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Support

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Objectives

- Recognize the danger and lethality posed by strangulation.
- Use appropriate medical and anatomical terms to explain strangulation injury.
- Elicit accurate and effective direct examination testimony related to medical evidence.
- Support implementation of and access to victim-centered medical-forensic care.

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Practice Tips

- Consult with medical experts to determine the significance of the presence or absence of injury.
- Determine the need for expert testimony to provide an explanation of the context for victim responses to trauma.
- Effectively introduce medical and behavioral expert testimony at trial.

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Role of Forensic Nurses

Forensic nurses provide “specialized nursing care that focuses on patient populations affected by violence and trauma — across the lifespan and in diverse practice settings.”

INT’L ASSOC. OF FORENSIC NURSES, FORENSIC NURSING: SCOPE AND STANDARDS OF PRACTICE (2017)

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Sexual Assault Nurse Examiners (SANES)

“One well-known domain in forensic nursing practice is responding to the trauma of sexual assault and abuse and intervening through actions in systems to mitigate the impact of sexual violence on individuals, families, groups, communities, and society.”

INT’L ASSOC. OF FORENSIC NURSES, FORENSIC NURSING: SCOPE AND STANDARDS OF PRACTICE (2017)

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The Medical-Forensic Exam

Medical history

Assault history

Physical examination

Discharge planning

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Step 1: Medical History

Should include chronic and acute healthcare problems, current medications, pregnancy history, and drug allergies

- Includes gynecological history
- Includes last consensual sexual encounter

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Step 2: Assault History

- Helps guide the medical-forensic exam
- If applicable: areas of penetration, types of penetration, and weapons used
- Includes assailant information
 - Assists in determining risk factors and interventions
- Crucial for discharge planning

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Hearsay Exception: Statement for Medical Diagnosis/Treatment (F.R.E. 803(4))

A statement that:

- is made for—and is reasonably pertinent to—medical diagnosis or treatment; and
- describes medical history; past or present symptoms or sensations; their inception; or their general cause.



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Is identity of the assailant pertinent to medical treatment?

Can medical provider explain why assailant's identity is relevant to medical treatment?

- In asking a child sexual abuse victim what brought him to emergency room, the nurse explained identity of assailant "is important because it would affect their diagnosis and treatment in terms of mental health or emotional health concerns." U.S. v. Wandahsega, 924 F.3d 868 (6th. Cir. 2019).

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Is identity of the assailant pertinent to medical treatment? (cont'd)

In some circuits, it may be necessary to not only show that identity was pertinent to medical diagnosis, but also:

- Medical provider made clear to patient that identity was essential to medical care; and
- Patient manifested an understanding.

U.S. v. Bercier, 506 F.3d 625, 632 (8th Cir. 2007)
(citing U.S. v. Turning Bear, 357, F.3d 730, 738 8th Cir. 2004))

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Step 3: Physical Exam

Physical assessment of all body systems

Detailed ano-genital assessment (if applicable)

Physical evidence collection

Photography with consent

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What about the patient who is outside the timeline for evidence collection?

Physical assessment of all body systems

Detailed ano-genital assessment (if applicable)

Physical evidence collection

Photography with consent

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"Forced sex in intimate partner relationships increases the risk for intimate partner homicide over and above prior domestic violence, the use of a weapon against the female partner and repeat physical violence. In other words, the man who not only physically abuses his partner but also rapes her is particularly dangerous."

— Jacquelyn C. Campbell, PhD, RN,
Johns Hopkins University

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Examination for Strangulation

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Definition

Strangulation is a form of asphyxia (deprivation of oxygen) characterized by closure of the blood vessels and air passages of the neck as a result of external pressure on the neck

- Differentiate from “choke” which means to have the trachea blocked partly or entirely by a foreign object (*i.e.*, food)

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Types of Strangulation

- Hanging
- Manual (most common)
 - Chokehold
- Ligature
- Positional

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Strangling

18 U.S.C.A. § 113 (b)(4)

Intentionally, knowingly, or recklessly impeding the normal breathing or **circulation of the blood** of a person by **applying pressure to the throat or neck**, regardless of whether that conduct results in any visible injury or whether there is any intent to kill or protractedly injure the victim

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Suffocating

18 U.S.C.A. § 113 (b)(5)

Intentionally, knowingly, or recklessly impeding the normal breathing of a person **by covering the mouth of the person, the nose of the person, or both**, regardless of whether that conduct results in any visible injury or whether there is any intent to kill or protractedly injure the victim

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Animation
Transparent Hands

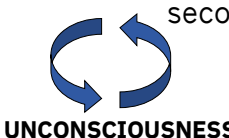
22

Animation
Transparent Rope

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Vessel Occlusion (blockage)

Carotid artery occlusion	Jugular vein occlusion
• Anterior neck	• Lateral neck
• 11 lbs of pressure for 10 seconds	• 4.4 lbs of pressure for 10 seconds


UNCONSCIOUSNESS

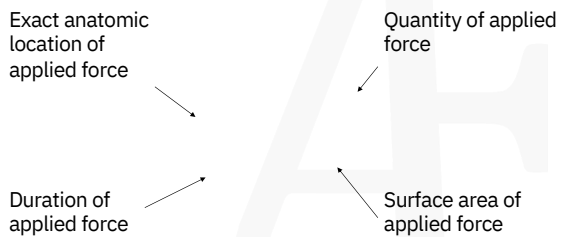
24

Tracheal Occlusion

- Usually minor (if any) role in causing death (as opposed to fracture of the trachea)
- 33 lbs of pressure to completely occlude
- At least 33 lbs of pressure or more to fracture tracheal cartilage

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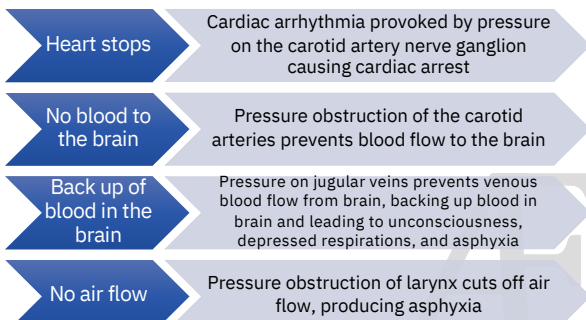
Variables Required for Effective Strangulation



Adapted from D. Hawley MD: Death by Strangulation

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Immediate Death



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Delayed Fatality

For clinicians, it is the potential for delayed fatality that is most concerning. Contributors include:

- Carotid artery dissection
- Respiratory complications: aspiration pneumonia and acute respiratory distress syndrome (ARDS)

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Duration of Abuse

In a study of 62 women in Los Angeles and Dallas, almost 70% had been strangled

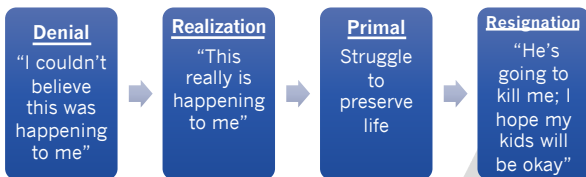
- Avg. relationship duration prior to initial strangulation event = 5.2 years
- Avg. length of abuse prior to initial strangulation = 3.1 years
- 87% had been threatened with death while being strangled and 70% believed they were going to die during strangulation event
- Symptoms increased with increasing # of strangulation incidents

L. Wilbur et al., *Survey results of women who have been strangled while in an abusive relationship*, 21(3) J. EMERG. MED. 297-302 (2001)

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Victim Experience

4 stages patients describe during the strangulation event prior to loss of consciousness (LOC)



Dean Hawley, George McClane, and Gael Strack, *A Review of 300 Attempted Strangulation Cases (I-III)*, 21(3) J. EMERG. MED. 303-309 (2001); Maureen Funk and Julie Schuppel, *Strangulation Injuries*, 102(3) WISCONSIN MED. J. 41-45 (2003)

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Clinical Presentation

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Signs and Symptoms

- Dependent upon the method used, the force used, and the duration of the strangulation
- Changes may include:
 - Voice
 - Swallowing
 - Breathing
 - Mental status

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Signs and Symptoms

Cont'd

- Edema from:
 - Internal hemorrhage
 - Injury of underlying neck structures
 - Fracture of the larynx causing subcutaneous emphysema
- Lung injury
 - Aspiration pneumonitis (inflammation of lung tissue) from vomiting
 - Pneumonia, hours to days later
 - Pulmonary edema possible

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Miscarriage

- Little info in the literature related to miscarriage and fetal demise in surviving strangulation victims
- 4 of 42 women who had been strangled experienced miscarriage within 2 weeks of the event

L. Wilbur, et al., *Survey results of women who have been strangled while in an abusive relationship* 21(3) J. EMERG. MED. 297-302 (2001)

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It is no coincidence that the best medical evidence of strangulation is derived from post mortem examination (autopsy) of the body, but even in living survivors of strangulation assaults it may be possible to recognize a pattern of injury distinctive for strangulation.

— Dean Hawley, MD

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Visible Injuries to Neck

Only about half of strangulation victims have visible injury

Scratches or nail marks (rarely from assailant)	Abrasions	Claw marks (self-inflicted)	Pressure erythema / reddening of the skin	Contusions
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Dean Hawley, George McClane, and Gael Strack, *A Review of 300 Attempted Strangulation Cases, Part I: Criminal Legal Issues*, 21(3) J. EMERG. MED. 303-309 (2001)

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Contusions

Finger touch pad contusions are caused by the assailant's grasp. The thumb generates more pressure than the other fingers, so singular thumb impression contusions are found more often than contusions showing the complete hand grasp.

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Visible Injuries to Other Areas

- Contusions behind ears, jaw line, submandibular area
- Tongue injury, including edema and bite wounds (from victim)
- Chin abrasions: protective mechanism causes injury as victim tries to protect neck by bringing chin to chest

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Ligature Marks

- Presence should increase suspicion of hyoid bone fracture
- May resemble natural folds of neck
- Presence of jewelry can cause ligature-type marks, even when manual strangulation was sole mechanism of injury

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Ligature Marks

- Presence should increase suspicion of hyoid bone fracture
- May resemble natural folds of neck
- Presence of jewelry can cause ligature-type marks, even when manual strangulation was sole mechanism of injury

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Petechiae

- Burst capillaries occurring towards the head or front of the body from the point of pressure
- May be found under and on eyelids, periorbital areas, face, scalp, and neck; also look at lower lip and hairline

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However...

It's a non-specific finding which can be caused from asphyxia of any type:

- Hanging
- Drowning
- Sudden infant death syndrome (SIDS)
- Aspiration of gastric contents
- Profound depressant drug intoxication

Lack of petechiae does not disprove strangulation

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Subconjunctival Hemorrhage

- Burst blood vessels in the eye
- May be to entirety of conjunctiva or isolated spot
- Particularly common with repeated pattern of pressure and release

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Neurological Findings

- Ptosis
- Facial droop
- Unilateral weakness
- Paralysis
- Loss of sensation

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Neurological Findings, cont'd

Studies indicate that victims of *repeated strangulation* have a significant increase in these symptoms

See, e.g., Smith et. al., *Frequency and Relationship of Reported Symptomatology in Victims of Intimate Partner Violence: The Effects of Multiple Strangulation Attacks* 21 J. EMERG. MED. 323-329 (2001)

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Symptoms

- Memory loss
- Depression
- Anxiety
- Suicidal ideation
- Post traumatic stress disorder (PTSD) symptoms
- Nightmares
- Dizziness
- Tinnitus (ringing in the ears)
- Acid reflux

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Medical Evaluation and Documentation

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Evaluation

Strangulation victims consistently under-evaluated in emergency departments

Lack of visible injury often correlates with lack of thorough evaluation

Patients may frequently be dismissed as hysterical, emotionally labile, intoxicated, exaggerating assault details

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Evaluation, cont'd

- Existing symptoms, such as hyperventilation and agitation easily written off as patient drama rather than seen as a logical response to a terrifying and hypoxic event
- Should be dependent upon signs and symptoms displayed
- Patients with more significant findings, such as dyspnea, visible neck lesions, behavioral, or neurologic changes should have more in-depth studies

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10-13-2028
 @ CRSD by
 Kim Park, MD
 SMC-A

Strangulation Evaluation Form

History/Exam:
 Please mark all that apply:
 Bleeding
 Coughing
 Drooling
 Difficulty breathing
 Difficulty swallowing
 Flaring of LOC "grogg"
 Headache "7/10"
 Incontinence of urine or stool
 Lightheaded
 Loss of memory
 Nausea/vomiting
 Numbness/tingling "w/ face"
 Neck pain
 Neck swelling
 Petechiae - face
 Pupil size
 Redness of face
 Cyanosis
 Face tender
 Retro-orbital/peri-orbital hemorrhage/edema
 Swelling tongue
 Bruising
 Voice changes
 Voice change
 Weakness or incontinence of excretions

Method/Manner of strangulation:
 One hand
 Two hands
 Ligature
 Approached from front "pt was lying on floor & I knelt"
 Approached from behind "top"
 Jewelry on pt's neck or on hands/wrist of suspect during incident?
 Other (please describe)

Description of injuries:
 1) Bilateral sclera petechiae
 2) Based contusion to top of head
 3) 2x 1cm circular abrasions on head behind (R) ear

Photographs:
 35 mm Polaroid (Digital) Number of photographs taken: 114

Areas of body photographed: (check scalp, eyelids, conjunctiva, face, chin, nose, jaw, shoulders & chest)
 114 PHOTOS (including pt labels, face, eyes, forehead, behind (R) ear)

Photographs taken to depict method of strangulation? (Y/N)
 Photographs taken by: Kim Park, MD
 Kim Park, MD SMC-A Examiner

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Imaging

- Soft-tissue neck radiographs
 - All strangulation victims and patients with a mechanism consistent with hanging
- Chest radiographs
 - Establish a baseline anticipating acute respiratory distress syndrome (ARDS)
- Computed tomography (CT)
 - When the neurologic status is compromised

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Imaging

Cont'd

- CT scanning of the neck
 - Detection of subtle fractures and other soft-tissue injury
- Doppler vascular imaging, CT angiography, or arteriography of the carotids
 - In cases of ligature strangulation

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Procedures

- Pharyngoscopy
 - Can reveal pharyngeal petechiae, edema and other findings caused by strangulation
- Fiberoptic Laryngobronchoscopy
 - Vocal cord and tracheal evaluation

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Photography

- Photos of any injuries to the body, with and without scale
- External genital photos
 - Taken before and after use of any special techniques
- Vaginal and cervical photos with colposcope or digital camera with magnification

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Alternate Light Sources (ALS) and Contrast Filters

Created by AEquitas and the International Association of Forensic Nurses, supported by Grant No. 15JOVW-22-GK-03987-MUMU and 15JOVW-21-GK-02194 MUMU awarded by the U.S. Department of Justice, Office on Violence Against Women (OVW). The opinions, findings, conclusions, and recommendations expressed in this document are those of the authors and do not necessarily reflect the views of OVW.




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How They Work

Uses different wavelengths of light to assist with the identification of:

- Biological fluids
- Fibers and trace materials
- Bruises

Black, 2013; SDFI, 2023; Mcleod-Henning, 2022; Scafide, et al., 2022



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“The amount of reflection and absorption allow for viewing of differences in color. Wavelengths of light that are reflected become the visible color of the skin’s surface, while absorbed light appears as a darker color (i.e., the color white reflects all visible wavelengths, and the color black absorbs all visible wavelengths). Light that is reemitted at a longer wavelength through the process of fluorescence appears brighter, or ‘glowing’ compared to the surrounding reflected light... [w]hen light penetrates the skin, the degree of reflection is influenced by the presence of any blood in the skin that has resulted from injury or disease processes.”

Pollitt et al., 2016

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Implications for Practice



Currently no clinical practice guidelines because no sufficient evidence base or research for reliability.



Much variability with both ALS and contrast filters—caution should be used in practice and in testimony



ALS and contrast filters alone should not be used for diagnostic purposes but can be used along with patient's history, evidence collection, and the criminal justice process.

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References

- Heather Black, *The Biomechanics of Bruising*. (Aug. 2013) (Thesis for MSc in Biomedical Engineering, University of Strathclyde), <https://stax.strath.ac.uk/downloads/dv13zt48m>.
- Heather Black et al., *On the relationship between applied force, photography technique, and the quantification of bruise appearance*, 305 FORENSIC SCI. INT'L (2019), <https://core.ac.uk/download/pdf/237453956.pdf>.
- Danielle McLeod-Henning, *Improving Bruise Detection with Alternate Light*, NAT'L INST. JUST. (Jan 4, 2022), <https://nij.ojp.gov/topics/articles/improving-bruise-detection-alternate-light#tab=alternate-light-source-technology>.
- Erin Pollitt et al., *Alternative Light Source Findings of Common Topical Products*, 12(3) J. FORENSIC NURSING 978-103 (2016), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5486918/>.

59

References, cont'd

- Peter Rowan et al., *The use of infrared aided photography in identification of sites of bruises after evidence of the bruise is absent to the naked eye*, 17(6) J. FORENSIC & LEGAL MED. 293-97 (2010), <https://www.sciencedirect.com/science/article/abs/pii/S1752928X10000594?via%3Dihub>.
- Katherine Scafide et al., *Predicting alternate light absorption in areas of trauma based on degree of skin pigmentation: Not all wavelengths are equal*, 339 FORENSIC SCI. INT'L (2022), <https://www.sciencedirect.com/science/article/pii/S0379073822002407?via%3Dihub>.
- *What is contrast forensic photography?* SECURE DIGIT. FORENSIC IMAGING, <https://www.sdfi.com/Photography.asp> (last visited June 14, 2023).

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Step 4: Discharge Planning



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Referrals for

STI follow up

Counseling

Law enforcement
referral if
applicable



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Follow-Up

Medical follow-up, crisis follow-up information and plans for STI testing, if appropriate

- Sets healthcare professionals apart from forensic technicians, should the issue of objectivity be raised



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Standard of Care

- Routine prophylaxis for gonorrhea, chlamydia and in some cases, trichomoniasis if applicable
- A prophylactic is a medication or a treatment designed and used to prevent a disease from occurring
- Emergency contraception if applicable

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Trial

- Discuss clinical background at length
- Draw out the lack of “typical” in domestic violence patients
- Discuss victim behavior
- Avoid statistics; ask about frequency in a Forensic Nurse Examiner’s clinical experience instead
 - Is it common to ... ?
 - Is it your experience that ... ?

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Case File

In the late evening of September 30, 2023, after the police left her home, Eva took herself to the hospital after experiencing trouble breathing. She underwent a medical-forensic exam. Law enforcement has just received Eva’s permission to get a copy of these medical records.

Please refer to Medical Forensic Report
(released on website and sent on Chat)

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Small Group Exercise

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Group Assignments

Groups 1 and 2

- The defense has filed a motion to preclude the expert from testifying to patient statements, claiming that because the exam is for forensic purposes, they don't fall under the medical hearsay exception. Develop a response to the defense motion.

Groups 3 and 4

- Develop foundation questions for the medical expert

Groups 5 and 6

- Develop direct examination questions for the medical expert

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Large Group Report Back

Groups 1 & 2

- Respond to the defense motion

Groups 3 & 4

- Pose foundational questions to the medical expert

Groups 5 & 6

- Pose direct examination questions to the medical expert

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Going Forward

- Charge appropriate strangulation crimes
- Use appropriate medical and anatomical terms to document and explain strangulation injury and sexual assault
- Elicit accurate and effective direct examination testimony related to medical evidence.

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Day 2 Wrap-Up

Please take a few minutes to complete an evaluation of Day 2 (MANDATORY for PA and OH CLE)

Please find link in chat and at the end of the Day 2 agenda on aequitasinstitute.org

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Appendix

Strategies for Investigating Strangulation

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Investigators Should Look For

Injuries behind the ears, the inner lips, inner cheeks, on the face, eyelids, neck, scalp, chin, jaw line, shoulders, chest, arms, and hands

Redness, bruising, abrasions, scratch marks, finger/thumb pad marks, ligature marks, tiny red spots, swelling, and/or lumps on neck and face

If the victim is wearing makeup, ask her to remove it before you leave the scene; you may be able to identify additional injuries

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Consider



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Reminders

- Look for injuries on victim in a well-lit room
- Photograph all injuries noted on the body
- Photograph neck and face even if no injuries are apparent
- Take photographs close enough so injuries can be seen in the photos
- Arrange for follow-up photos 24 to 48 hours later
- Ask questions regarding symptoms (pain, tenderness, difficulty moving head and neck, difficulty swallowing at scene and at follow-up)

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Reminders

Cont'd

- If ligature used, photograph and collect
- Document quotes and details of the strangulation in your report
- Record your interviews
- Look for injuries on suspect's hands, arms, chest, neck, and face
- Photograph suspect's injuries

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Reminders

Cont'd

- Get 911 tapes
- Get EMS and ER medical records for victim and suspect
- Charge appropriately, considering the evidence and potential lethality of strangulation

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Questions to Ask

1/4

- How was the victim strangled (methods)?
- How many times was the victim strangled?
- Was the victim shaken simultaneously (whiplash)?
- Did victim hit head (concussion)?
- Did victim feel faint, dizzy or lose consciousness (passout)?
- Did victim have trouble breathing (during or after)?
- Did victim hyperventilate after?

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Questions to Ask

Cont'd (2/4)

- Any trouble swallowing (painful, drooling)?
- Any voice changes (hoarse, raspy, loss of)?
- Any coughing?
- Does victim have neck/throat pain (where)?
- Did victim lose control of bladder or bowels?
- Did victim feel nauseated or vomit afterwards?
- Is the victim pregnant (increased risk of miscarriage/fetal death)?

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Questions to Ask

Cont'd (3/4)

- What did the suspect say when he was strangling the victim (use quotes)?
- What did the victim say to the suspect (use quotes)?
- What did the victim think was going to happen when strangled (was going to die, etc.)?
- What caused the suspect to stop (victim passed out, witness intervention)?

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Questions to Ask

Cont'd (4/4)

- Did victim attempt to protect his/herself?
- Was incident witnessed by children?
- Any pre-existing injuries to victim or suspect?
- Any prior incidents of strangulation?
- Any prior incidents of domestic violence?
- Did suspect force victim to have sex?

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Attempted Strangulation Documentation Sheet
IR # _____

Symptoms and/or Possible Internal Injury:
Did the defendant "choke" you today? _____ In the past? _____

Breathing Changes	Voice Changes	Swallowing Changes	Behavioral Changes	OTHER
Difficulty Breathing <input checked="checked" type="checkbox"/>	Raspy voice <input type="checkbox"/>	Tracheal Swallowing <input type="checkbox"/>	Agitation <input type="checkbox"/>	Dizzy <input type="checkbox"/>
Hyperinflated <input type="checkbox"/>	Hoarse voice <input type="checkbox"/>	Halt/Strangled <input type="checkbox"/>	Anxiety <input type="checkbox"/>	Headache <input type="checkbox"/>
Under 15 breaths <input type="checkbox"/>	Coughing <input type="checkbox"/>	Stuck Pan <input type="checkbox"/>	PTSD <input type="checkbox"/>	Fatigue <input type="checkbox"/>
Other <input type="checkbox"/>	Under 15 speech <input type="checkbox"/>	Swallowing <input type="checkbox"/>	Hallucinations <input type="checkbox"/>	Ulcers <input type="checkbox"/>
			Consciousness <input type="checkbox"/>	Subsides <input type="checkbox"/>

Face	Eye & Eyelids	Mouth	Neck	Under Chin / Behind Ears
Petechiae <input type="checkbox"/>	Swollen <input type="checkbox"/>	Swelling / Swelling <input type="checkbox"/>	Redness / Swelling <input type="checkbox"/>	Abnormal <input type="checkbox"/>
Purple Red Spots <input type="checkbox"/>	Dark Lips <input type="checkbox"/>	Swollen Tongue <input type="checkbox"/>	Swollen Marks <input type="checkbox"/>	Swelling / Pain <input type="checkbox"/>
Swollen Lips <input type="checkbox"/>	Blood Red Eyes <input type="checkbox"/>	Swollen Lips <input type="checkbox"/>	Hand Prints <input type="checkbox"/>	Swollen Marks <input type="checkbox"/>
Bleeding <input type="checkbox"/>	Other <input type="checkbox"/>	Cuts / Abrasions <input type="checkbox"/>	Bluish <input type="checkbox"/>	Hemorrhage <input type="checkbox"/>
Other <input type="checkbox"/>		Other <input type="checkbox"/>	Ligature Marks <input type="checkbox"/>	Other <input type="checkbox"/>

Method / Manner:
How and where was the victim strangled?
One Hand (R or L) _____ Two hands _____ Forearm (R or L) _____ Knees / Feet _____

Ligature? (Describe): _____

How long were you choked/strangled? _____

From 1 to 10, how hard was the suspect's grip? (Low: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (high)) _____

Is the suspect RIGHT or LEFT handed? (Circle one) _____

What did the suspect say while he was strangling the victim? _____

What did the victim think was going to happen? _____

Other:
Physical Evidence Collected at Scene?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

 If Yes, Type of Photo Taker: _____

(Very Important) Photos Taken?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

 Photos Taken By: _____

Did FSU or a PD Tech Respond?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

 Voucher Number: _____

List Evidence Collected: _____

PD 008 (Page 3)

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Sufficiency

- “Held her down, pushing on her throat until she had trouble breathing”
- “Told police and medical personnel that her throat hurt and it was swollen”

State v. Coleman, No. A10-667, 2011 WL 781088 (Minn. Ct. App. Mar. 8, 2011)

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Sufficiency

Coleman, cont'd

“The medical witness testified that although J.P. did not have obvious bruises or petechiae, she had other signs of strangulation, including a painful throat and difficulty swallowing.”

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Sufficiency

Coleman, cont'd

“Strangulation requires only the impediment of “normal breathing or circulation of blood, not the full cessation of breathing or blood circulation.”



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