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# Law Enforcement Perspectives on Nuclear Forensics

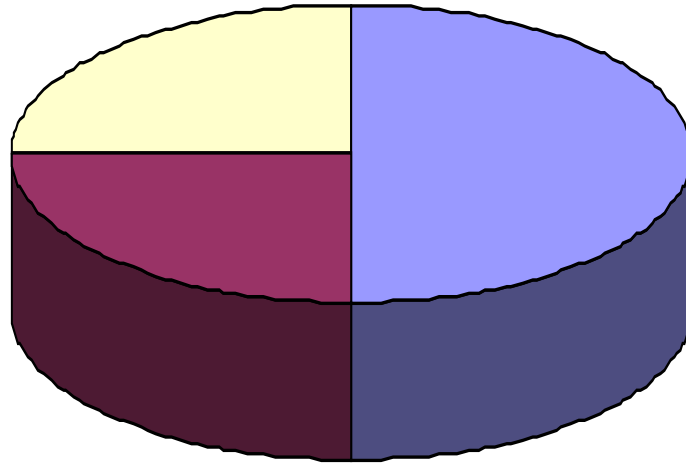
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# Investigation Data sources

Physical evidence

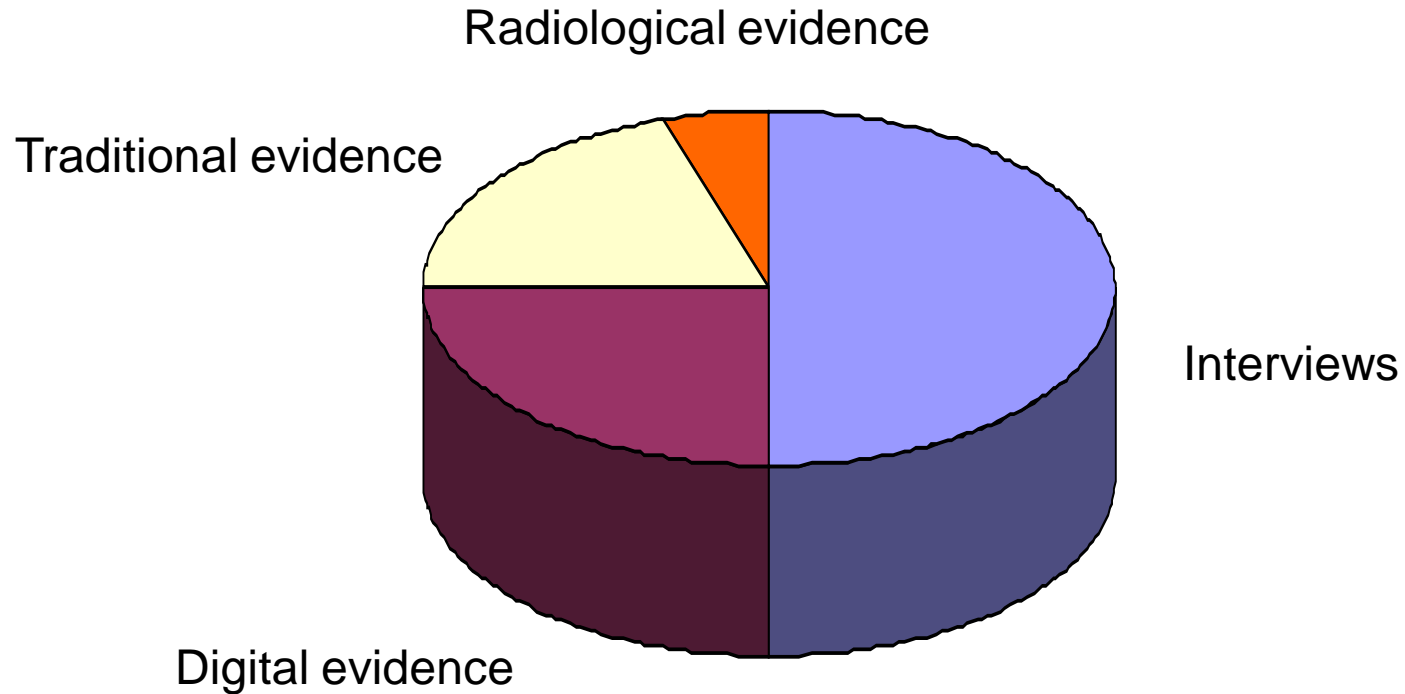


Interviews

Digital evidence



# Investigation Data sources



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# Investigative Value

- Probative
- Actionable
- Admissible



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# Forensics Program

- Dedicated facilities
- Analytical procedures
- Quality Assurance / Quality Control



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# Forensics Program

- Dedicated facilities
- Analytical procedures
- Quality Assurance / Quality Control



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# Facilities

- Evidence handling
- Examination capabilities
- Safety / Licensing



# Facilities - Savannah River National Laboratory

- Evidence handling
- Examination capabilities
- Safety / Licensing





# Facilities - Lawrence Livermore National Laboratory

- Evidence handling
- Examination capabilities
- Safety / Licensing



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# Forensics Program

- Dedicated facilities
- Analytical procedures
- Quality Assurance / Quality Control



# Admissibility of New Technologies

*Daubert v. Merrell Dow Pharmaceuticals (1993)*

*Kumho Tire Company v. Carmichael (1999)*

- Federal standard for acceptance of new technologies.
- Trial judge acts as “gatekeeper”



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# Daubert Conditions

- Scientific validation
- Peer review
- Reliability
- General acceptance in relevant scientific community



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# Scientific Validation

- Extensive research in the development of a new technology.
- Once process developed, reliability of technology determined by repetitive experiments - same results from a sample every time.



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# Scientific Validation

- For forensic applications, technology applied to types of materials collected from crime scenes.
  - Simulated samples
  - Actual case specimens from adjudicated cases.



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# Peer Review

- Publications in appropriate scientific journals.
- Presentations at scientific meetings/conventions.



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# Reliability

- Error rate: in the performance of the test, what percentage of the time will the test give an incorrect answer?
  - ❑ False inclusion
  - ❑ False exclusion





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# Forensics Program

- Dedicated facilities
- Analytical procedures
- **Quality Assurance / Quality Control**



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# QA / QC

- Must have a documented Quality Assurance Program



ISO 17025



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# QA / QC

- Documented procedures
- Qualified personnel
- Proficiency testing
- Standardized reporting



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# General Acceptance

- Adoption of technology by scientific community
- Application of technology in other areas



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# Admissibility

Be prepared to support technology with  
extensive documentation



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# Conclusions



# Investigation Data sources

