



The Australasian Faculty of
Occupational and Environmental Medicine



The Royal Australasian
College of Physicians

Free Papers /
Ramazani
Presentations

6 May 2019

Accelerated Silicosis

An epidemic
Still emerging

Dr Graeme Edwards

- Consultant Physician in Occupational and Environmental Medicine
- RACP Media spokesperson
- AFOEM Qld Regional Councillor
- A/Chair AFOEM Qld Regional Committee

Learning Objectives

Improved understanding of the epidemic hitting Australia

Respirable Crystalline Silica

- What is Silicosis
- How is Accelerated Silicosis from engineered stone different

What's Next

Health screening, health monitoring and health surveillance tomorrow.



Conflicts of Interest?

No known

Consulting Physician in solo private practice

My consulting company is based in Brisbane:

“Streamline International Pty Ltd T/A Work & Health Risk Management”

My primary clinic is on the Gold Coast (Parkwood):

a treating specialist practitioner



Parkwood Village

76-122 Napper Rd PARKWOOD Qld 4214

E: admin@theworkdoctor.com.au

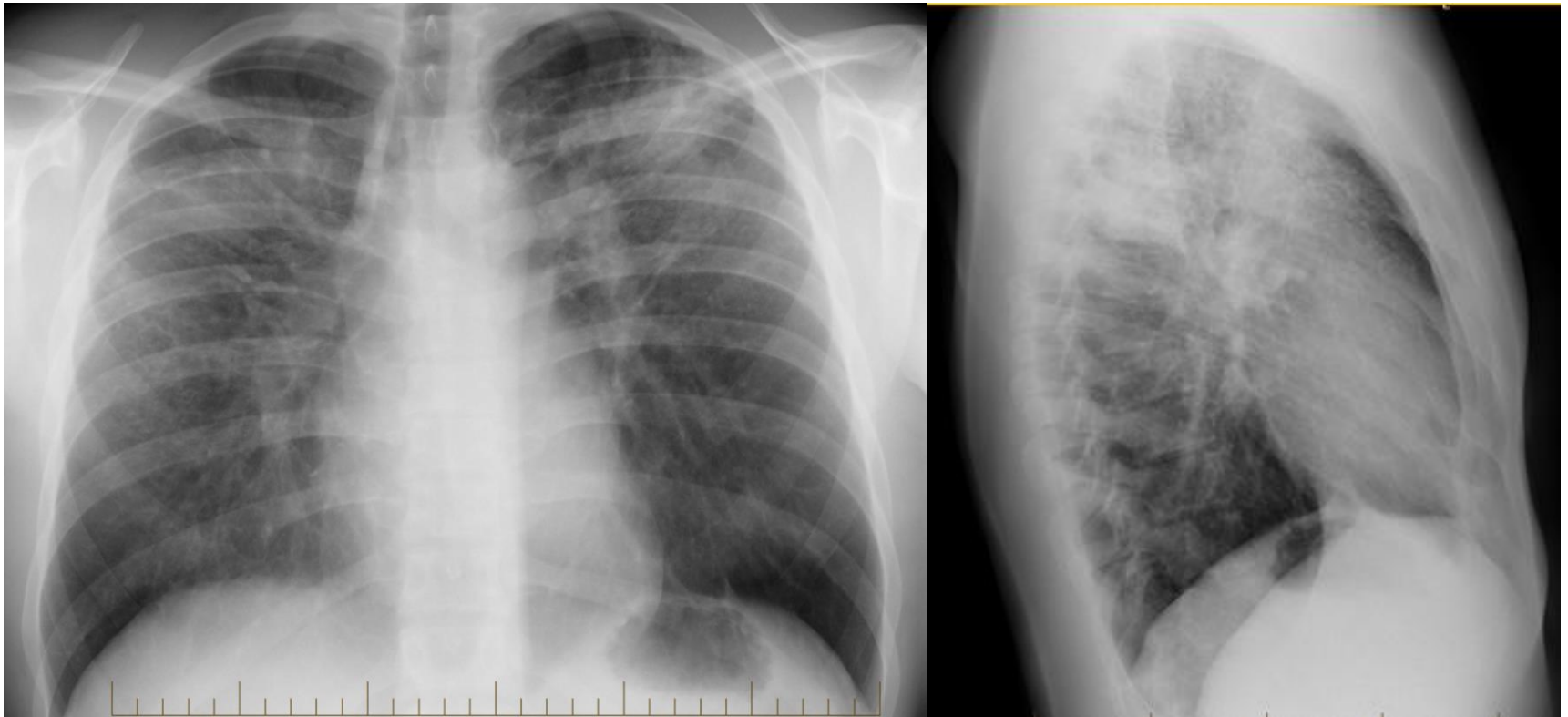
P: 07 5574 5792 F: 07 5571 7564



Asymptomatic 27 year old – ILO Grade 2/3 with PMF

Dry processes 2009-2015 – 6 years

Mixed dry and wet processes since 2015 – 2.5 years

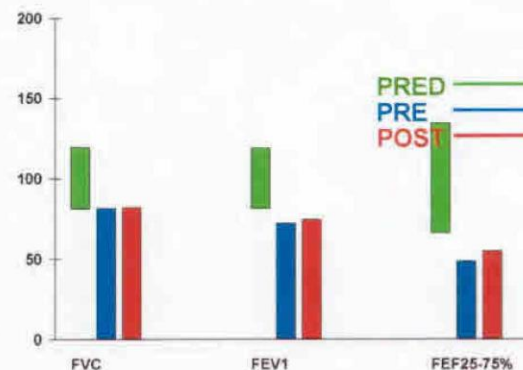
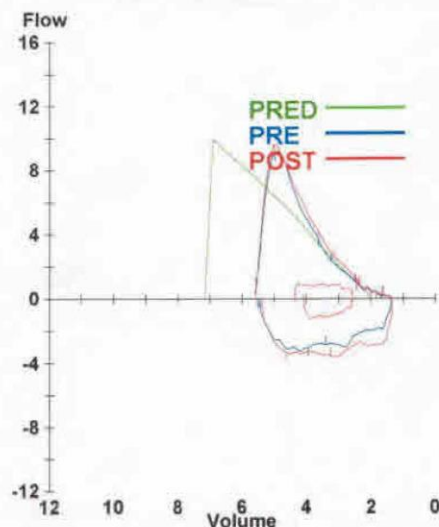


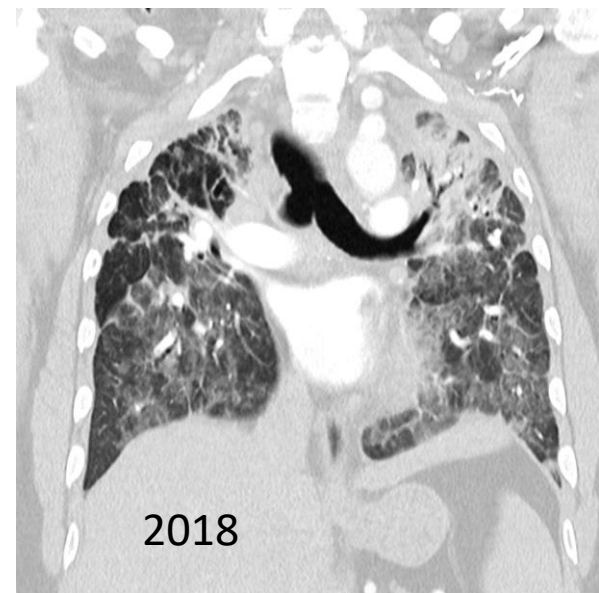
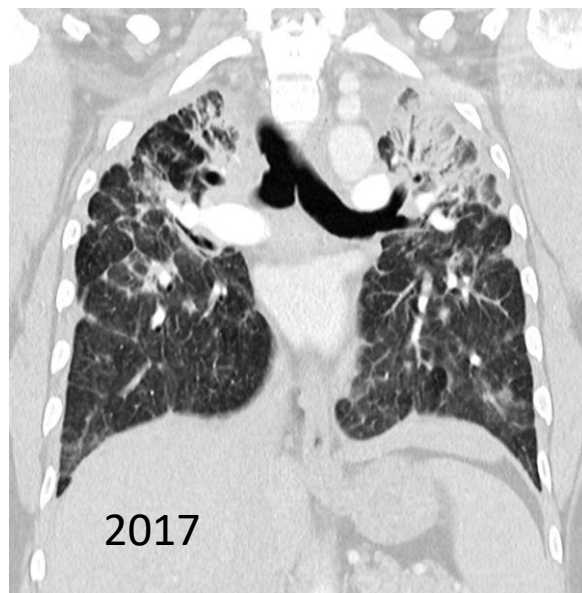
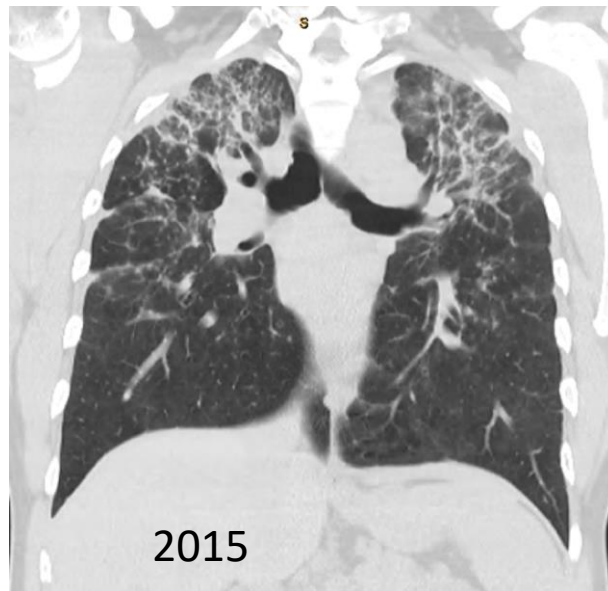
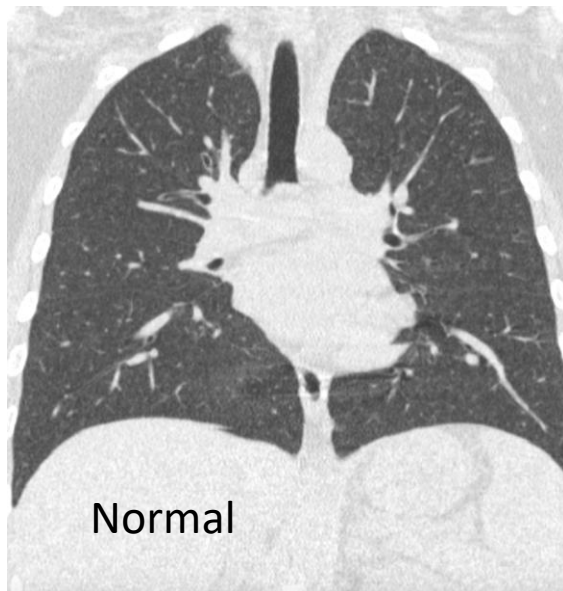
Complex Lung Function Study

Name:
 Age: 27 yr Birth Date:
 Gender: Male Race: Caucasian
 Height: 178 cm Weight: 74.0 kg
 Smoking History: Ex 2007-2014 5/0/0
 Body Mass Index: 23.36

Date: 23/08/18
 ID:
 Physician:
 Temp: 20 Press: 760 Tech:
 Bronchodilator Used: Salbutamol

SPIROMETRY	(BTPS)	PRED	PRE-RX		POST-RX		% CHG
			BEST	%PRED	BEST	%PRED	
FVC	Liters	5.20	4.23	81	4.25	82	0
FEV1	Liters	4.38	(3.16)	(72)	(3.26)	(74)	3
FEV1/FVC	%	82	75		77		
FEF25-75	L/sec	5.00	(2.42)	(48)	(2.73)	(55)	13
PEF	L/sec	9.93	9.17	92	9.59	97	5
DIFFUSION							
DLCO	mL/mmHg/min	35.8			(25.1)	(70)	
V	Liters				4.96		
DLCO/VA	mL/mmHg/min/L	6.38			(5.06)	(79)	
IVC	Liters				3.94		
LUNG VOLUMES							
VC	Liters	5.45			(4.25)	(78)	
TLC	Liters	7.14			(5.60)	(78)	
RV	Liters	1.69			1.35	80	
RV/TLC	%	24			24		
FRC PL	Liters	3.33			2.77	83	





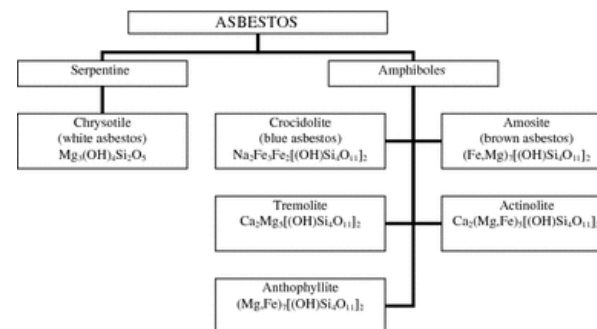
With thanks to Dr R Hoy



Silica (SiO_2)

Silica is a generic term for

- crystalline silicates – mainly quartz = white sand
- It is a naturally occurring mineral which makes up **59%** of the mass of the earth's crust
- Not amorphous silicates (asbestos)



Respirable Crystalline Silica exposure

Typical industries include:

- tunnelling
- foundries
- stonemasonry
- cement manufacturing
- power generation
- brick and tile manufacturing
- ceramics
- construction, including granite grinding and polishing
- metal polishing
- architectural abrasive blasting
- quarrying
- mining



Diseases associated with Respirable Crystalline Silica

- **Silicosis**
- Lung cancer
- **Chronic obstructive pulmonary disease (COPD)**
- Tuberculosis
- **Scleroderma**
- **Rheumatoid arthritis**
- Chronic kidney disease



Silicosis - Pathogenesis

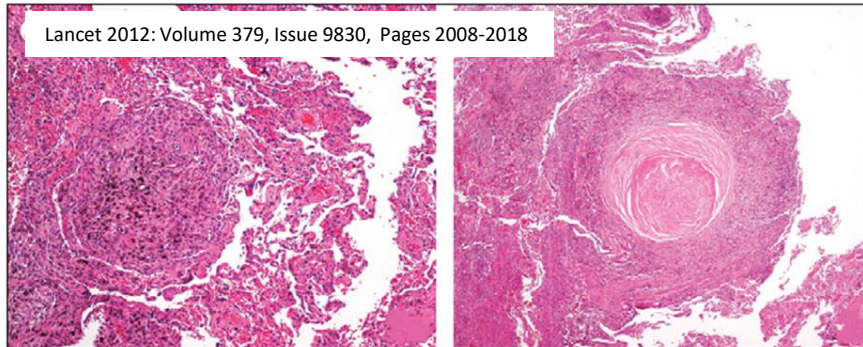
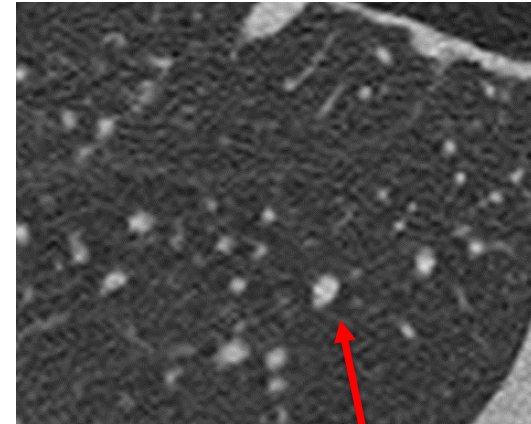
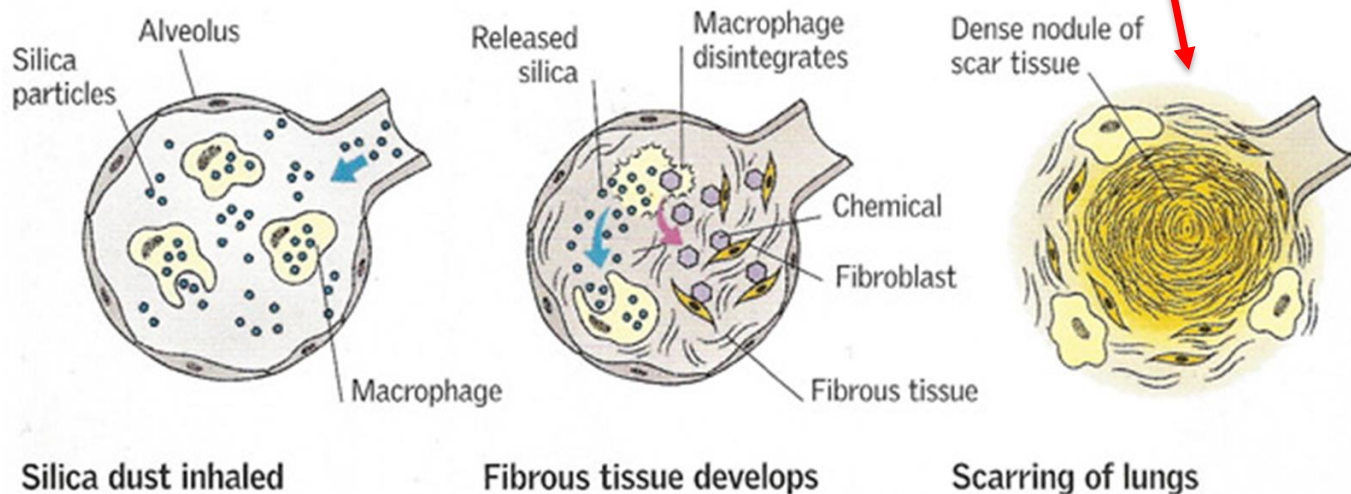


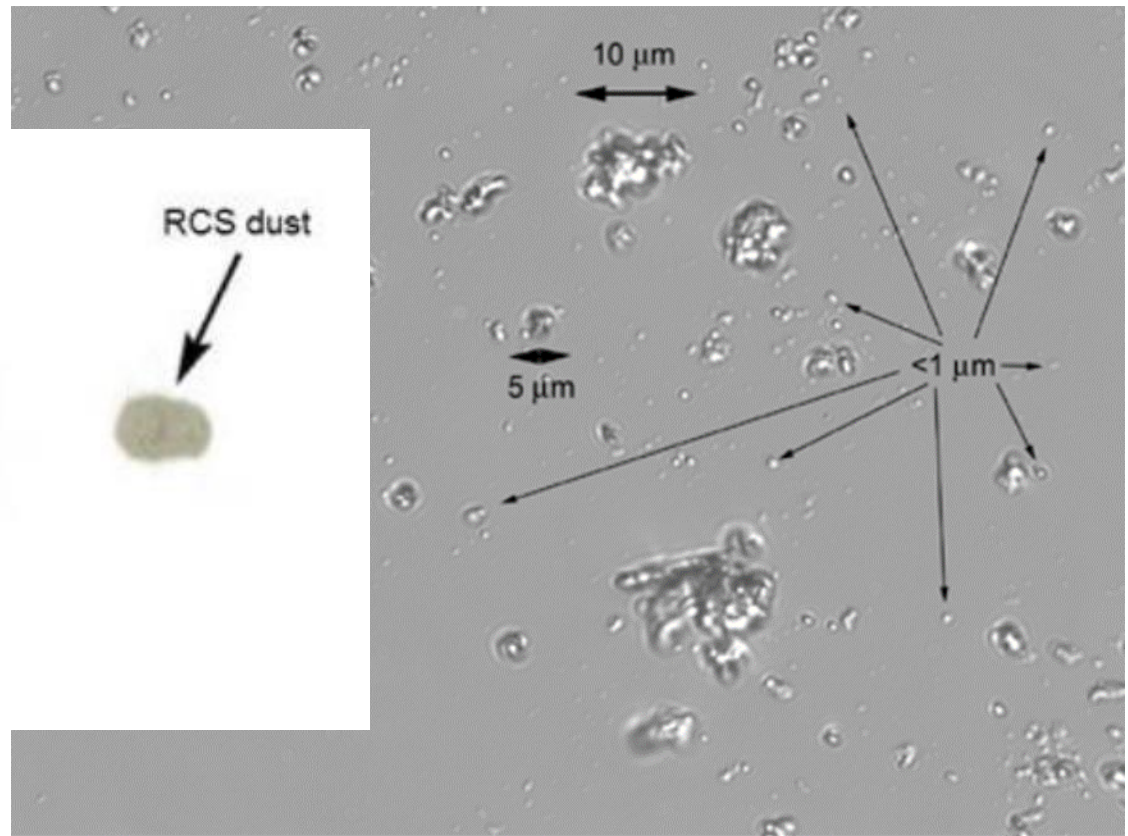
Figure 1: Histological sections of lung with silicotic lesions
Early silicotic lesion as cellular nodule of dust-laden macrophages (A; $\times 100$). Chronic silicotic nodule with concentric fibrosis in the centre and peripheral dust-laden macrophages (B; $\times 40$).



With thanks Dr K Newbigin

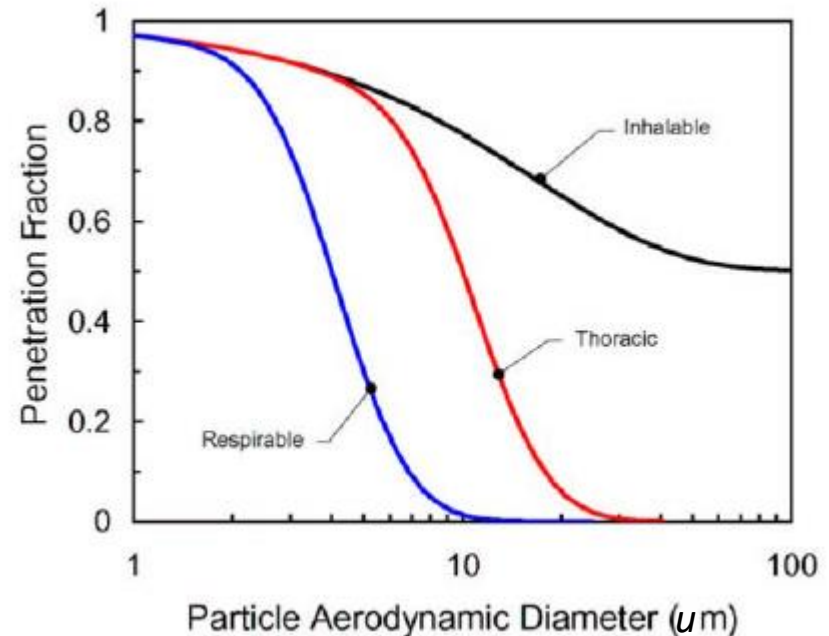


Size Matters



Respirable dust particles - Silicosis

- Particles less than 10 micrometer (μm) AED
- Three forms of silicosis:
 - Chronic >10 years
 - Accelerated 1-10 years
 - Acute <1 year
 - Silicoproteinosis - exudative



μ



Accelerated Silicosis

- 2010 – Case reports by respiratory physicians started appearing in international literature
- 2015 – Increased frequency of overseas published cases and case series – no denominator
- 2016 – Concerns flagged by TSANZ
- 2017 – Australian case report published in MJA
- 2017/8 – Australian case series published in OEM
- 2017/8 – Regulator compliance audits (in Qld and NSW) with notices to individual businesses - *not reported* to the industry nor to the medical profession



September 2018

- **5 September** – Notification to Insurer and Regulator,
- Preliminary findings from the first *complete* health surveillance data from two businesses – crude prevalence:
 - 35 workers examined
 - 12 cases of Accelerated Silicosis or Chronic Silicosis complicated by Progressive Massive fibrosis (PMF)
 - 7/12 cases – PMF
 - Youngest worker 27 years; most late 30's early 40's, some with family and dependent children
- **18 September** – Minister for Industrial Relations (WHS), announced:
 - a ban on dry cutting,
 - notices sent to 160 business and
 - a “health screening program”



And counting

- **Over 100 workers** in Queensland;
- Crude prevalence rate ~ 25-30%, with just under 1 in 5 of these workers presenting with PMF
- Most were relatively **asymptomatic**
 - DID NOT have hilar or mediastinal calcific lymphadenopathy, suggesting:
 - either very early case detection, or
 - a different pathophysiology (e.g. an effect of the resin used in the manufacturing process).
 - **may be amenable to therapeutic intervention**



The Call to Action



1. Educate the industry and enforce the Regulations
2. Control the dust and use appropriate respiratory protection
 - Powered Air Purified Respirators
 - No uncontrolled dry processes
3. National surveillance program and disease registry
 - From exposure
 - Notifiable Disease – engaging Public Health
4. Health assessments of all high-risk workers
 - False negative rate of spirometry and ILO CXR – add Diffusion Capacity and HRCT
5. Better our understanding of the disease

Frequently asked questions



The Australasian Faculty of
Occupational and Environmental Medicine



The Royal Australasian
College of Physicians

The screenshot shows a web browser window with the URL <https://www.racp.edu.au/advocacy/division-faculty-and-chapter-priorities/faculty-of-occupational-environmental-medicine/accelerated-silicosis/faqs>. The page features a dark blue header with navigation links: HOME, ABOUT, NEWS AND EVENTS, POLICY AND ADVOCACY, INNOVATION, and CONTACT US. Below the header is a white navigation bar with the RACP logo and the tagline 'Specialists. Together'. It also includes links for 'Become a Physician', 'Trainees', and 'Fellows', along with a search bar and a 'LOG IN' button. The main content area has a large image of two healthcare professionals looking at a chest X-ray. A left sidebar contains a 'Policy and Advocacy' menu with options: 'Represent your profession', 'Evolve', 'Policy and Advocacy Priorities', and 'Division, Faculty and Chapter Priorities'. The main heading is 'Frequently asked questions' followed by 'Accelerated Silicosis'. The first question visible is 'What is the issue?'. A breadcrumb trail at the top of the content area reads: Home > Policy and Advocacy > Division, Faculty and Chapter Priorities > Faculty of Occupational & Environmental Medicine > Accelerated Silicosis > Frequently asked questions.

<https://www.racp.edu.au/advocacy/division-faculty-and-chapter-priorities/faculty-of-occupational-environmental-medicine/accelerated-silicosis/faqs>

The footer shows a sidebar with the following links: 'Medicine' and 'Chapter of Sexual Health Medicine'. The main content area contains text about 'New and Veterans since 2010' and 'Who is affected?'. The text is partially cut off at the bottom of the slide.