

# Gastric neoplasm

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# Gastric adenocarcinoma

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Gastric cancer is one of the most common causes of cancer death in the world.

Its prognosis tends to be poor, with cure rates little better than 5–10%, although better results are obtained in Japan, where the disease is common.

Early diagnosis is therefore the key to success with this disease

# Incidence

- There are marked variations in the incidence of gastric cancer worldwide.
- In Japan, the disease is much more common, with an incidence of approximately 70 per 100 000 per year
- In general, men are more affected by the disease than women
- The incidence increases with age.

# Statistical fact

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- Increase in the incidence of carcinoma in the proximal stomach, particularly the esophagogastric junction.
- Carcinoma of the distal stomach and body of the stomach is most common in low socioeconomic groups, whereas the increase in proximal gastric cancer seems to affect principally higher socioeconomic groups.
- Proximal gastric cancer does not seem to be associated with *H. pylori* infection, in contrast with carcinoma of the body and distal stomach.

# Etiology

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- Gastric cancer is a multifactorial disease.
  - *H. pylori*
    - principally associated with carcinoma of the body, stomach and distal stomach rather than the proximal stomach.
    - gastritis, gastric atrophy and intestinal metaplasia,

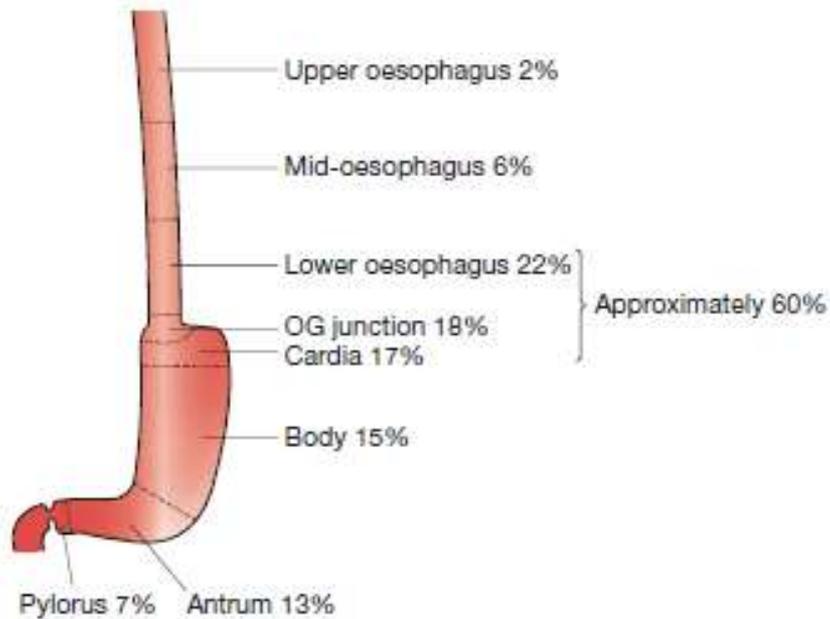
# Etiology.. Cont.

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- pernicious anemia
  - gastric atrophy
  - gastric polyps
- Peptic ulcer surgery( 4x)
- duodenogastric reflux and reflux gastritis
  - cigarette smoking
    - Diet
- Proximal type ( obesity , high socioeconomic status )

# Clinical features

- Nonspecific signs and symptoms
- Abdominal pain
- Unexplained weight loss,
- Nausea, vomiting, anorexia,
- Early satiety, and fatigue.
- Dysphagia (proximal ) and GOO( distal )
- Bleeding
- Enlarged supraclavicular nodes (Virchow node) and infiltration of the umbilicus (Sister Mary Joseph's node) represent metastatic and incurable disease.
- Others ( jaundice , Ascites , palpable liver )



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- The proximal stomach is now the most common site for gastric cancer in resource-rich western countries.

# Clinicopathological classification

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- Lauren classification
- Bormann classification

## Lauren classification

### 1. Intestinal gastric cancer

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Forms polypoid tumours or ulcers.

It probably arises in areas of intestinal metaplasia

Arise from the gastric mucosa.

Distal stomach

Associated with *H. pylori*

Hematogenous metastatic spread

## Lauren classification

### 2. diffuse gastric cancer (often with signet ring cells).

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Most common type

Infiltrates deeply into the stomach without forming obvious mass lesions, but spreads widely in the gastric wall

Transmural and lymphatic spread

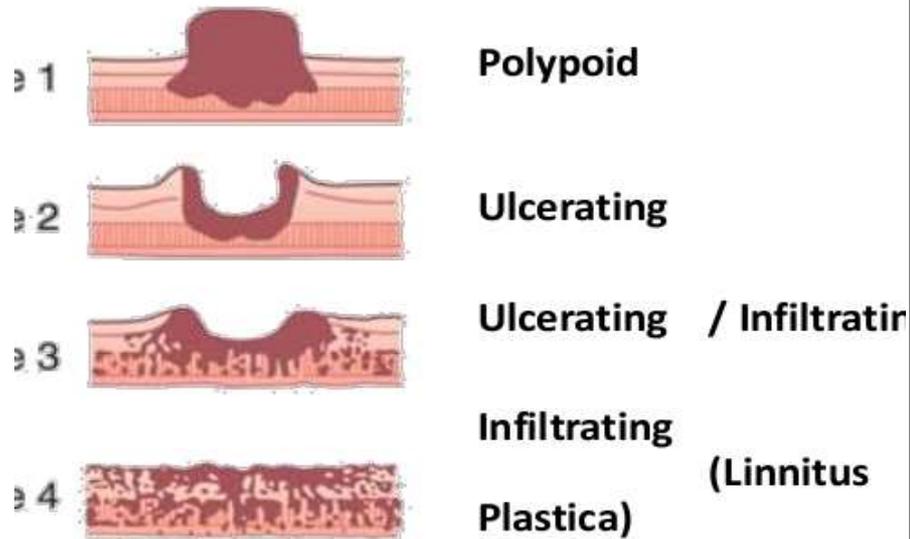
Arise from the lamina propria

Much worse prognosis

Young female

proximal stomach.

## Bormann Classification



## Bormann classification

- Its macroscopic appearances have been classified by into four types
- Types III and IV are commonly incurable

# Diagnosis

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- Double-contrast upper GI barium contrast studies
- EGD with tissue biopsy
- CT scan ( for staging )
- **Positron emission tomography (PET)/CT**
- **EUS**
- **Laparoscopic staging**

# Endoscopic appearance

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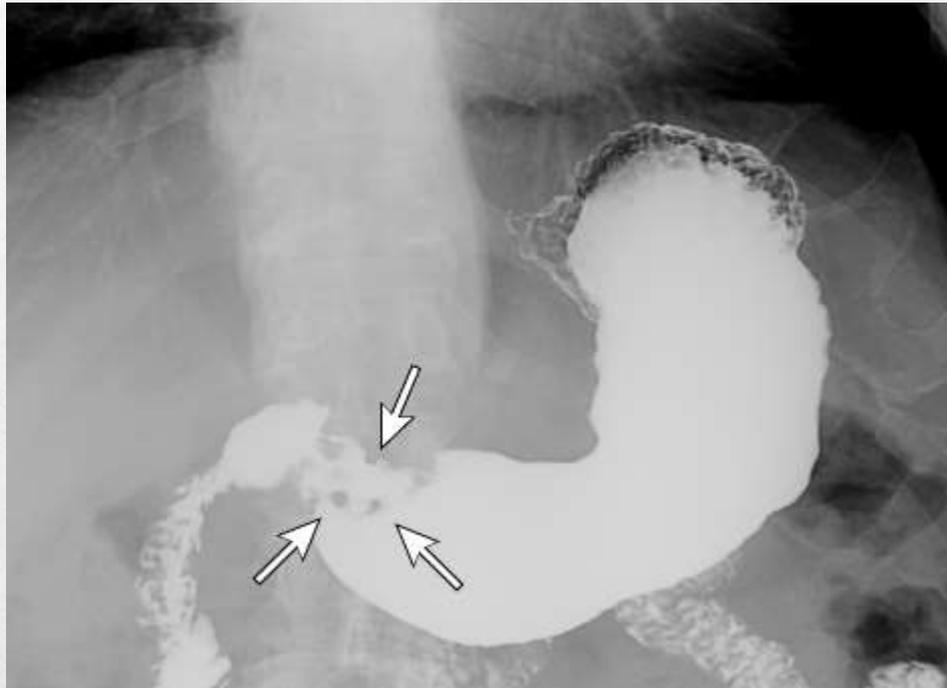
**A**



**B**

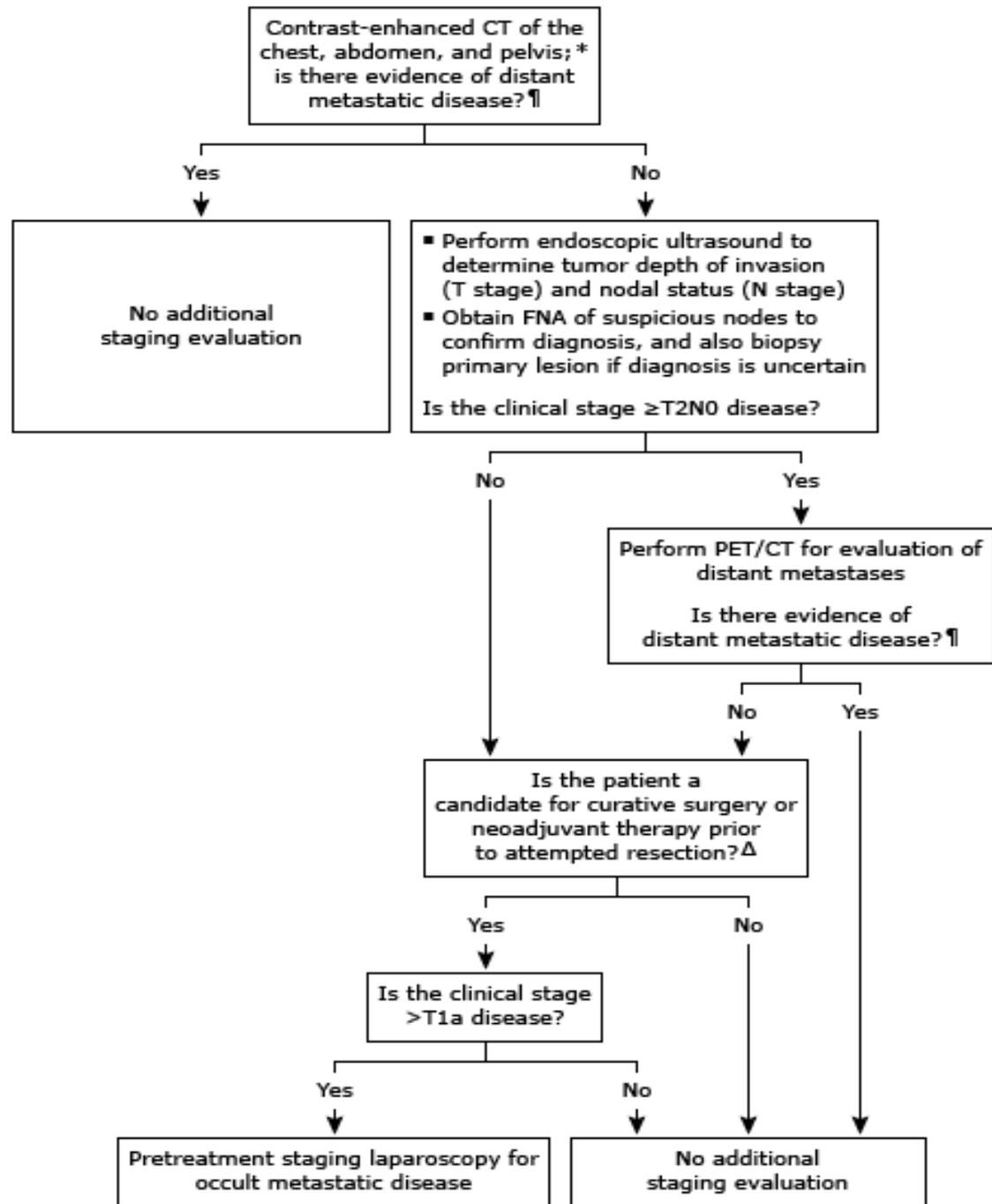
# Barium contrast study

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# STAGING

- Suggested approach to staging evaluation in patients with gastric cancer



# CT scan

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- Computed tomography (CT) with oral and IV contrast scans of the chest, abdomen, and pelvis are indicated in all patients with histological confirmed or suspected gastric cancer to evaluate for metastatic disease (M stage).
- Peritoneal metastases and hematogenous metastases smaller than 5 mm are frequently missed by CT
- CT accurately assesses the T stage of the primary tumor in only approximately 50 to 70 percent of cases

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- **Endoscopic ultrasound** — EUS is the most reliable nonsurgical method available for evaluating the depth of invasion of primary gastric cancers.
  - FDG-PET is more sensitive than CT for the detection of distant metastases
  - **Staging laparoscopy** — Our practice is to use pretreatment staging laparoscopy to detect occult peritoneal dissemination in any medically fit patient who appears to have more than a T1a lesion on EUS, who has no histologic confirmation of stage IV disease, and who would not otherwise require palliative gastrectomy because of symptoms.

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- Serologic markers — Serum tumor markers (including CEA and CA 125) are of limited utility in selected patients. Low rates of sensitivity and specificity prevent the use of any of these serologic markers as diagnostic tests for gastric cancer.
  - **Alpha-fetoprotein** : AFP-producing gastric cancers
  - AFP-producing gastric cancers are aggressive and associated with a poor prognosis.

# TNM

Regional lymph nodes (N)		Primary tumor (T)	
N category	N criteria	T category	T criteria
NX	Regional lymph node(s) cannot be assessed	TX	Primary tumor cannot be assessed
N0	No regional lymph node metastasis	T0	No evidence of primary tumor
N1	Metastases in 1 or 2 regional lymph nodes	Tis	Carcinoma <i>in situ</i> : Intraepithelial tumor without invasion of the lamina propria, high-grade dysplasia
N2	Metastases in 3 to 6 regional lymph nodes	T1	Tumor invades the lamina propria, muscularis mucosae, or submucosa
N3	Metastases in 7 or more regional lymph nodes	T1a	Tumor invades the lamina propria or muscularis mucosae
N3a	Metastases in 7 to 15 regional lymph nodes	T1b	Tumor invades the submucosa
N3b	Metastases in 16 or more regional lymph nodes	T2	Tumor invades the muscularis propria*
<b>Distant metastasis (M)</b>		T3	Tumor penetrates the subserosal connective tissue without invasion of the visceral peritoneum or adjacent structures <sup>†Δ</sup>
M category	M criteria	T4	Tumor invades the serosa (visceral peritoneum) or adjacent structures <sup>†Δ</sup>
M0	No distant metastasis	T4a	Tumor invades the serosa (visceral peritoneum)
M1	Distant metastasis	T4b	Tumor invades adjacent structures/organs

# Spread of carcinoma of the stomach

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- It is important to note that this distant spread is unusual before the disease spreads locally, and distant metastases are uncommon in the absence of lymph node metastases.
- *Direct spread*
- *Lymphatic spread*
- *Blood-borne metastases*
- The most common sites of metastatic disease are the liver, the peritoneal surfaces, and the nonregional or distant lymph nodes.

## Transperitoneal spread

This is a common mode of spread once the tumour has reached the serosa of the stomach and indicates incurability.

The ovaries may sometimes be the sole site of transcoelomic spread (Krukenberg's tumours).

Tumour may spread via the abdominal cavity to the umbilicus (Sister Joseph's nodule).

Transperitoneal spread of gastric cancer can be detected most effectively by laparoscopy and cytology.

# Management

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- Complete surgical removal of a gastric cancer with resection of adjacent lymph nodes represents the best chance for long-term survival
- The only widely accepted criteria of unresectability for gastric cancer are the presence of distant metastases, invasion of a major vascular structure, such as the aorta, or disease encasement or occlusion of the hepatic artery or celiac axis/proximal splenic artery.

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- Surgery
  - total gastrectomy
  - Sub total gastrectomy
  - Palliative

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- D1/ D2 lymphadenectomy
  - D1- peri gastric LN
  - D2 : LN along the left gastric artery, common hepatic artery, celiac artery, splenic hilum, and splenic artery
  - 15 or more LN are required for proper examination

# Other treatment modalities

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- *Radiotherapy*
- The routine use of radiotherapy is controversial
- Radiotherapy has a role in the palliative treatment of painful bony metastases

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- *Chemotherapy*
  - Gastric cancer may respond well to combination cytotoxic chemotherapy and neoadjuvant chemotherapy improves the outcome following surgery.
  - Most patients therefore should have prior chemotherapy.
  - 5 years survival rate in surgically resected gastric carcinoma for stage I, II,III is 75%,50%,25% respectively

# Linitis plastica

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- 5 percent of primary gastric cancers, a broad region of the gastric wall or even the entire stomach is extensively infiltrated by malignancy, resulting in a rigid thickened stomach
- extremely poor prognosis
- all of these patients should undergo some form of preoperative therapy and diagnostic laparoscopy prior to resection to identify the subset of patients who might benefit from resection

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- the most common site of relapse following radical gastrectomy is the gastric bed, representing inadequate extirpation of the primary tumour.
  - Widespread nodal intraperitoneal metastases, distant nodal metastases and liver metastases are all common.
  - Dissemination to the lung and bones usually only occurs after liver metastases are already established.

# GASTROINTESTINAL STROMAL TUMOURS

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- 50-70% will be found in the stomach.
- They are tumors of mesenchymal origin and are observed equally commonly in males and females.
- The tumors are universally associated with a mutation in the tyrosine kinase *c-kit* oncogene
- GISTs comprise 1–3% of all gastrointestinal neoplasia

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- The biological behavior of these tumors is unpredictable but size and mitotic index are the best predictors of metastasis.
  - Peritoneal and liver metastases are most common but spread to lymph nodes is extremely rare.
  - Lymph node involvement is rare, occurring in only 0-8% of cases

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- Gastric GISTs carry a better prognosis than small bowel GISTs of similar size and mitotic rate.
  - In general, gastric GISTs portend a much better prognosis than adenocarcinoma of the stomach.

The following characteristics appear to be the most predictive of aggressive behavior in GISTs:

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- Mitotic rate greater than 5 mitoses per 50 high-power fields (HPFs)
- Size larger than 5 cm and 10 cm, which pose moderate and high malignant potential
- size > 5 cm has a metastatic potential.
- Location (small bowel GISTs of comparable size and mitotic rate are generally more aggressive than gastric GISTs)

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- Other factors found to have a negative impact on prognosis are as follows:
  - Tumor rupture during operation
  - Involvement of histologic margins
  - Lymph node involvement

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- GISTs are not associated with elevation of any serum tumor markers.
  - 70% of gastric GIST in the body
  - No laboratory test can specifically confirm or rule out the presence of a GIST.

# Investigations

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- Blood test ( CBC KFT , PT , LFT )
- Endoscopy
- EUS
- CT scan
- MRI
- PET

# CT scan

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- Essential for the diagnosis and staging of GISTs
- Provides comprehensive information regarding the size and location of the tumor and its relationship to adjacent structures
- Can also be used to detect the presence of multiple tumors and of metastatic spread

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- **MRI**

- MRI can depict tumors and yield information about surrounding structures
- Detect the presence of multiple tumors and metastases

- **PET scan**

- Detection of metastatic disease
- Monitoring of response to adjuvant therapy

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- Endoscopy

- Endoscopic features of GISTs include the suggestion of a smooth submucosal mass displacing the overlying mucosa
- Problematic for biopsy specimen collection because of the submucosal location of GISTs
- Obtaining a repeat biopsy in the same site as a prior biopsy may increase the diagnostic yield

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- Endoscopic features of GISTs include the suggestion of a firm, smooth, yellowish submucosal mass displacing the overlying mucosa.
  - Some tumors may be associated with ulceration or bleeding of the overlying mucosa from pressure necrosis.

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- These tumors can be missed on endoscopy because of their frequent submucosal and extraluminal growth.
  - If the diagnosis is suspected prior to endoscopy, an endoscopic ultrasound scan can be performed to further characterize and help confirm the origin of the lesion

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- **Medical Care**

- Imatinib is the standard choice for adjuvant therapy of GISTs, as well as for treatment of locally advanced inoperable and metastatic GISTs, but GISTs vary in their response to imatinib
- **Surgery is the definitive therapy for localized GISTs.**

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- For locally invasive tumors, en bloc resection of adjacent involved organs, such as colon, spleen, or liver, may be indicated.
  - Routine lymphadenectomy is not indicated, as lymph node involvement is very rare.

# GASTRIC LYMPHOMA

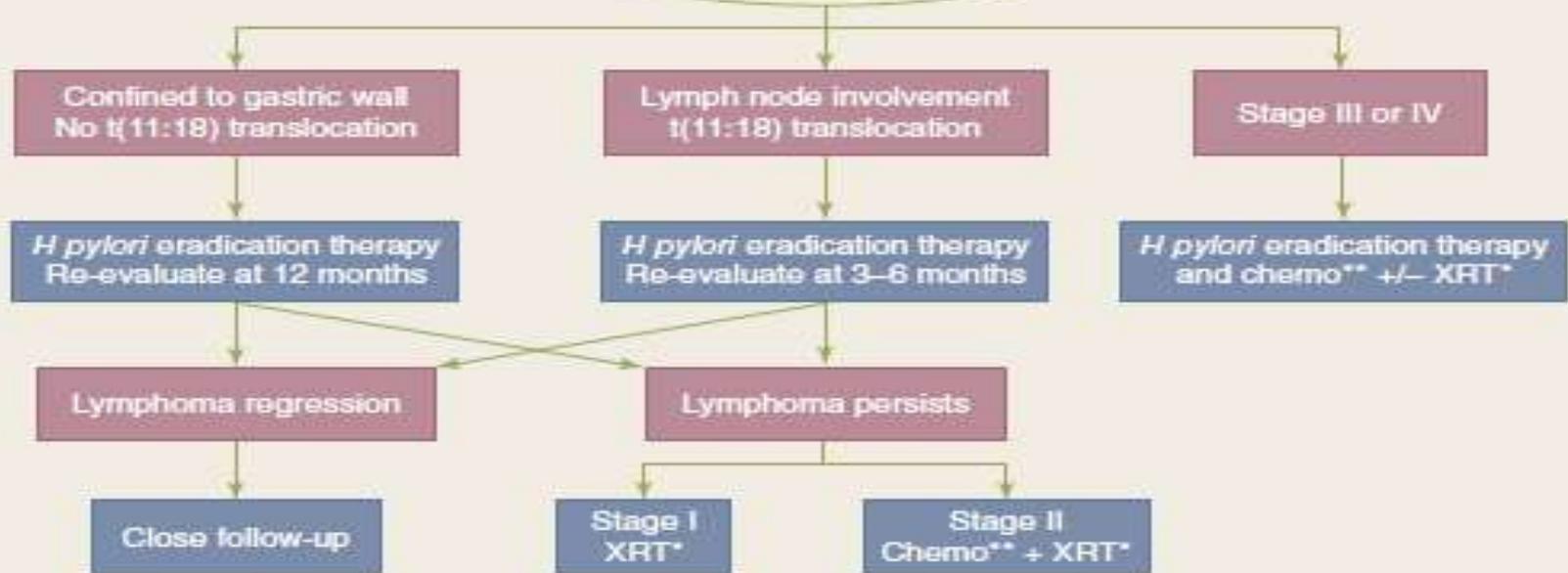
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- Primary gastric lymphoma accounts for approximately 5% of all gastric neoplasms.
- Gastric lymphoma is most common in the sixth decade and the presentation is no different from gastric cancer, the common symptoms being pain, weight loss and bleeding

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- Primary gastric lymphomas are B-cell derived, the tumor arising from the mucosa-associated lymphoid tissue (MALT).
  - Diagnosis is made as a result of the endoscopic biopsy

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- Following diagnosis, adequate staging is necessary, primarily to establish whether the lesion is a primary gastric lymphoma or part of a more generalized process.
  - CT scans of the chest and abdomen and bone marrow aspirate are required, as well as a full blood count.

### Low-grade (indolent) MALT



\*XRT: external beam radiation therapy, approximately 30 Gy with 10 Gy boost  
\*\*Chemo: chemotherapy regimens include chlorambucil, fludarabine, and cyclophosphamide, vincristine, prednisone (COP) +/- rituximab

### High-grade (aggressive)

