Small Cell Lung Cancer: A Case of Complications & Treatment

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Objectives

- List preferred chemotherapy treatment regimen(s) for extensive stage small cell lung cancer
- Differentiate among chemotherapy regimens for small cell lung cancer based on patient-specific needs
- Recognize signs and symptoms of superior vena cava syndrome
- Identify treatment options for superior vena cava syndrome

Patient Case

- CC: LC is a 65 yo WF who presented to the ED with extreme SOB, chest tightness/pain, swelling at head
- HPI: Symptoms x 5-7 days, progressively worsening. Increased eyelid, face, side of head veins swelling x 2 days. Headache, usual smoker's cough. Mild hemoptysis 7 days ago. Facial flushing with occasional purplish discoloration of face.

Patient Case

- PMH: Heavy tobacco abuse, HTN, anxiety with panic attacks, chronic lower back pain (degenerative disk disease)
- Surgical Hx: Total hysterectomy 12/2013; B breast augmentation surgery
- FH: hypertension
- SH: 2-3 PPD smoker x 40 yrs , 2-3 cocktails nightly, no illicits
- Ht 64”Wt 68 kg
- IBW 55 kgAdjBW60 kg
- BMI 25.7 BSA 1.73 m2

Patient Case

- PE/Vital Signs:
  - Pale, very ill appearing, anxious, mild distress
  - Poor dentition, extensive swelling of bilateral eyelids and face as well as upper neck area with prominent veins and circulation venous return on head and upper neck
  - Bibasilar crackles
  - BP: 182/88, HR 88, RR 18, O2 sat 97%

Patient Case

- ED Imaging
  - Stat CTA chest (SVC syndrome/PE?)
  - Chest x-ray- **mediastinum and hilar adenopathy** on right; marked changed from 2011; suggest CT
  - CT chest- **bulky right hilar, right paratracheal, and precarinal adenopathy**--lymphoma vs metastatic disease; spread of malignancy?-subtle perihilar infiltrates
  - CTA chest-**right main pulmonary artery compression**; no PE

Patient Case

- Patient admitted secondary to findings of right hilar mass
  - Pulmonary consult
  - Superior vena cava syndrome with pleural effusion
- Hypertension, uncontrolled
- COPD

Patient Case

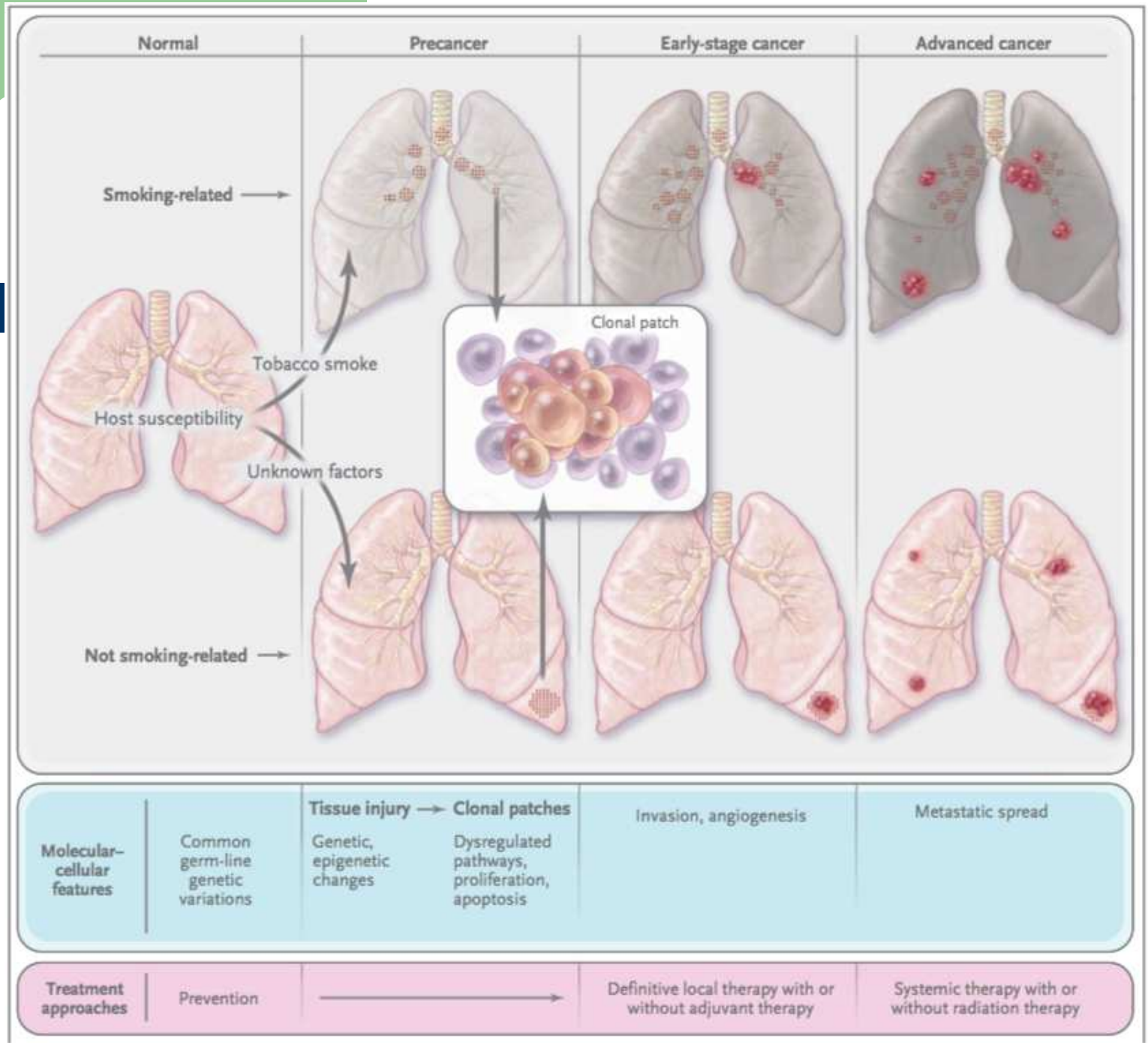
- **Medications ordered on admission:**
  - Symbicort
  - Flonase
  - Mucinex
  - Solu-Medrol 60 mg IV q12h
  - Ativan 1 mg IV q4h prn
  - Zosyn 3.375 gm q8h (ext infusion)
  - Dilaudid 1-2 mg IV q4h prn
  - Melatonin 10 mg HS prn
  - Thiamine, MVI, folic acid
  - Hydralazine 10 mg IV q4h prn
  - Diovan 80 mg daily

Patient Case

- Pulmonology Consult
  - Bronchoscopy with endobronchial ultrasound (with needle aspiration biopsy) to assess mass
    - Preliminary pathology report indicative of SCLC
  - Medication Changes
    - D/C Solu-Medrol
    - Prednisone 40 mg daily
    - Albuterol nebs
    - Spiriva

Lung Cancer

- Lung cancer is the leading cause of cancer deaths in the US and worldwide
  - Non-small cell lung cancer (85%)
  - Small cell lung cancer (15%)
- Small cell lung cancer
  - 31,000 new cases of SCLC were estimated to occur in the US in 2013
  - Primarily due to smoking
  - Female:male ratio 1:1


Normal
Precancer
Early-stage cancer
Advanced cancer
Smoking-related
Tobacco smoke
Host susceptibility
Unknown factors
Not smoking-related
Clonal patch
Molecular–cellular features
Common germ-line genetic variations
Tissue injury
Clonal patches
Genetic, epigenetic changes
Dysregulated pathways, proliferation, apoptosis
Invasion, angiogenesis
Metastatic spread
Treatment approaches
Prevention
Definitive local therapy with or without adjuvant therapy
Systemic therapy with or without radiation therapy

Small Cell Lung Cancer

- Rapid doubling time
- High growth fraction
- Early development of widespread metastases
  - ~1/3 present with limited disease confined to the chest
- Highly sensitive to initial chemotherapy and radiotherapy
  - Most patients eventually die of recurrent disease
- Typically diagnosed when patients present with symptoms indicative of advanced-stage disease

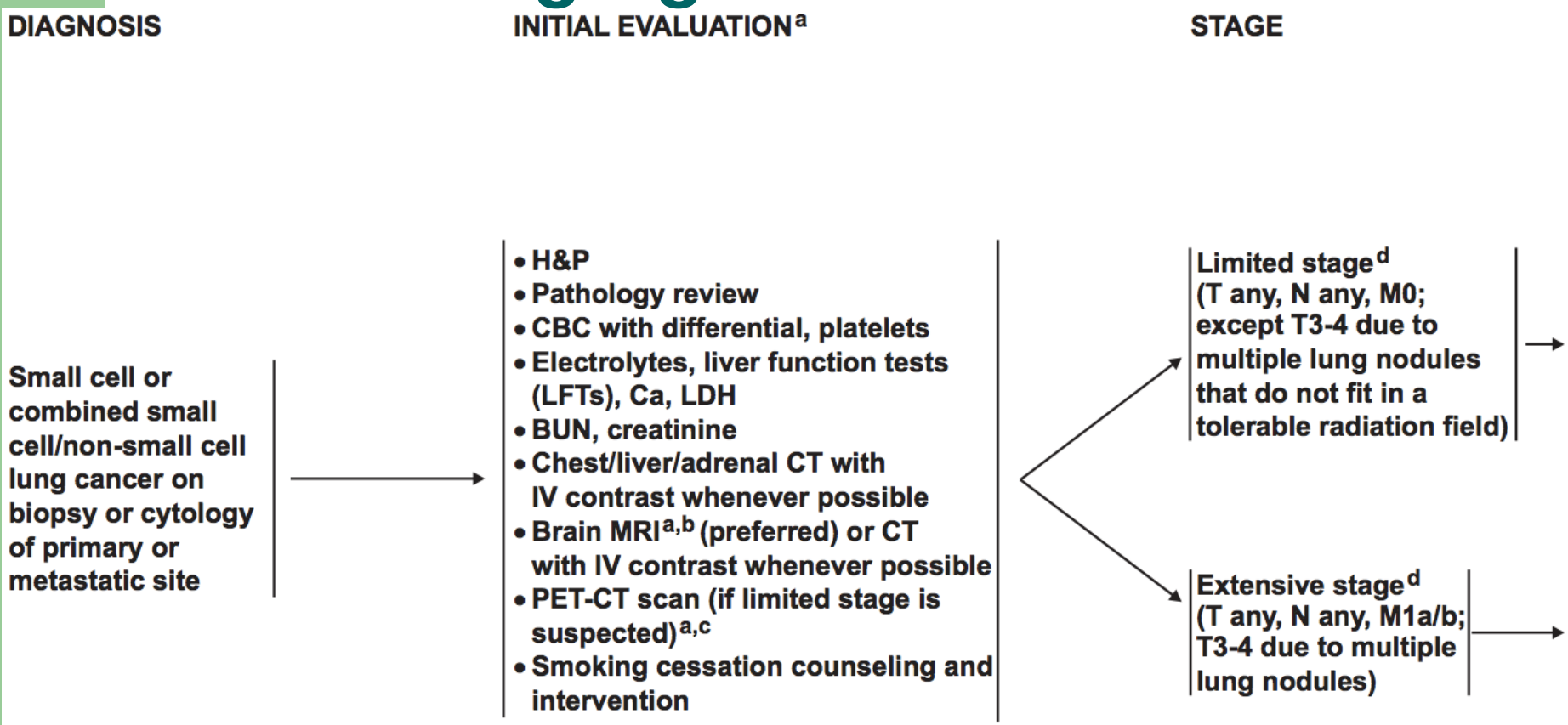
SCLC: Presentation

- Malignant epithelial tumor
  - Large hilar mass
- Bulky mediastinal lymphadenopathy
  - Cough, dyspnea
- Symptoms of widespread metastatic disease
  - Weight loss, debility, bone pain, and neurologic compromise.

Patient Case

- Oncology Consult
  - Right pulmonary artery compressed at 70-80%
  - SVC at rest: <4 mm diameter lumen
- A/P:
  - “SCLC with SVC syndrome, final pathology pending, clinical presentation suggestive
  - Complete staging with CT abd/pelvis, bone scan, MRI brain
  - If extensive→palliative therapy with carboplatin + etoposide
    - If limited, treat curatively with chemotherapy plus radiation
  - Begin chemotherapy inpatient and then continue outpatient, depending on clinical condition”
- Patient transferred to 4 East

SCLC: Staging



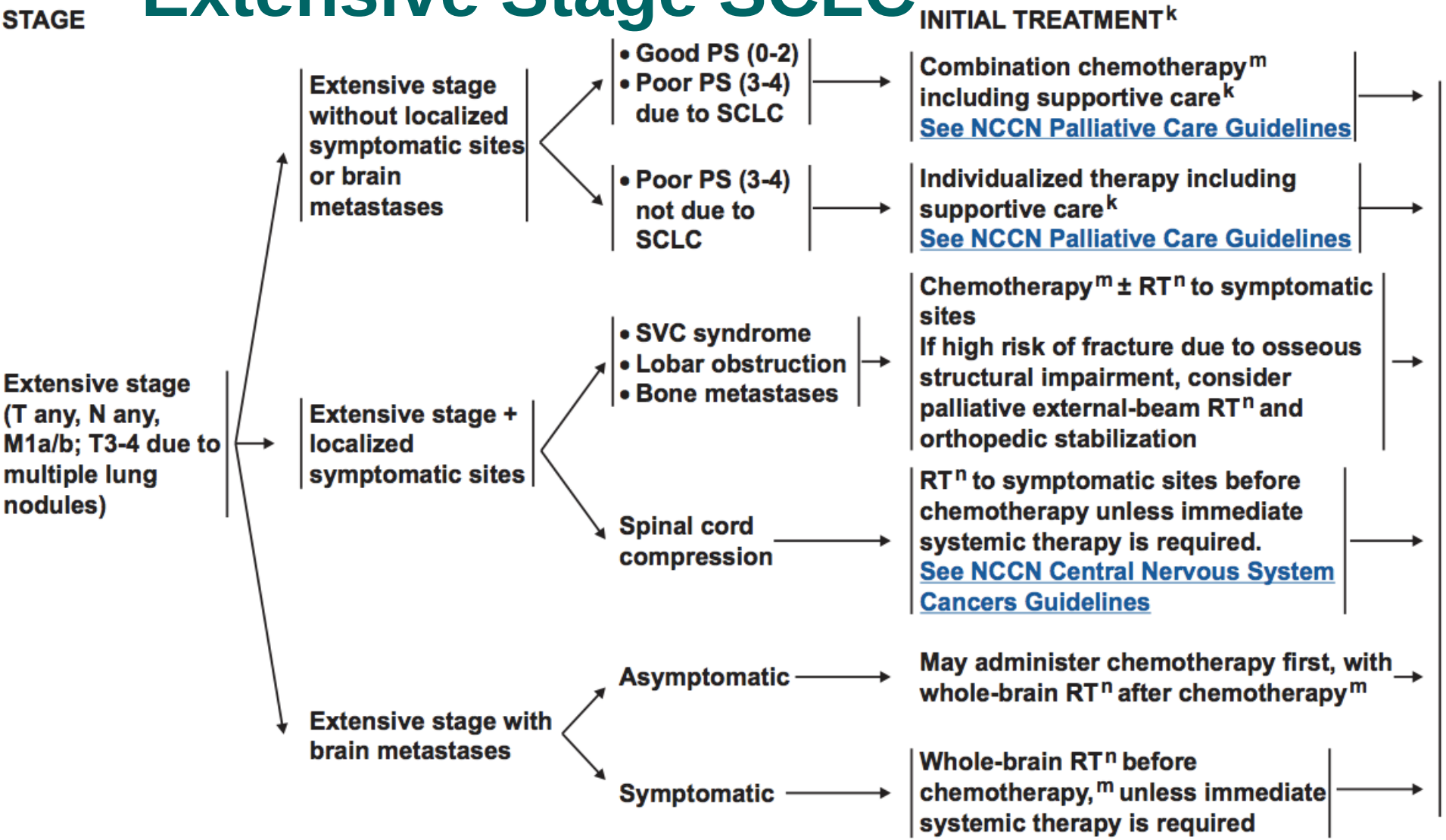
SCLC Treatment Goals

- Limited-stage SCLC
  - Cure using chemotherapy plus thoracic radiotherapy
- Extensive-stage SCLC
  - Chemotherapy alone for palliation of symptoms and prolonged survival
    - Long-term survival rare

Patient Case

- Imaging results (to assist with staging):
  - MRI brain- **multiple metastatic deposits**, no ventricle involvement
  - CT abd/pelvis- no metastases founds
  - Bone scan- no bony metastases

Extensive Stage SCLC



SCLC Treatment

- Clinical trials ideal per NCCN
- Smoking cessation (5 A's)
- Chemotherapy +/- radiation
  - Stage dependent
- +/- Prophylactic cranial irradiation (PCI)

SCLC Treatment

- Limited stage (maximum of 4-6 cycles):
  - Cisplatin 60 mg/m2 day 1 and etoposide 120 mg/m2 days 1, 2, 3
  - Cisplatin 80 mg/m 2 day 1 and etoposide 100 mg/m 2 days 1, 2, 3
  - Carboplatin AUC 5-6 day 1 and etoposide 100 mg/m2 days 1, 2, 3

SCLC Chemotherapy

- Extensive stage (maximum of 4-6 cycles):
  - Cisplatin 75 mg/m2 day 1 and etoposide 100 mg/m2 days 1, 2, 3
  - Cisplatin 80 mg/m2 day 1 and etoposide 80 mg/m2 days 1, 2, 3
  - Cisplatin 25 mg/m2 days 1, 2, 3 and etoposide 100 mg/m2 days 1, 2, 3
  - **Carboplatin AUC 5-6 day 1 and etoposide 100 mg/m 2 days 1, 2, 3**
  - Cisplatin 60 mg/m2 day 1 and irinotecan 60 mg/m2 days 1, 8, 15
  - Cisplatin 30 mg/m2 and irinotecan 65 mg/m2 days 1, 8 every 21 days
  - Carboplatin AUC 5 day 1 and irinotecan 50 mg/m2 days 1, 8, and 15

Patient Case

- Chemotherapy orders:
  - Carboplatin AUC 5 x 1 dose today (= 500 mg)
    - Normally AUC 5-6
  - Etoposide 100 mg/m^2 daily (=173 mg) x 3 doses
  - BSA = 1.73 m^2
- Other medication changes:
  - D/C prednisone
  - Dexamethasone4 mg PO every 6 hours

Patient Case

- Radiation oncology consult
  - Pt states history of recent altered mentation and incoordination over baseline
  - Slight abnormalities; chronic headaches unchanged
- A/P:
  - SVC syndrome 2/2 presumed SCLC, stabilized
    - Agree with oncologist to start chemotherapy given SVC syndrome
  - Brain metastases
    - No neuro radiation unless neuro abnormalities worsen ("sandwiched" between chemo treatments, if necessary); should improve with systemic therapy
  - SCLC
    - Some evidence for consolidative radiation AFTER good chemotherapy response; TBD later

Patient Case

- Treatment:
  - Day 1:
    - Carboplatin 500 mg
    - Etoposide173 mg
  - Day 2:
    - Etoposide173 mg
  - Day 3:
    - Etoposide173 mg

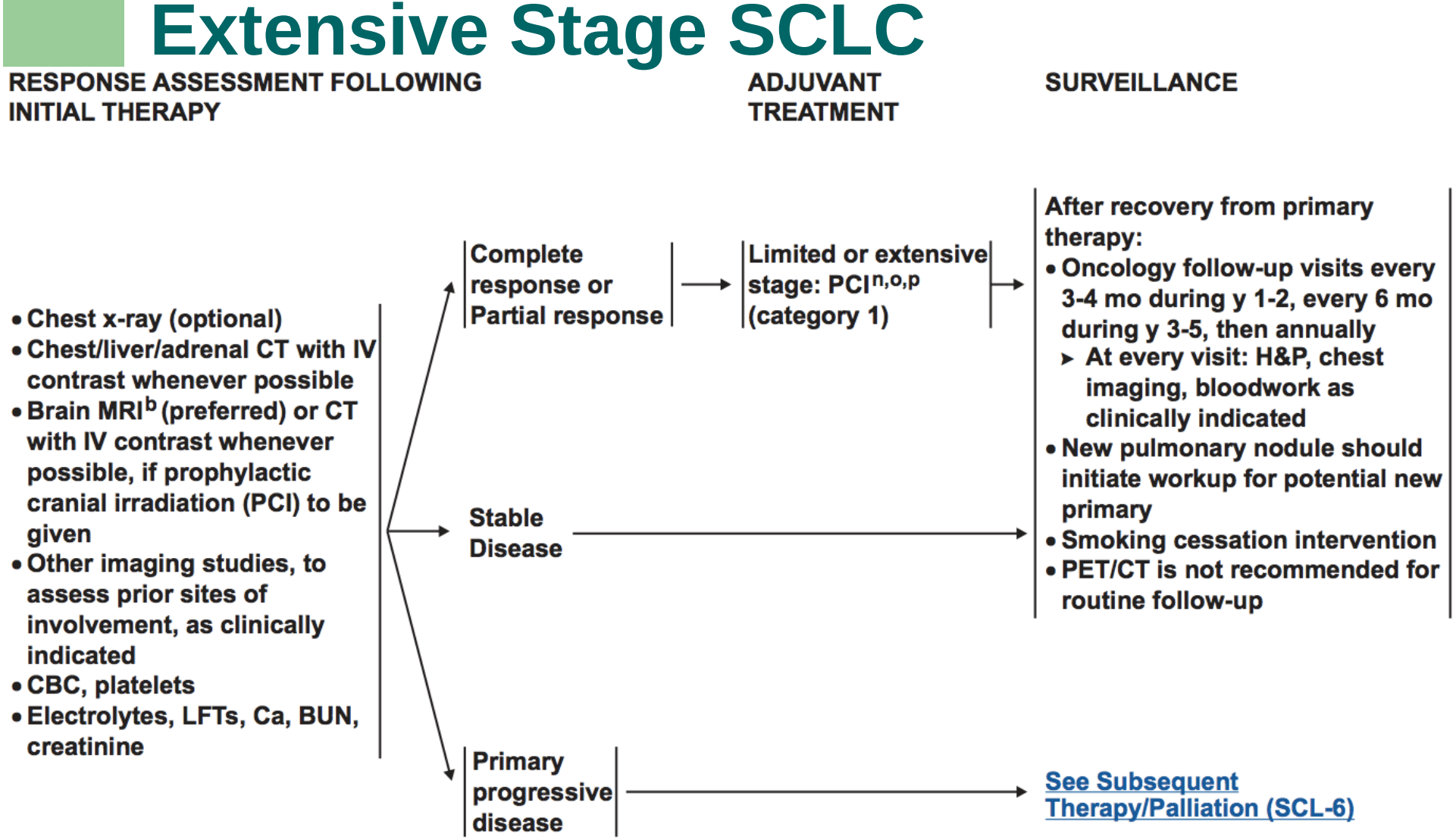
Patient Case

- SIADH developed
- Treatment
  - Free water restriction
  - Bumex IV x 5 doses, Lasix IV x 1 dose
  - Chemotherapy fluid changed to NS
  - Demeclocycline 300 mg every 8 hours

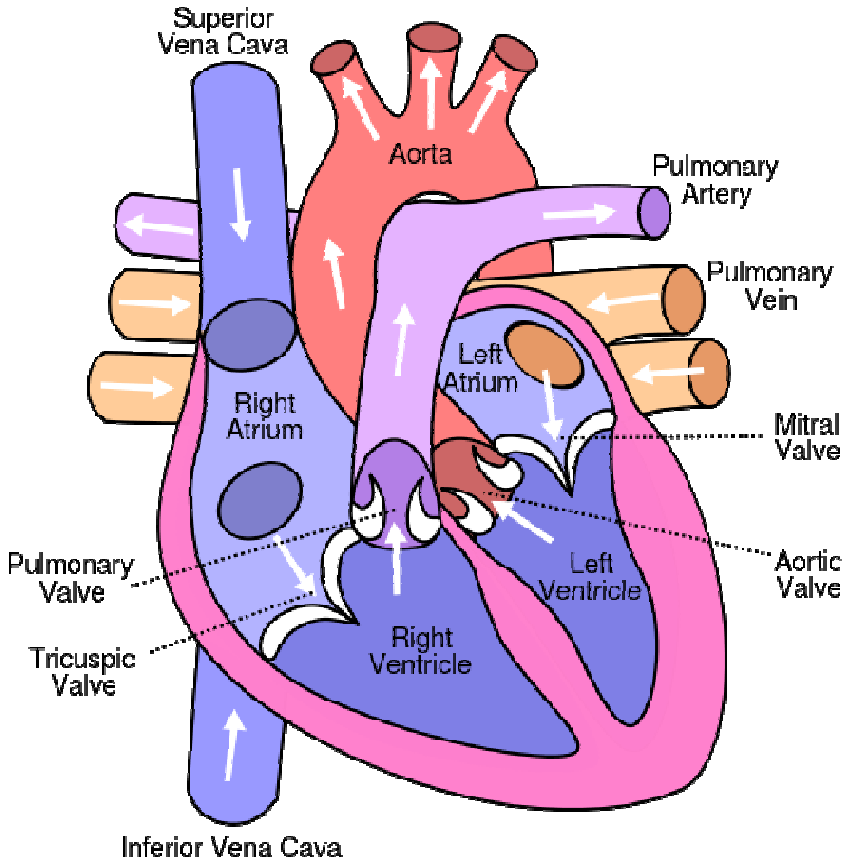
SCLC: SIADH

- SIADH
  - SCLC cells produce vasopressin (ADH), adrenocorticotropic hormone (ACTH)
    - Hyponatremia of malignancy (SIADH& Cushing's)
    - SIADH > Cushing syndrome.
- Chemotherapy and/or supportive care may also cause hyponatremia
- Treatment
  - Fluid restriction
  - Demeclocycline
  - Vasopressin receptor inhibitors ("vaptans")

Extensive Stage SCLC



Superior Vena Cava Syndrome



Superior Vena Cava Syndrome

- Obstruction within lung or chest wall due to a mass
  - Narrows diameter of SVC*
- Increased venous pressure in upper body
- Decreased venous return

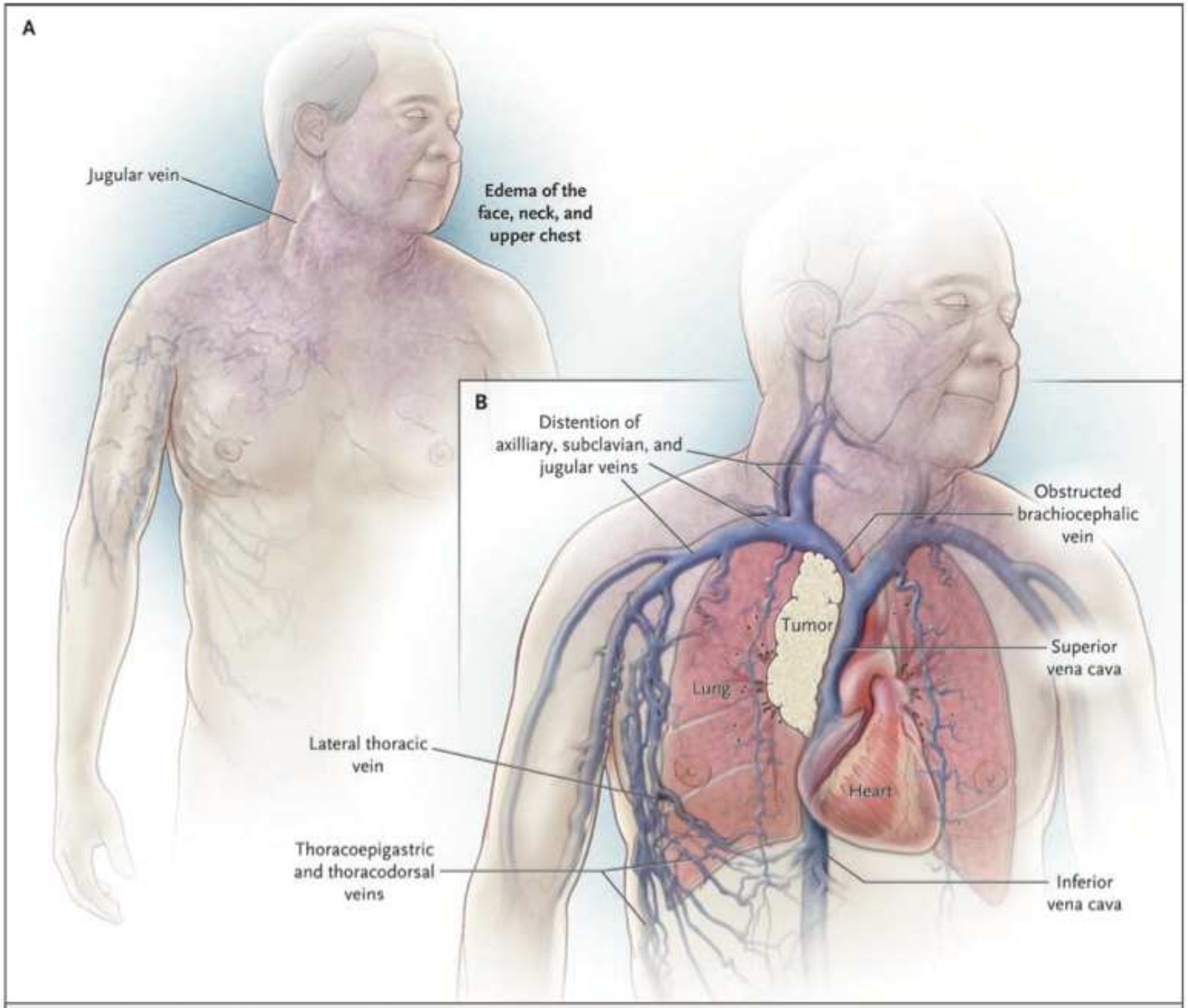


Figure 1. The Superior Vena Cava Syndrome.

Clinical findings in a patient with the superior vena cava syndrome, including facial edema, plethora, jugular venous distention, and prominent superficial vascularity of neck and upper chest, are shown in Panel A. The vascular anatomy of the upper chest, including the heart, superior vena cava, inferior vena cava, and subclavian vessels, is shown in Panel B. The tumor is shown compressing the superior vena cava.

Table 2. Symptoms and Signs Associated with the Superior Vena Cava Syndrome.*

Sign or Symptom	Frequency	Range
	percent	
Facial edema	82	60–100
Arm edema	46	14–75
Distended neck veins	63	27–86
Distended chest veins	53	38–67
Facial plethora	20	13–23
Visual symptoms	2	0–3
Dyspnea	54	23–74
Cough	54	38–70
Hoarseness	17	15–20
Stridor	4	0–5
Syncope	10	8–13
Headaches	9	6–11
Dizziness	6	2–10
Confusion	4	0–5
Obtundation	2	0–3

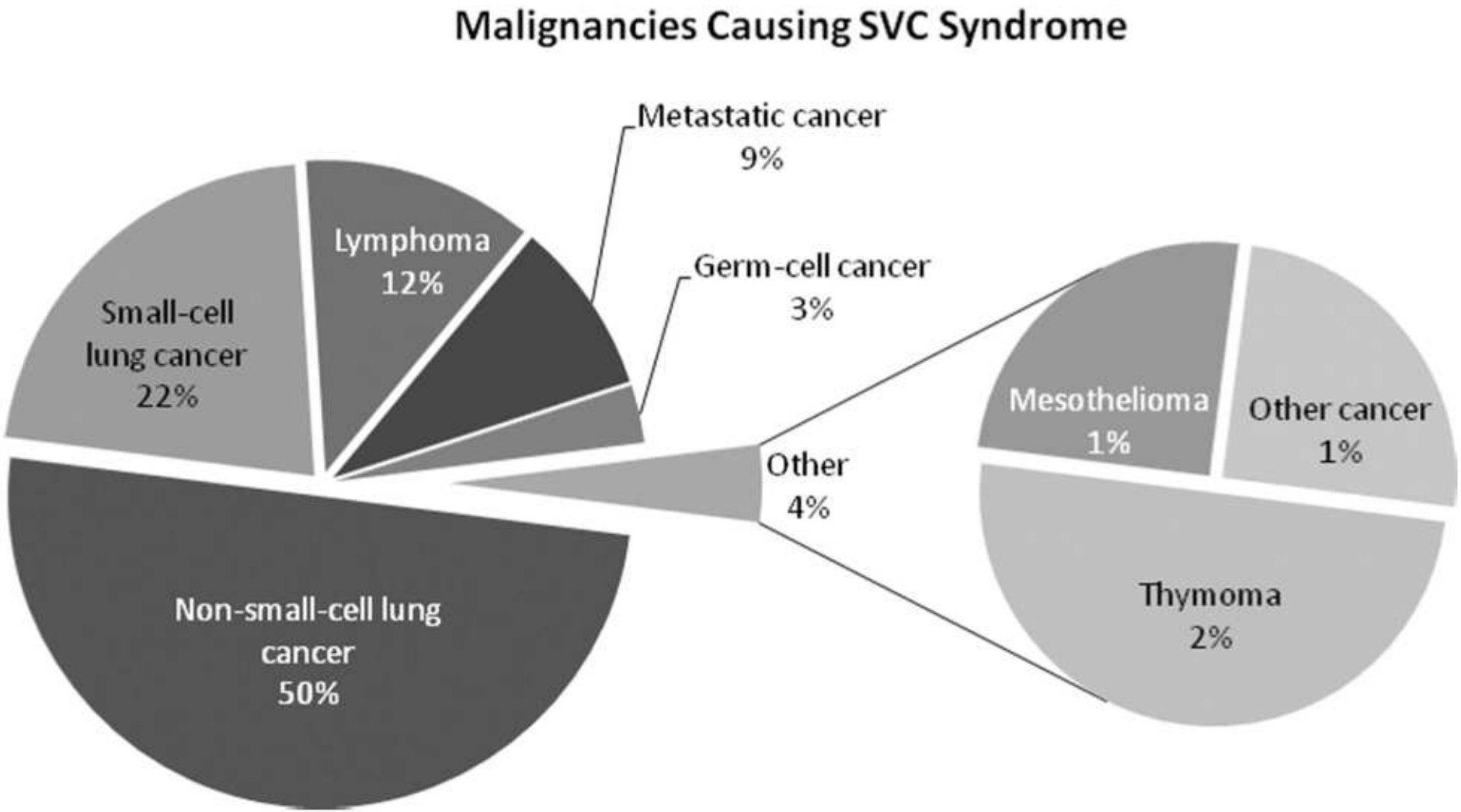


Figure 1. Distribution of malignancies causing superior vena cava syndrome. Data from Wilson et al (9).

SVCS: Oncologic Emergency?

- Emergency
  - Airway obstruction
    - Pharynx, larynx
    - Cough, hoarsenss, dysphagia, stridor, dyspnea
  - Cerebral edema
    - Headache, confusion, coma

SVCS by Malignancy: Treatment

- Cancer treatment
  - Chemotherapy
  - Complete symptom resolution in 80% of patients
- Symptomatic relief of obstruction
  - Elevate patient's head
    - Decrease hydrostatic pressure, edema
  - Decadron 4 mg every 6 hours
    - Case reports
  - Radiotherapy
    - Tissue diagnosis required
    - Symptom relief in $\geq$ 72 hours

SVCS by Malignancy: Treatment

- Stent placement
  - Bypass the SVC obstruction
  - Percutaneous
  - Benefit in brain metastases?
    - Decreased cerebral edema
  - Stent placement +/- radiotherapy consideration generally recommended by ACCP and NCCN
- Treatment of SVCS complications
  - Ex: thoracentesis for pleural effusion

Patient Case

- SVCS
  - Limiting factor for hospital discharge
  - Chemotherapy
  - Decadron
    - Rx at discharge for tapered regimen
- Granix
  - 2 doses prior to discharge
  - Not routinely recommended by NCCN during chemotherapy initiation treatment

Conclusion

- Our patient's care mimicked NCCN treatment guidelines for SCLC
- SCLC must be staged
  - Treatment relies on stage
  - Cisplatin + etoposide mainstay of chemotherapy
- Cancer and treatment-related complications will arise
  - SVCS may/may not be emergent

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Questions?