



The Australasian Faculty of Occupational and Environmental Medicine

Accelerated Silicosis "worse than asbestos"

An update on an epidemic that is 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

Silica Dust

Wednesday 14 August 2019



Work

RISK





August - September 2018

24 August – 5 workers seen, 4 had silicosis – email to WHSQ

5 September – Formal report to the 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

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 – 18/23 had greater than 3 years since first exposure and negative ILO CXR





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



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Complex Lung Function Study



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Work

RISK

MANAGEMENT





32 year old <u>2 years</u> dry processing 4.5 years since first exposure



Lung Function and Immunology

Spirometry

Work

RISK

The 'thresholds' for FEV1 and impairment are defined by the comparison of absolute measurements to reference values, or long tubilal studies that how excessive declines in FEV1. The thresholds below require further eview by a repiratory physician where:

- absolute FEV1 is less than the bourder Limit of Nonnar (LLN); OR
- absolute FEV1 is less than 20% predicted from Global Lury Function Initiative (GLI) reference values - which verils lower OK
- longitudinal decline (F. 1 is greater man 15% chance of predicted GLI. •

	Pred	GL LL V	16-Aug-1	Prd	GLI LLN	10-J (r 19	Change (10mths)			
	Aug-18	A g-18	*	Jun-19	Jun-15		Preu	Vol	%	
FVC	5.27	4.29	4 48	5.19	4. 2	4.96	0. 8	0.02	-0.4%	-25%
FEV1	4.36	3.46	4.0 -	4.28	3 40	3.84	-0.08	0.2	-5.0%	-250%
FEV1%	82.7%	73.2%	81.1%	82 5%	73.0%	77.46				

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Immunology (4 Uy 2019)

MANAGEM

- Antinuclear Antibody Title 1940 Centromere
- ENA Antibody Screen POSTIVE
- CENP B Antibody (Anti-centromery arkibodies) POSITIVE .
- Angiotensin Converting Enzyme 56 U/L (NR<51)

Health Dr Graeme Edwards FAFOEM RACP MBBS BMedSci CIME MR0



Conflicts of Interest?

No known conflicts of interest

Consulting Physician in solo private practice

My consulting practice – based in Brisbane: "Streamline International Pty Ltd T/A Work & Health Risk Management"

My primary clinic – located on the Gold Coast (Parkwood):

a specialist medical practice in Occupational and Environmental Medicine



Parkwood Village 76-122 Napper Rd PARKWOOD Qld 4214 E: <u>admin@theworkdoctor.com.au</u> P: 07 5574 5792 F: 07 5571 7564

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Accelerated Silicosis – *Prima Facie* evidence of a failed regulatory framework in Australia

- What are we concerned about
- Why Now
- Update on activity
- What next





2019 – In Queensland still counting

- Over 160 workers in Queensland;
- Crude prevalence rate ~ 15-20%, with just under 1 in 6 of these workers presenting with PMF
- Most **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





Engineered Stone





Health Dr Graeme Edwards

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Engineered Stone

Over 90% Quartz

Work

- Developed late 80's early 90's in Italy
- Increasingly penetrated the Australian market from 2000
- Wet processing really only in the past 2-4 years
 - Importers and distributors risk mitigation
 - Contractors/Subcontractors increasingly adopting safer work practices

- "social conscience and social responsibility"
- Inconsistent and incomplete utilization at significant, emerging human cost





Size Matters



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Respirable dust particles - Silicosis

Particles less than • 10 micrometre (µm) AED

- Three forms of silicosis:
 - Chronic >10 years
 - Accelerated 1-10 years
 - Silicolymphadenopathy
 - Acute <1 year

Health

MANAGEN

Work

Silicoproteinosis





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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

Silica particles Macrophage Macrophage Keleased silica Macrophage Chemical Fibroblast Fibroblast

Silica dust inhaled

Fibrous tissue develops

Scarring of lungs



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Diseases <u>associated</u> with Respirable Crystalline Silica

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







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

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mining





History in Australia

- 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



Work



Why Now – Lag and Latency

- Since 2001: dramatic increase in the number of workers exposed, really escalated about 10 years ago
- The lag time necessary for the "cumulative lung burden" necessary to trigger the disease. Compared with chronic silicosis:
 - Shorter due to the intensity of exposure
 - Much younger age group
 - Additional immunological reaction.



- Accelerated Silicosis is a previously rare condition materially different from chronic silicosis
 - The disease itself indicates exposure occurred 5-10 years prior to the onset of symptoms.
 - The level of awareness historically rare disease in both radiological and general medical practices





Why Now – **Caesarstone Company Overview - September 2018**

Caesarstone U.S. Revenue Performance (\$mm) 186^{20%} 223^(0%) 223^{10%} 245 YoY organic growth 34.4% CAGR Canada 42% 123^{*} 9% 60 31. Israel 2012 2013 2014 2015 2016 2017 2010 2011 Singapore ?\$150m AUD Caesarstone Direct Sales in 6 countries (DC & offices) 0

O Leading Global Footprint with Diverse Revenue Mix





O

48 Caesarstone Distributors



Australia

Health Monitoring

 Health monitoring means monitoring a person's health to identify changes in their health status because of exposure to certain substances.

For RCS:

- Silicosis
- COPD
- Auto-immune connective tissue diseases
- Health monitoring aims to detect adverse health effects at an early stage so effective action may be taken to protect the worker from significant consequences.

For RCS

Work

Accelerated silicosis





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Health

For RCS

Work

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Accelerated silicosis

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RCS Exposure: Composite Stone Workers





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Failed legislative framework (1)

 No case of silica related disease has ever been reported as arising in a scenario that was compliant with the prevailing regulatory requirements of the day.

This means:

Changing the Workplace Exposure Standards will not change the potential for adverse health consequences, arising from persons conducting the business or undertaking (PCBU) who are:

- naive or
- unscrupulous





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Failed legislative framework (2)

2. Statutory intervention only occurs after a breach is detected, and while an inspector may identify non-compliance with the existing regulatory framework there is no process for any specifically exposed worker/s to be identified to the medical practitioner as needing assessment.

This Means

Work

- No trigger or system to enable a statutory empowered investigation into the circumstances or the case
- There is no framework, except in Queensland from 1 July 2019, to enable a medical practitioner to notify the regulator about a worker who is diagnosed with a RCS related disease





Failed legislative framework (2)

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Failed legislative framework (3)

3. Serial Analysis

Is fundamental to reliable, timely and cost effective medical assessment of the previously exposed worker

- no statutory enabled, researchable and accessible repository of
 - exposure history (traditionally recorded as a narrative)
 - the air monitoring data
 - health surveillance / monitoring data
- Especially if
 - The PCBU stops trading
 - A worker leaves the employ of the PCBU responsible for the exposure, or
 - The worker leaves the industry

This means

There is no funded process to enable the serial investigations to be done, and the supervising medical practitioner to access historic data







Failed legislative framework (3)

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2019 - Elsewhere

Active case finding activity:

- Victoria
- SA
- New Zealand

Case reports:

- NSW
- WA

Research:

- Epidemiological study commenced in Victoria
- Various proposals in different stages of funding applications





The Call to Action

Work

^CHealth



- 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

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- 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

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The Call to Action





The Royal Australasian

The Australasian Faculty of Occupational and Environmental Medicine

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College of Physicians

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Powered Air Purified Resp No uncontrolled dry

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- apacity and HRCT
- inderstanding of the disease

National Taskforce

- 1. Stock-take existing efforts
- 2. Identify the gaps in the regulatory framework
- 3. Facilitate pooled data analysis
 - An engineered stonemasonry exposure registry
 - Dust disease registry
- 4. Standardise diagnostic criteria
- 5. Improve <u>coordination</u> and <u>collaboration</u> across jurisdictions
 - Awareness, knowledge transfer, education
 - Research into:
 - Exposure cumulative lung burden
 - Toxicology the role of the composite materials
 - Diagnosis biomarkers
 - Management
 - optimal occupational and respiratory function
 - novel treatments used much earlier in the clinical course of the pathology







Frequently asked questions





The Australasian Faculty of Occupational and Environmental Medicine The Royal Australasian College of Physicians



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

Medicine	Australia and New Zealand.	
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Thank you





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