TSTS 2019

# Management of Lung Nodules-MMH experences

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# 2018 台灣10大死因分析

| | 死亡人數(人) | | 死亡率(每十萬人口) | | | |
|---|---|---|---|---|---|---|
| | 107年 | 較上年增減% | 106年順位 | 107年順位 | 107年 | 較上年增減% |
| 所有死亡原因 | 172,859 | 0.6 | | | 733.1 | 0.5 |
| 1.癌症 | 48,784 | 1.6 | 1 | 1 | 206.9 | 1.5 |
| 2.心臟疾病（高血壓性疾病除外） | 21,569 | 4.5 | 2 | 2 | 91.5 | 4.5 |
| 3.肺炎 | 13,421 | 7.5 | 3 | 3 | 56.9 | 7.4 |
| 4.腦血管疾病 | 11,520 | -2.0 | 4 | 4 | 48.9 | -2.0 |
| 5.糖尿病 | 9,374 | -4.8 | 5 | 5 | 39.8 | -4.8 |
| 6.事故傷害 | 6,846 | -1.7 | 6 | 6 | 29.0 | -2.0 |
| 7.慢性下呼吸道疾病 | 6,146 | -1.8 | 7 | 7 | 26.1 | -1.9 |
| 8.高血壓性疾病 | 5,991 | -1.3 | 8 | 8 | 25.4 | -1.6 |
| 9.腎炎、腎病症候群及腎病變 | 5,523 | 2.6 | 9 | 9 | 23.4 | 2.6 |
| 10.慢性肝病及肝硬化 | 4,315 | -5.2 | 10 | 10 | 18.3 | -5.2 |

| | 死亡人數(人) | | 死亡率(每十萬人口) | | | |
|---|---|---|---|---|---|---|
| | 107年 | 較上年增減數 | 106年順位 | 107年順位 | 107年 | 較上年增減% |
| 所有死亡原因 | 48,784 | 747 | | | 206.9 | 1.5 |
| 氣管、支氣管和肺癌 | 9,388 | 153 | 1 | 1 | 39.8 | 1.5 |
| 肝和肝內膽管癌 | 8,222 | -180 | 2 | 2 | 34.9 | -2.2 |
| 結腸、直腸和肛門癌 | 5,823 | 11 | 3 | 3 | 24.7 | - |
| 女性乳癌 | 2,418 | 41 | 4 | 4 | 20.4 | 1.5 |
| 口腔癌 | 3,027 | 185 | 5 | 5 | 12.8 | 5.8 |
| 前列腺(攝護腺)癌 | 1,377 | -15 | 6 | 6 | 11.8 | -0.8 |
| 胃癌 | 2,299 | -5 | 7 | 7 | 9.7 | -1.0 |
| 胰臟癌 | 2,292 | 210 | 8 | 8 | 9.7 | 10.2 |
| 食道癌 | 1,929 | 132 | 9 | 9 | 8.2 | 7.9 |
| 子宮頸及部位未明示子宮癌 | 653 | 2 | 10 | 10 | 5.5 | - |

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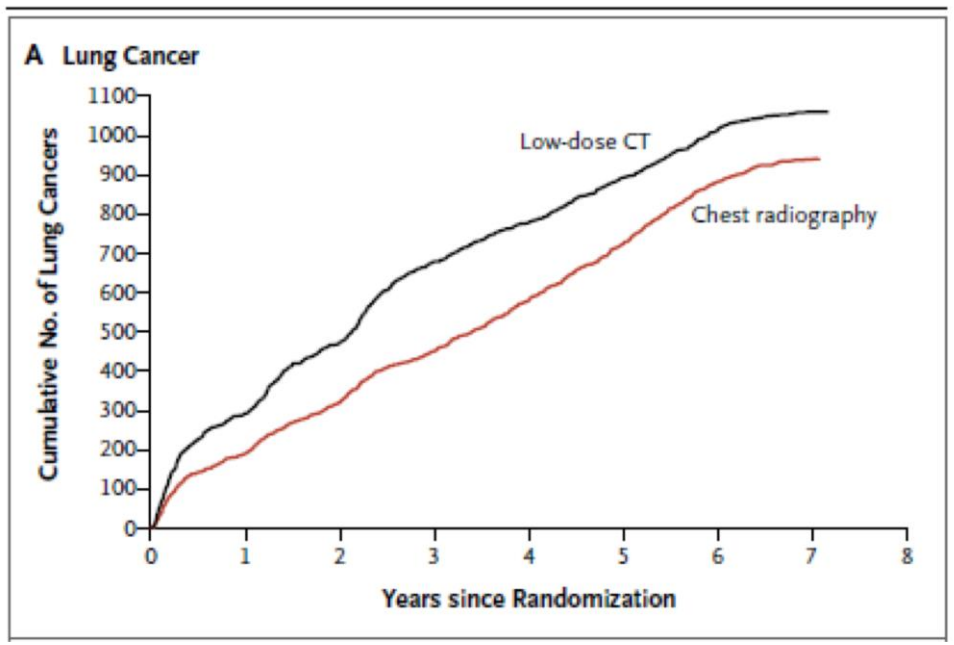
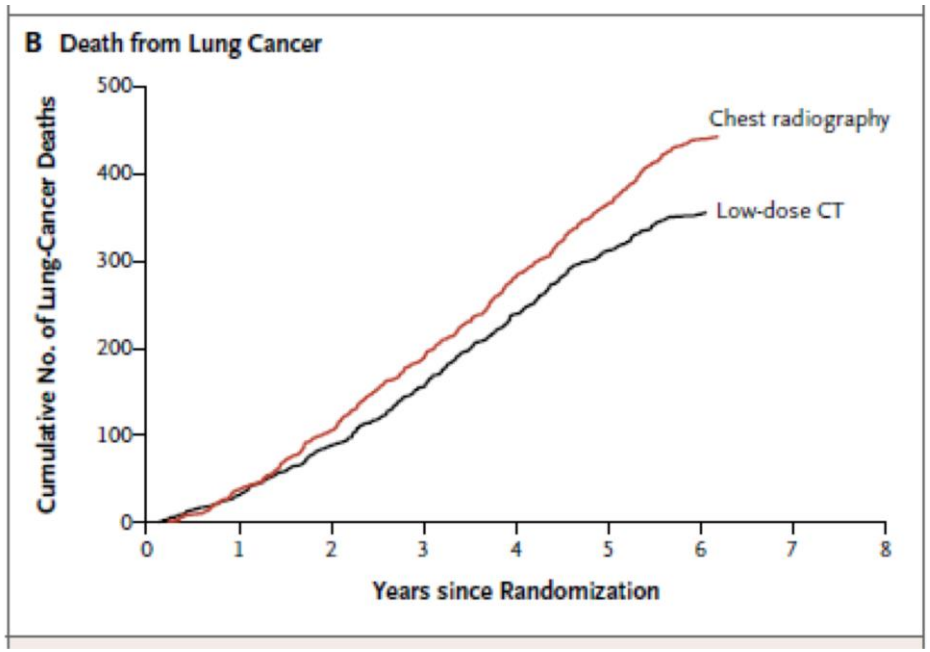
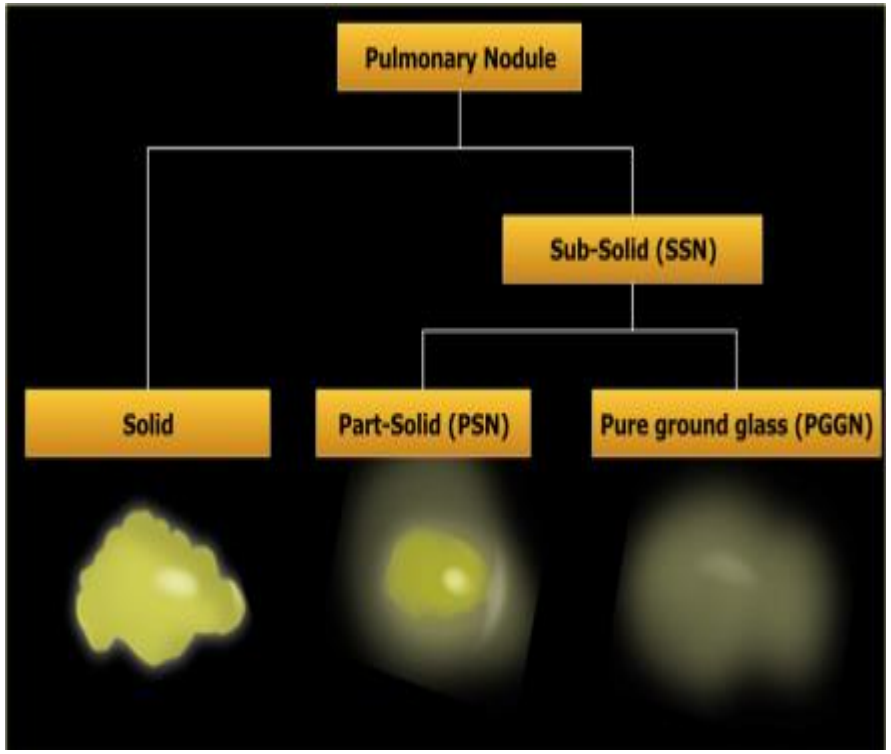
# Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening

The National Lung Screening Trial Research Team*

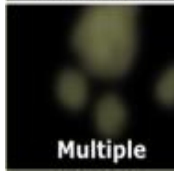


# Fleischner 2017 guideline for pulmonary nodules




| Solid | Size | Follow up | | |
|---|---|---|---|---|
|  | < 6 mm (<100mm$^3$) | Single | Low risk<br>High risk | No routine follow<br>Optional CT at 12 months |
| | | Multiple | Low risk<br>High risk | No routine follow<br>Optional CT at 12 months |
| | 6-8 mm (100-250mm$^3$) | Single | Low risk<br>High risk | CT at 6-12 mo, then consider CT at 18-24<br>CT at 6-12 mo, then CT at 18-24 |
| | | Multiple | Low risk<br>High risk | CT at 3-6 mo, then consider CT at 18-24<br>CT at 3-6 mo, then CT at 18-24 |
| | > 8 mm (> 250mm$^3$) | Single | All | Consider CT at 3 mo, PET/CT or Biopsy |
| | | Multiple | Low risk<br>High risk | CT at 3-6 mo, then consider CT at 18-24<br>CT at 3-6 mo, then CT at 18-24 |

| Subsolid | Size | Follow up |
|---|---|---|
|  Groundglass | < 6 mm | No FU indicated |
| | ≥ 6 mm | CT at 6-12 months to confirm persistence, then CT at 3 and 5 years |
|  Part-solid | < 6 mm | No FU indicated |
| | ≥ 6 mm | CT at 3-6 months to confirm persistence, then annual CT for 5 years |
|  Multiple | < 6 mm | CT at 3-6 months. If stable CT at 2 and 4 years |
| | ≥ 6 mm | CT at 3-6 months.<br>Subsequent management based on most suspicious nodule |

# Revised version 2019.08.17 肺癌團隊會議討論

- Subsolid nodule
  - **<5 mm**
    - → F/U, 3 months , 6 months, 12 months
    - → 有變大趨勢 或 出現 morphology 變化 → further investigation 或 繼續 f/u
    - → stable → 可不追蹤 或 評估風險後，每年追蹤 CT scan
    - → 消失 → 不追蹤
  - **5-8 mm**
    - → 至少 f/u 一次CT scan (high resolution CT scan, HRCT)
      - Pure GGO 建議三個月 f/u
      - 疑似soft tissue component→ 3-4 wks f/u CT scan , 用來排除發炎性腫塊
    - → 評估罹癌風險或病患意願 → 可以選擇三個月到半年再 f/u, 或 further investigation
    - → f/u 時出現 solid part (不計算大小)→ biopsy or surgery
    - → 消失 → 不追蹤
  - **>=8 mm**
    - 評估病患罹癌風險與病患意願，可以直接選擇 further investigation
    - 如果難以判斷或病患意願不高，可
      - Pure GGO → 三個月追蹤
      - 疑似 soft tissue component → 3-4 wks f/u CT scan，來排除發炎性腫塊
    - Stable → 持續評估病患癌症風險與病患意願
    - 消失 → 不追蹤

**Further Investigation：**
**Relevant cancer survey**
**Bronchoscopy (navigation/biopsy/ablation)**
**Surgical biopsy or excision**

- 建議 **每個肺腫瘤病患手術前，請住院醫師書寫病歷時加上 Brock Model**：
- https://www.uptodate.com/contents/calculator-solitary-pulmonary-nodule-malignancy-risk-in-adults-brock-university-cancer-prediction-equation

- References :
- Probability of cancer in pulmonary nodules detected on first screening CT**. N Engl J Med.** 2013 Sep 5;369(10):910.

# MMH experience (2018/11/01~2019/11/30)

-Single “Solid” lung nodule (< 3cm, no pre-op. diagnosis)

-Single or multiple “Subsolid” lung nodules (no pre-op. diagnosis)

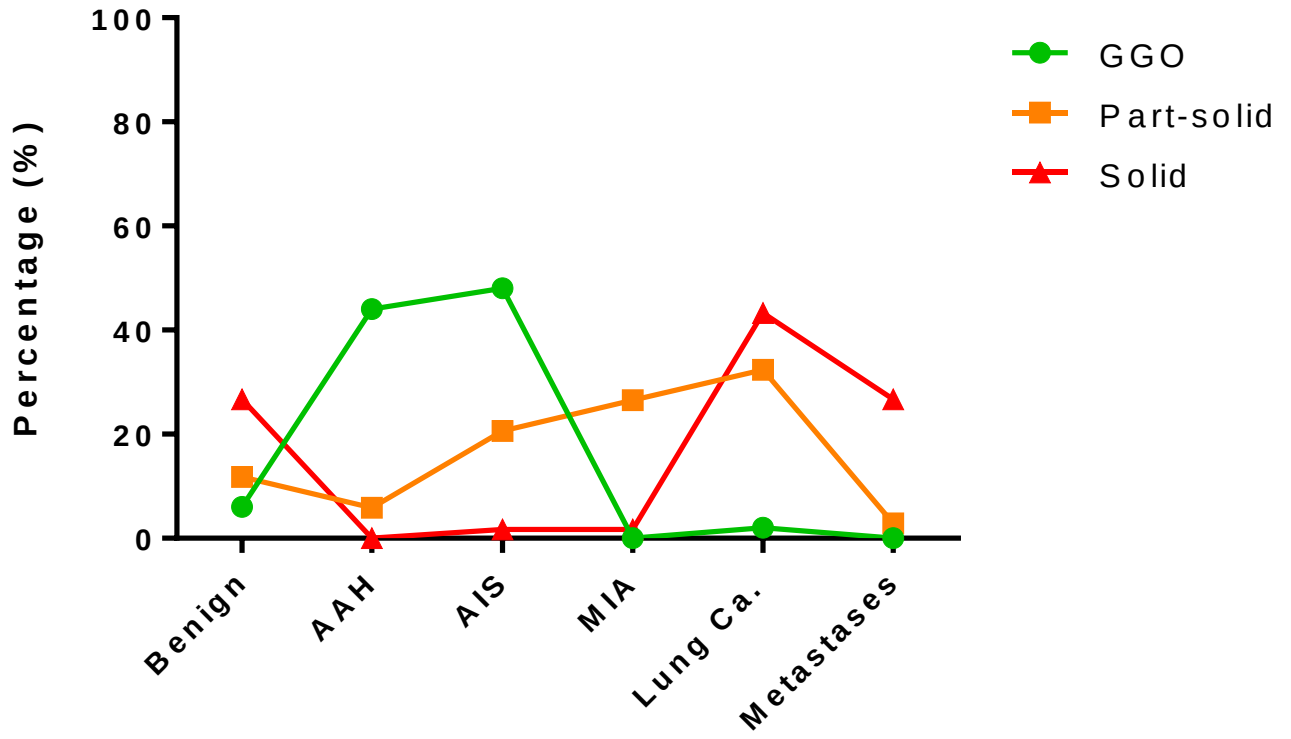
| | N(%) |
|---|---|
| **Patients** | **119** |
| Male | 44 (36%) |
| Female | 75 (63%) |
| **Nodules** | **144** |
| GGO | 46 (32%) |
| Part-solid | 38 (26.3%) |
| Solid | 60 (41.7%) |
| **Surgery** | 119 |
| Wedge (81 SITS; 1 two-ports) | 82 (66.1%) |
| Segmentectomy (SITS) | 19 (15.3) |
| Lobectomy (SITS) | 23 (18.6%) |

| | N(%) |
|---|---|
| **Tumor size** | |
| <0.5 mm | 10 |
| 0.5~0.8mm | 20 |
| >=0.8mm | 114 |
| **Pathology** | |
| AAH | 25 (17.4%) |
| AIS | 28 (19.4%) |
| MIA | 11(7.6%) |
| Adenocarcinoma | 34 (23.6%) |
| Squamous cell carcinoma | 3 (2.1%) |
| Small cell Carcinoma | 1 (0.7%) |
| Atypical Carcinoid tumor | 1(0.7%) |
| Metastases | 17(11.8%) |
| Inflammatory disease | 17 (11.8%) |
| Other benign (harmatoma, LNs) | 7 (4.9%) |

| | N(%) |
|---|---|
| **Localization of nodules** | |
| No (visible, palpate, anatomic) | 110 |
| CT-guided (wired placement) | 2 |
| Navigation system (ICG) | 3 |
| Navigation system (Methylene) | 4 |
| **Complication** | |
| Prolong air-leak | 2 |
| Pneumonia | 2 |
| chylothorax | 1 |
| Lung atelectasis | 1 |
| CVA | 1 |
| **Discharge after surgery** | 5.5.+/- 3.3 |

# Correlation of image character on chest CT and pathology

| | Benign (inf, LNs, granuloma harmatoma, ect.) | AAH | AIS | MIA | Lung Ca. (AdCC, SqCC, SCC) | Metastases |
|---|---|---|---|---|---|---|
| **GGO** | 3 (6%) | 22 (44%) | 24 (48%) | 0 (0%) | 1 (2%) | 0 (0%) |
| **Part-solid** | 4 (11.8%) | 2 (5.9%) | 7 (20.6%) | 9 (26.5%) | 11 (32.4%) | 1 (2.9%) |
| **Solid** | 16 (26.7%) | 0 (0%) | 1 (1.67%) | 1 (1.67%) | 26 (43.3%) | 16 (26.67%) |

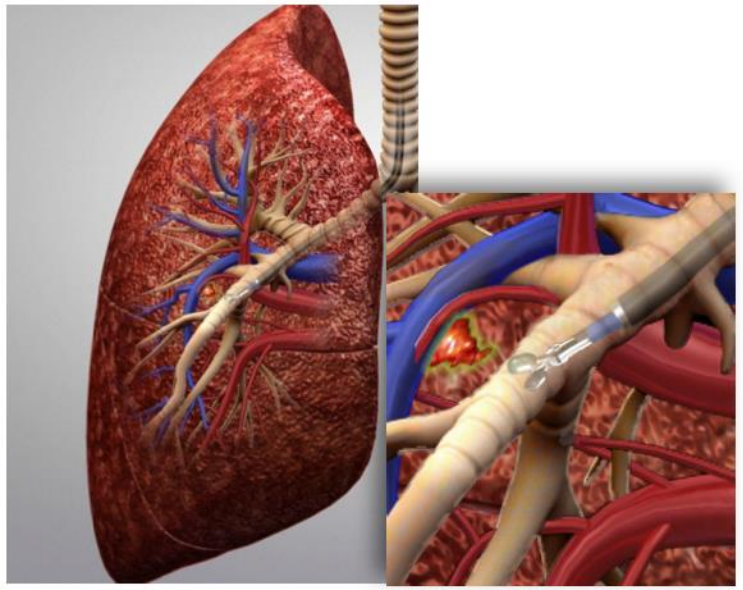


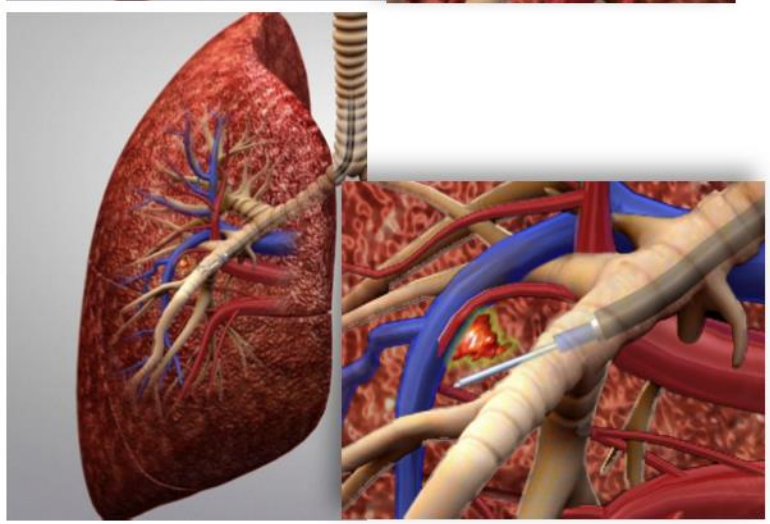
# Current Management of Small Lung Tumor in MMH

| Image Oriented | Intra-op. Localization | Treatment |
|---|---|---|
| CT | Intra-op. visible, palpable or anatomic resection (110 p'ts) | Drugs<br>SBRT<br>Surgery |
| | CT-guided (2 p'ts) | |
| | Electromagnetic Navigation Bronchoscope (ENB) | |
| | Virtual Bronschoscopy Navigation (VBN) (7p'ts) | |

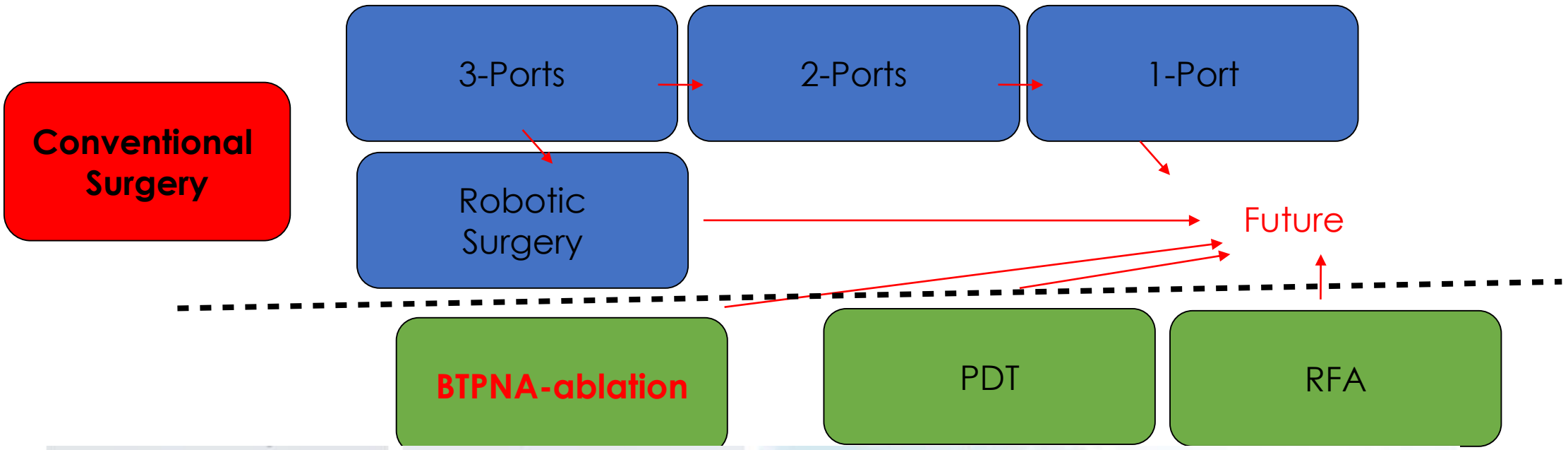
# Bronchoscopic Diagnosis with VBN (Mackay Experience)

| | | |
|---|---|---|
| Number of patients | | 21 |
| Mean Age | | 66.6 ± 8.5 |
| Male Gender | | 12/21 |
| Average diameter of nodule | | 3.1 ± 1.6 cm |
| Solid / GGO | | 18/1 |
| Position | RUL | 5 |
| | RML | 3 |
| | RLL | 7 |
| | LUL | 2 |
| | LLL | 2 |
| Endobronchial lesion (+ : -) | | 7 : 14 |
| Endobronchial lesion (+) Diagnosis Yiled | | 100% (7/7) |
| Diagnosis | Inflammation | 3 |
| | Small cell Lung Cancer | 1 |
| | Adenocatcinoma | 9 |
| | Carcinoma | 1 |
| | Breast Cancer Lung Meta | 1 |
| | no Dx | 6 |
| Diagnosis Yield | | 71% (15/21) |





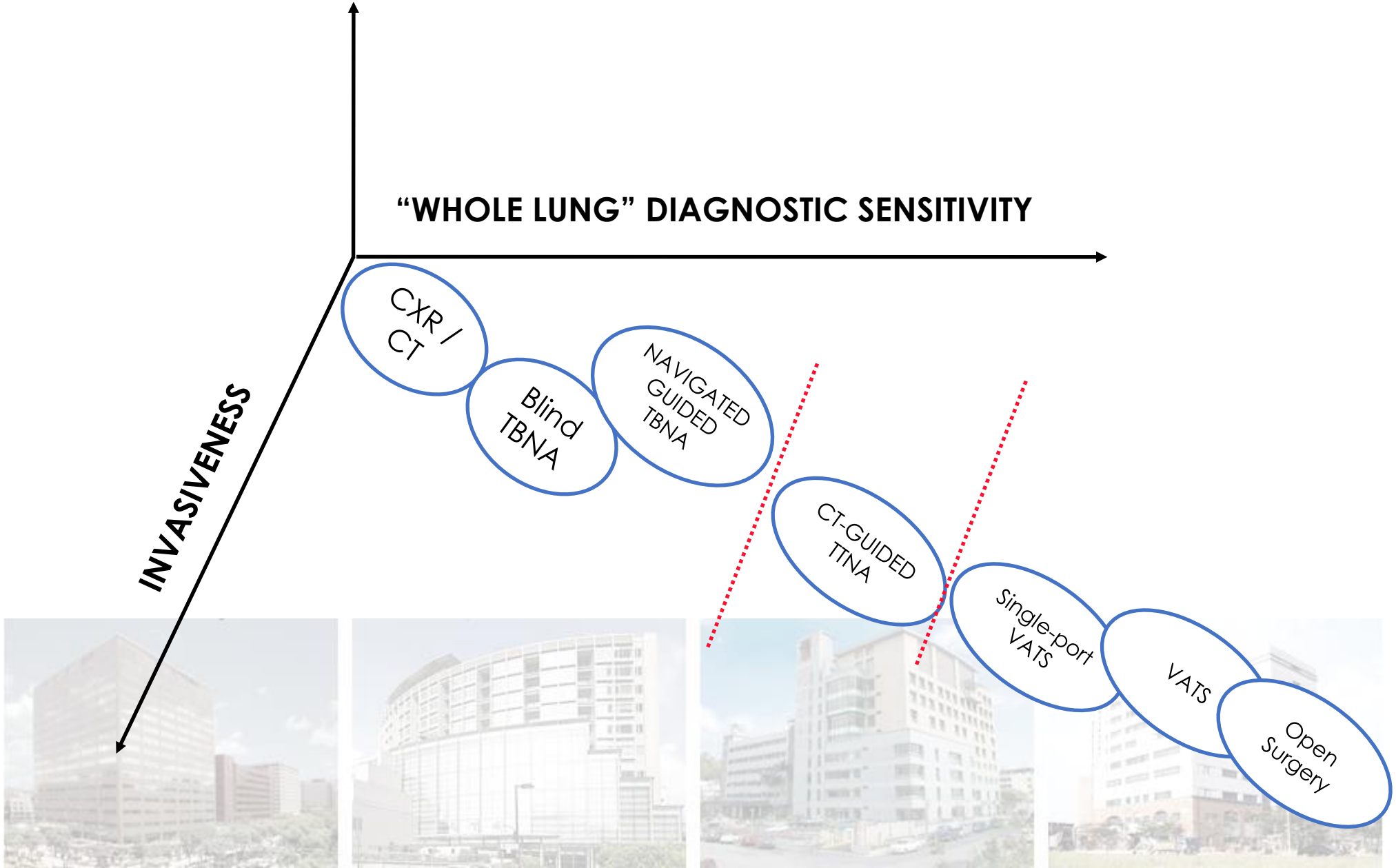
# Approaches to Early Lung CA




# Lung Cancer Surgical Treatment

- Pneumonectomy 1933
- Lobectomy 1955
- Segmentectomy 1972
- VATS lobectomy 1992
- VATS Segmentectomy 1994
- Robotic Lobectomy 2004
- EBUS, Energy, sealants, pain treatment
- Alternative Treatment – SBRT, RFA, BTPNA ablation

# Current Management of Small Lung Tumor



# THANK YOU FOR YOUR ATTENTION