Occupational Disease: Current & Future Issues

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Objectives

■ To identify how occupational disease research is used to:
  – Develop and clarify occupational disease policies
  – Adjudicate claims without policy
  – Identify emerging issues
Background

Policy development and adjudication of occupational diseases are more complicated than for work-related injuries because:

– Cause-effect relationship between exposures and disease not always obvious
– Some diseases develop long after exposure
– Often require prolonged and/or intense exposure
– Most diseases have many causes, not all occupational
Clarification of existing policies
Gastro-Intestinal Cancer & Asbestos (1)

Gastro-Intestinal Cancer - Asbestos Exposure (16-02-11)

- Primary cancers associated with the esophagus, stomach, small bowel, colon & rectum
  - Clear & adequate history of occupational exposure to asbestos dust
  - Exposure should be of a continuous & repetitive nature, and should be the major component of the occupational activity
  - Minimum interval of 20 yrs between 1st asbestos exposure and GI cancer diagnosis
Gastro-Intestinal Cancer & Asbestos (2)

- Similar to Schedule B in BC and policies in MB and NL

- Issues:
  - Cancers of the GI tract have different causes
  - Occupational exposure not quantitatively defined
  - In ON policy wordings “clear and adequate” and “continuous and repetitive” difficult for adjudicators to interpret
  - Policy in ON based on epidemiological evidence prior to 1976
Gastro-Intestinal Cancer & Asbestos (3)

- 2009 clarification of GI Asbestos Policy
- Based largely on exhaustive 2006 review by Institute of Medicine (IoM)*
  - IoM found scientific evidence to be suggestive of a causal relationship between asbestos exposure and stomach and colorectal (colon & rectal) cancers
  - For esophageal cancer, the evidence was inadequate to infer a causal relationship

Gastro-Intestinal Cancer & Asbestos (4)

- Based on WSIB analyses of existing evidence level & duration of asbestos exposure suggests high cumulative exposure is required
  - Best estimate is above a cumulative lifetime exposure of 100 f/mL-years for stomach, colon and rectal cancers
  - The evidence of a causal association between esophageal cancer and asbestos exposure is inadequate regardless of the exposure level or duration
Traumatic Mental Stress (1)

- **Ontario Policy: Traumatic Mental Stress (15-03-02)**
  - Worker is entitled to benefits for traumatic mental stress that is an acute reaction to a sudden and unexpected event arising out of and in the course of employment

- Scientific opinion requested to determine if police officers are at greater risk of developing Post-Traumatic Stress Disorder (PTSD)
Traumatic Mental Stress (2)

- Qualitative literature review undertaken
- Findings:
  - Police officers at higher risk of being exposed to traumatic events
  - No study was found that directly addressed whether police officers are at higher risk of developing PTSD than persons employed in other occupations or the general population.
Adjudication without policy
Silica, Silicosis and Lung Cancer (1)

1. Does exposure to silica cause lung cancer?
2. Does exposure to silica cause lung cancer in the absence of silicosis?
3. How much silica exposure is required to increase the risk of lung cancer?
Silica, Silicosis and Lung Cancer (2)

1. Does exposure to silica cause lung cancer?

– IARC classified crystalline silica a confirmed human carcinogen in 1997 (Group 1)
– Recent research confirms evidence of a causal relationship between occupational exposure to silica and increased risk of lung cancer

Answer: YES
Silica, Silicosis and Lung Cancer (3)

2. Does exposure to silica cause lung cancer in the absence of silicosis?

– Strong association between silicosis and lung cancer
– There is inadequate scientific evidence to determine whether exposure to silica increases the risk of lung cancer in the absence of silicosis

Answer: UNCERTAIN
Silica, Silicosis and Lung Cancer (4)

3. How much silica exposure is required to increase the risk of lung cancer?

– Some evidence of increased risk with exposures above 2.0 mg/m³-years
– Strong evidence of cumulative silica exposures above 5.0 mg/m³-years
Silica, Silicosis and Lung Cancer (5)

General adjudicative advice:

1. Strong evidence: Lung cancer with pre-existing silicosis
2. Some evidence: Lung cancer in the absence of silicosis or other significant risk factors with cumulative occupational exposure above 2.0 mg/m³-years
3. Stronger evidence: Lung cancer in the absence of silicosis with cumulative occupational exposure equivalent to or above 5.0 mg/m³-years
Rheumatoid Arthritis and Silica Exposure (1)

Does exposure to silica increase the risk of developing rheumatoid arthritis (RA)?

- Meta-analysis undertaken
- Results:
  - There is *positive evidence* of an association between silica exposure and risk of developing RA; this is supported by evidence of a dose-response relationship
  - Elevated risk is observed after about 20+ years of high exposure to silica (e.g. granite industry)
  - Shorter durations around 10 years have been observed in workers with exceptionally high exposures (gold mining or sand industry) before the 1950s
Rheumatoid Arthritis and Silica Exposure (2)

Risk estimates

- Meta-Analysis – Overall RR 3.43 (95%CI:2.25-5.22)
- Cohort studies – RR range 2.19 to 8.3, all statistically significant
- Case-control studies – statistically significant 2 to 3-fold increased risk of RA
- Silicosis and RA – RR range 2.73 to 8.3
- Granite Industry – RR range 2.01 to 5.08
Emerging issues
Breast cancer and shift work

- IARC has identified that “shift-work that involves circadian disruption is probably carcinogenic to humans” (Group 2A) (IARC Monograph 98)

- Internal review:
  - Compelling experimental and mechanistic evidence for association between overnight shift work and breast cancer
  - Human evidence less clear but some suggestive evidence for nurses who have worked overnight shifts for long durations (20 – 30 years)
  - It is premature to provide adjudicative advice but the science should continue to be monitored.
Breast cancer and shift work

- Potential implications for Compensation Boards:
  - Approx. 20% of working women regularly work in the evening or night or rotating shifts
  - Breast cancer is the most common cancer in women. 1 in 9 women will be diagnosed with breast cancer in their lifetime.
Conclusions

- In occupational disease adjudication and policy development, evaluation of the current scientific evidence is critical.
- Often there is no simple response to issues related to causation, duration of exposure or types of occupations.
- Scientific knowledge is constantly evolving. It is important that compensation boards be aware of new evidence and its potential implications.