Alternative Light Source

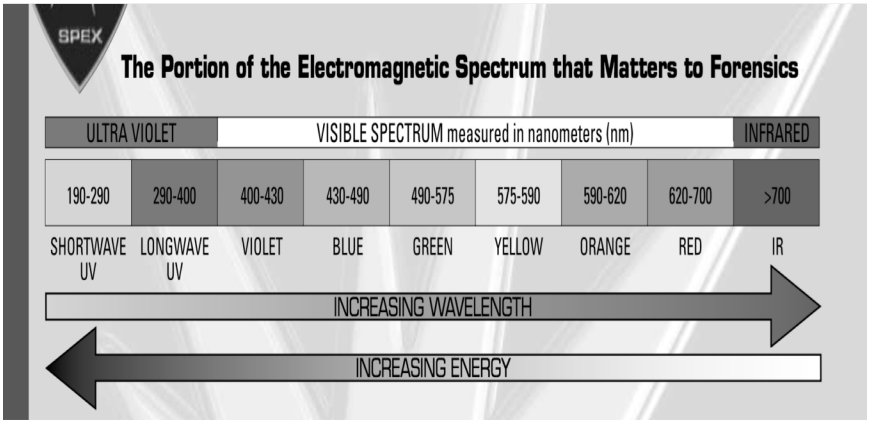
ALS Basics

- A high intensity, multiple wavelength, bulb based, alternate light source designed specifically for use in Forensic Applications.
- Allows Forensic Examiner to observe findings not able to be seen with the naked eye in ambient room light

ALS Basics

- Visible spectrum measures in nm (nanometers)
- Ranges from UV TO INFARED
- Higher on spectrum =
- increased wavelength (infrared)
- Lower on spectrum =
- decreased wavelength (UV)

ALS Basics



ALS Basics

- Visible spectrum measures in nm (nanometers)
- Absorption = evidence/findings darkens
- Fluorescence = evidence/findings glows
- SANE of BC uses 455 nm ALS - Sirchie BlueMax

ALS Basics

ALS Basics

- Forensic Light Sources may reveal bruise and patterned wound details that are invisible under normal white
  light illumination.
- Details of a bruise pattern on a patient's body can correlate the patient's story.
- Furthermore, details of a bruise on a victim, for instance, a bite mark or a shoe mark, can link a suspect to the victim.

ALS Basics

- Multiple wavelengths are necessary because different colors penetrate to different depths within the skin and therefore depending on the depth of the bruise or wound you will need to vary the wavelength of the instrument.
- 455 nm is the primary ALS used in forensic nursing due to broad range of capturing details

ALS Basics

- Always use orange goggles when viewing through ALS
- Goggles filter out excess wavelength colors to allow visualizing findings
- Bloodstains will darken = x4 contrast with ALS
- Good detector of bruising patterns (bite marks/object used during assault)

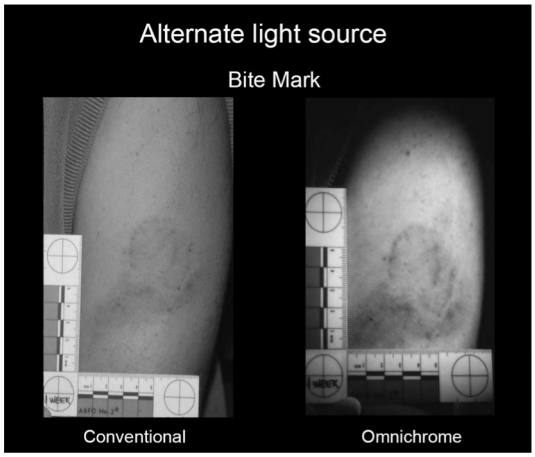
ALS can be used to detect more than just semen
*Great tool to detect injuries – broken capillary beds under the epidermis

Figure 1. A Stage 1 pressure ulcer in ambient light with visible tissue erythema on a participant's heels.

SAME area using ALS 415 nm violet wavelength

Figure 2. The same participant's heels (as Figure 1) viewed under alternate light source using 415-nm violet wavelength.

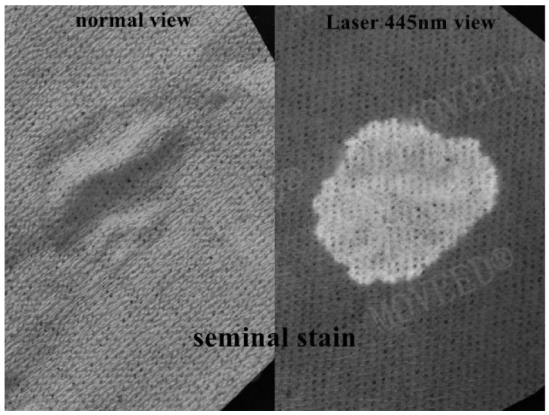
ALS Basics



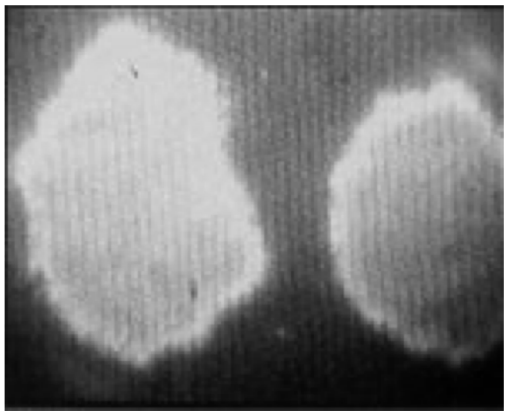
**Best practice is to always assess clothing for dry stains with ALS

*Remember to mark stain with fluorescent measuring device

Seminal stain using 455 nm ALS

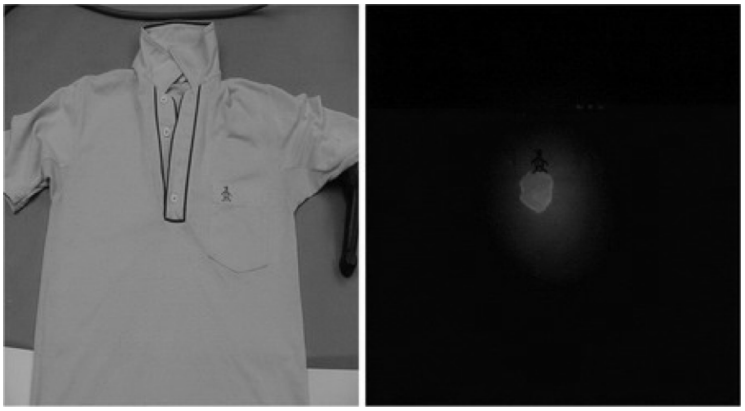


Seminal stain using 455 nm ALS

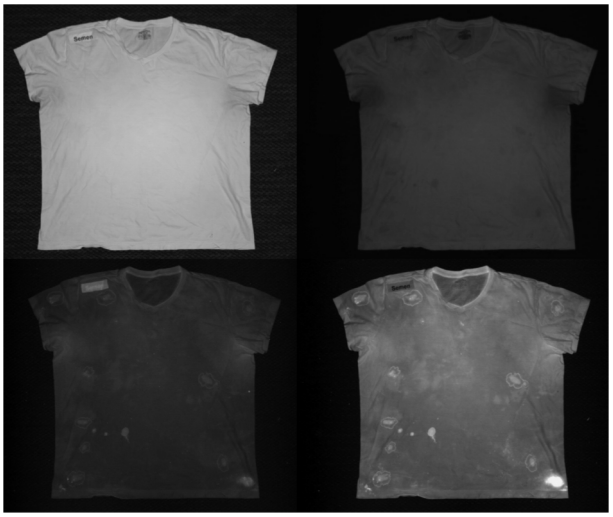


Blood stain using 455 nm ALS – NOTE THE CONTRAST ON DARK SHIRT

ALS Basics



ALS Basics



ALS Basics

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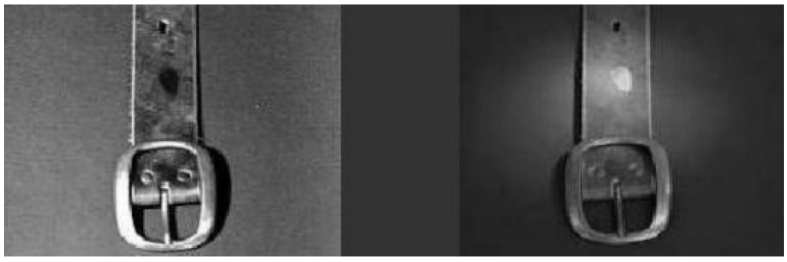

Some soaps/lotions and medications will fluoresce with ALS
*Document all findings regardless of what the agent fluorescing is

ALS

- Some fungal infections also fluoresce:
- 3 types of dermatophytes that cause fungal infections (tinea)
- 1. trichopyton
- 2. microsporum
- 3. epidermophyton

- **microsporum organisms will fluoresce!

ALS

- You do not need differentiate what the finding is at the bedside (will be done in the lab)
- Remember:
- -if it contrasts = collect a swab
- -if it fluoresces = collect a swab
- *do your best to obtain a photograph of the finding using low light photography (will be covered in forensic photography lessons)

ALS

- IF something does fluoresce on the capitus (body) it is very important to obtain a solid medical history from the patient for any recent infections/fungal infections
- *perform a focused history and assessment on the body region where fluorescence is observed and relay this to the physician
- Assess area thoroughly under ambient room light

Using ALS on Exam

- Areas that fluoresce must be swabbed for DNA evidence
- This is done using what is called a DRY STAIN
- Name can be deceptive because you CANNOT swab the area when the applicator is dry
- Goal = PICK UP DNA/SPECIMEN FROM AREA

Using ALS on Exam

- Use a "dry stain" applicator from kit to collect specimen (named from specimen being collected from generally dry areas of the body)
- Dry stains MUST have moisture applied to them prior to collection in order to pick up the specimen onto the swab (sterile water)
- LABEL area you collected it from on Forensic Chart AND BOX
- SA kits have 6 dry stain swabs in each box
- Need more = open another kit to obtain swabs from that box

Using ALS on Exam

- When collecting the dry stains use the Rule of 3's
  - 3 drops of sterile water or sterile saline to moisten the swab
  - 3 passes on area = Roll the swab on the area 3 times
- Roll lightly and avoid too much pressure – this will cause you to LOSE DNA rather than pick it up on the swab (rolling allows more of the swab to touch the area)
- Avoid oversaturating swab – DNA will not be collected

Using ALS on Exam

- Examiner can swab clothing as well
- If patient declines clothing collection you should USE ALS ON CLOTHING and swab anything that you see
- Underwear (garment touching genitalia) should ALWAYS be swabbed if the patient declines collection of clothing items
- Photograph area on clothing/garment with ALS

Using ALS on Exam

- Pro-tip – always use your goggles (orange) – you will not see any stains without them
- Patient and advocate will not be able to see what you are viewing through goggles with the ALS
- Scenario: Advocate and the case of the glowing mouth and hands

Additional Exam Lighting

- **Tangential lighting** can identify contours or swelling to body parts easily
- Use indirect lighting to area in attempts to accentuate contours within the area
- JVD assessment technique

Tangential Lighting

Documenting

- Always clearly document the light source used (or visual inspection) for the exam
- This should be done regardless if findings are present or not during the examination

Questions