Office Emergency Training

Diagnosis and Management of Loss of Consciousness
Disclaimer

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What is Syncope?

- Syncope is a transient, self-limiting (if treated appropriately) loss of consciousness, followed by spontaneous recovery.
- Can be secondary to several medical conditions.
- Syncope is most commonly associated with anxiety or fear of an event or an impending event.
- Most common in healthy male patients.
- Used synonymously with the term “fainting”.
Physiology of Syncope

- Most syncopal episodes are caused by vasopressor-like effect
- Nervousness initially causes a “fight or flight” response (blood is diverted to the muscles, heart and CNS)
- Upon relaxation, parasympathetic response pools blood in visceral tissues (reduces CNS blood flow)
- Result is slight or complete LOC (vasovaginal)
Signs and Symptoms of Syncope

- Sweating
- Lightheadedness, dizziness
- Difficulty standing
- Decreased blood pressure, decreased pulse
- Pale
- Feeling of warmth
Causes of Syncope

- Stress
- Hypoglycemia (low blood sugar)
- Hypoxia (decreased oxygen intake)
- Hypovolemia (decreased blood volume due to dehydration)
- CVA (stroke)
- Pregnancy
- Disruption in cerebral blood flow due to cardiac abnormalities
### When is a Patient Most Likely to Faint?

<table>
<thead>
<tr>
<th>Event</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Just prior to treatment</td>
<td>1.5%</td>
</tr>
<tr>
<td>During/following local anesthetic injection</td>
<td>54.9%</td>
</tr>
<tr>
<td>During dental treatment</td>
<td>22.9%</td>
</tr>
<tr>
<td>In office following treatment</td>
<td>15.2%</td>
</tr>
<tr>
<td>Later at home</td>
<td>5.5%</td>
</tr>
</tbody>
</table>
## Common Procedures Associated With Fainting in the Dental Office

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tooth extraction</td>
<td>38.9%</td>
</tr>
<tr>
<td>Pulpal extirpation</td>
<td>26.9%</td>
</tr>
<tr>
<td>Tooth preparation</td>
<td>7.3%</td>
</tr>
<tr>
<td>Tooth filling</td>
<td>2.3%</td>
</tr>
<tr>
<td>Incision</td>
<td>1.7%</td>
</tr>
<tr>
<td>Apicoectomy</td>
<td>0.7%</td>
</tr>
<tr>
<td>Removal of fillings</td>
<td>0.7%</td>
</tr>
</tbody>
</table>
Treatment of Syncope

- Check for responsiveness, if unresponsive, activate office emergency protocol
- Position the syncopal patient with the head lower than the legs (Trendelenburg Position) to promote the return of blood from the peripheral circulation to the core circulation
Treatment of Syncope

- Administer oxygen (loss of consciousness is secondary to deprivation of oxygen)
- 4 liters/minute will provide approx. 36% O₂ if given via nasal cannula or nasal hood
- Set oxygen flow between 10 – 15 L/min to keep reservoir bag full (will provide approx. 90% oxygen)
- Full face mask provides higher oxygen concentration
Treatment of Syncope

Ammonia Vaporole

- Activated by either cracking or crushing
- Releases a noxious odor
- Place under patient’s nose
- Stimulates the respiratory and vasomotor centers in the medulla
Treatment of Syncope

If patient is hypotensive but has normal heart rate:

- Position patient to optimize fluid return to core circulation (CNS and heart) Most patients respond to this simple maneuver
- If the patient responds slowly, establish intravenous access and administer a bolus of isotonic fluid (e.g. normal saline)
- Ephedrine can be considered (constricts peripheral blood vessels)
Treatment of Syncope

If patient is hypotensive and bradycardic:

• Administer atropine (reverses vagal effect on heart)
• Increase in heart rate will result in increase in blood pressure
Is it Syncope or Worse?

• Consider the timing of the events surrounding the loss of consciousness
• Did the patient manifest any of the presyncopal signs or symptoms?
• Did the patient demonstrate any classic manifestations associated with other problems? (chest pain)
• Is there anything in the patient’s medical history that suggests a different cause for the loss of consciousness? (diabetic/cardiovascular disease)
Post-Syncope Recovery

- Patient should have near full recovery within 20 minutes
- Patient might be more susceptible to hemodynamic changes. A second syncopal event is possible
- Weakness may persist for several hours following event
Post-Syncope Recovery

- Assess patient for injuries that may have resulted from the loss of consciousness (laceration, fracture)
- After 5-10 minutes of recovery, assist patient to standing
Treatment Considerations Post-Syncope

• Consider behavioral or anxiety relieving pharmacologic interventions for current or future treatment

• The patient may be more susceptible to fluctuations in blood pressure and heart rate during the procedure

• This is a relative consideration, but not an absolute indication for discontinuing the procedure
Discharge Considerations

• Presyncopal
  ▪ Observe for an interval of time
  ▪ Can be discharged if assessed to be fully recovered without residual deficit

• Syncopal
  ▪ Similar to a sedated patient
  ▪ Needs to be escorted home
Minimizing the Risks of Syncope

- Approx. 15% of Americans are reported being terrified of going to the dentist
- Approx. 50% of Americans report some degree of dental anxiety
- Manage the patient’s anxiety
  - Behavioral or pharmacologic
  - Consider pre-medicating the patient prior to coming to the office
  - Sedative / anxiolytic administered perioperatively
Other Causes of Syncope

- Hypoglycemia
- Orthostatic hypotension
- Cerebral vascular accident
- Epilepsy – seizure
- Pregnancy
Hypoglycemia

• Glucose and oxygen are the primary nutrients for the brain
• Most common cause of hypoglycemia is self medication of insulin by the diabetic patient who fails to consume an appropriate glucose source
• Check blood glucose prior to treatment
• Know when the patient has taken their insulin and verification of food intake

Prevention is key!
Signs and Symptoms of Hypoglycemia

**Early/mild**
- Slight changes in mentation
- Nausea
- Hunger
- Shakiness

**Intermediary**
- Diaphoretic
- Cold skin w/ piloerection
- Tremor
- Tachycardia
- ↑ Behavioral changes

**Late/severe**
- Unconsciousness
- Seizures
- Hypotension
- Myocardial ischemia
Treatment of Hypoglycemia

- Stop procedure
- ABC, vitals, supine position, consider activating EMS
- Check blood sugar if possible
- Administer oral glucose (glucose paste sublingual or buccal mucosa)
- Juice if patient is compliant and conscious
- If LOC, administer oxygen, activate EMS
Orthostatic Hypotension

- Sudden decrease in blood pressure associated with changing one’s posture from a supine position to a sitting or standing position or a sitting position to a standing position
- Can be caused by antihypertensive medication or diseases that affect the autonomic nervous system (diabetes mellitus, multiple sclerosis)
Seizure

- Uncontrollable, rapid and redundant movement of arms, legs, or entire body
- Loss of consciousness
- Jaw clenching
Signs and Symptoms of Seizure

- Progressive lightheadedness, dimming vision, sense that something is wrong
- Sensation of fear, smell, or memory (deja-vu)
- Gradual or sudden LOC, loss of muscle tone or sporadic jerking
Treatment of Seizure

- Stop procedure
- Maintain ABC
- Place patient in supine position, remove harmful objects from area, do not restrain patient
- If seizure persists for 10 minutes or multiple seizures occur without recovery, call EMS
- Patient may or may not remember event
Pregnancy

- Syncope most common in third trimester
- When pregnant patient is in supine position, the pressure from the uterus compresses the inferior vena cava
- Causes a decrease in the return of blood from the lower extremities back to the core circulation
What is Hyperventilation?

- Rapid breathing with larger breaths beyond what is required to provide the necessary oxygen and removal of carbon dioxide, usually secondary to stress.

- Hyperventilation is different from hyperpnea which is an increase in respiratory rate and depth greater than normal, which is secondary to a metabolic abnormality.
Hyperventilation Syndrome

- Stress induced
- 9% of all emergencies in the dental office
- Rapid breathing –
  - ↑ minute ventilation
    - ↑ respiratory rate
    - ↑ tidal volume
  - above requirements of normal metabolism
- Causes release of catecholamines
Signs and Symptoms of Hyperventilation

- Lightheadedness, dizziness, tinnitus, paresthesias (tingling) in the face or extremities, (e.g. fingers) nausea, chest discomfort and palpitation
- Tachycardia, trembling, sweating, and tetany (including carpopedal spasm)
Treatment of Hyperventilation Syndrome

- Anxiety intervention
- Forced nasal breathing
- Directed ventilation
- Rebreathing (cupped hands, paper bag)
Prevention of Hyperventilation Syndrome

- Recognize an individual’s anxiety or ascertain from the medical history
- A behavioral or pharmacologic plan needs to be developed to minimize anxiety for future dental treatment
Risk Management Tips

• Train your staff to recognize and properly manage medical emergencies, proper training can help minimize adverse outcomes
• Review medical history and identify potential issues
• Maintain all emergency equipment and run emergency drills regularly with your staff
• Develop the ability to recognize the anxious patient and take pre-emptive action to minimize the situation from developing in the first place
• Prevention of emergencies is key!
Review/Discussion Questions

• What are the signs/symptoms of syncope?
• What are some of the causes of syncope?
• How is syncope managed?
• What are the signs/symptoms of hyperventilation?
• How is hyperventilation managed?
References

Michael Stronczek DDS,MS - Fort Wayne, IN
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www.pbhs.com - PBHS Emergency Guidebook