Stomach Cancer: Causes, Symptoms, Staging, Diagnosis and Treatment

Gastric carcinoma refers to malignant neoplasms arising from the lining of the stomach, most commonly **adenocarcinomas** . It ranks among the leading causes of cancer-related deaths worldwide, often diagnosed at an advanced stage due to vague, non-specific symptoms.

Etiology and Risk Factors

Infectious

- **Helicobacter pylori** infection (strongly associated with intestinal-type gastric cancer)
- **Epstein-Barr Virus (EBV)** infection

Pre-malignant Conditions

- Chronic atrophic gastritis (especially autoimmune gastritis ? pernicious anemia)
- Intestinal metaplasia
- Gastric adenomas
- Barrett's esophagus (though more commonly associated with esophageal adenocarcinoma)

Environmental & Lifestyle

- High intake of smoked, salted, pickled foods (nitrosamines)
- **Cigarette smoking**
- **Alcohol consumption**
- Low intake of fresh fruits and vegetables

Medical History

- **Gastric ulcers** (especially with H. pylori)
- **Partial gastrectomy** (bile reflux and remnant gastritis)
- History of radiation therapy to the upper abdomen

Genetic/Hereditary

- **Familial Adenomatous Polyposis (FAP)**
- **Hereditary Diffuse Gastric Cancer (HDGC)** – CDH1 mutation
- Lynch syndrome (HNPCC)

Clinical Features

Non-Specific Symptoms *(Often described as 5 A’s)* :

- **Asthenia** (weakness/fatigue)
- **Abdominal pain** (epigastric, retrosternal, or back; may mimic PUD)
- **Anorexia** with early satiety and nausea
- **Anemia** (due to chronic GI bleeding)
- **Achlorhydria**

Common Presentations

1. **Weight Loss** – Most frequent presenting symptom
2. **Epigastric Pain** – Worse postprandially; may be relieved by antacids
3. **Vomiting** – Especially with tumors near the pylorus
4. **Dyspepsia, early satiety**
5. **Gastrointestinal Bleeding** – Hematemesis or melena (10%)
6. **Dysphagia** – Suggests proximal (cardioesophageal junction) involvement
7. **Constipation** – From poor intake

Signs Suggestive of Metastasis

Feature	Implication
Jaundice	Hepatic or porta hepatis involvement
Virchow's Node	Left supraclavicular LN metastasis
Sister Mary Joseph Nodule	Periumbilical nodule from peritoneal spread
Blumer's Shelf	Palpable rectal shelf (posterior cul-de-sac metastasis)
Krukenberg Tumor	Ovarian metastases (bilateral mucin-producing signet ring cells)
Acanthosis Nigricans	Paraneoplastic marker
Trousseau's Sign	Migratory thrombophlebitis (more common in pancreatic CA)

Physical Examination Findings

- Pallor (anemia)
- Cachexia, dehydration
- Palpable epigastric mass (advanced)
- Hepatomegaly (liver metastasis)
- Ascites (malignant)
- Lymphadenopathy (Virchow's node, left supraclavicular)
- Umbilical nodule (Sister Mary Joseph)
- Pelvic shelf on DRE (Blumer's shelf)

Diagnostic Evaluation

First-Line Investigation

- **Esophagogastroduodenoscopy (EGD) with biopsy and brush cytology**

- Gold standard
- ?6 biopsies from suspicious lesions

Imaging

Test	Use
Barium meal (double contrast)	Alternative if endoscopy not available
Endoscopic Ultrasound (EUS)	Best for assessing tumor invasion depth & nodal spread
CT scan (abdomen & pelvis)	Staging, assess resectability, detect metastases
PET-CT	Whole-body staging; useful for detecting occult metastases
Abdominal Ultrasound	Evaluate liver metastases, ascites, Krukenberg tumor
Chest X-ray	Pulmonary metastasis assessment
Laparoscopy	Detect peritoneal seeding, operability, cytology washout

Laboratory Tests

- **CBC** – Microcytic anemia from chronic blood loss
- **Liver Function Tests (LFTs)** – Elevated bilirubin, ALP if liver metastasis
- **CEA (Carcinoembryonic Antigen)** – Elevated in advanced disease, useful for follow-up
- **Stool occult blood test** – Often positive

Staging – TNM (AJCC 8th Edition)

T – Tumor Invasion

- **Tis** – Carcinoma in situ
- **T1** – Submucosa
- **T2** – Muscularis propria
- **T3** – Subserosa
- **T4a** – Serosa
- **T4b** – Adjacent organs (e.g., pancreas, colon, liver)

N – Regional Lymph Nodes

- **N0** – No lymph node involvement
- **N1** – 1–2 nodes
- **N2** – 3–6 nodes
- **N3** – ?7 nodes

M – Distant Metastasis

- **M0** – No distant spread

- **M1** – Metastasis present (e.g., liver, peritoneum, lungs)

Principles of Management

- Management depends on **tumor stage** , **location** , **histology** , **patient performance status** , and **metastatic spread** .
- **Multidisciplinary approach** : Surgery, oncology, gastroenterology, radiology, and palliative care.

Curative Treatment (Localized/Resectable Disease)

Surgical Resection – Mainstay of Treatment

Type of Surgery

Location of Tumor	Procedure
Distal stomach	**Subtotal (distal) gastrectomy**
Proximal or diffuse tumor	**Total gastrectomy**
Tumor extends to adjacent organs	**En bloc resection**

Surgery includes **D2 lymphadenectomy** (removal of perigastric + regional nodes). D1 alone is insufficient for curative intent.

Neoadjuvant Therapy (Pre-operative Chemotherapy)

- Indicated for **stage ? IB** (T2+ or N+) disease
- Improves survival and resectability
- Example regimen:
  FLOT = 5-FU + Leucovorin + Oxaliplatin + Docetaxel

Adjuvant Therapy (Post-operative)

- Given after surgery to reduce recurrence
- Options:
  - **Chemoradiotherapy** (e.g., 5-FU + radiation)
  - **Adjuvant chemotherapy alone** (especially in Asia – S-1 based)

Unresectable/Advanced/Metastatic Gastric Cancer

Palliative Care Goals

- Alleviate symptoms
- Prolong survival
- Maintain quality of life

Palliative Interventions

Symptom	Intervention
Gastric outlet obstruction	Endoscopic stent / Gastrojejunostomy
Bleeding tumor	Endoscopic hemostasis / Radiotherapy
Pain, nausea	Opioids, antiemetics
Ascites	Paracentesis, diuretics
Obstructive jaundice	Biliary stenting

Systemic Chemotherapy

- Extends survival in metastatic disease
- Common regimens:
  - **FOLFOX** : 5-FU + leucovorin + oxaliplatin
  - **EOX** : Epirubicin + Oxaliplatin + Capecitabine
  - **FLOT**
- HER2-positive tumors: Add **trastuzumab** (HER2-targeted therapy)
- MSI-H/dMMR tumors: Respond to **immune checkpoint inhibitors** (e.g., pembrolizumab)

Targeted & Immunotherapy (Advanced Disease)

Target	Drug	Indication
HER2	Trastuzumab	HER2+ gastric adenocarcinoma
VEGF	Ramucirumab	2nd-line for advanced disease
PD-1	Nivolumab / Pembrolizumab	MSI-H or PD-L1+ tumors

Surveillance Post-Treatment

- Regular physical exams, labs, imaging (CT)
- Frequency: every 3–6 months for 2 years, then annually
- Monitor for recurrence, nutritional status (especially post-gastrectomy)

Nutritional Support

- Small frequent meals, high protein and calorie intake
- **Vitamin B12 supplementation** (if total gastrectomy)
- Monitor for **dumping syndrome**
- Dietician referral is essential

Prognosis

- Prognosis depends on stage:
  - Localized: 5-year survival ~70%
  - Regional spread: ~30–50%

    - Metastatic: <10%
- **Early detection dramatically improves outcomes**

High-Yield Clinical Pearls

Concept	Key Point
Most curable subtype	Intestinal-type (especially early-stage)
Best for early-stage detection	Japan/Korea use mass endoscopic screening
MSI-H tumors	Good response to immunotherapy
Most important prognostic factor	Stage at diagnosis
Recurrence monitoring	CEA & imaging
Common recurrence	Peritoneal carcinomatosis