

## **THE PATHOLOGICAL INVESTIGATION OF DRUG-RELATED DEATHS: ADVICE TO PATHOLOGISTS**

### **1. History**

Encourage the Coroner's Officer to provide a detailed history.

Information of particular relevance includes:

- **Medications** – prescribed (past and current) to the deceased, including dose of methadone if on a maintenance programme.
- **Known illicit drug use** – including method of administration.
- **Major illnesses** – particularly those which might point to an alternative cause of death e.g. epilepsy, asthma, diabetes, mental illness.
- **Alcohol misuse**
- **Unexplained symptoms** – e.g. odd “fits” or “faints”, palpitations.
- **Relevant family history** – e.g. sudden unexplained death at a young age, which might point to an inherited arrhythmia/SADS.
- **Previous investigations** – e.g. ECG – which may be relevant if SADS or QT prolongation become issues – and virology tests (HIV/hepatitis).
- **Scene** – e.g. drug paraphernalia – particularly needles; illicit substances and prescribed medications; position of body; vomit/froth in the mouth or nostrils.
- **Recent release from prison** – there is an increased risk of fatality in the few days and weeks after release, due to reduced tolerance.

### **2. Post-mortem examination**

Routine external and internal examination but consider:

- A specific comment on the presence/absence of recent needle puncture marks or scars – which may relate to previous episodes of injection.
- Presence/absence of gastric contents in the trachea/main bronchi.
- Opening the bowel to look for drugs, as “wraps” may be found.

### **3. Histology/Tissue retention**

To assess whether there is microscopic evidence of a disease process which may have contributed to death e.g. pneumonia, or may provide a cause of death if toxicology is negative.

- Sample all major organs.
- Consider skin injection marks – if you wish to determine whether there may have been previous injections at those sites.
- Consider muscle – if rhabdomyolysis is suspected.
- Consider freezing a piece of spleen – to facilitate the investigation of an inherited condition.

### **4. Toxicology**

- If death occurred in hospital, advise the Coroner's Officer to obtain the admission samples – if available.

- Take appropriate samples into the appropriate container, and store them correctly before submitting them to the Toxicology Laboratory.
- Standard samples include femoral blood and urine; if no urine is available – or you wish to analyse for betahydroxybutyrate (BHB) – consider vitreous; consider stomach/bowel contents, hair (for historical intake and therefore tolerance), brain (volatiles), muscle (if severe decomposition), bile (late morphine deaths).
- Blood and urine should be stored in universal (plain) containers and yellow-topped fluoride (1.5%w/v) bottles (clinical (grey-top) containers are not appropriate as they do not contain sufficient fluoride).
- Most samples should be refrigerated; some may be frozen if there is likely to be a delay in submission; consult the toxicologist if in doubt.
- Provide sufficient information to the toxicologist e.g. circumstances of death, name, date of birth, date and time of collection, type of specimen, anatomical site of blood sample, date of death, known medication and illicit drug use.
- Request analysis for alcohol, drugs of abuse and a general screen to cover acidic/basic/neutral drugs; consider the possibility of volatiles and carbon monoxide; consider mast cell tryptase if an allergic reaction to drugs is suspected (the blood sample will need to be obtained as soon as possible and spun-down) ; consider BHB if history of alcoholism and fatty liver; remember that some drugs e.g. gammahydroxybutyrate (GHB), cyanide, paraquat, ethylene glycol, will not show up on a general screen and require specific tests; encourage the toxicologist to provide detail as to what drugs would have been detected by the tests employed, and to provide a comment on the toxicology findings.

## 5. Comment

- Consider reasonable alternative causes of death (other than drug toxicity), particularly those which might be indicated by the history but would not necessarily show an anatomical abnormality e.g. epilepsy, schizophrenia, SADS, alcoholism.
- Consider a drug aetiology for an apparently natural cause of death e.g. intracerebral haemorrhage related to cocaine or amphetamine.
- Explain the reasoning behind the recommended cause of death.
- Address the relevant medico-legal issues (if known) e.g. route of drug administration; post-administration survival period; tolerance/evidence of previous (historical) illicit drug use.

## 6. Cause of Death

- Be as specific as possible. Name the drug(s) involved e.g. morphine (heroin), rather than the general group e.g. opiates, drugs of addiction.
- Avoid the term “overdose”; there is no normal dose for illicit substances and therefore the term is misleading; “toxicity” or “poisoning” are more appropriate terms.
- Consider the possible contribution of alcohol; the combination of morphine (heroin), and alcohol is particularly dangerous.
- Be aware that gastric contents may enter the trachea and bronchi after death due to post-mortem handling and therefore this finding does not necessarily mean that “aspiration of gastric contents” was the mechanism of death.