






Caring for Lung Cancer Patients

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OBJECTIVES



- ❖ Describe the types, stages and diagnostic needs for treatment :
 - Pathophysiology of lung cancers
 - incidence and survival of lung cancer
 - risk factors and signs/symptoms
 - diagnostic tests and screening
- ❖ Discuss the treatment options and side effects management for lung cancer patients ; as well as the emotional impact and needs of patients.
- ❖ Discuss the impact oncology nurse in the improvement outcomes and quality of life in lung cancer patients.
- ❖ Survivorship for lung cancer patients



Pathophysiology of Lung Cancers

Small cell lung cancer responds to radiotherapy and chemotherapy, and for that reason the treatment is extremely different from the other types. Malignant tumors arise most generally in response to repetitive carcinogenic stimuli, inflammation, or irritation. The mucosal lining is the most susceptible to injury, particularly at locations of bronchial bifurcation. The slow alteration of normal mucosal cells into malignant cells is a complex course. Most cases are found in smokers, however, less than 2% are from non-smokers.

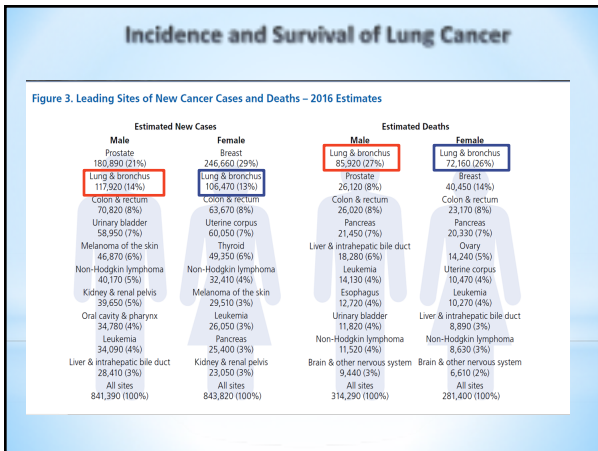
Non-small cell lung cancer accounts for about 85% of all cancers of lung. That is further divided further into squamous cell carcinoma, adenocarcinoma, and large cell carcinoma histologies. All of them share identical treatment methods and prognoses but have different histologic, clinical characteristics and mutations.

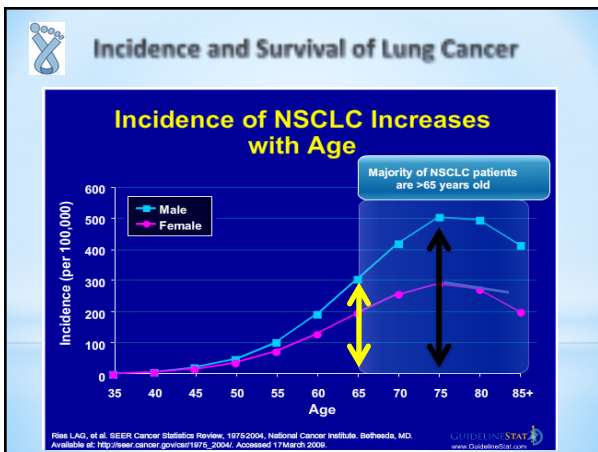




FALSE!!
It is **NOT** a smokers disease and happens to people of **ALL** ages. If you have lungs... you are at risk.







Challenges of Biomarker Use for Second & Third Line Treatment

- ✓ Tumor biopsy usually required for biomarker testing
- ✓ Tissue difficult to obtain in advanced NSCLC patients
- ✓ Re-biopsy in second line often not feasible
- ✓ Genetic variations between primary and metastatic tumors may occur
- ✓ A minority of patients harbor mutations that predict benefit of targeted therapy

Number of patients

Enrolled patients (N)

Available tumor samples for EGFR mutation analysis

Available tumor samples for EGFR gene amplification analysis

30% Average percentage of patients providing tumor samples

BR.21

Frequency of Mutations and Availability of Targeted Therapies in NSCLC

Gene	Alteration	Frequency in NSCLC
AKT1	Mutation	1%
ALK	Rearrangement	3-7% ★
BRAF	Mutation	1-3% ★
DDR2	Mutation	~4% ★
EGFR	Mutation	10-35% ★
EGFR1	Amplification	20%
HER2	Mutation	2-4% ★
KRAS	Mutation	15-25%
MEK1	Mutation	1% ★
ME1 ^q	Amplification	2-4% ★
NRAS	Mutation	1%
PIK3CA	Mutation	1-3%
PTEN	Mutation	4-8%
RET	Rearrangement	1% ★
ROS1 ^q	Rearrangement	1% ★

★ = drug for tx

Patient Characteristics to Consider in Treatment Decisions

- ❖ Age
- ❖ Co-morbidities
- ❖ PS 0, 1 vs. PS 2
- ❖ Female vs. male
- ❖ Non-squamous vs. squamous histology
- ❖ Mutation positive vs. mutation wild type
 - ❖ Principally EGFR
- ❖ Non-smoker vs. smoker
- ❖ Non-Asian vs. Asian

Lung Cancer Stages and Treatments

Stage 1: Localized
Stage 2: Larger (> 5 cm) or spread to local lymph nodes

Surgery, +/- chemotherapy

Stage 3: Locally advanced

Chemotherapy and radiation, +/- surgery

Stage 4: Advanced/metastatic

Chemotherapy +/- palliative radiation

Lung Cancer: Stage, Treatments and Targeted Therapies - David Barbie, MD, Lowe Center for Thoracic Oncology, Dana-Farber Cancer Institute, November 2, 2013

Surgical Candidate Assessment

- ❖ Size and Tumor location (clinically stage I, II, some IIIa)
- ❖ Pulmonary function status
- ❖ Assess Fev¹ and DLCO
- ❖ May need exercise study
- ❖ May need perfusion scan
- ❖ Assess cardiac function

Radiotherapy in Stage I /II NSCLC

- ❖ While surgery is the most beneficial therapy radiation alone has been used in patients that can not tolerate surgery.
- ❖ Smaller tumors have better survival outcomes.
- ❖ In larger tumors cure is rare but local control may be obtained.
- ❖ Co-morbidities also influence survival rates
- ❖ Has been used to preoperatively but with little increase in survival benefit
- ❖ Cyberknife radiation can be done – must have fiducials placed via bronchoscopy

Radiotherapy in Stage III NSCLC

- ❖ Traditional Dosing 1.8 – 2.0 Gy/ day in 2 dimensions to a total dose of 60 Gy standard of care until late 1990s
- ❖ Clinical trials have been ongoing looking at dosing up to 90 Gy
- ❖ Trials have looked at sequential vs concurrent chemo/rads with results showing that concurrent has better outcomes (sequential – happens one after the other. Concurrent – at same time. Can be more toxic)
- ❖ Trials have also looked at hyperfractionation which also seem to have better outcomes (dose is given twice a day rather than once)
- ❖ Conformal 3D radiotherapy is considered the new standard of care (tighter fields / less toxicity)



Radiotherapy In Stage IV NSCLC

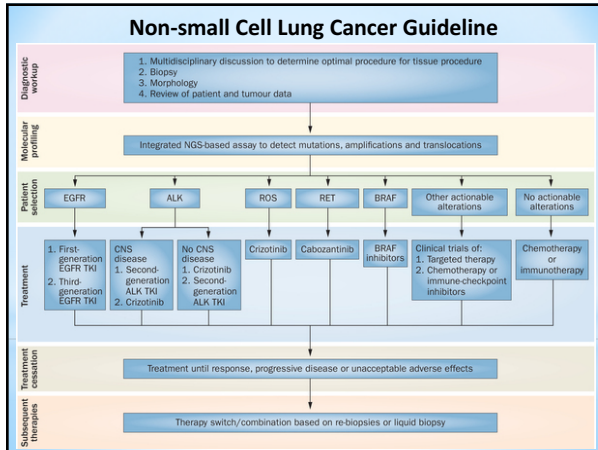
- ❖ Radiotherapy is used to treat brain metastasis and painful bone metastasis
- ❖ Prophylactic with small cell lung cancer – to brain
- ❖ Occasionally radiotherapy may be used to treat pneumonias caused by tumor obstruction resulting in cough, SOB and hemoptysis
- ❖ Stage IV radiotherapy is **always** palliative



Radiation Patient and Nursing Care

- ❖ Assess patient and family's knowledge regarding treatment process
- ❖ Teach family about treatment plan and appropriate side effects
- ❖ Assess for skin changes during radiation - be sure patients are aware to monitor skin changes and prevent breakdown
- ❖ Assess for esophagitis in patients undergoing mediastinal radiotherapy
- ❖ Assess for pain management
- ❖ Assess for dietary interventions– be sure patient is able maintain intake of fluids and nutritional intake





* Mesothelioma

Aggressive cancer affecting the membrane lining of the lungs and abdomen

- Rare type of lung cancer: ~2,000 new cases/year in the U.S.
- 80 percent of cases are the result of asbestos exposure
- Currently no known cure
- treatments such as surgery and chemotherapy can help to improve prognosis
- Prognosis 1-2 years with treatment

Small Cell Lung Cancer

- ❖ Most common in Smokers. Less than 2% are never smokers.
- ❖ Described in two stages : Limited – confined to chest; Extensive - outside the chest
- ❖ Limited stage disease- disease confined to the chest that can be encompassed in one radiation port ; Extensive stage disease – outside of one radiation port.
- ❖ 20% cure rate for Limited Stage (LS) (only if caught in limited stage)
- ❖ Overall response rate 50-75%
- ❖ Untreated survival 6 weeks ; Treated survival ~9mo
- ❖ Most aggressive of all lung cancer types

Treatment Options - Small Cell

- ❖ **Limited Stage Disease (LS)**- Chemotherapy in combination with radiation therapy
- ❖ **Extensive Stage Disease(ES)**- Chemotherapy and radiation to any painful areas for pain control
- ❖ **Chemotherapy used in SCLC:** Cisplatin + Etoposide(VP16) or Irinotecan; Carboplatin/ VP16 (Etoposide), Carboplatin/Cisplatin + Paclitaxel; Adriamycin + Cytosar.
- ❖ **LS** – prophylactic CRT is usually recommended; **ES**- radiotherapy may be used palliative (SVC, Brain mets, bone mets)
- ❖ **Clinical trials**



Nursing Care for Lung Cancer Patients

To optimize their quality of life, patients need to be aware of ways to control their symptoms and side effects of their treatments through...

- ❖ **Proper nutrition** – Educate patients the need of good diet and adequate hydration. Small frequent meals. High calorie foods to prevent weight loss. Monitor for weight loss and look for early interventions. Educate the patient early in the needs and ways to prevent alterations in taste and weight loss.
- ❖ **Adequate rest** – monitor for sleeplessness due to medication interactions, depression, anxiety, etc. When patients come in to clinic, assess sleep patterns. To prevent fatigue, some studies show low impact exercise prevents fatigue. Instruct patients to not take more than 1 nap a day and no more than 30 minutes at a time.
- ❖ **Managing pain and side effects** – When starting on pain medications, make sure patients understand side effects and monitor control of pain with medications. Keep pain log to see if changes are needed.



Nursing Care for Lung Cancer Patients


- ❖ **Controlling anemia** – monitor labs closely and question patient on visit to see if having signs/symptoms – i.e., Shortness of breath, fatigue, weakness, etc..
- ❖ Obtaining **physical therapy** if needed – question patient on visits about his daily activity and any changes in ambulating and transfers, or falls.
- ❖ **Emotional/social support** and meeting spiritual needs– monitor for symptoms for depression, family interactions, family attending with patient on visits, offer information on support groups and other community activities with patients of similar needs. Identify depression or depressive symptoms and address as needed.
- ❖ **Educate patients and family about treatment related side effects.** Making them aware of the side effects that may occur or ways to prevent/treat them, makes them more accountable for their own health and needs. This can hopefully prevent unnecessary ER visits or hospital admissions.



Oncology Emergencies in Lung Cancer

SUPERIOR VENA CAVA SYNDROME- SVCS


- ❖ Develops in approximately 3% to 15% of patients with lung cancer.
- ❖ Four times more likely to occur in patients with right- versus left-sided lesions
- ❖ Presents with: facial edema or erythema, dyspnea, cough, orthopnea, or arm and neck edema. Also may include hoarseness, dysphagia, headaches, dizziness, syncope, lethargy, and chest pain.
- ❖ Symptoms may be worsened by positional changes, particularly bending forward, stooping, or lying down.
- ❖ **Common findings** : edema of the face, neck, or arms; dilatation of the veins of the upper body; and plethora or cyanosis of the face. Periorbital edema may be prominent. Also may have laryngeal or glossal edema, mental status changes, and pleural effusion (more commonly on the right side).
- ❖ Treatment includes: radiotherapy, chemotherapy, thrombolytic therapy and anticoagulation, expandable wire stents, balloon angioplasty, and surgical bypass.
- ❖ Most patients derive relief from obstructive symptoms which may be radiation or chemotherapy and also when treated with diuretics and steroids



Oncology Emergencies in Lung Cancer

Paraneoplastic Syndrome


- ❖ Anorexia, weight loss (cachexia):
 - most common presenting symptoms of ANY cancer. Loss of greater than 10% of baseline weight. No appetite or desire to eat. (Hormonal supplement, steroids or herbal treatments).
- ❖ Hormonal
 - SIADH (low sodium - nausea, vomiting, headache, weakness, muscle cramping, decreased appetite, confusion, N/V, diarrhea, decreased output and increase thirst). Common in small cell lung cancer. Require supplements, fluid restriction, chemotherapy and other medications (Demeclocycline- tetracycline derivative.)
- ❖ Hypercalcemia
 - high calcium – confusion, abdominal pain, renal stones, bradycardia, anorexia, N/V, dehydration, pruritus. present in advanced disease with bone mets
 - Tx: Hydration, bisphosphonates
- ❖ Deep venous thrombosis or Pulmonary embolism
- ❖ Anemia - common in advanced disease or related to treatment.
- ❖ WBC elevation -can be elevated as a direct response to the cancer (like an inflammatory response) in some patients. May see the WBC level drop as patient responds to treatments.



Oncology Emergencies in Lung Cancer

Pericardia Effusion/ Pericardial Tamponade

- ❖ Abnormally large accumulation of fluid within the pericardial sac.
- ❖ Amounts range from 200 cc – 1800 cc (normal fluid amount is 15-50cc)
- ❖ Can be caused by disease, radiation effects on heart or chemotherapy.
- ❖ Tamponade results when the heart is compromised from increase amount of fluid and heart can no longer function properly.
- ❖ Signs/symptoms depend on rate of the accumulation: fatigue, mild dyspnea, orthopnea, and cough. Asymptomatic if accumulates slow, or may decompensate and critically ill if onset is rapid. Vague retrosternal chest pain that may be severe in supine position with palpitations.
- ❖ More fluid = more pronounced symptoms. May include worsening dyspnea, cough, peripheral edema, and possibly low grade fever.
- ❖ Severe tamponade =increase in anxiety, restless and confusion.
- ❖ Treatment –drain the fluid and restore cardiac function; prevention of reaccumulation of fluid; treat the cancer that is the underlying cause. Pericardial catheter may be placed and monitor the re-accumulation of the fluid. Pericardiocentesis may be the definitive treatment. Surgical intervention includes pericardial window or pericardiectomy.



Oncology Emergencies in Lung Cancer

Pleural Effusion

- ❖ Excess accumulation of pleural fluid within the pleural space and a common complication of cancer
- ❖ Malignant pleural effusion is common – fluid may appear to be exudate
- ❖ Symptoms depend on the amount of fluid present and rate of reaccumulation: shortness of breath, dry cough, pleuritic chest pain, orthopnea, ipsilateral shoulder pain or discomfort
- ❖ Can become emergent when large amounts of fluid are present and a mediastinal shift may exist that can lead to hemodynamic compromise. If mediastinal shift occurs, trachea may deviate to the opposite side. Decreased, absent breath sounds, or rub may be heard.
- ❖ Diagnosed with CXR or CT scan
- ❖ Treatment – thoracentesis to drain off fluid, placement of pleurex catheter, or pleurodesis (sclerosing of the pleura with talc) or pleurectomy



Oncology Emergencies in Lung Cancer

Malignant Spinal Cord Compression

- ❖ True neurologic emergency. Without prompt intervention and treatment, may result in paralysis or loss of bowel/bladder control
- ❖ Symptoms depend on site of met and amount of tumor invasion. Back pain is usually presenting symptom. Pain is localized (at or near site of tumor), or radicular (from irritation of nerve root from compression); shooting pain or burning pain worse with cough or movement. Thoracic vertebrae will cause bilateral pain where cervical or lumbar may be unilateral.
- ❖ Compression pain is worse with lying flat - arthritic pain is relieved with lying flat.
- ❖ Palpation of the spine reveal tenderness at the level of tumor involvement.
- ❖ Diagnosed with plain x-ray of spine, bone scan, CT or MRI (best images are obtained via MRI)
- ❖ Treatment – Surgery is for lesions with spinal instability, compression from bone fragments and radioresistant areas, or significant pain. Medical management includes – corticosteroids, pain control, radiation therapy and possibly kyphoplasty.





Survivorship in Lung Cancer



- ❖ The 1 and 5 year relative survival rates for lung cancer are 44% and 17%, respectively.
- ❖ Only 15% of lung cancers are diagnosed at an early stage or locally, for which the 5 year survival rate is 54%.
- ❖ More than half (57%) are diagnosed at a distant stage (metastatic), for which the 1 and 5 year survival is 26% and 4%, respectively.
- ❖ The 5 year survival for small cell lung cancer is 6%, significantly lower than that of NSCLC (21%).



 **Resources** 

UNC Lineberger Cancer Center www.cancer.med.unc.edu	NC Lung Cancer Initiative www.lungcancerinitiative.org
Cancer Grace CANCERGRACE.org	Never Smokers with Lung Cancer www.neversmokers.com
American Cancer Society www.cancer.org	Lung Cancer Alliance www.lungcanceralliance.org
National Cancer Institute www.cancer.gov	I CAN COPE American Cancer Society 1-800-ACS-2345
Cancer Care www.cancercares.org	Chemocare.com
NC Radiation Protection http://www.ncradiation.net/	



What Cancer Cannot Do

- Cancer is no fiend.
- It cannot cripple love.
- It cannot shatter hope.
- It cannot corrode faith.
- It cannot eat away peace.
- It cannot destroy confidence.
- It cannot kill friendship.
- It cannot shut out memories.
- It cannot silence courage.
- It cannot reduce eternal life.
- It cannot quench the spirit.

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