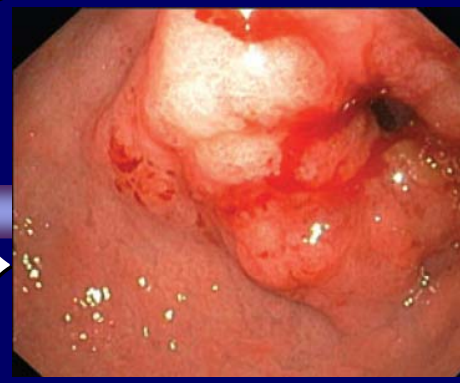
Issue #1: Premalignant Lesions

Gastric Cancer: Etiologic Factors

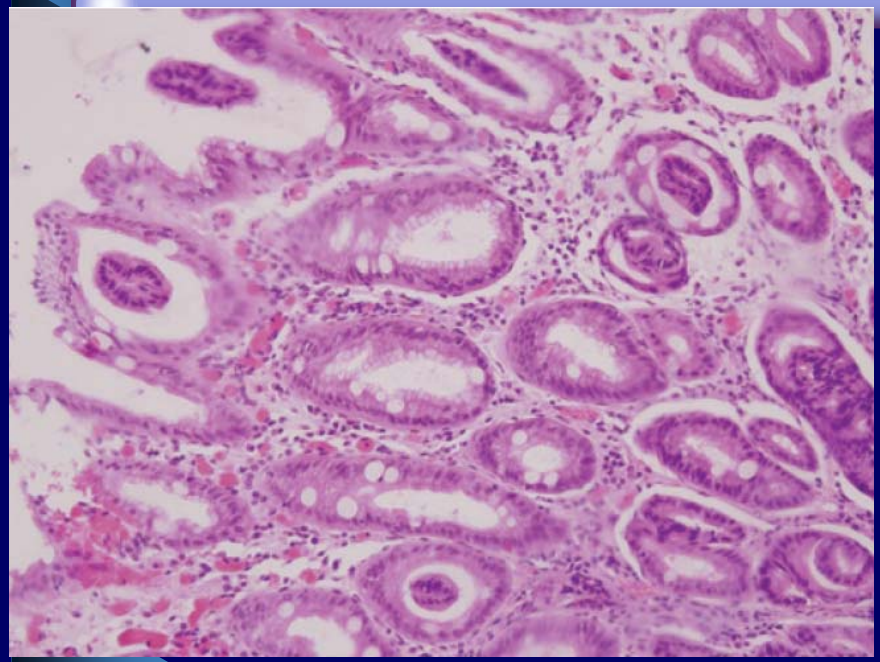
- H. Pylori
- diet (salt, nitrates)
- lifestyle (smoking, obesity)
- familial (~10% in West)
  - diet
  - hereditary
    - HNPCC
    - DGC

Lauren Classification of Histology

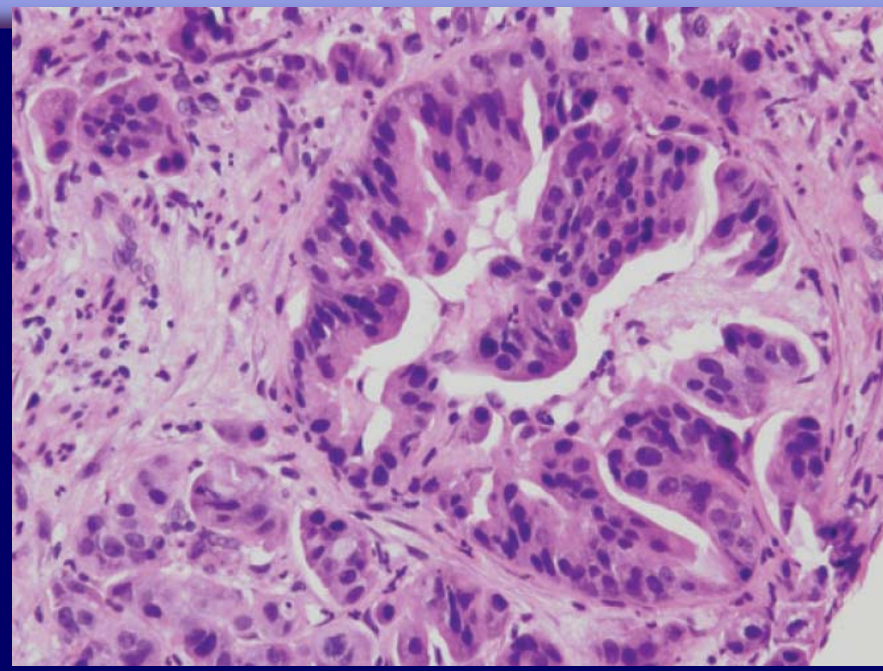


- **Intestinal Type (60%)**
  - grossly discrete mass
  - precancerous cascade: gastritis→ atrophy → intestinal metaplasia
  - cohesive cells that form gland-like tubular structures
  - well- or mod- diff'd adenoCa, papillary adenoCa
  - incidence has declined
  - H. Pylori, diet, smoking, HNPCC
- **Diffuse Type (40%)**
  - grossly diffuse (linnitis), microscopically multifocal
  - no cell cohesion, cells infiltrate and thicken wall
  - poorly diff'd signet-ring cell Ca, mucinous adenoCa
  - incidence stable
  - diet, smoking, obesity, HDGC

Issue #1: Premalignant Lesions



Intestinal Metaplasia



Poorly Differentiated Intestinal-Type Adenocacrinoma

Issue #1: Premalignant Lesions

Gastric Cancer Risk in Patients With Premalignant Gastric Lesions: A Nationwide Cohort Study in the Netherlands

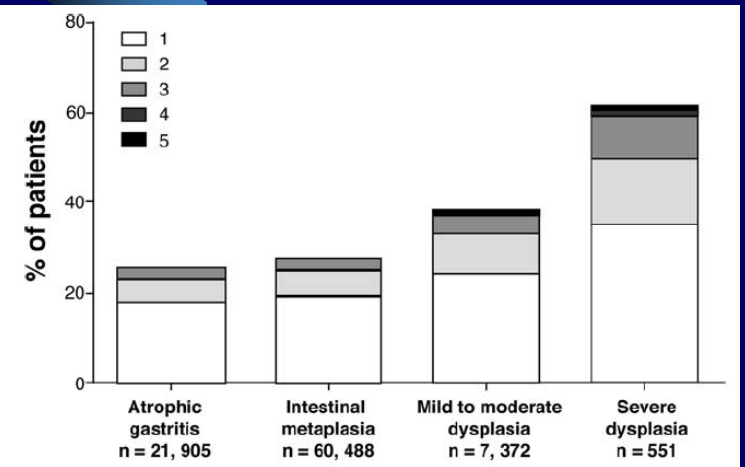


Figure 1. The proportion of patients with atrophic gastritis, intestinal metaplasia, and dysplasia receiving 1 or more follow-up upper-gastrointestinal endoscopies.

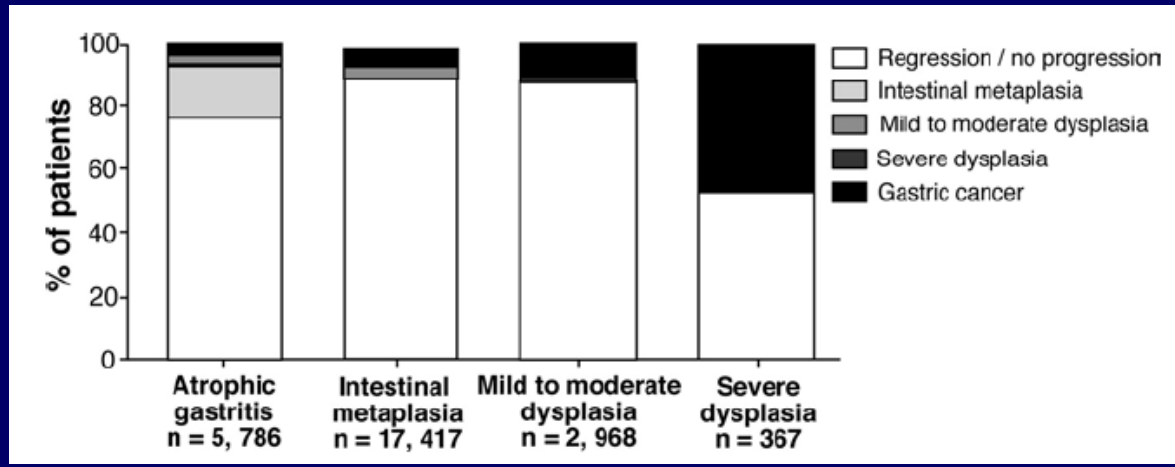
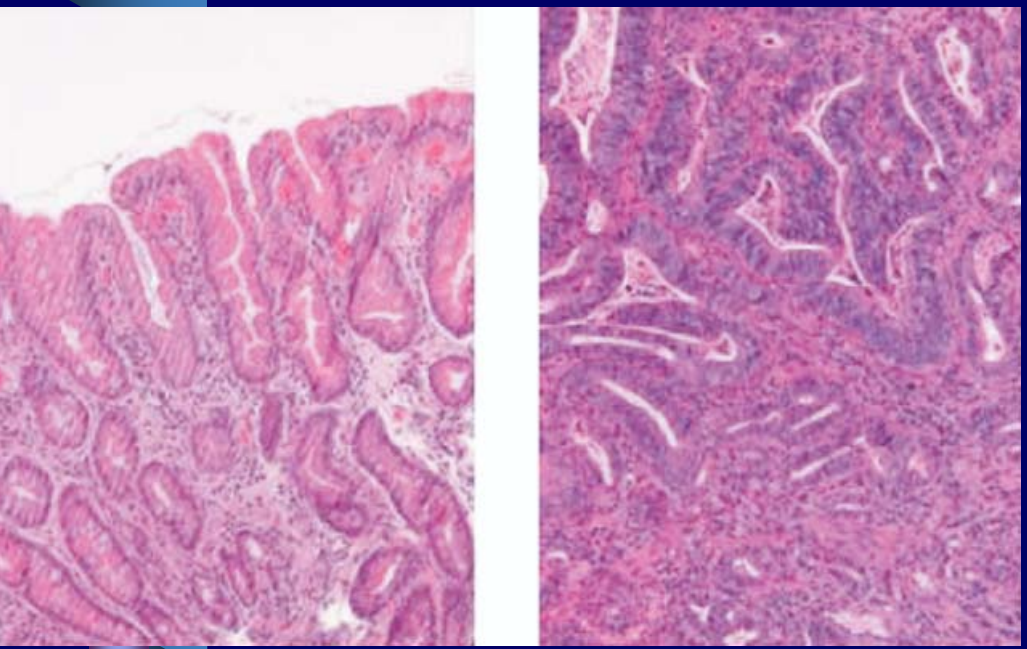


Figure 4. Follow-up results in patients in whom histological re-evaluation was performed. The results are presented as most advanced gastric lesion during follow-up for each category of premalignant gastric lesions at baseline. The outcome of patients who developed esophageal or cancer at the esophagogastric junction is not mentioned in this figure. Mean length of follow-up for patients with atrophic gastritis, intestinal metaplasia, mild-to-moderate dysplasia, and severe dysplasia: 3.5, 2.8, 2.5, and 1.0 years, respectively.

De Vries et al., Gastroenterol 2008; 134:945

Issue #1: Premalignant Lesions

Gastric Cancer Risk in Patients With Premalignant Gastric Lesions: A Nationwide Cohort Study in the Netherlands



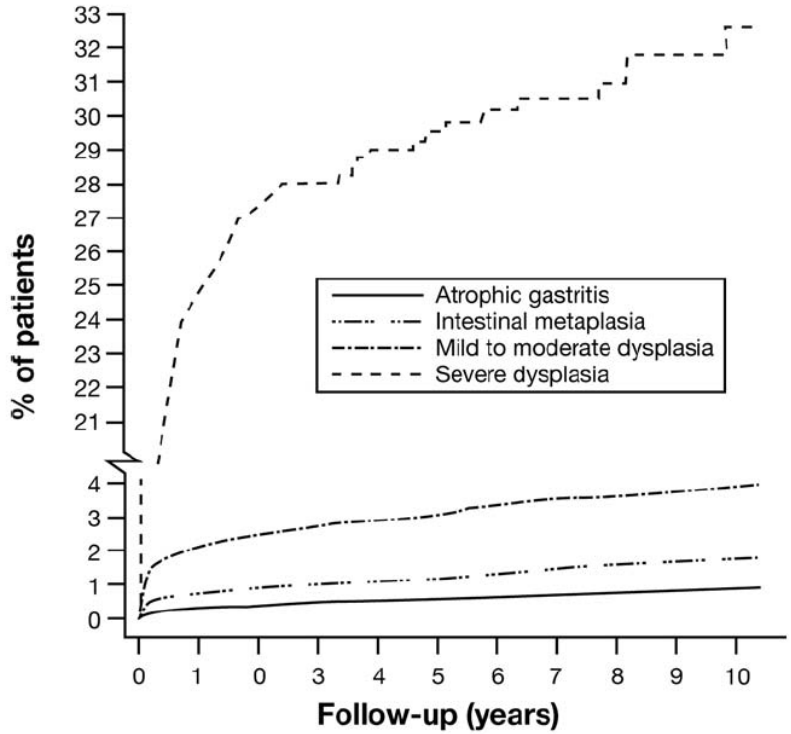


Figure 5. Progression rate of premalignant gastric lesions to gastric cancer in 92,250 patients with premalignant gastric lesions (90,780 censored patients).

De Vries et al., Gastroenterol 2008; 134:945

Issue #1: Premalignant Lesions

Epidemiological trends of pre-malignant gastric lesions: a long-term nationwide study in the Netherlands

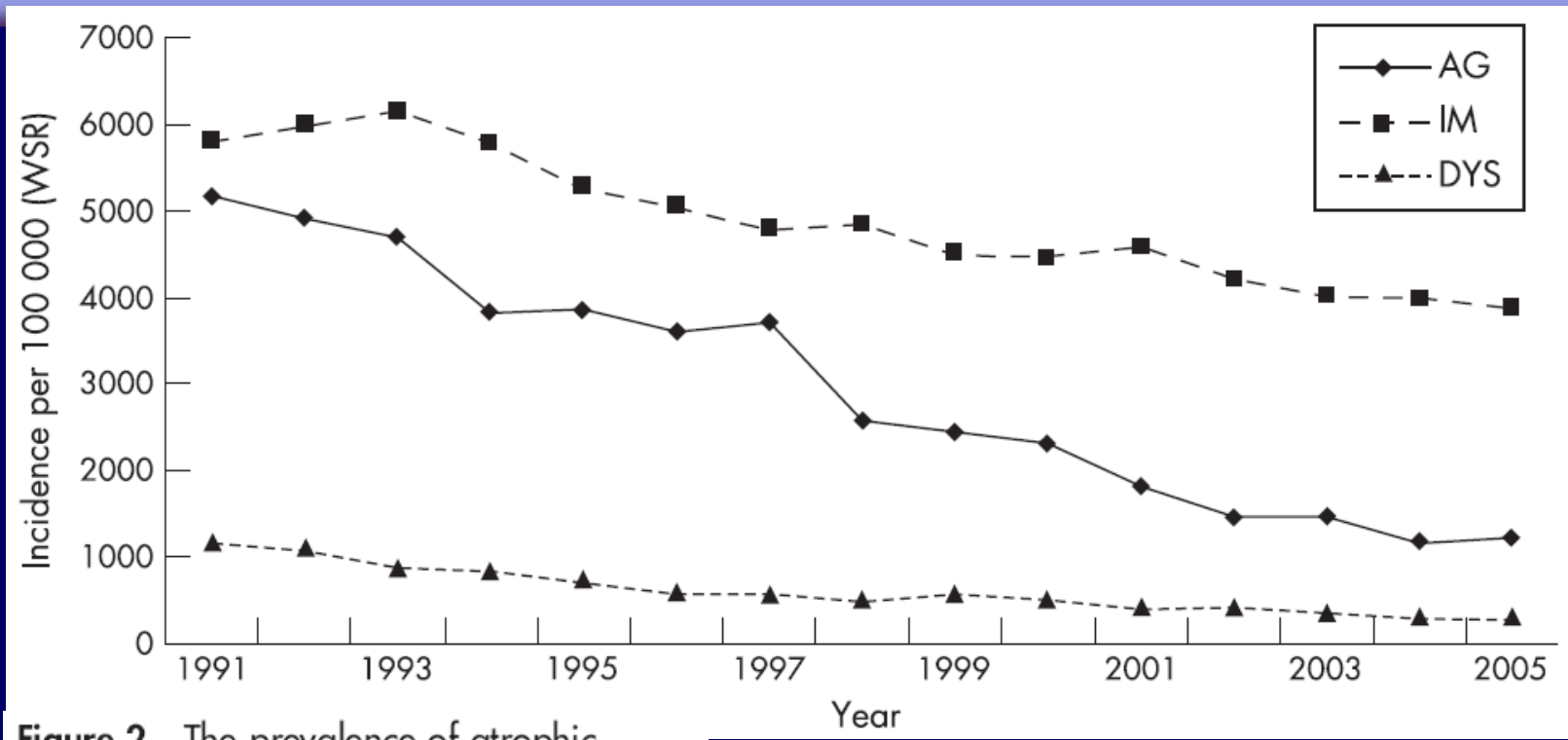


Figure 2 The prevalence of atrophic gastritis, intestinal metaplasia and dysplasia (WSR) relative to total number of patients with a first gastric biopsy over time. AG: atrophic gastritis; DYS: dysplasia; IM: intestinal metaplasia; WSR: world standardised rate.

De Vries et al., Gut 2007; 56:1665

Issue #1: Premalignant Lesions

The management of gastric polyps

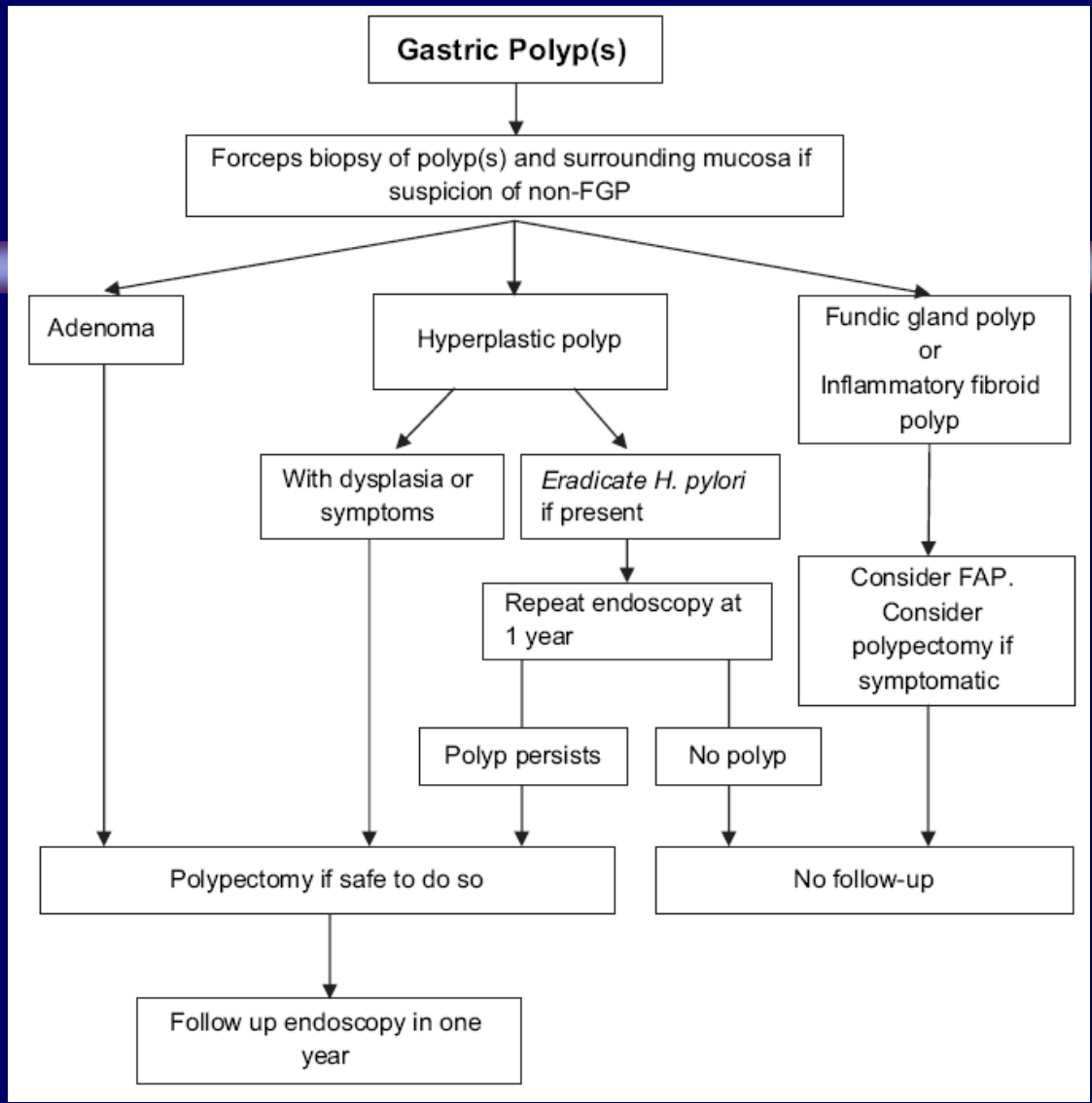
Polyp type	Usual number and size	Usual site	Malignant potential of polyp	Malignant potential of background mucosa	Management
Sporadic fundic gland polyp	Multiple 1–5 mm	Upper and lower body	Very low	Very low	Biopsy to confirm nature of polyp No follow-up needed
Familial adenomatous polyposis-associated fundic gland polyp	Multiple 'carpet' <1 cm	Upper and lower body	Low	Low	Biopsy to confirm nature of polyp Repeat OGD every 2 years
Hyperplastic	Single 1–2 cm	Antrum	Low but significant	Low	Remove polyp if dysplastic Eradicate *H pylori* Repeat OGD 1 year
	Multiple <1 cm	Lower body	Low but significant	Low	Eradicate *H pylori* Repeat OGD 1 year
Adenoma	Single 1–2 cm	Antrum	High	Significant	Remove polyp Sample rest of gastric mucosa Repeat OGD at 1 year
Inflammatory fibroid polyp	Single 1–5 cm	Antrum	Very low	Very low	Biopsy to confirm nature of polyp Remove if causing obstruction No follow-up

Andrew F Goddard, Rawya Badreldin, D Mark Pritchard, et al.

British Society of Gastroenterology

Gut 2010;**59**:1270–1276

The management of gastric polyps



Andrew F Goddard, Rawya Badreldin, D Mark Pritchard, et al.

British Society of Gastroenterology

Gut 2010;**59**:1270–1276

Issue #1: Premalignant Lesions

The management of gastric polyps

Table 1 Management of gastric polyps associated with polyposis syndromes

Syndrome	Lifetime risk of malignancy	Surveillance recommendation
Familial adenomatous polyposis	100% (colon)	OGD every 2 years after age 18 Biopsy >5 polyps Remove polyps >1 cm Surveillance also required for duodenal polyps
Peutz–Jeghers'	>50% (extra-GI)	OGD every 2 years after age 18 Biopsy >5 polyps Remove polyps >1 cm
Juvenile polyposis	>50%	OGD every 3 years after age 18
Cowden's	Rare	Eradicate *H pylori* No further OGD needed

There is very little evidence for the following recommendations, but given the high risk of malignancy in these conditions careful surveillance is necessary.
GI, gastro-intestinal; OGD, gastroscopy.

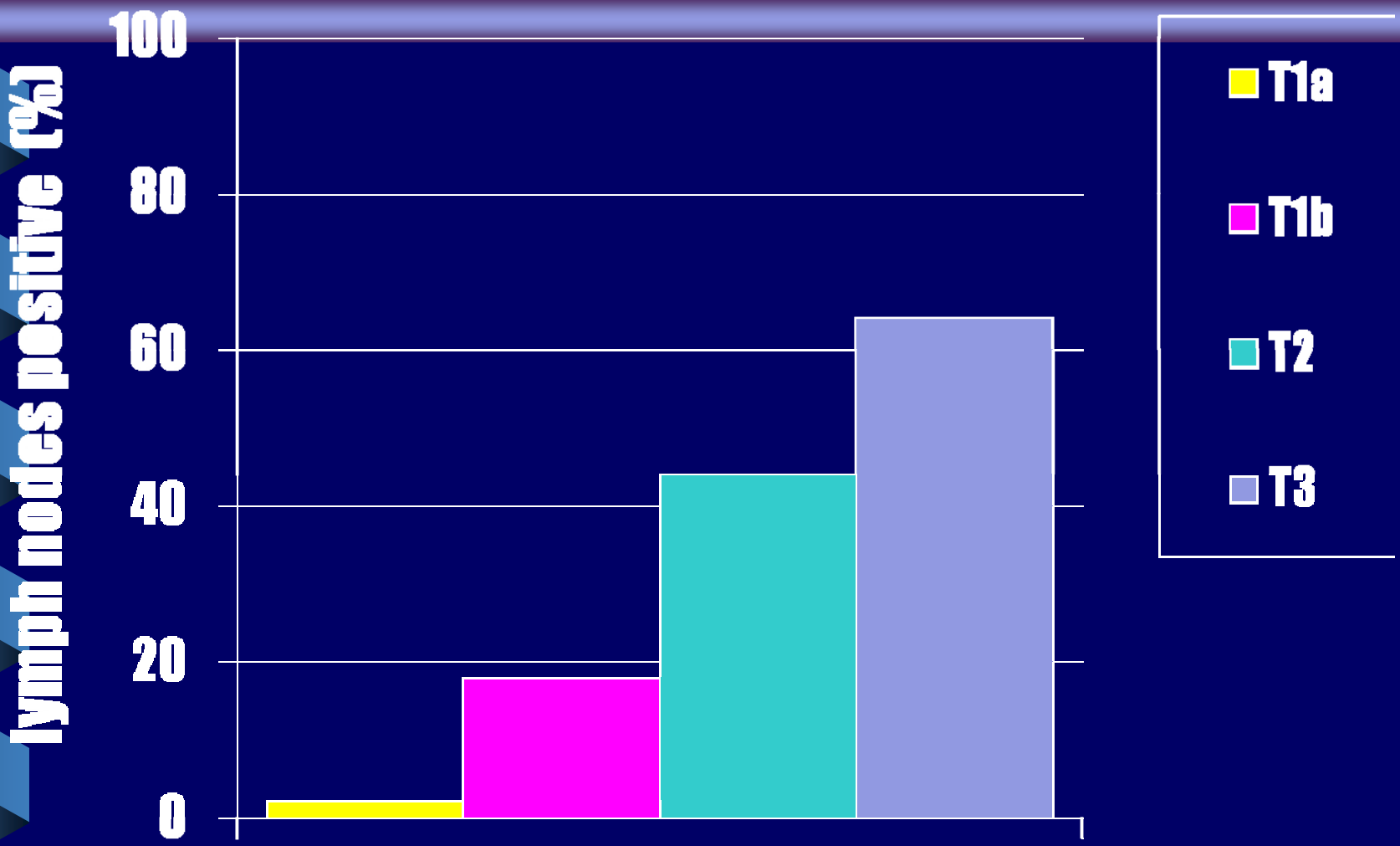
Andrew F Goddard, Rawya Badreldin, D Mark Pritchard, et al.

British Society of Gastroenterology

Gut 2010;**59**:1270–1276

Issue #2: Early Gastric Cancer

LN Involvement depends on T Stage



Early Gastric Cancer (EGC)

- mucosal or submucosal invasion
- ~50% of GC in Japan, 26% in Taiwan, <10% in West
- size, depth, LVI predict LN mets
- LN mets predict recurrence, DSS

Role for endoscopic mucosal resection (EMR), endoscopic submucosal dissection (ESD)

or

laparoscopic resection in well-defined cases

Early Gastric Cancer (EGC)

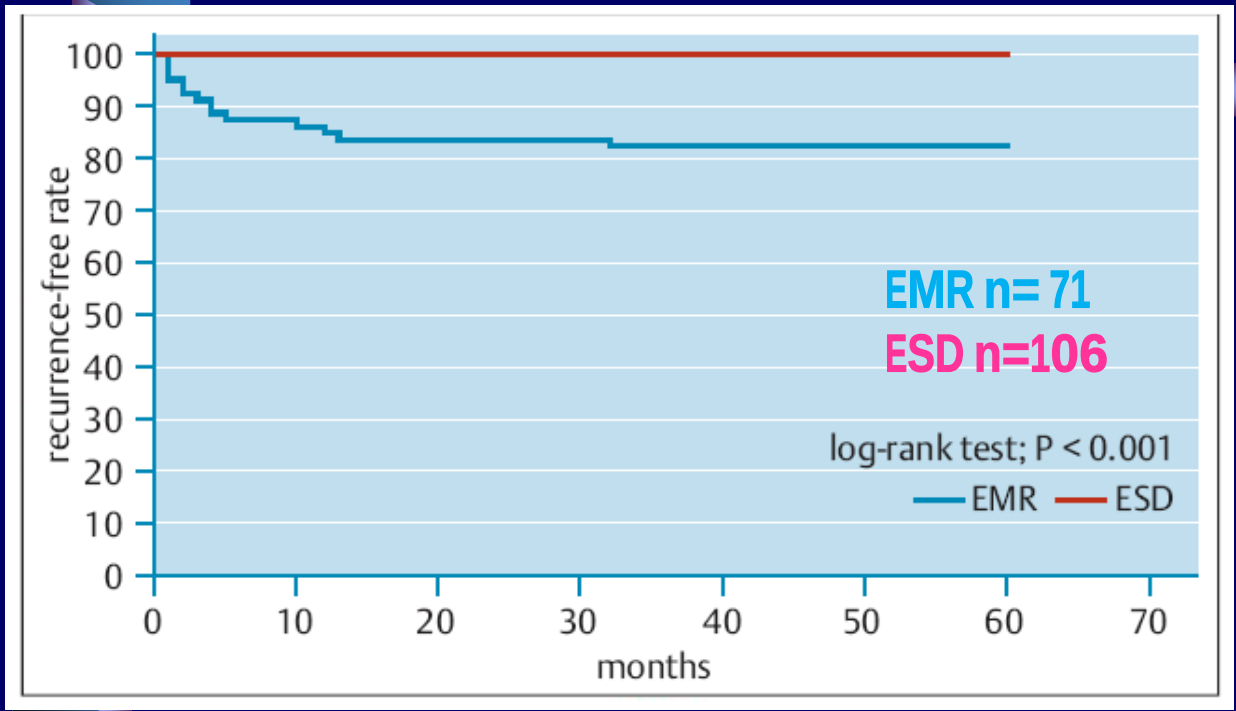


Fig. 1 Overall recurrence-free rate curves in endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD) groups. The overall recurrence-free rate was significantly lower in the EMR group than in the ESD group ($P < 0.001$).

Well diff'd

< 20 mm (elevated)

<10 mm (depressed)

Not with peptic ulcer

Nakamoto et al., Endoscopy 2009; 41:746

Early Gastric Cancer (EGC)

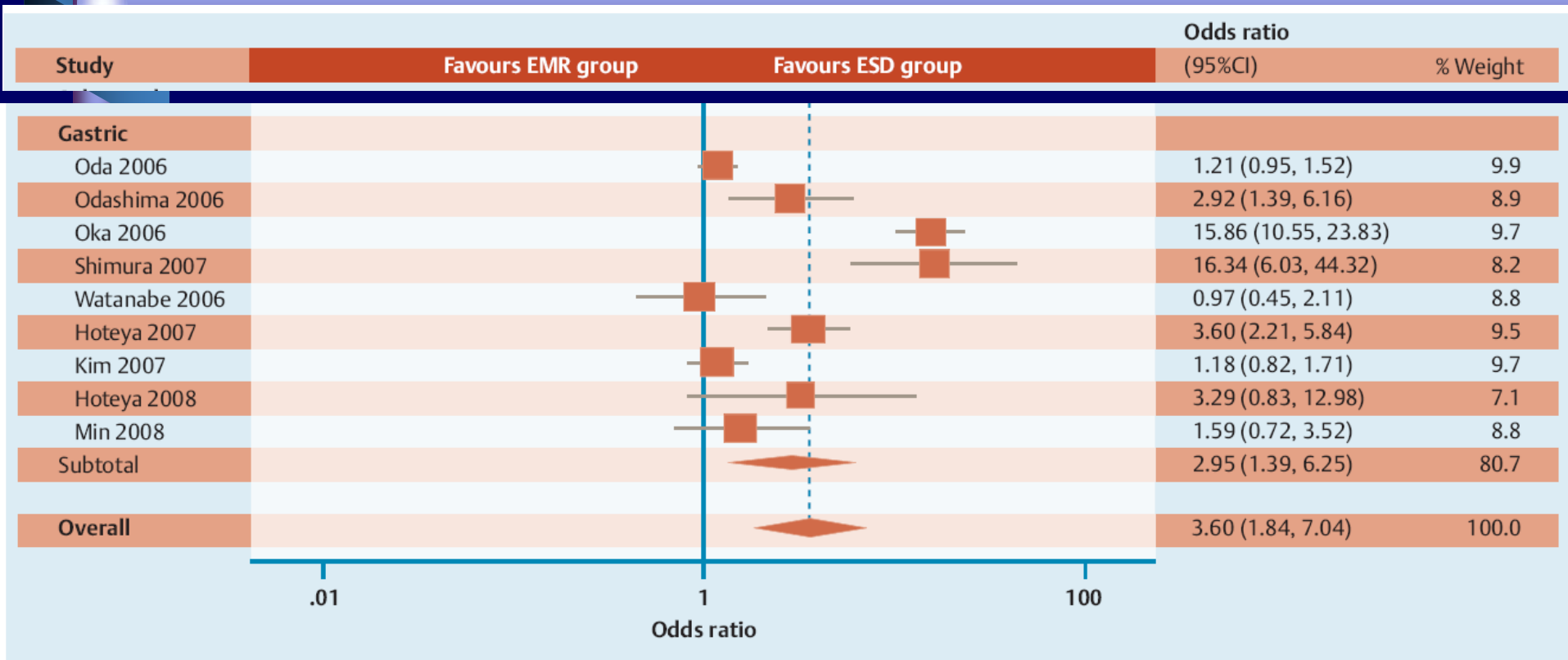


Fig. 4 Curative resection rates with EMR and ESD, according to subgroup meta-analysis for different sites in the gastrointestinal tract.

Cao et al., Endoscopy 2009; 41:751

Early Gastric Cancer (EGC)

n= 1294 EGC Japanese patients

16 centres

1994-2003

Laparoscopic gastrectomy

5 yr DFS >95%

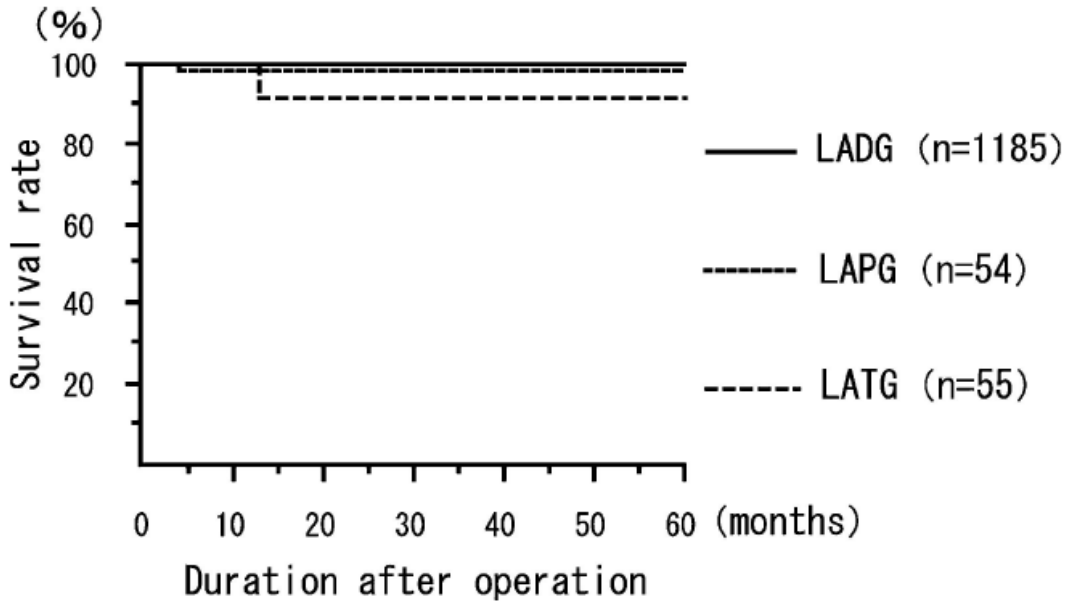


FIGURE 2. The disease-free survival rate according to operation. The 5-year disease-free survival rate was 99.4% for LADG, 98.7% for LAPG, and 93.2% for LATG.

Kitano et al., Ann Surg 2007, 245:68

Issue #3: Hereditary DGC

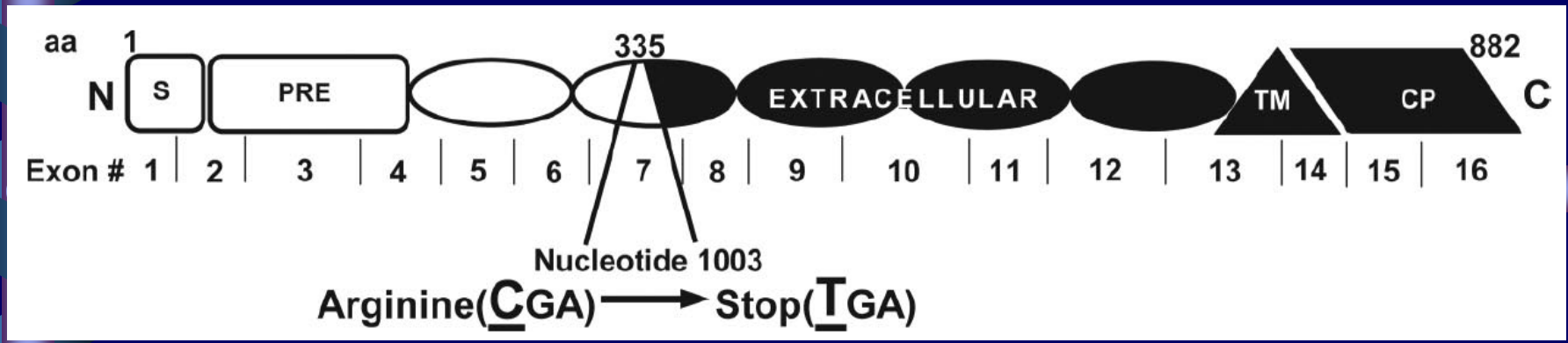
HDGC Criteria

I. 2 or more path documented cases of DGC in 1st- or 2nd- degree relatives, with at least one Dx'd before age 50

II. 3 or more path documented cases of DGC in 1st- or 2nd- degree relatives, of any age

* ~30% of such families have a truncating mutation in CDH1

E-cadherin (CDH1) Mutations and HDGC

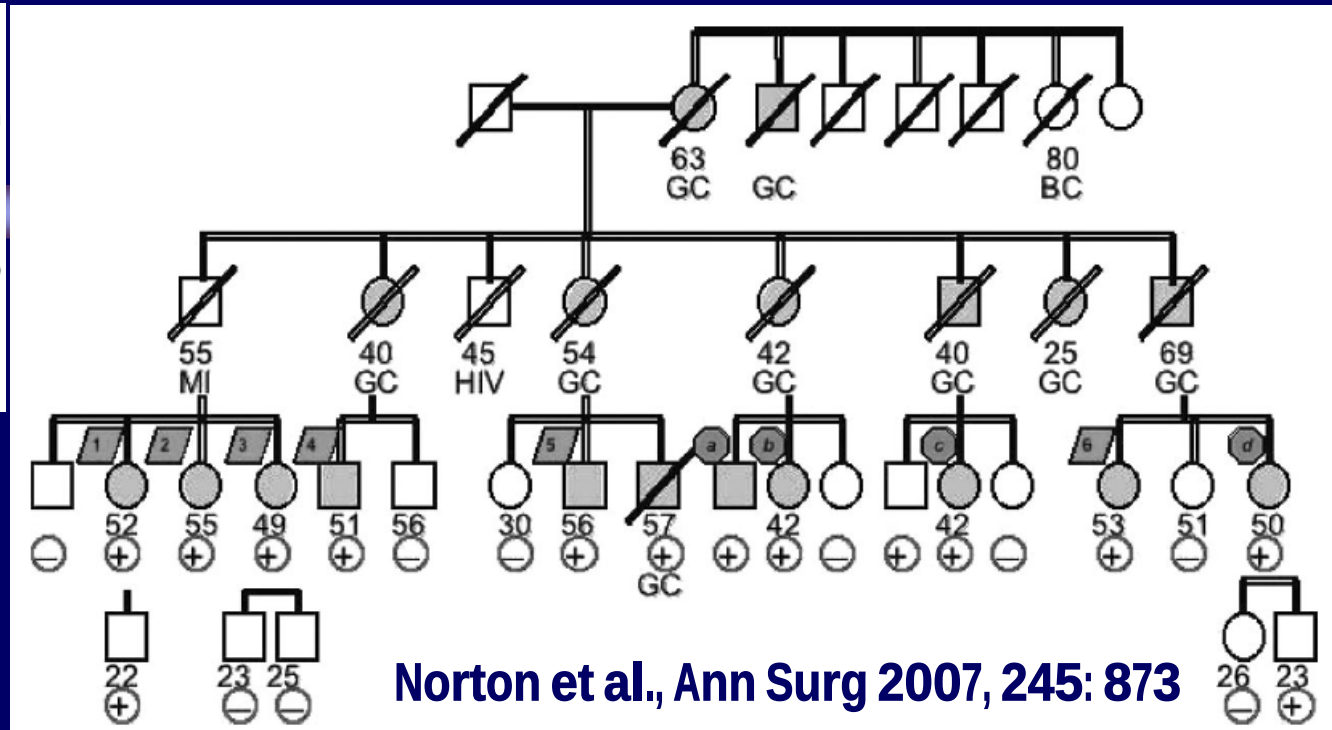


- tumour suppressor gene
- chromosome 16q22.1
- 1998 – 3 Maori families with DGC
- germline truncating mutations
- lifetime GC risk ~70% (AD, high pen)
- lifetime lobular breast Ca risk ~40%

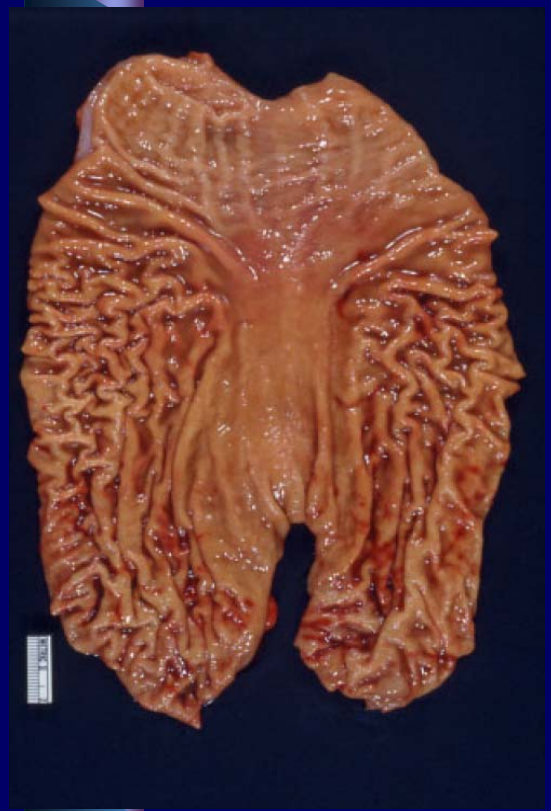
Norton et al., Ann Surg 2007, 245: 873

E-cadherin (CDH1) Mutations and HDGC

FIGURE 1. Family pedigree showing autosomal dominant inheritance of gastric cancer (GC). Individual mutation testing results for the codon 1003 CDH1 mutation are indicated by a + or −. Individuals affected with GC are shaded. The 6 who underwent prophylactic gastrectomy on the current study are numbered 1 to 6. Five other individuals who have had prophylactic gastrectomies are labeled a to e. Individual c had the procedure prior to the availability of genetic testing but was ultimately found not to have inherited a CDH1 mutation.



Norton et al., Ann Surg 2007, 245: 873



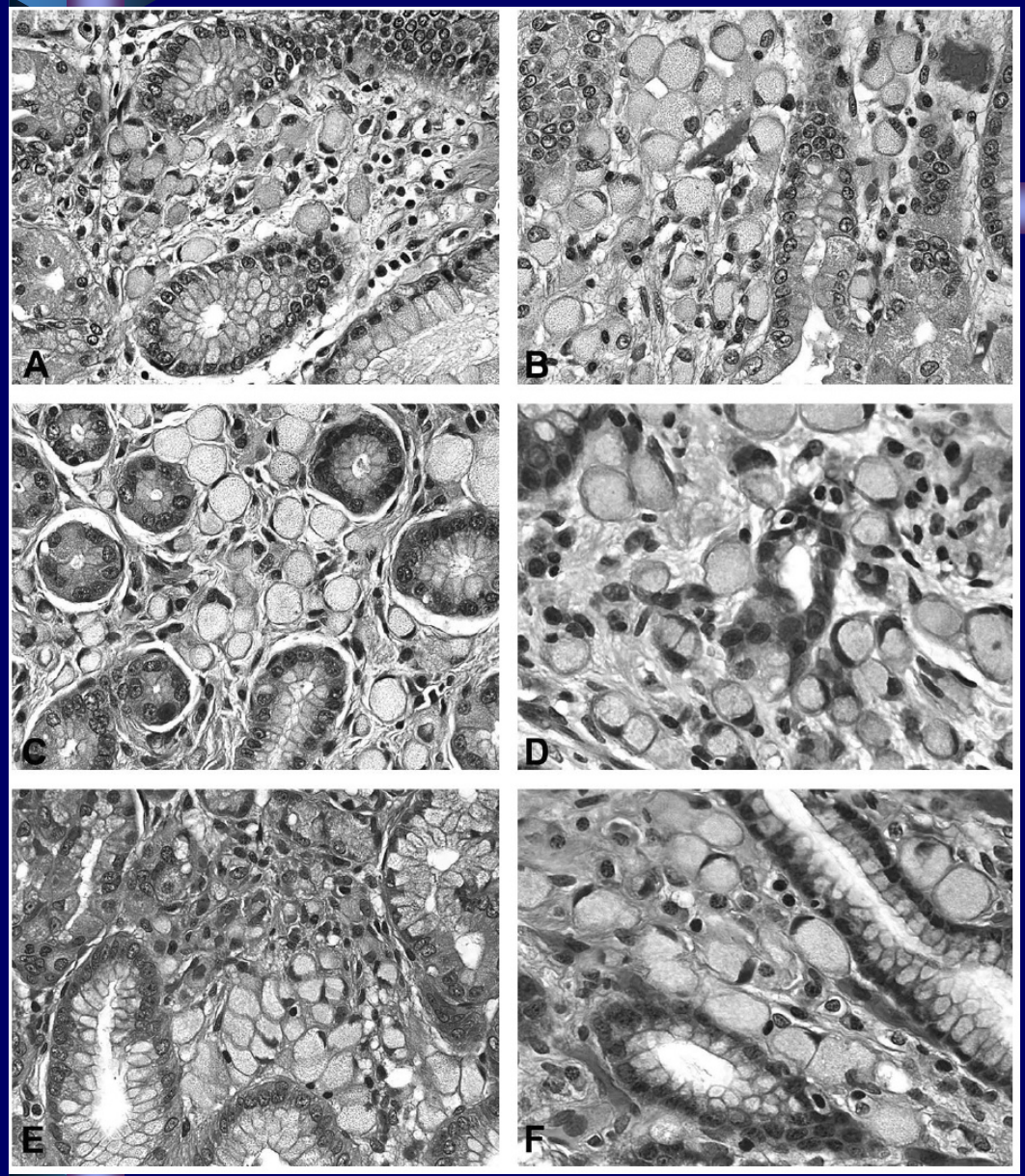
normal endoscopy + random Bx

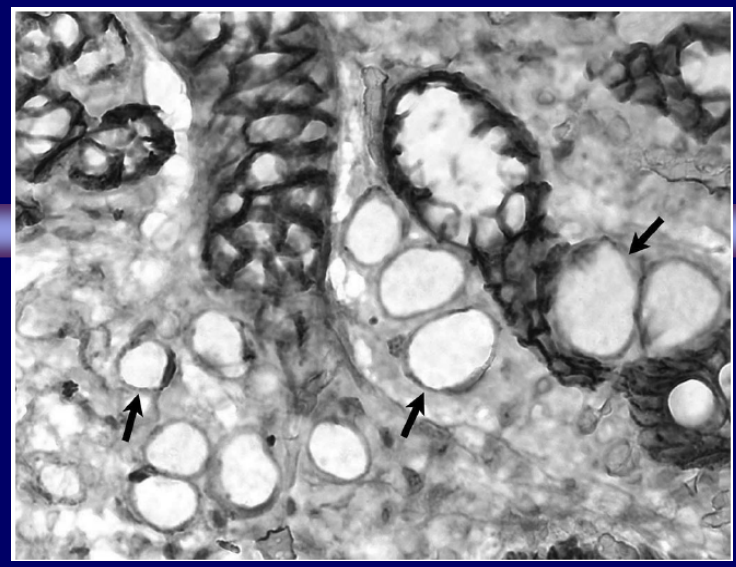
normal chromoendoscopy + random Bx

normal EUS, CT, PET

6/6 had multiple foci of T1 cancer

E-cadherin (CDH1) Mutations and HDGC





Recommendation : TG in CDH1 mutation carriers @ 5 yrs younger than youngest family member at GC presentation

Norton et al., Ann Surg 2007, 245: 873

Table 4. Criteria for CDH1 mutation testing modified to reflect current data

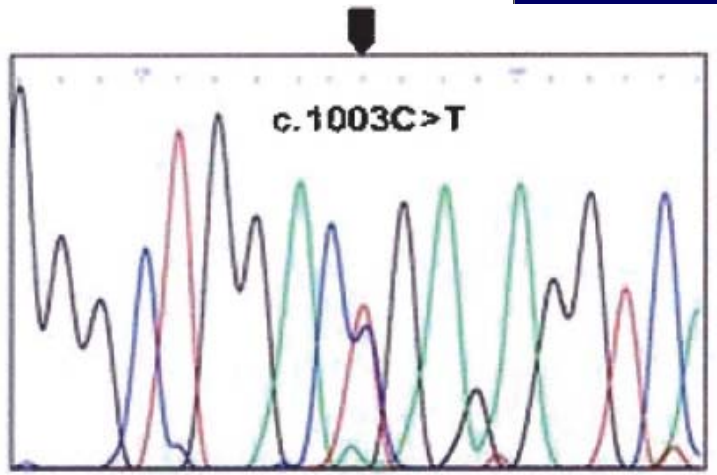
Modified testing criteria	1. Family with two or more cases of gastric cancer, with at least one DGC diagnosed before the age of 50. (>30%)*
	2. Family with multiple LBC with or without DGC in first-degree relatives (unknown)*
	3. Isolated individual diagnosed with DGC at <35 y from a low-incidence population (>10%)*
	4. Isolated personal history of both DGC and LBC (unknown)*
Potential additional criteria	5. Family with three or more cases of gastric cancer diagnosed at any age one or more of which is a documented case of DGC; no other criteria met (such families are extremely rare)
	6. Family with one or more cases of both DGC and signet ring colon cancer (this association is unproven)

*Percentage of expected positive results.

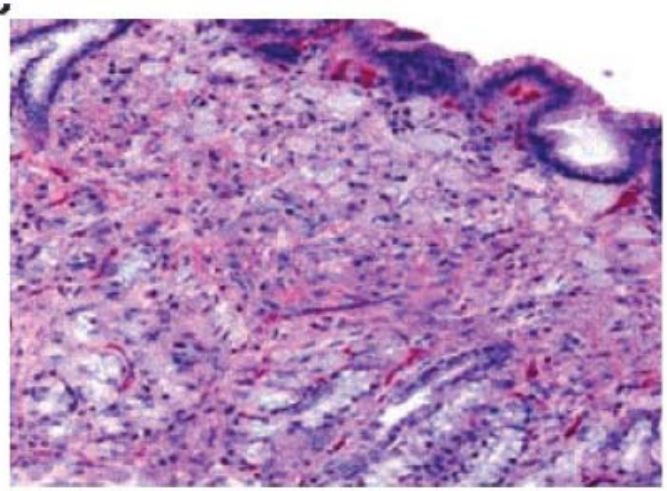
Giampaolo Suriano

Henry Lynch,[11] and David G. Huntsman[1,3,4]

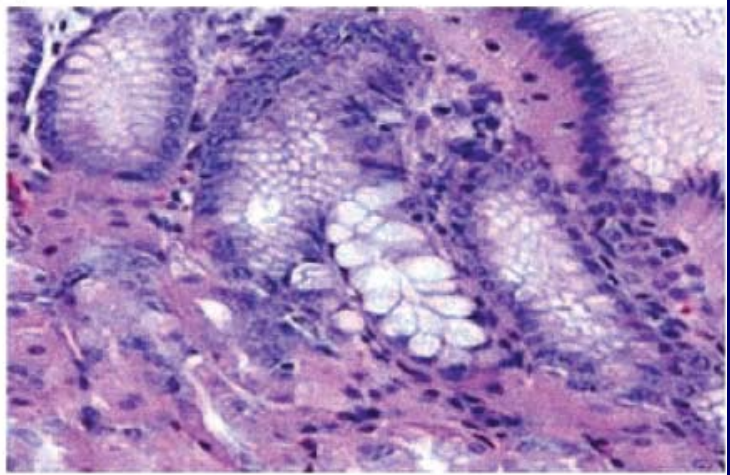
Clin Cancer Res 2005;11(15) August 1, 2005



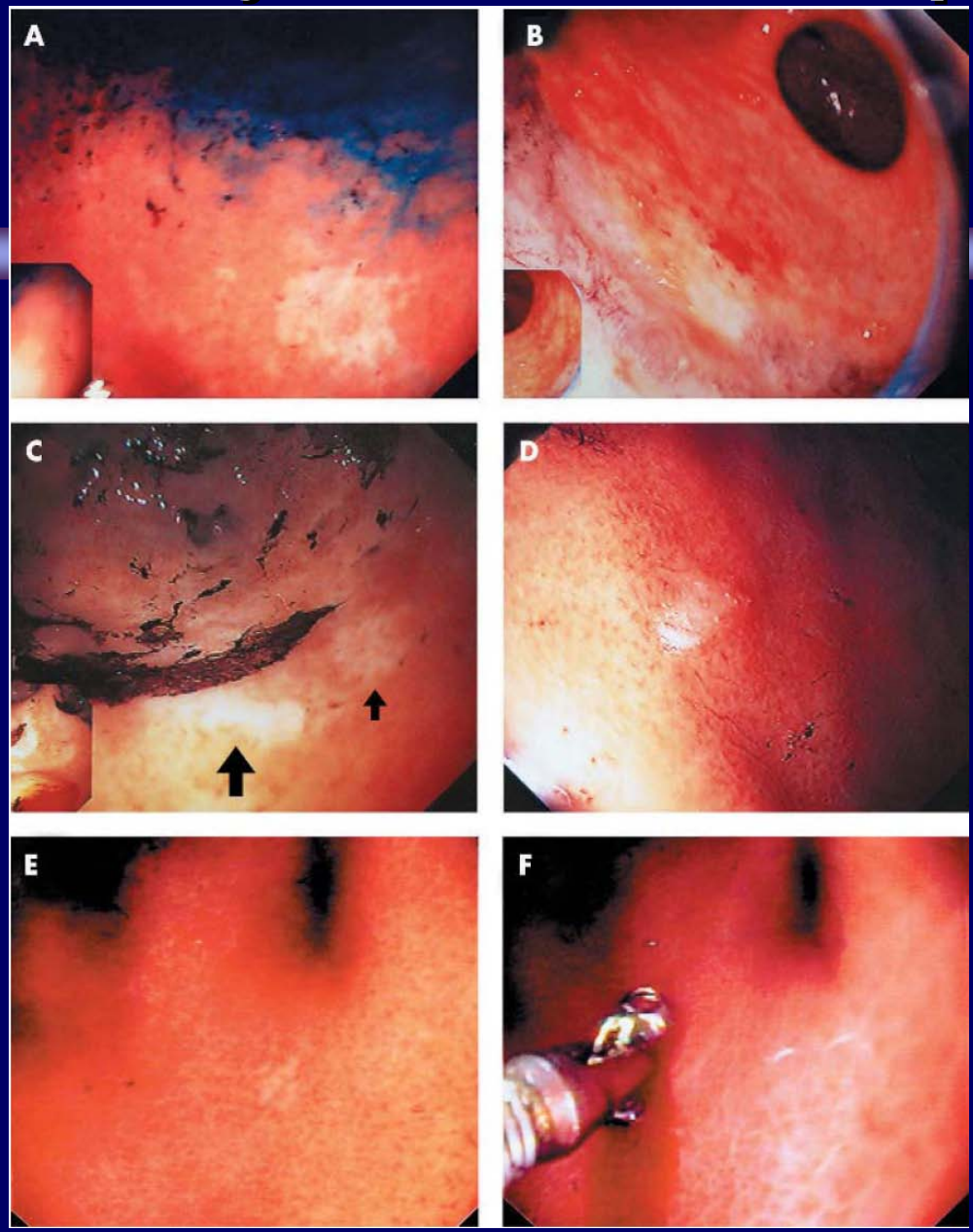
C



D



Surveillance by Chromoendoscopy in HDGC



Shaw, Blair et al.,
Gut 2005, 54: 461

Surveillance by Chromoendoscopy in HDGC

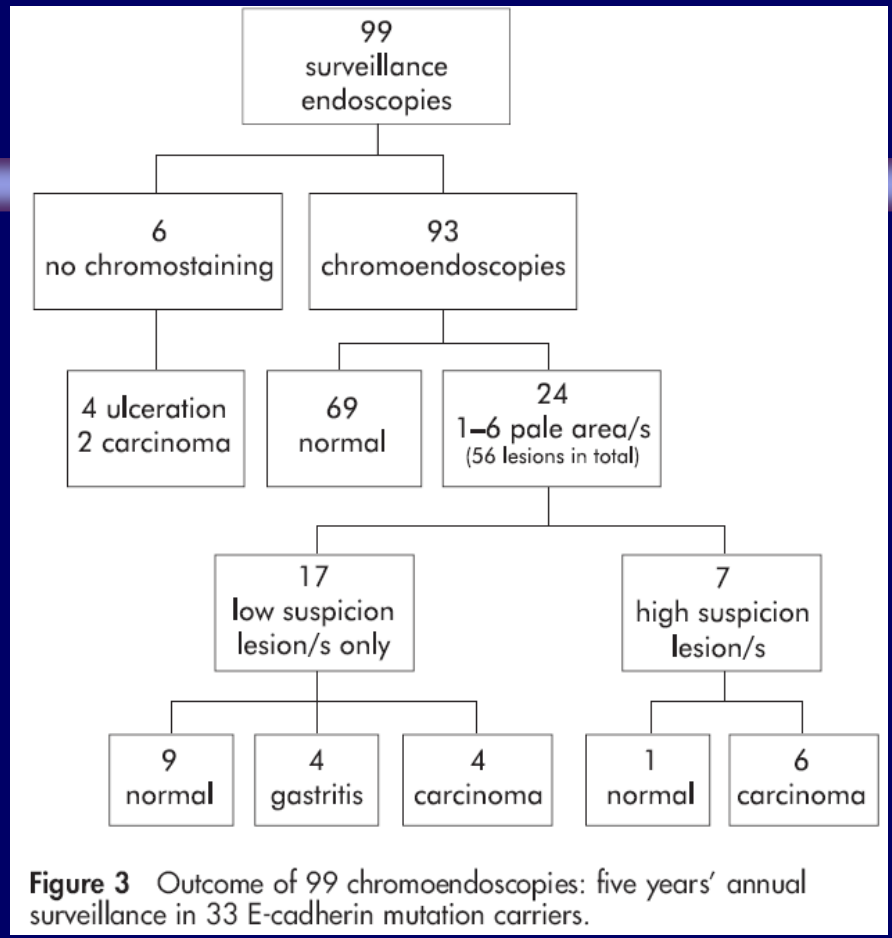


Figure 3 Outcome of 99 chromoendoscopies: five years' annual surveillance in 33 E-cadherin mutation carriers.

Shaw, Blair et al., Gut 2005, 54: 461

Decision-Making and Impact of Prophylactic Gastrectomy in Individuals with Hereditary Diffuse Gastric Cancer Syndrome

Muir, Aronosn, Swallow, Esplen. *Departmentt of Surgery and Psychiatry, University of Toronto*

Study population:

-English-speaking patients with known CDH-1 mutation considering prophylactic gastrectomy at Mt. Sinai Hospital

-current N = 7, expected N = approx 20

First study to examine the health-related quality of life and psychological impact of surgery in this patient population

Questionnaires assessing:

-quality of life (EORTC QLQ 30 & EORTC STO 22)

-body image

-regret

-decisional conflict

-psychological wellbeing (BSI: brief symptom inventory)

-satisfaction with hospital services

-interest in support resources

-current health, diet, medications

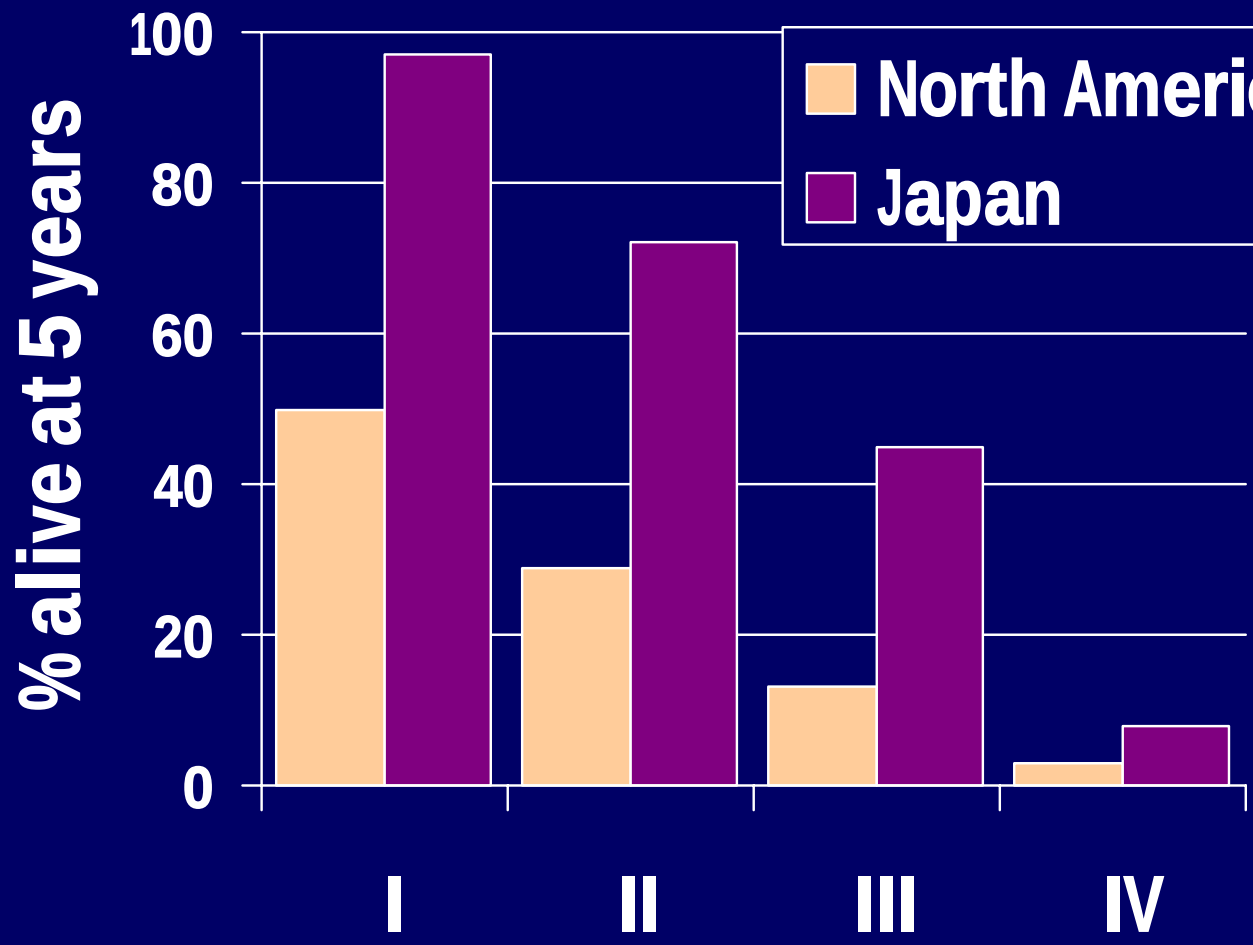
Questionnaires distributed to patients at 5 time points:

- 1 month pre-op
- 2-4 weeks post-op
- 6 months post-op
- 1 year post-op
- 2 years post-op

Goal: Improved understanding of unique patient needs allowing tailoring of services to provide optimum care & decision-making support

Issue #4: Quality of Resection

Outcomes of Resection for Gastric Cancer

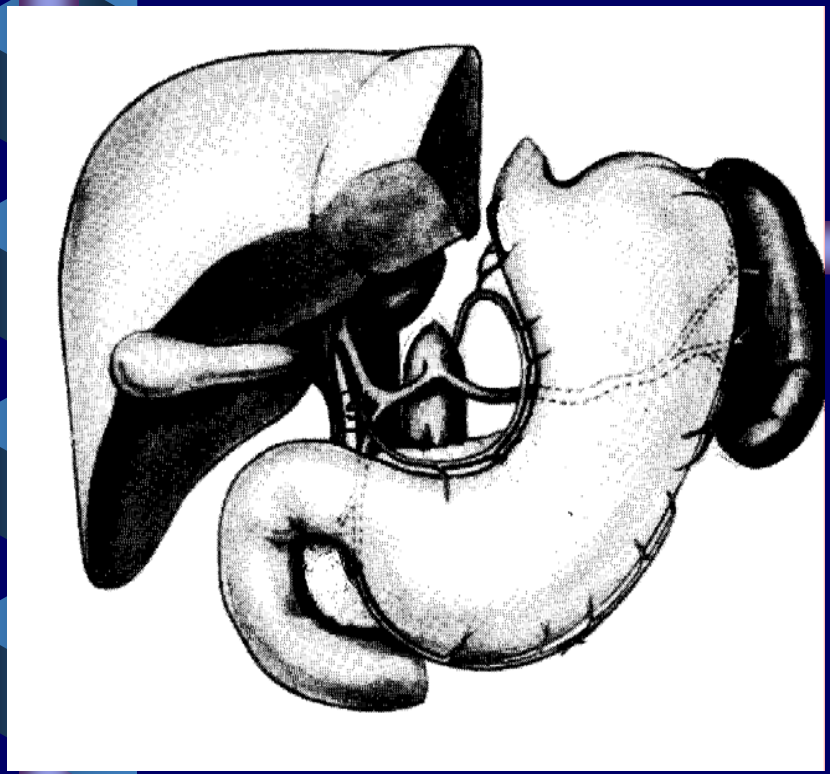


	postop mortality
North America	7%
Japan	2%

1993

The Question of Quality: What is the Secret of Japan?

- younger, less CV disease
- less obese
- stage migration 2° to better N staging
- TECHNIQUE



1997 AJCC, 5th Ed.

N0- No regional LN metastases

N1- Metastasis in 1-6 regional LN

N2- Metastasis in 7-15 regional LN

N3- Metastasis in > 15 regional LN

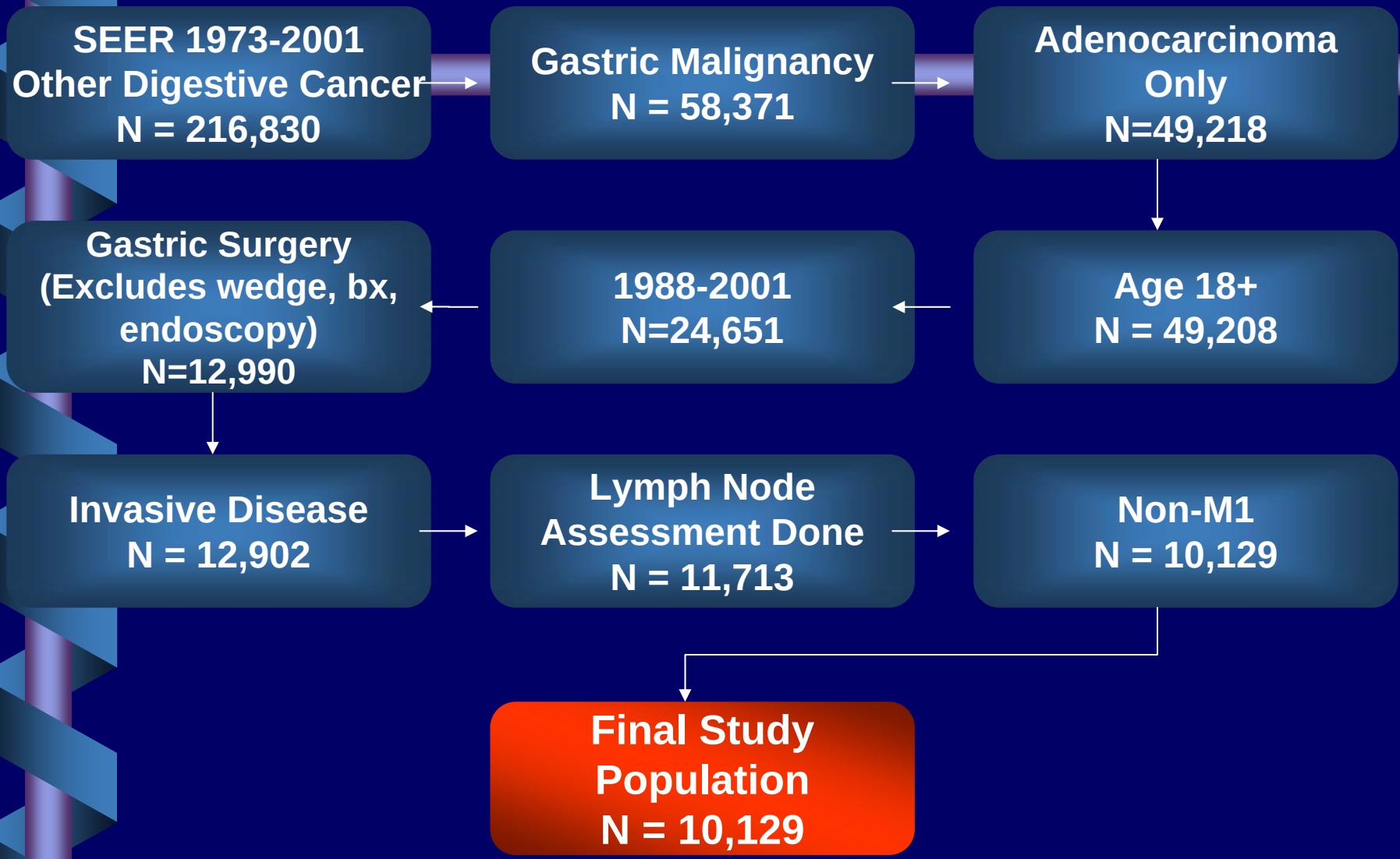
"…it is suggested that at least 15 regional nodes be assessed..."

Significant Regional Variation in Staging and Survival of Gastric Cancer- An Analysis of the SEER Database

Natalie G. Coburn, MD, MPH
Carol J. Swallow, MD, PhD
Calvin Law, MD, MPH

ASCO, 2005
Coburn NG, Swallow CJ, Kiss A, Law C. Cancer, 2006.

Defining the Study Population



Overall Results

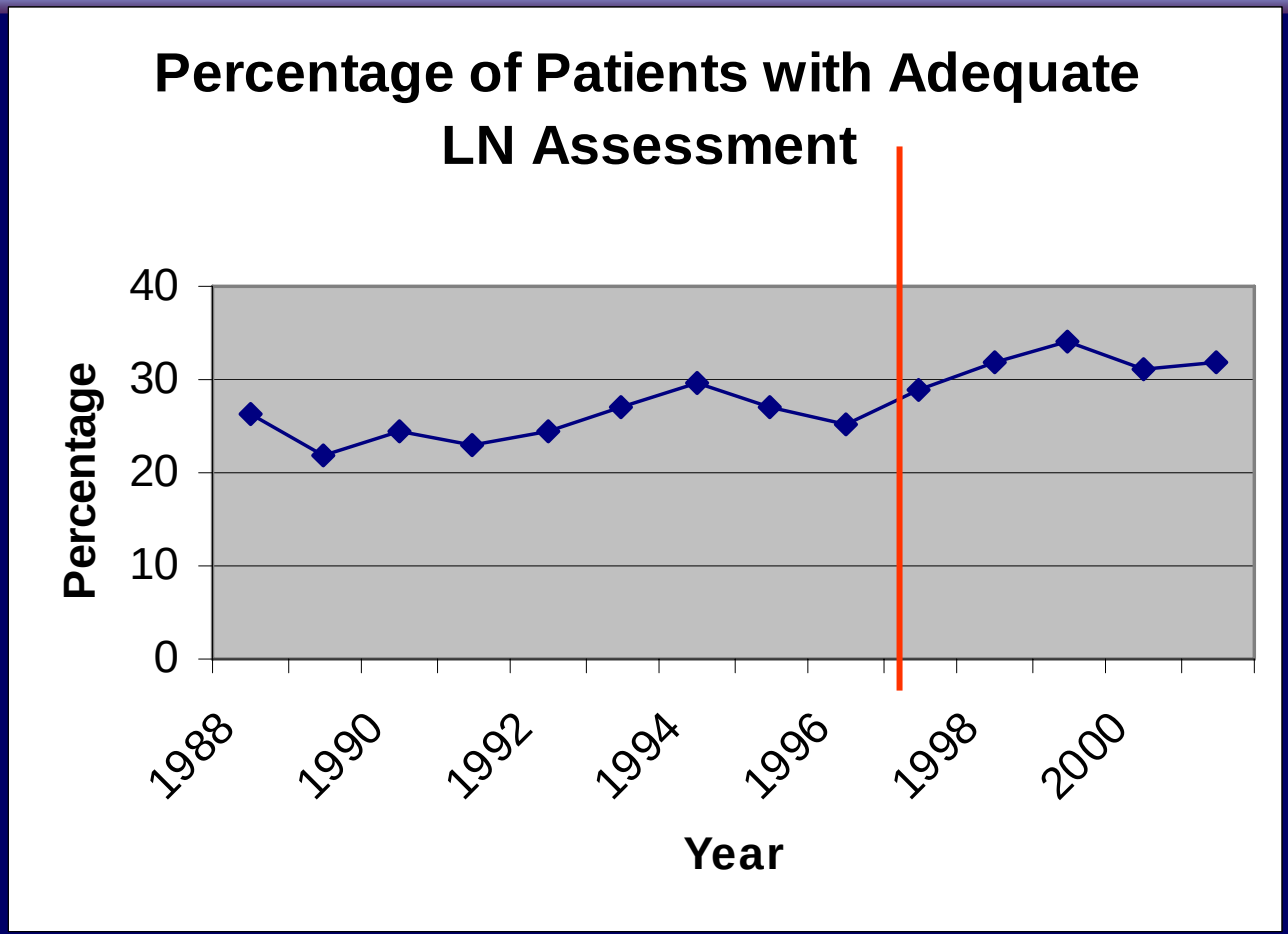
- 10,129 cases
- Male: 64%
- Age
  - Median: 70 years
  - Mean: 68.3±12.5 years
- Median # of LN assessed: 9
- Overall percentage of patients with Adequate LN assessment = 28.6%
  - Improved to 32.7% 1998-2001 ($p<0.05$)

*

Adequate LN Assessment - SEER Database

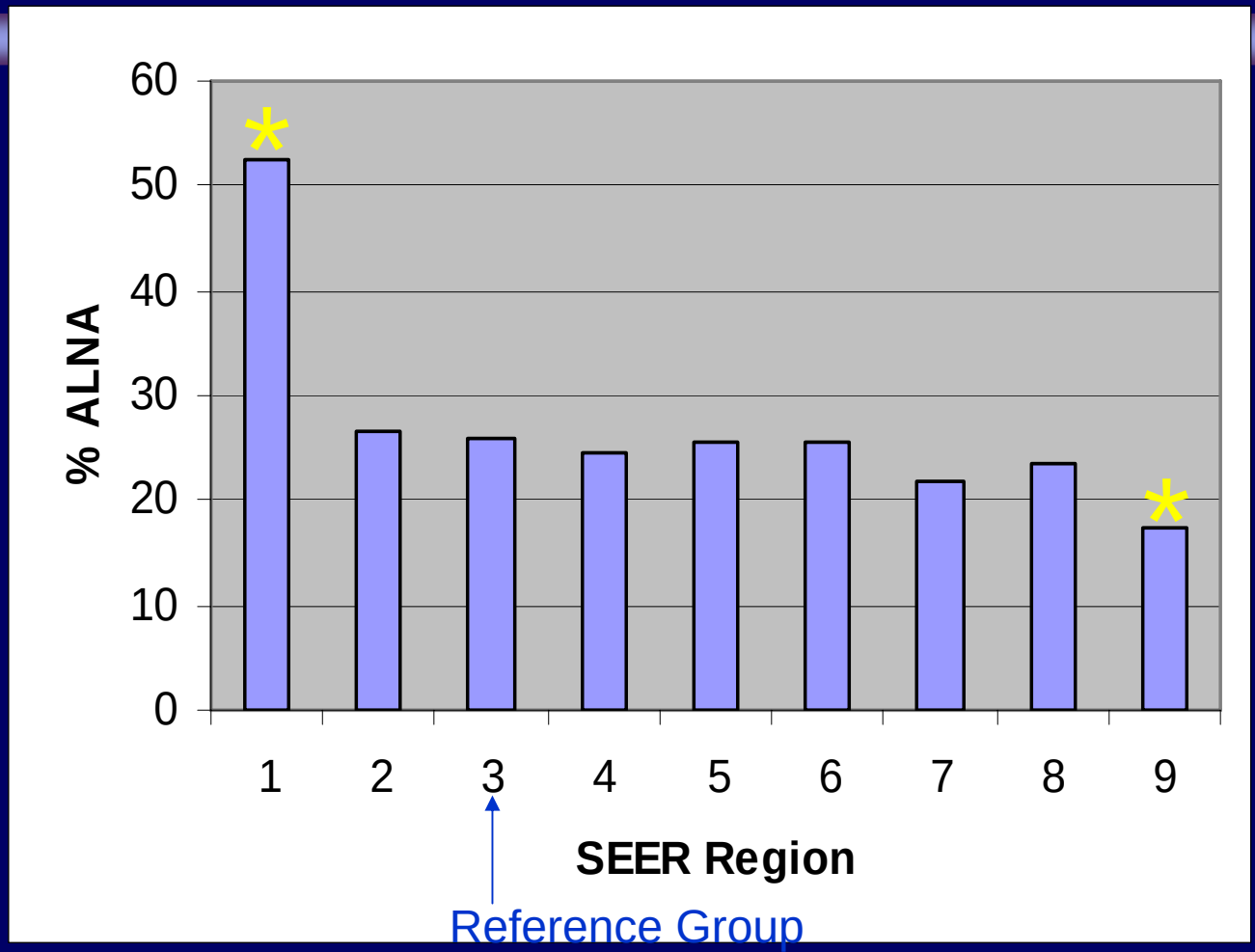
Minimum # LN recommended by AJCC, 1997: 15

Median # LN evaluated, since 1997: 10

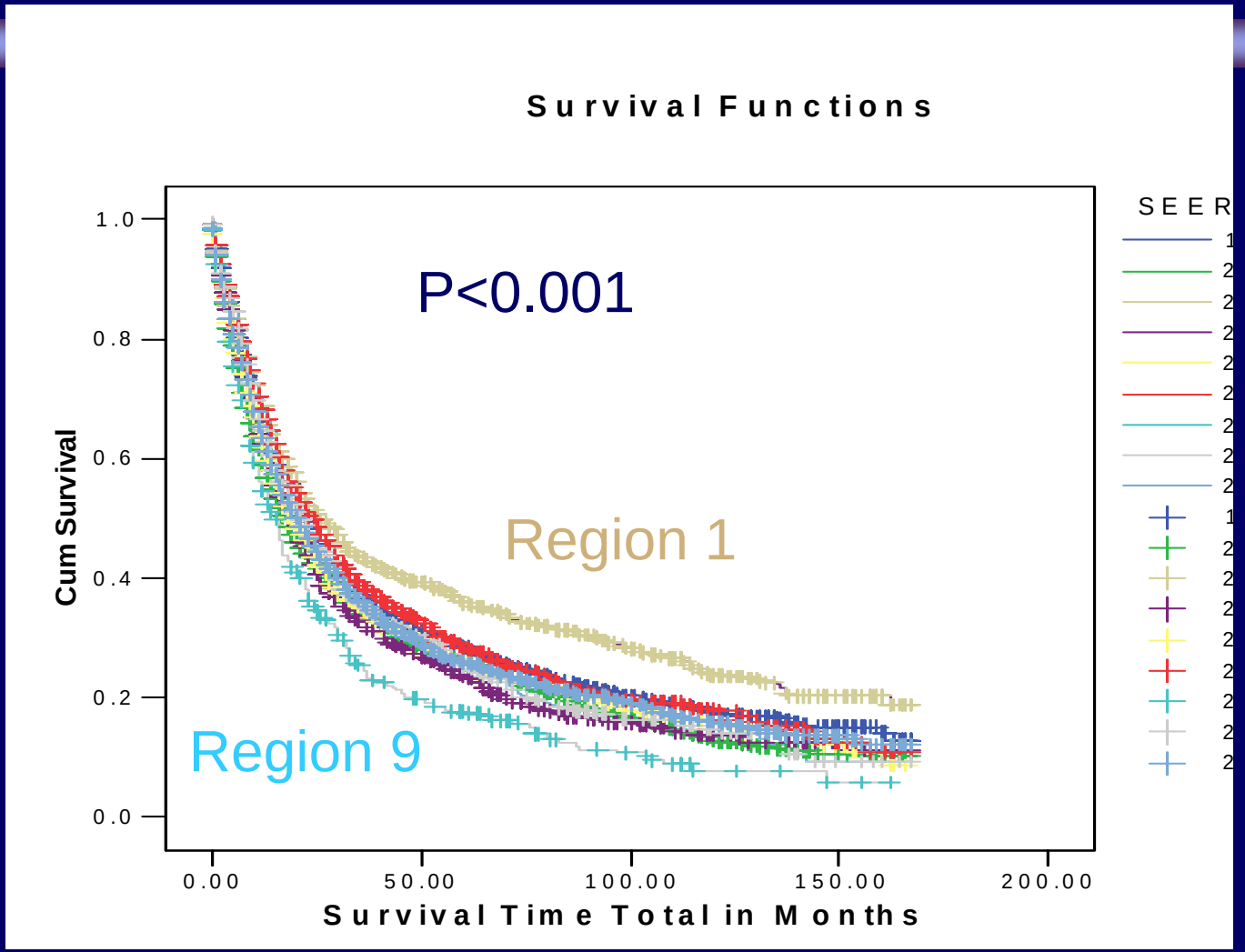


Coburn NG, Swallow CJ, Kiss A, Law C. Cancer, 2006.

Adequate LN Assessment- by SEER Region

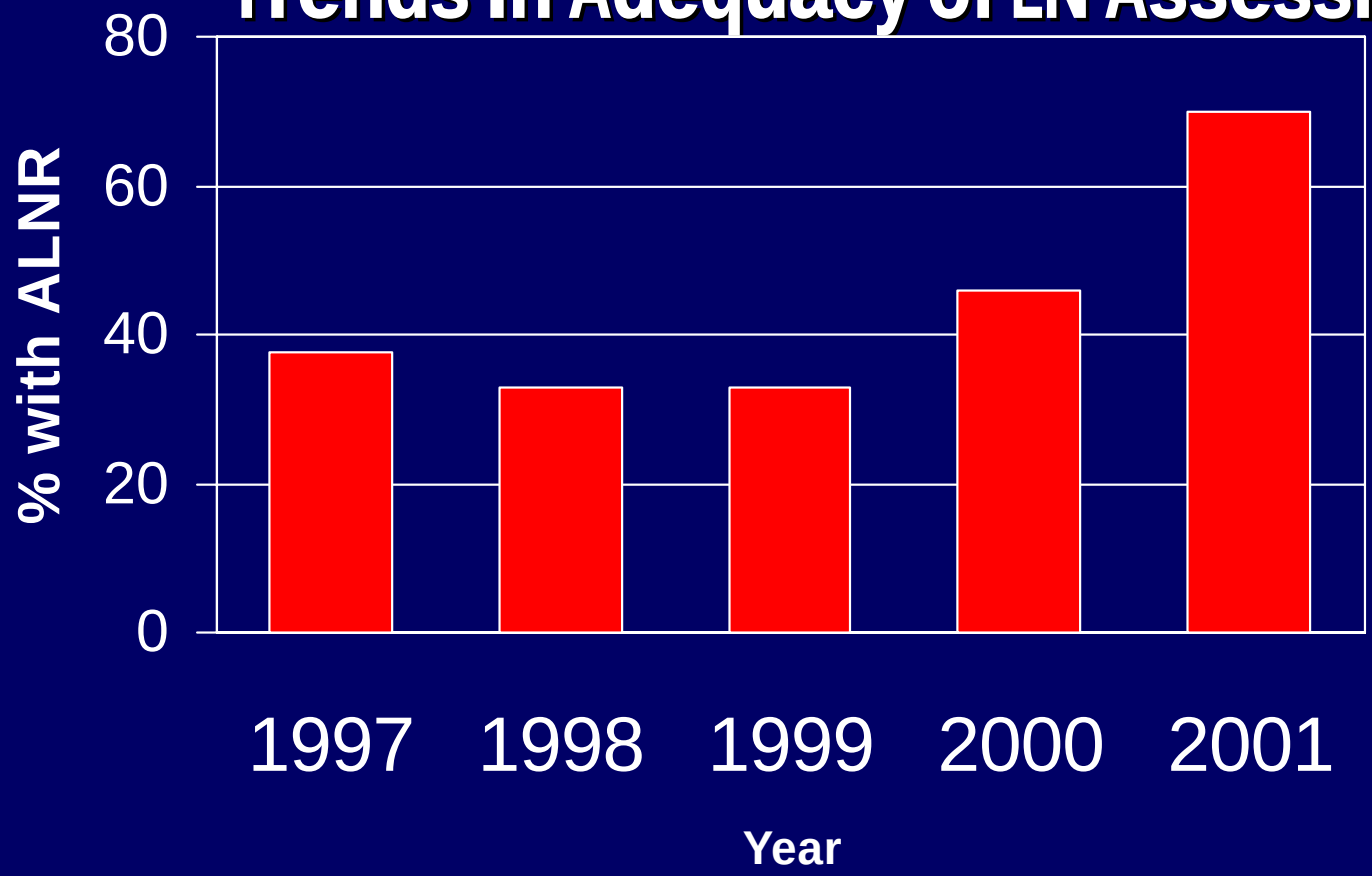


Factors Predictive of Survival- SEER Region



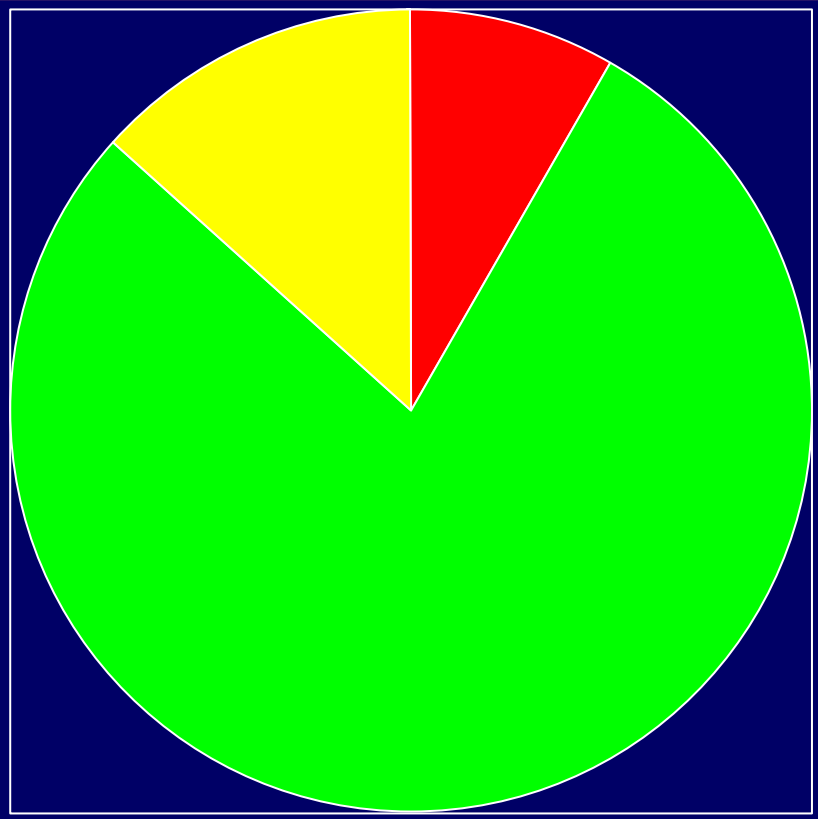
How can we improve?

Mount Sinai Hospital, Toronto
Trends in Adequacy of LN Assessment



Gupta, Haddad, Bacani, O'Brien, Pollett, Gallinger, Swallow, CSSO 2005

Extent of LND reported by Ontario general surgeons



Helyer, Coburn, O'Brien, Swallow, ASCO 2006
Helyer et al, Gastric Cancer 2007: 10 (4): pp 205-14

The Question of Quality: What do Ontario surgeons strive for?

- n=206 who perform gastric surgery
- # nodes desired
  - mean = 11
  - median = 10 (2-30)

Helyer, Coburn, O'Brien, Swallow, ASCO 2006
Helyer et al, Gastric Cancer 2007: 10 (4): pp 205-14

Overcoming Barriers to Improving the Quality of Gastric Cancer Management

What Can We Do?

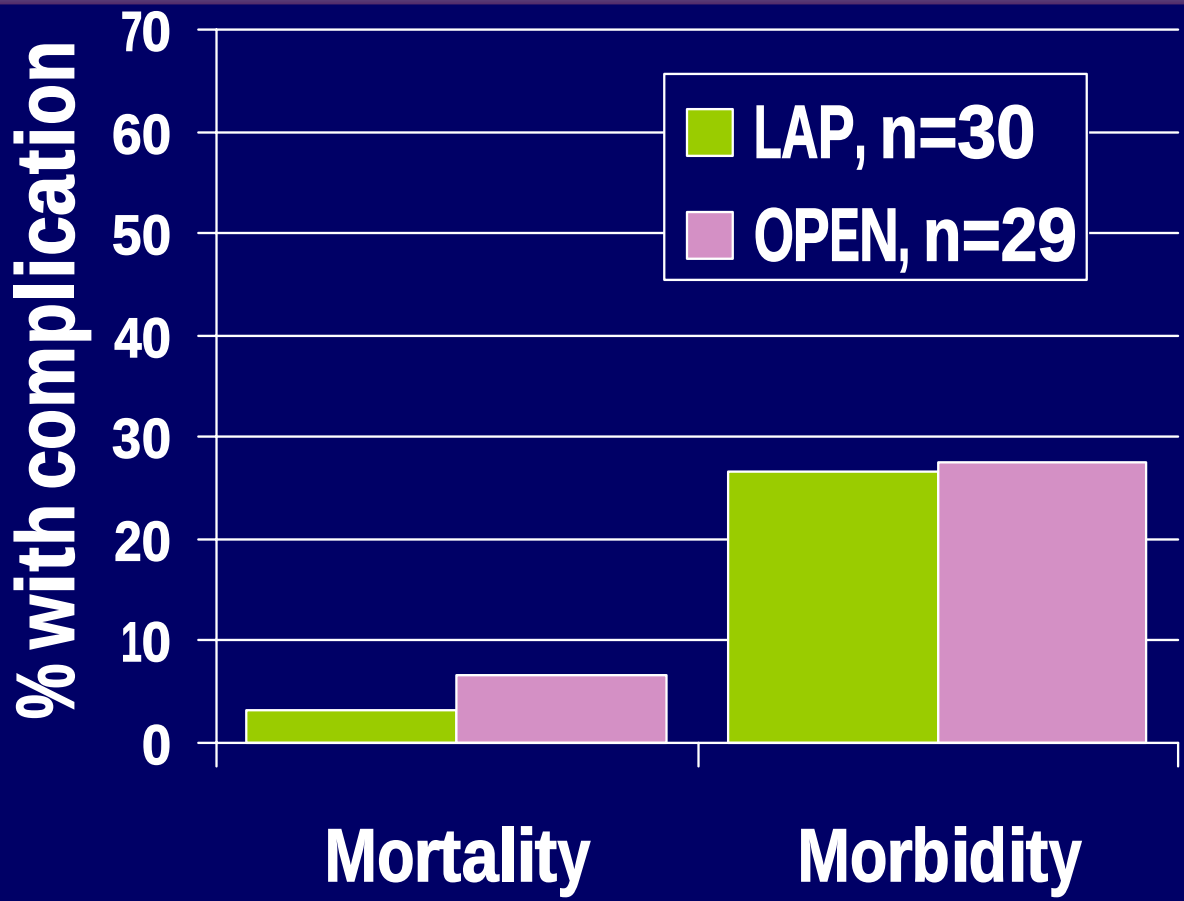
- Improving gastric cancer survival: Development and measurement of quality indicators using the RAND/UCLA Appropriateness Method and population-based data analysis
  - (Coburn et al., Toronto Gastric Cancer Study Group)
- 1) Extensive literature review
-

2) Expert Panel

a) paper questionnaire regarding appropriateness (2009)
b) panel meets in Toronto to discuss disagreements (2010)

3) Provincial chart review of 2000 cases to determine how often 'appropriate' care was given, and did this affect outcome?

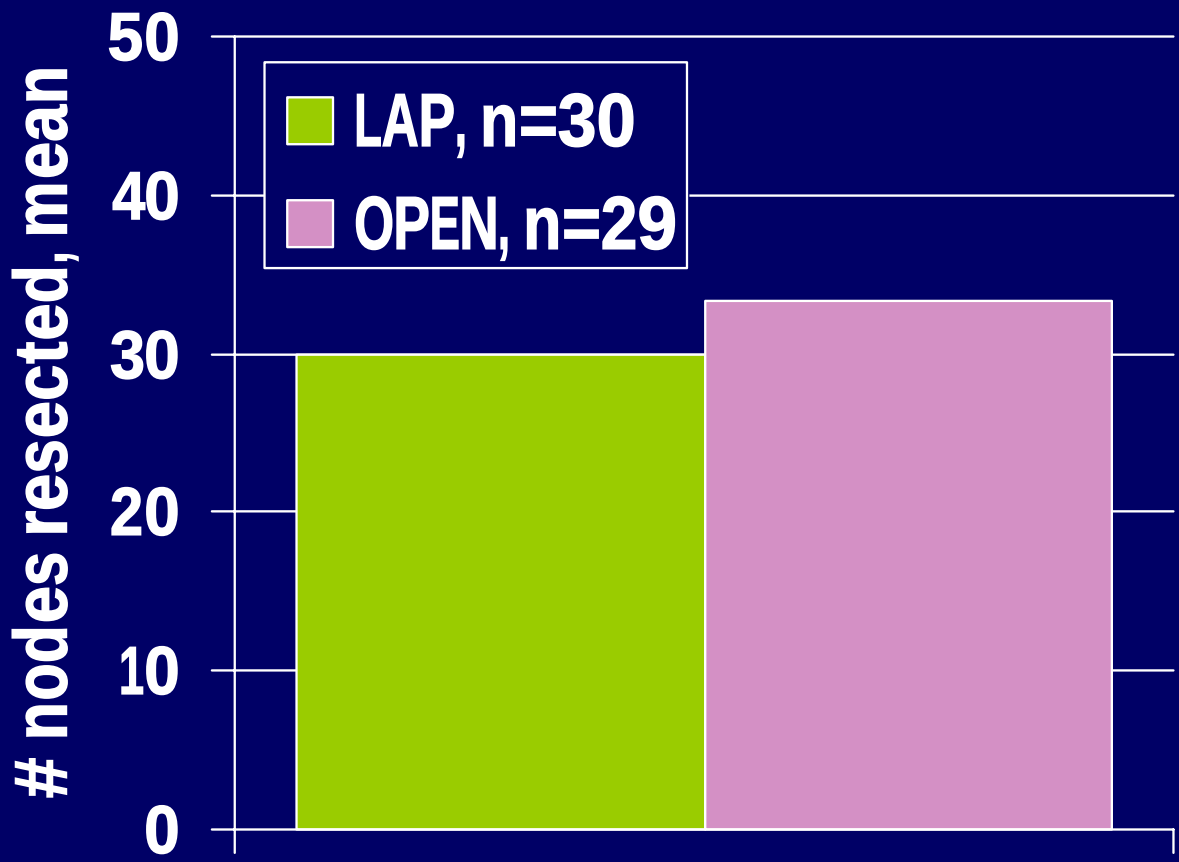
Laparoscopic vs Open Gastrectomy: RCT



STG for distal cancer

Huscher, Ann Surg 2005; 241:232

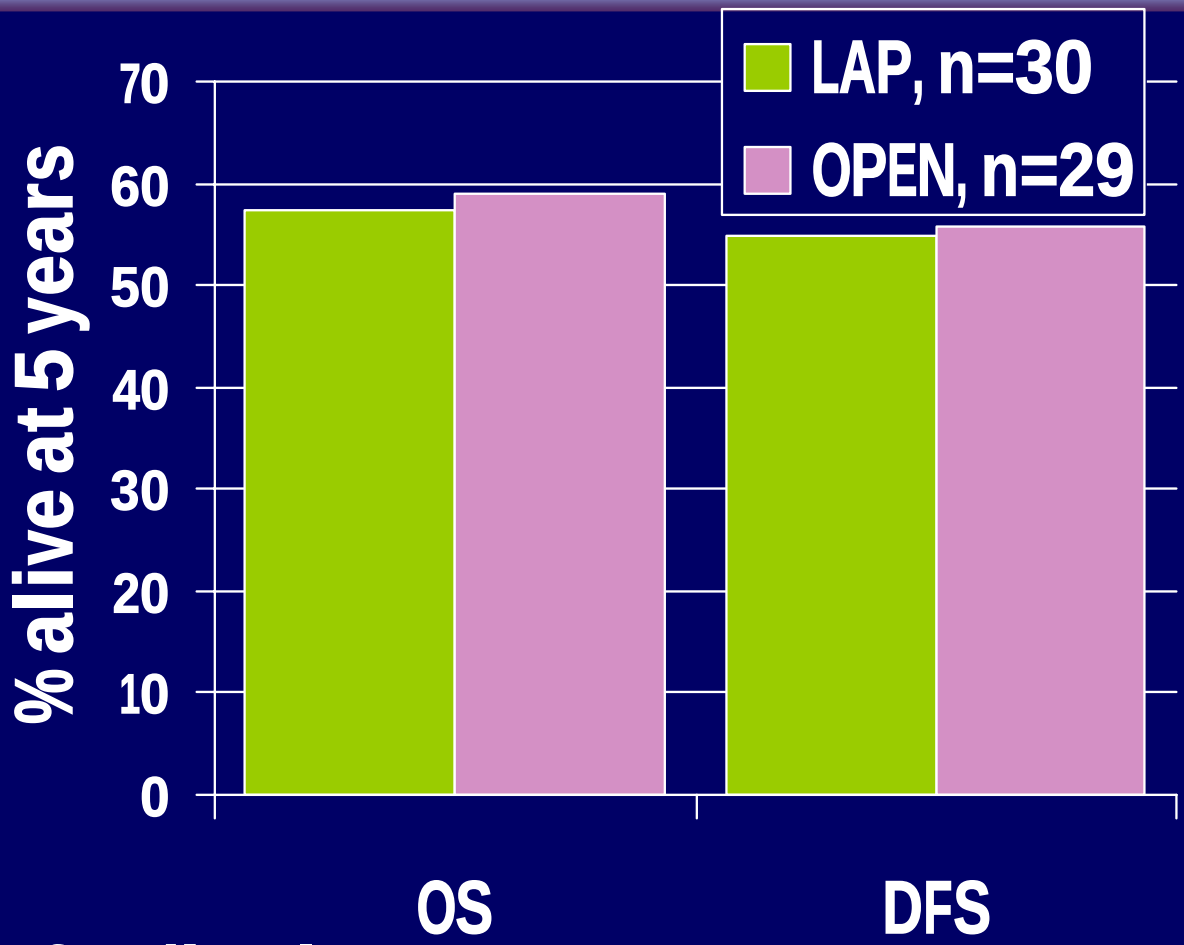
Laparoscopic vs Open Gastrectomy: RCT



STG for distal cancer

Huscher, Ann Surg 2005; 241:232

Laparoscopic vs Open Gastrectomy: RCT



STG for distal cancer

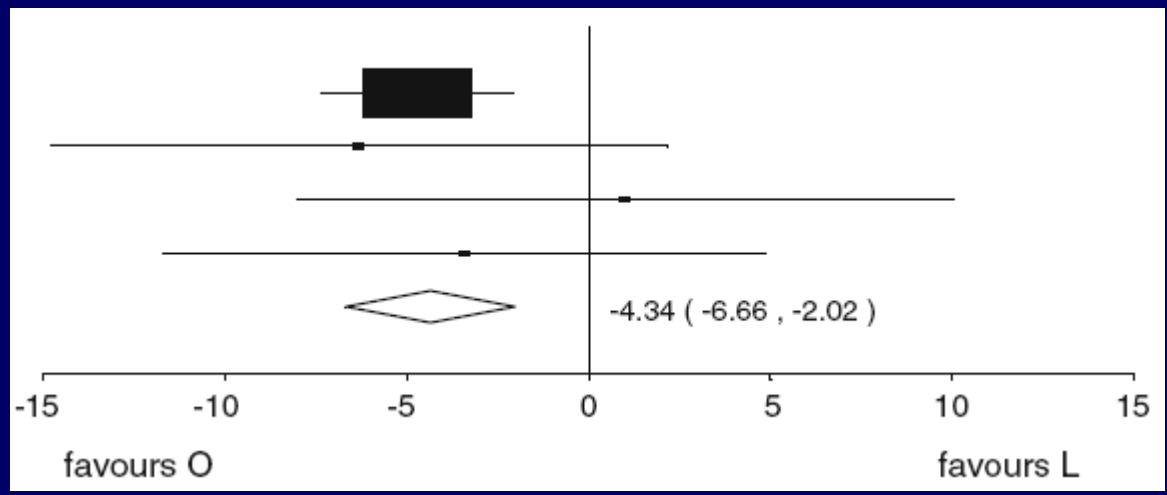
Huscher, Ann Surg 2005; 241:232

Laparoscopic vs Open Gastrectomy: Meta-analysis of 4 RCTs

STG for distal cancer

Mean of lymph nodes harvested (standard deviation)

Authors	*Pt*	*LADG*	*Pt*	*ODG*	*MD (95% c.i.)*	*weight*
Kitano et al	14	20.2(3.6)	14	24.9 (3.5)	-4.7(-7.33, -2.07)	0.78
Lee et al	24	31.8(13.5)	23	38.1(15.9)	-6.3(-14.75,2.15)	0.08
Hayashi et al	14	28(14)	14	27(10)	1(-8.01,10.01)	0.07
Huscher et al	30	30(14.9)	29	33.4(17.4)	-3.4(-11.68,4.88)	0.08
Pooled	82	28.51(171.11)	80	32.14 (203.93)	-4.3(-6.66, -2.02)*	1

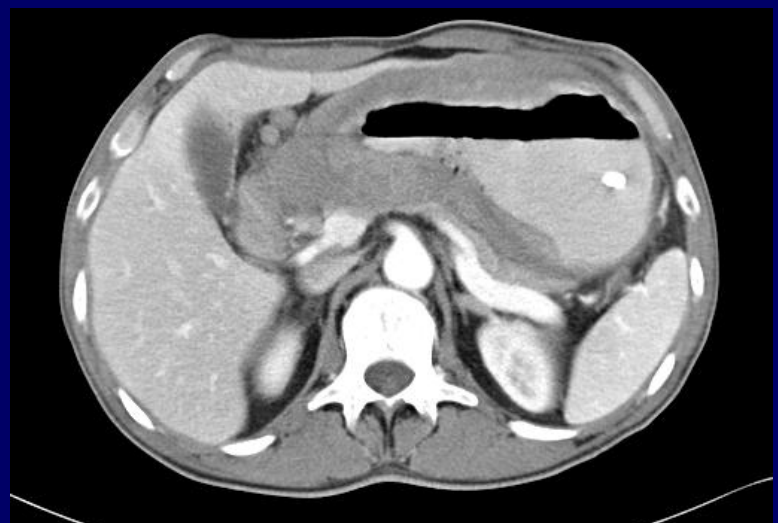


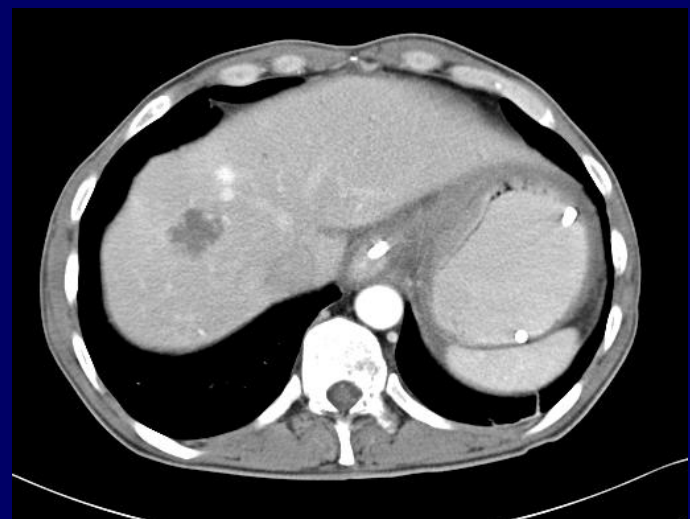
Memon et al., Surgical Endoscopy 2008, 22:1781

Issue #5: Management of Advanced GC

"Palliative" Gastrectomy

- conventional wisdom: better quality of life with resection
- institutional series: longer survival in patients who underwent resection vs. those who did not
- NB: alternative modalities of palliation





- 211 consec patients with gastric adenoca, 2001-2004, Leeds, UK
- 208 had CT; 57 had laparoscopy
- 67 synchronous M1 disease; 45 on CT, 16 at laparoscopy, 6 other
- 63 treated nonoperatively; info avail on 55

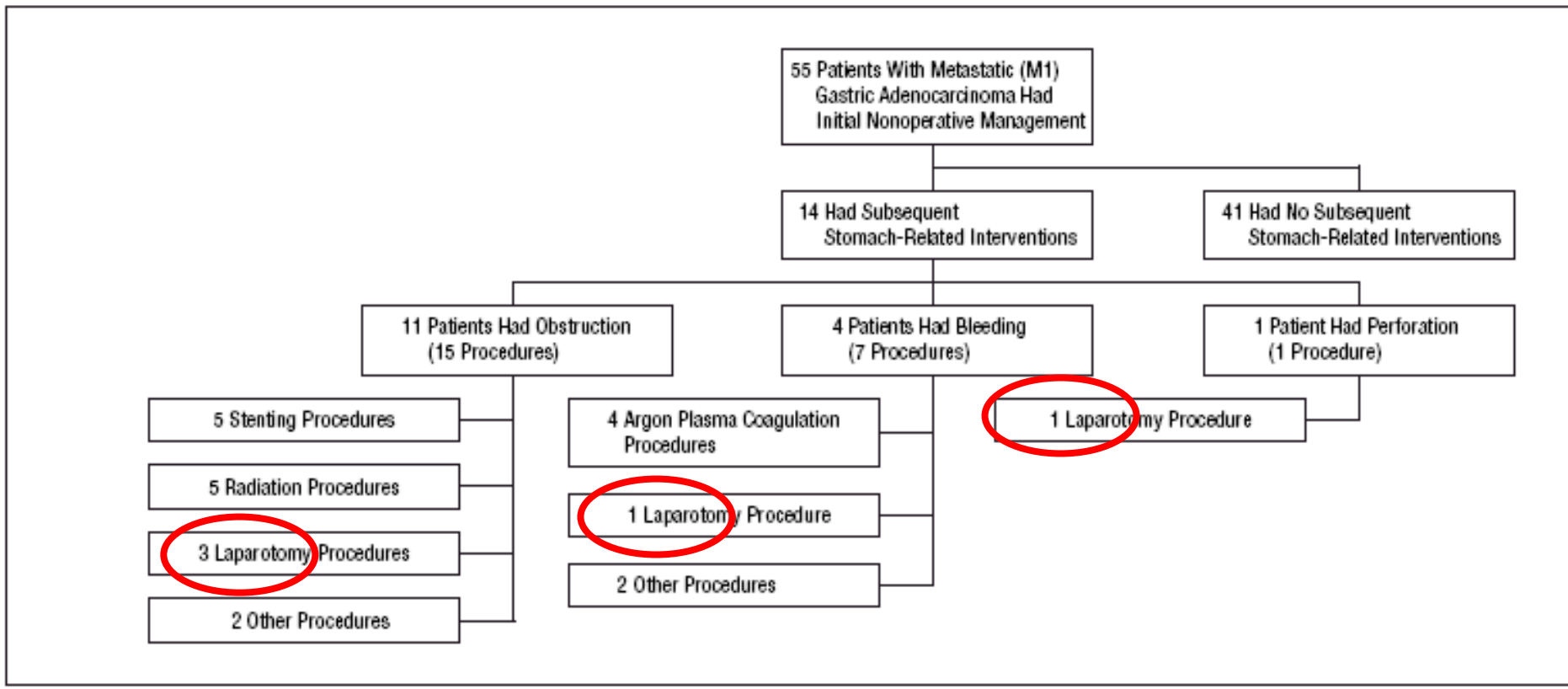


Figure 2. Palliative interventions for symptoms related to an unresected primary tumor in patients with M1 gastric adenocarcinoma.

Sarela et al., Arch Surg 2007; 142:143-9

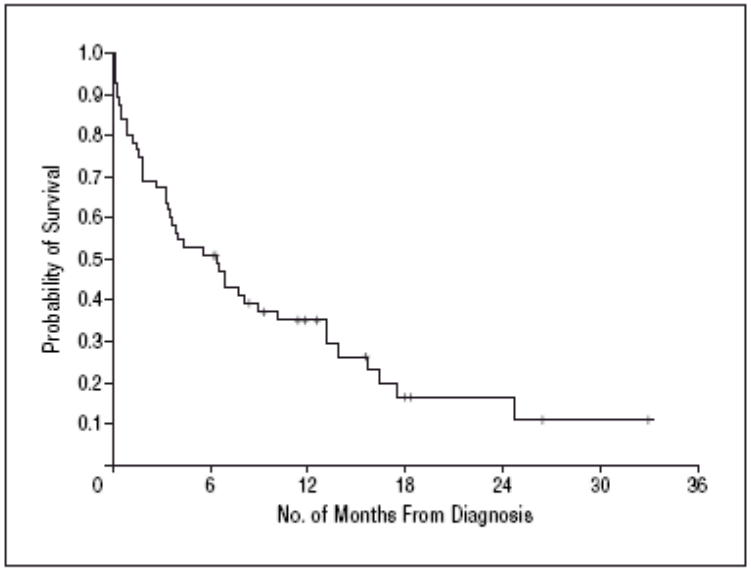


Figure 3. Kaplan-Meier analysis of survival for 55 patients with synchronously metastatic adenocarcinoma of the stomach or gastroesophageal junction and an unresected primary tumor (median survival, 7 months; 1-year actuarial survival, 35%).

Noncurative gastrectomy was asst'd with:

mortality of 6%,

morbidity of 50%

benefit in <50%

(Miner et al, JACS 2004; 198:1013)

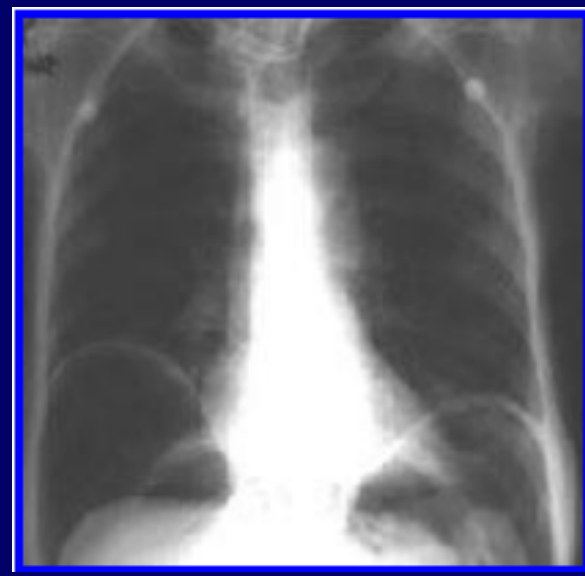
Table. Survival Characteristics and Prognostic Variables for M1 Gastric Adenocarcinoma

				Univariate Analysis		Multivariate Analysis	
Variable	Category	1-Year Survival, %	Median Survival, mo	HR (95% CI)	*P* Value	HR (95% CI)	*P* Value
Age	NA	NA	NA	1.0 (0.9-1.0)	.24	NA	NA
ECOG FPS	0 or 1 vs 2 or 3	46 vs 11	9 vs 2	2.8 (1.5-5.4)	.002	0.7 (0.3-1.8)	.50
Histologic grade	Other vs poor	48 vs 26	9 vs 4	2.0 (1.0-3.9)	.04	1.2 (0.6-2.4)	.70
Pattern of metastasis	Nonperitoneal vs peritoneal	58 vs 28	16 vs 4	3.1 (1.2-8.0)	.02	2.3 (0.9-6.3)	.09
Stomach-related intervention	No vs yes	49 vs 30	9 vs 4	0.9 (0.5-1.8)	.80	NA	NA
Chemotherapy	Yes vs no	52 vs 0	13 vs 1	15.7 (6.5-38.0)	<.001	15.6 (6.5-38.0)	<.001

Sarela et al., Arch Surg 2007; 142:143-9

Perf'd Gastric Cancer

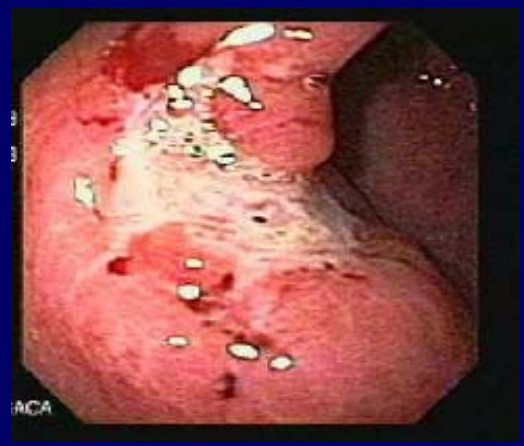
- ≈1/3 known to have cancer prior to presentation with perf
- ≈50% in antrum
- ≈50% have obvious distant mets at laparotomy



So et al., Br J Surg 2000; 87:1702.
Kasakura et al., Am Surg 2002; 68:434
Lehnert et al., Eur J Surg Oncol 2000;26:780.
Gertsch et al., Arch Surg 1995; 130:177.

Perf'd Gastric Ulcers: Words to the Wise

- ≈10% grossly c/w benign were malignant on final path
- just think about it
- biopsy
- Follow-up endoscopy!

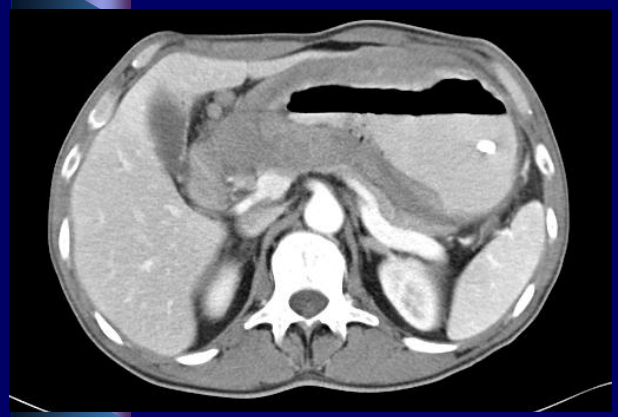


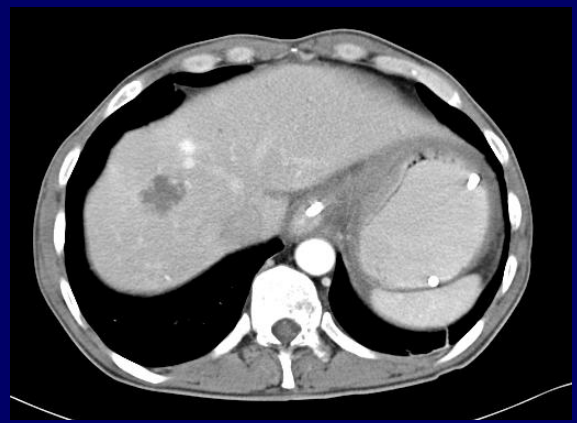
So et al., Br J Surg 2000; 87:1702.
Kasakura et al., Am Surg 2002; 68:434
Lehnert et al., Eur J Surg Oncol 2000;26:780.
Gertsch et al., Arch Surg 1995; 130:177.

Now, Later or Never?

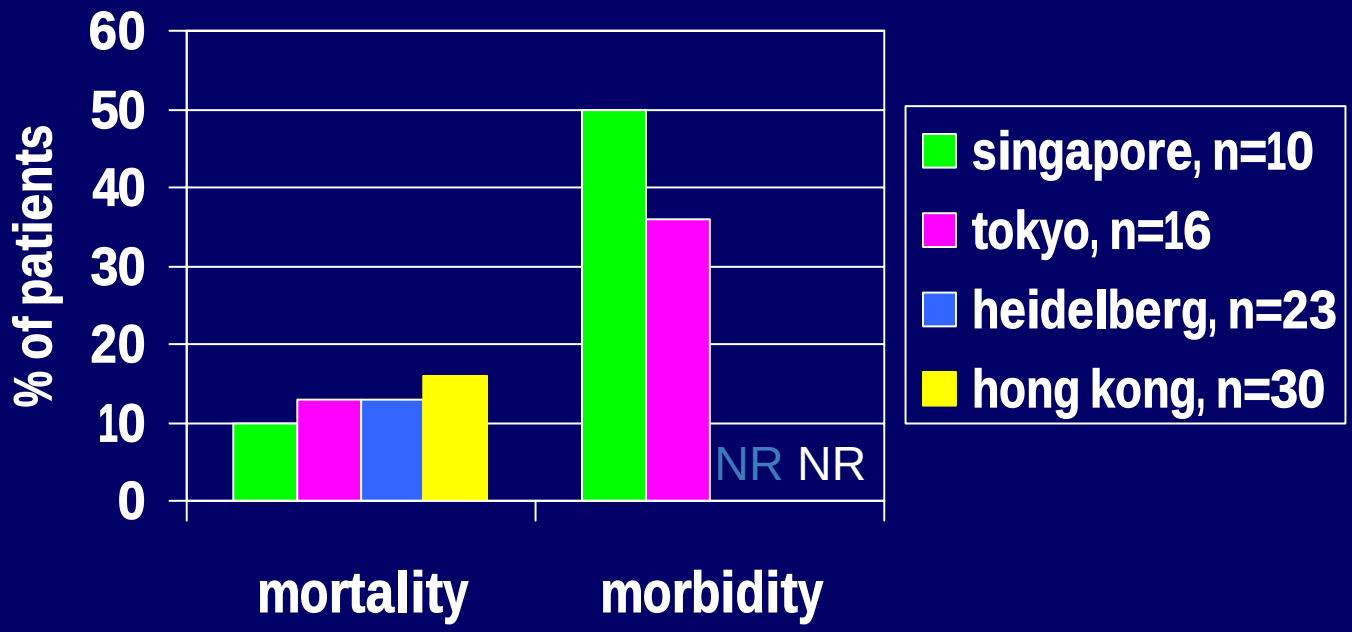
The Surgeon's Dilemma

- diagnosis unproven
- stage unknown
- survival from perf/peritonitis uncertain
- delayed relap (2 stage): adhesions, delay





Gastrectomy for Perf'd Gastric Cancer: Mortality and Morbidity



So et al., Br J Surg 2000; 87:1702.
Kasakura et al., Am Surg 2002; 68:434

Lehnert et al., Eur J Surg Oncol 2000;26:780.
Gertsch et al., Arch Surg 1995; 130:177.

Management of perforated gastric carcinoma: A report of 16 cases and review ...
Yuichi Kasakura; Jaffer A Ajani; Masashi Fujii; Fumiro Mochizuki; Tadatoshi T...
The American Surgeon; May 2002; 68, 5; Research Library
pg. 434

Tokyo

Stage 1 n=3
Stage 2 n=1
Stage 3 n=3
Stage 4 n=8

R0 resection n=4
R2 resection n=10
no resection n=2

TABLE 3. *Long-Term Survival Times*

	No. of Cases	Median Survival Time, Range (Months)	*P* Value
Stage			
I plus II	4	75.2, 13.1–210.1	0.0108
III plus IV	10	4.8, 2.1–38.0*	
Curability			
R_0	4	75.2, 38.2–210.1	0.0018
R_1 or R_2	10	4.8, 2.1–14.7*	

* Except for two cases of operation-related death.

Review of Japanese literature of perf'd GC

total n=128
R0 n=62
5 yr OS R0 74%
5 yr OS R1/R2 7.5%

Adachi et al . 1997

Perf'd Gastric Ulcers: Is there a "standard" management?

Historical Perspective

pre 1950s - Oversew/Patch/Excise ± V&P

- High postop M&M
- High recurrence rate

1950s to 1980s - RESECT

- 20% mortality
- functional sequelae

present - Oversew/Patch/Excise

Quality in Management of Gastric Cancer

Summary

- **Goals in the resection of localized disease**
  - R0 resection
  - accurate staging
  - STG > TG
  - D1+ dissection
  - consider adjuvant treatment stage 1B – IV, M0

- **Goals in the treatment of incurable disease**
  - symptom control
  - strongly consider non-operative approaches

THE HOT QUESTION OF TODAY:
What is the role of postoperative adjuvant chemoradiation with D2 dissection?

Korean Protocol: D2

- 5 cycles 5-FU and leucovorin
- 45 Gy RT concurrent from 2nd cycle
- n=291, median f/u 48 mos.
- in-field recurrence rate= 16% (1/3 of all recurrences) Br J Cancer 2004; 91: 11

Loading...

STOMACH CANCER

SUMMARY

> Cancer of the stomach is amongst the most common malignancies worldwide, with some 870,000 new cases every year. Mortality from stomach cancer is second only to lung cancer.

> Incidence is declining worldwide. In most European countries it has fallen by more than 60% during the past 50 years. This trend is mainly due to markedly decreased consumption of salt-preserved food, increasing avoidance of a high-salt diet and availability, in many countries, of fresh fruit and vegetables throughout the year.

> Infection with *Helicobacter pylori* causes chronic atrophic gastritis and is considered a factor in the development of stomach cancer.

> Patients are often diagnosed with advanced disease and five-year survival rates are poor, usually less than 30%.

Fig. 5.23 Global incidence of stomach cancer in men; the highest rates occur in Eastern Asia, South America and Eastern Europe.

Definition

The vast majority of stomach cancer cases are gastric carcinomas. Non-epithelial tumours predominantly include lymphomas and mesenchymal tumours.

Epidemiology

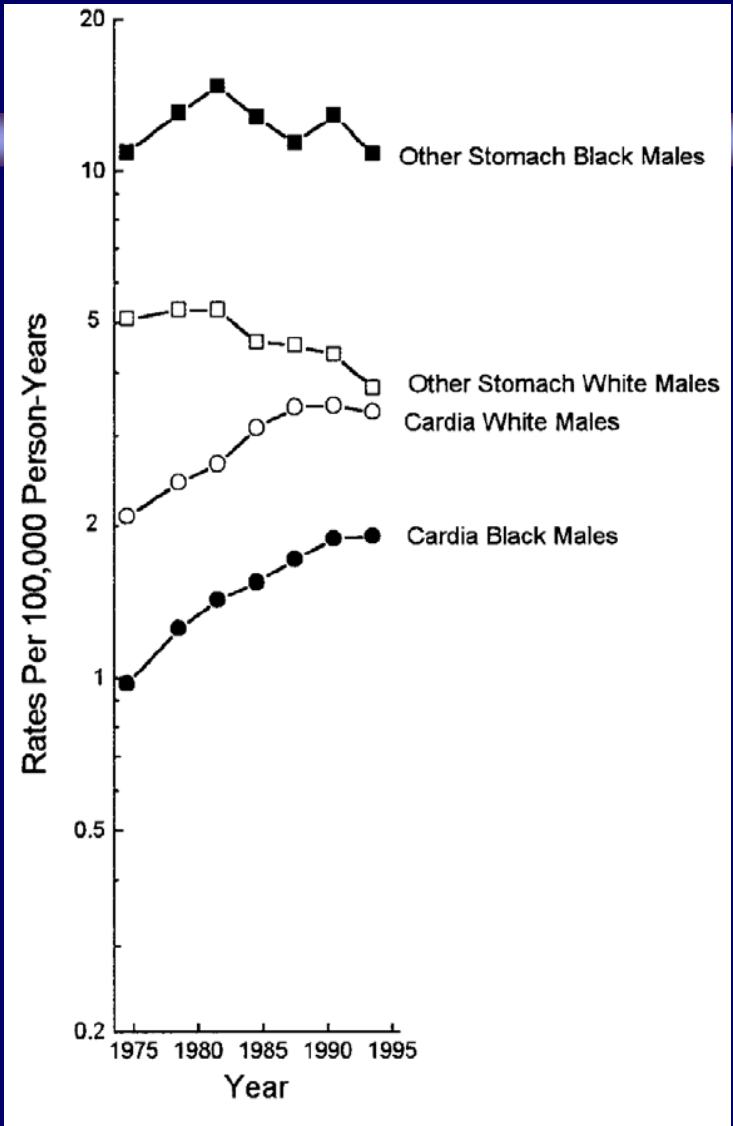
Stomach cancer was the fourth most common malignancy in the world in 2000, with an estimated 870,000 new cases and 650,000 deaths per year [1]. Approximately 60% of all stomach cancers occur in developing countries (Fig. 5.23). The areas with the highest incidence rates (>40/100,000 in males) are in Eastern Asia, the Andean regions of South America and Eastern Europe. Low rates (< 15/100,000) occur in North America, Northern Europe and most countries in Africa and in South Eastern Asia. There is marked geographical variation in incidence between countries and among different ethnic groups within the same locale. Migration studies show that the risk of cancer changes within two generations when people move from high-incidence to low-incidence areas. For example, Japanese immigrants to the USA retain their original risk of stomach cancer, whereas subsequent generations show the incidence of the host country. Incidence in men is twice that in women in both high- and low-risk countries.

The well-differentiated type of adenocarcinoma (which is showing the greatest decrease in incidence) occurs more predominantly in high-risk areas, while the diffuse poorly-differentiated type is relatively more frequent in low-risk areas [2]. In contrast to the overall decreasing trend, there has been an increase of cancers localized to the cardia, documented by data from the UK and USA. The reasons for this increase are not known. Over the last few decades, a steady decline in the incidence and mortality rates of gastric carcinoma has been observed worldwide and in particular in North America and Western Europe (Fig. 5.24 and *Stomach cancer prevention and screening*, p175). However, the absolute number of new cases per year is increasing mainly because of ageing of the population. Gastric carcinoma is extremely rare below age 30; thereafter incidence increases rapidly and steadily to reach the highest rates in the oldest age groups in both sexes.

Etiology

Dietary risk factors include inadequate intake of fresh fruits and vegetables, high salt intake and consumption of smoked or cured meats or fish. There is good evidence that refrigeration of food also protects against this cancer by facilitating year-round consumption of fruit and vegetables and probably by reducing the need for salt as a preservative. Vitamin C, contained in vegetables and fruits and other foods of plant origin, is probably protective, and so too are diets high in wholegrain cereals, carotenoids and allium compounds, and also green tea. Conversely,

Gastric Cancer
Trends in Incidence and Mortality



Susan S. Devesa, Ph.D.[1]
William J. Blot, Ph.D.[2]
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[1] Division of Cancer Epidemiology and Genetics, National Cancer Institute, Bethesda, Maryland.

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Cancer 1998; 83:2049-53
U.S.A. figures from SEER

GE Junction Cancers

- Increasingly common in North America
- Extensive preop staging required (including PET)
- Consider preop chemo ±RT (T3/T4)
- Tailored procedure based on level and T stage

Siewert Classification of GE Junction Cancers

- **Type I:** adenocarcinoma of the distal esophagus, which usually arises from an area with specialized intestinal metaplasia of the esophagus (i.e., Barrett esophagus) and may infiltrate the esophagogastric junction from above;
- **Type II:** true carcinoma of the cardia arising immediately at the esophagogastric junction;
- **Type III:** subcardial gastric carcinoma that infiltrates the esophagogastric junction and distal esophagus from below.

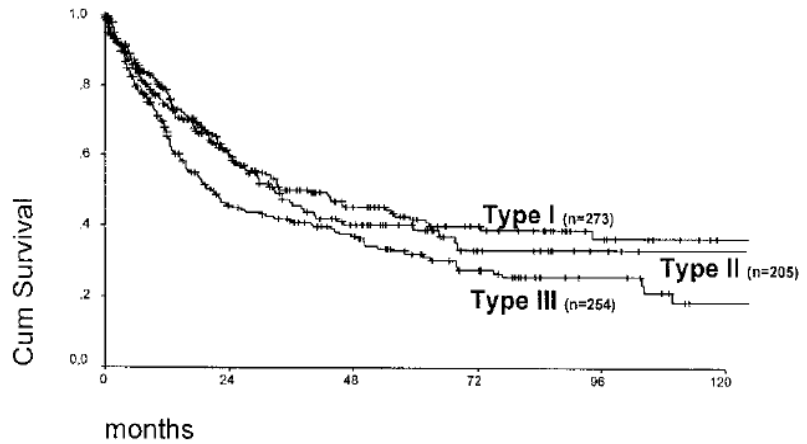
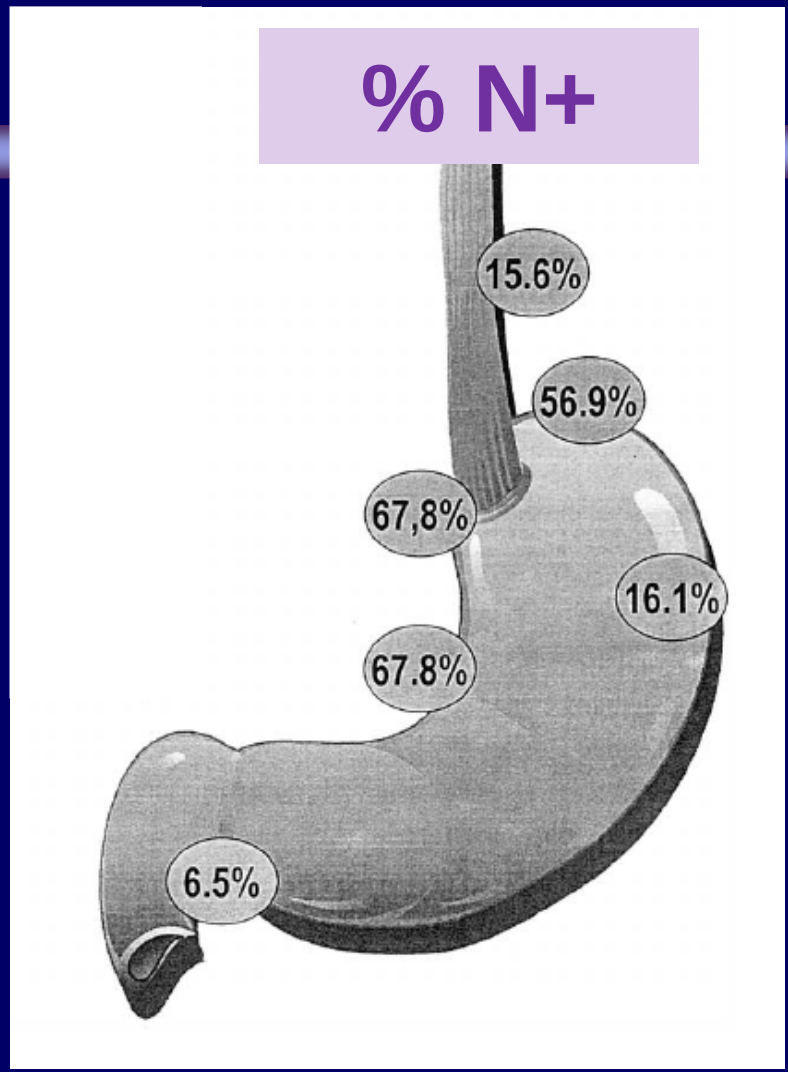


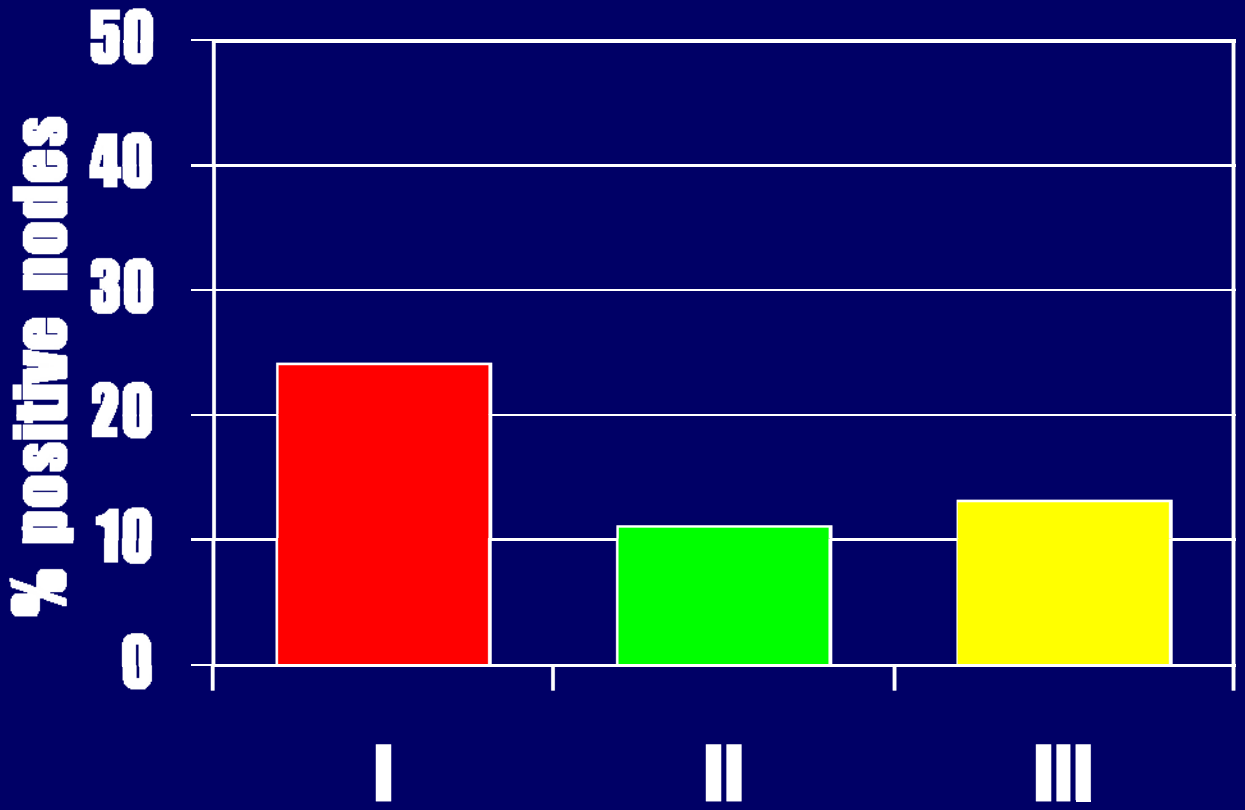
Figure 2. The 10-year survival rates of patients with R0-resected (no residual macroscopic or microscopic tumor) adenocarcinoma of the distal esophagus (type I tumors), true carcinoma of the cardia (type II tumors), and subcardial gastric cancer infiltrating the esophagogastric junction (type III tumors). Type I vs. type III, $P < .01$; type II vs. type III, $P < .05$; type I vs. type II, not significant.



GE Junction Cancers

Incidence of Lower Mediastinal Nodal Involvement

Honig et al., Hepatogastroenterology 2002 ; 49: 419



N=50 specimens
N=1730 nodes

GE Junction Cancers

- **Type I:** adenocarcinoma of the distal esophagus, which usually arises from an area with specialized intestinal metaplasia of the esophagus (i.e., Barrett esophagus) and may infiltrate the esophagogastric junction from above;
- **Type II:** true carcinoma of the cardia arising immediately at the esophagogastric junction;
- **Type III:** subcardial gastric carcinoma that infiltrates the esophagogastric junction and distal esophagus from below.

Level	In Germany	In Japan
I	Transmed esophagectomy, Lower med LND, celiac axis LND	Upper med LND, resection of cardia and lower esophagus, D2
II, T1	Extended TG + transhiatal resection distal esophagus , D2	resection of cardia and lower esophagus, D2
II, T2,3,4	Extended TG + transhiatal resection distal esophagus , D2	Extended TG, D2
III	Extended TG + transhiatal resection distal esophagus , D2	Extended TG, D2

GE Junction Cancers
Evidence for Neoadjuvant Treatment

Table 3. Phase III trials of chemotherapy and surgery for resectable esophageal and gastric carcinomas including gastroesophageal junction cancers

Trial	N	Site	Histology	GEJ	CT regimen	Curative resection		OS		
						S	CS	S	CS	Yrs
Intergroup 0113[22]	440	E	SCC 46% ADC 54%	NR	CF: preop × 3, postop × 2	59%	62%	26%	23%	3
MRC[23,24]	802	E	SCC 31% ADC 66%	10%*	CF: preop × 2	54%		17% 60%†	23%†	5
FFCD 9703[25]	224	E/G	ADC 100%	64%*	CF: preop x 2-3	NR	NR	24%	38%†	5
MAGIC[28]	503	G	ADC100%	12%	ECF: preop × 3, postop × 3	66%	69%	23%	36%†	5

Gastrointest Cancer Res 2:235–243. ©2008

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