



The Royal College of Pathologists

Guidelines on Autopsy Practice

Scenario 7: Industrial/occupational-related lung disease deaths including asbestos

Role of the autopsy

- Describe and diagnose all occupational/industrial disease manifestations.
- Determine the aetiology.
- Determine the extent and severity of any other disease present (that would affect life expectancy or quality). This will be taken into account in assessing compensation if death is deemed to be due to a prescribed occupational/industrial disease.

Pathology encountered at the autopsy

Macroscopic examination: disease by common aetiological agents.

Asbestos:

- pleural plaques
- diffuse pleural fibrosis (uni- or bilateral, lower zone, >5 mm thick, >one third of lung)
- rounded atelectasis
- diffuse interstitial fibrosis (asbestosis)
- malignant mesothelioma: pleura; peritoneum; pericardium; gonads
- lung carcinoma.

Silica:

- nodular fibrosis 'classical silicosis'
- progressive massive fibrosis 'complicated silicosis'
- acute silicoproteinosis
- mixed dust fibrosis: silica plus inert/weak fibrogenic dust
- tuberculosis
- lung carcinoma.

Coal:

- simple coal workers' pneumoconiosis
 - primary dust macules (impalpable)
 - secondary dust nodules (palpable)
 - diffuse interstitial fibrosis
- Complicated coal workers' pneumoconiosis
 - progressive massive fibrosis (lesions >1 cm).

Specific health and safety aspects

- Subjects with silicosis are at increased risk of tuberculosis.
- No other aspects.

Clinical information relevant to the autopsy

- The medical records and often witness statements are required to detail the occupational and environmental exposure histories. For causation purposes, it is important to know:
 - the date of the first and last exposure to the claimed aetiological agent(s)
 - job details and employment histories. This allows for the assessment of cumulative dust exposure (intensity and duration). This includes the complete chronological job details and/or other exposures (para-occupational/domestic; environmental; ambient).
 - for chronic fibrotic and neoplastic conditions, exposures less than 15 years prior to death are unlikely to be related to that putative or claimed aetiological agent.
- Social history and hobbies are important in cases of extrinsic allergic bronchiolo-alveolitis.
- In lung cancer cases, the smoking history should be identified.
- In diffuse interstitial fibrosis (DIF) cases, clinical history and course is important. Pneumoconioses usually have a long clinical course compared with DIF of cryptogenic origin.

The autopsy procedure

Complete post mortem.

Specific significant organ systems

Organ	Pathology	Agent
Skin	Linear tattoos	Coal
	Corns (knuckles, finger tips)	Asbestos
Thorax/lungs	Adult respiratory distress syndrome (shock lung)	Smoke, fumes
	Emphysema	Coal
	Macules	Coal, silicates, iron
	Nodular fibrosis	Coal, silica
	Progressive massive fibrosis	Silicate (talc, mica) Coal, silica

Organ	Pathology	Agent
Thorax/lungs (continued)	Diffuse fibrosis	Asbestosis
	Lower zone predominant	
	Diffuse fibrosis	Coal (rare)
	Upper zone predominant	Silica
		Aluminium
		Beryllium
		EABA*
Thorax/pleura	Carcinoma	Asbestos, silica
	Plaques	Asbestos
	Nodular fibrosis	Silica
	Diffuse fibrosis	Asbestos
	Mesothelioma	Asbestos
Peritoneum	Mesothelioma	Asbestos
Pericardium	Mesothelioma	Asbestos

* EABA = extrinsic allergic bronchiolo-alveolitis/hypersensitivity pneumonitis.

Organ retention

- For tumour-related occupational deaths: lung (tumour and contralateral lung background), pleura, pericardium, peritoneum (if mesothelioma).
- For non-tumour cases: extensive sampling of lung parenchyma to determine extent and distribution as well as causation of fibrosis/other pathology.

Recommended blocks for histological examination – best practice

- If mesothelioma – tumour (two random): immunohistochemistry essential in unsuspected cases.
- If lung cancer – tumour (two random).
- In non-tumour related occupational deaths: lung (a minimum of four tissue blocks required: upper lobe, mid zone/middle lobe, upper aspect lower lobe and lung base) to determine extent, distribution and causation. (Optimal tissue blocks = 15).
- Other organs: myocardium, liver, kidneys, spleen – determined by macroscopic findings.

Other samples required

- Three 2 cm³ samples of lung (contralateral lung in tumour deaths) retained for mineral fibre analysis if no fibrogenic dusts are identified by light microscopy.

The clinicopathological summary

- Document gross/histological findings relating to occupational/industrial lung disease.

- Correlate exposure history from clinical records/witness statements with pathological findings.
- Determine significance of mineral fibre analysis if performed.
- Document other concurrent pathology.
- Determine cause of death.

Specific cause of death opinions/statements

- 1a. Malignant pleural mesothelioma
- 1b. Asbestos exposure

- 1a. Lung carcinoma
- 1b. Asbestosis
- 1c. Asbestos exposure

- 1a. Bronchopneumonia
- 1b. Asbestosis

- 1a. Respiratory failure
- 1b. Progressive massive fibrosis (complicated coal workers' pneumoconiosis)

- 1a. Primary lung carcinoma
- 1b. Silicosis
- 1c. Silica exposure

References

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The RCPATH Working Party on the Autopsy

January 2005