

# Utility of FDG PET-CT Scan in Determining Pathological Response to Neo-adjuvant Chemo-radiation Therapy in Non-small Cell Lung Cancer (NSCLC)

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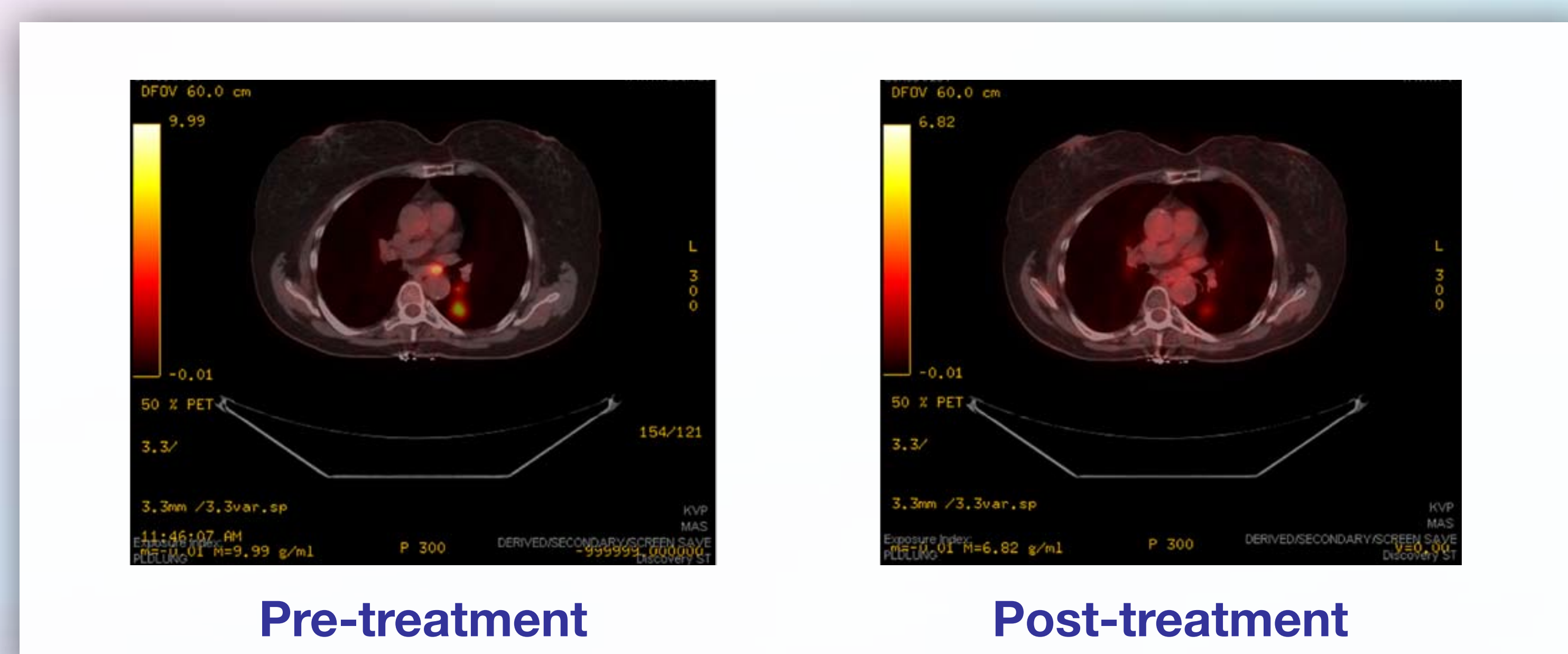
# Utility of FDG PET-CT Scan in Determining Pathological Response to Neo-adjuvant Chemo-radiation Therapy in Non-small Cell Lung Cancer (NSCLC)

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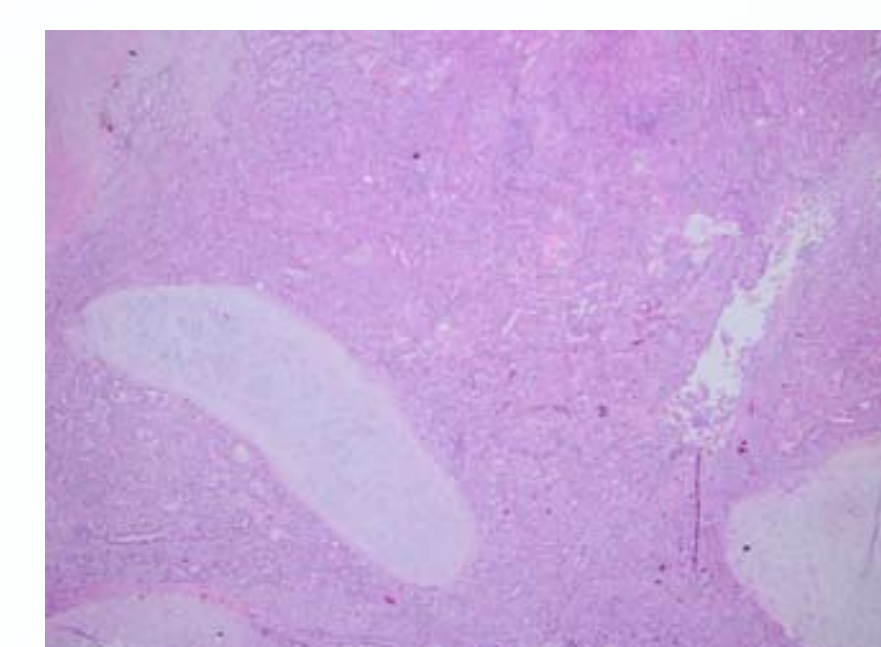
Lehigh Valley Health Network, Allentown, Pennsylvania

## Background

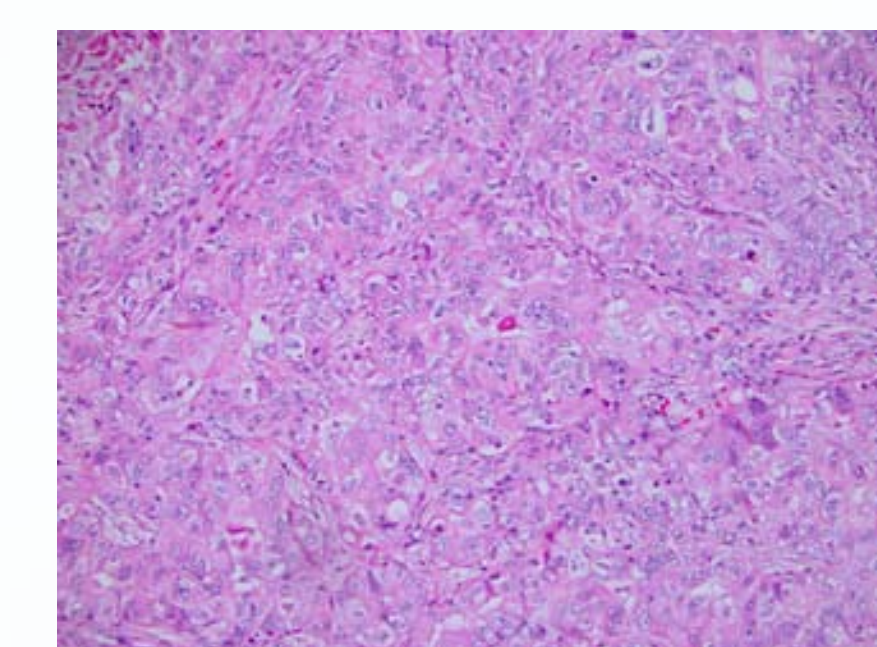
- Stage IIIA (N2+) non-small cell lung cancer (NSCLC) represents a heterogeneous group of diseases
- There is no consensus for the use of chemotherapy, radiation therapy and surgery in the treatment of stage IIIA NSCLC
- Pathological response of N2 lymph nodes is predictive of long term survival (1, 2, 3, 4, 5)
- Data is accumulating indicating that pathological response of the primary tumor may be predictive of long term survival (6, 7, 8, 9)



## Post Treatment Pathology "Viable"

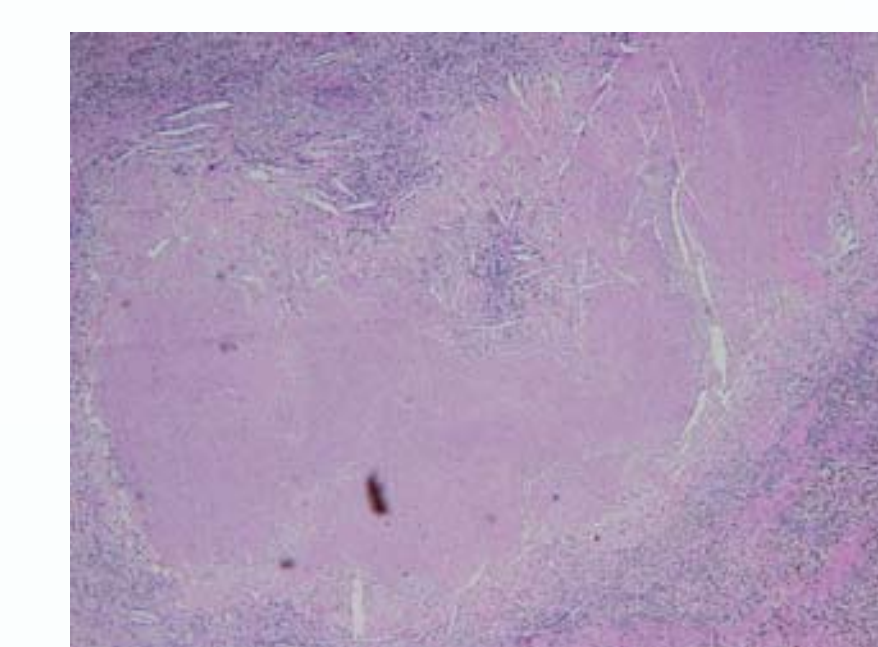


**40x H&E stain**  
Large sheets of viable tumor with no significant fibrosis or necrosis  
Tumor wrapped around bronchus

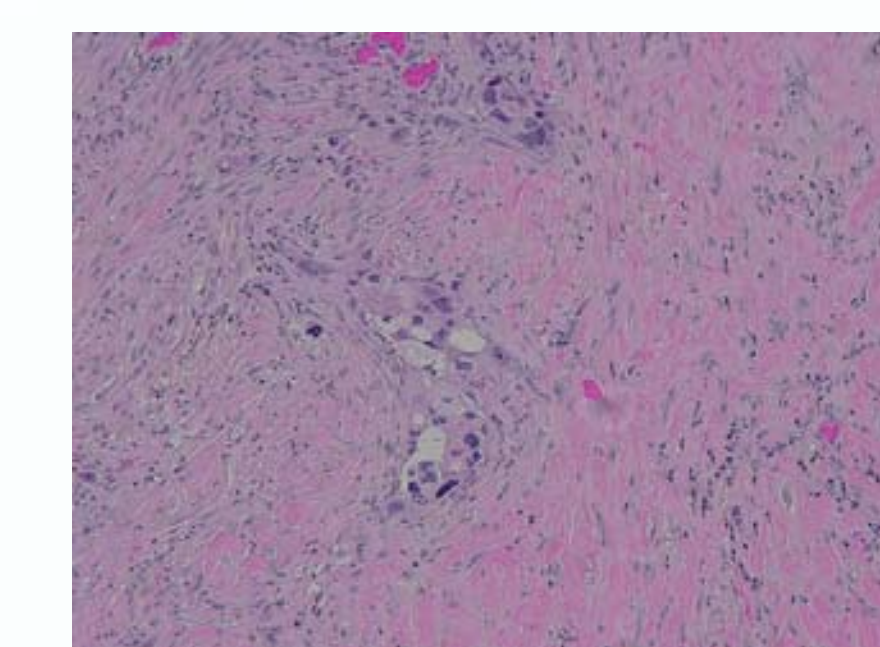


**200x H&E stain**  
Large sheets of viable tumor with no significant fibrosis or necrosis

## Post Treatment Pathology "Fibrosis"

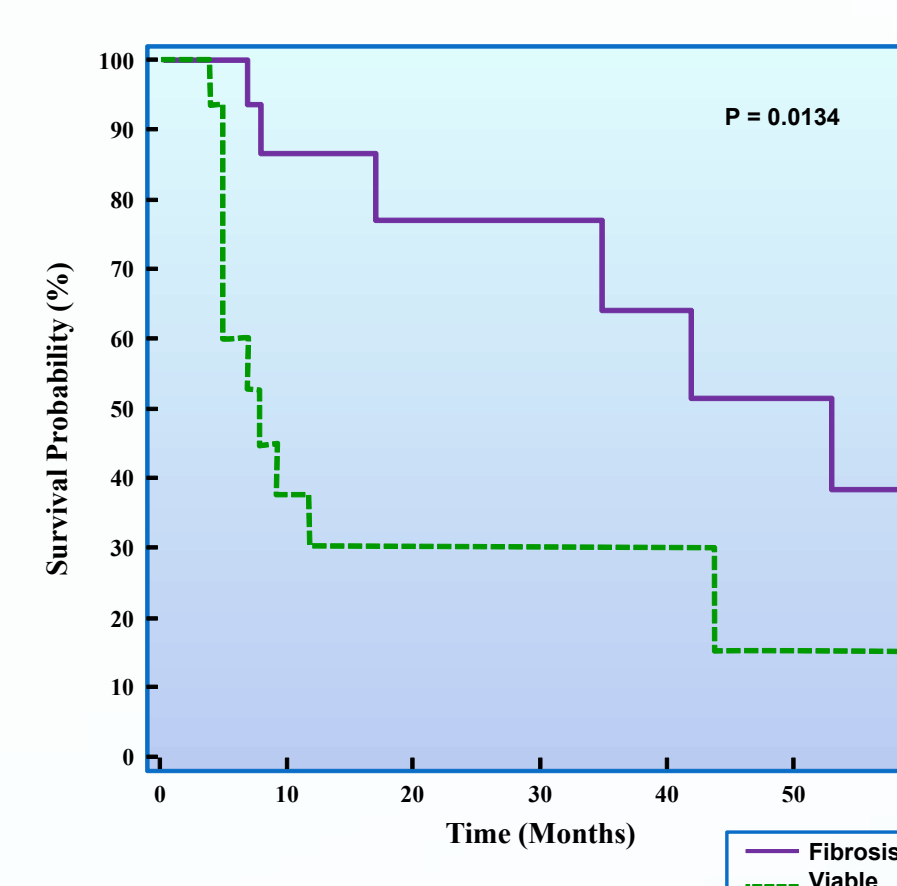


**40x H&E stain**  
Small residual nest of tumor cells with marked tumor necrosis

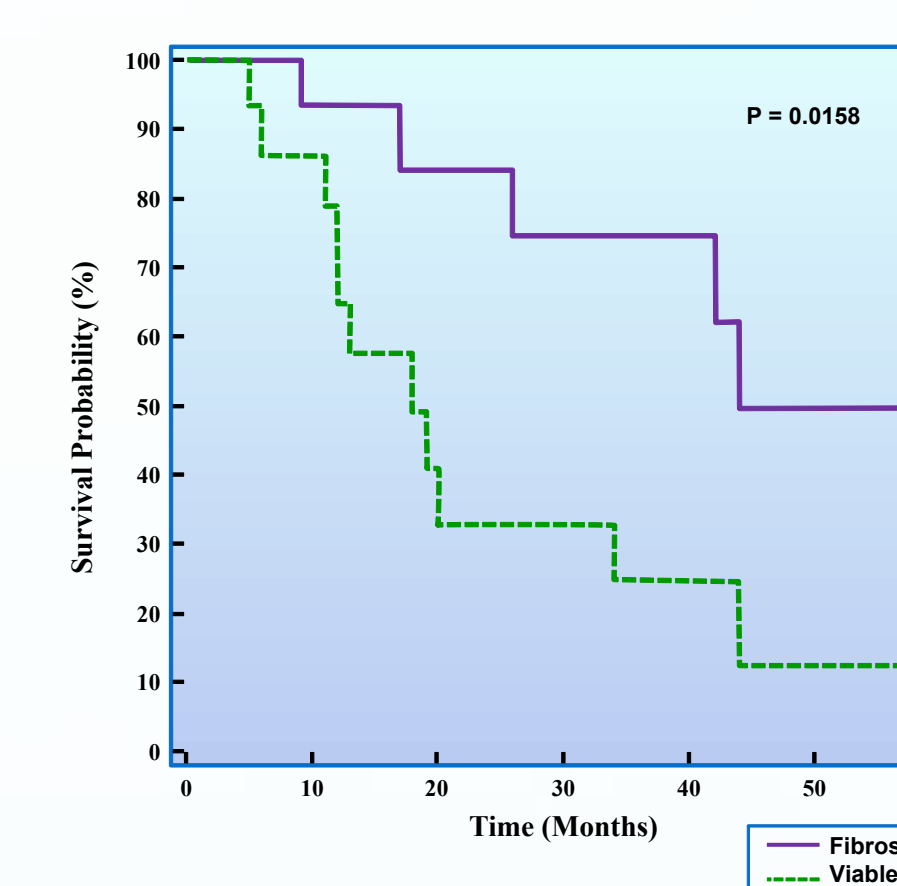


**400x H&E stain**  
Small residual nest of tumor cells in dense fibrous background

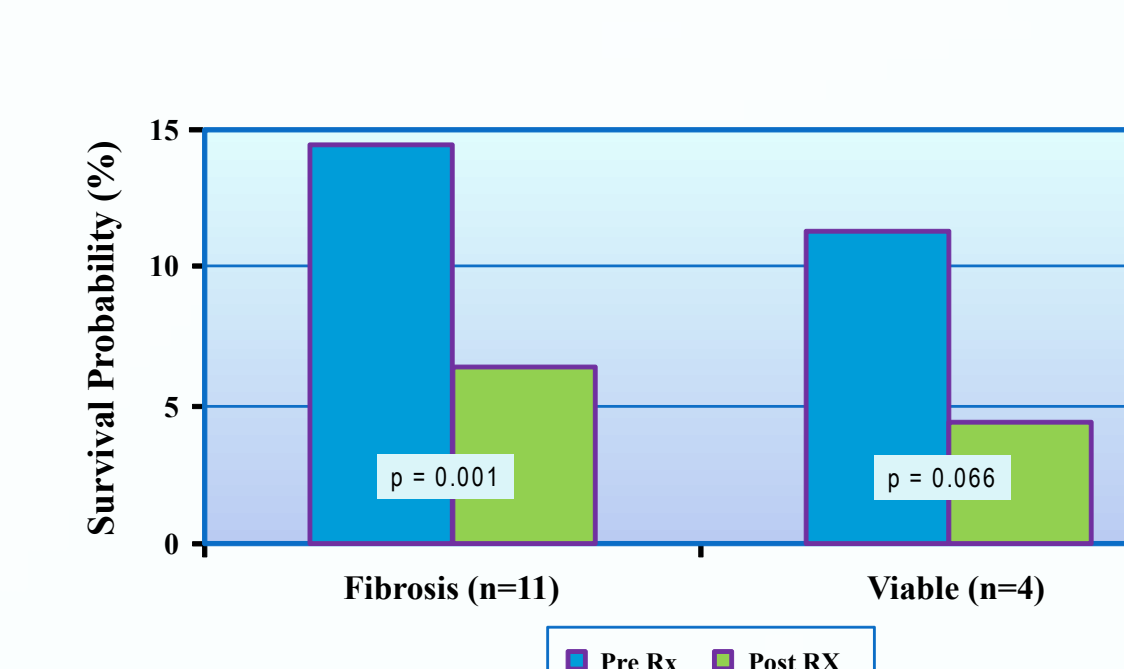
## Relapse Free Survival



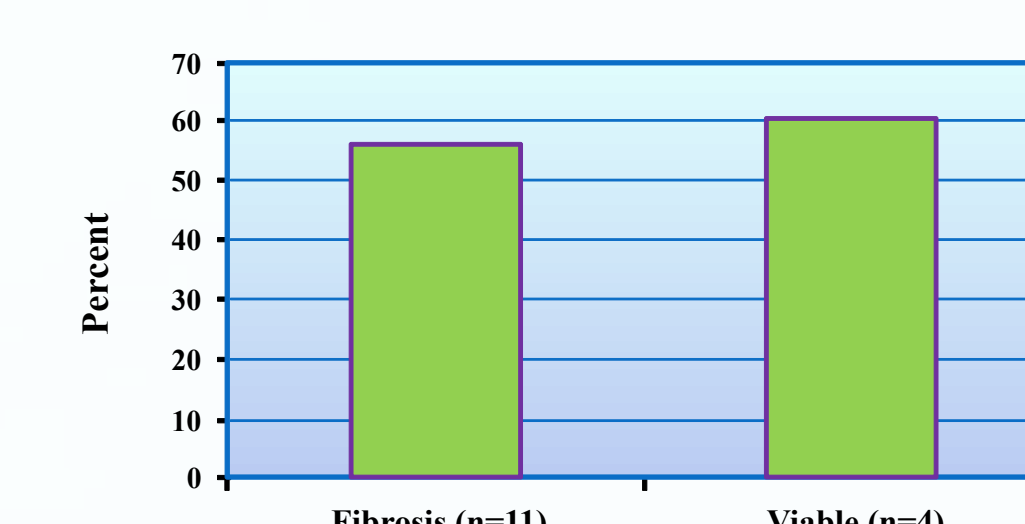
## Overall Survival



## Primary Tumor Change in SUV<sub>max</sub> with treatment



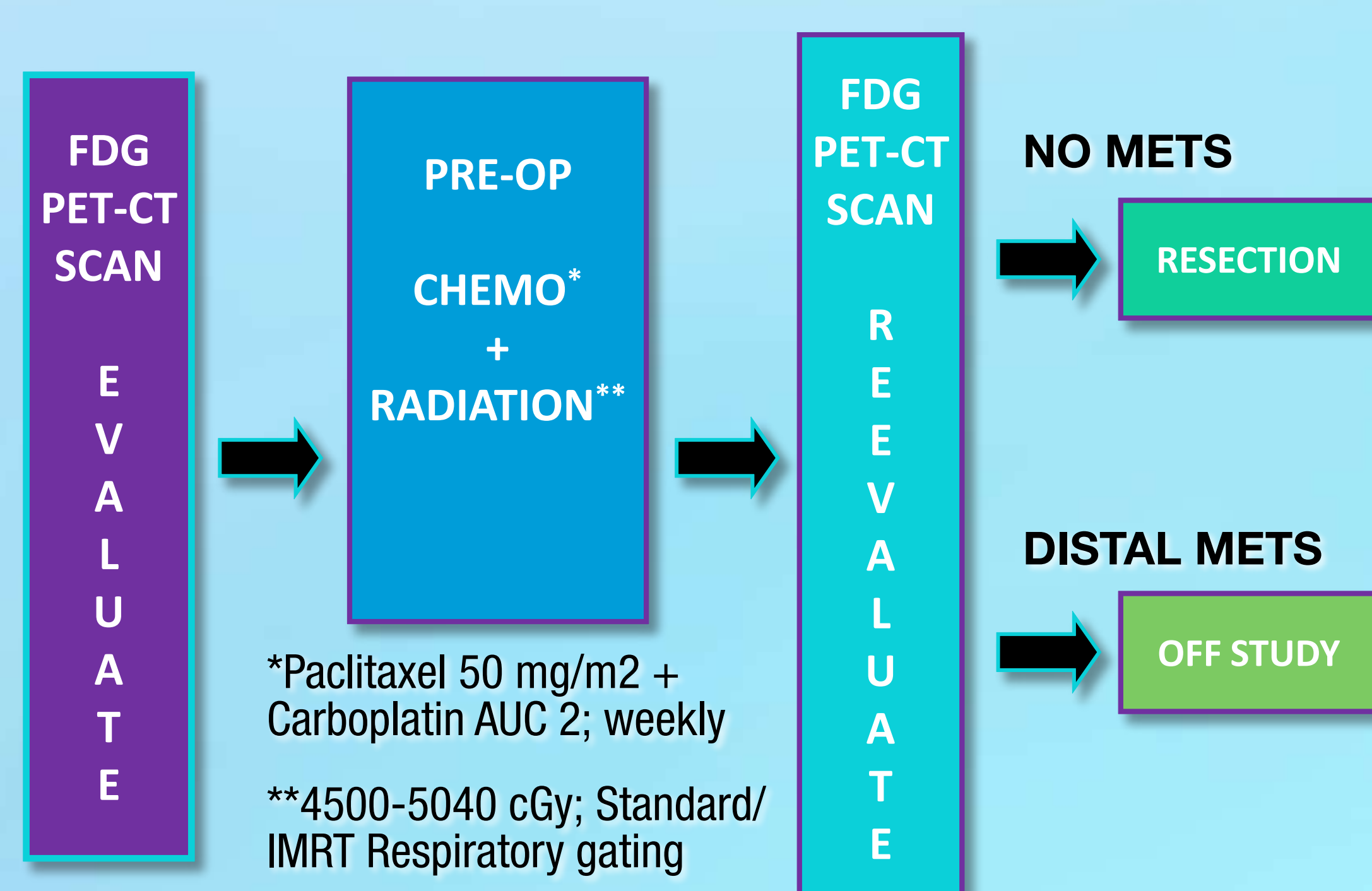
## Primary Tumor Percent Decrease in SUV<sub>max</sub>



## Patients

- Mean age
  - 57.7 years old (49 – 77)
- Gender
  - 7male
  - 8 female
- Stage
  - IIIA
    - T<sub>1</sub>N<sub>2</sub>M<sub>0</sub> – 1 patient
    - T<sub>2</sub>N<sub>2</sub>M<sub>0</sub> – 5 patients
    - T<sub>3</sub>N<sub>2</sub>M<sub>0</sub> – 5 patients
  - IIIB
    - T<sub>4</sub>N<sub>0</sub>M<sub>0</sub> – 3 patients
    - T<sub>4</sub>N<sub>2</sub>M<sub>0</sub> – 1 patient
- Pathology
  - Adenocarcinoma - 8/15
  - Squamous Cell Carcinoma - 4/15
  - Adenosquamous - 3/15

## Treatment Schema



## Conclusions

- FDG PET-CT can detect a decrease in SUV<sub>max</sub> within two weeks of completing neo-adjuvant chemotherapy and radiation therapy
- The percent change in SUV<sub>max</sub> before and after neo-adjuvant therapy is not predictive of pathological findings at the time of surgery
- FDG PET-CT is useful in identifying metastatic disease that appears after neo-adjuvant therapy, obviating surgery
- Increase of sample size in the future may enable us to demonstrate utility of FDG PET-CT in determining pathological response to therapy

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