On-Scene Detection of Semen

- Visually
  - White or cream-colored stains
On-Scene Detection of Semen

- Alternate light sources (ALS)
  - UV, Omnichrome, Luma-Lite, Crimescope, CrimeLite
ALS Principle

- Different substances react differently to light
Detectable Body Fluids

- Urine
- Semen
- Saliva
- Vaginal Secretions
- Sweat
ALS Rules

- Semen stains reflect specific light differently than the background fabric
  - May be darker than the background
  - May be lighter than the background
Light Sources

• Location/screening use
  • Not confirmatory
  • Detection ability based on fluid & fabric
• All ALS stains NOT semen stains
• All semen stains NOT detected with ALS
False Positives

• Laundry detergents:
  • Contain phosphors *(appear brighter in sunlight)*
    » Sunlight contains UV light making whites whiter
    » Dark pigments absorb the UV light and don’t glow
What to Collect

- Anything to link suspect, victim, weapon, crime scene
- Anything to clarify what happened
- Known Standards
  - Blood or oral swab
  - Hair
- Control area
“Known” Standards

- Known victim, suspect, and elimination samples:
  - Eliminates the need for repeated analyses
  - Enables a more discriminating search of the data bank
  - Ensures that it’s the suspect’s profile being searched
  - Enables more discriminating statistics and conclusions
Control Swabs

- An unstained area near the stain collected

- Check with your laboratory regarding their preference for collecting control swabs
Small or Mobile Items

Collect and submit entire item

- Knife
- Shoe
- Hat
Large or Immobile Items

Submit portion of items

- **Cutting**: carpet, car seat
- **Swabbing**: linoleum
- **Lifting**: glass, counter top
- **Scraping**: cement wall
- **Absorbing**: wet blood
• DNA is a very stable molecule and can remain intact for many years

• Not every item at a crime scene should be considered probative evidence
Probative Value

- The best evidence occurs when a victim’s or suspect’s DNA is found where it is not supposed to be.
Packaging of Evidence

- Dry items should be packaged in porous containers such as paper bags, envelopes, boxes
Packaging of Evidence

- Wet items should be allowed to air dry prior to packaging

- Very wet items can be transported in plastic containers but should be air-dried as soon as possible
Chain of Custody

• Key to the proper resolution of a criminal investigation

• All the work in the lab is meaningless if the chronological history of the evidence is not maintained
Transportation of Evidence

• Extended exposure to heat or humidity causes degradation to biological evidence

• Packaged items from the crime scene need to be moved to a suitable storage facility as soon as possible
Transportation of Evidence

- Liquid samples should be transported in refrigerated or insulated containers

- Evidence should be stored in a temperature controlled facility
Evidence Storage

- The hallmarks of proper evidence storage include:
  - Paper packaging
  - Items are “sealed”
  - Items from a single case are kept together when possible
  - Items are kept away from heat sources
  - Chain of Custody is current
Collection of Evidence

Proper Collection, Packaging & Preservation of DNA Evidence
Rule of “Thumb”

- It’s better to collect it and not submit it than to not have collected it at all!
- Keep lines of communication open between you and the laboratory
Amount to Collect

- Early DNA - Size of quarter
- Serology - Size of dime
- Current DNA - If you can see it, we can try
Collection of Blood

- Evaluate the item/stain and its probative value
- Swab the stain (works best on non-absorbent surfaces)
- Scrape the stain
- Cut the stain from the item
- Collect the item
Swabbing the Stain

- Lightly moisten the swab (distilled or sterile water)
- Rub swab over the stain, rotating swab
- Use 2 - 4 more swabs
Swabbing the Stain

- Concentrated!!
- Better to collect it and not use it rather than to lose the sample altogether
- Don’t sacrifice other exams!! (latents!)
Collecting the Item

- Recommended
  - When staining pattern is important
  - Item is difficult to swab
  - Item requires multiple exams
- Make sure the item is dry
- Package to ensure integrity (glass, sharps, breakables)
Collection of semen:

- Evaluate the stain and its probative value
- Swab the stain
  - Works best on non-absorbent surfaces
- Cut the stain from the item
- Collect the item
Possible Victim Vaginal Fluid

- From suspect pubic area or fingers
  - Lightly moisten the swab (distilled or sterile)
  - Swab the entire area, rotating the swab
  - Use no more than 2 swabs
Victim Sexual Assault Kit

- Standardized kit to collect pertinent biological evidence from the body of the victim
- Contact your local laboratory to determine which kit they use
Suspect Standard Kit

- Standardized kit to collect pertinent biological evidence from the body of the suspect
- Contact your local laboratory to determine which kit they use
Collection of Hairs/Fibers

• Post-It notes placed into envelope or Ziploc bag
  • Straight into Ziploc bag **NOT** recommended due to static electricity
• Gloves or forceps to transfer hair/fiber(s) into a glassine envelope
• Vacuum is generally not recommended
• Talk to YOUR laboratory!
Collection of Saliva

- From a bitemark:
  - Moisten one swab and swab area of mark
  - Follow with a dry swab to collect any remaining moisture on skin
  - Allow swabs to air dry and package together
- From Suspect Pubic Area
  - Refer to vaginal fluid instructions
Known Saliva (Buccal) Swabs

- Known standard
- Swab the inside of the cheek area using 2 swabs
- Rotating them during collection
- Allow swabs to air dry (or place in swab box) and package together
Fingernail Scrapings/Clippings

- Collect only when indicated
- Clip nails into clean paper with a clean clipper
- Separating left and right nails

OR

- Scrape the underside of each nail onto a clean paper
- Package the scrapers inside this paper
Bone

- Co-mingled remains, mass graves, skeletal remains, exhumations, airplane crashes
- Marrow is where blood is made
- Good to use if no blood is available
- Best to collect rib bone or vertebrae
- Place in jar and freeze
Teeth

- DNA is in the dental pulp
- Very resistant to decay
- Obtained from teeth of mummies
- Saved baby teeth can be used as secondary DNA standard in missing person cases
- Collect into pill box
Organs/Tissue

- Collect if no blood is available
- Collect liver or spleen
- Place in jar and freeze
Data Bank Samples

• Follow your state or local protocol for collecting samples from arrestees and/or convicted offenders
Knowledge into Practice

• Look at the following items and determine the best way to handle the object
Knowledge into Practice
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Knowledge into Practice

• For the following items, indicate how you would collect the evidence
Knowledge into Practice
Knowledge into Practice