

METROPOLITAN STATE UNIVERSITY OF DENVER
HUMAN IDENTIFICATION LABORATORY

Students in the Forensic Laboratory: Fostering
Education While Maintaining Quality

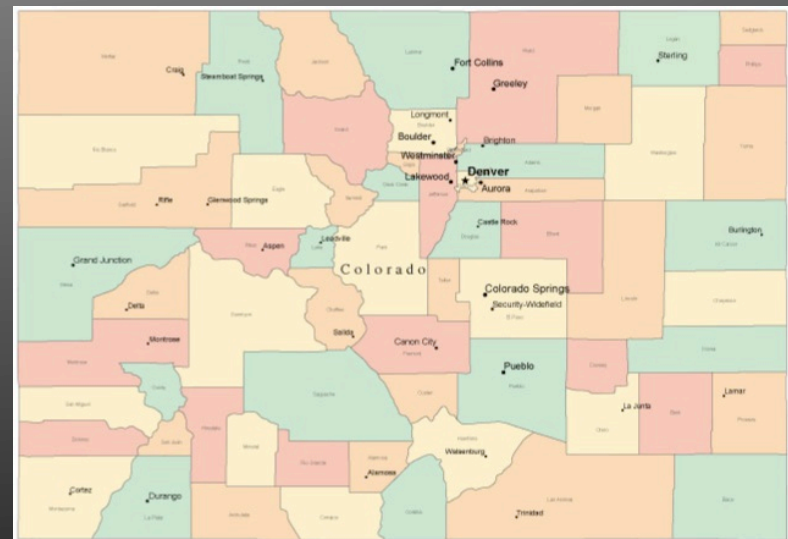


The National Institute of Standards and Technology (NIST)
Forensic Science Error Management International Symposium
July 20 – 24, 2015 • Washington D.C.

Christiane Baigent, MSc.
Catherine M. Gaither, PhD.

Background

- Forensic anthropology laboratory located in Denver, Colorado (western region of North America).
 - 250 State and local law enforcement agencies
 - 63 Coroners offices
 - Augmented variably by Medical Examiners offices
- The Metropolitan State University of Denver Human Identification Laboratory (MSUD-HIL) was established in 2011 to assist the medico-legal community with the search, recovery, and analysis of human skeletal remains.



Distribution of counties/jurisdictions, Colorado.

MSUD-HIL Infrastructure

Director

Dr. Catherine Gaither (founder)
PhD. Physical Anthropology
Former full-time faculty MSUD

Laboratory Coordinator

Christiane Baigent
MSc. Physical Anthropology
Affiliate faculty MSUD

Analyst

Gary Scott
MA. Physical Anthropology
Affiliate faculty MSUD

Tier IV Interns

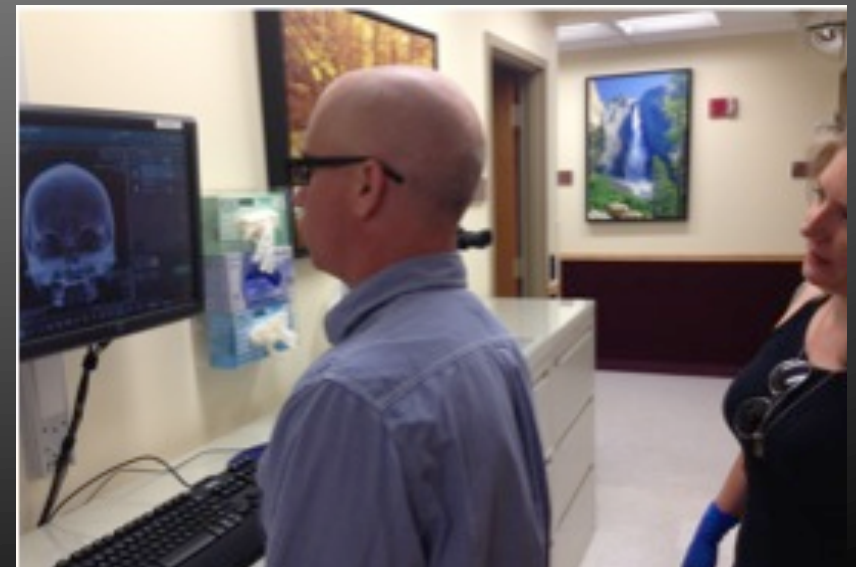
Tier III Interns

Tier II Interns

Tier I Interns

Laboratory Activity

- Typical investigations encompass
 1. Field operations
 2. Laboratory operations
 - The majority of investigations involve both
- Average annual case statistics
 - Six full scale searches
 - Spanning 2-5 days
 - 15 skeletal analyses
 - Range from cranium to full skeleton
 - 26 Osteological Inquiries
 - human/non-human bone
 - May involve digital assessment, laboratory analysis, field observation, or any combination.



Local Environment

- Colorado defined by complex and highly variable topography.
 - Every biome represented
 - Elevation ranging from 1000 – 4500 meters
- Environmentally induced changes to bone one of our greatest challenges
 - Changes in appearance due to local environment
 - Movement of bone by secondary agents such as scavengers
- MSUD-HIL Internship program developed to introduce qualified assistants to the search and recovery process.



Primary Goals of an Internship

- Benefit the Organization while maintaining quality.
- Benefit the student by offering practical experience to supplement pedagogical knowledge.
 - Educational development
 - Professional development
- Ultimately helps create a new generation of qualified forensic practitioners.



Internship Goals

- Educational Goals
 1. The acquisition and application of knowledge
 - Both pedagogical and experiential
 2. The development of skills
 3. Personal development
- Professional Development
 1. Clarification of career goals
 2. Clarification of job placement goals



BONES





Emphasis:

- Specified training models!
 - Observation/shadow based models limit meaningful experience.
 - If certain laboratory operations preclude direct student involvement, consider setting up mock scenarios.
- A clear-cut framework is necessary to promote education and for maintaining quality.



Interns in the Laboratory:

The cons?

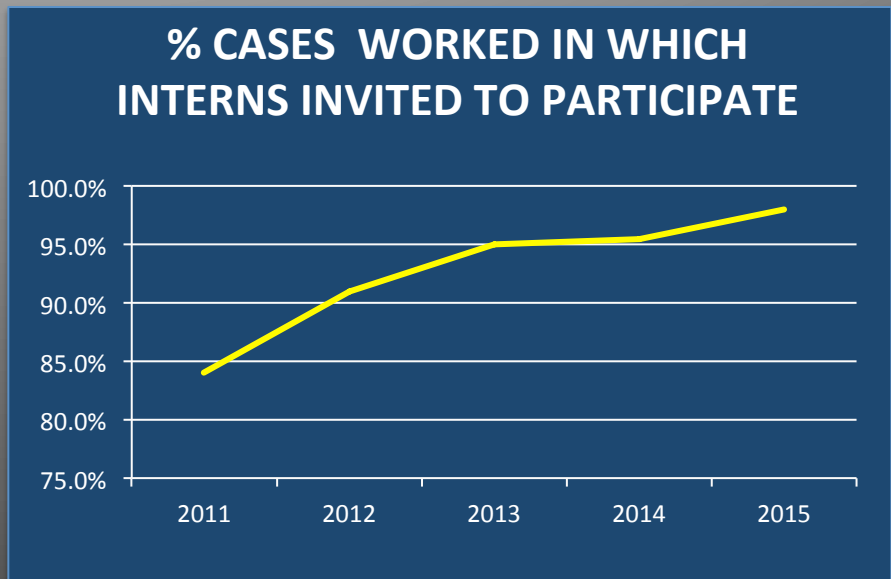
- Interfering with the Daubert Standard
 - Interns will not act as an expert in *any* case.
 - A well designed internship program may enhance the perception of a primary analyst's expertise.
- Potential to reduce/eliminate admissibility
 - Intern behavior is managed by a well designed internship.
 - Presence of skilled interns has to potential to increase information gain.
- Time
 - Return on investment is high if the program is designed and implemented thoughtfully.

Are these “problems” actually problems?

- Are these ‘problems’ merely a cast within which to form a strong internship program?
- There is a lack of judicial decisions to support this claim.
 - A search of the Lexis Nexis legal database using the following key words revealed zero results:
 - Forensic laboratory intern
 - Intern inadmissible
 - Intern evidence inadmissibility
 - Laboratory intern
 - Forensic evidence intern
- Additional lack of published literature

History of Interns in the MSUD-HIL

- Intern participation ultimately left to the discretion of the contracting law enforcement agency.
 - Steady increase in invitations for intern participation since 2011.
 - Currently, law enforcement will call and request intern assistance.
 - Allows interested members of law enforcement to act as mentors
 - Allows interns to exercise (and show-off) their knowledge and skills.
- Intern participation at the discretion of lead MSUD-HIL analyst.
 - Allows quality control to be exerted at multiple levels.



Intern Selection

- Screening is critical! For security and for dedicated candidates.
 - CV, cover letter, writing sample, copy of transcripts.
 - Background check
 - Minimum course completion requirement
 - Both upper and lower division courses.
 - A minimum GPA of 3.5
 - Somewhat negotiable
 - Commitment to a minimum of 10 hours of work per week.
 - Includes:
 - Weekly journal
 - Bi-weekly assignments
 - Formal paper



Quality Assurance in the MSUD-HIL

- Field: SOPs are compliant with the FEMA National Incident Management System (NIMS)
 - Operate under the ICS Incident Command System Model.
- Laboratory: SOPs are compliant with ISO17025 and Supplemental standards.
 - Printed and easy to reference step-by-step SOP manuals for all field and laboratory activities.
- Formal code of ethics
- System for measuring and logging inter/intra-observer error rates
- All cases are peer reviewed
- Guidelines are ever evolving to uphold the strictest standards of quality.

Transferring the QA model to the SQA Model:

- Educational goals, heightened quality demands, and current quality model were factored into program development.
- The result was a four tiered internship program:
 - Each tier associated with a specific knowledge set/skill base.
 - Increases in complexity as student moves through the tiers.
 - Passing a tier means a student is allowed to participate in associated task(s) in field and laboratory operations.

TIER IV
Supervisor
Research and Supervision

TIER III
Advanced Intern
Advanced field/lab methods

TIER II
Intermediate Intern
Int. field/lab methods

TIER I
Entry Intern
Basic field/lab methods

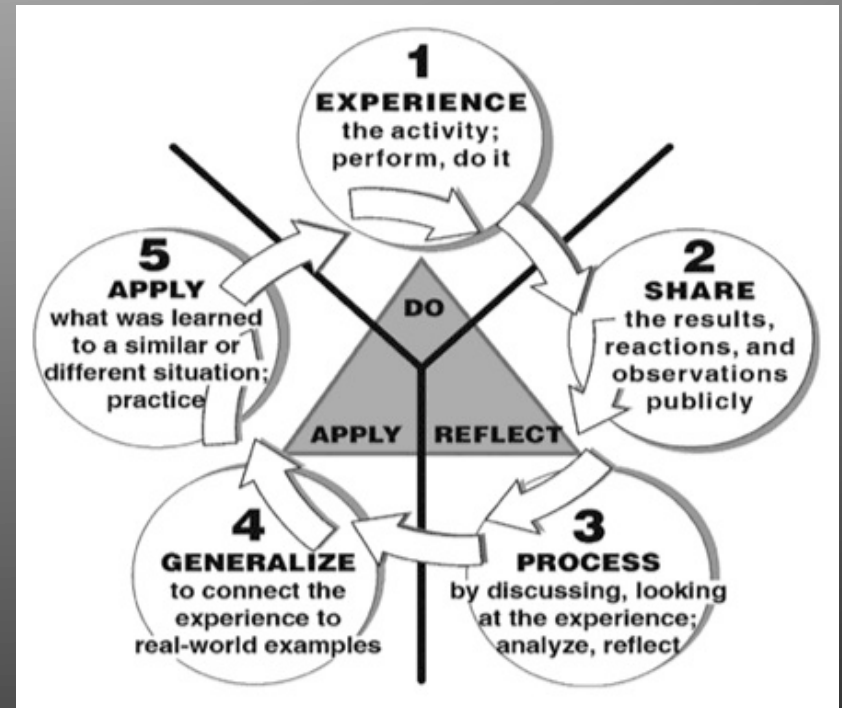
Tasks Required of All Interns at All Levels:

- Foundation of quality is reinforcing certain concepts relentlessly.
 - Review and demonstrate an understanding of:
 - Standard operating procedures (SOPs)
 - Code of ethics
 - MSUD-HIL
 - AAFS
 - SWIGANTH
 - Error rate testing
 - Complete a minimum of two Forensic Technology Center of Excellence courses per term.
 - Familiarize themselves with the language, methods, and problems within adjacent disciplines.



Authentic Assessment

- Activities and assessment designed around the idea of authentic assessment.
- The goal is to directly measure one's ability to practically apply skills.
 - These assessment models may also be applied to an organization as a whole.



Internship Tiers: Level I

- This tier involves several tasks and levels of assessment, but we will focus on those that sufficiently exemplify the program.
- Emphasis placed on resources:
 - Receive copy of SOPs
 - Code of Ethics
- Report writing
 - Made familiar with style and format of report writing, photography, and critical analysis using animal bones.
- Practical laboratory analysis tasks
 - Setting out skeletons in anatomical position
 - Conducting skeletal inventory
- Practical field Analysis
 - Develop/refine basic search skills
 - Scene documentation
 - Writing field reports



SQA: Error Rate Assessment

- Field search exercises will be used as an example of assessing error to both teach and ensure quality:
 - Material is laid out by a proctor who knows the number and location of elements.
 - Error rate assessed by ratio of items planted to items recovered.
 - Error rates assessed and documented across three exercises
 - Final assessment entails the student designing and organizing a search which *should* focus on the mitigation of error.
 - Model may easily be transferred to all laboratory activities.
 - Added benefit of continuous scrutiny



Certification

- End of semester assessment:
 - SOP Tests
 - Field tests
- Upon successful completion certification is granted.
- Student is allowed to progress to the next tier of training.
- Obtain clearance to perform specified laboratory activities.
- Tier one clearance allows:
 - Pedestrian search
 - Observation status in laboratory analysis
 - Supervised handling of skeletal material
 - Assisting with set-up/inventory.



Certification and Visual Markers

- MSUD-HIL supervises 4-10 variably certified students in a semester.
 - Management made more complex by vast outdoor scenes.
- Certification level-specific, visually striking ID cards developed to quickly manage students in the field.
- Cost effective system
 - PVC printer cards \$20.00/50
 - PVC ID card printer tray insert \$15.99
 - Printer \$100-\$300



The Benefits!

- The tiered internship system has demonstrated both expected, and unexpected benefits.
 - Activities students are allowed to participate in are clearly outlined.
 - Across the board
 - Within individual tiers
 - Clear hierarchy
 - Mirrors professional organizations
 - Informal mentoring program
 - Additional resources for newer interns
 - Teaching/mentoring experience for advanced interns
 - Dedication to self-management

A Quick Review

- Student Quality Assurance is maintained through a series of standardized tests independently assessed by two members of laboratory management at each stage of certification.
 1. Traditional test based models
 - SOPs
 2. Authentic assessment
 - Direct measure of one's ability to apply learned concepts
 - Used to assess all practical/action based skills

Conclusion

- Constructing training and certification exercises that mirror those of your organization has several benefits:
 - Intern training
 - Continuous audit
 - Results in higher levels of quality both among interns and within the organization.
- Utilizing a tiered model reduces error
 - No question about who has been trained in what, or to what level.
- Students can make a meaningful contribution to the forensic laboratory.



Acknowledgements

- We wish to acknowledge the following people and institutions for their invaluable support:
 - Metropolitan State University of Denver
 - Gary T. Scott
 - David Kintz, Park County Coroner
 - The Denver Office of the Medical Examiner
 - All of the local, state, and federal law enforcement agencies that have supported and fostered our internship program
 - All of the MSUD-HIL Interns and Volunteers – both past and present



References

- Parilla, P.F., Smith-Cunnien, S.L. (1997). Criminal Justice Internships: Integrating the Academic with the Experiential. *Journal of Criminal Justice Education*, 8(2): 225-238.
- Rodolfa, E.R., Kaslow, N.J., Stewart, A.E., Keilin, W.G., Baker, J. (2005). Internship Training: Do Models Really Matter? *Professional Psychology: Research and Practice*, 36(1): 25-31.
- Mueller, J. *The Authentic Assessment Toolbox*. <http://jfmueller.faculty.noctrl.edu/toolbox/>. Accessed 03/07/14, 06/15/15.