Health Technology in Forensic Pathology Laboratory

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Forensic Pathology in South Africa

• More than 70 000 non natural deaths take place annually in South Africa
• Since 2006, medicolegal mortuaries and forensic pathology service was transfer from the SAPS to the provincial department of health
• There are currently three main forensic pathology laboratories in the country: Cape town, Pretoria and Johannesburg.
• The branches in Durban, Bloemfontein and Port Elisabeth also do some forensic work.
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  • 1. Post Mortem
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Introduction

• A new facility is being developed to replace one of the existing forensic laboratory and mortuary that has become overutilised and outdated.

• The facility will provide for integration of a forensic laboratory, more than 500 bodies storage capacity cold room, an academic training facility and a biosafety post mortem suite.

• The biosafety post mortem suite is used to handle autopsy for highly contagious and sometimes dangerous unknown agents such as Ebola with life-threatening disease that is frequently fatal.
New design
Concept Design

- The HT team identify 4 main area in the design for planning and development:
  - 1. Post Mortem
  - 2. Post Mortem for Biosafety Containment
  - 3. Cold Storage
  - 4. Forensic Pathology Laboratory
Post Mortem

• Autopsies are performed in this area. The facility have the capacity to perform 24 examinations simultaneously.

• The main equipment are downdraft autopsy and dissecting table configure in a way that 4 medical practitioners can work in one room

• This configuration also facilitate teaching of medical students
Downdraft Autopsy table

STANDARD FEATURES
A  Table Top
B  GFCI Electrical Outlet (2)
C  Hydro Aspirator
D  Fixture w/Swing Spout
E  Sink – 20” x 12” x 12”
F  Hand Spray
G  Pedestal
H  Removable Grid Plates (4)
I  Down Draft Ventilation System
J  Mixing Valve
K  Access Panel
L  Main Circuit Breaker Switch

OPTIONAL FEATURES
CO009  Autopsy Table Perimeter Rinse Assembly
CO017  Scale Stand Table Mount
BL800  1 HP Disposal
Biosafety Containment

1. Agents not associated with disease in healthy adults

2. Agents associated with human disease that is rarely serious and for which preventive or therapeutic interventions are often available

3. Agents associated with serious or lethal human disease for which preventive or therapeutic interventions may be available (high individual risk but low community risk).

4. Agents likely to cause serious or lethal human disease for which preventive or therapeutic interventions are not usually available (high individual risk and high community risk).
Post Mortem Containment

• The Containment suite has a decontamination area and a secondary chamber.

• The bodies in this unit are store in 3 tier fridge

• Movement of personnel, body and material in the facility is controlled by highly trained personnel.
Post Mortem Containment
Biosafety Containment
Containment - Summary
Effluent Decontamination System (EDS)

Figure 1: Schematic of a thermal batch operated effluent decontamination system.
Cold Storage

• The main body storage cold room is made up of a long and short term sections.

• Bodies are kept in the same tray from arrival, autopsy room and storage.

• The body tray is compatible with the racking system, autopsy tables and transport trollies.
Forensic Pathology Laboratory

• The Lab is divided into 4 sections:
  - Histology
  - Entomology
  - Toxicology
  - Anthropology

• This is where most of the sophisticated equipment is located
Lab Equipment
Forensic Pathology Laboratory

• Most of the lab equipment require building services like Gas, water purification system, extraction duct, ventilation and emergency power.
• Gas Types: Helium, Nitrogen, Argon and Air
• Water Type: Type 1, 2 and 3
• Power: Normal Supply, Emergency and UPS
• Drainage: Effluent decontamination system. Biological and chemical waste are collected in a “kill tank”
Conclusion

• Forensic pathology is a unique science and they are many features to the design of a forensic Lab. This presentation attempted to share some of these unique features.
• The project is in construction phase and will take 36 months to complete.
• The final design was approved including all costs
• We hope to share more about the project and lessons learned in 3 years time once the project is complete.
Questions?

Thank you

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