‘Completing the Jigsaw’ : Forensic Imaging

Trauma Services Conference 2016
Lindsay Batty-Smith PgDip
What is Forensic Radiography?

- Forensic radiography is the application of the science of diagnostic imaging to questions of law.
- Such evidence may be collected from either living or deceased subjects with the latter being presented as either whole cadavers or as pathological specimens.
Applications of Forensic Radiography

- Provision of evidence for litigation e.g. Assault, RTA
- Assists in diagnosis of non-accidental injury (NAI) and physical abuse of vulnerable individuals
- Confirmation of identity (living and deceased)
- Demonstration of ingested illegal substances
Continued...

- Assisting with, or confirmation of cause or circumstances surrounding a death
- Investigation of Sudden Infant Death (SID)
- Investigation of Genocide and Torture
- Demonstration of artefacts or persons entering or exiting the country illegally
- Demonstration of potentially hazardous foreign objects
X-Ray security screening
Forensic NAI
Smuggling
Evidence for Litigation
Determine cause of suspicious death
Number of bullets
Identification of the deceased
Objectives

- Who Died? (Disaster Victim Identification)
- Why did they die? (Cause of Death)
- How did they Die? (Circumstances of Death)
Pan American Flight 103, Lockerbie
21 December 1988

- 259 + 11 fatalities
- All remains imaged
- Major review of UK practice
World Trade Centre, New York
11 September 2001

- 19,934 Remains Recovered
- All remains Imaged
- Imaging confirmed ID in 14% cases
- Imaging assisted ID in 77% cases (Office of Chief Med Ex. NY.2003)
MAJOR DISASTER

Tsunami December 2004
Investigation of Genocide and Torture

Victim of Srebrenica Massacre 1995
We are seeking the truth so justice can be served
2004 - 2005

- Association of Forensic Radiographers asked to assist the Home Office National Mass Fatalities Working Group
Mortuary Procedure for Mass Fatality Incidents

- Primary Survey - Fluoroscopy (triage)
- Secondary Survey - Dental
- Tertiary Examination - Odontology
- Odontology
- Anthropology
- Finger Printing
- Reconstruction
Radiography Examination

Skeletal Survey

- Any identifying pathology
- Healed trauma
- Uncommon anatomical variants
- Degenerative changes
- Determination of anthropological parameters; age, sex etc
Fluoroscopic Survey

- Fluoroscopy
  - Documentation of previous injuries or skeletal abnormalities
  - Location of small body parts, eg: teeth
  - Location & retrieval of projectile fragments and other items of evidence
Tertiary Radiographic Exam

Plain Imaging specific to the particular investigation:

Identification:
Skeletal anomalies, previous injuries or surgery
7/7 Summary

- 24 Radiographers involved over 17 days
- 52 victims, 4 perpetrators and 1162 body parts examined
- All individuals identified within approx. 8 days
- First time application of digital radiography
Dental Radiography

- Recommended for all dental remains
- Open Incident/Closed Incident
- Disaster Victim Identification (92% accurate)
Radiography and Terrorism

- Radiographic spectroscopy of materials used in anti terrorist activities
  https://www.researchgate.net/publication/2172835_Multi-Energy_Radiography_Against_Terrorism_Theory_and_Experiments
- Emergency imaging after a mass casualty incident: role of the radiology department during training for and activation of a disaster management plan  (BJR Vol 89 issue 1061)
Future developments - PMCT
Post Mortem CT
Future developments - PMCT

INTERPOL
Disaster Victim Identification Guide

AM radiograph    dental PMCT
A
B
C
D
Future developments - Further Education

- MSc in Forensic Radiography, Teesside University, Online, Virtual learning environment, International student base, [www.tees.ac.uk/postgraduate_courses/health_social_care/msc_forensic_radiography](http://www.tees.ac.uk/postgraduate_courses/health_social_care/msc_forensic_radiography)
- Annual Virtopsy course, Zurich, [http://www.virtopsy.com](http://www.virtopsy.com)
Contacts of Interest

- The International Association of Forensic radiographers -
  http://www.afr.org.uk

- British Association of Human Identification-BAHID -
  http://www.bahid.org