

## FORENSIC PATHOLOGY IN AVIATION

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Aircraft accident investigation requires the usage of a Forensic pathologist for many reasons. They include issues of:

- a. Manipulation of the controls
- B. Time and cause of death
- c. Pain and suffering
- d. Useful cognitive consciousness and awareness
- e. Drug and alcohol
- f. Prescription and non-prescription counter drugs
- g. Pre existing medical conditions
- h. Pre emergency incapacitation or death

In general, Aviation accidents it is unusual that a forensic pathologist examines the bodies. In some counties, the coroner does not need be an MD. The extent of an examiner or coroners' examination varies from location to location, and with the type of accident. Air carrier accidents always include crew and most passengers.

Military accidents usually include autopsy and toxicology by the Armed Forces Institute of Pathology protocol. Additionally the military sends a team or a specialist to include human factors and survivability aspects of the accident. Their report is separate and privileged from release because of the privacy act. Portions of it can be obtained by signature of release by next of kin.

General Aviation and Air carrier accidents result in blood, urine or body fluid toxicology being done at C.A.M.I at the Bill Maroney Center, an F.A.A, Facility located in Oklahoma City at Will Rogers airport. In civilian cases the N.T.S.B. - F.A.A. utilizes a human factors /survivability checklist as well.

**Who was flying, when** the airplane is multi-piloted and there was qualified crew aboard may sometimes become a legal problem. Autopsy reports are helpful here:

- a. Broken wrists, hand bones and digits are some evidence of control manipulation.
- b. Often examination of control yoke or stick show bending that would explain the bone fractures.
- c. Broken ankles, feet and toes, decimated shoes absent heels and broken or bent rudder pedals are some indication of foot placement at impact.

### CLUES TO DEATH at IMPACT

1. Arterial bleeding in significant amounts shows heart action after laceration.
2. High lung content of smoke and discoloration by soot of lung tissue.
3. High levels of blood carbon monoxide after a ground fire.

4. Seat belt release without chest or head trauma suggests released after impact.
5. Crew or passengers near escape doors.
6. In the case of high temperature fire, exposures the typical skull fractures may not be blunt force trauma. They may be from inter-cranial steam. Thus more important is the lungs.

A pathologist can identify traumas that cause loss of awareness or instant death. This is important to the issue of pain and suffering and survival statutes. These pathologists can probe exactly what it was that caused each injury and he can relate how and when they probably occurred in the crash sequence. This is extremely important since in aviation law there exists the "**Second Crash Theory**" or the "**Doctrine of Crashworthiness**".

A bio medical expert for instance was able to determine that the transverse dissection of a spinal column with chord severance at c5-c6 was due to the pilot being miss- positioned at the time of parachute opening shock after ejection.

These Drs. are invaluable in crashworthiness cases where the crash was survivable but the second impact caused or enhanced the injury complained.

The examples in aviation are similar to those documented in automobile accidents, as example:

- a. Restraint system designs
- b. Knob design and placement
- c. Seat strength and collapse
- d. Structural crushing
- e. Building a safety cocoon around occupants

### **TOXICOLOGY -BLOOD TESTS- URINE TESTS - BODY FLUIDS**

Normally after cases where there was a death, the Governmental agency will conduct a scan of body fluids necessary to obtain data. The purpose of the scan is to determine, blood alcohol, controlled substance abuse, prescription medicines and shelf medicines. The military will often take body tissue samples for protein bonding analysis and other sophisticated analysis.

When the N.T.S.B. orders it done, the samples are usually packed in ice and air freighted commercially to the Civil Aeromedical Institute (**C.A.M.I.**) Laboratory in Oklahoma City. These samples are tested in a very modern laboratory that has the

newest of equipments. In place an updated control catalogue and inventory methods will withstand legal scrutiny for protocol. The equipments are in good order and calibrated with records kept. Trained and qualified persons do the testing. Such was not always the circumstance of this once scandal-ridden lab.

One very important facet is the blood alcohol testing that will occur. The problem is that the F.A.A. considers 0.05 under the influence for flying. Such a minute amount is easily found in false positive tests from contaminated blood samples and body fluids laden with bacteria of the coli form varieties. Often the blood samples and body cavity fluid samples are drawn from badly mangled bodies that have begun the putrefication process. Once the fluid is contaminated with the bacteria begins as a function of time, temperature and culture. This process produces alcohol as a product. Thus the sample source, the time, the contamination and the temperature of retrieval and storage take on significance to an investigator.

Attorney's should recognize that a crewmember is supposed to be alcohol free, controlled substance free and only using approved drugs of which there are few when flying.