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*Forensic Learning Series*

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# Manual Nonfatal Strangulation Assessment

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For Health Care Providers and First Responders  
*Forensic Learning Series*

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# Manual Nonfatal Strangulation Assessment

For Health Care Providers and First Responders  
*Forensic Learning Series*

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The authors would like to thank the many forensic nurse professionals and physicians  
who continue to care for patients affected by violence worldwide.

This workbook is dedicated to my son, Chris Faugno.

Diana Faugno, MSN, RN, CPN, SANE-A, SANE-P, FAAFS, DF-IAFN

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## FOREWORD

“Tell me and I forget, teach me and I may remember, involve me and I learn.”

— Benjamin Franklin

It took the deaths of two teenagers in San Diego, who died as a result of domestic violence in 1995, for me to understand the seriousness and lethality of nonfatal strangulation. Before they were murdered, they were strangled by their intimate partners. They called the police for help, but due to a lack of visible injuries, neither case was prosecuted. At that time, it was believed there was insufficient evidence to prove an assault had occurred. As a former prosecutor, I should have known more. But we called it “choking” back then, and most choking cases were either not prosecuted or handled as misdemeanors. Most victims even thought they were fine and rarely requested paramedics or sought medical attention. It was a lack of visible injuries, a lack of medical training, a lack of medical experts, and a lack of adequate laws and protocols that bred system-wide minimization of choking cases. Because we were focused on external signs of injury, we missed the significance of potentially life-threatening internal injuries.

The heartbreak of those murders caused the San Diego City Attorney’s Office to immediately launch one of the largest studies of nonfatal strangulation to date: a careful analysis of 300 cases. The results of that study proved that most victims of strangulation did not present with visible injuries; however, there were subtle, identifiable signs and symptoms that could be documented by well-trained professionals with the support of adequate laws, protocols, and leadership.

Today, we know that nonfatal strangulation is more prevalent than we ever realized, impacting victims of domestic violence, sexual assault, child abuse, and elder abuse. It is believed that up to 68% of all high-risk domestic violence victims are repeatedly strangled and that many go unreported. If a victim is strangled even one time, she is between 7 and 10 times more likely to be killed. If a victim is lucky enough to survive, victims of strangulation will likely suffer some form of anoxic or traumatic brain injury and/or long-term consequences. Early detection and intervention is the key to survival.

Thankfully, we now know so much more about nonfatal strangulation and related life-threatening injuries thanks to the many dedicated professionals who have written articles on strangulation, developed training, passed laws, created new tools, and implemented best practices. Diana Faugno is one such pioneer and a leader in the field of nonfatal strangulation. I am grateful to Diana for allowing me to ask her thousands of questions about strangulation and never making me feel any of my questions were silly. Casey Gwinn and I are also grateful that Diana continues to serve as an advisor, mentor, faculty, and friend of the National Training Institute on Strangulation Prevention, which I am proud to lead.

But our work is not done. First responders and health care providers examining patients who have been strangled still face multiple challenges: lack of knowledge and competence due to lack of training; limited contact with this patient population due to a lack of reporting or awareness of the seriousness of strangulation; limited access to experts who might provide ongoing evaluation and peer review; and increasing demands from employers limiting time available for practitioners to maintain and improve highly specialized skills.

Until recently, much of the literature useful for continuing education and skill-building was not readily accessible outside academic institutions. Now there is a large body to support peer-reviewed articles published in medical and social science journals. This has improved education and training for professionals who deal with strangulation patients, including advanced courses for specialists, trainers, and experts.



This advancement in the field allows for more accurate evaluations of findings, or lack of findings, in strangulation patients.

*Manual Nonfatal Strangulation Assessment for Health Care Providers and First Responders* will be one of those valuable tools that should be made readily available in all settings and to all disciplines. This workbook will allow both new and experienced practitioners the opportunity to build skills in identification, documentation, assessment, and treatment of strangulation.

As the CEO of the Training Institute on Strangulation Prevention, an adjunct professor for California Western State School of Law, and an educator working with many students and professionals interested in both legal and medical practice, it is inspiring to know that there is now a well-developed teaching tool comprised of real case studies available to challenge the critical thinking skills of trainees, novices, and early-stage practitioners. This material is also a valuable tool for managers and supervisors responsible for the ongoing evaluation of competencies in newly trained beginning examiners.

Professional education is an important aspect of ensuring competent care for this unique patient population. I strongly recommend this material as a valuable addition to every basic training curriculum and to every professional handling nonfatal strangulation cases—from emergency room physicians, to first responders, and nursing libraries. Had this workbook been available back in 1995, I am confident many more cases would have been adequately identified by police and prosecutors, victims would have been adequately assessed by medical professionals, and offenders would have been held accountable for their crimes.

Thank you, Diana, for creating this wonderful tool for the field. It will be a lifesaver.

**Gael Strack, Esq.**

CEO & Co-Founder

Training Institute on Strangulation Prevention

A Project of Alliance for HOPE International

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## PREFACE

The authors of *Manual Nonfatal Strangulation Assessment for Health Care Providers and First Responders* share over 60 collective years in forensic medical and nursing evaluation in the care of strangulation patients, beginning as early as 1982. We have provided and continue to provide education and training, both nationally and internationally, as experts on the subject of strangulation.

This workbook is designed to standardize anatomic nomenclature, as it relates to the head and neck, for both new and experienced sexual assault nurse examiners (SANEs) and sexual assault forensic examiners (SAFEs), first responders, medical residents and physicians, nursing students, and nurse practitioners, including nurse midwives, women's health nurse practitioners, pediatric nurse practitioners, and forensic nurse practitioners. Standardization of the language of strangulation creates consistency among forms developed by programs within agencies, where checklists have been demonstrated to improve objectivity.

*Manual Nonfatal Strangulation Assessment for Health Care Providers and First Responders* will teach beginning first responders, SANE/SAFE practitioners, medical residents, and nursing students the language of evidence-based evaluative methods of care for the strangulation patient. It will present peer-reviewed strangulation case studies with a clear history, photographic representation and confirmation of anatomical landmarks and injuries, discussions about existing conditions and their influence, identification of injury, evidence-based collection techniques, and treatment based on current standards of practice. Offering this workbook to first responders and health care providers will help fulfill their need for basic, peer-reviewed information and will contribute to continuing competence in care for strangulation patients.

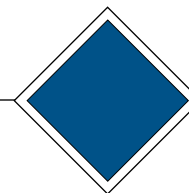
This book should be used for basic and continuing education reinforcing recognition of anatomy, injury, illness and conditions, interpretation of findings, and evidence collection. Because 80% of all strangulation patients will have no visible trauma, it is important to consider evidence collection and treatment in any case suspicious for strangulation. The authors hope that you will find *Manual Nonfatal Strangulation Assessment for Health Care Providers and First Responders* valuable in practice.

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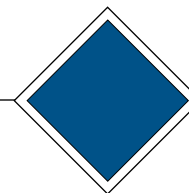
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# Manual Nonfatal Strangulation Assessment

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For Health Care Providers and First Responders  
*Forensic Learning Series*



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# STRANGULATION ASSESSMENT

## OBJECTIVES

*After reviewing the figures presented in this section, the student will be able to:*

1. *Identify anatomy of the neck.*
2. *Define strangulation.*
3. *Identify signs and symptoms of strangulation.*
4. *Identify potential complications from strangulation.*
5. *Define recommended courses of treatment and care for patients with a history of strangulation.*

## INSTRUCTIONS

An anatomical diagram of the neck has been provided to help the participant correctly identify anatomical landmarks. Participants should refer to this diagram, in conjunction with the definitions that follow, when documenting normal anatomy, injuries, and other variant conditions or findings throughout *Strangulation Assessment for Health Care Providers and First Responders*.

Additionally, participants are encouraged to review the sections on symptoms, lethality, and treatment as a supplement to the exercises in *Strangulation Assessment for Health Care Providers and First Responders*. By familiarizing themselves with signs and symptoms of strangulation and treatments available to patients, participants will be better prepared to identify and respond to cases of strangulation, in addition to documenting visible physical injuries.

## DEFINITIONS OF STRANGULATION

- **Abrasion:** Superficial injuries to the skin that are limited to the epidermis and superficial dermis. Abrasions are normally caused by rubbing, sliding, or compressive forces against the skin in a parallel manner rather than by vertical force.<sup>1</sup>
- **ALS light:** A valuable tool that helps detect forensic evidence (eg, urine, sweat, semen, saliva, vaginal secretions, fibers) and other substances (eg, lotion, oils, powders) that would otherwise remain invisible to the naked eye. The area fluoresces, or glows, allowing potential evidence to be collected; however, the collector cannot confirm the origin of the substance or fiber at the time of collection.<sup>2,3</sup>
- **Bruise or Contusion:** An area of hemorrhage on soft tissue caused by the rupture of blood vessels from blunt force trauma. Contusions may be present in skin and internal organs. Contusions may be patterned to reflect the configuration of the object used or correspond to the edges of the object used. Deep bruising may not be visible externally. A contusion can be presumed if the area is tender but the hemorrhage is nonvisible. Estimation of the age of contusions is imprecise and discouraged.<sup>4</sup>
- **Buccal swabs:** Cotton swabs used to collect cheek cells for DNA sample from the inside of the mouth.<sup>2</sup>

- **Choking:** Blocking of a respiratory passage by constriction of the neck, obstruction of the trachea, or swelling of the larynx. May result from materials, such as food, blocking the deeper respiratory tract, thereby preventing oxygen from entering the alveoli.
- **CT:** Computed tomography (CT) is an imaging technique that has revolutionized medical imaging. It is widely available, fast, and provides a detailed view of the internal organs and structures. The two major types of CT are helical CT and conventional/axial/step-and-shoot CT. Helical CT is most prevalent. Conventional/axial/step-and-shoot CT technique is used for high-resolution scanning of the lungs, coronary artery calcium scoring, and prospective ECG-gated coronary CT angiography.<sup>5</sup>
- **DNA, RNA, and protein:** Deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) are linear, polymerized strands of linked nucleotides and considered the building blocks of life. A nucleotide is a nucleoside, or a combination of a sugar (ribose or deoxyribose) and a base, that is linked to a phosphate group. RNA differs from DNA in that the hydrogen at the 2' position in DNA is replaced by a less stable hydroxyl group in RNA. There are four DNA bases: adenine (A), cytosine (C), guanine (G), and thymidine (T). In RNA, thymidine is replaced by uracil (U). DNA or RNA polymers are formed by the linking of the 5' phosphate of one nucleotide to the 3' hydroxyl group of another.<sup>6</sup>
- **Dysphonia:** Involves the muscles of the throat that control speech, otherwise known as spastic dysphonia. It causes strained and difficulty speaking.<sup>7,8</sup>
- **Dyspnea:** Shortness of breath or difficulty breathing.<sup>7,9</sup>
- **ENT:** Ears, nose, and throat.<sup>10</sup>
- **Examiner:** The term refers to the health care provider conducting the sexual assault medical forensic examination. The examiner is also referred to in this document as the “sexual assault forensic examiner,” “sexual assault examiner,” and “forensic examiner.” Many communities refer to their sexual assault examiners by more specific acronyms based upon the discipline of practitioners and/or specialized education and clinical experiences.<sup>11</sup>
- **MRI:** Magnetic resonance imaging (MRI) is a technique that uses a magnetic field and radio waves to create detailed images of the organs and tissues within the body. An MRI machine can also be used to produce 3-D images that can be viewed from many different angles.<sup>12</sup>
- **Odynophagia:** Pain when swallowing.<sup>7</sup>
- **Petechial hemorrhages:** Small, pinhead-sized hemorrhages caused by leaking capillaries that may be singular or multiple in appearance. Frequency of hemorrhages is caused by increased pressure within the blood vessel, as with straining during vomiting or strangulation. This may also be caused by a bleeding disorder, infection, or localized trauma.<sup>4</sup>
- **Positional asphyxia (postural asphyxia):** A form of asphyxia occurring when the position of a person's body prevents the person from breathing adequately.<sup>13</sup>
- **Pulse oximetry:** A device that measures the oxygen saturation of arterial blood in a subject. A sensor is attached typically to a finger, toe, or ear to determine the percentage of oxyhemoglobin in the blood that is pulsating through a network of capillaries.<sup>14</sup>
- **Sexual assault forensic examiner (SAFE):** Registered nurses, advanced practice providers, nurse practitioners, physician assistants, and physicians with specialized education in the forensic aspects of health care for sexual assault patients.<sup>1,11</sup>

- *Sexual assault nurse examiner (SANE)*: A registered nurse who has an advanced education in the forensic examination of sexual assault patients.<sup>1,11</sup>
- *Sexual assault response team (SART)*: Coalitions of agencies that serve sexual assault victims. Core membership for SARTs typically includes victim advocates, law enforcement officers, forensic medical examiners, forensic scientists, and prosecutors. Multidisciplinary SARTs work together to formalize interagency guidelines that prioritize victims' needs, hold offenders accountable, and promote public safety.<sup>15,16</sup>
- *Strangulation*: Asphyxiation (ie, oxygen deprivation) characterized by closure of the air passage or vessels of the neck, resulting from external pressure applied to the neck.
- *Suffocation*: Obstruction or restriction of breathing by external mechanical forces. Suffocation does not require blunt force.<sup>7</sup>
- *Victim advocate*: Someone who pleads, supports, or defends the cause for the victim.<sup>2</sup>

## METHODS OF STRANGULATION

- *Hanging*: Suspension from a cord or cord-like object wound around the neck.
- *Ligature strangulation*: Strangulation without suspension using some form of cord-like object.
- *Manual strangulation*: Strangulation using the hands, fingers, or other extremities.

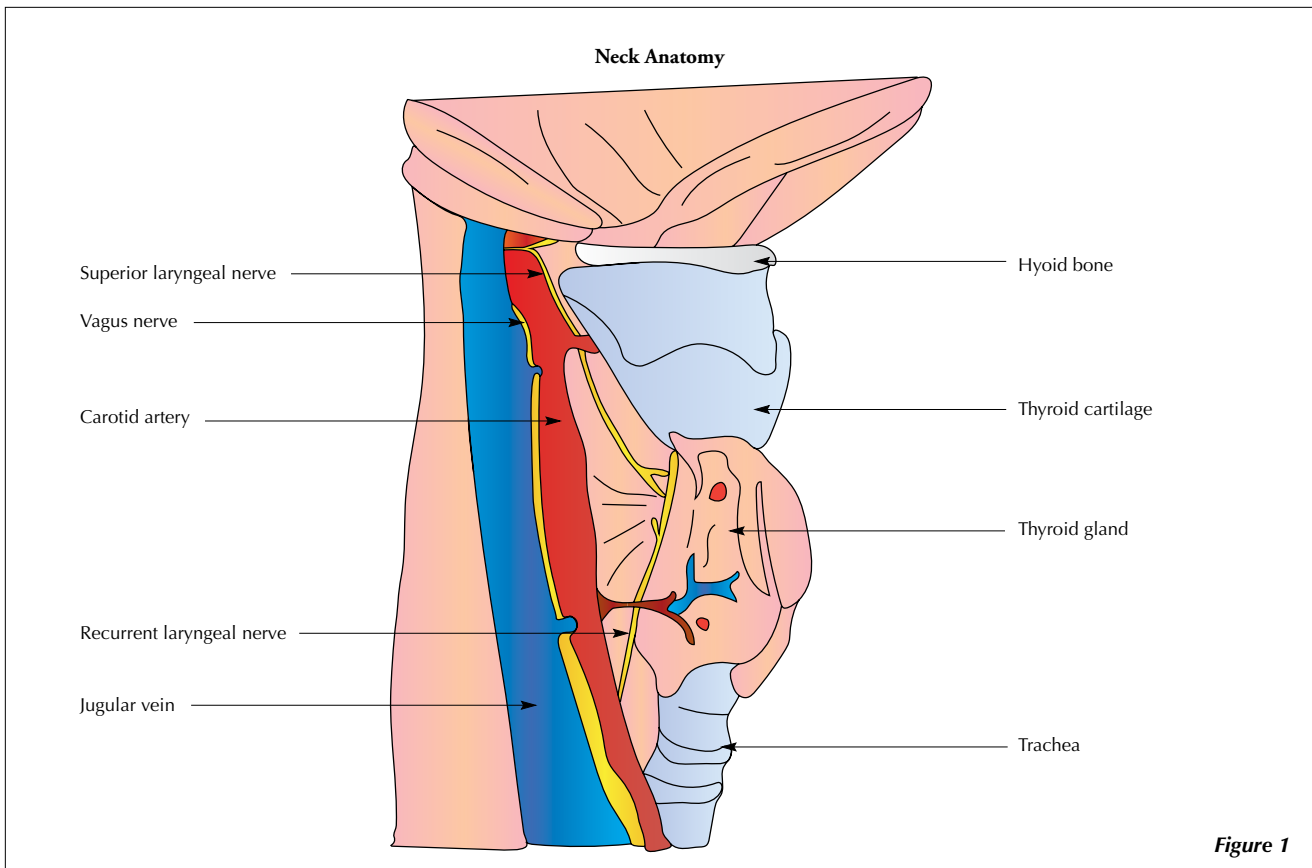
## MECHANISMS OF STRANGULATION

- *Compression of the laryngopharynx, larynx, or trachea*: Inhibits inhalation and exhalation, causing asphyxia.
- *Compression over the carotid artery ganglion*: Stimulates the carotid sinus reflex; produces bradycardia, hypotension, and cardiac arrest.
- *Sustained compression of the carotid arteries*: Prevents oxygenated, nutrient-rich blood flow to the brain. Leads to cerebral hypoxia within seconds.
- *Sustained compression of the jugular veins*: Prevents outflow of venous blood from the brain. Leads to a gradual backup of blood into the brain, leading to stagnant hypoxia, unconsciousness, decreased respirations, and ultimately, asphyxia.

## ANATOMY OF THE NECK

To best understand the clinical features associated with strangulation, one must understand the basic anatomy and functions of the neck (**Figure 1**). The neck is comprised of subcutaneous fat, muscle, cartilage, bone, vessels, nerves, lymph nodes, and salivary glands. The underlying neck structures that are especially vulnerable to the intentional external pressure of strangulation are located in the anterior and anterolateral neck. These structures include the hyoid bone, larynx, trachea, jugular veins, carotid arteries, and carotid artery nerve ganglion. To grasp the importance of these structures, one must understand their role in the cardiovascular and respiratory system.

Life-sustaining oxygenation depends on the combination of air and blood flow. Respiration is the free movement of oxygenated air through the upper air passages (ie, the nose and mouth). Then, the air must flow freely through the larynx, to the trachea, and finally, to the lungs. Oxygenation occurs when the lungs shift oxygen from inhaled air into the blood. Following that, the cardiovascular system pumps oxygenated blood through the heart and up into the carotid arteries of the neck for oxygenation of the brain. At the brain's cellular level, blood exchanges oxygen for waste products, which are then transported down the neck's jugular veins to the lungs for exhalation.



Cessation of oxygenated blood flow to the brain cells leads to asphyxia. Asphyxia may result from strangulation when intentional pressure to the neck compromises air flow, blood flow, or both. Asphyxia, resulting from compressive force on the vessels and air passages of the neck, is the most common cause of lethality in strangulation. Injuries to neck structures may also lead to compromised air and blood flow. Anterior neck structure fractures, tears to neck vessels, intrinsic neck muscle bleeding, supporting ligament tears, nerve injury, and cervical spine fractures or lacerations may also occur as a result of the locational force applied during strangulation. Injury-associated bleeding, swelling, and/or functional disability in maintaining a patent airway interferes with oxygenation leading to asphyxia.

The following is a more detailed explanation of underlying neck structures, including their location, function, and susceptibility to compressive forces of strangulation.

#### CAROTID ARTERIES

The carotid arteries originate from the aortic arch at the top of the heart and are located on the left and right side of the neck. Protected by neck muscles, the carotid arteries lie deeper than the jugular veins and more proximal to the midline structures of the neck. The carotid arteries carry oxygenated, nutrient-rich blood from the heart to the head and brain. Pressure inside the carotid arteries exerts the force required not only to deliver oxygenated blood but to diffuse oxygen throughout the brain tissues.

It takes approximately 11 pounds of pressure to occlude the carotid arteries and compromise oxygenated blood flow to the brain. Sustained pressure causes unconsciousness within 10 seconds, due to immediate cessation of oxygenated blood flow. Immediate relief of pressure allows consciousness to return in approximately 10 seconds. Permanent brain damage can occur within 2 minutes. Carotid artery occlusion has caused death in as little as 15 to 20 seconds, usually resulting from force sufficient to crush or tear the arteries as they are compressed against underlying neck structures. Tears can

also occur to the internal lining of the carotid arteries. As the arteries heal, small blood clots can form at the site of injury. These blood clots can break off, travel to the brain, and compromise blood flow. As a result, neurologic compromise often presents with clinical symptomology of a stroke. These findings are often delayed and may not present until weeks after strangulation occurs.

#### CAROTID ARTERY GANGLION

The carotid artery ganglion, also called the carotid body, is a cluster of cells located at the bifurcation of the carotid artery. The carotid body is an important neurological sensor—primarily stimulated by oxygen and highly sensitive to carbon dioxide. Its main function is to trigger nerve impulses for relay of important information to the central nervous system. Although it requires a specific area of compression with strangulation, sustained compression for 3 to 4 minutes activates the carotid sinus reflex, resulting in bradycardia, which often leads to unconsciousness. If compression continues, cardiac arrest may occur.

#### HYOID BONE

The hyoid bone is a horseshoe-shaped bone located at the base of the mandible and above the larynx. It is not connected to any other bone in the body. The hyoid bone's main function is to support the tongue in movement and swallowing. A fracture of the hyoid bone may lead to difficulty swallowing (ie, dysphagia), painful swallowing (ie, odynophagia), and pain upon neck rotation. Effective swallowing is important to maintaining uncompromisable air flow in respiration. Therefore, a hyoid bone fracture's impact on swallowing, as well as the potential for associated bleeding and/or swelling, may compromise airway potency. Hyoid bone fracture is more common in manual strangulation and requires approximately 35 to 46 pounds of pressure.

#### JUGULAR VEINS

The jugular veins are vessels located on the left and right side of the anterior neck and are more external and lateral to the carotid arteries. The jugular veins return the bulk of deoxygenated blood from the brain and head back to the heart.

It takes approximately 4.4 pounds of pressure to occlude the jugular veins. This occlusion causes venous outflow obstruction, resulting in deoxygenated blood backing up into vessels of the head and brain. This build-up of deoxygenated blood is known as stagnant hypoxia. If venous outflow is obstructed without carotid artery occlusion, the veins above the level of constriction will begin to dilate in order to accommodate the incoming blood that cannot exit the neck. This process causes the veins to engorge, resulting in increased internal venous pressure. When pressure is sustained for approximately 20 to 30 seconds without carotid occlusion, the dilated vessels will rupture, causing pinpoint hemorrhages known as petechiae. Petechiae may occur anywhere above the level of constriction, including the brain, scalp, skin, conjunctiva of the eyes, soft palate of the mouth, and the external ear canal. Brain asphyxia eventually develops as venous filling restricts incoming arterial blood, ultimately compromising oxygen delivery to the brain. Unconsciousness may occur in as little as 15 to 30 seconds. Permanent brain damage may occur in 2 minutes. Death usually occurs around 4 minutes.

#### LARYNX

The larynx (ie, voice box) is a tubular framework of cartilage connected superiorly to the hyoid bone and inferiorly to the trachea. The larynx serves two important functions: First, as a part of the respiratory tract, the larynx allows inhaled air to pass while simultaneously keeping food and liquid from obstructing the airway; second, the larynx houses the vocal cords and so functions to produce sound and vocalization. The larynx contains the following structures, which are important to swallowing and vocalization: cricoid cartilage, epiglottis, thyrohyoid membrane, thyroid cartilage, and vocal cords.

— *Cricoid cartilage.* A ring-shaped structure providing the transition from larynx to trachea. Provides an attachment point for the cartilage, ligaments, and muscles involved in sound production and the opening and shutting of the airway.

- **Epiglottis:** An elastic, spoon-shaped flap extending from the posterior tongue to the anterior border of the thyroid cartilage. During swallowing, the epiglottis folds over to cover the opening of the larynx (ie, glottis) to block any food or fluid from entering the airway.
- **Thyrohyoid membrane:** A fibrous, elastic membrane connecting thyroid cartilage to the hyoid bone by a mucosa bursa that aids the upward movement of the larynx in swallowing.
- **Thyroid cartilage:** A semicircular structure positioned on the anterior larynx. Consists of a fusion of 2 cartilage plates. The external point of fusion is the laryngeal prominence (ie, Adam's apple) and is more visible through the skin in males. The thyroid cartilage supports and protects the upper larynx and anchors the anterior portion of the vocal cords.
- **Vocal cords:** Situated in the mucous membrane on each side of the larynx opening. As exhaled air moves through the larynx, the vocal cords vibrate and produce sound.

The compressive forces of strangulation may lead to occlusion, fractures, and hemorrhages of the larynx's cartilaginous framework. It takes approximately 22 pounds of force for airway occlusion at the level of the thyrohyoid membrane, 31.5 pounds of force to fracture the thyroid cartilage, and 41 pounds of force to fracture the cricoid cartilage. Laryngeal fractures may allow air to escape into the soft tissues of the neck (ie, subcutaneous emphysema), resulting in potential airway compromise, acute asphyxia, and death. Subsequent hemorrhages and swelling may also play a role in airway compromise as a result of these fractures. If these fractures go untreated or unrecognized, the victim may survive initially, but over hours, or even days, the victim may develop life-threatening airway complications, leading to a delayed death. Vocal cord swelling and/or hematoma formation may lead to temporary or long-term vocal dysfunction that includes a hoarse voice (ie, dysphonia) or the inability to produce a voice (ie, aphonia).

#### TRACHEA

The trachea is a hollow tube located along the body's midline that connects the larynx to the 2 main bronchi of the lungs. Incomplete, highly elastic, C-shaped cartilage rings are located anteriorly along the tracheal wall. The trachea's primary function is to allow air flow to and from the lungs. It takes approximately 33 pounds of pressure during strangulation to completely occlude the trachea. Tracheal occlusion inhibits the inhalation of oxygen and the exhalation of carbon dioxide, resulting in multisystem hypoxia and acidosis. Force of strangulation may also fracture the trachea, causing subcutaneous emphysema and subsequent airway compromise.

### STRANGULATION-RELATED INJURIES AND CONDITIONS

The participant may find reviewing the following definitions useful in completing the activities within this book. Terminology for indicators of direction when documenting findings in a medical forensic examination include *anterior* (nearer the front), *posterior* (nearer the back), *inferior* (nearer the bottom), *superior* (nearer the top), *medial* (at the middle), *lateral* (to the side), *proximal* (nearer the center of the body), and *distal* (away from the center of the body).

#### VISIBLE INJURIES TO THE NECK

- **Abrasion (scratches and scrapes):** The scraping or wearing away of a surface, such as skin. A variety of traumatic abrasions may result from strangulation:
  - **Chin abrasion:** Incurred when, in an effort to protect the neck, the victim instinctively lowers and scrapes the chin against whatever is applying external pressure to the neck.
  - **Claw mark abrasion:** Abrasions left by fingernails that may present as grouped, parallel markings running vertically down the front of the neck, though they



are often scattered in a random fashion. Tend to be more “vicious” and “dramatic” in appearance.

- **Impression mark abrasion:** Occurs when fingernails cut into the skin, leaving a curvilinear (ie, semicircular) mark.
- **Ligature mark abrasions:** Horizontal, circumferential abrasions left on the neck that follow a predictable pattern. Distinguishable from suicidal hanging marks by the suicidal suspension ligature mark rising toward one ear.
- **Scratch mark abrasion:** Long, superficial abrasions that may be as wide or narrow as the fingernail itself. Because strangulation victims are usually female, the scratch marks caused by their longer nails are more severe than the scratch marks caused by the assailant.
- **Bruise (contusion):** Injuries occurring below the intact epidermis, resulting from extravascular collection of blood leaked from ruptured capillaries or blood vessels after sufficient force has been applied to distort soft tissues and tear one or more vessels. Results in discoloration of the skin or other organs.
- **Clustering bruises:** Usually located on the sides of the neck and on the jawline. May extend onto the chin and collar bones. Consistent with fingers in a hand-grasp strangulation.
- **Fingertip bruises:** Circular, oval-shaped, often faint bruises consistent with the assailant’s grasp.
- **Single bruise on neck:** Most frequently caused by the assailant’s thumb. Because the thumb generates more pressure than any other finger, this bruise is found more often than fingertip bruises in a hand-grasp strangulation.
- **Petechiae (tiny red spots):** Occur in cases of strangulation involving sustained pressure to the jugular veins without carotid obstruction, causing venous engorgement and subsequently ruptured capillaries. May be found only under the eyelids (conjunctive), around the eyes, scalp, or anywhere on the face and neck in and above the area of constriction.
- **Subconjunctival hemorrhage:** Capillary rupture and bleeding into the white portion of the eye (ie, sclera). Suggests a particularly vicious struggle between the patient and assailant.
- **Swelling (edema) of the neck:** Notable puffiness and/or tight appearance of the neck caused by tissue trauma, bleeding, or subcutaneous emphysema. Victim may complain of feeling tightness or fullness in the neck. Examiner may see jewelry impressions on the neck.

## SIGNS AND SYMPTOMS OF STRANGULATION

- **Breathing changes:** Difficulty breathing (dyspnea), hyperventilation, inability to breathe (apnea).
- **Evidence of hypoxia and near-unconsciousness:** Changes in vision (tunnel vision, blurred), changes in hearing (hearing loss, ringing), loss of control over body (weakness/limpness).
- **Evidence of hypoxia and unconsciousness:** Loss of memory, unexplained injuries, involuntary urination and defecation.
- **Mental status changes:** Restlessness/combativeness, seizure activity, frank psychosis/amnesia.
- **Swallowing changes (larynx/hyoid bone injury):** Difficult, but not painful, swallowing (dysphagia); painful swallowing (odynophagia).
- **Symptomatic voice changes:** Hoarse or raspy voice (dysphonia), complete loss of voice (aphonia).

## LETHALITY OF STRANGULATION

Lethality refers to capacity to cause death. Therefore, lethality of strangulation refers to one's chances of dying as a result of strangulation.<sup>17</sup>

### LETHALITY AS A RESULT OF EXTERNAL PRESSURE

- **Hypoxia:** In cases of strangulation, an oxygen deficiency depriving the brain of oxygenated blood. Characterized by tachycardia, hypertension, dizziness, mental confusion.
- **Neck swelling:** May present as tissue trauma/inflammation, internal bleeding (carotid dissection), laryngeal injury (subcutaneous emphysema). May progress slowly.
- **Pneumonitis:** Inflammation of the lung, resulting from inhaled emesis where the gastric juices begin to digest lung tissue.
- **Postanoxic encephalopathy:** Decrease in blood flow to the brain by which some brain cells die immediately while others survive for days. Surviving brain cells eventually succumb to the cerebral hypoxia. Surviving patients may incur lifelong brain damage and neurological deficits. May be fatal: "brain death," persistent vegetative coma, cerebral edema (ie, brain swelling), and herniation of the brain.
- **Pulmonary edema:** Accumulation of extravascular fluid in lung tissues and alveoli. Caused by excessive negative respiratory pressures resulting from victim's attempts to breathe while external neck pressure impedes the airway.

### LETHALITY OF INTERPERSONAL VIOLENCE (IPV) WITH NONFATAL STRANGULATION: RISK FOR HOMICIDE\*

- Nonfatal strangulation has been reported in 45% of attempted homicides.
- Nonfatal strangulation has been reported in 43% of completed homicides.
- With nonfatal strangulation, odds of attempted homicide increase sixfold.
- With nonfatal strangulation, odds of completed homicide increase sevenfold.

## TESTS AND TREATMENT

- **CT angiography:** Considered the gold standard for strangulation because it is sensitive for bony, cartilaginous, and soft tissue injuries as well as for blunt vascular injury. This technique visualizes arterial and venous vessels and is highly sensitive for clinically significant injuries.
- **CT of the neck:** Sensitive for bony, cartilaginous, and soft tissue injuries. Also identifies edema, hemorrhage, and subcutaneous emphysema.
- **Discharge:** Considered safe if patient experienced no loss of consciousness, presents with no injury/minimal soft tissue neck injury and no objective/subjective neurological findings, and if patient has access to reliable home monitoring.
- **Fiberoptic laryngoscopy:** Evaluates the soft tissues of the oropharynx; however, this approach does not offer information on deep soft tissue injuries.
- **Forensic nurse consultant:** Treat assault victims, investigate crime scenes, and/or provide health care in correctional settings.
- **Magnetic Resonance Imaging (MRI):** Produces best imaging for assessment of deep soft tissue, larynx, and vessels.
- **Plain radiographs:** May identify bone and laryngotracheal injuries (eg, hyoid bone fracture, subcutaneous emphysema, edema, hemorrhage, tracheal deviation).

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\*Data from Glass N, Laughon K, Campbell J, et al. Non-fatal strangulation is an important risk factor for homicide in women. J Emerg Med. 2008;35(3):329-335.

## REFERENCES

1. Faugno DF, Speck PM, Spencer MJ, Giardino AP, eds. *Sexual Assault Quick Reference: For Health Care, Social Service, and Law Enforcement Professionals*. 2nd ed. Saint Louis, MO: STM Learning, Inc; 2016.
2. Ditton M, Gray L. *The ABC's - Anatomy, "Bunk" and the Courtroom of Sexual Assault*. Fort Wayne, IN: Socratic Parenting, LLC; 2015.
3. Pollitt EN, Anderson JC, Scafide KN, Holbrook D, D'Silva G, Sheridan DJ. Alternate light source findings of common topical products. *J Forensic Nurs*. 2016;11(3):97-103.
4. Besant-Matthews PE. Blunt and sharp injury: examination, interpretation, documentation. Lancaster General Health Web site. <http://www.lancastergeneralhealth.org/LGH/ECommerceSite/media/LGH-Media-Library/Documents/LCCA/Blunt-and-Sharp-Injury-Examination.pdf>. Accessed October 27, 2016.
5. Stark P. Principles of computed tomography of the chest. UpToDate Web site. <http://www.uptodate.com/contents/principles-of-computed-tomography-of-the-chest?source=preview&search=CAT+Scan&language=en-US&anchor=H1&selectedTitle=1-150#H1>. Updated June 2, 2015. Accessed October 27, 2016.
6. Raby BA. Basic principles of genetic disease. UpToDate Web site. <http://www.uptodate.com/contents/basic-principles-of-genetic-disease?source=machineLearning&search=DNA&selectedTitle=1-150&section-Rank=1&anchor=H5203404#H5203404>. Updated April 4, 2016. Accessed October 27, 2016.
7. Training Institute on Strangulation Prevention, California District Attorneys Association. *The Investigation and Prosecution of Strangulation Cases*. San Diego, CA: California District Attorneys Association, California Emergency Management Agency; 2013.
8. Schwartz SR, Cohen SM, Dailey SH, et al. Clinical practice guideline: hoarseness (dysphonia). *Otolaryngol Head Neck Surg*. 2009;141(3 suppl 2):S1-S31.
9. Bass JB Jr. Dyspnea. In: Walker HK, Hall WD, Hurst JW, eds. *Clinical Methods: The History, Physical, and Laboratory Examinations*. 3rd ed. Boston, MA: Butterworths; 1990. National Center for Biotechnology Web site. <https://www.ncbi.nlm.nih.gov/books/NBK357/>. Accessed October 27, 2016.
10. What is an otolaryngologist? American Academy of Otolaryngology - Head and Neck Surgery Web site. <http://www.entnet.org/content/what-otolaryngologist>. Accessed October 27, 2016.
11. US Department of Justice, Office on Violence Against Women. *A National Protocol for Sexual Assault Medical Forensic Examinations: Adults/Adolescents*. 2nd ed. Washington, DC: US Department of Justice, Office on Violence Against Women; 2013. National Criminal Justice Reference Service Web site. <https://www.ncjrs.gov/pdffiles1/ovw/241903.pdf>. Accessed October 27, 2016.
12. MRI. Mayo Clinic Web site. <http://www.mayoclinic.org/tests-procedures/mri/home/ovc-20235698>. Accessed October 27, 2016.
13. Parkes J, Thake D, Price M. Effect of seated restraint and body size on lung function. *Med Sci Law*. 2011;51(3):177-181.
14. Pulse oximetry. Johns Hopkins Medicine Web site. [http://www.hopkinsmedicine.org/healthlibrary/test\\_procedures/pulmonary/oximetry\\_92,p07754/](http://www.hopkinsmedicine.org/healthlibrary/test_procedures/pulmonary/oximetry_92,p07754/). Accessed October 27, 2016.
15. National Sexual Violence Resource Center. *Sexual Assault Response Team Development: A Guide for Victim Service Providers*. Enola, PA: National Sexual Violence Resource Center; 2011.

16. Introduction to the SANE Program Development and Operation Guide. Office for Victims of Crime Training and Technical Assistance Center Web site. <https://www.ovcttac.gov/saneguide/introduction/>. Accessed October 27, 2016.
17. Sorenson SB, Joshi M, Sivitz E. A systematic review of the epidemiology of nonfatal strangulation, a human rights and health concern. *Am J Public Health*. 2014;104(11):e54-e61.

## CASE STUDY CHAPTERS

### OBJECTIVES

*After completing the exercises presented in this chapter, the student will be able to:*

1. Correctly identify the anatomy of strangulation patients.
2. Identify and document injuries based on an analysis of case photographs.
3. List at least 3 items of evidence that should be collected.
4. Discuss treatment and discharge instructions

### KEY TERMS

- **Carotid artery:** Arteries supplying oxygenated blood from the heart to the brain.
- **Choking:** Blocking of a respiratory passage by constriction of the neck, obstruction in the trachea, or swelling of the larynx.
- **Hanging:** Suspension from a cord or cord-like object wound around the neck.
- **Jugular vein:** Veins transporting deoxygenated blood from the brain back to the heart.
- **Lethality of strangulation:** Odds of death as a result of strangulation.
- **Ligature strangulation:** Strangulation without suspension using a cord-like object.
- **Manual strangulation:** Strangulation using the hands, fingers, or other extremities.
- **Petechial hemorrhage:** Subcutaneous hemorrhages presenting as minute purple or red spots on the skin. Characteristic of asphyxia by external force.
- **Strangulation:** Asphyxia characterized by closure of the air passage or vessels of the neck as a result of external pressure.
- **Suffocation:** External prevention of respiration via occlusion of nose and mouth with an object.
- **Training Institute on Strangulation Prevention:** California-based training and technical assistance program concerned with domestic violence and sexual assault strangulation crimes.

### INTRODUCTION

The following cases represent a compilation of many different patients and are not intended to represent an individual case. Any similarity is purely coincidental. The photographs are from individual cases but have been de-identified for the purposes of this publication.

The *Manual Nonfatal Strangulation Assessment* assists first responders, nurses and physicians, nurse practitioners, physician assistants, emergency room health care providers, attorneys, and law enforcement personnel in the assessment and documentation of strangulation cases.

First responders and health care providers evaluating patients with strangulation experiences often face challenges related to lack of education, knowledge, experience, and competence. The reasons include limited contact with this particular patient population, lack of access to experts who provide ongoing evaluation and peer review, and increasing demands from employers to manage all patients effectually. To maintain and improve highly specialized skills necessary for the evaluation of patients with strangulation experience, this workbook improves provider's understanding about the assessment, documentation, and treatment of strangulation, thereby improving competency and allowing for improved quality of care for strangulation patients.

## 26-YEAR-OLD FEMALE PATIENT ASSAULTED BY A FORMER INTIMATE PARTNER

### CASE HISTORY

Maria is a 26-year-old female who cleans rooms at a resort hotel. She was in the shower getting ready for work when her ex-partner, Tom, entered the home through the kitchen window. Tom approached her in the shower, grabbed her by the neck, and pulled her out of the shower. At first, she did not recognize her assailant. Once she realized it was her ex-partner, and her son's father, she loudly protested, "You should not do this." He squeezed down harder on her neck. Maria reported that Tom directed her to have sex with him and that she complied. Their son, who was sleeping upstairs, awoke and came downstairs. Tom released Maria's neck when he realized their child was watching. Under Tom's supervision, Maria ran to the bathroom to finish dressing and continued pleading for him to leave. Tom threatened to kill her if she told anyone and left the home.

Maria drove their son to Tom's mother's house for her to watch the child while Maria was at work. After she dropped off her son, Maria left without disclosing the crime to Tom's mother. Instead of reporting for work, she called the police, who brought her to the hospital where she was met by a sexual assault nurse examiner (SANE) for a medical forensic examination. During the medical forensic history, Maria disclosed the strangulation.

During examination, Maria said, "His hands are large and he only needs to put one hand on my neck. He has done this many times before. I know it will only get worse if I do not do what he wants. I usually tell the people I work with that they are suck marks. I do not discuss what happens to me when I am with him. I need to work." During the examination, her demeanor was flat and she played games on her phone. She was disengaged and kept asking to leave to go to work.

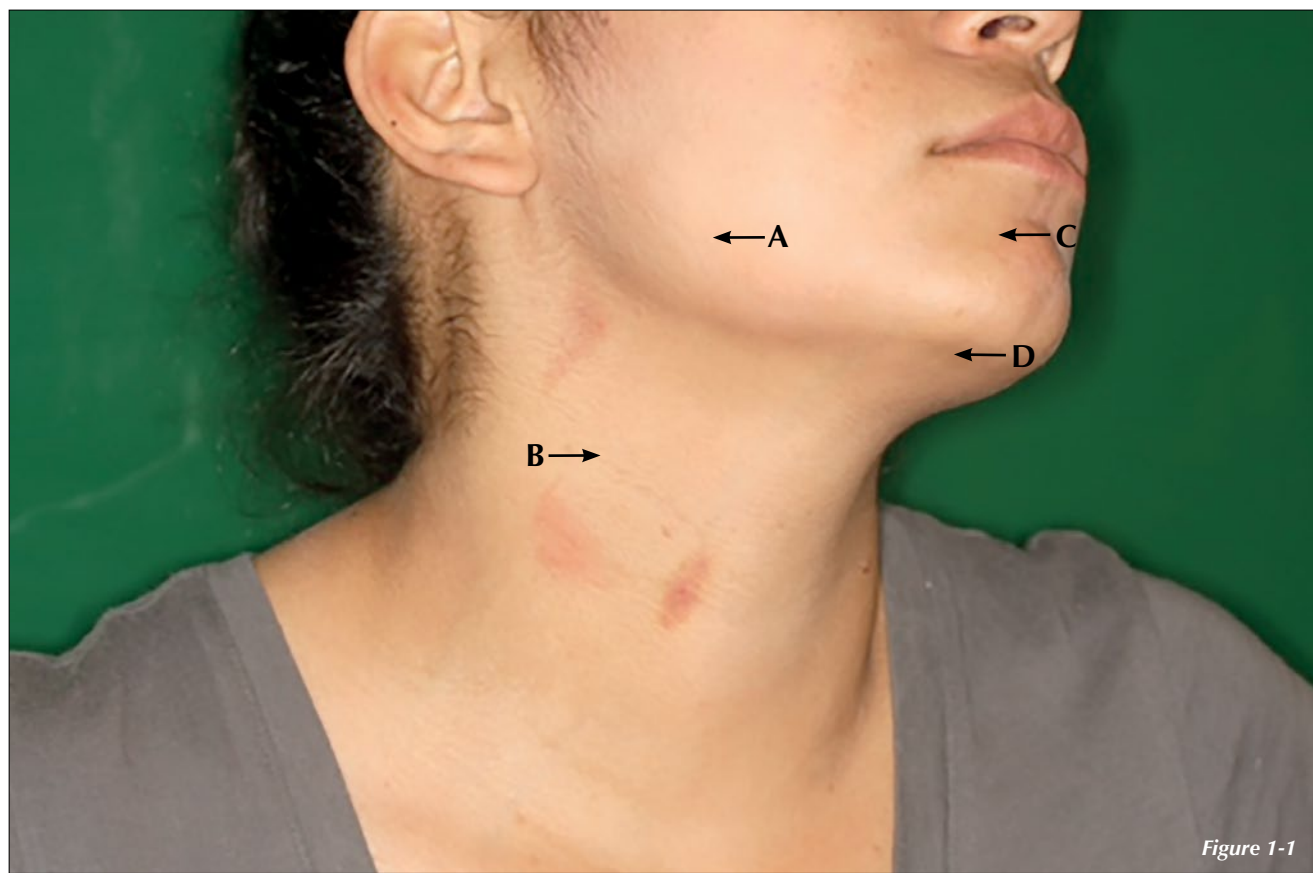


Figure 1-1

### ANATOMICAL SKILLS 1-1

Refer to **Figure 1-1**. Using the letters that point/correspond to the structure in the photograph, label the anatomical location.

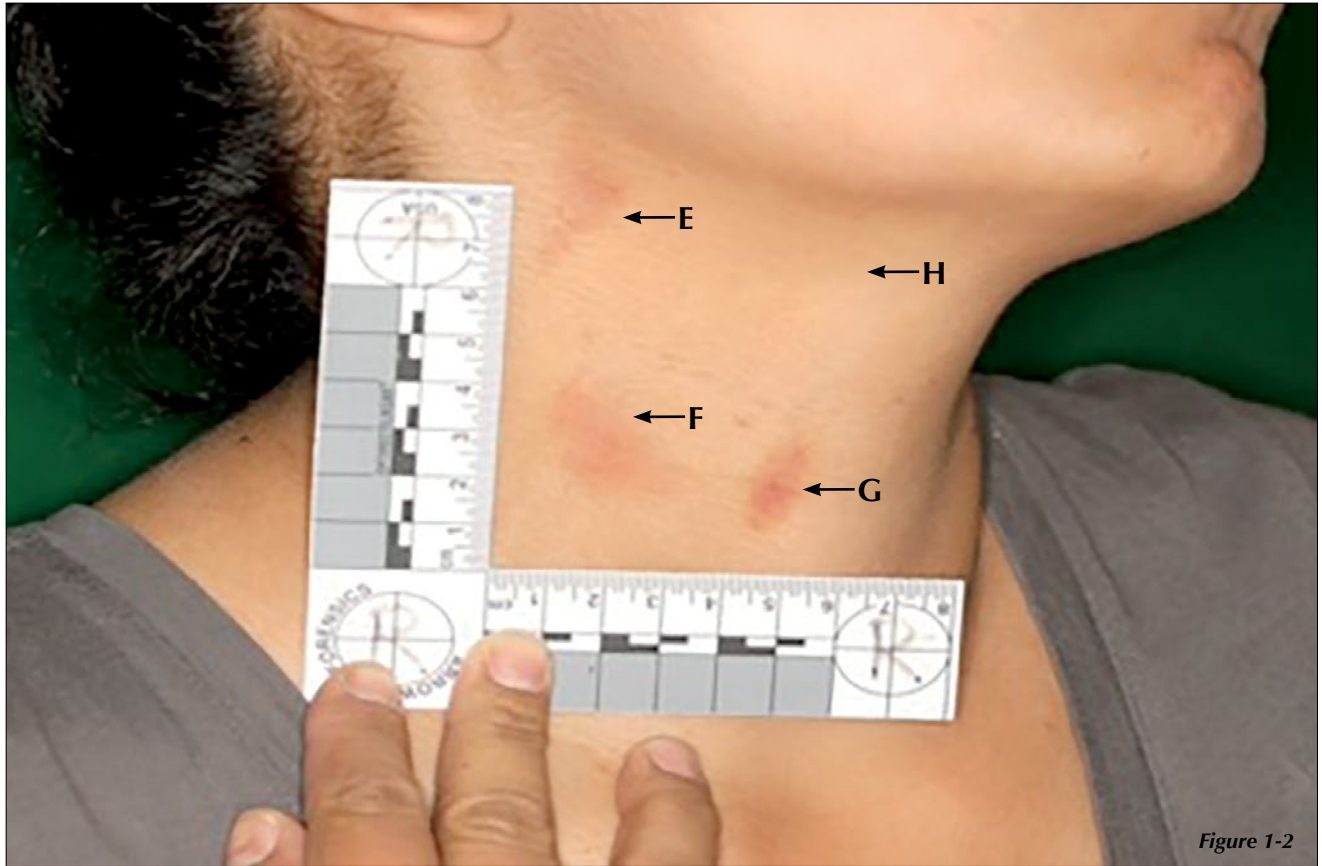
Arrow A: \_\_\_\_\_

Arrow B: \_\_\_\_\_

Arrow C: \_\_\_\_\_

Arrow D: \_\_\_\_\_





## ACTIVITIES

### ACTIVITY 1-1. INJURY IDENTIFICATION

Refer to **Figure 1-2**. Identify any injuries in respect to their anatomical location. Give objective descriptions when documenting findings.

Arrow E: \_\_\_\_\_

Arrow F: \_\_\_\_\_

Arrow G: \_\_\_\_\_

Arrow H: \_\_\_\_\_

List 3 additional questions that the sexual assault nurse examiner (SANE) should ask regarding the physical findings.

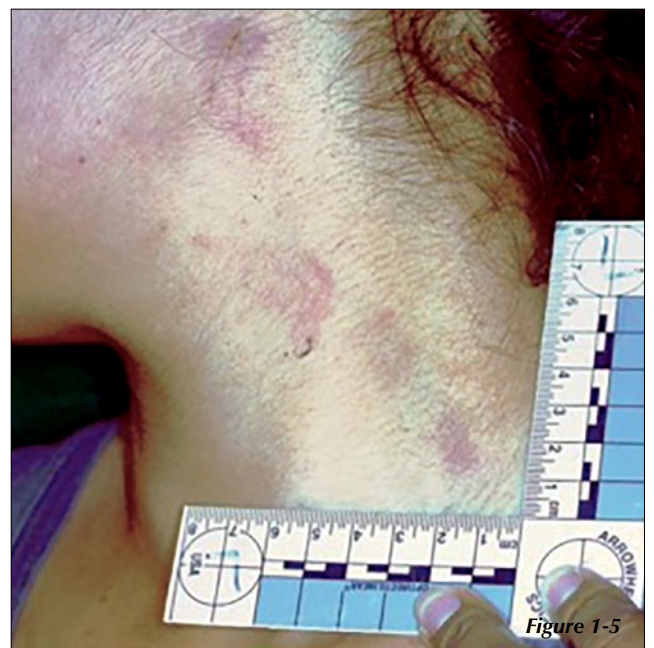
Remember that due to the potential for diminished function, assessment is continuous in all patients and when recognized, requires immediate referral (ie, to an MD, PA, ARNP). List 3 to 6 additional physical assessment procedures you should consider.

Using the patient's history, what evidence would you collect?

Based on the history and your findings, what treatment would you offer this patient? Would you report this case to the police or CPS?

[illegible]

## ADDITIONAL PHOTOS



## NOTES

[illegible]



## ANSWER KEY\*

### NOTE TO STUDENTS

Community standards and agency protocols for evidence collection, prophylactic treatment, patient referrals, and follow-up vary across the United States and internationally. It is the student's responsibility to know his or her community standards, agency protocols, and the rationale surrounding any variations where national or international standards or recommendations exist.

When documenting findings in the medical forensic record, documentation should include approximate length, width, shape, and color of injuries. This level of documentation is not possible when reviewing photodocumentation as presented in these case studies. Limitations to assessment of injury via photodocumentation are related to several variables, including scale, angle, lighting, equipment settings, picture quality, and provider technique (eg, separation, traction).

The case studies in this book are brief summaries of complex patient encounters. The figures provided with each case study represent a sample of the photodocumentation collected during the medical forensic examination. Please note the detail and extent of evidence collection, prophylactic treatment, patient referrals, and recommended follow-up are based on these brief summaries, not on the additional details that would be available during an actual patient encounter. Also, the authors purposefully created the answer key for a broad audience to reflect the diversity and scope of practice of individuals completing this book. In doing so, it is recognized that the answer key may often reflect those roles that have a more limited scope of practice (eg, RN versus APRN/MD).

### CHAPTER 1: 26-YEAR-OLD FEMALE PATIENT ASSAULTED BY A FORMER INTIMATE PARTNER

#### ANATOMICAL SKILLS 1-1

- A. Right jawline or submandibular area
- B. Right middle neck
- C. Perioral area under the lower lip
- D. Under chin

#### ACTIVITY 1-1. INJURY IDENTIFICATION

- E. 2.0 cm x 0.5 cm red bruise at right jawline below the ear or submandibular area
- F. 2.0 cm x 1.0 cm brown bruise at middle neck
- G. 2.0 cm x 2.0 cm red bruise at right neck
- H. No injury noted

\*Answers reviewed for accuracy by Kathy Bell MS, RN, SANE-A, SANE-P; Catherine H. Rossi MSN, FNP-BC, RN, SANE-A, SANE-P; Eileen M. Allen, MSN, RN, FN-CSA, SANE-A, SANE-P; and Trinity Ingram-Jones, DNP, CPNP, PCNS, AFD-BC, SANE-A, SANE-P.

#### ACTIVITY 1-2. ASSESSMENT

- What was the method of strangulation (ie, 1 hand, 2 hands, ligature)?
- Was there loss of consciousness/light-headedness/other neurological symptoms?
- Is there any neck pain (now and after strangulation)?
- Is there any difficulty breathing (now and after strangulation)?
- Are there any changes in the patient's voice (now and after strangulation)?
- Are there any changes in vision (now and after strangulation)?
- Does the patient have any difficulty swallowing (now and after strangulation)?
- Was there any incontinence of the bowel or bladder? (Did the patient change clothes?)
- Assess patient demeanor and document behavior (ie, flat affect, looking away, etc).

#### ACTIVITY 1-3. PHYSICAL ASSESSMENT

- Neurological checks (ie, cranial nerves, cervical nerves in upper body, strength).
- Skin assessment for petechial hemorrhages (ie, conjunctiva, retinal hemorrhages, scalp, ears).
- Speech assessment (ie, for clarity, slurring).
- Memory assessment (ie, orientation, sensory memory).
- Strength assessment and balance (ie, hands, jaws, squint).
- Assess the oral cavity for tears to frenulum, bruising to buccal mucosa, petechiae, and other injuries.

#### ACTIVITY 1-4. EVIDENCE COLLECTION

- Evidence collection kit for *sexual assault and strangulation*, as stated by the patient. (Kit should include buccal swab for reference DNA; swab fingernails, oral, sides of face, and ears.)
- Document the history given by the patient, using quotation marks around the patient's exact words.
- Assess and inspect specific anatomical locations for potential injury.
- Photograph and measure, documenting all injuries, bruises, and areas the patient notes.
- Photograph the 9 diagnostic positions of gaze of the eyes, including the inner aspects of the upper and lower lids.
- Take photographs 360 degrees around the neck.
- Inspect and photograph the oral cavity, including the hard palette, soft palette, uvula, and oropharynx, for petechiae or other injury.
- Inspect and photograph the ears. Initial injury may not be visible but may show up later.
- For references, measure and mark the neck at present, 12 hours later, and at follow-up in 72 hours to 14 days.
- Some programs will use an ALS light to scan the neck for substances and to highlight injury. At this time, research does not support that ALS light identifies bruising.
- Photograph the hands, denoting fingernails and any injuries.

## ACTIVITY 1-5. TREATMENT AND CARE

- *Depending on jurisdictional laws, notify CPS of a child witness present for assault. The child may need to provide a report.*
- *Counseling referral for domestic violence and referral for age-specific child counseling for witnessing domestic violence.*
- The results of the exam are positive for visible physical injury.
- Apply ice to the neck to reduce swelling, as tolerated.
- Prepare the patient for radiographic studies.
- Discuss safety planning with the patient.
- Recommend medical observation for a duration of 12 to 23 hours, with continuous monitoring of pulse oximetry and vital signs, as needed.
- Assess if the patient has a safe place to go following examination and discharge.
- Victim advocate or forensic nurse will refer for shelter and victim of crime application.
- Victim advocate or forensic nurse will offer to assist in/refer for restraining order protection, if needed.
- Provide a danger assessment and discuss the results with the patient.
- Depending on jurisdictional mandated reporting laws, report to police or notify the agency within the jurisdiction if the patient requests law enforcement involvement. (Failure to report when mandatory may result in legal action against the nurse or health care provider.)
- Discuss findings with the patient and provide patient-specific strangulation discharge information, such as detailed instructions to return to the emergency department if neurological signs/symptoms, dyspnea, dysphonia,odynophagia, or seizures develop or worsen.
- Schedule follow-up forensic exam for 72 hours to 14 days post assault, as needed.
- Assess patient access to primary provider care/clinic care for follow-up in 14 days.

## CHAPTER 2: 30-YEAR-OLD FEMALE PATIENT ASSAULTED BY AN INTIMATE PARTNER

## ANATOMICAL SKILLS 2-1

- A. Right jawline or submandibular area
- B. Right lower neck
- C. Under chin
- D. Left jawline
- E. Left lower neck

## ACTIVITY 2-1. INJURY IDENTIFICATION

- F. Circular abrasion to the patient's right lower lip
- G. Circular abrasion under the chin
- H. Two circular abrasions to left inferior aspect of patient's mouth
- I, J, and K: 2.0 cm x 0.5 cm light blue linear contusion/bruise to patient's right neck, scattered dark blue and red colored linear contusion/bruise to right neck 2 cm in length
- L: Patient complained of pain when touched in the right neck area (she gave it a 10/10 on the pain scale and pulled away when touched here)



#### ACTIVITY 2-2. ASSESSMENT

- What was the method of strangulation (ie, 1 hand, 2 hands, ligature)?
- Was there loss of consciousness/light-headedness/other neurological symptoms?
- Is there any neck pain (now and after strangulation)?
- Is there any difficulty breathing (now and after strangulation)?
- Are there any changes in the patient's voice (now and after strangulation)?
- Are there any changes in vision (now and after strangulation)?
- Does the patient have any difficulty swallowing (now and after strangulation)?
- Was there any incontinence of the bowel or bladder? (Did the patient change clothes?)
- Assess patient demeanor and document behavior (ie, flat affect, looking away, etc).

#### ACTIVITY 2-3. PHYSICAL ASSESSMENT

- Neurological checks (ie, cranial nerves, cervical nerves in upper body, strength).
- Skin assessment for petechial hemorrhages (ie, conjunctiva, retinal hemorrhages, scalp, ears).
- Speech assessment (ie, for clarity, slurring).
- Memory assessment (ie, orientation, sensory memory).
- Strength assessment and balance (ie, hands, jaws, squint).
- Assess the oral cavity for tears to frenulum, bruising to buccal mucosa, petechiae, and other injuries.

#### ACTIVITY 2-4. EVIDENCE COLLECTION

- Evidence collection kit for *strangulation*, as stated by the patient. (Kit should include buccal swab for reference DNA; swab fingernails, oral, sides of face, and ears.)
- Document the history given by the patient, using quotation marks around the patient's exact words.
- Assess and inspect specific anatomical locations for potential injury.
- Photograph and measure, documenting all injuries, bruises, and areas the patient notes.
- Photograph the 9 diagnostic positions of gaze of the eyes, including the inner aspects of the upper and lower lids.
- Take photographs 360 degrees around the neck.
- Inspect and photograph the oral cavity, including the hard palette, soft palette, uvula, and oropharynx, for petechiae or other injury.
- Inspect and photograph the ears. Initial injury may not be visible but may show up later.
- For references, measure and mark the neck at present, 12 hours later, and at follow-up in 72 hours to 14 days.
- Some programs will use an ALS light to scan the neck for substances and to highlight injury. At this time, research does not support that ALS light identifies bruising.
- Photograph the hands, denoting fingernails and any injuries.



**ACTIVITY 2-5. TREATMENT AND CARE**

- The results of the exam are positive for visible physical injury.
- Apply ice to the neck to reduce swelling, as tolerated.
- Prepare the patient for radiographic studies.
- Discuss safety planning with the patient.
- Recommend medical observation for a duration of 12 to 23 hours, with continuous monitoring of pulse oximetry and vital signs, as needed.
- Assess if the patient has a safe place to go following examination and discharge.
- Victim advocate or forensic nurse will refer for shelter and victim of crime application.
- Victim advocate or forensic nurse will offer to assist in/refer for restraining order protection, if needed.
- Provide a danger assessment and discuss the results with the patient.
- Depending on jurisdictional mandated reporting laws, report to police or notify the agency within the jurisdiction if the patient requests law enforcement involvement. (Failure to report when mandatory may result in legal action against the nurse or health care provider.)
- Discuss findings with the patient and provide patient-specific strangulation discharge information, such as detailed instructions to return to the emergency department if neurological signs/symptoms, dyspnea, dysphonia, odynophagia, or seizures develop or worsen.
- Schedule follow-up forensic exam for 72 hours to 14 days post assault, as needed.
- Assess patient access to primary provider care/clinic care for follow-up in 14 days.

## **CHAPTER 3: 26-YEAR-OLD FEMALE PATIENT ASSAULTED BY A FORMER INTIMATE PARTNER**

**ANATOMICAL SKILLS 3-1**

- A. Right jawline or submandibular area
- B. Right middle neck
- C. Right lower lip

**ACTIVITY 3-1. INJURY IDENTIFICATION**

- A. Linear abrasions to right jawline
- B. Abrasion to the right middle neck
- D. Linear abrasion to left middle neck
- E. Multiple linear abrasions/scratch marks to the right middle neck
- F. Linear abrasions (“scratches”) to the back of the neck

**ACTIVITY 3-2. ASSESSMENT**

- What was the method of strangulation (ie, 1 hand, 2 hands, ligature)?
- Was there loss of consciousness/light-headedness/other neurological symptoms?
- Is there any neck pain (now and after strangulation)?
- Is there any difficulty breathing (now and after strangulation)?
- Are there any changes in the patient’s voice (now and after strangulation)?