

# Hanging, Strangulation and Other Forms of Asphyxiation

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16 October 2018

# Overview

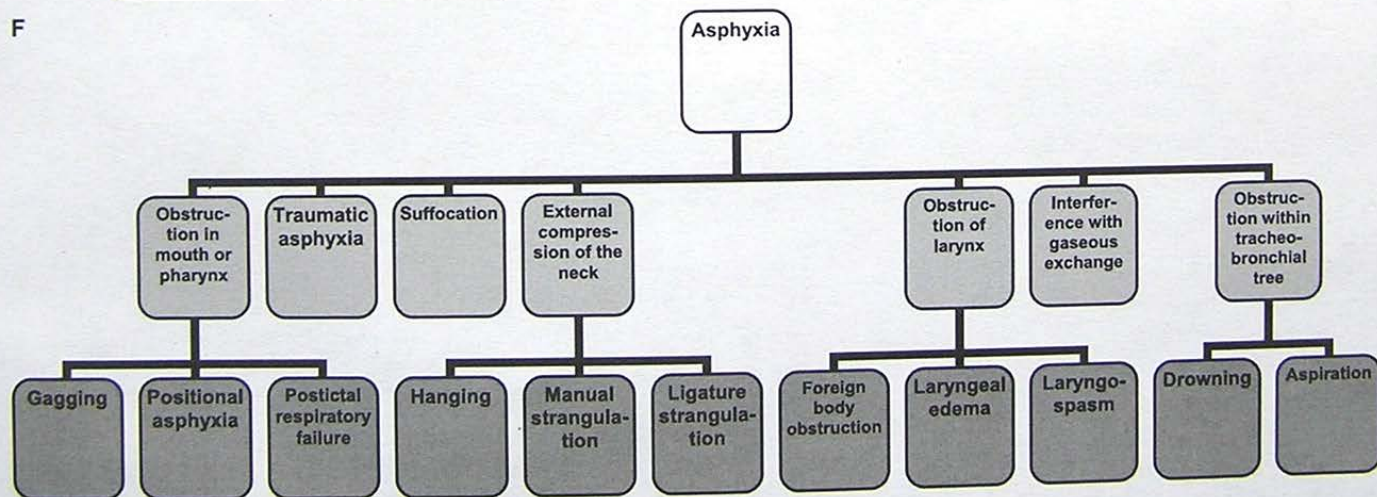
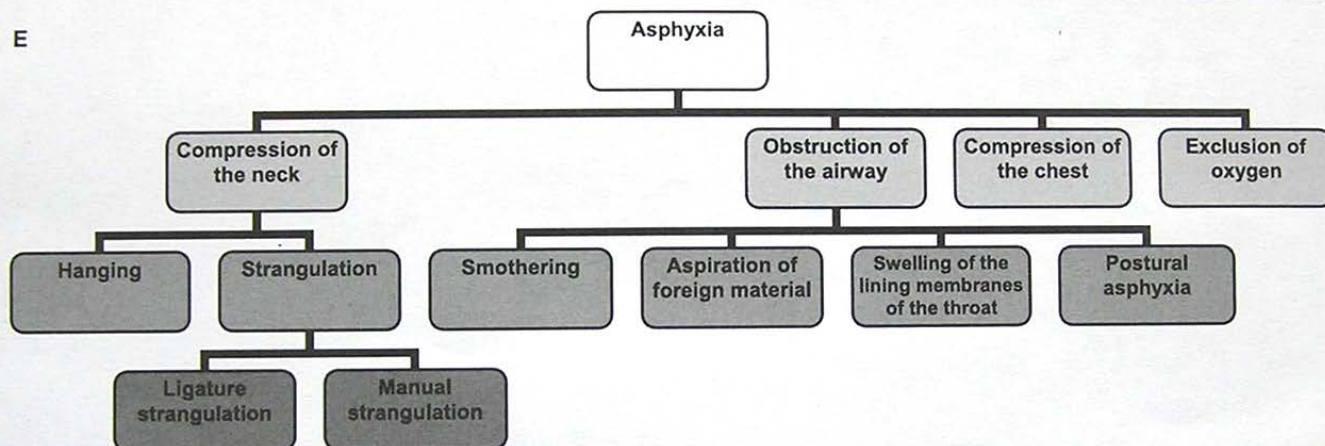
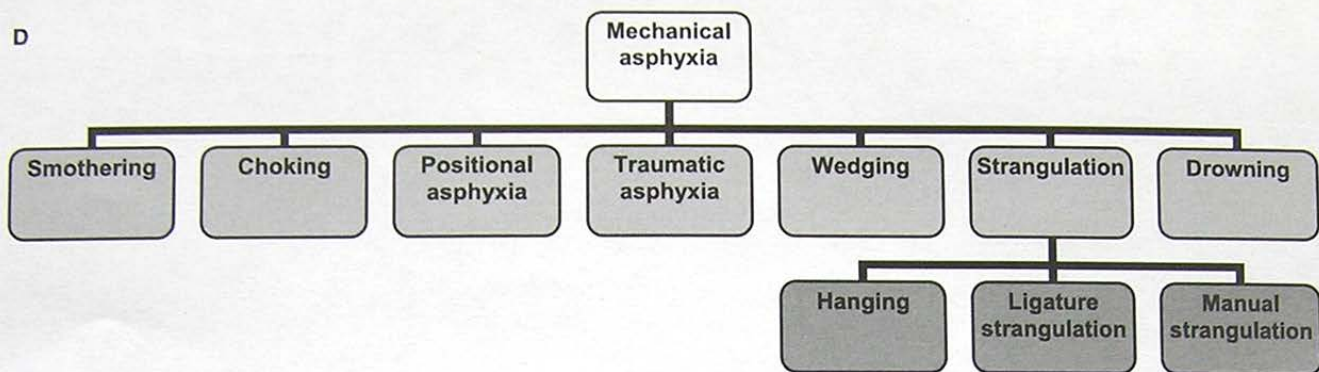
- Terms
- Other forms of asphyxiation
- Neck Compression
  - Hanging
  - Strangulation

# Asphyxia

- The physical and chemical state caused by the interference with normal respiration.
- A condition that interferes with cells ability to receive or use oxygen.

# General Effects

- Decrease and cessation of breathing
- Leads to bradycardia and eventually asystole
- Slowing, then flattening of the EEG



# Many Terms

- **Gag:** to obstruct the mouth
- **Choke:** to compress or otherwise obstruct the airway
- **Strangle:** asphyxia by external compression of the throat
- **Throttle:** same as strangle; especially manual strangulation
- **Garrote:** strangle; especially ligature strangulation
- **Burking:** chest compression and smothering.

# Many Terms

- **Suffocate**: (broad term) a layperson's synonym for asphyxiation, sometimes used to mean smother.
- **Choke**
  - a layperson's term for strangulation
  - A medical term for internal blocking of the airway

# Classification of Asphyxia

Neck  
Compression

Airway  
Obstruction

Mechanical  
Asphyxia

Exclusion  
of Oxygen



# Airway Obstruction

- Smothering
- Gagging
- Choking (laryngeal blockage, aspiration, food bolus)









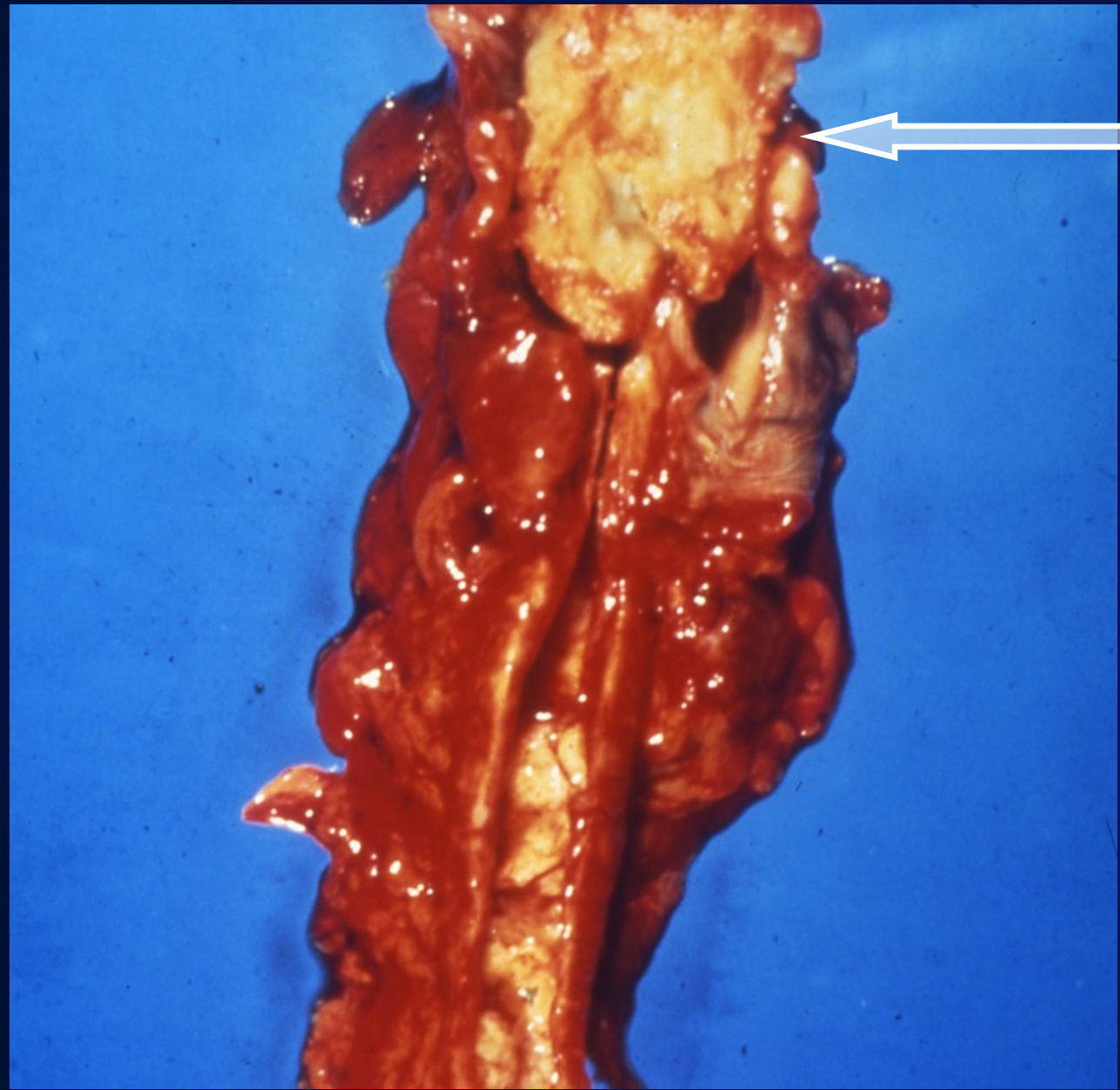
# Suicide Kit



# Choking

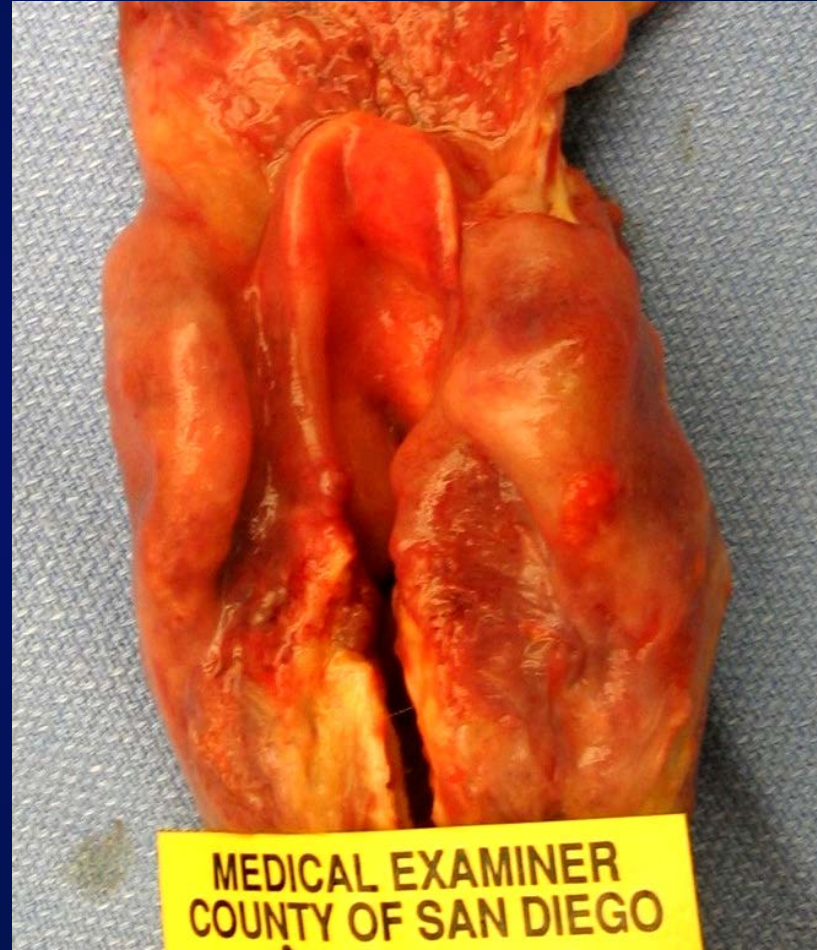
## Internal obstruction of airway

- Mouth: gag
- Larynx or trachea: obstruction by foreign body, “café coronary,” anaphylaxis, laryngospasm, epiglottitis
- Tracheobronchial tree: aspiration, drowning

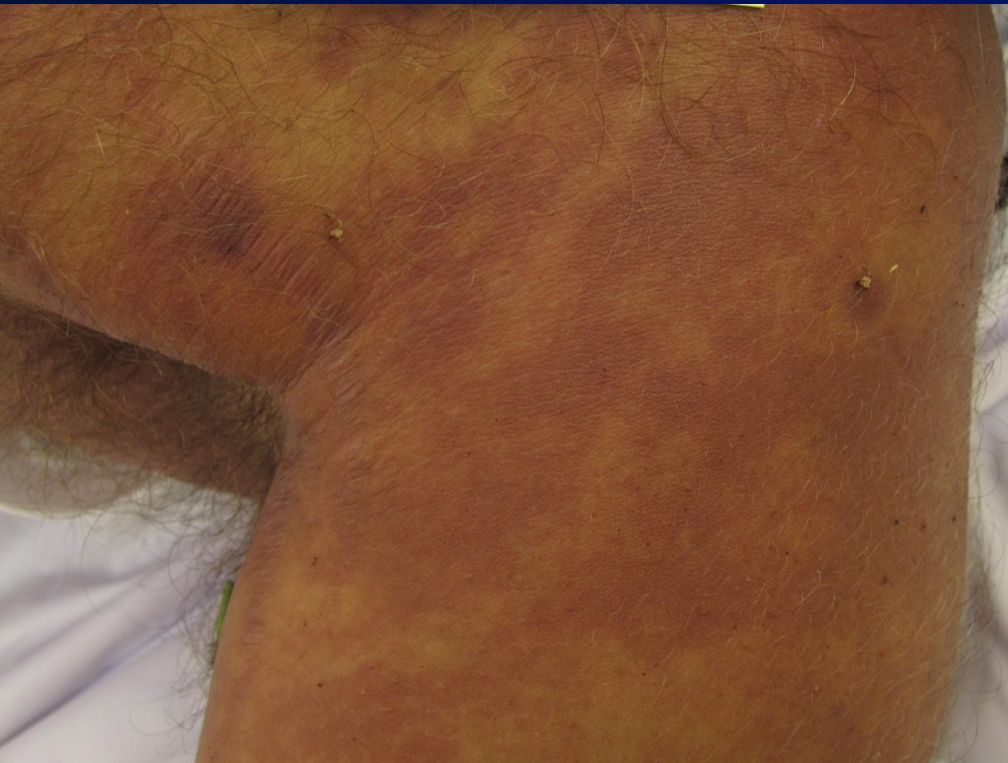


FOOD  
BOLUS





# Anaphylaxis from Wasp Stings



# Mechanical Asphyxia

Ability to breath is compromised by restriction of respiratory movements

- Traumatic asphyxia: external compression (crush) of chest or abdomen
- Positional asphyxia: body wedged, pinned or inverted - Or other condition in which the position of the body compromises the ability to breath: e.g., hyperflexion of neck onto chest



# Positional (postural) asphyxia





# Exclusion of Oxygen

- Confined Space
- Entrapment
- Vitiating atmosphere
- Chemical asphyxiants (CO or CN)
- Drowning





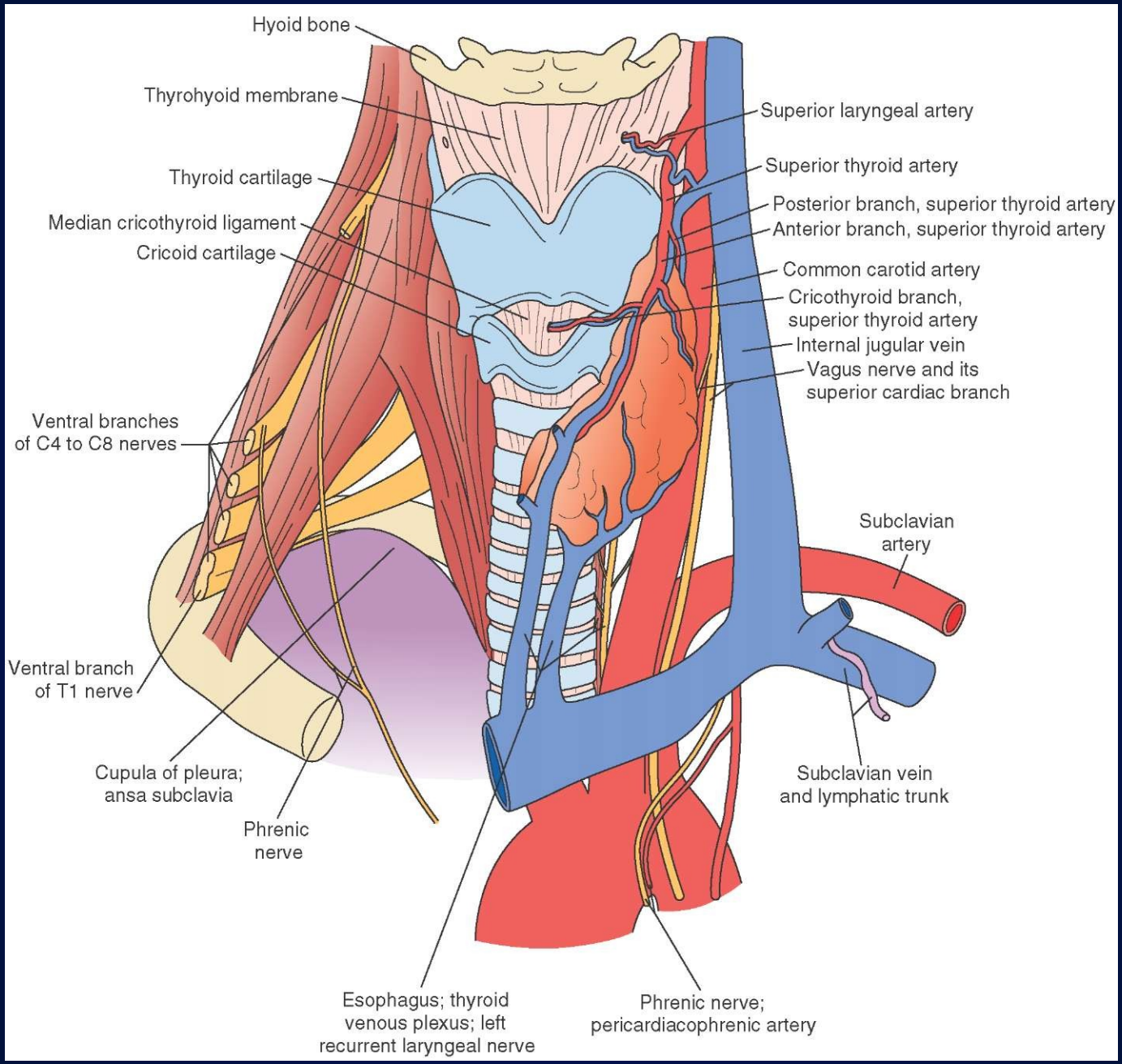


# External compression of neck

- Hanging: suicide, autoerotic or judicial
- Strangulation: manual, ligature, choke hold

# Mechanisms of Asphyxiation in Neck Compression

- Compression of jugular veins
- Compression of carotid arteries
- Compression of airway
- Carotid sinus reflex (in hypersensitive persons - rare)



# Dog Study

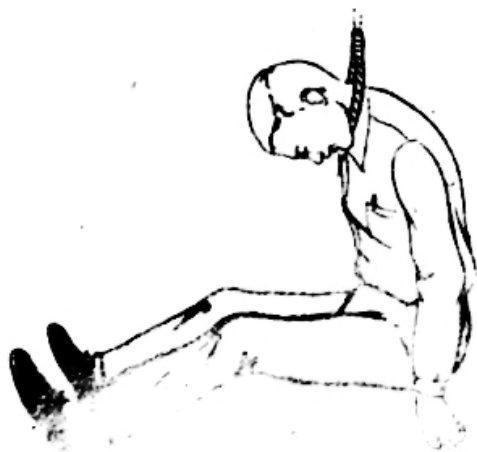
Jugular Veins - 4.5 lbs.

Carotid Arteries - 11 lbs.

Trachea - 33 lbs.

Vertebral Arteries - 66 lbs.

# Hanging positions











# Ligature mark pattern





# Dog Study

Jugular Veins - 4.5 lbs.

Carotid Arteries - 11 lbs.

Trachea - 33 lbs.

Vertebral Arteries - 66 lbs.

# Comparison



20 pounds

# Comparison



80 - 100 pounds

# STRANGULATION

## SIGNS AND SYMPTOMS<sup>2</sup>

### NEUROLOGICAL

- Loss of memory
- Loss of consciousness
- Behavioral changes
- Loss of sensation
- Extremity weakness
- Difficulty speaking
- Fainting
- Urination
- Defecation
- Vomiting
- Dizziness
- Headaches

### EYES & EYELIDS

- Petechiae to eyeball
- Petechiae to eyelid
- Bloody red eyeball(s)
- Vision changes
- Droopy eyelid

### FACE

- Petechiae (tiny red spots - lightly red or florid)
- Scratch marks
- Facial drooping
- Swelling

### CHEST

- Chest pain
- Redness
- Scratch marks
- Bruising
- Abrasions

### VOICE & THROAT CHANGES

- Raspy or hoarse voice
- Unable to speak
- Trouble swallowing
- Painful to swallow
- Coughing
- Nausea
- Drooling
- Sore throat

### SCALP

- Petechiae
- Bald spots (from hair being pulled)
- Bump to the head (from blunt force trauma or falling to the ground)

### EARS

- Ringing in ears
- Petechiae on earlobe(s)
- Bruising behind the ear
- Bleeding in the ear

### MOUTH

- Bruising
- Swollen tongue
- Swollen lips
- Cuts/abrasions
- Internal Petechiae

### NECK

- Redness
- Scratch marks
- Finger nail impressions
- Bruising (thumb or fingers)
- Swelling
- Ligature Marks

### BREATHING CHANGES

- Difficulty breathing
- Respiratory distress

## CONSEQUENCES<sup>9</sup>

### PSYCHOLOGICAL INJURY

PTSD, depression, suicidal ideation, memory problems, nightmares, anxiety, severe stress reaction, amnesia, and psychosis.

### DELAYED FATALITY

Death can occur days or weeks after the attack due to carotid artery dissection and respiratory complications such as pneumonia, ARDS and the risk of blood clots traveling to the brain (embolization).

Today,  
**38 States**  
have legislation  
**AGAINST**  
**STRANGULATION<sup>8</sup>**

**VAWA 2013**  
added strangulation  
and suffocation to  
**FEDERAL LAW**

# S/S associated with strangulation:

- May include
  - Dizziness, fainting, sore throat, cough, changes in voice, loss of voice, difficulty in or painful swallowing, difficulty breathing, hyperventilation, loss of bowel/bladder control, swelling, neck pain/swelling.
  - Also note report of symptoms at time of the incident—changes in vision, blacking out, feelings of panic, etc





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WRITER OF 4/17/12

METRIC 1



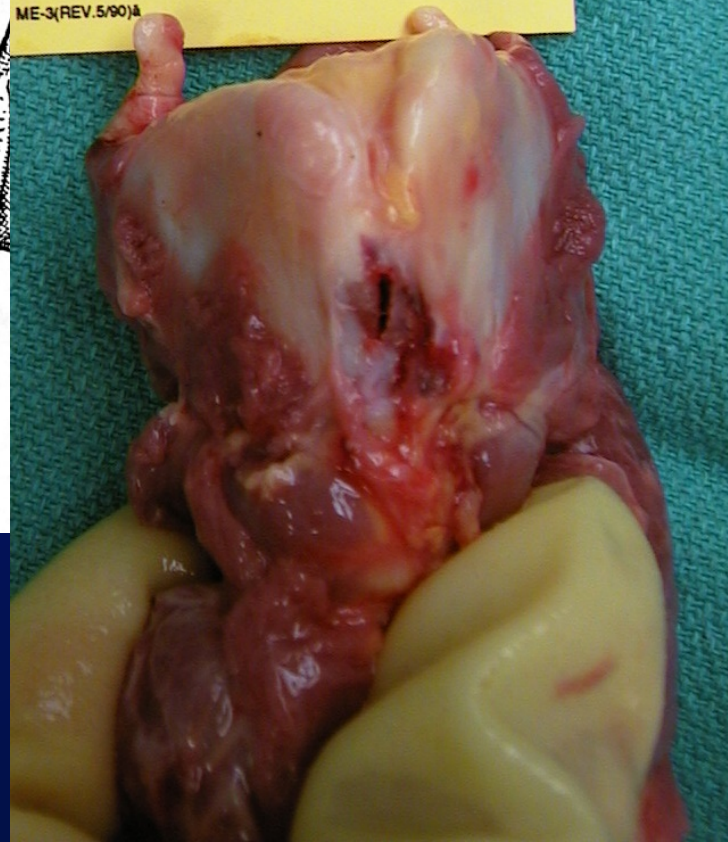
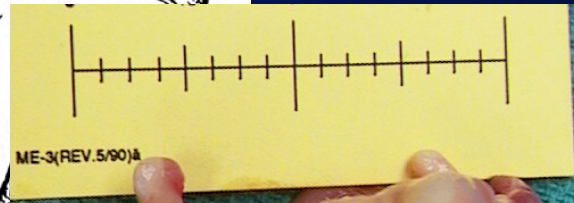
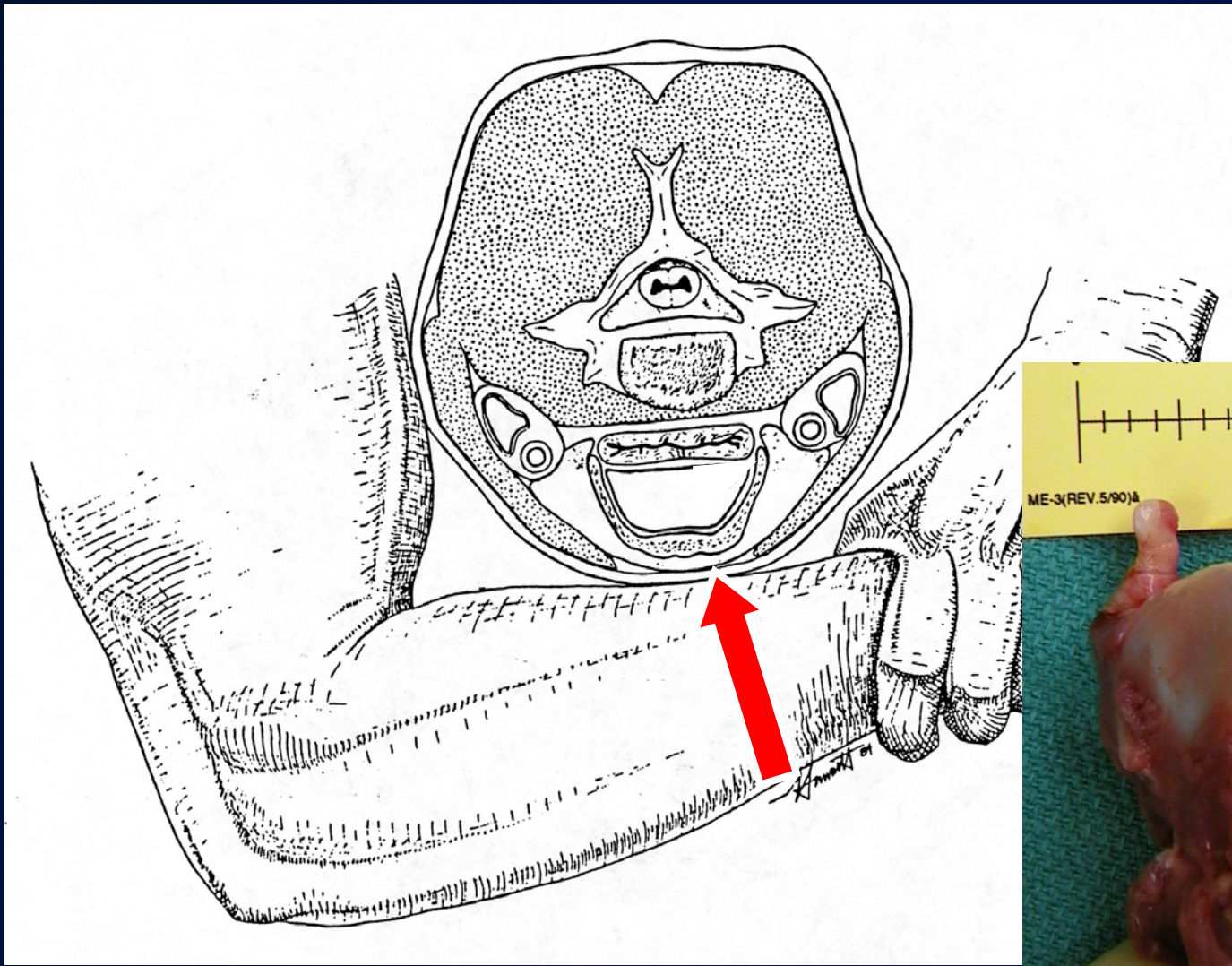
# Neck Holds

- AKA “Upper Body Control Holds”
- Various names, “choke holds”
- Two main
  - Choke hold, AKA bar arm hold  
(older name: bar arm control hold)
  - Carotid hold, AKA carotid sleeper hold  
(older name: carotid choke hold)

# Bar Arm Hold

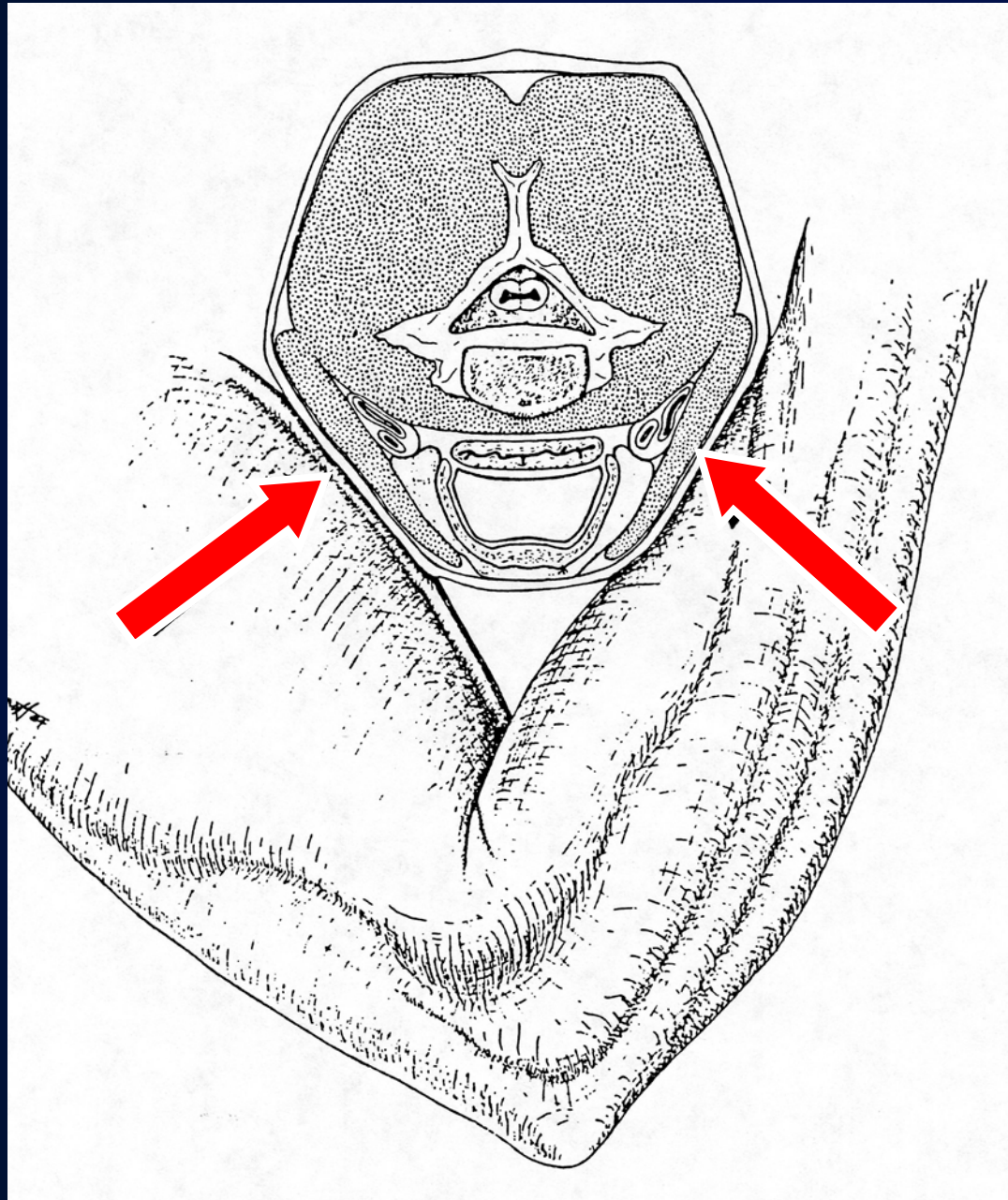






# Carotid hold/sleeper













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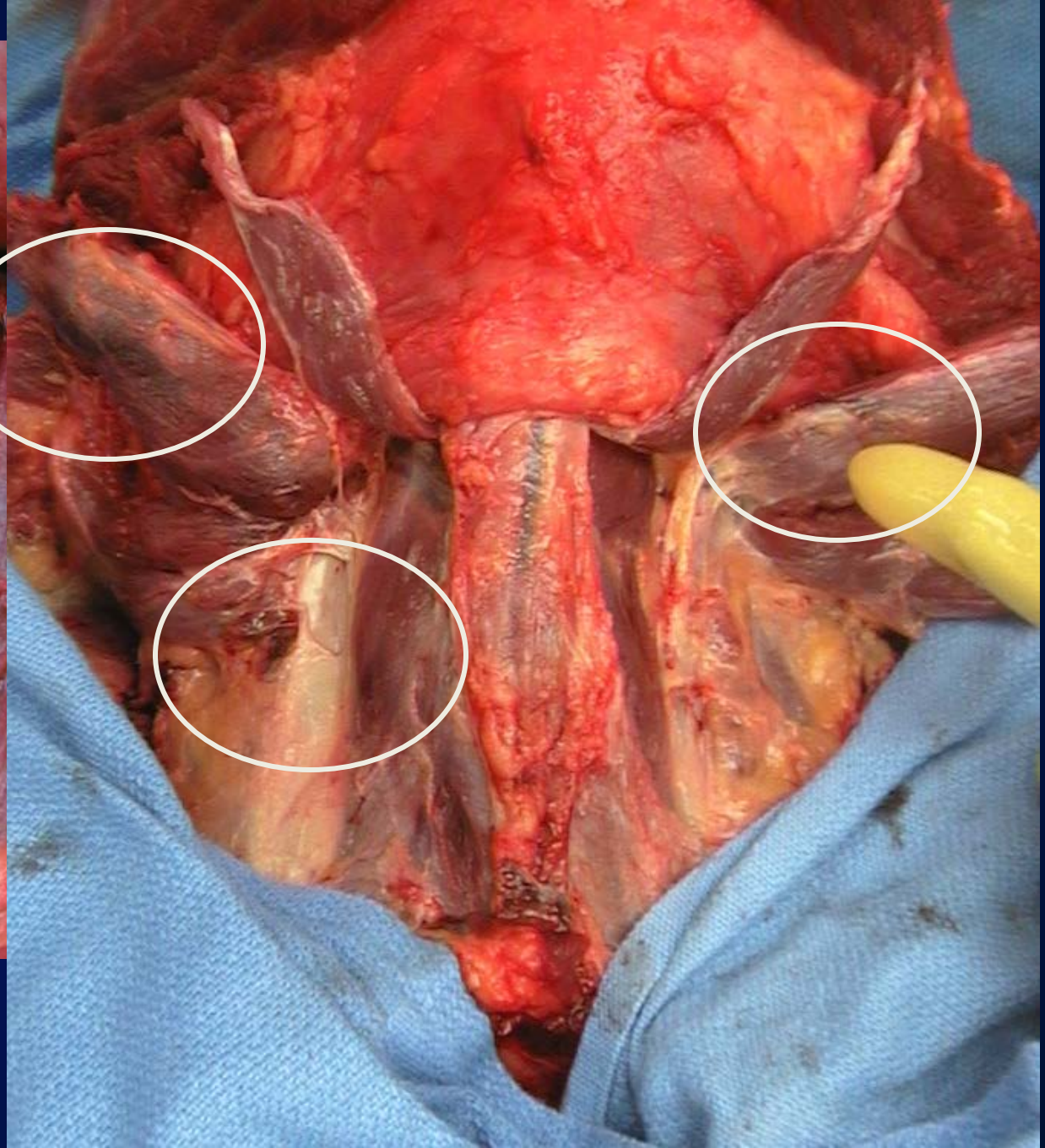
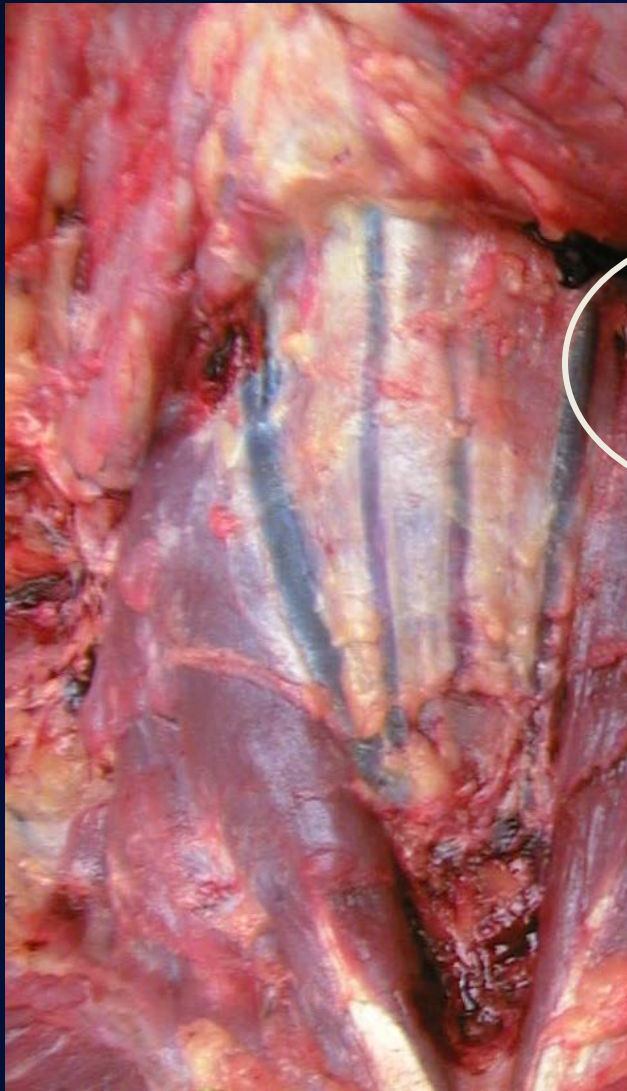
# Autopsy Approach To Asphyxial Deaths

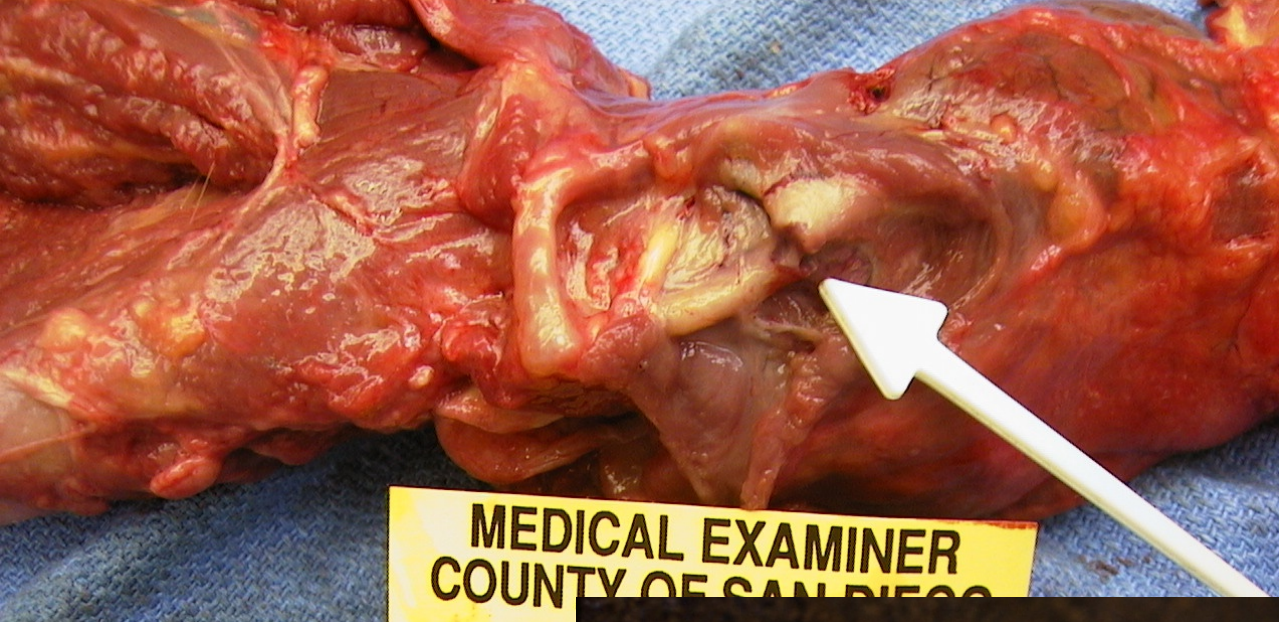
## CLASSIC SIGNS OF ASPHYXIA (nonspecific):

- Petechiae: eyes, skin, serosal surfaces
- Postmortem fluidity of blood
- General visceral congestion
- Cyanosis



PETECHIAE







# Summary

- Terms
- Other forms of asphyxiation
- Neck Compression
  - Hanging
  - Strangulation



STIFNECK  
EXERCISE COLLAR  
NO-NECK  
Laerdal  
Laerdal Medical Products Inc.  
3000 North 17th Street  
Reno, NV 89502  
© 1998 Patent No. 5,812,222

**FAST-PATCH®**  
DEPRILLATOR/REPRILLATOR/ON ELECTRODE  
**PHYSIO-CONTROL®**

1. WIPE CHEST DRY
2. SNAP CABLES TO ELECTRODES
3. REMOVE BACKING FROM ELECTRODE
4. PRESS ELECTRODES FIRMLY TO CHEST IN AREAS IN INSTRUCTIONS ON DEPRILLATOR
5. FOLLOW INSTRUCTIONS ON DEPRILLATOR
6. TOLL STRAIGHT UP

**WARNING:**  
• Do not discharge hand-held paddles on electrodes  
• Do not use for noninvasive pacing  
• Do not use if electrode gel is damaged  
• Do not pull on cables to disconnect from electrodes

 Paramed US 4.979.517  
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# Questions & Discussion