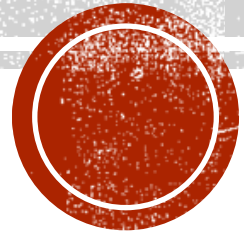
PRETREATMENT STAGING ASSESSMENT OF ESOPHAGEAL CANCER

By Ahmad Sadeghi MD



INTRODUCTION

Clinical manifestation:

- Progressive dysphagia (when esophageal luminal diameter <13 mm) and weight loss.
- Odynophagia (approximately in 20% of patients)
- Iron deficiency anemia from chronic blood loss
- Transient sticking of food particles
- Retrosternal discomfort or burning sensation
- Occasionally early intramucosal carcinoma may be found by endoscopy during surveillance of Barrett's esophagus.
- Regurgitation of saliva, Hoarseness, Hematemesis and Melena, Tracheobronchial fistula and its symptoms, Signs of metastatic disease

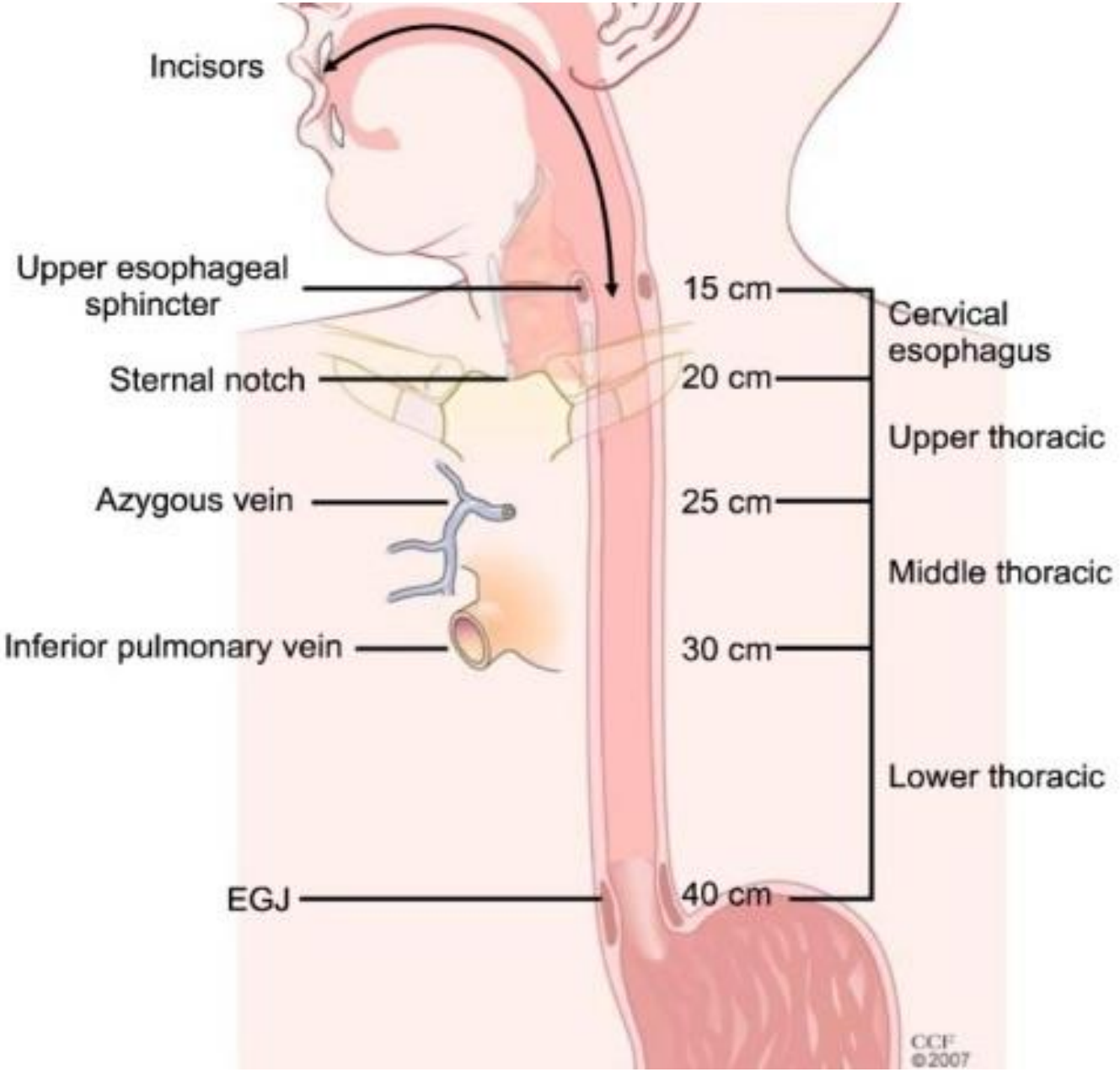


DIAGNOSIS

Endoscopic biopsy;

- First biopsy 93%
- Four biopsy 95%
- Seven biopsy 98 %

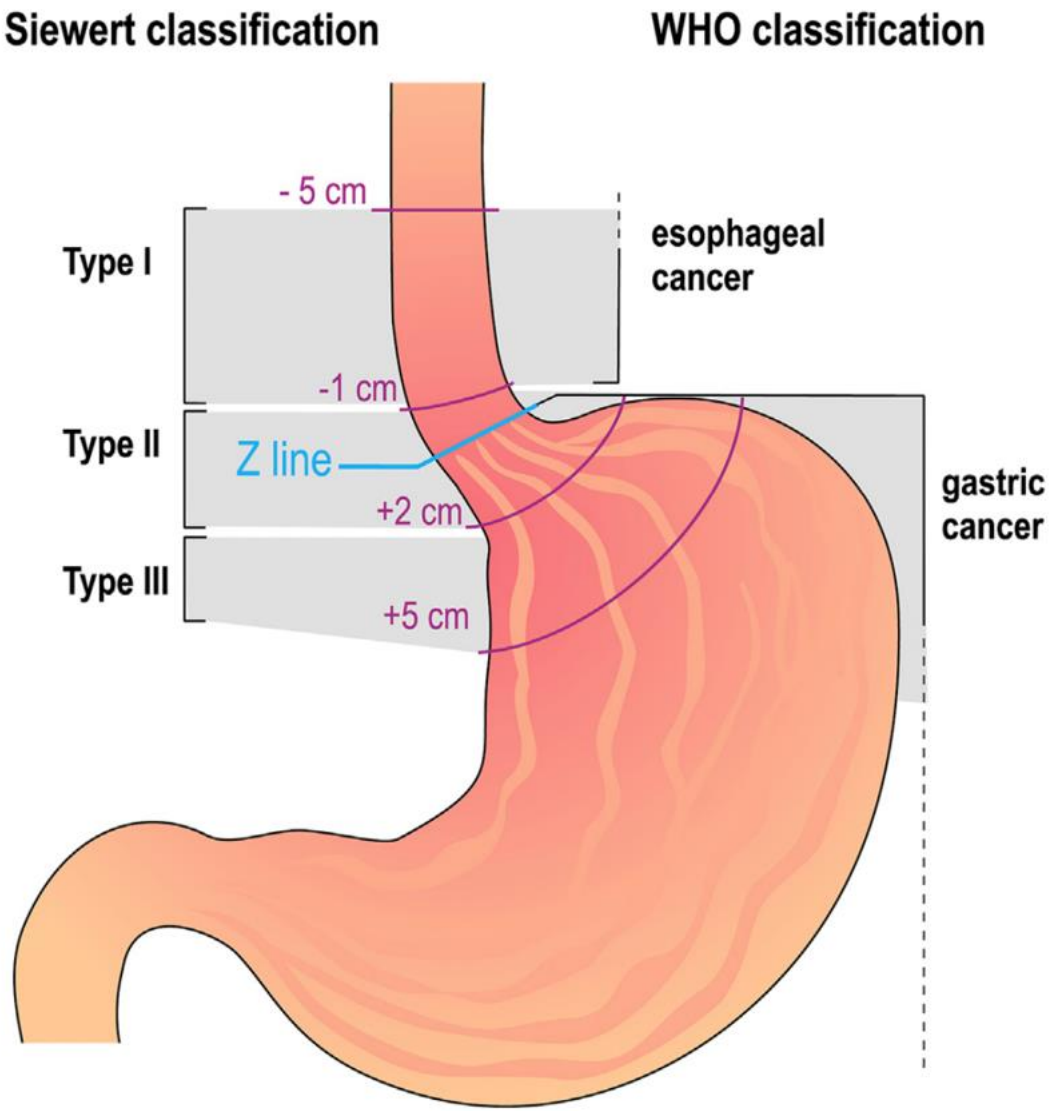
For small lesions, endoscopic enbloc removal is both therapeutic and diagnostic.


Incisors
Upper esophageal sphincter
Sternal notch
Azygous vein
Inferior pulmonary vein
EGJ
15 cm
20 cm
25 cm
30 cm
40 cm
Cervical esophagus
Upper thoracic
Middle thoracic
Lower thoracic
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SIEWERT'S CLASSIFICATION

- **Type I**
- Adenocarcinoma of the distal part of the esophagus. The tumor center is located 1–5 cm above the gastric cardia.
- **Type II**
- Adenocarcinoma of the real cardia. The tumor center is located 1 cm above or 2 cm below the gastric cardia. Considered to be true gastroesophageal junction.
- **Type III**
- Adenocarcinoma of the subcardial stomach. The tumor center is located 2–5 cm below the gastric cardia.




Siewert classification
WHO classification
- 5 cm
Type I
esophageal cancer
-1 cm
Type II
Z line
+2 cm
gastric cancer
Type III
+5 cm

OVERVIEW OF PRETREATMENT STAGING EVALUATION

Evaluation about distant metastasis:

- By contrast enhanced CT scan of neck, chest and abdomen, whole body integrated FDG positron emission tomography/CT , EUS and sometime diagnostic laparoscopy.
- Integrated FDG-PET/CT scan is more sensitive than contrast enhanced CT scan for detecting metastatic disease and now indicated for the detection of occult metastases; if they are not detected on the initial staging CT scan.
- Pretreatment PET/CT can change management strategy in up to 20 % of patients.
- EUS: Metastases of <1 cm in left liver lobe, malignant ascites, , can get tissue by FNA/FNB from suspected sites.



- Invasive staging (laparoscopy, thoracoscopy), may be used to enhance or replace EUS or imaging.

- May suggest laparoscopy for stage 3 or 4 adenocarcinoma arising from cardia or EGJ, or when there is suspicion for intraperitoneal metastatic disease that can not be otherwise confirmed.

- Brain imaging just for patients with sign and symptoms of brain metastases.



- **EUS:** Preferred method for locoregional staging.
- **Broncoscopy:** Thoracic esophageal tumoursat or above carina.
- **Flexible laryngoscopy:** For cervical SCC

TNM STAGINMG CRITERIA

- American Joint Committee on Cancer (AJCC)/ Union for International Cancer Control (UICC). (2017, eight edition)
- Importance of epicenter
- The tumors involving the EGJ with the tumor epicenter no more than 2 cm into the proximal stomach at staged as esophageal cancer.
- In contrast EGJ tumors with their epicenter located more than 2 cm into the proximal stomach are staged as stomach cancer.
- All cardia cancers not involving EGJ, even if they are within 2 cm of EGJ are staged as gastric cancer.



EPICENTER

- Clinically, the epicenter is determined from upper and lower border measurements, which also provide cancer length.
- Example: If the lesion was from 15-21 cm, this is a 6-cm lesion with epicenter at 18 cm. It is the midpoint.
- Maximal thickness.



REGIONAL LYMPH NODES

- Data suggesting the prognostic importance of the number of involved lymph nodes rather than the location.
- Regional lymph nodes for all locations in esophagus extend from periesophageal lymph nodes to celiac nodes.



LOCOREGIONAL STAGING, EUS

- T stage; sensitivity 81 to 92 %,,,,, specificity 94 to 97%
- Doing better with advanced T disease
- T1a/b disease→ endoscopic removal
- T2,T3, T4→struicture, ulceration, exophytic masses
- T4a→invading of potentially resectable organs; pleura, pericardium , azygus vein, diaphragm , peritoneum.
- T4b→ invading non-resectable organs; aorta, vertebra, airway

- Limitation of EUS; stenosing tumoral lesion, occurring in approximately 30 % of cases, under-estimate the staging.
- Stenosing disease→ at least T3
- Dilation of the stenotic area for EUS examination is controversial due to high rate of perforation.



REGIONAL NODES

- Endoscopic criteria the are suggestive of malignant involvement of a visible lymph node: **width >10 mm**, round shape, smooth borders, **echo-poor pattern.**
- Presence of all these features→80 to 100% chance of metastatic involvement (just about 25 % of malignant lymph nodes will have all of these features).
- EUS FNB may improve the accuracy of N staging. (sensitivity and specificity above 85%).
- Presence of malignant celiac lymph node is considered as regional lymph node.



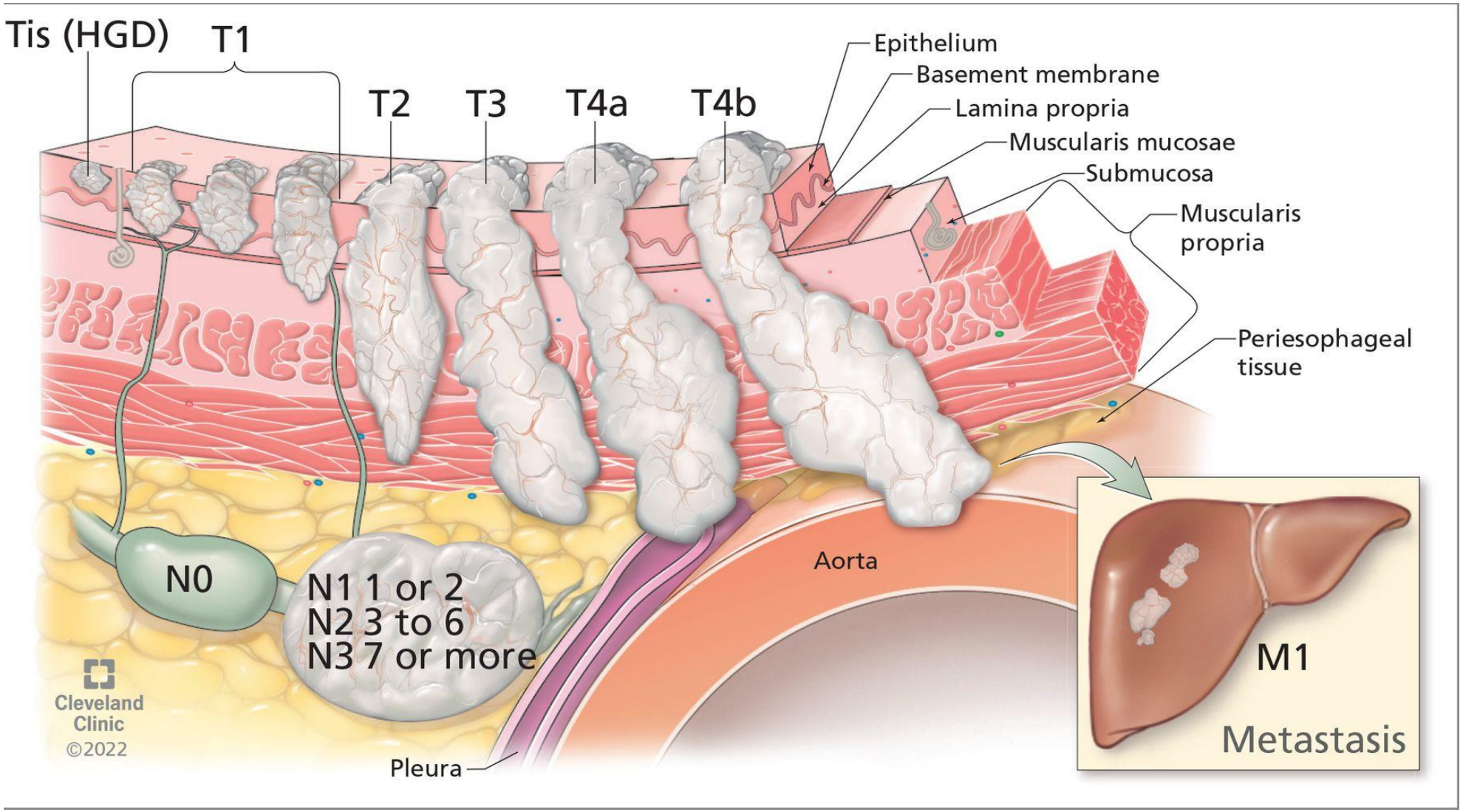

Tis (HGD)
T1
T2
T3
T4a
T4b
Epithelium
Basement membrane
Lamina propria
Muscularis mucosae
Submucosa
Muscularis propria
Periesophageal tissue
N0
N1 1 or 2
N2 3 to 6
N3 7 or more
Aorta
M1
Metastasis
Pleura
Cleveland Clinic
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Table 1 T, N, and M status and histologic grade definitions for esophagus and esophagogastric junction cancer in the 7th edition of the American Joint Committee on Cancer (AJCC) Cancer Staging Manual

T status	
T_{is}	High-grade dysplasia
T1	Invasion into the lamina propria, muscularis mucosae, or submucosa
T2	Invasion into muscularis propria
T3	Invasion into adventitia
T4a	Invades resectable adjacent structures (pleura, pericardium, diaphragm)
T4b	Invades unresectable adjacent structures (aorta, vertebral body, trachea)
N status	
N0	No regional lymph node metastases
N1	1 to 2 positive regional lymph nodes
N2	3 to 6 positive regional lymph nodes
N3	7 or more positive regional lymph nodes
M status	
M0	No distant metastases
M1	Distant metastases
Histologic grade	
G1	Well differentiated
G2	Moderately differentiated
G3	Poorly differentiated
G4	Undifferentiated

Adenocarcinoma				
0	Tis	N0	M0	N/A
IA	T1a	N0	M0	G1, X
IB	T1a	N0	M0	G2
	T1b	N0	M0	G1–2, X
IC	T1	N0	M0	G3
	T2	N0	M0	G1–2
IIA	T2	N0	M0	G3, X
IIB	T1	N1	M0	Any
	T3	N0	M0	Any
IIIA	T1	N2	M0	Any
	T2	N1	M0	Any
IIIB	T4a	N0–1	M0	Any
	T3	N1	M0	Any
	T2–3	N2	M0	Any
IVA	T4a	N2	M0	Any
	T4b	N0–2	M0	Any
	T1–4	N3	M0	Any
	T1–4	N0–3	M1	Any

N/A, not applicable; X, not defined.

Table 3 Pathologic (pTNM) stage groups

pStage group	pT	pN	pM	pGrade	pLocation
Squamous cell carcinoma					
0	Tis	N0	M0	N/A	Any
IA	T1a	N0	M0	G1, X	Any
IB	T1b	N0	M0	G1, X	Any
	T1	N0	M0	G2–3	Any
	T2	N0	M0	G1	Any
IIA	T2	N0	M0	G2–3, X	Any
	T3	N0	M0	Any	Lower
	T3	N0	M0	G1	Upper/middle
IIB	T3	N0	M0	G2–3	Upper/middle
	T3	N0	M0	X	Any
	T3	N0	M0	Any	X
	T1	N1	M0	Any	Any
IIIA	T1	N2	M0	Any	Any
	T2	N1	M0	Any	Any
IIIB	T4a	N0–1	M0	Any	Any
	T3	N1	M0	Any	Any
	T2–3	N2	M0	Any	Any
IVA	T4a	N2	M0	Any	Any
	T4b	N0–2	M0	Any	Any
	T1–4	N3	M0	Any	Any
IVB	T1–4	N0–3	M1	Any	Any



WORK-UP OF ESOPHAGEAL AND ESOPHAGOGASTRIC JUNCTION CANCERS

- Upper GI endoscopy and biopsy
- Chest/abdominal CT with oral and IV contrast
- Pelvic CT with contrast as clinically indicated
- PET/CT evaluation if no evidence of M1 disease
- Complete blood count and comprehensive chemistry profile
- EUS if no evidence of M1 disease
- ER is essential for accurate staging of early stage cancers (T1a or T1b)



- Biopsy of metastatic disease as clinically indicated.
- HER2 testing if metastatic adenocarcinoma is documented/suspected
- Bronchoscopy, if tumor is at or above the carina with no evidence of M1 disease.
- Assign Siewerts category
- Nutritional assessment and counseling
- Smoking cessation advice, counseling and pharmacotherapy as indicated.
- Screening for family history

