



Non-fatal strangulation: in physical and sexual assault

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Definitions

Strangulation is the obstruction of blood vessels and/or airway by external pressure to the neck resulting in decreased oxygen (O₂) supply to the brain.

- Non-fatal strangulation (NFS) is when the strangulation does not cause death.
- Fatal strangulation is where death ensues.

Choking, a term often used incorrectly when referring to strangulation, is the mechanical obstruction of the windpipe (trachea), such as a stuck piece of food. (See *Management of Choking in Police Care and Custody*).

Strangulation is different to suffocation as the latter is due to obstruction of the airway at the nose or mouth, above the level of the epiglottis.

Healthcare professionals (HCPs) should be aware that patients may refer to strangulation as “choking”, or use other terms, e.g. “pressure on my neck”, “throttling me” or “I couldn’t breathe”, so it is important to explore and clarify what is meant, by the patient.

There are four main methods of strangulation¹:

1. Manual strangulation is used to describe the application of pressure to the neck using the hands.²
2. Chokehold or head lock – where the external pressure is applied by an arm around the neck. A choke hold involves an assailant holding their arm across the person’s neck from behind, so that pressure is applied by the upper arm and forearm to the vascular structures of the neck. The amount of elbow flexion determines the amount of pressure applied to the neck. This is a known ‘martial arts’ grappling hold and is variably termed a sleeper hold or vascular/carotid restraint.
3. Ligature e.g. a scarf or belt tightened around the neck.
4. Hanging.

Less common is pressure on the neck from a foot or knee. All these methods can lead to external pressure on the neck causing partial or complete obstruction of the blood vessels or windpipe (trachea).

Non-fatal strangulation has been described as the domestic abuse ‘equivalent of water boarding: both leave few marks immediately afterwards, both can lead to loss of consciousness, both are used to assert the actor’s dominance and authority over the life of the other, both create intense fear and potentially result in death, and both can be used repeatedly, often with impunity’.³

What may happen in strangulation?

Immediate and significant effects

- Obstruction of the arteries leads to hypoxia.
- Obstruction of the veins can lead to increased cerebral blood pressure and ‘stagnant hypoxia’.
- Obstruction of the trachea causes hypoxia and hypercapnia
- Damage to the spinal column, and in turn to the cord and nerves
- Rarely, a cardiac dysrhythmia due to pressure on the carotid body (node)
- Damage to the intima of the blood vessels leading to thrombus or dissection

NFS can lead to physical and psychological problems. It can result in damage to anatomical structures within the neck, such as the muscles, blood vessels, vocal cords, hyoid bone or thyroid gland.⁴ Recovery is variable, it may be complete or lead to long term problems.

The brain is particularly sensitive to decreased oxygen levels. Experiments on healthy adult male volunteers in the 1940s showed that loss of consciousness (LoC) took on average 6.8 seconds.⁵ Often these volunteers were dazed and confused afterwards for a short period of time. Some insisted that they had not lost consciousness. With prolonged strangulation, some lost bladder control between 15 to 40 seconds, two lost bowel control at 30 seconds. There was considerable variation in terms of response between the different volunteers.

Pressure required

For ethical reasons it is not possible to conduct experiments in humans to determine how much pressure is required to obstruct the blood vessels and airways in the neck. However previous studies have shown the following pressures are required:

Pressure required to occlude structures in the neck³

Jugular vein	4psi
Carotid artery	11psi
Trachea	34psi

(psi = pounds per square inch)



Who experiences NFS?

A 10 year-review of Living Victims of Strangulation⁶, from the USA, where 102 victims were examined, showed:

- 101 were female, age range 17-68 years; average age 31 years
- 81 were assaulted by an intimate partner
- 7 were assaulted by a stranger and 14 by acquaintances, other family members or police
- 81 were assaulted via manual force
- 13 were associated with a sexual assault

In the context of NFS and sexual assault, the complainants overwhelmingly tend to be young adult females. The alleged assailants are usually male with many being the partner or ex-partner of the complainant. In a review of NFS cases seen at Saint Mary’s SARC, Manchester, in the three years up to December 2019 (unpublished data), 214 of 224 complainants were female, all were aged 10 years or older, with most being over the age of 18. The systematic review by Sorensen et al,³ showed between 3 – 10% of women had experienced NFS by an intimate partner. A study by Glass showed prior NFS was associated with an increased risk of attempted and completed homicide.⁷

Presentation and assessment

History

Details of the history should include what happened at the time of the incident, and afterwards, bearing in mind that not all symptoms and signs are apparent straightaway, and some individuals may not present immediately, or recollect what happened. Some exploration or clarification

of the history may be needed, in order to be sure what is described/meant.

N.B. In the history, it is important to note how pressure was applied, by whom and if possible, for how long.

Experience, memory, symptoms	
At the time of the incident	Since the incident
<ul style="list-style-type: none"> • None, (e.g. no awareness of what happened) • Visual disturbance • Auditory disturbance • Faecal and/or urinary incontinence • Loss of consciousness (LoC) • Other 	<ul style="list-style-type: none"> • Respiratory/laryngeal: stridor, dyspnoea, cough or other breathing problems, inability to speak/hoarse voice • Oro-pharyngeal: pain on or difficulty swallowing, dribbling/drooling, oedema/swelling, vomiting • Neurological: seizures, (fits), dizziness, headache, motor impairment/weakness, sensory impairment/symptoms (e.g. visual, auditory, altered sensation), memory loss (without necessarily being aware of LoC) • Gynaecological: ask about any bleeding <i>per vaginum</i>, (PV), in pregnancy, and even if none, seek advice from obstetricians and gynaecologists; refer for assessment, e.g. Doppler checks, ultrasound, if deemed necessary

Signs

This will depend upon numerous variables including the duration and amount of pressure used and will range from no signs or symptoms, to death. The key to detecting NFS is to have a high level of suspicion and to be proactive in the history taking and examination with regards to signs and symptoms. An unpublished analysis of 62 adult females reporting NFS and seen at Saint Mary’s SARC in 2017, showed that up to 40% complained of at least one sign or symptom, including headaches, pain on swallowing and memory disturbance.

Bruises and abrasions may be seen on the front and sides of the neck, but the pattern of skin surface injuries may be difficult to interpret because the dynamic nature of an assault and the possibility of the repeated re-application of pressure

during strangulation.¹ Clinical assessment may reveal pain on swallowing, hoarseness, noisy breathing (stridor), neck, head or back pain.¹

As a minimum, the general examination should include:

- the face/mouth/eyes/behind ears: swelling, bleeding, bruising, including petechiae, and/or subconjunctival haemorrhages
- the neck: pain, swelling, bruising, abrasions, (marks from a ligature, if used)
- other as appropriate



Physical examination may reveal⁸:

- No injury
- Tenderness
- Transient erythema (reddening) and (oedema) swelling
- Bruising and/or abrasions at the point of compression
- Petechiae (pinpoint, or splinter-like bruises) above the site of the compression, in skin, eyes and mucous membranes e.g. lining of the mouth
- Damage to the larynx, and/or thyroid cartilage, and/or hyoid bone including fracture, which may be frequently under-diagnosed⁹
- Linear abrasions on the neck from the assailant and victim, as the person tries to take the assailant's hand away
- Damage to the mucosa of the mouth and tongue due to direct pressure on the teeth internally
- Bleeding from mucosa where venous pressure is increased e.g. nose
- Bruits from damage to the carotid vessels

As noted, survivors of manual strangulation (or throttling) may have no injuries or only minor injuries such as small curvilinear abrasions on the neck,¹⁰ which may not be noted in the busy environment of an emergency department or general practice.

Moreover, research has confirmed that often symptoms of strangulation are overlooked and there are no visible injuries. In a study of 300 cases 50% of survivors of strangulation had no visible markings to the neck and 25% only minor injuries.¹¹

Clinical assessment and management

A structured history should be followed by a comprehensive examination, with consideration given to:

- General observations: pulse, blood pressure, oximetry, respiratory rate, level of consciousness/Glasgow Coma Scale, (GCS)
- Cardio-vascular and respiratory system: including auscultation of carotid vessels for bruits
- Neurological: consciousness, as well as confusion or restlessness, (perhaps indicating hypoxic brain injury), assess for any motor and/or sensory impairment
- Detailed examination of the head, face, eyes, ears and neck (and the structures therein) for signs, as noted above, including, but not limited to, abrasions, bruises, including petechiae, laryngeal pain or abnormal crepitus, subcutaneous emphysema
- Other, as appropriate

After obtaining the history from and examining the patient, management will depend on numerous factors, including severity of symptoms and time since the incident, as well as local referral protocols. Clinical leads/directors of SARCs and police custody suites should establish effective referral pathways with their nearest emergency department ED and/or ear nose and throat (ENT) departments, as well as the local ambulance service.

Symptoms and signs for which urgent advice from, and/or referral to ED or ENT specialists must be considered, include:

Recent incident (within 36 hours)¹²:

- loss of consciousness, and/or concern of hypoxic brain injury
- incontinence (urine and/or faeces)
- unable to/significant pain on swallowing
- unable to breath/stridor/dyspnoea/cyanosis/decreased O₂ saturation
- unable to speak or significant difficulty in speaking
- significant visible bruising to skin and/or significant swelling; sub-cutaneous emphysema of the neck

ED and ENT specialists may consider other investigations, e.g. endoscopy (of the nasopharynx/larynx) and imaging (e.g. x-ray, CT scans, including angiography).

N.B. Where there is the possibility of current or evolving airway obstruction, the patient should be evaluated in an acute hospital setting. It is possible for oedema of the neck to develop after several hours, which may be life threatening; ED and ENT specialists may opt to keep patients under observation for some hours

A recent study described the management and outcomes 349 patients who presented to a US ED, after a 'near hanging' experience, (21, all of whom had 'advanced imaging', MRI or CT), or after 'manual strangulation' (328, 57% of whom had 'advanced imaging'). Amongst the inclusion criteria was a GCS of 13 or above. In this highly selected group, the findings were: 6 patients were found to have injuries on imaging (one in the 'near-hanging' group and five in the 'manual strangulation' group). Injuries were then classed as 'clinically significant', (or not), of which there were two, both cervical artery dissections, in the 'manual strangulation' group. The two patients were managed conservatively with aspirin, without any adverse (neurological) consequences.¹³

Less recent incident:

- Where a patient has ongoing symptoms or signs, the HCP should seek advice from ED/ENT and appropriate referrals made, as required.

Pregnancy

Whatever the time since the incident, as noted above, advice should be sought from obstetricians.



Forensic medical assessment

Forensic aspects may still be addressed, with appropriate discussion and liaison, even if the patient needs to be referred to hospital. What is done will depend on the history and the time elapsed since the incident, and any activities afterwards e.g. washing.

The assessment/examination should include:

- Careful documentation of positive and negative signs, using a written description and body diagrams/maps
- Consideration of forensic sampling of the neck for DNA, if appropriate
- Consideration of fibre samples, e.g. with low adhesive tape (if available), if a ligature was used
- A description of the ligature, if it is found, e.g. at the scene
- Consideration of fingernail swabs, if appropriate, as the assailant's skin may be caught beneath the fingernails
- If a nail is broken, consider cutting it, so it might be matched to the fragment, if found
- If nail extensions are missing, possibly dislodged during the assault, police should be advised in case they are found at the scene
- Consideration of photo-documentation of injuries. The head and neck should be photographed from the front, sides and back, to ensure a complete view. Photography may need to be repeated as injuries evolve. See [PICS Working Group Guidelines on photography](#)

Aftercare

- Discuss with the patient the signs and symptoms of airway obstruction and how they should seek medical help if concerned. There is a useful list in the RCPA document [Clinical Forensic Assessment and Management of Non-Fatal Strangulation](#).
- Communicate clearly to the police involved, as soon as possible, that NFS is part of the allegation. This may reflect an escalation of violence and so have an impact on bail and charging decisions.
- In police custody, escalate to the duty inspector, if seen in the context of restraint used in an arrest
- Consider adult safeguarding: where the alleged assailant is a partner or ex-partner make sure that a domestic violence risk assessment, (DASH) has been undertaken prior to the person leaving the SARC or police custody suite, along with a referral to a multi-agency risk assessment conference (MARAC)
- A child safeguarding referral may also be required, where the patient is a child and/or is the parent of a child who may be at risk

- Check where the patient is going, when they leave – is it a safe place? Discuss the possible risks, should they plan to return to the alleged assailant.

The law

The police are permitted to use 'reasonable force' in order to arrest someone. In England and Wales, the three main powers relating to the use of force are contained within common law, section 3 of Criminal Law Act, 1967 and section 117 of the Police and Criminal Evidence Act 1984 (PACE).¹⁴ The law on the use of force varies depending on the jurisdiction.

What is 'reasonable' depends on the circumstances; the HCP working in police custody must be alert to injuries which may have been caused during an arrest, perhaps due to restraint. The HCP must assess the detainee objectively, documenting and interpreting any injuries and raise concerns, if identified. (See [The Role of the Healthcare Professional](#))

In England and Wales, the law in relation to strangulation is the Offences against the Person Act 1861 (OPA), section 21 Attempting to choke, suffocate or strangle etc. with intent.

'Whosoever shall, by any means whatsoever, attempt to choke, suffocate, or strangle any other person, or shall by any means calculated to choke, suffocate, or strangle, attempt to render any other person insensible, unconscious, or incapable of resistance, with intent in any of such cases thereby to enable himself or any other person to commit, or with intent in any of such cases thereby to assist any other person in committing, any indictable offence, shall be guilty of an offence, and being convicted thereof shall be liable to imprisonment for life.'

However, other charges might be brought under the OPA; the section under which a charge is made depends on many factors and might include, section 47, Assault Occasioning Bodily Harm (ABH). The Crown Prosecution Service (CPS) states in its guidance ([Offences against the Person, incorporating the Charging Standard](#)): *'Whilst the level of charge will usually be indicated by the injuries sustained, ABH may be appropriate in the circumstances of the case including where aggravating features set out below are present: the circumstances in which the assault took place are more serious e.g. repeated threats or assaults on the same complainant or significant violence (e.g. by strangulation or repeated or prolonged ducking in a bath, particularly where it results in momentary unconsciousness.)'*

Therefore, it is important to ensure that the police are made aware of the significance of NFS, and such information is also included in any statement or report. Where NFS occurs in the context of an intimate relationship consideration should be given as to whether the section 76 of the [Serious Crime Act, 2015](#), coercive and controlling behaviour is relevant.



Useful links

[Strangulation Training Institute](#)

Symptoms and Signs:

Adult: [Signs and Symptoms of Strangulation](#)

Paediatric: [Signs and Symptoms of Strangulation](#)

Medical and Radiographic Evaluation:

[Recommendations for Medical Radiological Evaluation of Non Fatal Strangulation](#)

Discharge information:

[Strangulation and/or Suffocation Discharge Information](#)

RCPA: [Clinical Forensic Assessment and Management of Non-Fatal Strangulation](#)

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