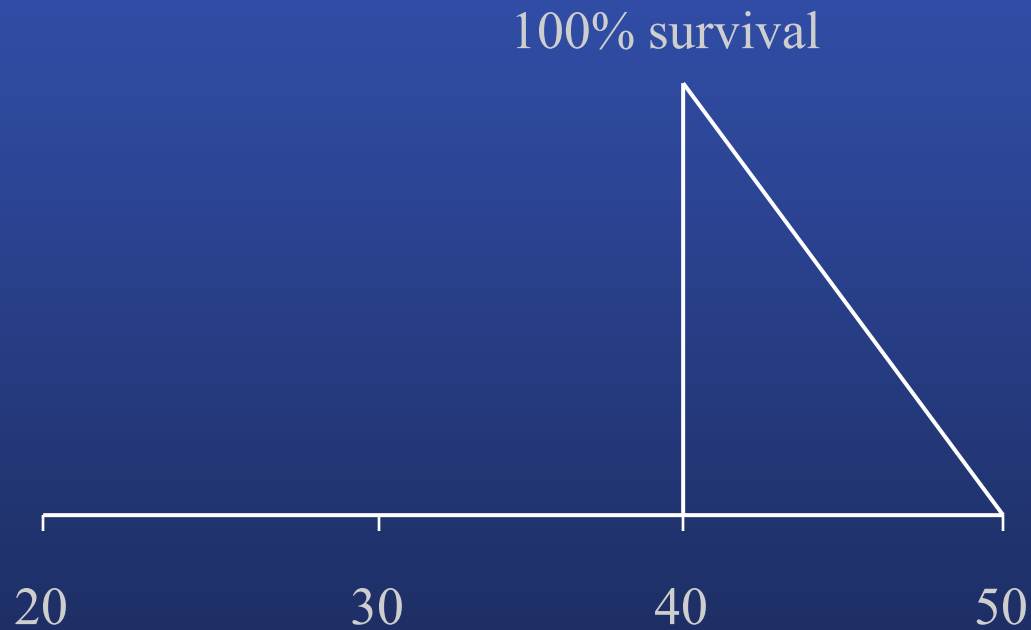
breast cancer



# the case for screening

breast cancer

hypothetical survival  
unscreened of 10  
years



# the case for screening

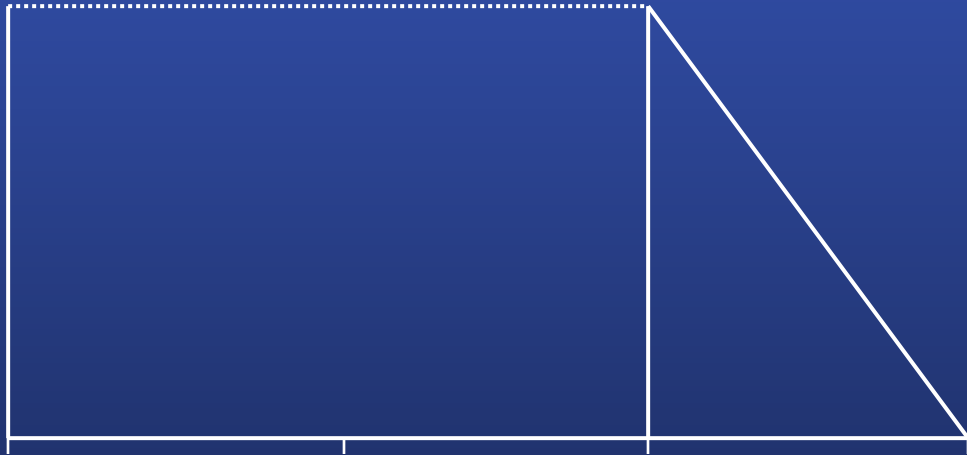
breast cancer

hypothetical survival  
screened of 30 years

detection by  
screening

100% survival

20 30 40 50



# the case for screening

breast cancer

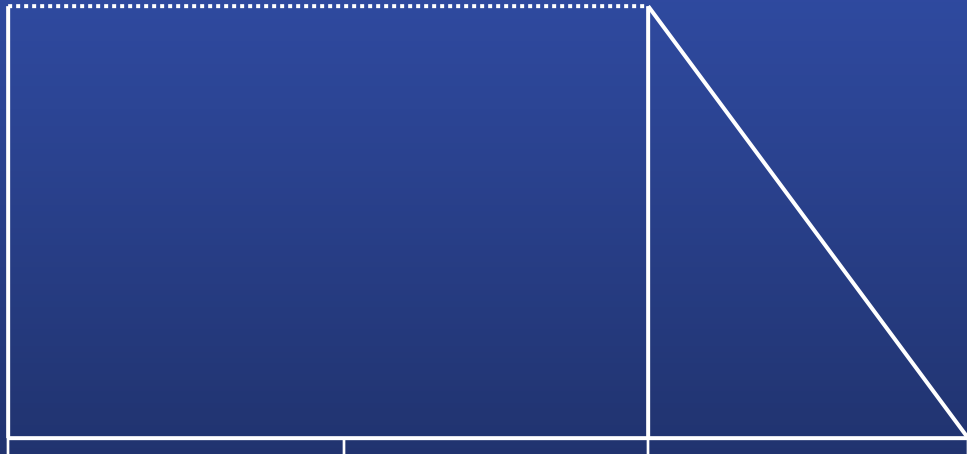
hypothetical survival  
screened of 30 years

detection by  
screening

100% survival

20 30 40 50

therefore introduce  
mammography!



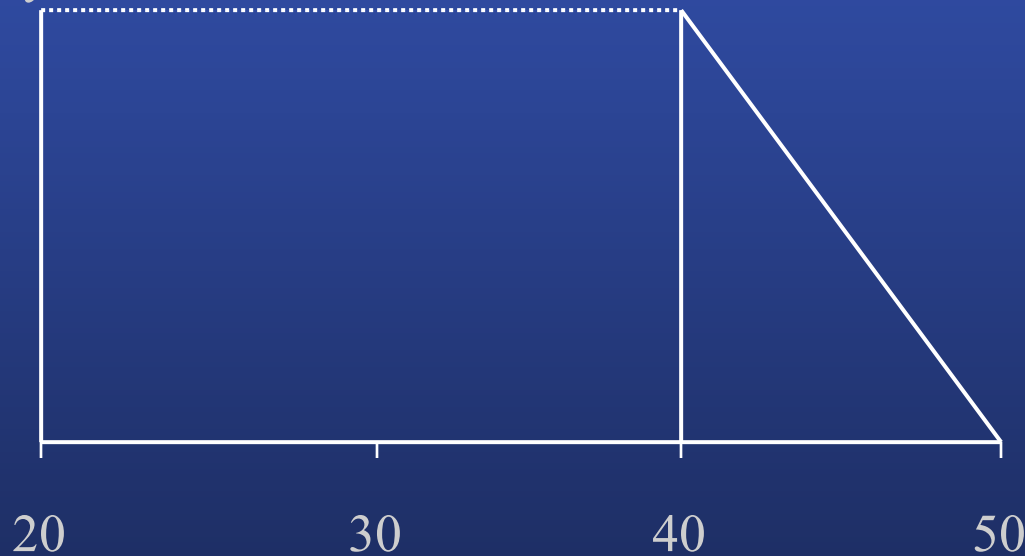
# the case for screening

breast cancer

hypothetical survival  
screened of 30 years

detection by  
screening

100% survival



therefore introduce  
mammography!





# the case for screening

breast cancer

hypothetical survival  
screened of 30 years

100% survival

detection by  
screening

LEAD TIME BIAS

therefore introduce  
mammography!



20

30

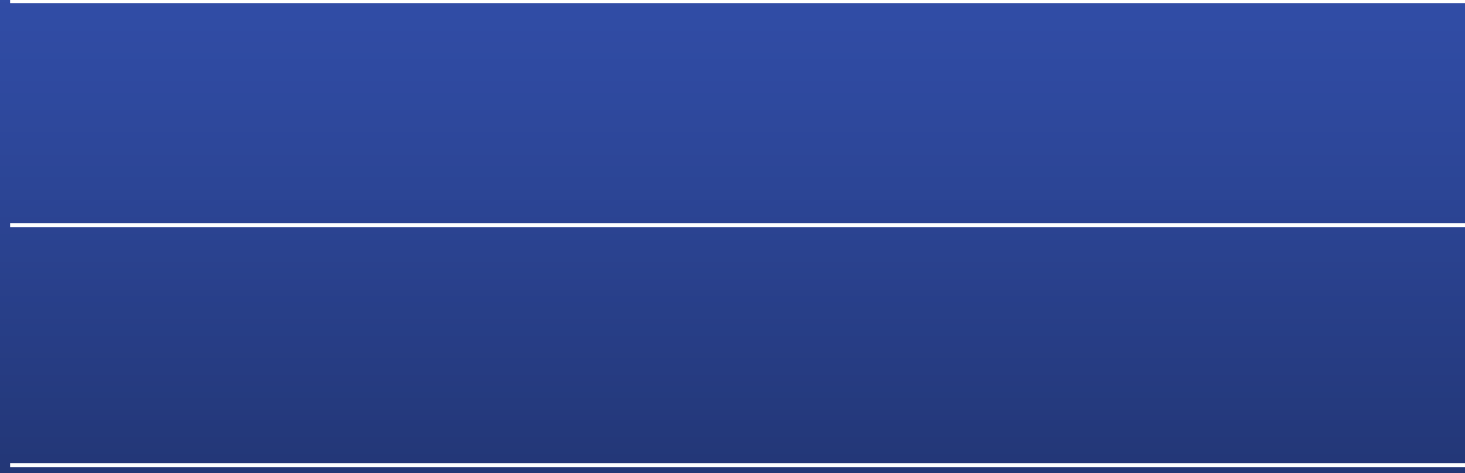
40

50



# the case for screening

tumour starts



patient dies

# the case for screening

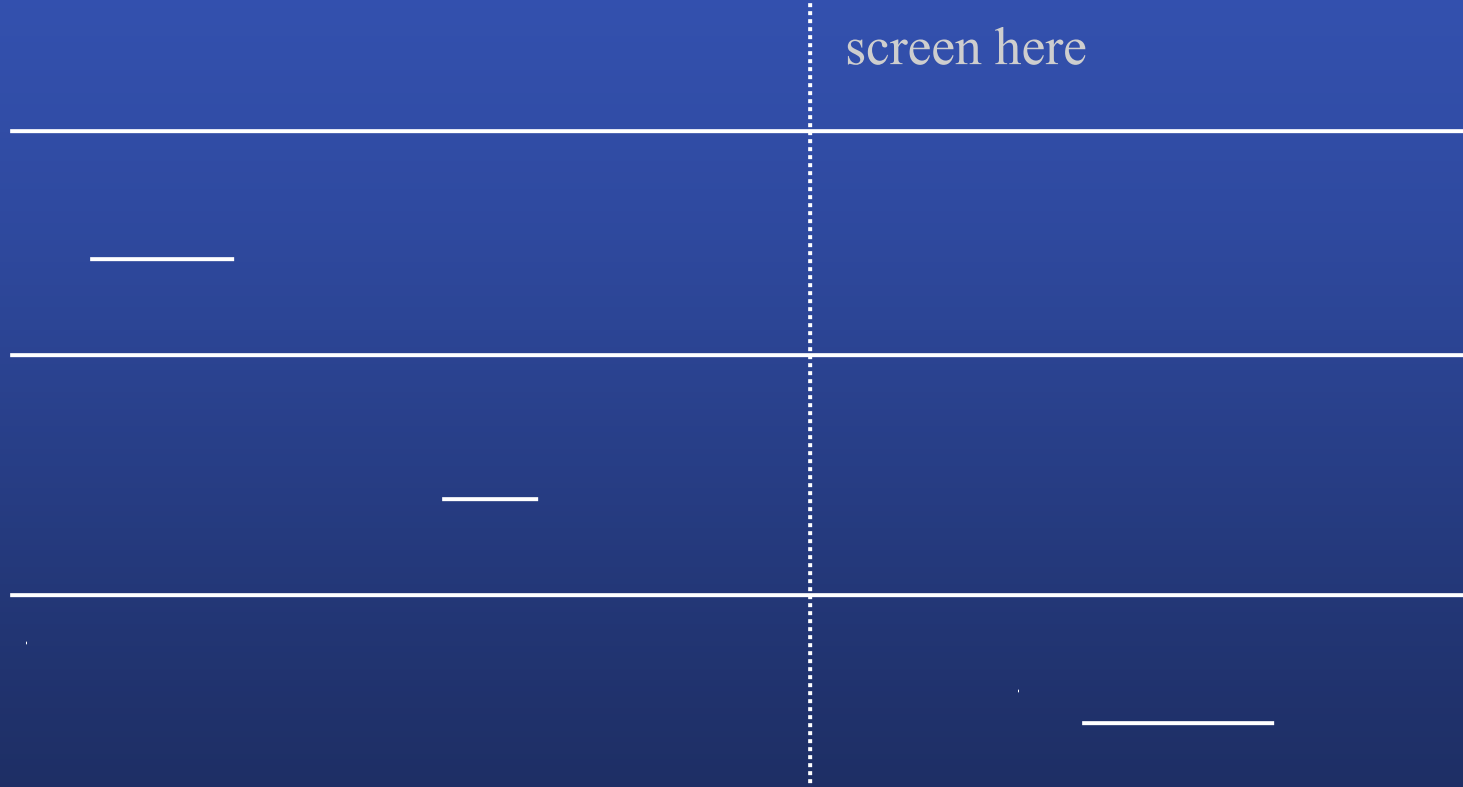
tumour starts



patient dies

# the case for screening

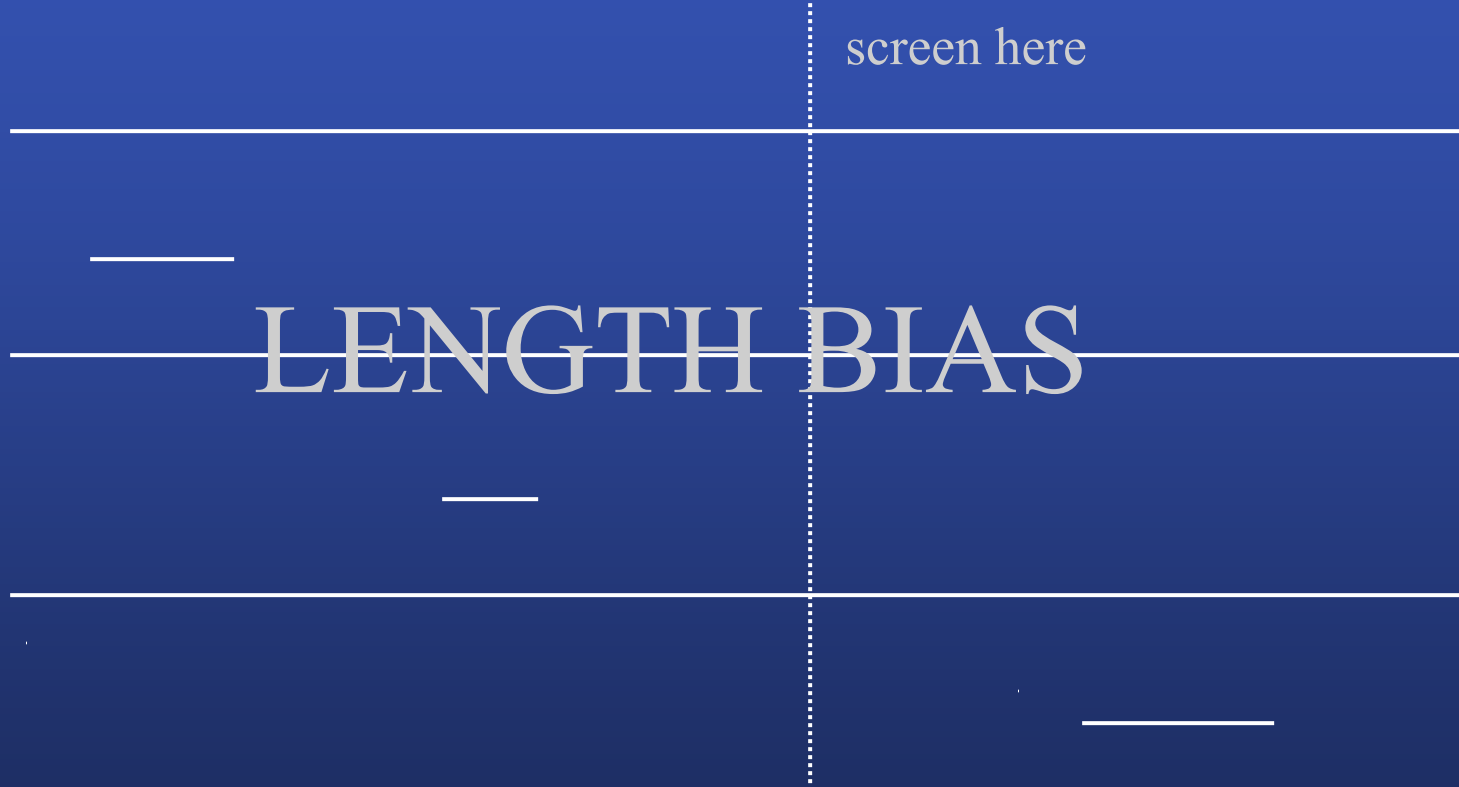
tumour starts



patient dies

# the case for screening

tumour starts



screen here

LENGTH BIAS

patient dies