



UZ
LEUVEN



IMRT/VMAT era: Added value of EBUS-TBNA-mapping to FDG-PET-CT

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Background

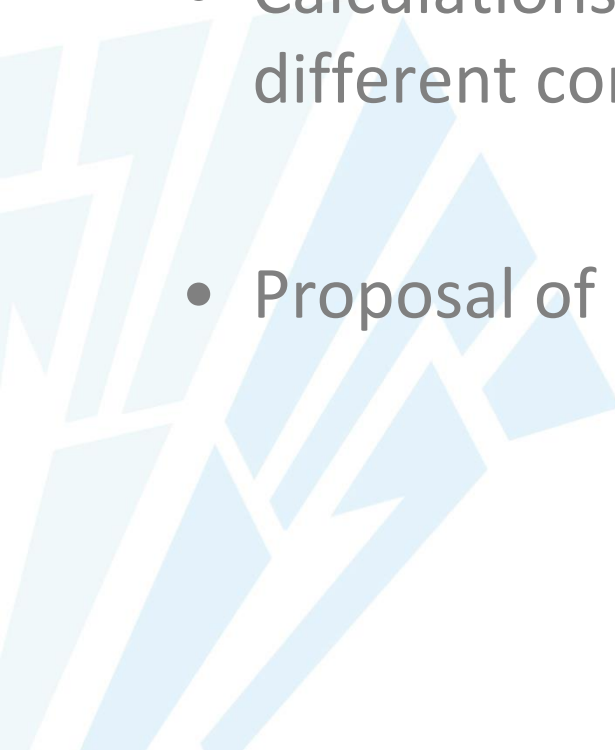
- Radiotherapy for stage III NSCLC: PET-CT based delineation of lymph nodes is safe with 3D-CRT*
- IMRT/VMAT: ↓ incidental nodal irradiation
→ PET-CT based delineation still safe?

Benefit of adding EBUS-TBNA mapping of mediastinal LN?

Aims

1. To provide a practical **algorithm** for the radiation oncologist on when to include LNs in the GTV for locally advanced NSCLC using PET-CT and EBUS-TBNA
2. To **test** this algorithm on patients treated with RT and evaluate the impact on the nodal GTV

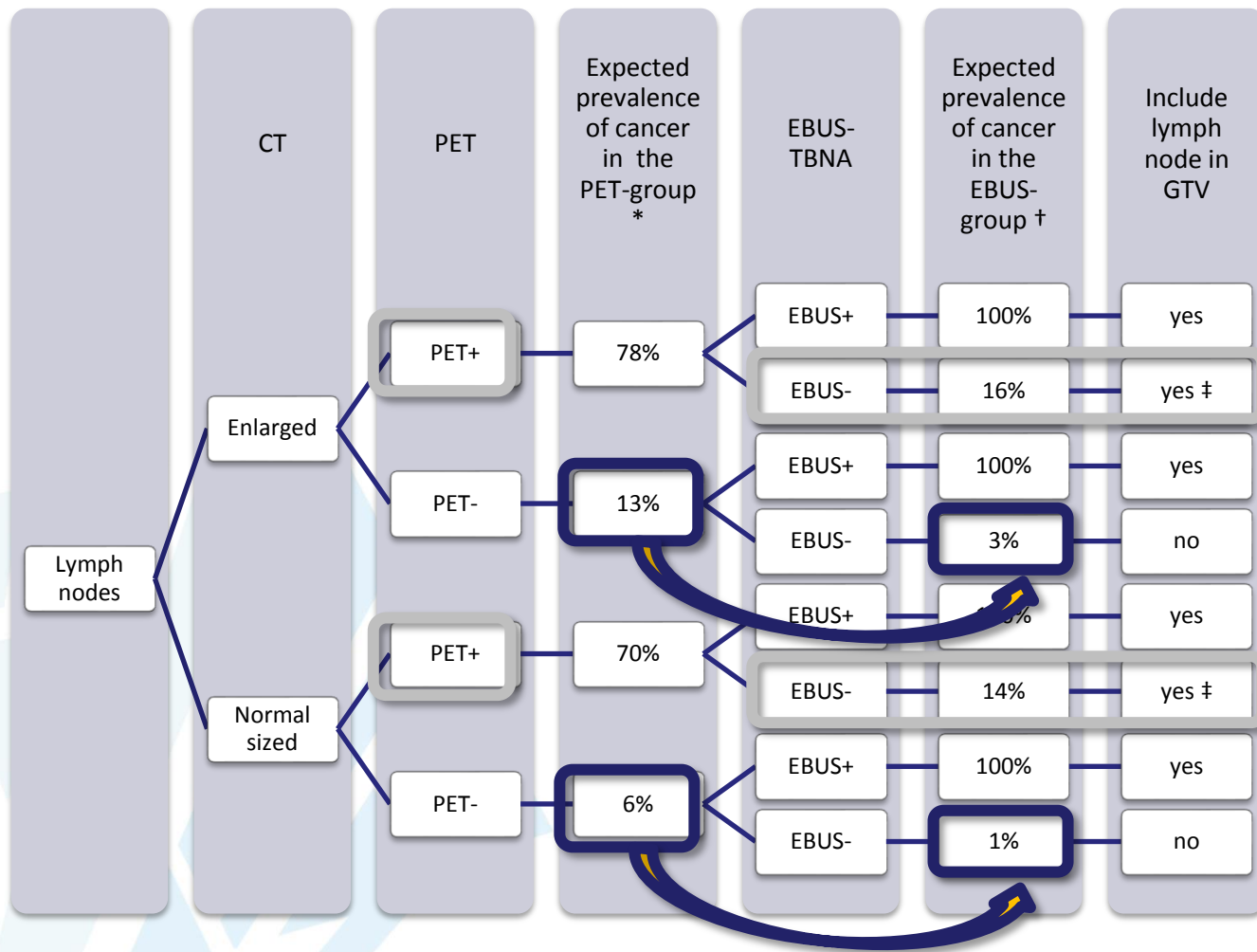
Methods: algorithm

- Literature data with sensitivity and specificity data on EBUS-TBNA in FDG-PET-CT staged NSCLC
 - Calculations of expected prevalence of LN+ for different constellations of CT, PET and EBUS-TBNA
 - Proposal of a practical algorithm
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Methods: patient data

- Test of the proposed algorithm on consecutive patients referred for RT who underwent full mediastinal mapping with EBUS-TBNA for PET-CT based N2/N3-disease
- Visual analysis of CT and PET of all mediastinal and hilar lymph nodes
- EBUS: inspection of LNs reachable by EBUS, and TBNA in enlarged or suspicious LNs

Results: algorithm



Include PET+ & EBUS- LN in GTV
→ No ↓ in nodal GTV volume

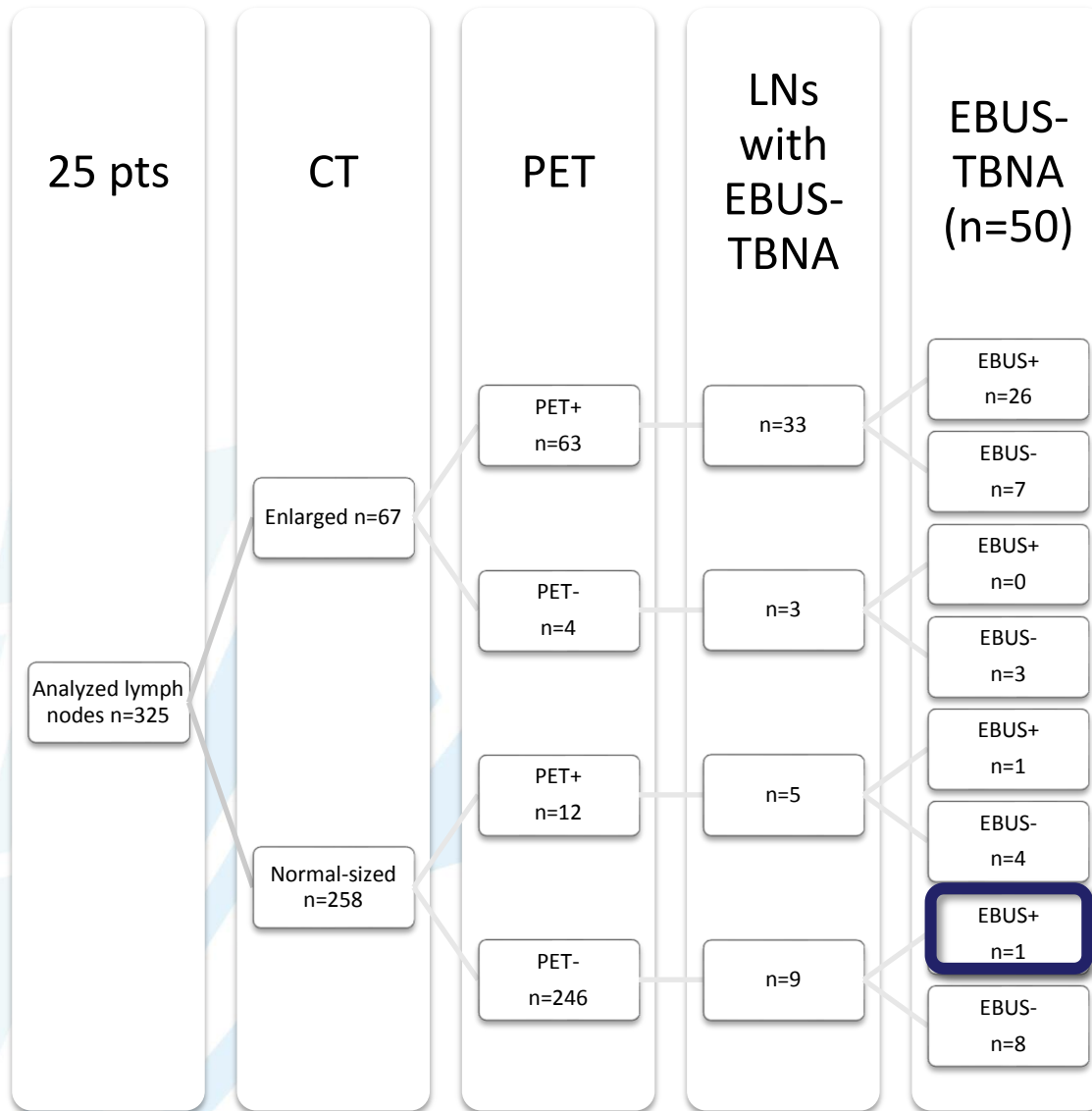
↓ False Negative rate with EBUS

* based on Hellwig et al. (Nuklearmedizin 2009): 5 meta-analyses

† prevalence of cancer taking into account a FN rate of EBUS of 20% (Detterbeck Chest 2007)

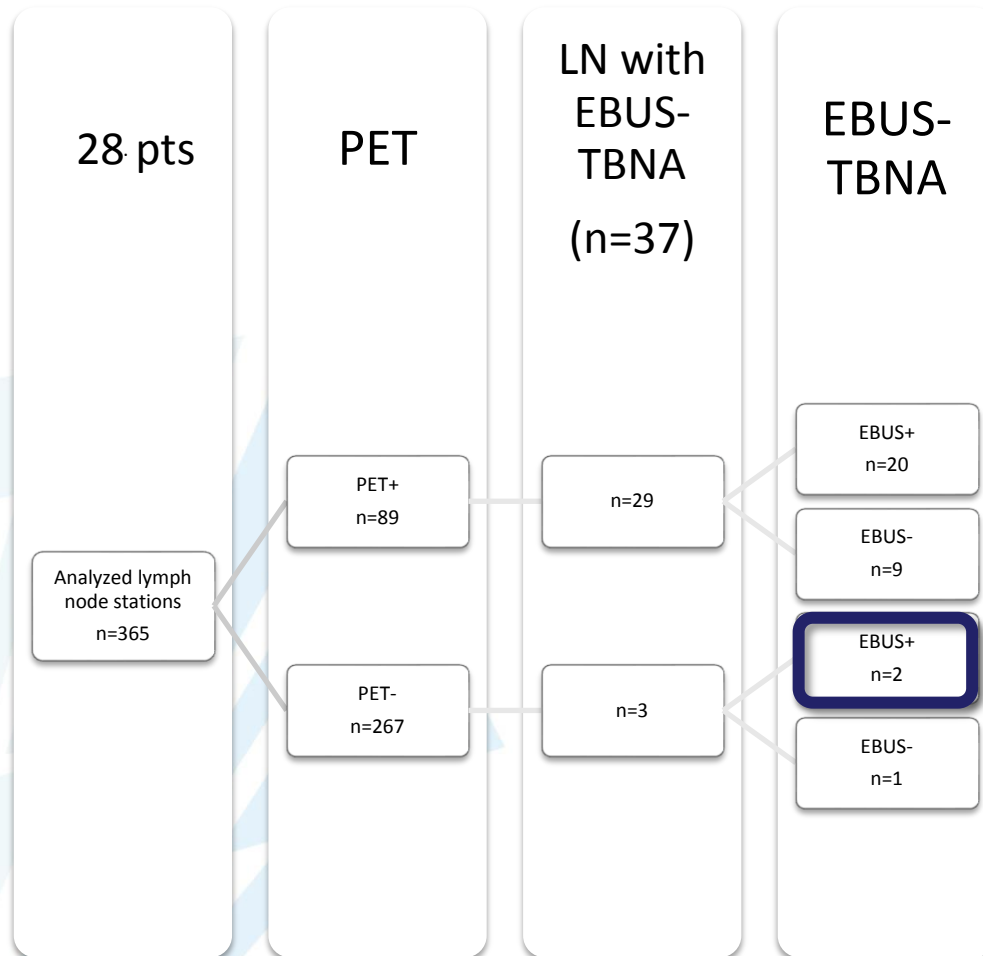
‡ With exception of symmetrical FDG-PET positive LN with a non-malignant diagnosis (anthracosis, silicosis, granulomatous disease) after adequate full EBUS-mapping

Results: Patient data Leuven



**1/25 patients (4 %)
geographical miss
with PET-CT only**

Results: Patient data Maastricht/ Heerlen



**2/28 patients (7 %)
geographical miss
with PET-CT only**

Conclusions

- When incidental nodal irradiation is low, such as in IMRT or VMAT, EBUS-TBNA should be added to FDG-PET-CT for mediastinal staging
- PET-positive and EBUS-negative LNs should be included in the GTV as false negative-rates remain high
- Adding EBUS-TBNA to FDG-PET-CT decreases the risk of geographical miss in 4-7 % of patients