Respiratory cases & update

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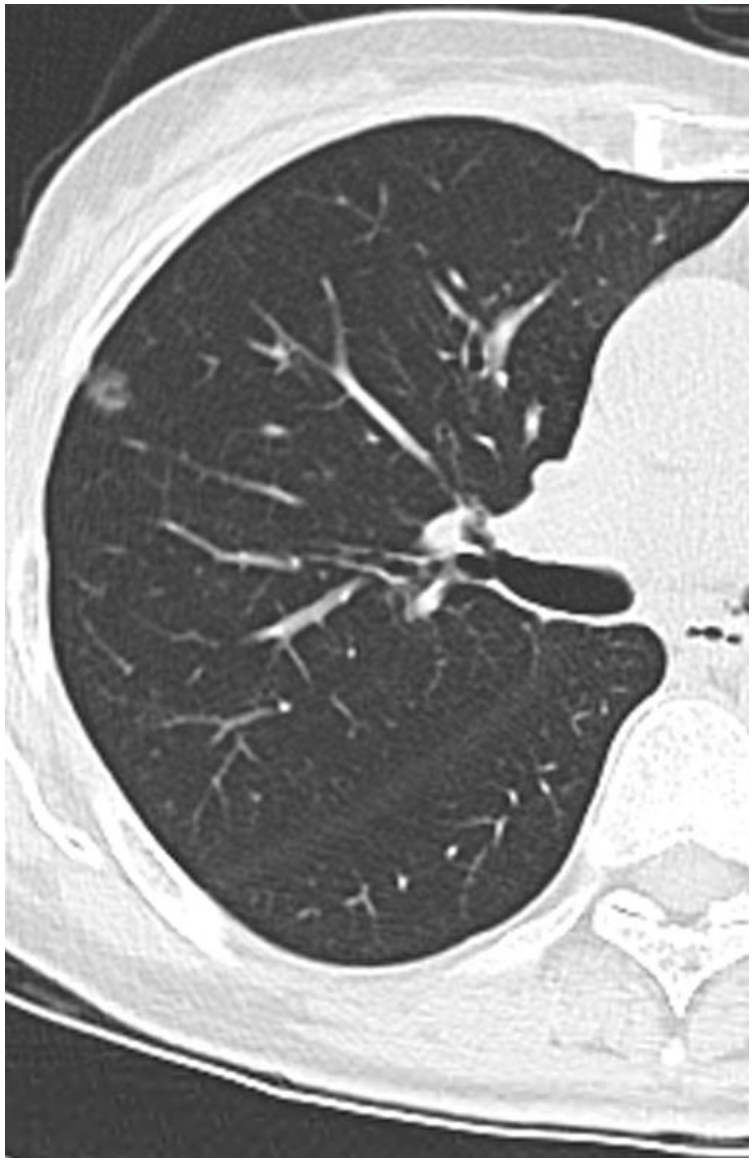
Case 1 55 yo female

- Typical patient concern with self health check up had overseas screening and has non-english report stating nodule/s seen need further follow up imaging
- What to do next?

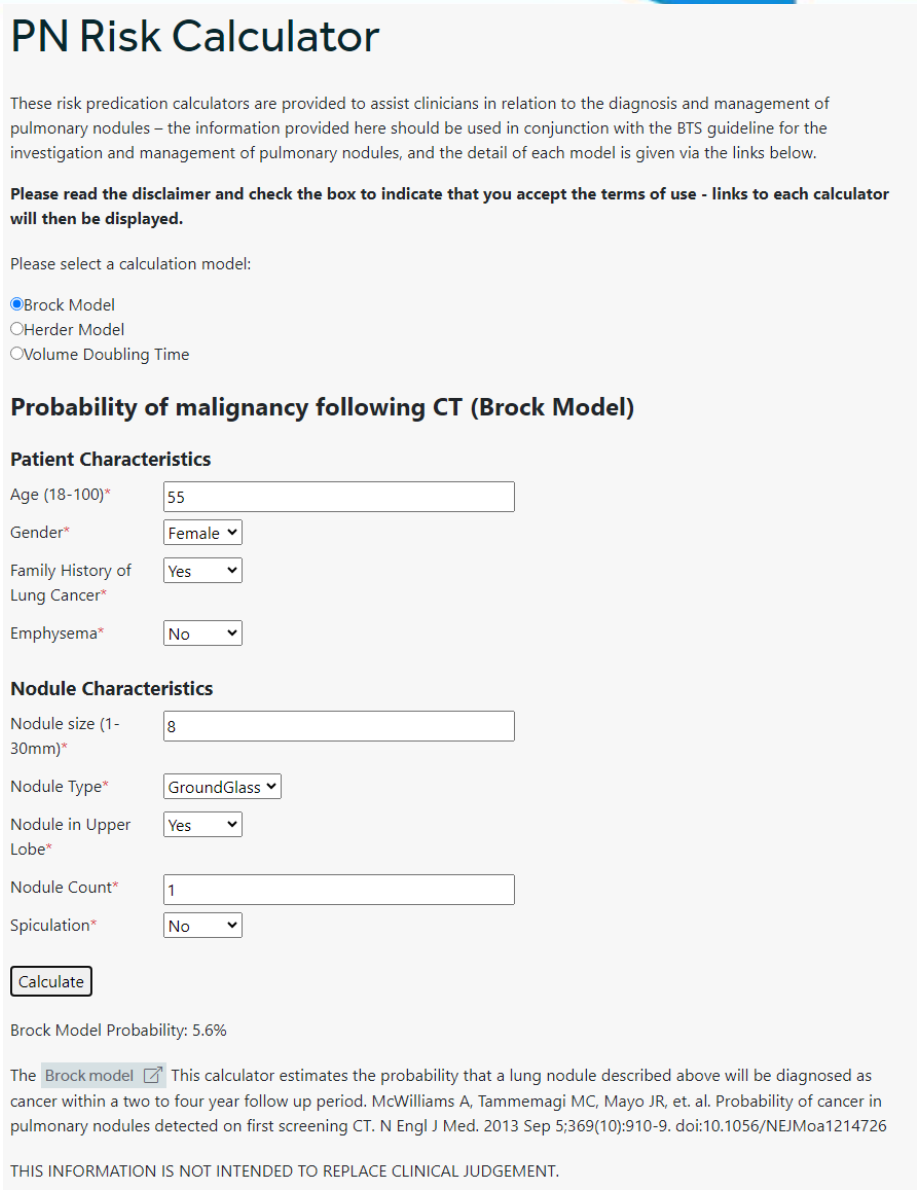


Case 2 Questions to ask

- Smoking status
- Family history
- Female Sex
- History of other cancers in self

Brock model for risk

- 5.6% risk of lung cancer in 55 yo female without emphysema (never smoker) with single RUL ground glass nodule of 8 mm with family history of lung cancer
- Pulmonary Nodule Risk app on iOS and Google play store



PN Risk Calculator

These risk predication calculators are provided to assist clinicians in relation to the diagnosis and management of pulmonary nodules – the information provided here should be used in conjunction with the BTS guideline for the investigation and management of pulmonary nodules, and the detail of each model is given via the links below.

Please read the disclaimer and check the box to indicate that you accept the terms of use - links to each calculator will then be displayed.

Please select a calculation model:

(•) Brock Model
( ) Herder Model
( ) Volume Doubling Time

Probability of malignancy following CT (Brock Model)

Patient Characteristics

Age (18-100)*	55
Gender*	Female
Family History of Lung Cancer*	Yes
Emphysema*	No

Nodule Characteristics

Nodule size (1-30mm)*	8
Nodule Type*	GroundGlass
Nodule in Upper Lobe*	Yes
Nodule Count*	1
Spiculation*	No

Calculate

Brock Model Probability: 5.6%

The Brock model This calculator estimates the probability that a lung nodule described above will be diagnosed as cancer within a two to four year follow up period. McWilliams A, Tammemagi MC, Mayo JR, et. al. Probability of cancer in pulmonary nodules detected on first screening CT. N Engl J Med. 2013 Sep 5;369(10):910-9. doi:10.1056/NEJMoa1214726

THIS INFORMATION IS NOT INTENDED TO REPLACE CLINICAL JUDGEMENT.

https://www.brit-thoracic.org.uk/quality-improvement/guidelines/pulmonary-nodules/pn-risk-calculator/

Fleishner 2017 Guidelines

Pulmonary Nodule Size	Lung Nodule Type	Single vs. Multiple	Low Risk Patient	High Risk Patient
< 6mm ($< 100mm^3$)	Solid	Solitary	No Follow-Up If suspicious morphology or upper lobe location, consider 12-month follow-up.	Optional CT in 12 months
		Multiple	No Follow-Up If suspicious morphology or upper lobe location, consider 12-month follow-up.	Optional CT in 12 months
	Part-Solid (Subsolid)	Solitary	No Follow-Up	
		Multiple	CT in 3 to 6 months. If unchanged, consider CT at 2 and 4 years.	
	Ground-Glass	Solitary	No Follow-Up If suspicious, consider follow-up at 2 and 4 years. If grows or increasingly solid, consider resection.	
		Multiple	CT in 3 to 6 months. If unchanged, consider CT in 2 and 4 years.	
6 to 8mm ($100-250mm^3$)	Solid	Solitary	CT in 6 to 12 months, then **consider** CT in 18 to 24 months.	CT in 6 to 12 months, then **obtain** CT in 18 to 24 months.
		Multiple	CT in 3 to 6 months, then **consider** CT in 18 to 24 months	CT in 3 to 6 months, then **obtain** CT in 18 to 24 months
	Part-Solid (Subsolid)	Solitary	CT in 3 to 6 months to confirm persistance. If unchanged and solid component below 6mm, CT annually for 5 years. **Persistent part-solid nodules containing a solid componment > 6mm are highly suspicious.**	
		Multiple	CT in 3 to 6 months. Then management based on most suspicious nodule(s).	
	Ground-Glass	Solitary	CT in 6 to 12 months to confirm persistence, then CT every 2 years until 5 years. If grows or increasingly solid, consider resection.	
		Multiple	CT at 3 to 6 months. Then management based on most suspicious nodule(s).	
> 8mm ($> 250mm^3$)	Solid	Solitary	In 3 months consider either CT, Biopsy, or PET-CT (however, negative PET-CT does not exclude low-grade malignancy, FDG uptake may be underestimated in small nodules < 1cm, or those close to diaphragm)	
		Multiple	CT in 3 to 6 months, then **consider** CT at 18 to 24 months	CT in 3 to 6 months, then **obtain** CT at 18 to 24 months
	Part-Solid (Subsolid)	Solitary	CT in 3 to 6 months to confirm persistance. If unchanged and solid component below 6mm, CT annually for 5 years. **Persistent part-solid nodules containing a solid componment > 6mm are highly suspicious.**	
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		Multiple	CT at 3 to 6 months. Then management based on most suspicious nodule(s).	

Update on current practice, incidental

- Public have to have enough information as per Fleishner, otherwise less than 6 mm especially if singular will be disregarded as risk< 1%

- Private anyone would see for a formal opinion, in addition patient decision for own risk of cancer and needing surveillance.
  - variable individual perception of risk as any new nodule could be cancer even in a non smoker

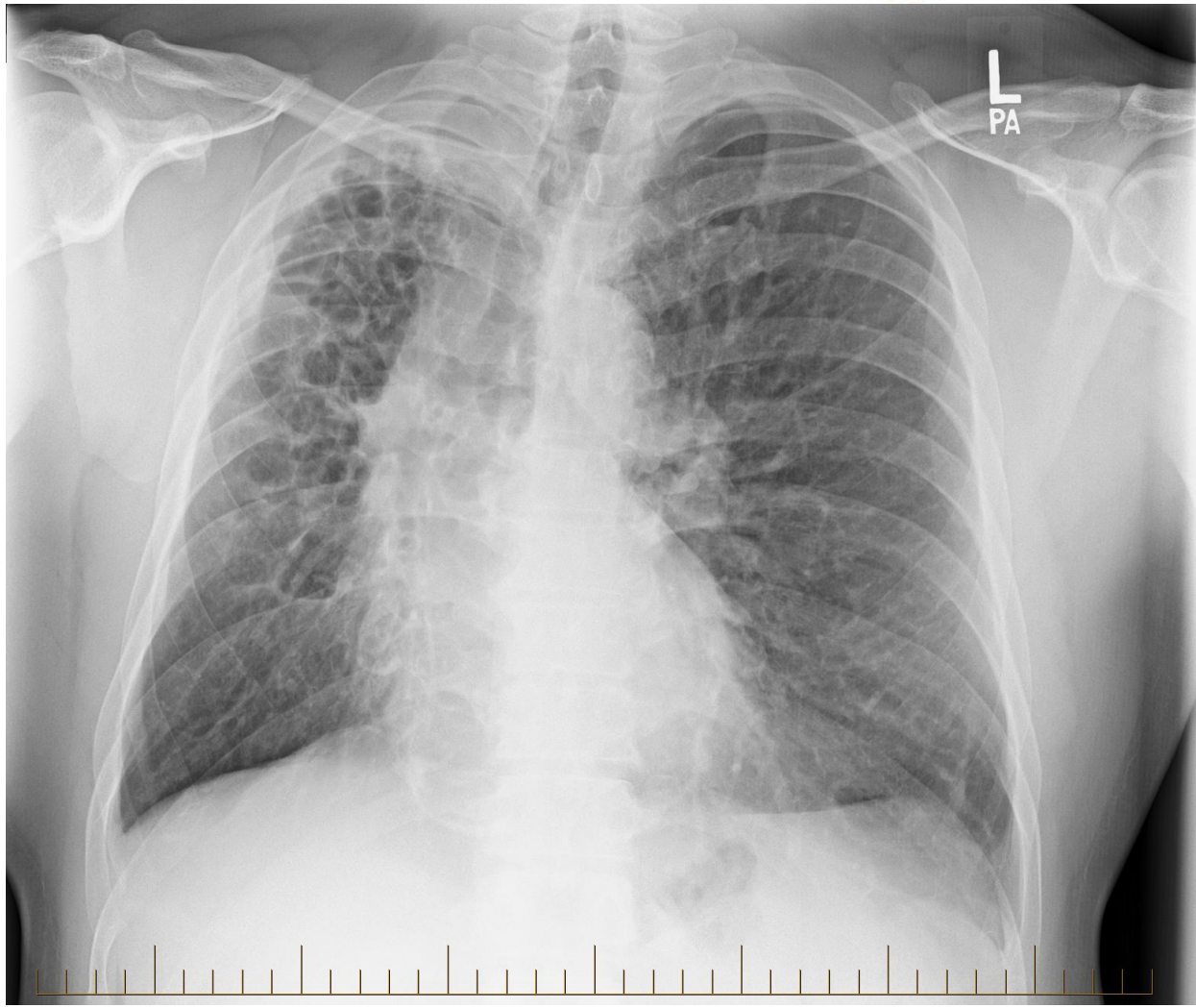
Update on current practice, screening

- NZ No screening provided in public or private (health insurance).
- Studies to prove concept in NZ

- USA does in “Adults aged 50 to 80 years, at least 20 pack-year smoking history and currently smoke or have quit within past 15 years.
  - yearly low dose CT
- UK 55-74 yo, smoker and and ex smokers
  - every 2 years low dose CT
- Australia 50-70 cigarette smoking of at least 30 pack-years, if former smokers, had quit within the previous 10 years. Starting July 2025
  - every 2 years low dose CT

Case 2 42 year old male

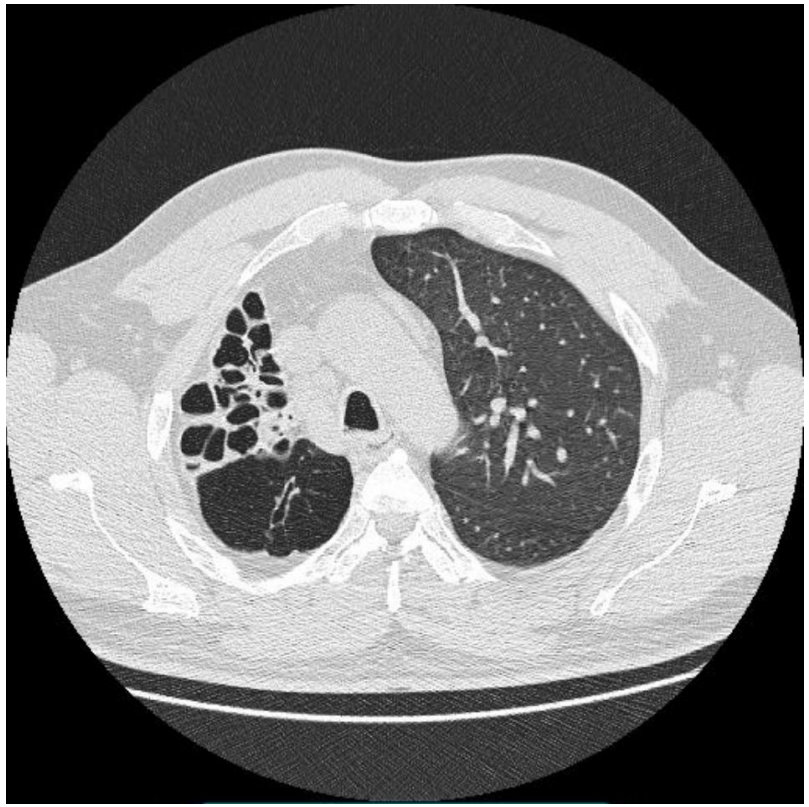
- Immigration medical abnormal chest x-ray
- What is the diagnosis?
- History to ask here?
- Investigations required?
- Reason for referral to specialist?
- Focus in primary care?

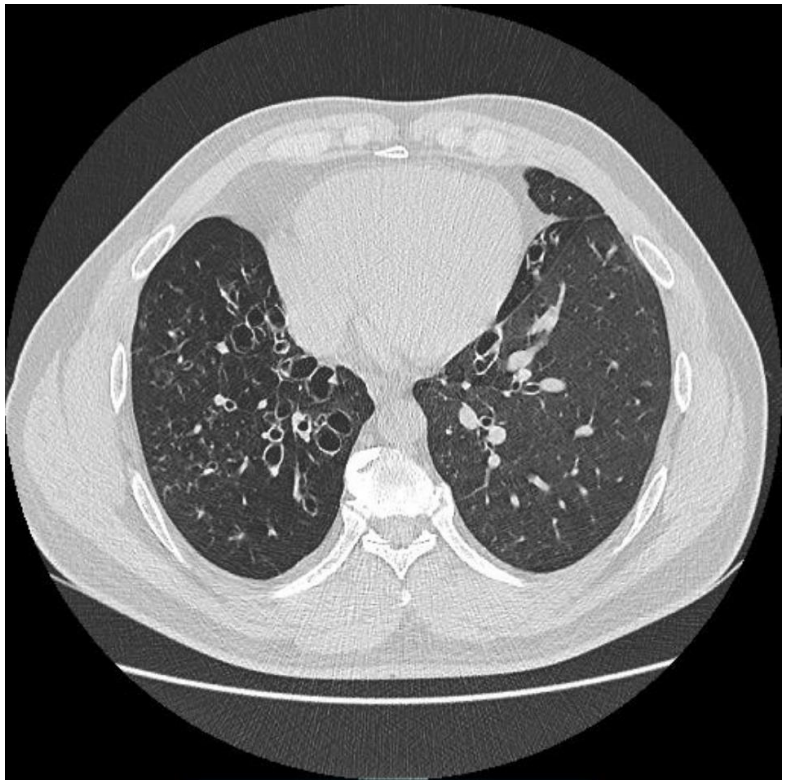


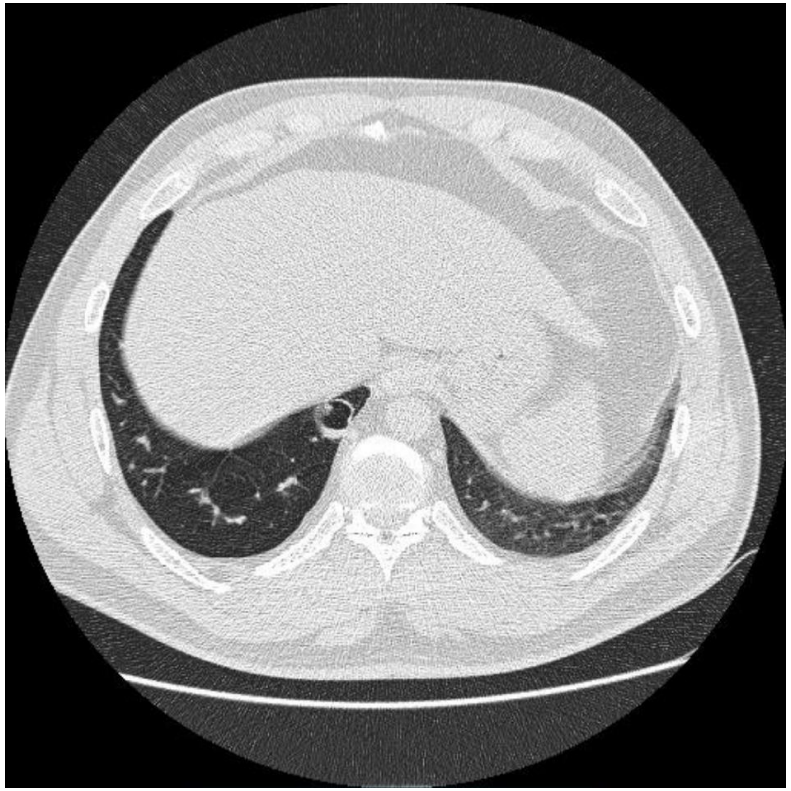
Case 2 Bronchiectasis Qs

- Sputum nature and amount
- Exacerbations
- History of repeated childhood chest infections, whooping cough, severe pneumonia
- Other airways disease (COPD/asthma) and comorbidities (?RA, features of CF, IBD, reflux)

Case 2 CT Images







Case 2 Investigations

- Full blood count
- Major immunoglobulin classes (G, A, M, E)
- Sputa testing for AFB and routine sputum
- Spirometry ideally
- Aspergillus serology (IgG precipitins, specific IgE to aspergillus or skin prick tests to Aspergillus)

Case 2 Goals of care

- Preserve lung function and halt disease progression
- Optimize well-being and quality-of-life for the patient and family
- Minimize the frequency and severity of respiratory exacerbations
- Prevent complications

- Additional aims in children/adolescents are to:
  - Optimize lung growth
  - If possible, reverse structural lung injury

Optimal management

- Lung health management, ie Keeping well, active and warm, hand hygiene, face masking, vaccinations (flu, covid and pneumonia), early treatment of exacerbations
- Keystone is chest clearance
- Think about other comorbidities management

Case 2 When to refer

- Ideally all those with bronchiectasis, especially if never seen a specialist
- Pseudomonas growth for the first time for eradication
- Recurrent exacerbations in a year
  - >3 could assess long term macrolide (AFB sputa and ECG)
  - Other reasons for exacerbations

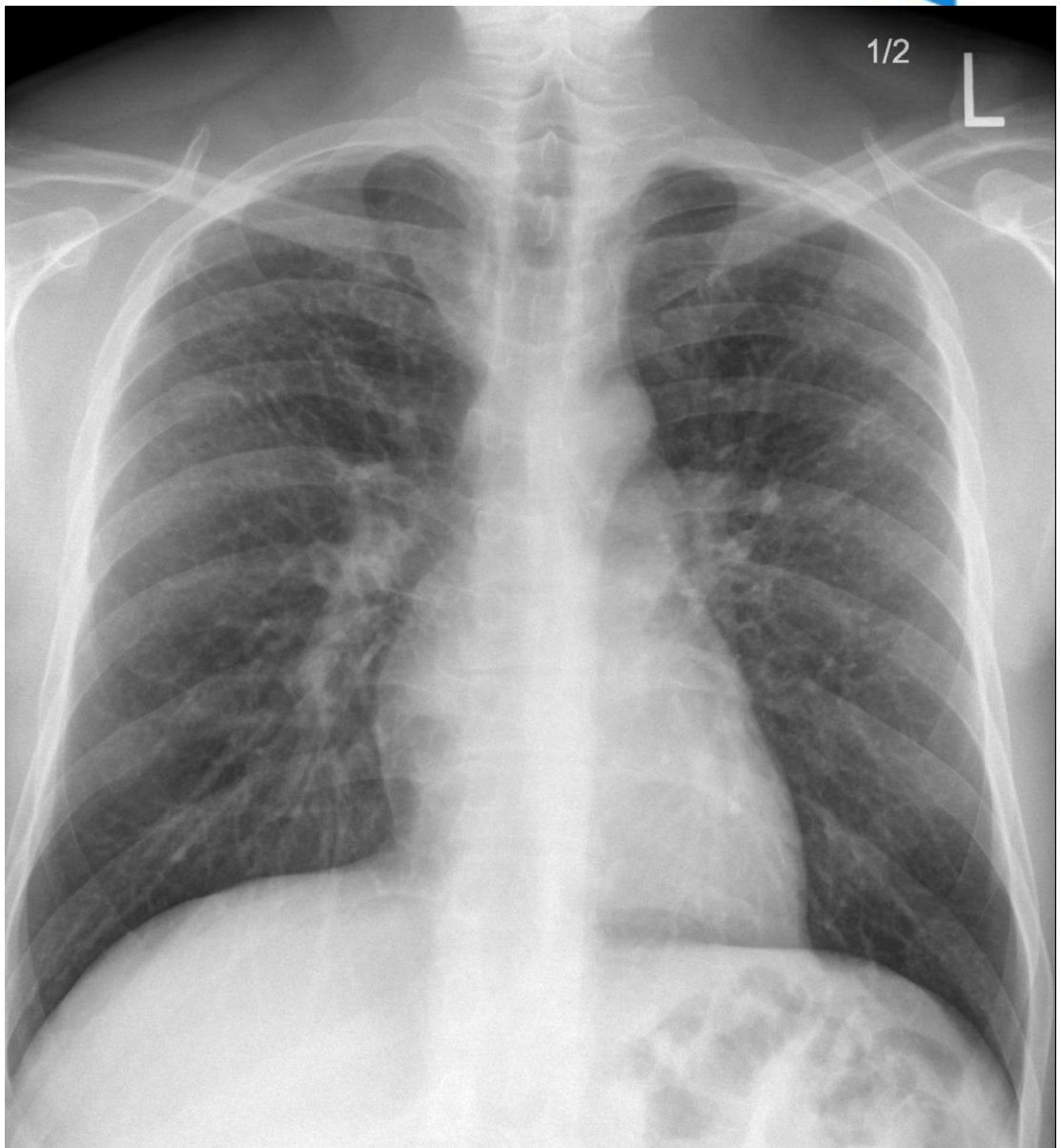
Case 2 Primary care

- No routine indication for inhalers as ICS increase risk of pneumonia
- Higher rates of bronchiectasis in Maori and Pacific Islanders
- Local transition from paed to adults
- Nutrition and smoking cessation
- Exacerbations require at least 2 weeks of antibiotics with ideally sputum testing

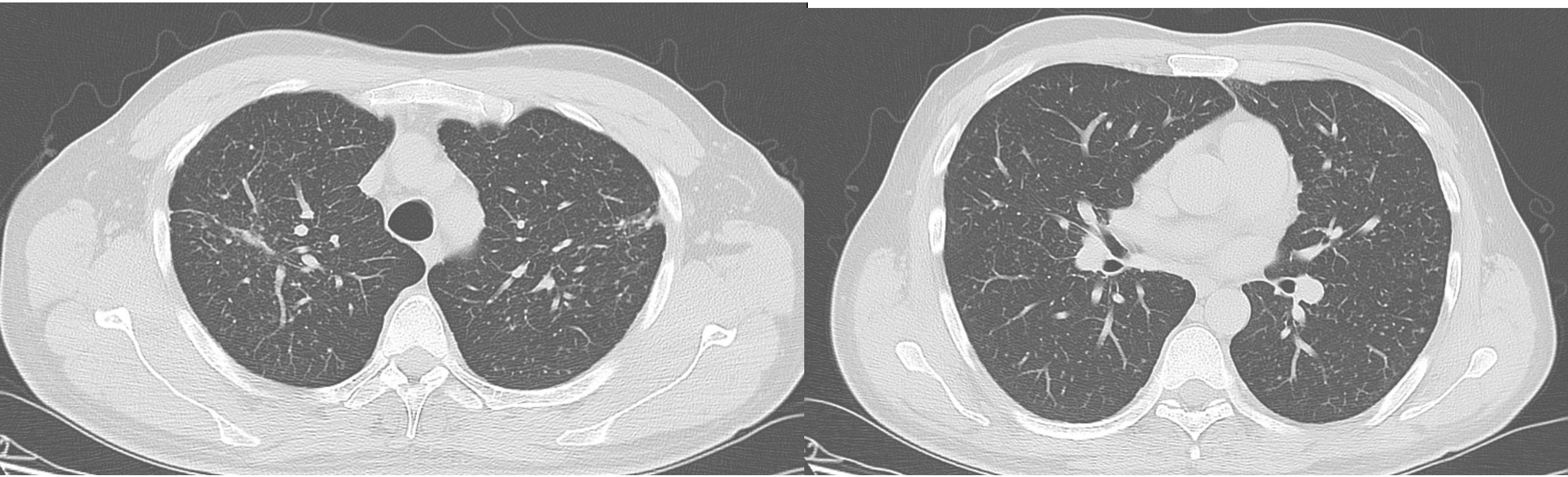
  -adult at least 5/7 IV if failed orals

Case 3 56 yo Male

- Minimal ex smoker and asymptomatic
- Long history of working with mining poly metals
- Fit and well otherwise
- Previous bronchoscopy washing
- What is it?



Case 3 CT scan 2 years earlier



Case 3 Silicosis

- Silicosis pattern of many small nodules ?miliary TB or chickenpox in adult or other
- 4 diseases seen
  - Acute silicosis (silicoproteinosis)
  - Accelerated silicosis
  - Chronic silicosis (simple, classical or nodular)
  - Complicated silicosis (progressive massive fibrosis)

Accelerated Silicosis Assessment Pathway

- Silica is a major component of most rocks and makes up more than half the earth's crust.
- Engineered stone is 90% silicate
- Occurs in first 1-10 years of work
- As of September, 2023, a total of 190 claims had been lodged with the Accelerated Silicosis Assessment Pathway
- At June 2022, 1,053 people who worked with artificial stone in Queensland; 204 people has silicosis (19%) and 36 have progressive massive fibrosis (3%)

A. Identify a potentially exposed person and encourage GP visit

A person[2] at risk of developing accelerated silicosis from more than six months of work with engineered stone in the last ten years should be encouraged to visit their GP for a health check. The person may initiate the visit or be encouraged by family, a workmate, their employer or a member of a profession or relevant organisation (e.g. a WorkSafe Inspector, occupational health nurse or union). It is helpful if the person brings any relevant health monitoring records from work to the appointment.

B. GP or other medical practitioner visit and initial assessment

1. The person discusses health and/or exposure concerns with GP.
2. If the accelerated silicosis exposure threshold is met[3], GP completes initial assessment with the person. If there are other health concerns, GP assesses as per usual process.
3. Obtain the person's consent to agreed actions. Consider any psychological support needs (e.g. workplace Employee Assistance Programme where available), complete initial assessment.
4. Lodge ACC claim if the accelerated silicosis exposure threshold and ACC eligibility crieria[4] are met.

C. ACC initial assessment

FOLLOW-UP

1. Case is reviewed. Contact person to discuss their claim, explain the process and gain consent to proceed.
2. Obtain relevant work and non-work exposure history using a questionnaire.
3. Confirm accelerated silicosis exposure threshold and ACC eligibility criteria[4] are met.
4. Request GP to make a further appointment with person and provide authorisation for silica-exposure investigations or issue decline cover decision.

D. GP or other medical practitioner visit and follow-up assessment (as needed)

1. Complete follow-up clinical assessment with the person (including spirometry). If other health concerns, GP assesses as per usual process.
2. Obtain the person's consent to agreed actions. Consider any psychological support needs (e.g. workplace Employee Assistance Programme where available).
3. Order silica-exposure investigations requested by ACC: chest x-ray, high resolution CT scan silicosis protocol (private radiology provider) and autoimmune screen bloods/urine (local community lab).

E. ACC follow-up assessment

FOLLOW-UP

1. Case is reviewed. Contact is made with the person to discuss their claim and confirm they have had follow-up GP appointment and investigations.
2. Request and review medical records and investigation results from GP.
3. Determine need for any further information or follow-up e.g. lung function test (spirometry & DLCO[5]).
4. Contact person to discuss next steps and gain consent to proceed.
5. Issue cover decision and follow up with GP or refer for external clinical expertise as needed.

FOLLOW-UP

Follow-up will take place at different points on the pathway for each person, usually when an ACC cover decision is made on a person's work related accelerated silicosis claim.

If a person is eligible to receive public health care in New Zealand, but their exposure has occurred overseas and/or they are not covered by ACC, their GP will consider a referral to a respiratory physician for further assessment.

Non-ACC health issues/ACC claim declined

- ACC provides reports to GP (with the person's consent).
- GP manages patient follow-up of any non-ACC health issues.
- The person is advised to talk to employer, union or see WorkSafe website about any workplace concerns.
- The person is advised to contact GP about any further health concerns.

Possible/probable silicosis

- ACC provides reports to GP (with the person's consent) and authorises payment for recommended follow-up investigations on a case-by-case basis.
- ACC discusses a return to work plan with the person, GP and employer (with the person's consent) based on recommendations from Occupational Medicine Physician and accelerated silicosis MDM as required.
- GP manages the person's follow-up as needed (ACC-funded referral or publicly funded health system).

Accepted ACC claim

- ACC follows up with the person, GP and employer (with the person's consent).
- ACC discusses a return to work or alternative work plan with the person, GP and employer based on

F. Occupational medicine assessment

Required if there are abnormalities on clinical assessment or investigations that raise the possibility of accelerated silicosis and/or concern based on level of exposure to engineered stone.

1. Full history and examination of the person.
2. Person advised of results and preliminary diagnosis, clearance for return to work, how to mitigate exposure risk, next steps.
3. Provide assessment report and recommendations to ACC.

G. ACC follow-up assessment

FOLLOW-UP

1. Case is reviewed. Contact is made with the person to discuss next steps and gain consent to proceed.
2. Issue cover decision and follow-up with GP or refer for accelerated silicosis multidisciplinary meeting (MDM) expert clinical review as discussed with the person.

H. Accelerated silicosis multidisciplinary meeting[6] discussion (as needed)

1. Expert clinical review of ACC-referred cases at accelerated silicosis MDM.
2. Confirm diagnosis.
3. Provide report and recommendations to ACC.

I. ACC final assessment

FOLLOW-UP

1. Case is reviewed. Contact is made with the person to discuss next steps and gain consent.
2. Issue cover decision and follow-up with GP as discussed with the person.

recommendations from Occupational Medicine Physician and an accelerated silicosis MDM as required.

- Treatment and support plan referrals made based on individual needs with the person's consent.
- Usual medical certification process of fitness for work/ modified work duties.

Feedback to WorkSafe New Zealand

Medical Officers of Health are required to notify WorkSafe of any injuries caused by a hazardous substance arising from work. This would apply to injuries caused by respirable crystalline silica, which meets the definition of a hazardous substance. (Note this substance is only hazardous if it's respirable.)

1. www.racp.edu.au/advocacy/division-faculty-and-chapter-priorities/faculty-of-occupational-environmental-medicine/accelerated-silicosis/overview
2. Person includes worker, patient and client depending on the pathway stage and terminology.
3. The accelerated silicosis exposure threshold is more than six months working with engineered stone in the last 10 years.
4. The ACC eligibility criteria are that some of the exposure occurred in a New Zealand workplace and the accelerated silicosis threshold is met.
5. DLCO are pulmonary function tests with diffusing capacity of the lung for carbon monoxide.
6. Accelerated silicosis multidisciplinary meeting that involves respiratory physicians, rheumatologists, chest radiologists, and occupational medicine practitioners.

Other exposure of silicate

- Concrete handling, cutting, grinding or drilling
- Abrasive sand blasting, e.g. construction, automotive and textile manufacturing
- Roading or tunnelling
- Demolition, e.g. crushing or moving rock
- Excavation and earthmoving
- Cement, brick or tile manufacture
- Hydraulic fracking for oil or gas
- Pottery and ceramics
- Jewellery and ornamental stone manufacture or repairs

Risk and known associations

- Smoking is risk factor
- Carcinogenicity, ie lung and renal cancer
- Autoimmune disease (RA, SLE, other CTDs)
- Tuberculosis risk also increased.

ACC paperwork

- Read code: H42z – Silica pneumoconiosis NOS; or
- SNOMED code: 805002 – Pneumoconiosis caused by silica (disorder)
- Type of claim: Work-related
- Provide details of why you think the patient meets the exposure threshold

Reducing exposure

- PPE
- Respiratory protective equipment
- Personal hygiene
- Local exhaust ventilation
- Dust suppression, water or vacuum
- Scheduling to reduce less people/contact

- BEST to stop working.

Silicosis Management

- No treatment available, only supportive care.
- Worst case lung Transplant.
- Chest x-ray and spirometry surveillance if no disease

Summary

- Nodules refer to Fleishner and refer for review if appropriate in public
- Bronchiectasis if never seen refer and lung health management and chest cleerance is keystone management
- Silocosis will come to NZ from engineered stone

Thanks for your attention

Further questions?