

# Endoskopisk ultralyd i relation til lungekræftudredning

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**Endoscopic Ultrasound in Airways and  
Esophagus in Suspected Lung Cancer:  
Rational Tissue Sampling**



PhD Thesis | Ida Skovgaard Christiansen

# Indhold

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Baggrund

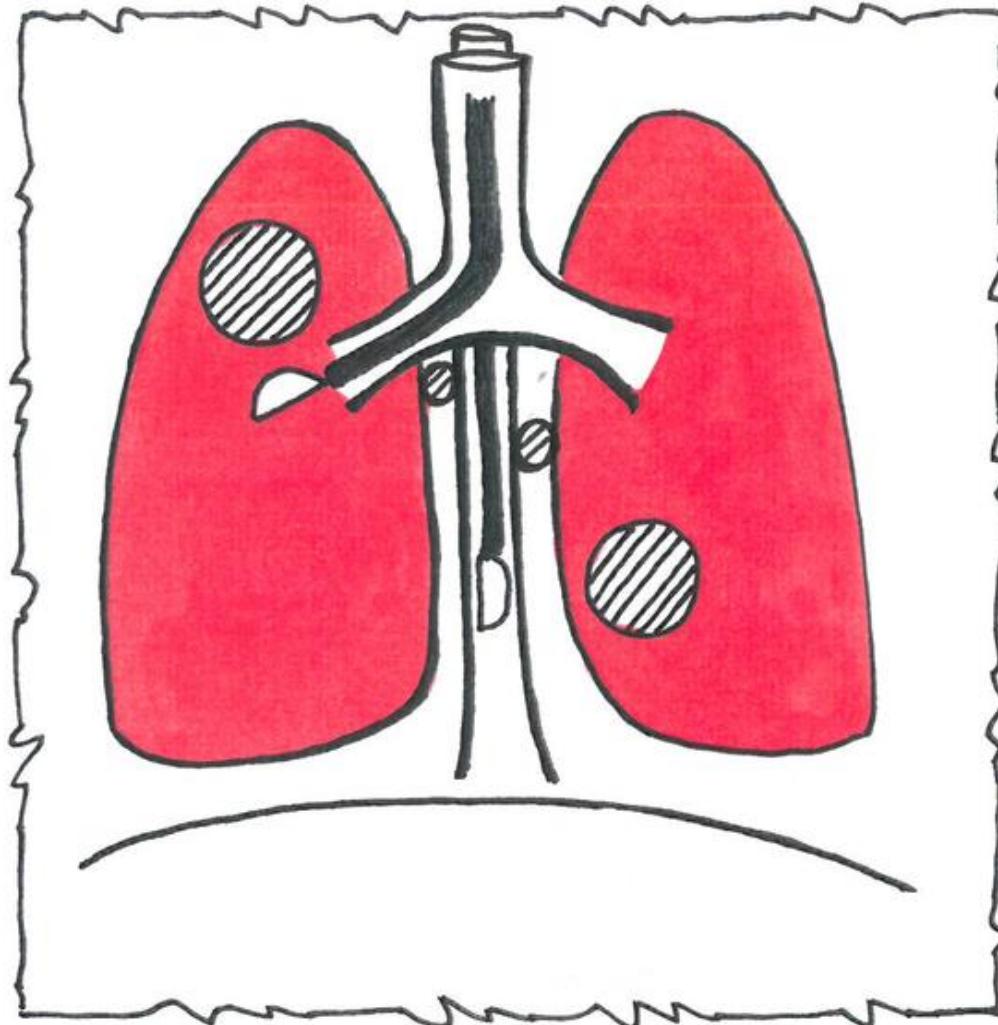
EUS-B og

- Tumor – Studie I + II
- Metastaser – Studie III + IV
- Sikkerhed – Studie V

Hovedbudskab

# Udredning af lungekræft

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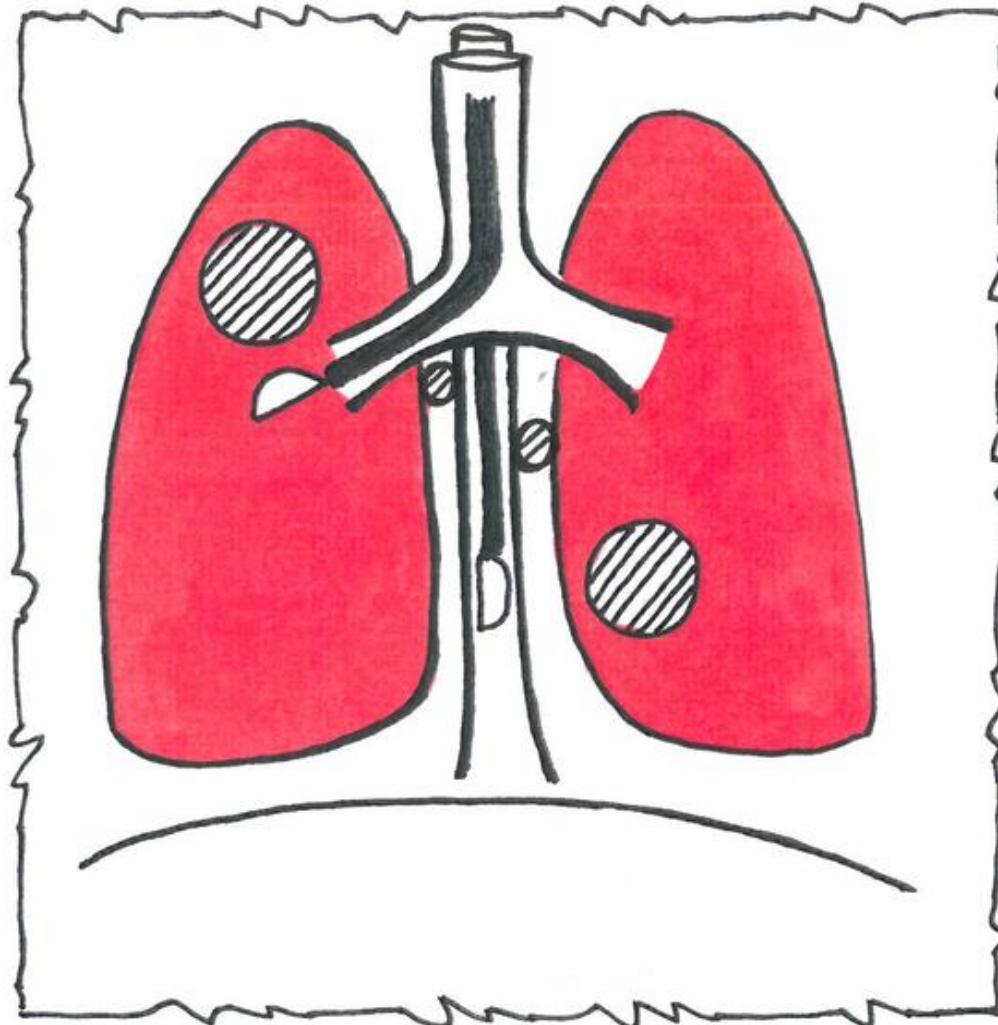


Spørgsmål:

- 1) Er det kræft?
- 2) Hvilken type?
- 3) Hvilket stadium?

# Udredning af lungekræft

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T – tumor

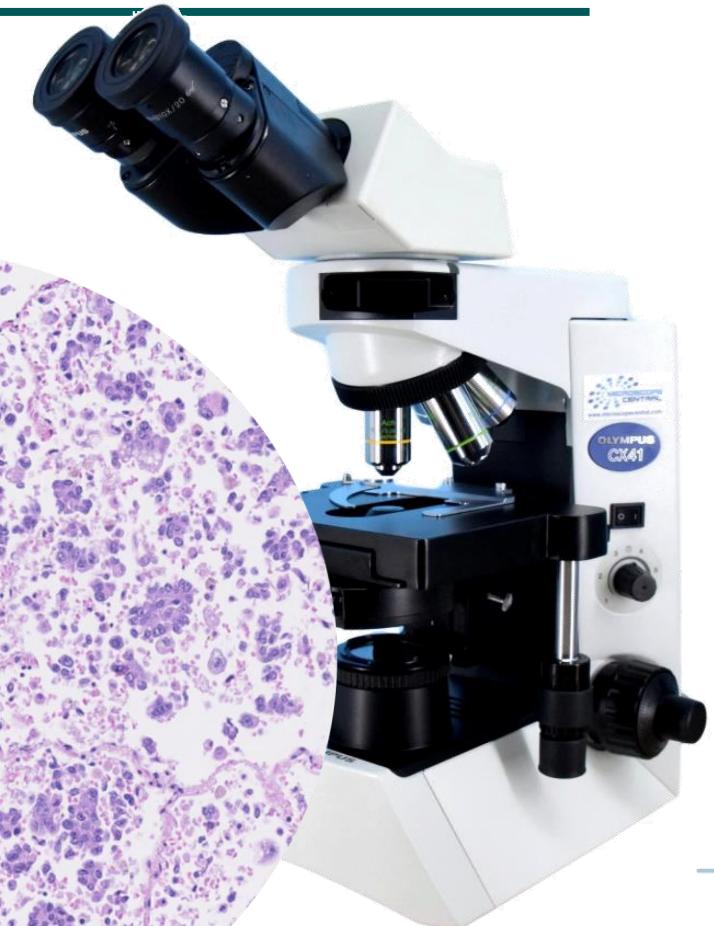
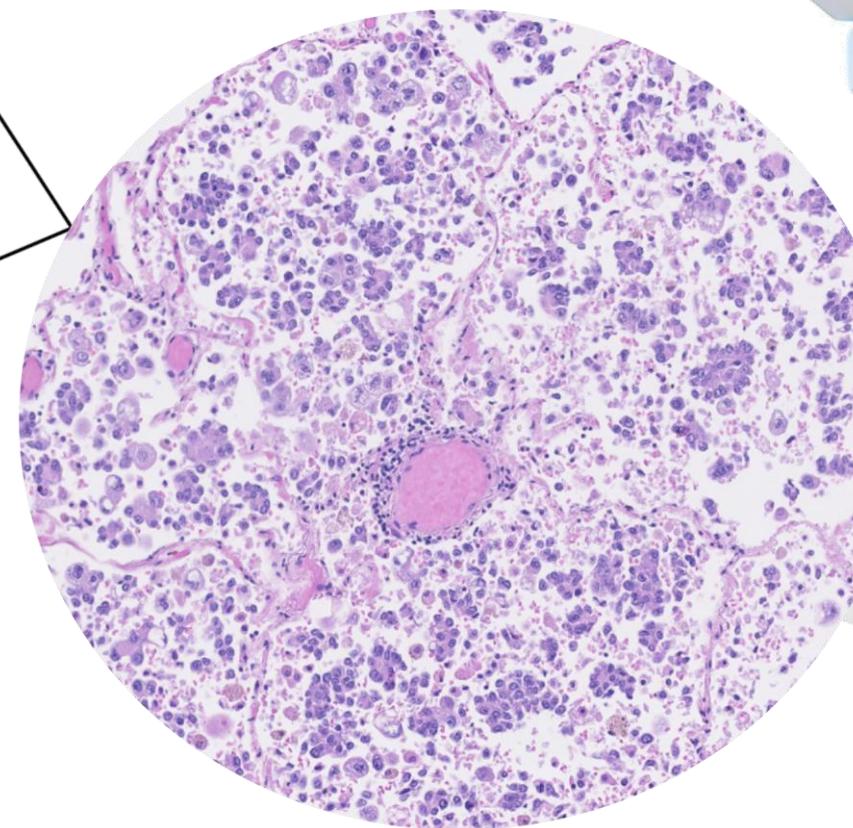
N – lymfeknuder

M – metastaser

Behandlingsbeslutning

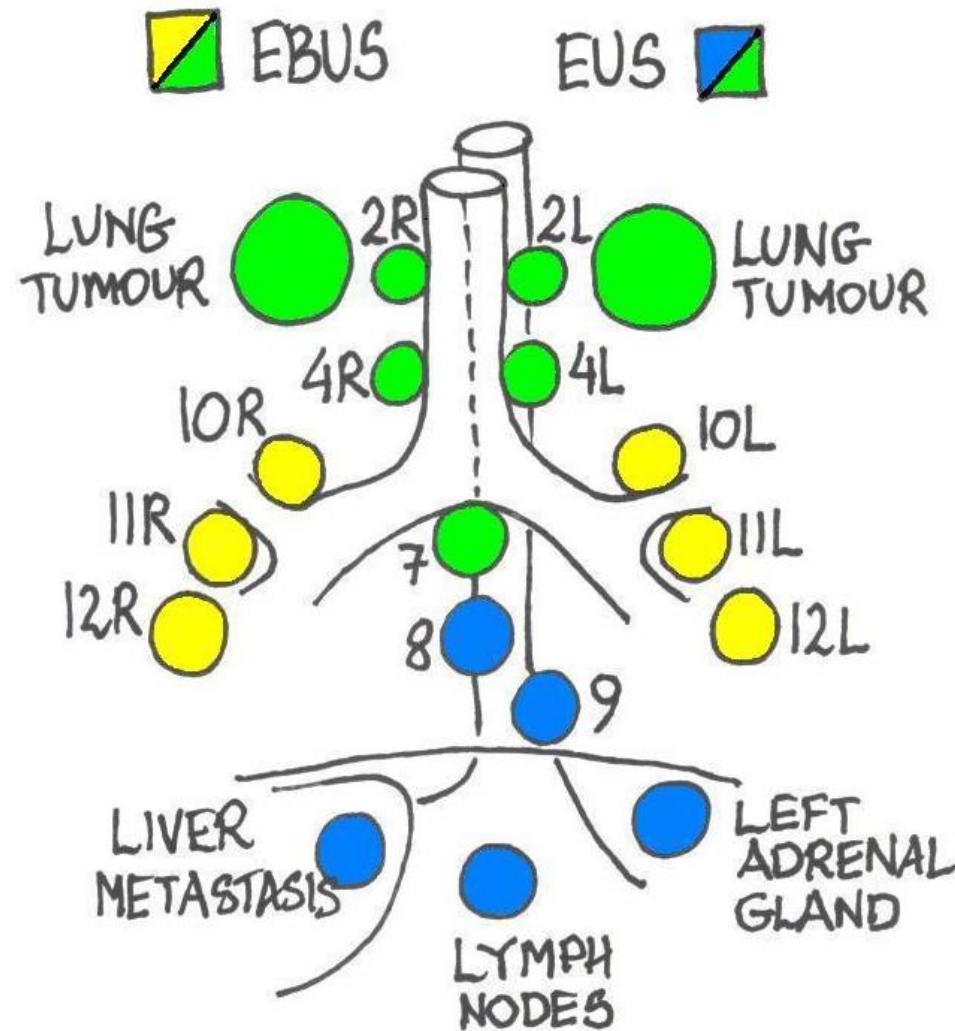
# Tissue is the issue

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# Endoskopisk ultralyd

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# EUS-B

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EUS med EBUS-endoskopet



# EUS-B i lungekræftudredningen

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EUS-B og TNM

T – tumor

N – lymfeknuder

M – metastaser

# Formål

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Undersøge EUS-B i lungekræftudredningen i relation til

Intrapulmonale tumorer

Strukturer under diafragma

Sikkerhed hos patienter med respirationsinsufficiens

# Intrapulmonale tumorer

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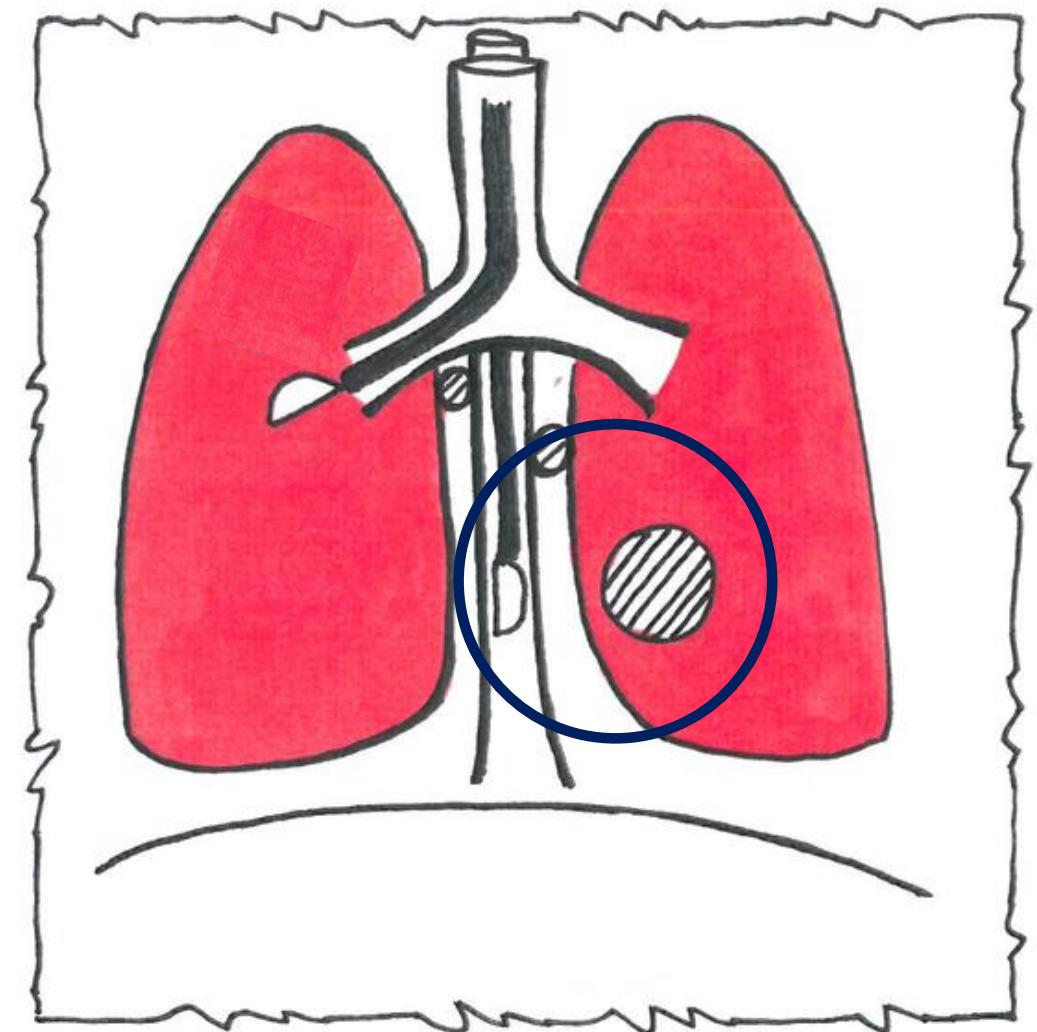
# Endoskopiske procedurer

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Bronkoskopi – tumorer inde i luftvejene

EBUS – tumorer lige udenfor luftvejene

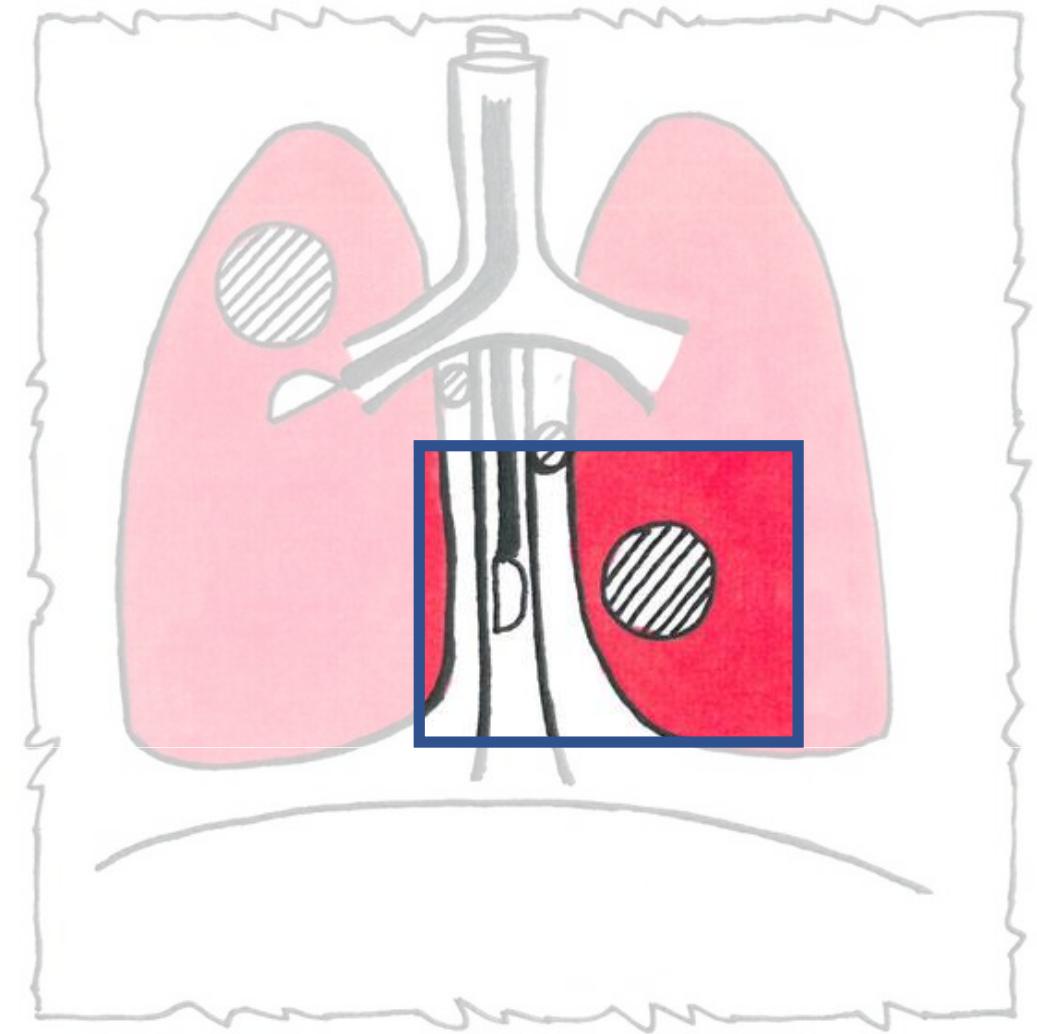
EUS-B – tumorer lige udenfor esophagus



# Intrapulmonale tumorer og EUS-B

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Anbefalet i de europæiske retningslinjer



# Studie I

Respiration

## Clinical Investigations

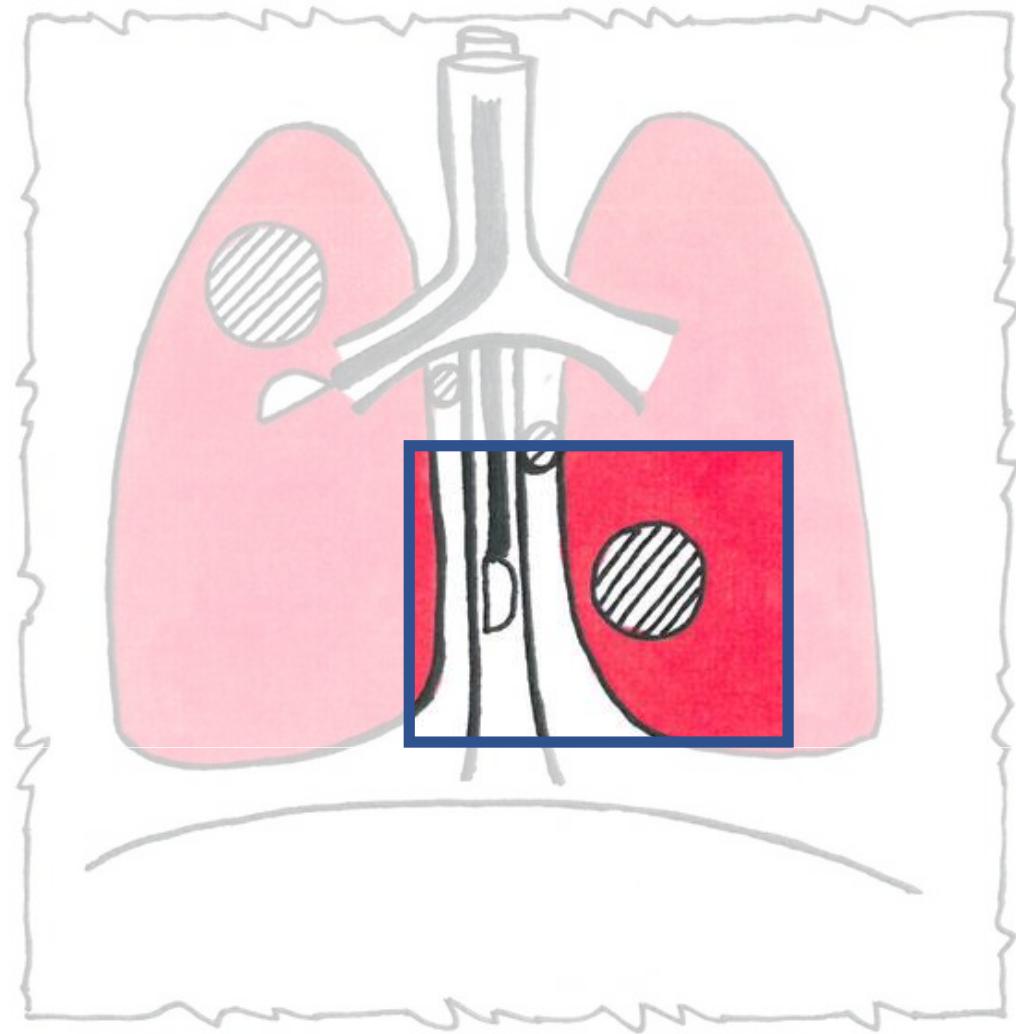
Respiration 2019;97:277–283  
DOI: 10.1159/000492578

Received: May 3, 2018  
Accepted after revision: July 25, 2018  
Published online: September 25, 2018

### Endoscopic Ultrasound with Bronchoscope-Guided Fine Needle Aspiration for the Diagnosis of Paraesophageally Located Lung Lesions

Ida Skovgaard Christiansen<sup>a,b</sup> Jolanda Corina Kuijvenhoven<sup>e</sup> Uffe Bodtger<sup>a,c</sup>  
Therese Maria Henriette Naur<sup>b,d</sup> Khalid Ahmad<sup>b</sup> Jatinder Singh Sidhu<sup>b</sup> Rafi Nessar<sup>a</sup>  
Goran Nadir Salih<sup>a</sup> Asbjørn Høegholm<sup>b</sup> Jouke Tabe Annema<sup>e</sup> Paul Frost Clementsen<sup>a,c</sup>

- EUS-B af intrapulmonale tumorer: sensitivitet på 90%
- Når tilføjet til bronkoskopi og EBUS blev diagnostisk udbytte øget



# Studie II

Respiration

Interventional Pulmonology

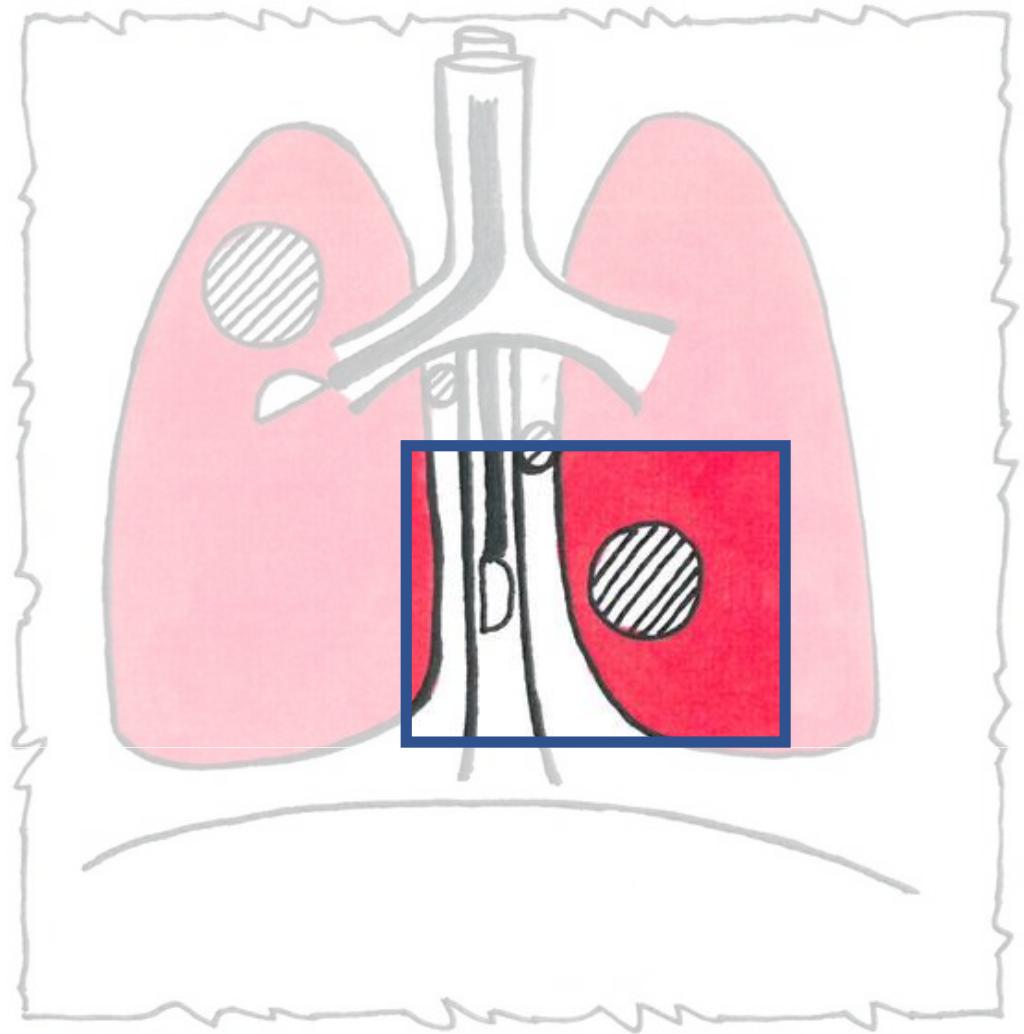
Respiration  
DOI: 10.1159/000512074

Received: July 1, 2020  
Accepted: September 22, 2020  
Published online: January 21, 2021

## Characterization of Lung Tumors that the Pulmonologist can Biopsy from the Esophagus with Endosonography (EUS-B-FNA)

Ida Skovgaard Christiansen<sup>a,c</sup> Morten Bo Søndergaard Svendsen<sup>b</sup>  
Uffe Bodtger<sup>a,c,d</sup> Jatinder Singh Sidhu<sup>c</sup> Rafi Nessar<sup>a</sup> Goran Nadir Salih<sup>a</sup>  
Asbjørn Høegholm<sup>c</sup> Paul Frost Clementsen<sup>a,b,e</sup>

Vurdering af tumor-størrelse og afstand fra esophagus kan bruges til at hjælpe med at prædiktere om tumoren kan biopteres



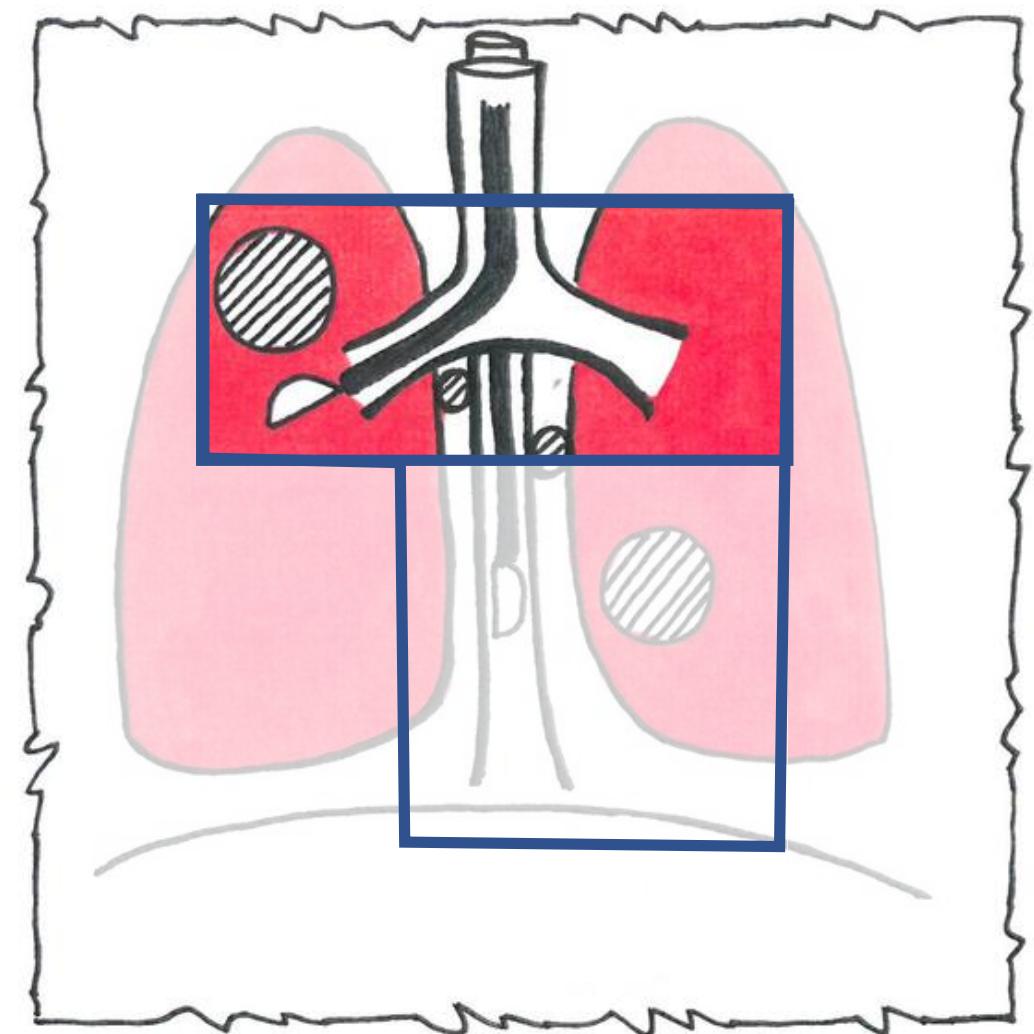
# Intrapulmonale tumorer

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Høj sensitivitet af EUS-B

Tilføjelse til bronkosopi og EBUS

-øger det anatomiske areal tilgængeligt  
for endoskopisk bioptering



# Intrapulmonale tumorer

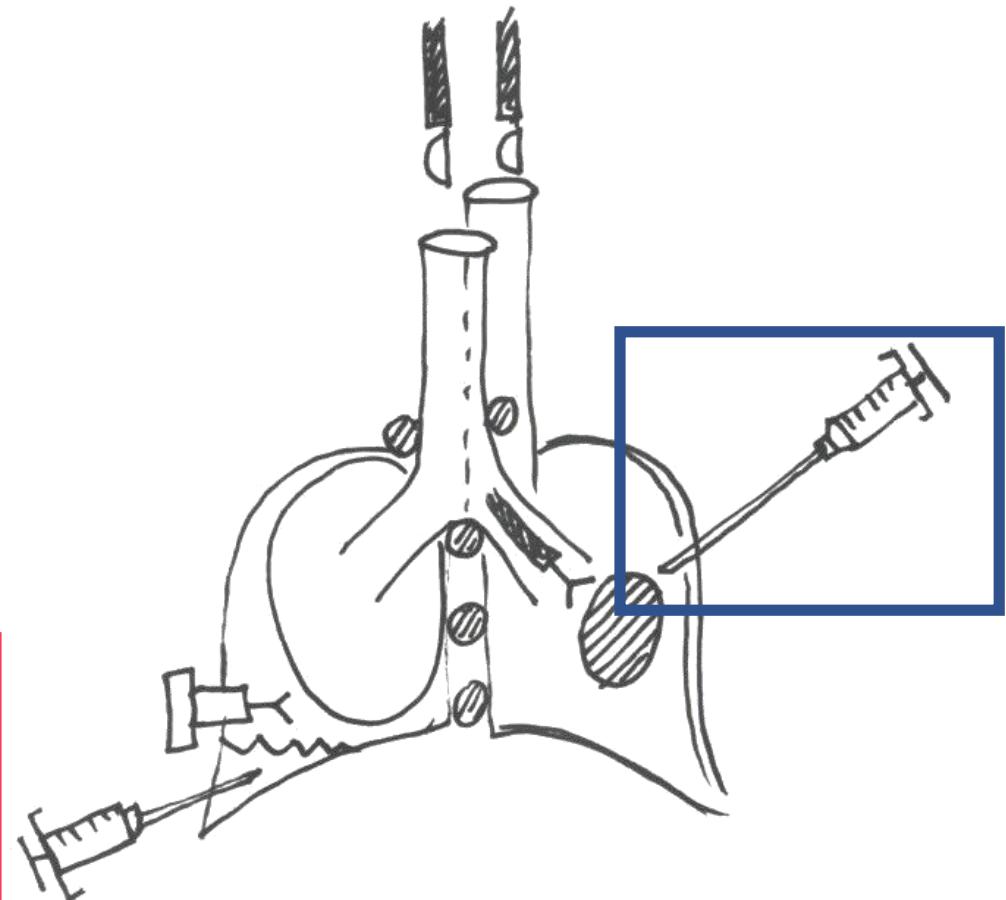
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Høj sensitivitet af EUS-B

Tilføjelse til bronkosopi og EBUS

Alternative procedurer

EUS-B af lungetumorer udvider  
mulighederne for endoskopisk biptering



# Strukturer under diafragma

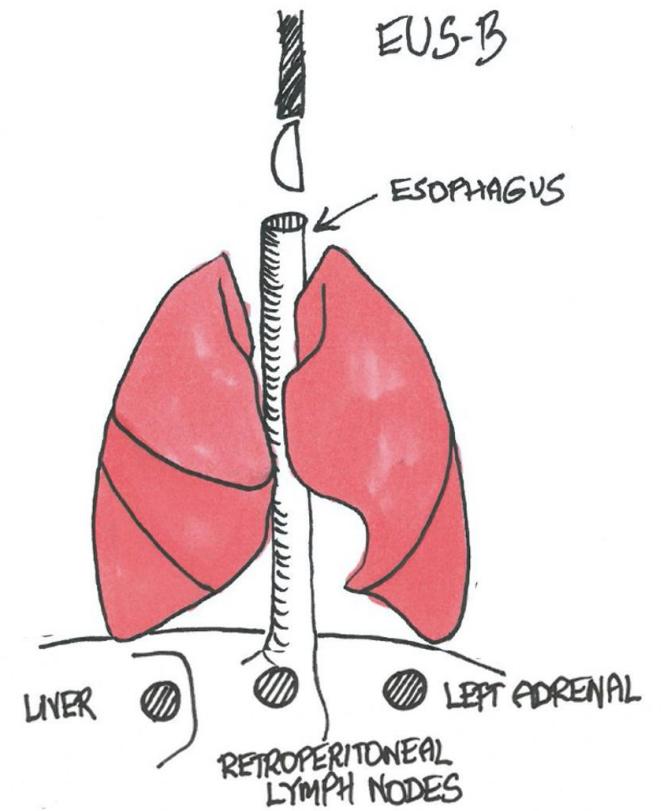
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# Strukturer under diafragma

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Ekstrathorakale metastaser –stage IV

Strukturer under diafragma kan biopteres med endoskopisk ultralyd

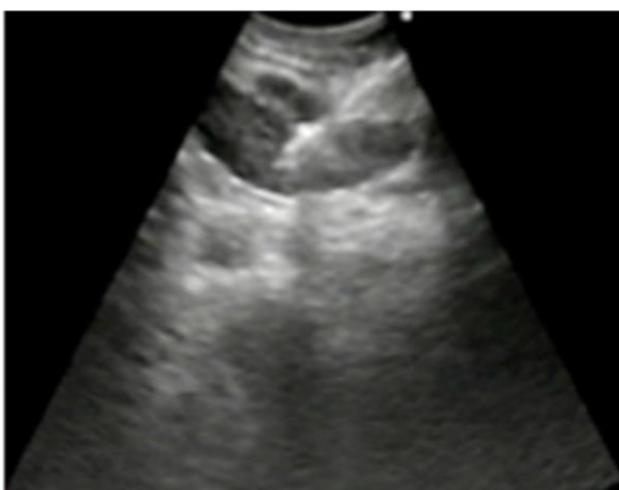
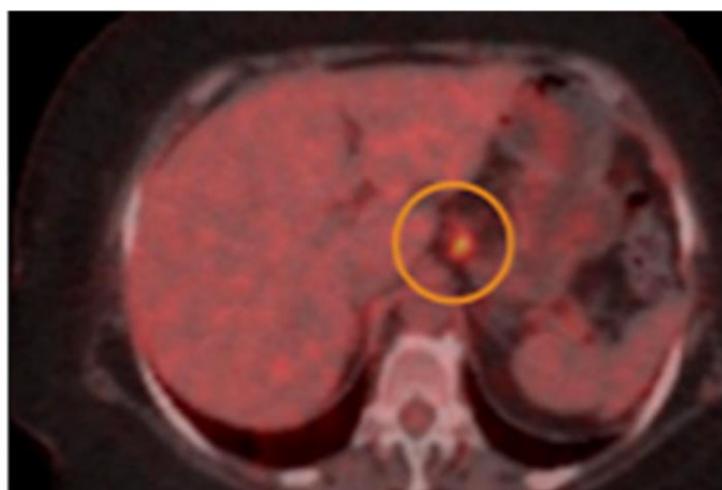


# EUS-B under diafragma

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Lever læsioner

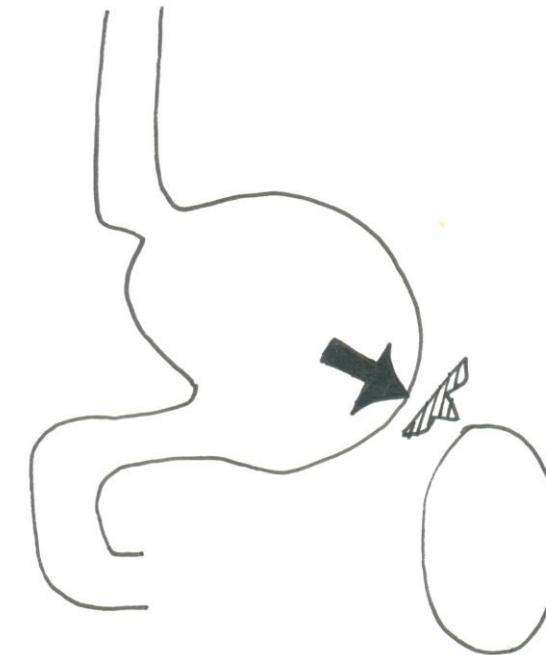


Retroperitoneale  
lymfeknuder

# EUS-B under diafragma

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Venstre binyre



# Studie III og IV

Respiration

Interventional Pulmonology

Respiration  
DOI: 10.1159/000501834

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Published online: September 27, 2019



Original Article

## EUS-B-FNA for Diagnosing Liver and Celiac Metastases in Lung Cancer Patients

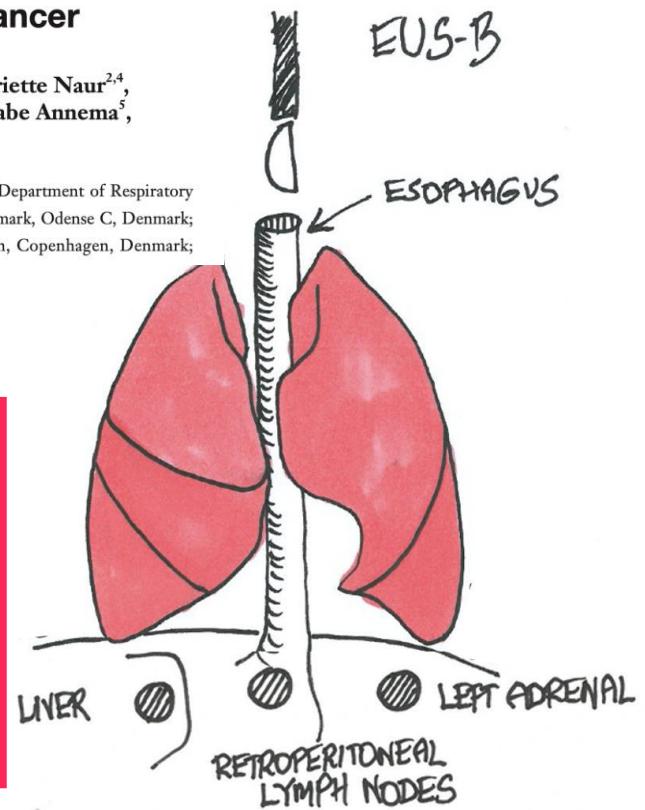
Ida Skovgaard Christiansen<sup>a,b</sup> Uffe Bodtger<sup>a,c</sup> Therese Maria Henriette Naur<sup>b,d</sup>  
Khalil Ahmad<sup>b</sup> Jatinder Singh Sidhu<sup>b</sup> Rafi Nessar<sup>a</sup> Goran Nadir Salih<sup>a</sup>  
Asbjørn Høegholm<sup>b</sup> Jouke Tabe Annema<sup>e</sup> Paul Frost Clementsen<sup>a,d,f</sup>

## EUS-B for suspected left adrenal metastasis in lung cancer

Ida Skovgaard Christiansen<sup>1,2#</sup>, Khalil Ahmad<sup>2#</sup>, Uffe Bodtger<sup>1,2,3</sup>, Therese Maria Henriette Naur<sup>2,4</sup>,  
Jatinder Singh Sidhu<sup>2</sup>, Rafi Nessar<sup>1</sup>, Goran Nadir Salih<sup>1</sup>, Asbjørn Høegholm<sup>2</sup>, Jouke Tabe Annema<sup>5</sup>,  
Paul Frost Clementsen<sup>1,4,6</sup>

<sup>1</sup>Department of Internal Medicine, Unit of Respiratory Medicine, Zealand University Hospital, Roskilde, Denmark; <sup>2</sup>Department of Respiratory Medicine, Næstved Hospital, Næstved, Denmark; <sup>3</sup>Institute for Regional Health Research, University of Southern Denmark, Odense C, Denmark;  
<sup>4</sup>Copenhagen Academy for Medical Education and Simulation (CAMES), Rigshospitalet, University of Copenhagen, Copenhagen, Denmark;

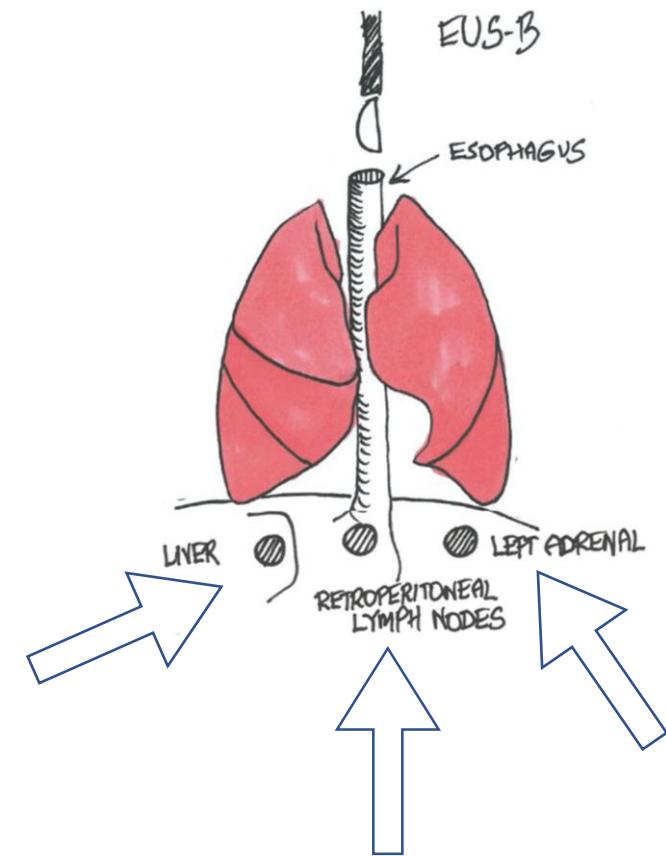
EUS-B udført i en kombineret endoskopisk lungekræftudredning kan bruges til bioptering af lever læsioner, retroperitoneale lymfeknuder og venstre binyre



# Strukturer under diafragma

## Alternative procedurer

EUS-B af strukturer under diafragma  
muliggør M klassifikation i samme session som  
T og N klassifikation



# Sikkerhed hos patienter med respirations insufficiens

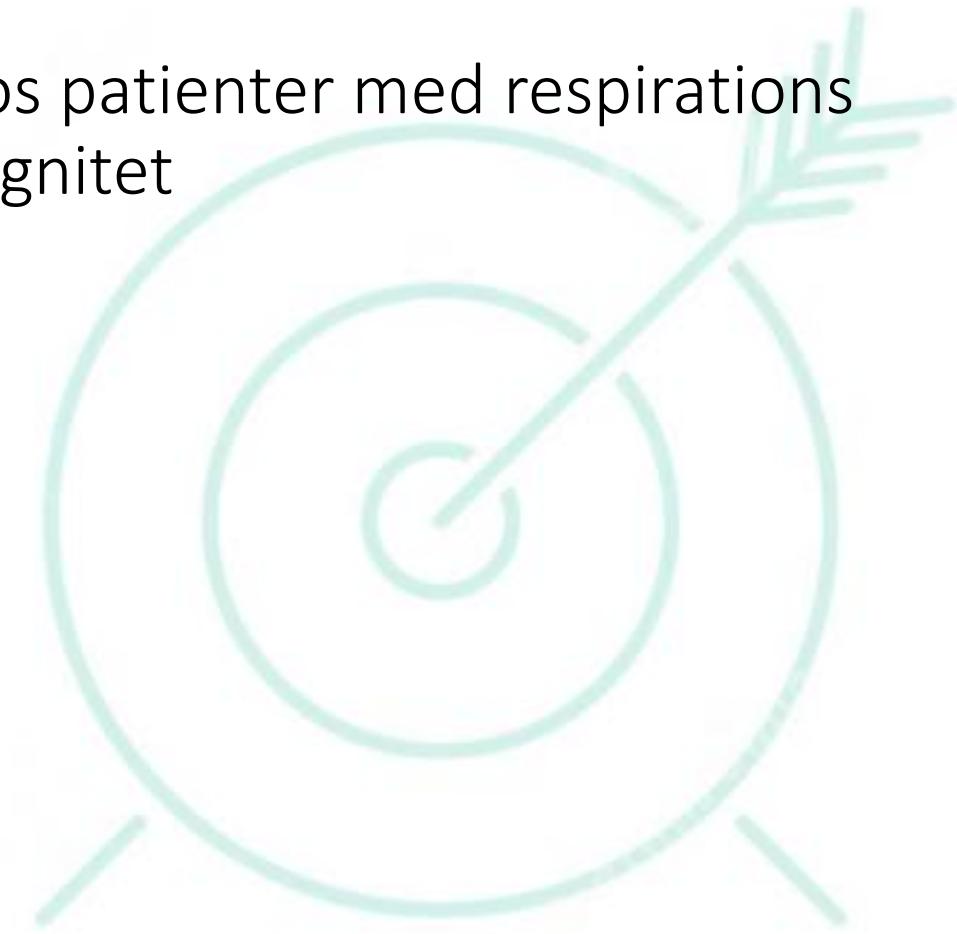
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# Studie V

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At undersøge sikkerheden af EUS-B hos patienter med respirations insufficiens og mistænkt thorakal malignitet



# Metode

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## Inklusion

- Indikation for EUS-B af læsioner nær esophagus
- EUS-B forventet at være eneste procedure nødvendig for diagnostisk afklaring
- Alvorlig respirationsinsufficiens defineret som
  - Iltmætning  $\leq 90\%$
  - Behov for kontinuert iltilskud
  - mMRC  $\geq 3$

# Primære outcome

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Procedurerelaterede adverse events

Under procedure

1 time efter procedure

# Definitioner

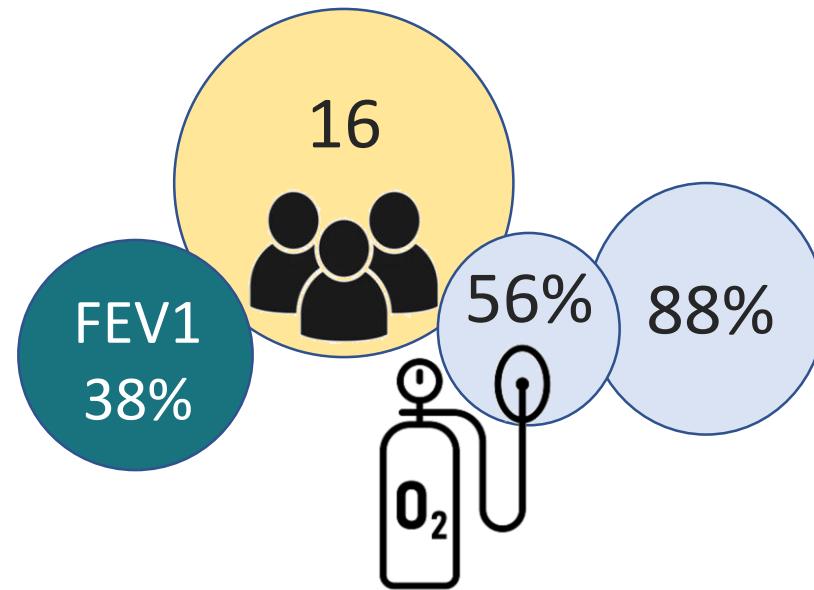
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## Adverse events

- Hypoxi eller øget ilttilskud
- Enhver episode med behov for intervention (fx voldsom hoste, opkast eller blødning)

# Resultater

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EUS-B proceduren gav diagnostisk afklaring i 81% af procedurerne.

# Adverse events

Adverse Events	Under procedure	Post procedure
Totalt antal af events, n	12	3
Hypoxi	10	3
Fald i systolisk blodtryk	1	0
Fald i respirationsfrekvens og somnolence	1	0
Procedurer med events, n (%)	8 (50%)	2 (13%)

# Studie V

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EUS-B var sikker i patienter med respirationsinsufficens.  
Halvdelen af patienterne havde milde events under  
proceduren. Ingen alvorlige events.



# Sikkerhed

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## Alternative procedurer

EUS-B er en sikker metode til at opnå  
diagnostisk afklaring



# Kliniske implikationer

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Fordelene ved EUS-B

- I Kombineret endobronkial og esofageal endoskopi med ét endoskop
- II Arealet for biottering i samme session udvidet
- III Sikker diagnostisk mulighed for patienter med respiratorisk insufficiens

# Implementering

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Træning i proceduren

Guideline

Udstyr



