Lung cancer: An update

Consultant Respiratory Physician

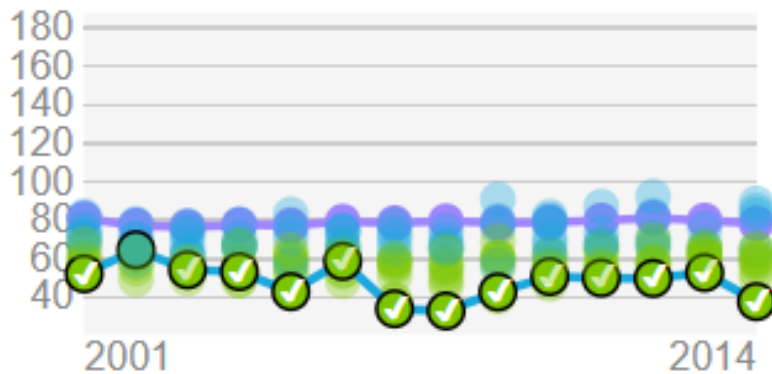jonathan.dakin@nhs.net

Programme

- Epidemiology
- Clinical presentation
- Investigation
- Staging
- Survival
- Therapy
- Nodules
- Screening
- The future

Local epidemiology / performance Incidence Rate and One Year Survival
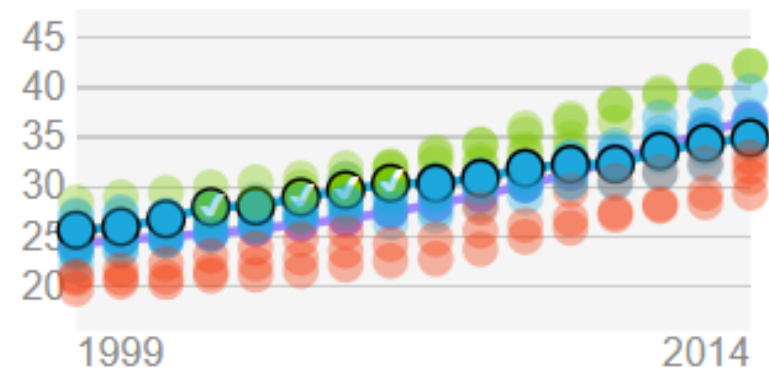

Incidence rate

Standardised rates per 100,000 population

One-year survival

Net survival index for adults

Clinical presentation

- Cough   55%
- Haemoptysis   28%   (<30% have Ca)
- Dyspnoea   45%   ($\leftarrow$ effusion)
- Chest pain   38%
- $\downarrow$ Weight   36%

- Mean age 64, M > F

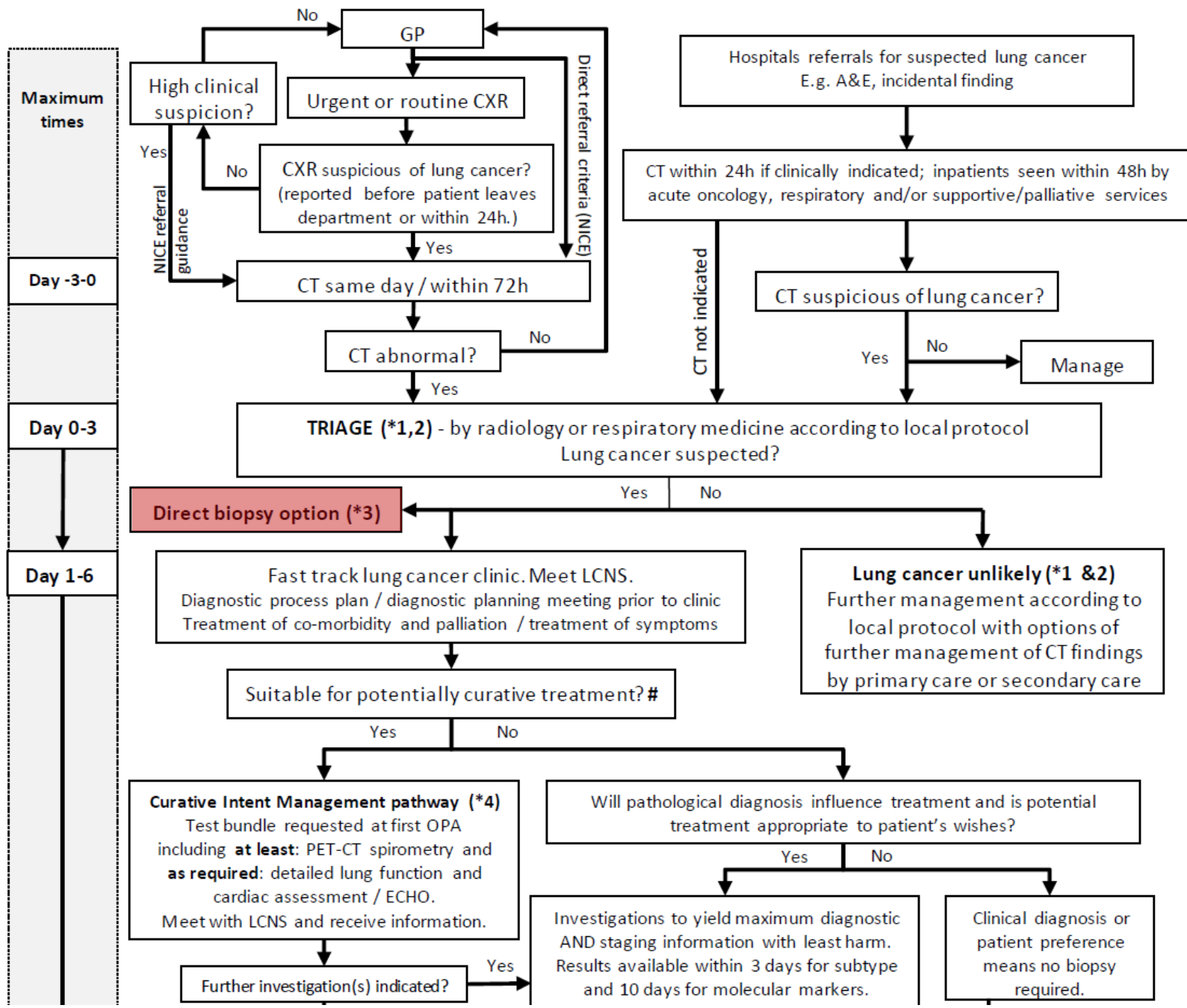Hyde L Chest 1974; 65:299 and Chute CG Cancer 1985; 56:2107

Clinical presentation: smoking

- Always say "never" (smoker).

- 16 years post cessation to reset risk.

- Always suspect in a current or former smoker with <u>new onset cough</u> or haemoptysis.
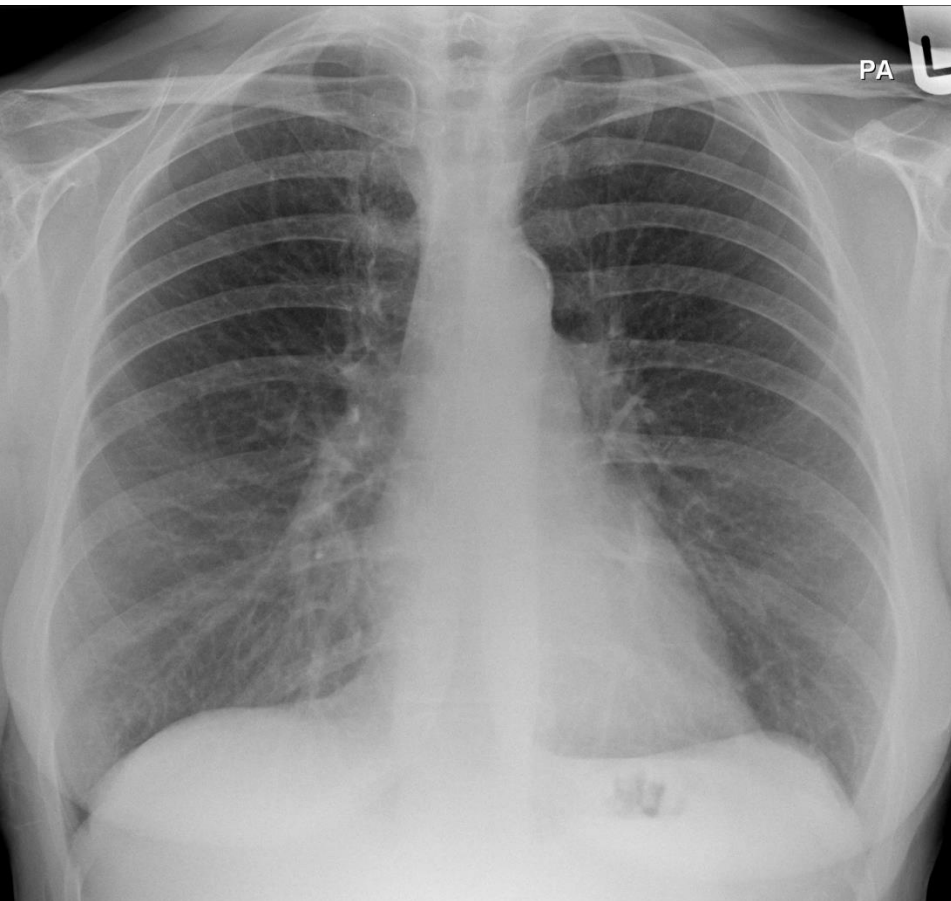
Investigation

- CXR (23% -ve*)
- CT
- Bronchoscopy
- Endobronchial ultrasound
- PET
- CT biopsy
- Pleural aspiration
- Thoracoscopy

*Stapley, S. Br J Gen Prac 2006

National Optimal Lung Cancer Pathway (49/7)

Maximum times

Day -3-0

Day 0-3

Day 1-6

No → **GP**

High clinical suspicion?

Urgent or routine CXR

NICE referral guidance

Direct referral criteria (NICE)

Yes

No → **CXR suspicious of lung cancer?** (reported before patient leaves department or within 24h.)

Yes → **CT same day / within 72h**

CT abnormal? → No

Yes

Hospitals referrals for suspected lung cancer E.g. A&E, incidental finding

CT within 24h if clinically indicated; inpatients seen within 48h by acute oncology, respiratory and/or supportive/palliative services

CT not indicated

CT suspicious of lung cancer?

Yes   No → **Manage**

TRIAGE (*1,2) - by radiology or respiratory medicine according to local protocol. Lung cancer suspected?

Yes   No

Direct biopsy option (*3)

Fast track lung cancer clinic. Meet LCNS. Diagnostic process plan / diagnostic planning meeting prior to clinic. Treatment of co-morbidity and palliation / treatment of symptoms

Lung cancer unlikely (*1 &2) Further management according to local protocol with options of further management of CT findings by primary care or secondary care

Suitable for potentially curative treatment? #

Yes   No

Curative Intent Management pathway (*4) Test bundle requested at first OPA including **at least**: PET-CT spirometry and **as required**: detailed lung function and cardiac assessment / ECHO. Meet with LCNS and receive information.

Further investigation(s) indicated? → Yes

Will pathological diagnosis influence treatment and is potential treatment appropriate to patient's wishes?

Yes   No

Investigations to yield maximum diagnostic AND staging information with least harm. Results available within 3 days for subtype and 10 days for molecular markers.

Clinical diagnosis or patient preference means no biopsy required.

Throughout pathway: • consider entry into a research trial • offer supportive & palliative care, e.g. by L
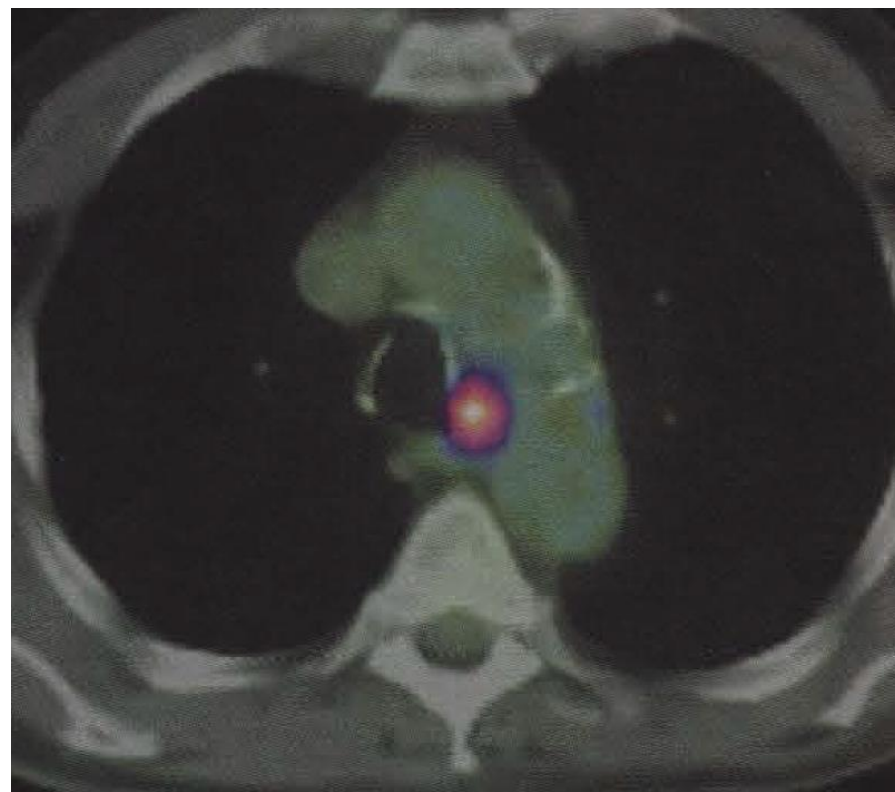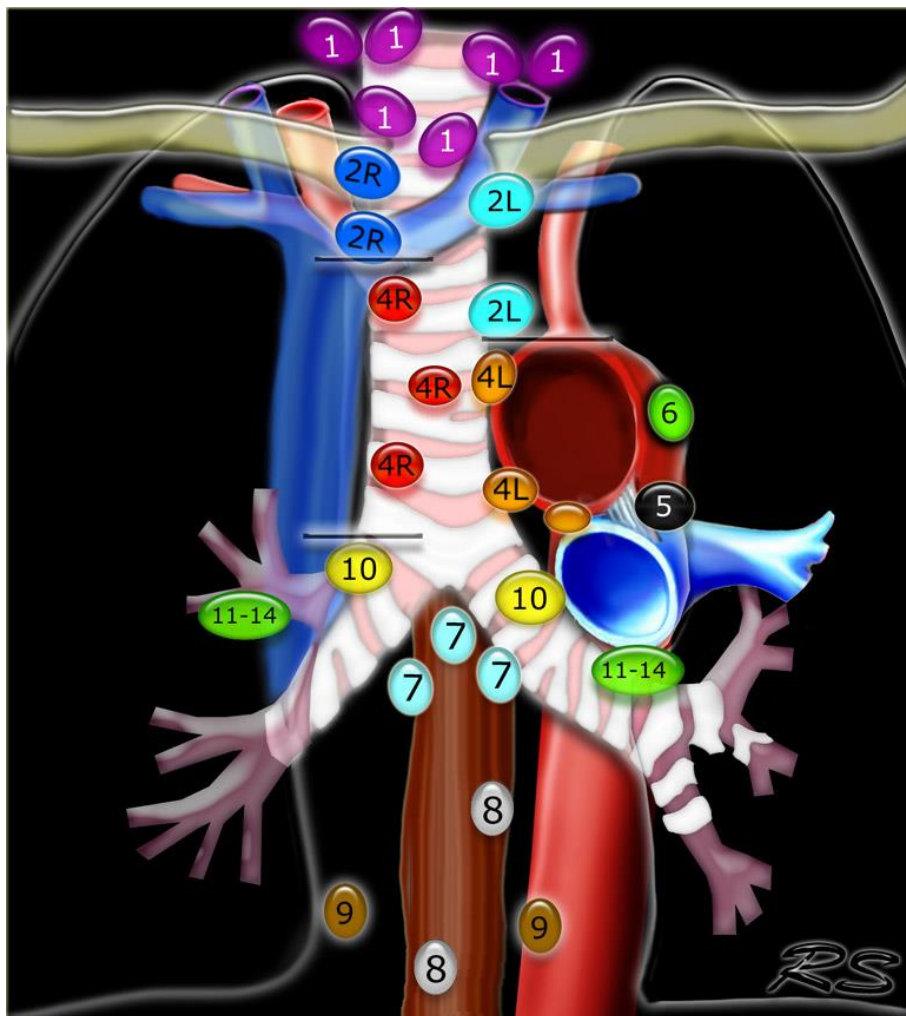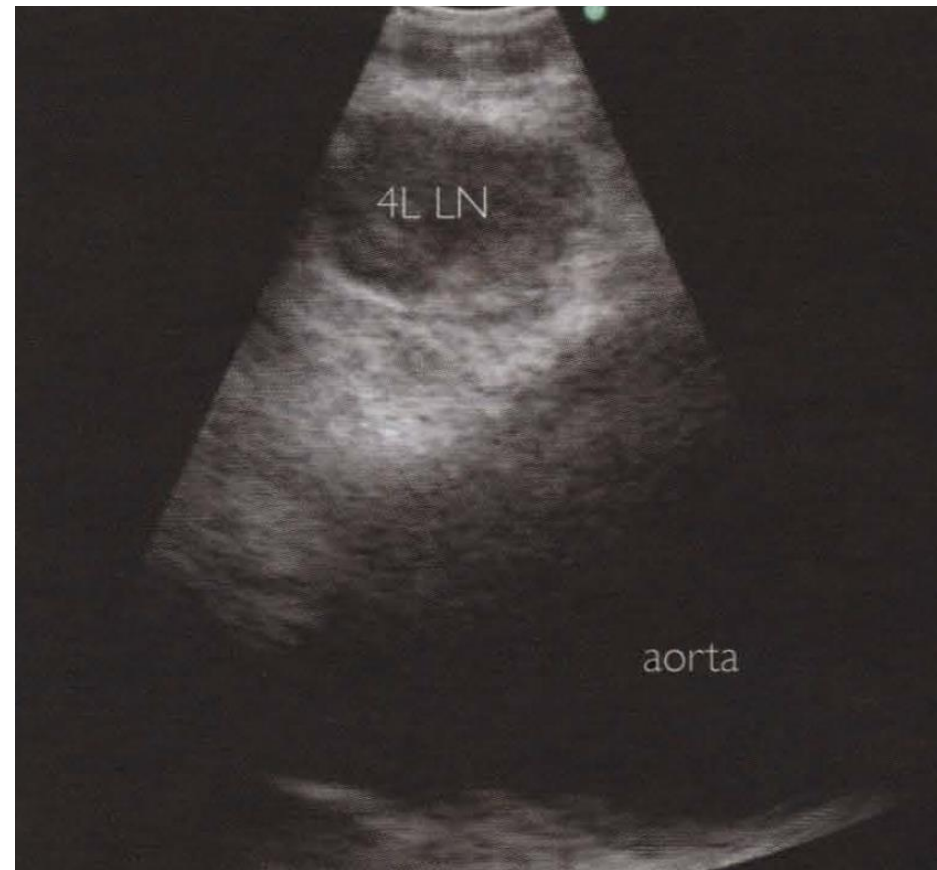
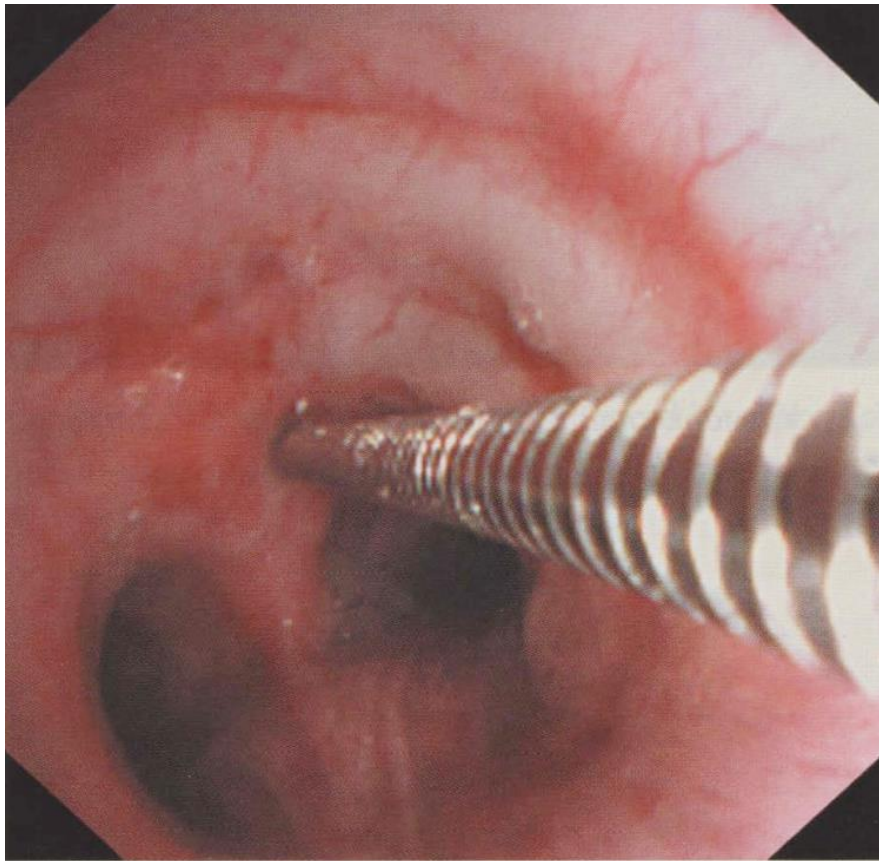# Investigation: CXR

CXR

CT

Bronchoscopy

Investigation: PET for staging

PET

Investigation: Endobronchial US

Survival by clinical stage

IA1
IA2
IA3
IB
IIA
IIB
IIIA
IIIB
IVA
IVB

ΔΔ

Goldstraw P. J Thorac Oncol 2016; 1:39.
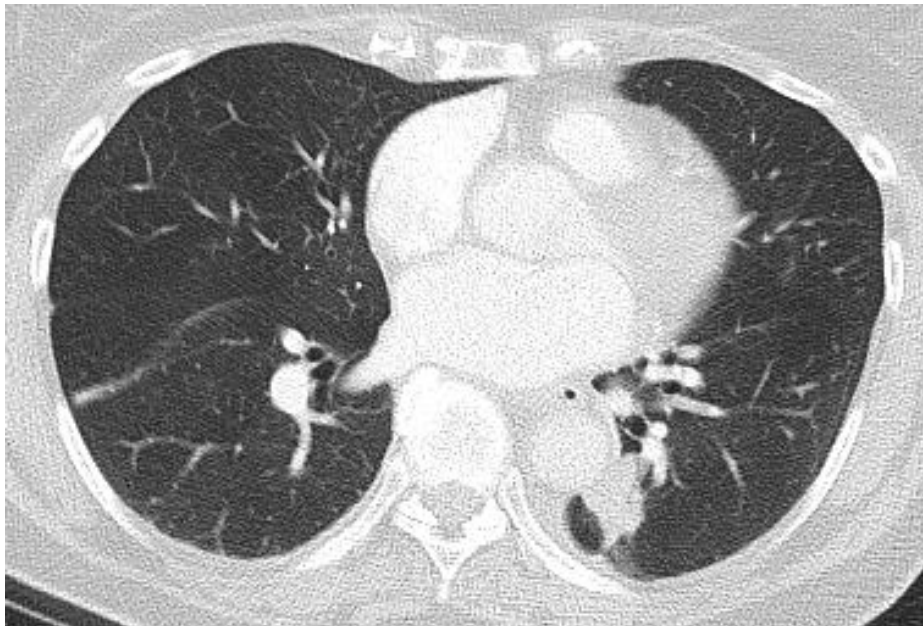
Types

- Squamous
- Adeno
- Small cell
- Adeno with Lepidic growth
  - (brocheolo-alveolar cell, BAC)

Adeno with lepidic growth

2014

2018

CT biopsy

Treatment

Therapy: Surgery

- Treatment of choice
- Stage I and II disease resectable
- 16% of patients in UK[1]
  - Heavily determined by stage at diagnosis
  - Many diagnosed on acute presentation
- 30% recurrence rate at 5 years[2]

1 National Cancer Registration & Analysis Service and Cancer Research UK: Chemotherapy, Radiotherapy and Tumour Resections in England: 2013-2014. London: NCRAS; 2017
2 Landreneau RJ. J Clin Oncol 2014

Therapy: Radiotherapy

- With curative intent
  - Stereotactic ablative radiotherapy (SABR)
  - 3 year survival 50%
- Adjunctive

  +ve margins, N2 disease

- Chemo / rad for stage 3
- Palliative for pain, SOB, haem, spinal column, bones, brain.

Treatment: Cytotoxic therapy
WHO performance scale

| Performance status	Definition
0	Fully active; no performance restriction.
1	Strenuous physical activity restricted; fully ambulatory and able to carry out light work.
2	Capable of all self-care but unable to carry out any work activities. Up and about >50% of waking hours.
3	Capable of only limited self-care; confined to bed or chair >50% of waking hours.
4	Completely disabled; cannot carry out any self-care; totally confined to bed or chair.

Targeted therapies
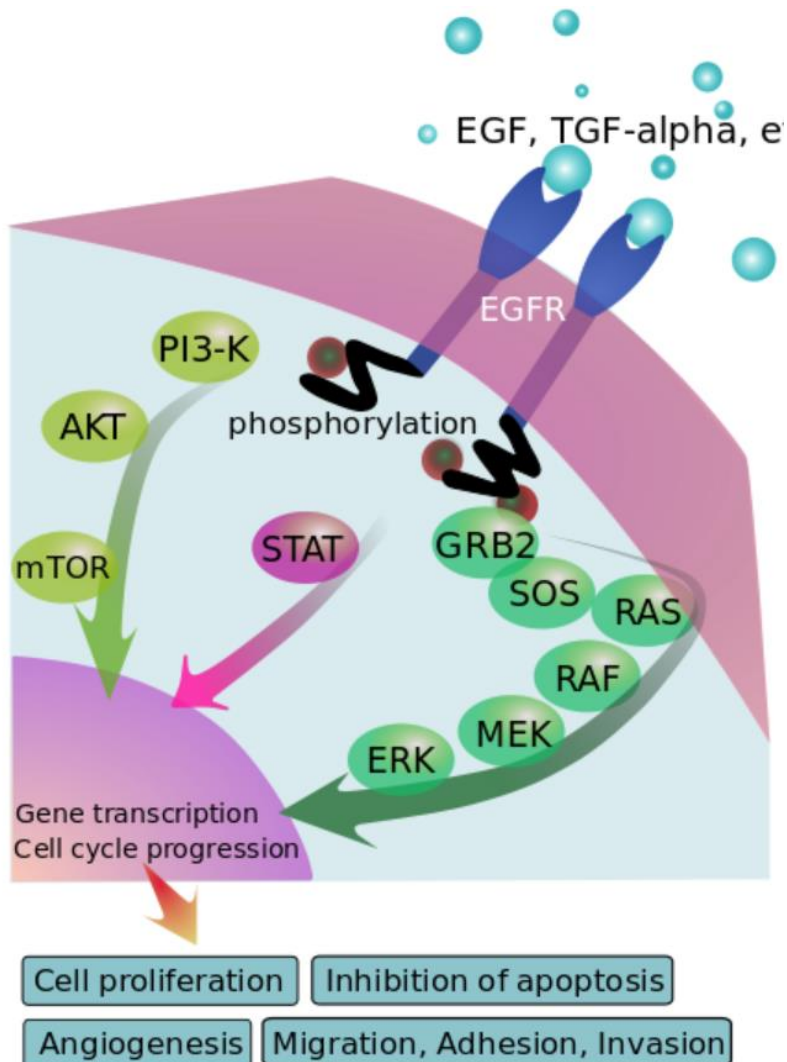
- Molecular targets involved in genesis / progression of cancer
- "Driver mutations"
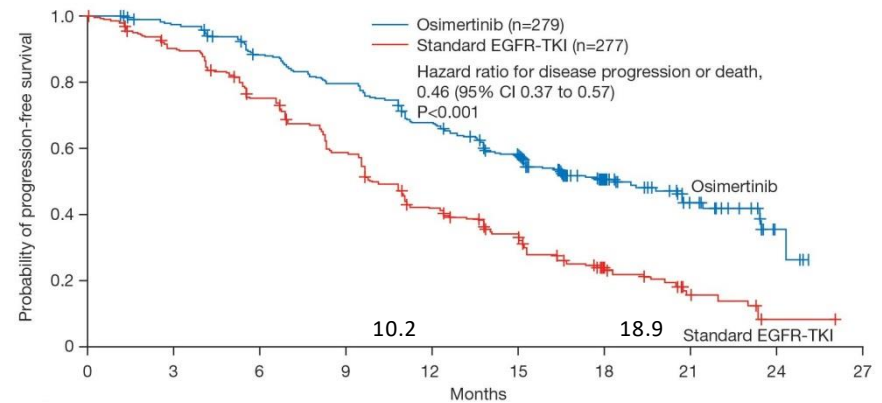- Proliferation switch in the on position

Targeted therapies

- Epidermal growth factor receptor (*EGFR*)
  - 15% of cancers in non-smokers
  - Up to 60% of Asians
- Anaplastic lymphoma kinase (*ALK*)
  - 2-5%
- ROS1
  - 1-2%

EGFR
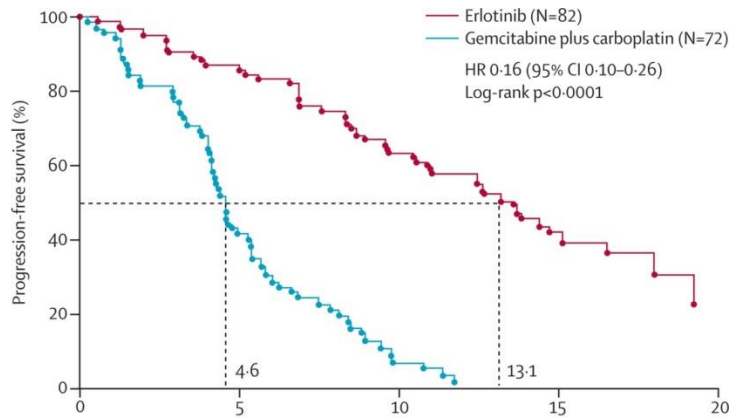
Erlotinib (Tarceva) vs Gemcitabine + carboplatin

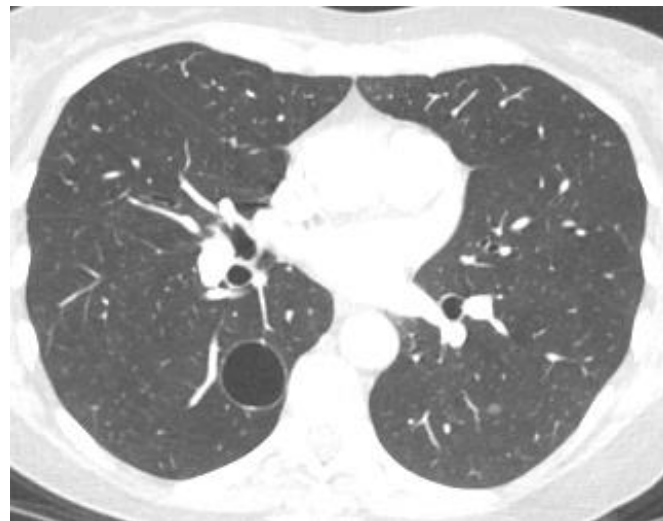Osimertinib (Tagrisso) vs std EGFR TKI

Caicun Zhou. Lancet Onc 2011
Soria, JC. *NEJM*. 2017

Nodules

- < 3cm
  - Types: solid, ground glass opacification
- 25% of CT scans in > 50 yo subjects
- Brock model predicts malignancy likelihood
- Surveillance needed for 3/12 to 4 years

Nodule CT
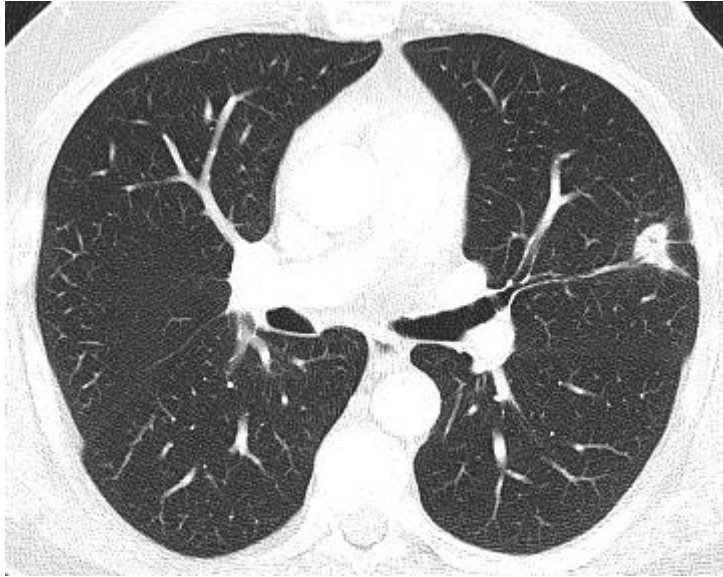
Brock calculator

Solid nodules
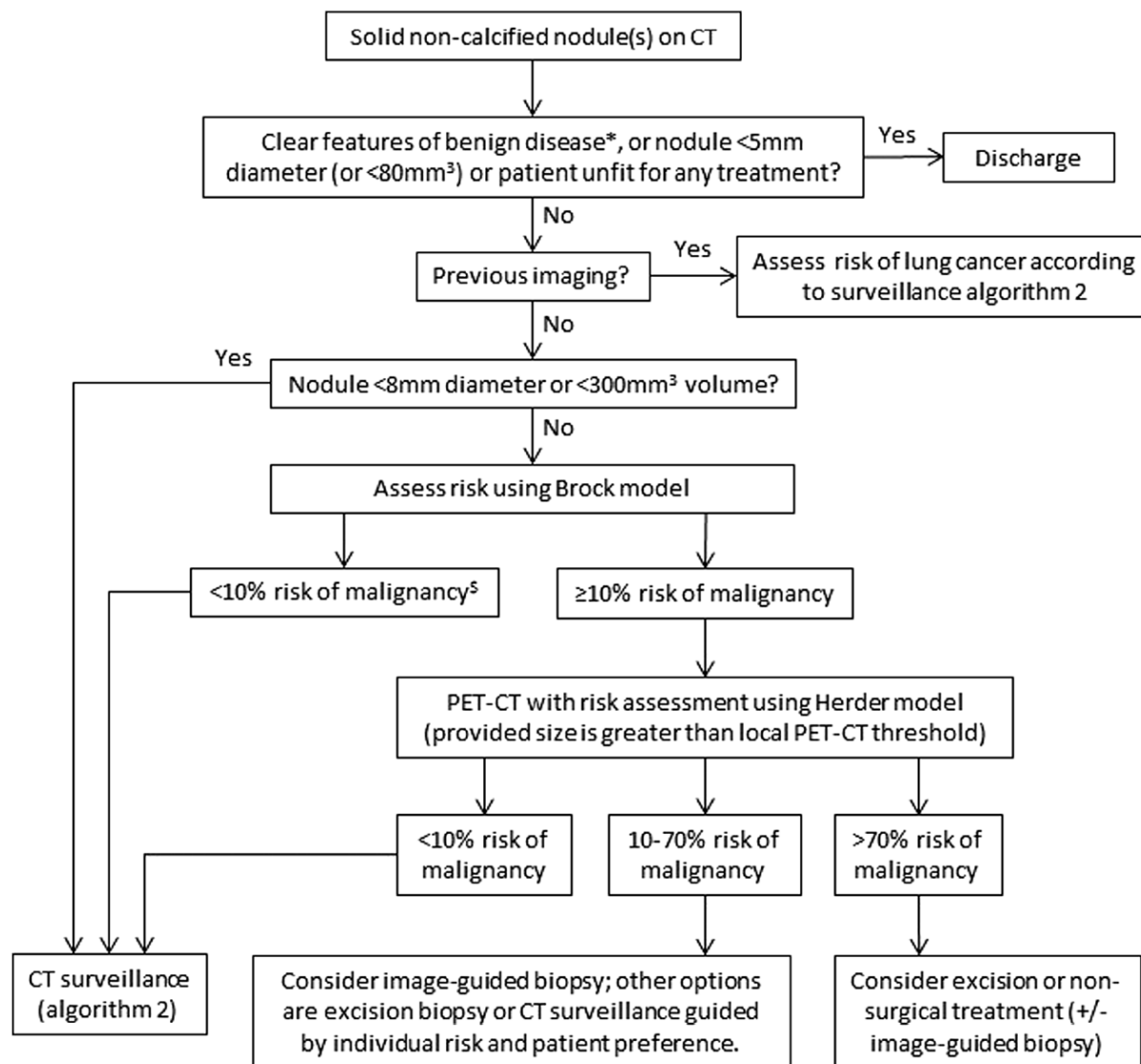
Screening

- National US lung screening trial*
- 20% ↓ † in trial group – stopped early
- Recommended (funded) for:
  - 65-75 yo
  - 30 py
  - active smoker or < 15 years post quitting

*Reduced Lung-Cancer Mortality with Low-Dose CT Screening. N Engl J Med 2011

European data

**Eurocare 5

Late diagnosis

59 F. S American. Cough 17/12

National Optimal Lung Cancer Pathway (49/7)
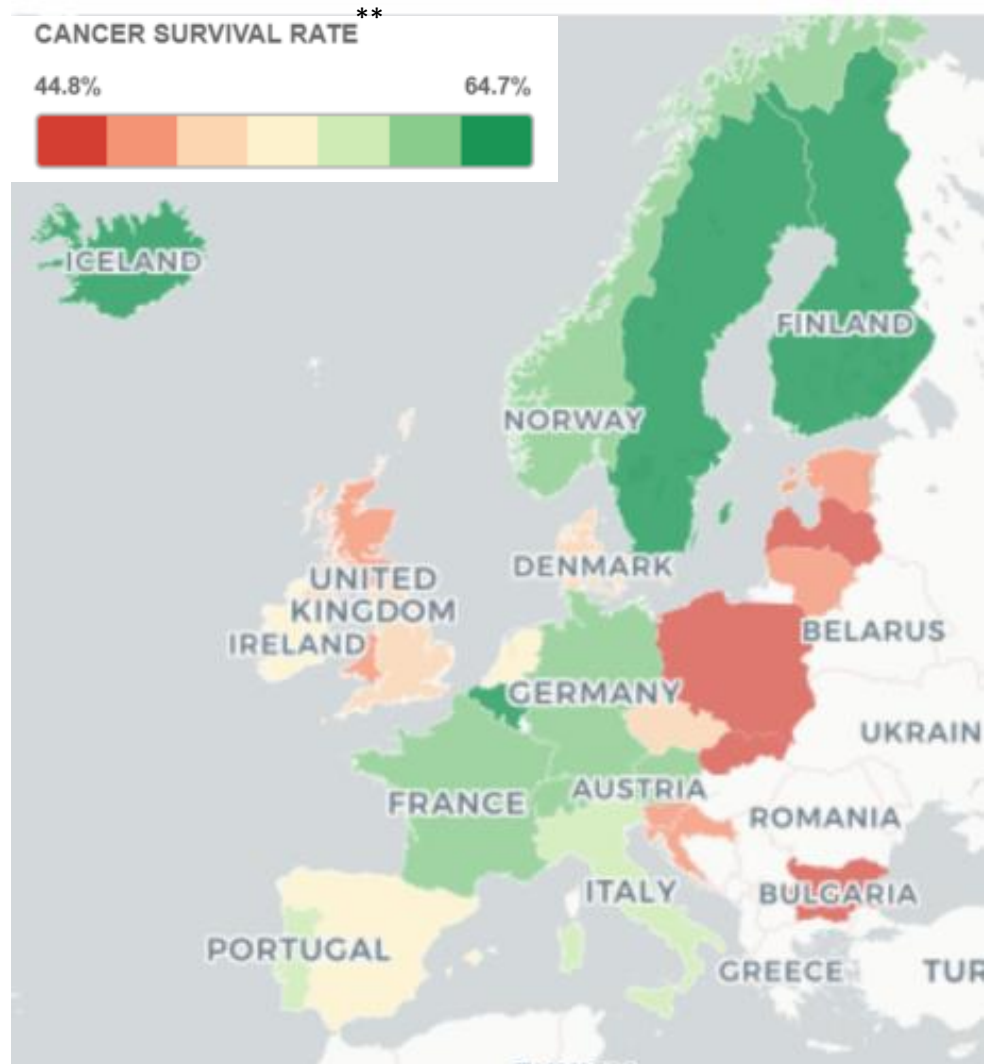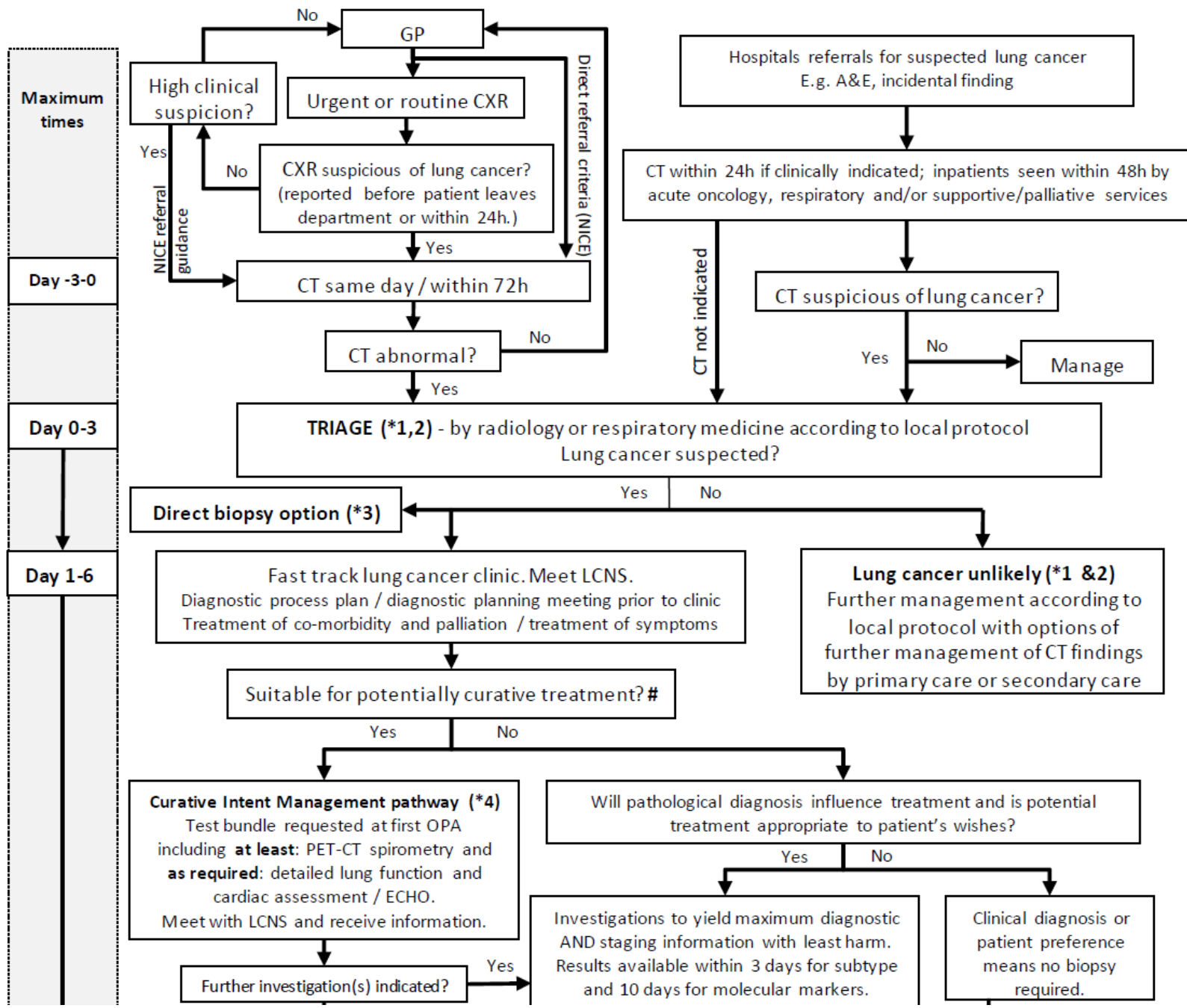
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The future

- Refinement of pathway
  - CT 1st
  - One-stop service
- Screening (?)
- Biologicals – personalised medicine