

Respirable Crystalline Silica and Health Surveillance

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Principal Medical Adviser

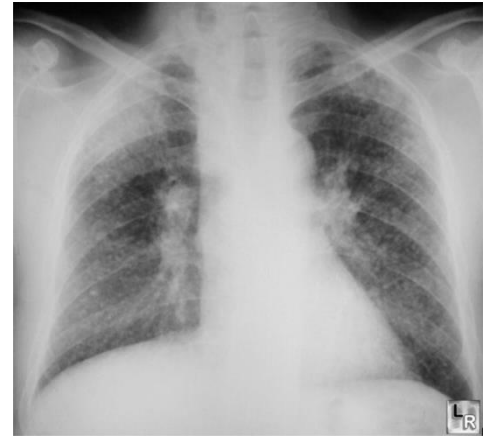
Consultant Occupational Physician

Session overview

- Silica health effects
- Health surveillance programme
- Outcomes
- Health / medical records

Silica health effects

- Silicosis (acute, accelerated, chronic)
- Chronic obstructive pulmonary disease (COPD)
- Lung cancer
- Tuberculosis
- Rheumatoid arthritis
- Systemic lupus erythematosus
- Scleroderma
- Gastric Cancer



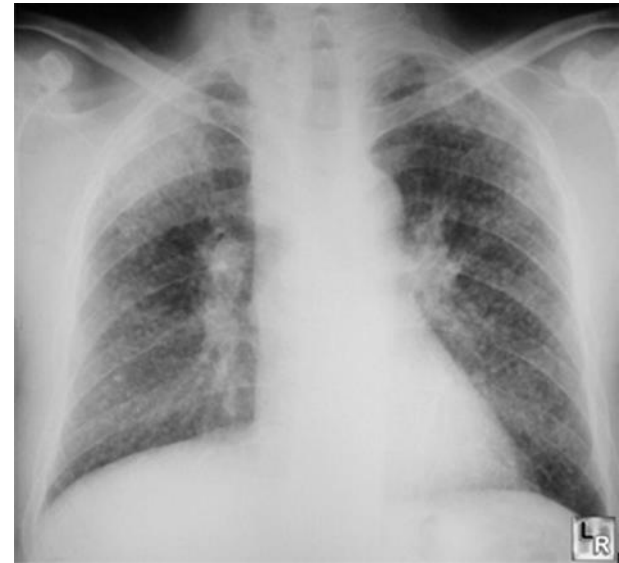
Silicosis

- Normally at least 10 years exposure to silica
- Normally no symptoms early on
- Normally lung function tests do not change early on
- Typical to see small opacities on a chest x-ray; this **makes** the diagnosis of silicosis


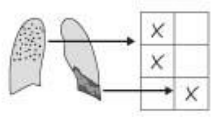


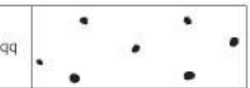

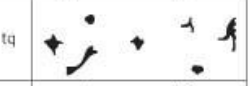

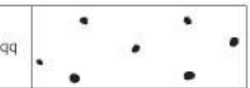

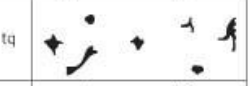

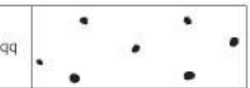

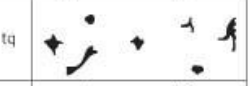


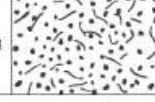
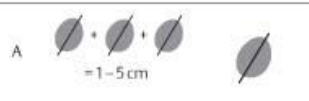
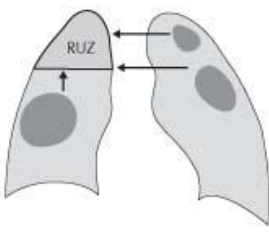
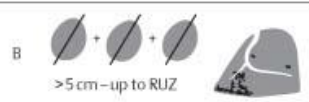
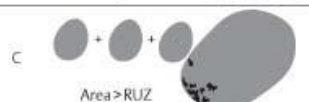


Chest x-rays

- Silicosis diagnosed by chest x-ray
- Exposure to x-rays justified in this context on health grounds
- Dose of radiation low
 - Chest x-ray (0.014 mSv)
 - Return transatlantic flight (0.08 mSv)
 - 100g of brazil nuts (0.10 mSv)
 - UK average radon dose (1.3mSv)



ILO classification


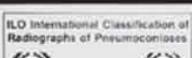
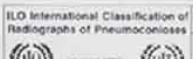
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R	mm	I												
p	-1.5	s												
q	1.5-3	t												
r	3-10	u												
A		= 1-5 cm												
B		>5 cm - up to RUZ												
C		Area > RUZ												



a



b


ILO International Classification of Radiographs of Pneumoconioses	PROFUSION	SHAPE-SIZE
	 1/1	u/u
	ILO International Classification of Radiographs of Pneumoconioses	
ILO International Classification of Radiographs of Pneumoconioses	PROFUSION	SHAPE-SIZE
	 2/2	u/u
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ILO International Classification of Radiographs of Pneumoconioses	PROFUSION	SHAPE-SIZE
	 3/3	u/u

c



d

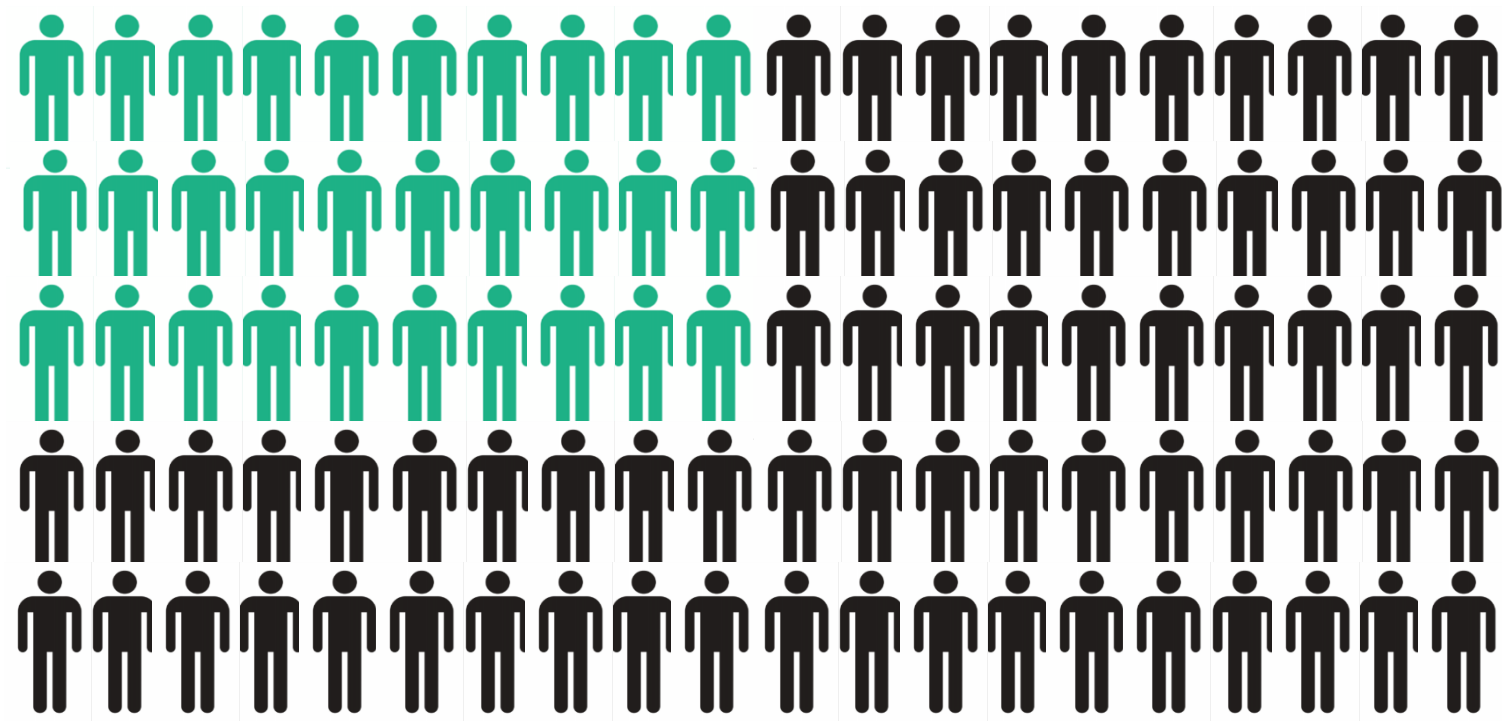
ILO Classification

Increasing profusion of small opacities 

Categories	0	1	2	3
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Subcategories	0/-	0/0	0/1	1/0	1/1	1/2	2/1	2/2	2/3	3/2	3/3	3/+
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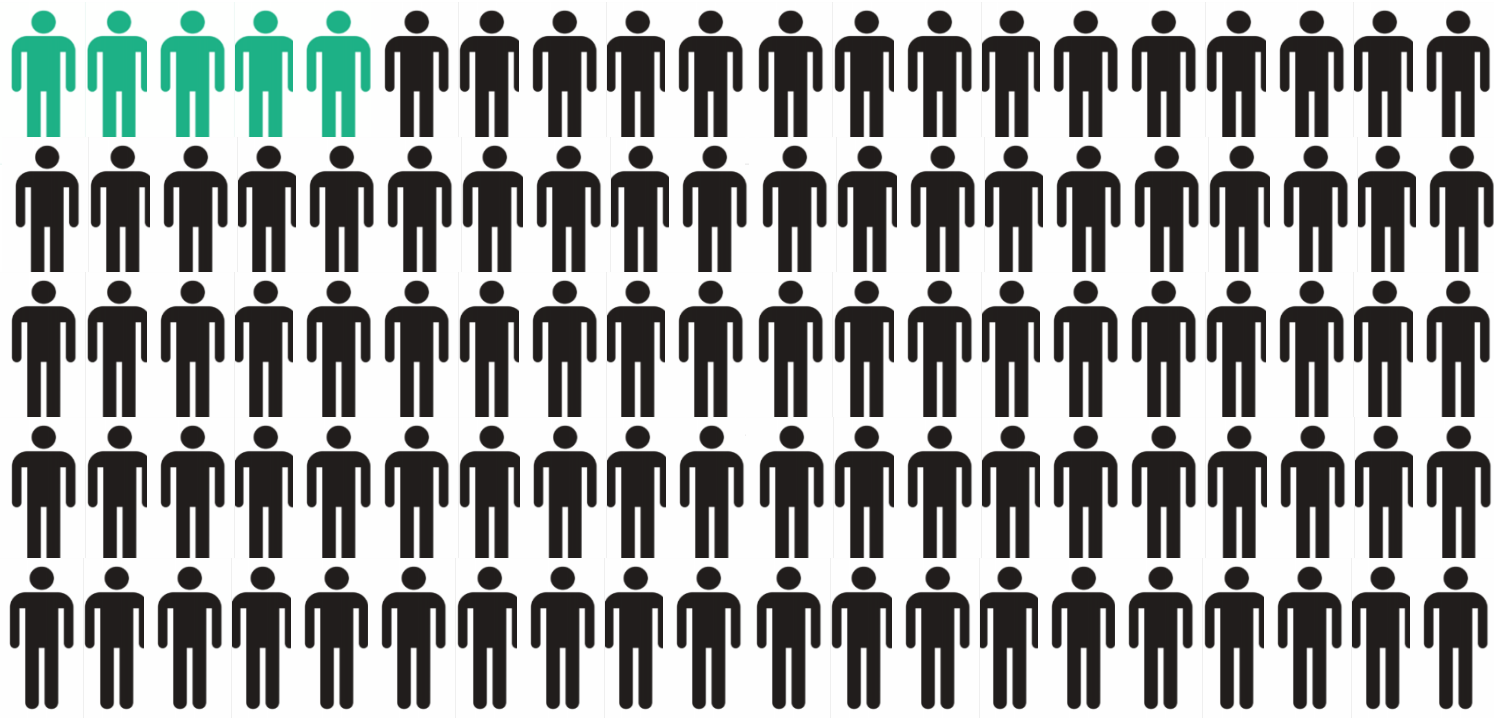
Lifetime risk from 0.1 mg/m^3 for 45 years



Current GB WEL = 0.1 mg/m^3 8hrs TWA

Source: US
OSHA 2016

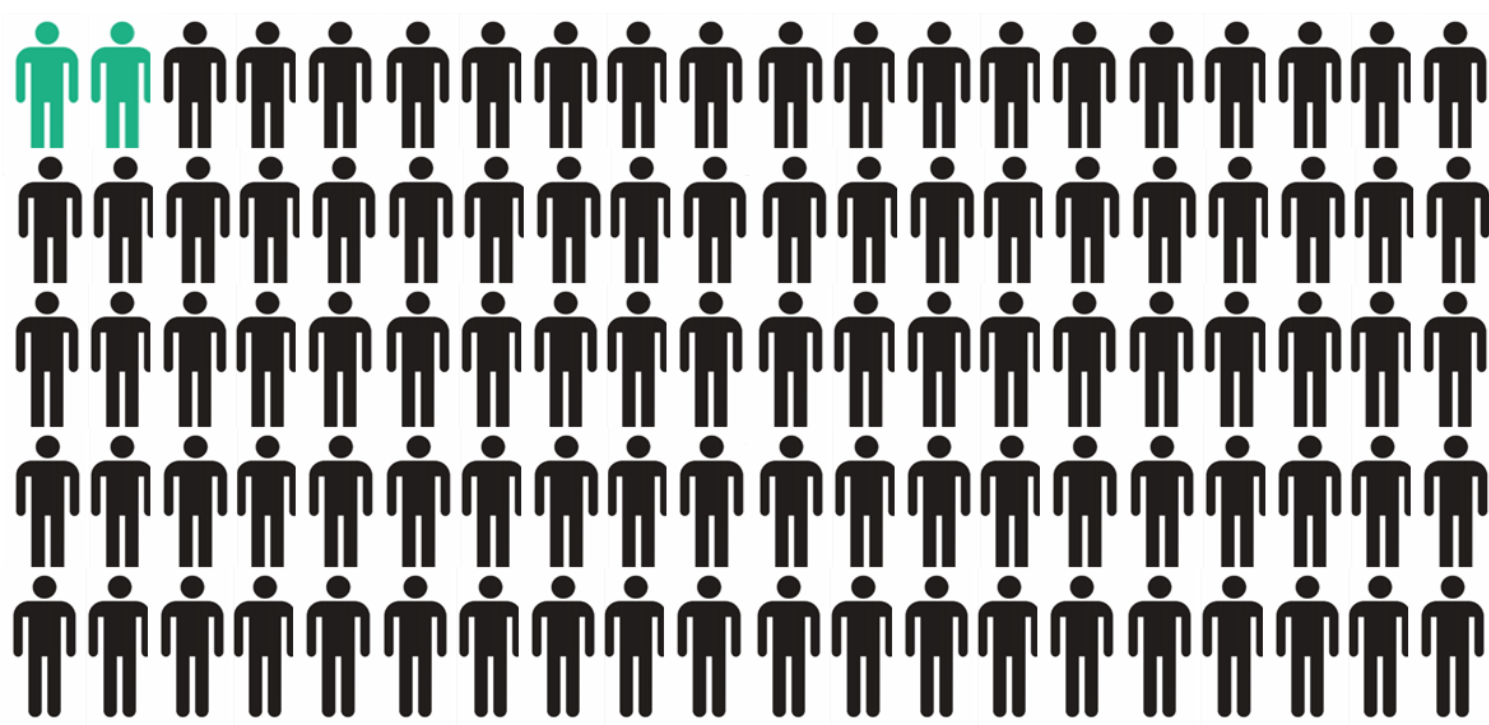
Lifetime risk from 0.05 mg/m³ for 45 years



Current GB WEL = 0.1mg/m³ 8hrs TWA

Source: US
OSHA 2016

Lifetime risk from 0.025 mg/m³ for 45 years

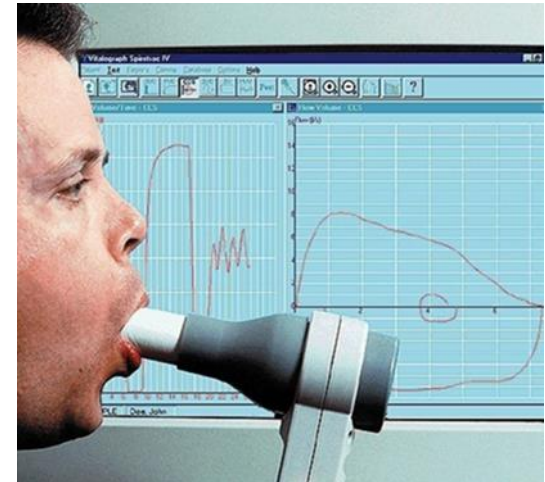


Current GB WEL = 0.1mg/m³ 8hrs TWA

Source: US
OSHA 2016

COPD

- Long term progressive loss on breathing tests
- Normally no symptoms early on
- Lung function tests every year spot those workers running into trouble
- Chest x-ray **NOT** generally useful



HSE guidance documents



G404 Health surveillance for those exposed to respirable crystalline silica (RCS)



Supplementary guidance for occupational health professionals

HSE Health and Safety Executive

G404

COSHH essentials:
General guidance

This information will help employers comply with the Control of Substances Hazardous to Health Regulations 2002 (COSHH), as amended, to control exposure and protect workers' health.

It is also useful for trade union safety representatives.

This sheet describes specialist advice on health surveillance for silicosis caused by respirable crystalline silica (RCS).

It sets out what you should expect from a health provider.

It also gives information about how to monitor respiratory health for other diseases that might be caused by RCS such as chronic obstructive pulmonary disease (COPD).

Tell your occupational health professional if workers have developed or noticed recent, persistent worsening of any of the following symptoms:

- difficulty in breathing; or
- coughing.

If workers smoke, help them to cut down or stop.

Control approach 4 Special

Introduction

- ✓ Your work involves dusts that can cause lung diseases. The risks depend on:
 - how long workers are exposed to the dust;
 - how much they are exposed to; and
 - how much crystalline silica there is in the dust.
- ✓ Although it arises in obviously dusty environments RCS dust is invisibly fine. It is breathed in through the nose and mouth and can stay in the lungs for many years. It can cause irreversible lung damage before any symptoms develop. The illness it causes may continue to worsen even after exposure stops.
- ✓ Silicosis

Silicosis is a major disease risk from RCS dust. It causes small hard nodules of scar tissue to develop in the lungs that are seen on a chest X-ray. Silicosis usually takes some years to develop. There is also an acute form of silicosis that occurs at very high exposures. This can start within a short time and can kill within a few months of first exposure.

- ✓ The main symptoms are cough and difficulty in breathing. Workers with silicosis are at increased risk of tuberculosis and lung cancer and may also develop kidney disease and arthritis (and related diseases). Those who work with silica may be at increased risk of some of these diseases even if they do not develop silicosis.
- ✓ Chronic obstructive pulmonary disease (COPD)

Exposure to RCS may also cause COPD. This disease interferes with air movement in and out of the lungs and causes breathlessness, often with a chronic cough and sputum (phlegm).

Occupations

- ✓ Occupations with exposure to RCS include: mining, quarrying, slate works, foundries, potteries, brick and tile making and stonemasonry.
- ✓ Construction work involving cutting or breaking stone, concrete or brick, abrasive blasting and tunnelling is associated with silicosis.
- ✓ Industries that use silica flour to manufacture goods are also at risk.

Planning and preparation

- ✓ Plan what you are going to do if a worker shows signs of lung disease. Make sure your employees are aware of your plans.

HSE Health and Safety Executive

Health surveillance for those exposed to respirable crystalline silica (RCS)

Supplementary guidance for occupational health professionals (amended January 2016)

Introduction

This supplement should be read and used within the context of the general guidance on health surveillance for those exposed to RCS found in HSE's COSHH essentials sheet G404 (www.hse.gov.uk/pubs/other/guidance/g404.pdf).

This supplement provides an example of a health surveillance programme for silicosis for occupational health providers and employers to consider. It provides advice on:

- who to include in a health surveillance programme; and
- who the competent person should be for carrying out each stage of the health surveillance programme.

Who should be included in the health surveillance programme?

Health surveillance for silicosis should be considered for workers who are involved in high-risk occupations, including construction, foundry work, brick and tile work, ceramics, glass manufacturing, quarry and stonework. Where workers are regularly exposed to RCS dust and there is a reasonable likelihood that silicosis may develop, health surveillance must be provided.

Further examples of where health surveillance for silicosis may be appropriate include:

- where there have been previous cases of work-related ill-health in the workforce;
- where there is reliance on RPE as an exposure control measure for silica; or
- where there is evidence of work-related ill health in the industry.

Chronic obstructive pulmonary disease

The questionnaire and lung function testing elements of the health surveillance should help in identifying chronic obstructive pulmonary disease (COPD) which is also associated with exposure to RCS.

Tuberculosis

There is no current evidence to support the regular use of tuberculosis testing for silica-exposed workers. Any worker suspected of having tuberculosis should be referred by their GP to the local NHS TB service.

Silica health surveillance

- High risk occupations:
 - Construction, foundries, brick and tile work, ceramics, quarries, stonework
- Wherever there is a reasonable likelihood that silicosis may occur

Chest X-ray frequency

- Consider baseline for future comparison
- After 15 years
- 3 yearly thereafter

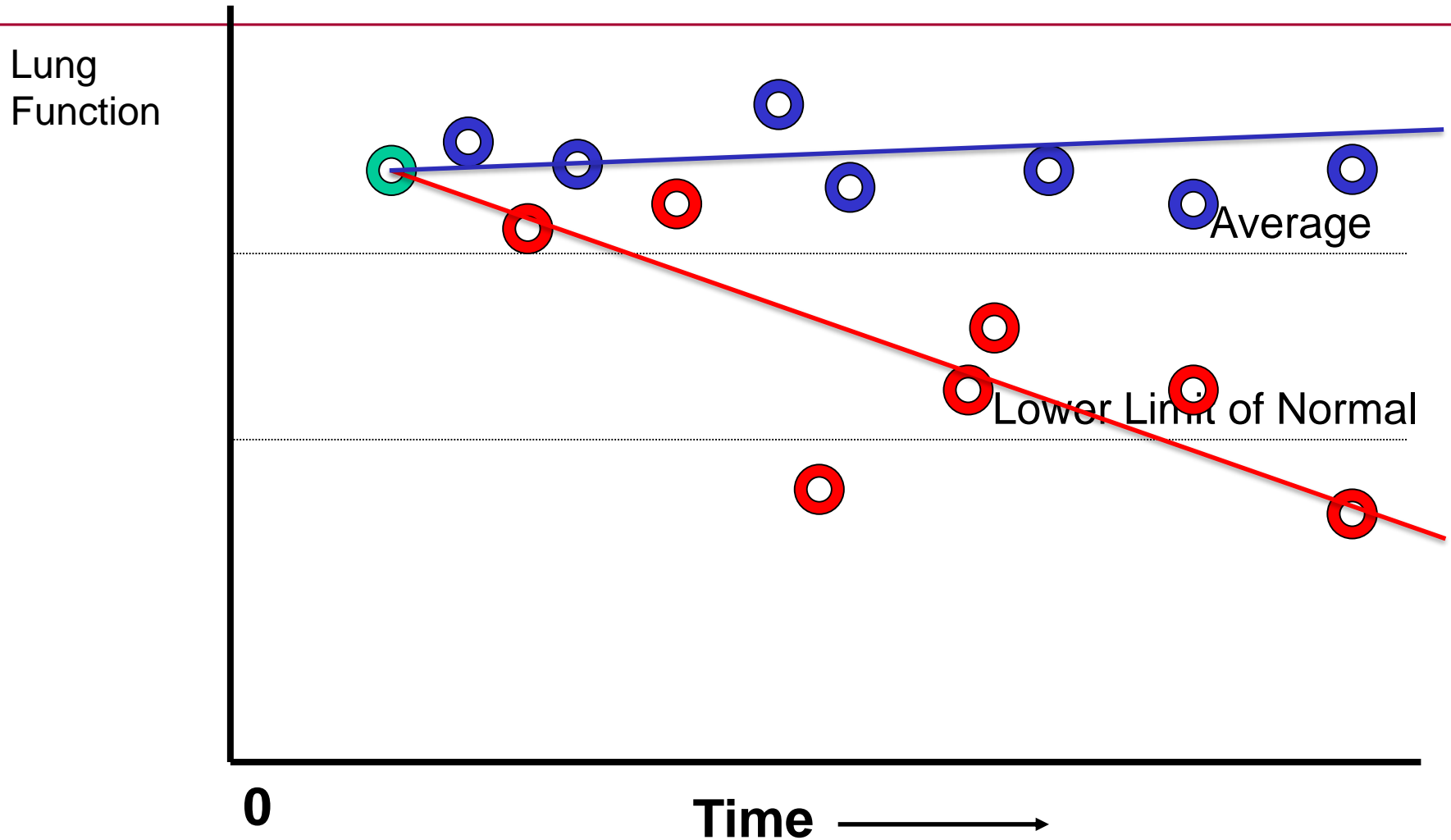
Baseline and Annual assessment

- Respiratory questionnaire
- Spirometry
- Serial results need to be accessible
- Need responsible person, supported by health professional, to report to between annual surveillance

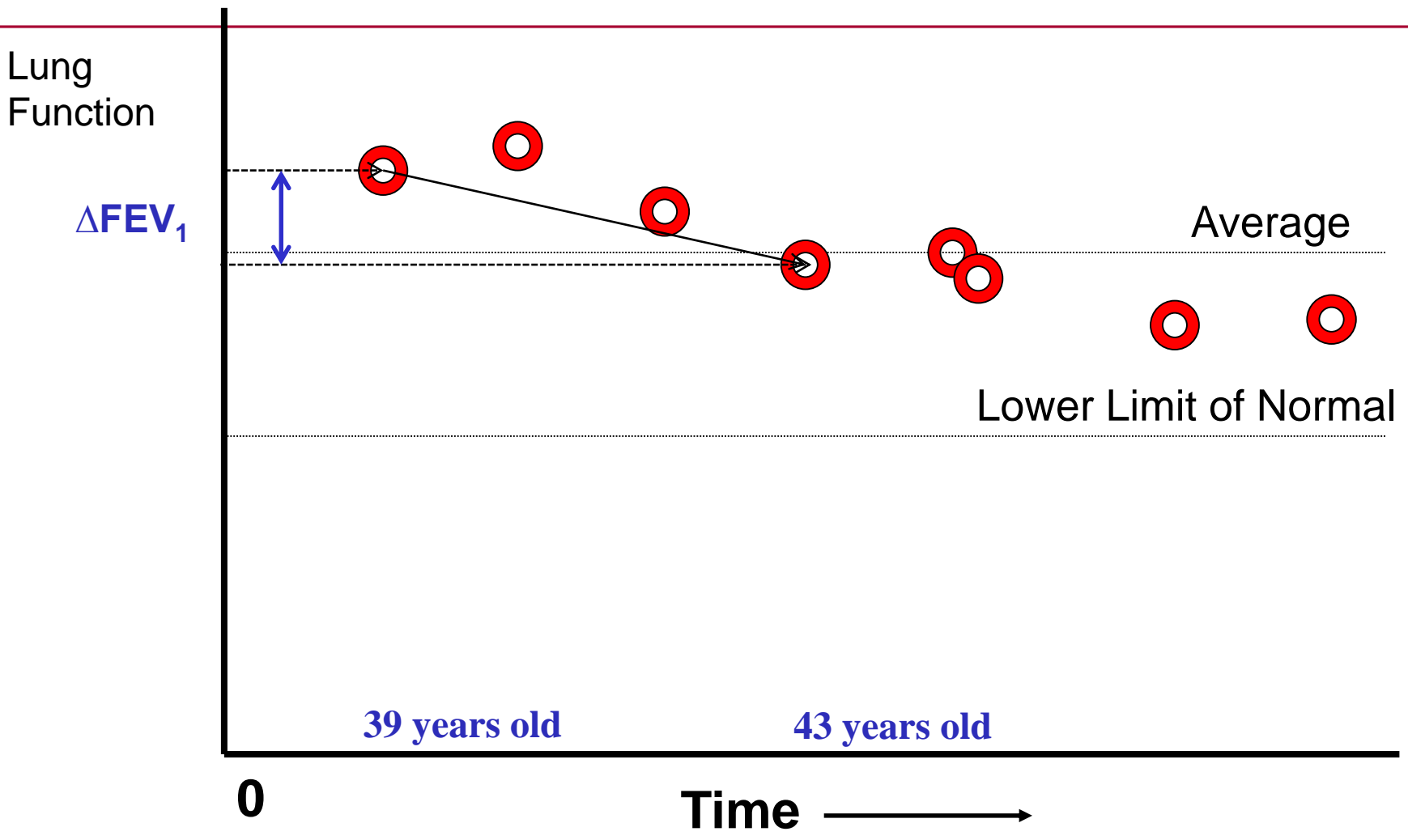
Spirometry

- Common problems:
 - Staff not properly trained
 - Machine not calibrated
 - Inadequate number of blows
 - Serial results not considered

Serial lung function



Above average lung function



What about already exposed employees?

- Baseline spirometry and respiratory questionnaire
- If 15 years or more exposure then perform chest x-ray, three yearly thereafter

Chest X-ray results

ILO grade 1/0 or greater



Refer to respiratory specialist with interest
in occupational lung disease

Respiratory Symptoms Reported

- Refer to health professional with appropriate expertise:
 - Symptoms at baseline
 - New symptoms developed
- Consider with other results i.e. spirometry
- Consider fitness for work

Abnormal Lung Function Tests

- FEV_1/FVC ratio < 0.7
- FEV_1 or FVC $< 80\%$ predicted
- FEV_1 fall >500 mls in 1 year
- FEV_1 fall 500mls over 5 years (i.e. average of 100mls per year)

Fitness for Work



- Opinion of occupational health professional and/or respiratory specialist
- Need clear procedure for management of cases at outset

Health surveillance

- Detect ill-health effects at an early stage
- Enables employees to raise concerns about how work affects their health
- Provides an opportunity to reinforce training and education of employees (e.g. the impact of health effects)
- **Not** an alternative to proper control of exposure
- **Not** the same as health promotion/health screening

Setting up health surveillance

- Consult with employees and their representatives
- Understanding duties, purpose and possible outcomes
- Clear procedure on management of cases

Issues

- Health surveillance not performed
- Inadequate health surveillance
- Communication of results
- Acting on results

Health records

- Duty for retention is on employer (e.g. for 40 years in the case of COSHH)
- Where no retention period – keep record at least as long as employee employed
- Should not include confidential medical information
- Should include fitness for work / health surveillance frequency

Medical Records

- Compiled by occupational health professional (OHP)
- Contains confidential medical information e.g. notes, test results
- Retention periods are not defined in Health and Safety legislation

Data protection principles

- Lawfulness, fairness and transparency
- Purpose limitation
- Data minimisation
- Accuracy
- Storage limitation
- Integrity and confidentiality (security)
- Accountability

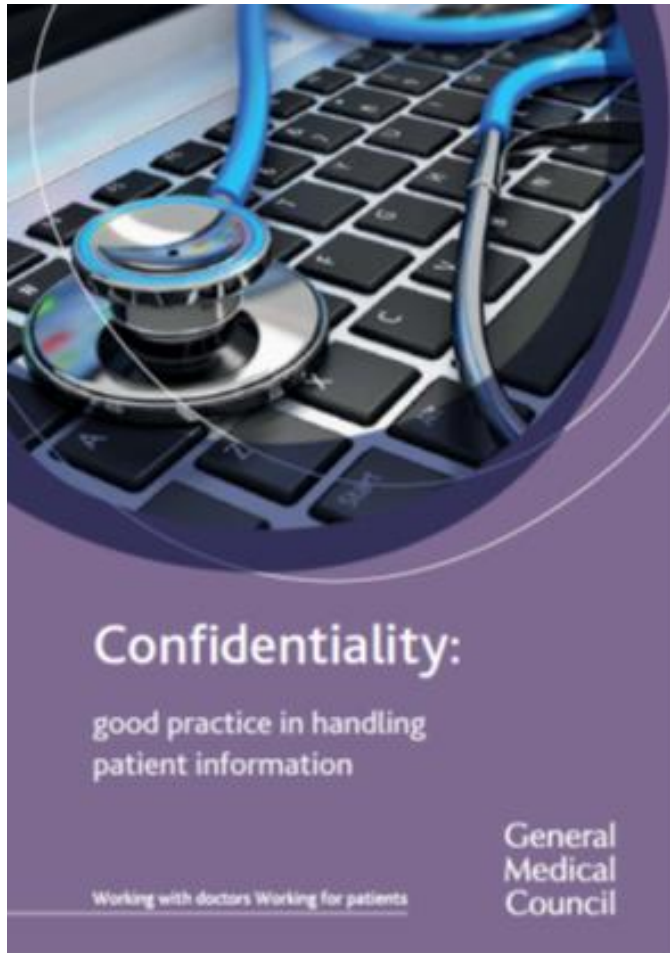
Storage limitation (ICO)

- You must not keep personal data for longer than you need it.
- You need to think about – and be able to justify – how long you keep personal data. This will depend on your purposes for holding the data.
- You need a policy setting standard retention periods wherever possible, to comply with documentation requirements.
- You should also periodically review the data you hold, and erase or anonymise it when you no longer need it.
- You must carefully consider any challenges to your retention of data. Individuals have a right to erasure if you no longer need the data.
- You can keep personal data for longer if you are only keeping it for public interest archiving, scientific or historical research, or statistical purposes.

FOM advice

“[The] health record is not confidential to OH and can be kept by management. The detailed clinical records with the results of the tests and other clinical information should be kept separate in the confidential OH record and not disclosed without consent. The health record should be kept for 40 years (30 years in the case of ionising radiations) but the clinical records do not need to be retained as long as that unless there is, exceptionally, a special reason for doing so.”

General Medical Council



- “UK health departments publish guidance on how long health records should be kept and how they should be disposed of. You should follow the guidance, even if you do not work in the NHS”

Information Governance Alliance



Information
Governance
Alliance **IGA**

- Records Management Code of Practice for Health and Social Care 2016
- Adult health records (not covered elsewhere in schedule) retain for 8 years from discharge or patient last seen

Records Management
Code of Practice for
Health and Social Care
2016

HSE example

- Operations:
 - Development, distribution and review of guidance to staff on the carrying out of operational duties and responsibilities.
 - Inspection, Investigation, Complaints, Enforcement, Notice and Prosecution
 - Destroy @ 10 years

What if employer ceases trading? (Health records)

- HSE does not normally accept such records (but may on occasion do so if they may contribute to health and safety research)
- Otherwise:
 - Return to employee (advise share with GP)?
 - Offer to GP with employee's consent?
 - OH provider to store?

What if OH provider ceases trading? (Medical Records)

- Ideally transfer records to new provider
- HSE does not normally accept such records (but may on occasion do so if they may contribute to health and safety research)
- Otherwise:
 - Give to worker (advise share with GP)?
 - Offer to GP with worker's consent?
 - Manage records within GDPR principles

If you are unsure.....

- Speak to the Information Commissioner's Office (ICO)

SHINE
A LIGHT ON
WORKERS'
HEALTH



**GO
HOME
HEALTHY**

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