



Direct to DNA:
A forensic casework approach
Tim Augsback




Outline

- SAK Testing Initiative
- Modified approach
- Adapting for casework
- Future outlook



Where we started

- Casework – start to finish → team approach
 - New scientists hired – casework and SAK
 - Robots utilized more
- Sexual Assault Kit testing initiative and reform
 - Nearly 14,000 previously untested kits submitted to BCI
 - SB 316 required law enforcement agencies to submit untested kits within 1 year if a crime likely occurred



Best Practice

National Best Practices for Sexual Assault Kits:
2017 Laboratory Guidelines


Direct to DNA

An integral component of high-throughput processing is to proceed directly to DNA (also known as the Direct to DNA approach) and then, as needed, follow up with serology, which requires the most hands-on time from an analyst. The serology tests employed by laboratories are less sensitive than modern DNA typing kits. Therefore, DNA typing only the swabs that screen positive in serology tests may miss CODIS-eligible DNA profiles. Rather than use serology to determine which swabs to subject to DNA analysis, a Direct to DNA approach is recommended.

RECOMMENDATION 27:
Laboratories should consider changing the order of processing the evidence by going to Direct to DNA and then, only if needed, proceed with serology.


Scientific Working Group on DNA Analysis Methods
Recommendations for the Efficient Processing of Sexual Assault Evidence Kits

With the increase in availability of the commercially available DNA kits, the Direct to DNA approach was the most sensitive to change first and must be followed by, with which necessary, serological examination under 10-15 min or less time. Processing the results from a DNA kit first allows for potential submission to false negative serology results of swabs that are not used on for DNA analysis because they fall below the serological test's limit of detection.

 **MIKE DeWINE**
GOVERNOR OF OHIO


Challenges with SAKs

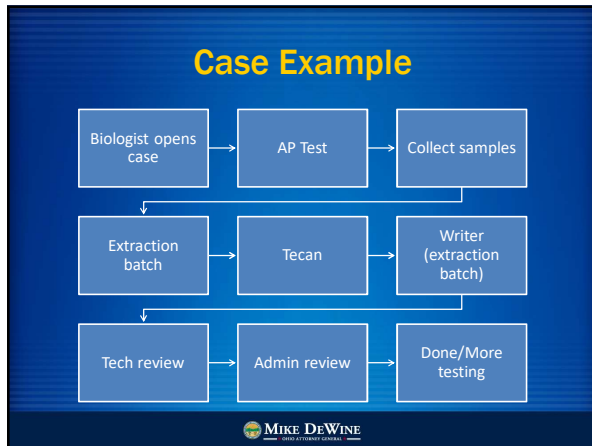
- Old evidence
 - Diminished bodily fluid reactivity
- Non-standardized collection
- Evidence previously tested or missing
- Multiple suspects/consent
- How to process without impacting current casework
- Want to finish all possible testing

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Modified Approach

- AP testing only for orifice samples
 - Evolved to very little AP testing at all
 - Differentials for most orifice samples
- Use synopsis for sample selection
- Run more samples to start in general

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- ### High Throughput
- Assembly line approach
 - Most personnel can work in any part of the process
 - Simplified notes
 - One comprehensive DNA/FB report
 - No table
 - Second round of testing if necessary
- MIKE DeWINE
GOVERNOR OF INDIANA

High Throughput

- Multi-lab system
 - Approx. 50 scientists
 - 6 supervisors
 - 2 lab technicians
 - 6 administrative professionals
 - More at regional facilities
 - 500-800 active cases/month



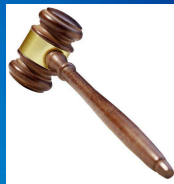
Ongoing Challenges

- What samples should be run first?
- Caregiver cases
- Balancing the roles of all scientists
- When is testing done?




In the courts


- Who testifies with so many hands in the process?
- Training attorneys





Future Work

- Refine our approach to find the best samples to test first
- Stop at quant/cherry picking
- Mixture interpretation software





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