

**TRAINING MODULE FOR NAUSEA AND VOMITING  
STANDING ORDER**

**SAEMS**  
**NAUSEA AND VOMITING STANDING ORDER**  
**Self-Learning Module**

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# TRAINING MODULE FOR NAUSEA AND VOMITING STANDING ORDER

**DATE: November 2008**

## **PURPOSE**

This Training Module has been developed to serve as a template for EMS provider training. The intent is to provide consistent and concise information to all providers practicing in the SAEMS Region and under a Base Hospital. One hour of SAEMS continuing education credit may be issued following successful completion of the module by your base hospital manager/coordinator.

**OBJECTIVES:** Upon completion of this learning module the participant will be able to:

1. List three benefits of the Nausea and Vomiting Standing Order
2. Outline inclusion and exclusion criteria for this Standing Order
3. List possible causes of vomiting in the pediatric population
4. List four serious conditions causing nausea and vomiting

## **INSTRUCTIONS:**

1. Read the accompanying information, standing order and any additional reference material as necessary.
2. Complete the attached post test and return to your base hospital manager/coordinator.
3. A SAEMS CE Form will be issued to providers scoring greater than \_\_\_% on the pretest.
4. Please contact your base hospital manager/coordinator for questions, suggestions or concerns.

# **TRAINING MODULE FOR NAUSEA AND VOMITING STANDING ORDER**

The EMS system is evolving from entities that only existed to initiate emergency treatment of obviously life-threatening traumatic and non-traumatic conditions to those which can perform triage, identify risk factors for signs and symptoms of potentially serious medical conditions, and begin the first stages of emergency department treatment. As the EMS system matures, so does the realization that the first contact gives the opportunity for EMT-P to positively affect the outcome of patient care.

Treatment for symptoms like nausea and vomiting would not have been considered the role of a paramedic even 15 years ago. EMT-P frequently began and ended with an apology for not being able to offer any treatment for the patient retching in the back of the ambulance. Today it is not only possible, but quite simple to provide prompt symptomatic relief to patients who have nausea and/or vomiting prior to their arrival in the ED.

It is imperative that the EMT-P recognizes that not all vomiting is viral-related; there are often potentially serious medical conditions that generate these symptoms, especially in the geriatric population. It is responsibility of the EMT-P who treat these patients to evaluate the patients signs and symptoms along with the medical history. You may encounter Ondansetron or other equivalents in the home of patients.

## **Ondansetron (Zofran):**

Ondansetron is a 5-HT<sub>3</sub> antagonist which is a very effective anti-nausea and anti-emetic medication with minimal reported significant side effects. Nausea and vomiting are strongly associated with a specific type of serotonin receptor in the brain (and possibly in other sites as well) called 5-HT<sub>3</sub>. Ondansetron was very expensive; however, now that it has gone off patent, generic versions are available. Side effects of Ondansetron have generally been infrequent and mild, including diarrhea, headache, fatigue and constipation. The only absolute contraindication to its use is hypersensitivity.

## **Morphine Induced Nausea and Vomiting:**

Nausea and vomiting are undesirable side effects associated with the use of Morphine Sulfate. Nausea or vomiting is apparent in up to 50% of patients taking opioids for relief of chronic pain conditions.

The incidence of nausea and vomiting varies little with the opioid analgesic used, although some opioids have been reported to induce slightly less nausea and vomiting than others. This may be related to functional differences in the various opioid receptors.

The time course of nausea and vomiting varies with the opioid used, presumably reflecting the pharmacokinetic profiles. The route of administration also plays a part. Intravenous morphine has a lower emetic potential than the same drug administered by the intramuscular route.

# TRAINING MODULE FOR NAUSEA AND VOMITING STANDING ORDER

## NAUSEA OR VOMITING STANDING

Initiate immediate supportive care

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Use standing order on ALL patients with these symptoms  
1. Nausea or Vomiting

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Standing order should not be used on patients with these symptoms  
1. Head Trauma  
2. Meets level one trauma triage criteria  
3. Where ACLS interventions should take precedence  
4. Pregnancy 14 weeks or less  
5. FSBG < 60

Patient has mixed symptoms  
or  
patient wishes to refuse

Contact medical direction  
**IMMEDIATELY**

Patient meets criteria for standing  
orders, prepare for transport

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Establish IV NS: If evidence of dehydration or hypo-perfusion, maintain adequate peripheral perfusion

- a. 20cc/kg bolus\*
- b. Reassess patient after each bolus

**ADMINISTER ONDANSETRON HCL**

1. Adult: Ondansetron 4 mg IV over 2-5 minutes, may repeat once after 15 minutes if no response
2. Pediatric: Ondansetron 0.1 mg/kg up to 4 mg PO (can mix/kg up to 4 mg IV over 2-5 minutes).

**NOTE:**

Ondansetron in general is ineffective for motion sickness.

**\*Caution:** avoid volume overload in geriatric patients

Effective 10/2008

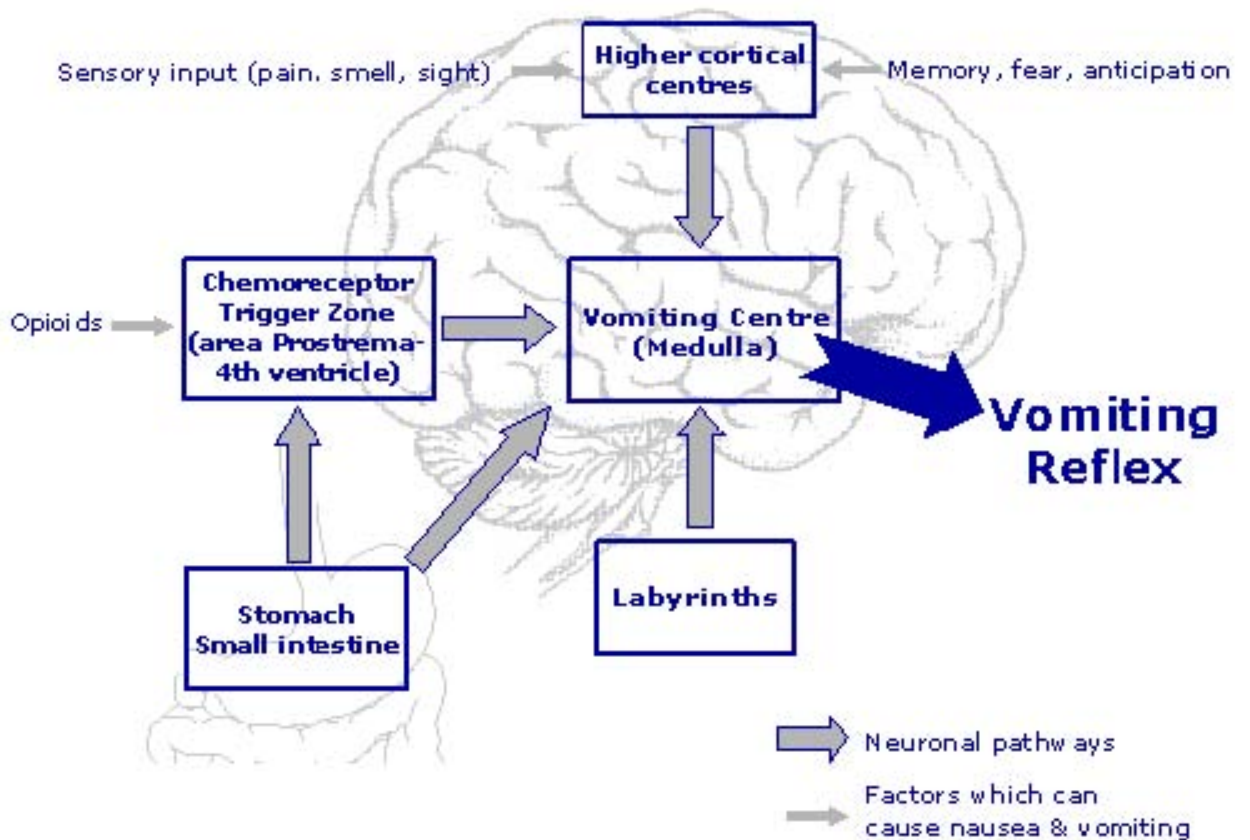
# TRAINING MODULE FOR NAUSEA AND VOMITING STANDING ORDER

## Causes of Morphine Induced Nausea and Vomiting:

Morphine is thought to induce nausea and vomiting by a direct action on the chemoreceptor trigger zone (CTZ), an area of the hind brain, which is outside the blood-brain barrier. This is supported by evidence showing that ablation of the CTZ prevents the induction of vomiting by opioids. The mechanism of action of opioids in emesis is, however, complicated. Biphasic dose-response curves have been reported and in certain circumstances, opioids can have anti-emetic actions.

The three known types of opioid receptor (kappa -  $\kappa$ , delta -  $\delta$  and mu -  $\mu$ ) are all thought to play a role in opioid-induced nausea and vomiting.

The factors involved with opioid-induced nausea and vomiting.



## Other Causes of Nausea and Vomiting:

Nausea and vomiting can be very distressing for patients when they are already feeling uncomfortable and anxious.

# TRAINING MODULE FOR NAUSEA AND VOMITING

## STANDING ORDER

Nausea and vomiting are not diseases, but rather are symptoms of many different conditions, such as infection ("stomach flu"), food poisoning, motion sickness, overeating, blocked intestine, illness, concussion or brain injury, appendicitis, and migraines. Nausea and vomiting can sometimes be symptoms of more serious diseases such as heart attacks, kidney or liver disorders, central nervous system disorders, brain tumors, and some forms of cancer.

Nausea and vomiting can occur in both children and adults.

Nausea and vomiting can be triggered by many factors, including:

1. **Gastroenteritis.** This inflammation of the lining of the stomach and intestines is typically caused by a viral infection or bacteria from contaminated food or water. In addition to nausea and vomiting, there may be watery diarrhea and abdominal cramps.
2. **Headache or inner ear disturbance.** An intense headache, such as a migraine, can cause nausea and vomiting. As can an inner ear disturbance, such as motion sickness. A rare cause of headache and nausea with vomiting is a brain tumor.
3. **Medical treatment.** Vomiting is often associated with anti-cancer drugs and radiation therapy.
4. **Toxins.** High levels of toxins in the blood – including alcohol, nicotine and drugs such as antibiotics – can cause nausea and vomiting.
5. **Hormones.** The hormonal changes of early pregnancy can induce nausea and lead to vomiting, as can the surges in hormones that often occur in periods of intense stress. Problems with the thyroid gland – producing either too much thyroid hormone or not enough – also can result in nausea.
6. **Diabetes.** Diabetes also can cause nausea, especially if it's poorly controlled.
7. **Peptic ulcers.** Peptic ulcers are open sores that develop on the lining of the stomach, upper small intestine or esophagus. The classic symptom is burning pain anywhere from the navel to the breastbone. Many peptic ulcers are caused by the bacterium *Helicobacter pylori* (*H. pylori*).
8. **Gastroesophageal reflux disease (GERD).** Stomach acid in the lower esophagus also can trigger nausea and regurgitation of food. It can also be associated with vomiting.
9. **Gallstones.** Gallstones are solid deposits of cholesterol or calcium salts that form in the gallbladder or nearby bile ducts.
10. **Pancreatitis.** In this condition, digestive enzymes attack the pancreas rather than break down food in the small intestine. Pancreatitis causes mild to severe abdominal pain, often accompanied by nausea, vomiting and fever.
11. **Liver disease.** Inflammation of the liver (hepatitis), which may be related to a virus or medication, can cause nausea, vomiting and fever.
12. **Kidney failure.** If the kidneys fail, the body loses the ability to filter toxins, and this can lead to nausea and vomiting.

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## **Examples of Serious Conditions Causing Nausea and Vomiting:**

1. Concussion or brain injury
2. Brain infections (encephalitis or meningitis)
3. Intestinal blockage
4. Appendicitis

## **Possible Causes of Vomiting in Infants (0-6 months):**

1. Congenital pyloric stenosis, a constriction in the outlet from the stomach (the infant vomits forcefully after each feeding but otherwise appears to be healthy).
2. Food allergies or milk intolerance
3. Gastroenteritis (infection of the digestive tract that usually causes vomiting with diarrhea)
4. Gastroesophageal reflux
5. An inborn error of metabolism
6. Hole in the bottle nipple may be wrong size, leading to overfeeding
7. Infection, often accompanied by fever or runny nose
8. Intestinal obstruction, evidenced by recurring attacks of vomiting and crying or screaming as if in great pain
9. Accidentally ingesting a drug or poison

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GD-093-PHS-EMS: Drug Profile for Ondansetron

**Generic Name:** Ondansetron

**Class:** Antiemetic agent

## **Mechanism of Action:**

Selectively blocks serotonin 5-HT<sub>3</sub> receptors located in the CNS at the chemoreceptor trigger zone and in the peripheral nervous system on nerve-terminals of the vagus nerve

## **Indications for use:**

Nausea and vomiting

## **Contraindications:**

Hypersensitivity

Use with caution in patients with hepatic impairment

## **Adverse Reactions:**

CNS: Headache, malaise, fatigue, dizziness, fever, sedation, extrapyramidal syndrome

Cardiovascular: Chest pain, arrhythmias

Respiratory: Hypoxia

GI & Hepatic: Diarrhea, constipation, abdominal pain, xerostomia, decreased appetite

Skin: Rash

## **Notes on Administration**

## **Incompatibilities/Drug Interactions:**

Inducers or inhibitors of P450 drug metabolizing enzymes may alter the clearance of Ondansetron. No dosage adjustment is recommended.

## **Adult Dosage:**

4 – 8 mg IV slow push over 2 – 5 minutes

8 mg PO ODT or tablet

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## **Pediatric Dosage:** (1 month to 12 years old)

Greater than 40 kg- 4 mg IV slow push over 2 – 5 minutes

Less than 40 kg- 0.1 mg/kg IV slow push over 2 – 5 minutes

4-12 years old 4 mg PO ODT or ODT

## **Route of Administration:**

IV, IM, PO

## **Onset of Action:**

Unknown but probably 10 to 30 minutes

## **Peak effects:**

Unknown

## **Duration of Action:**

Half life is approximately 4 hours. Exact duration unknown but appears to be prolonged compared to half-life

## **Dosage Forms/Packaging:**

4 mg/2 mL vial

4 or 8 mg ODT or tablet

## **Arizona Drug Box Standard Minimum Supply:**

Optional- 4 mg

## **Special Notes:**

**Instructions for Use/Handling ZOFTRAN ODT Orally Disintegrating Tablets:** Do not attempt to push ZOFTRAN ODT Tablets through the foil backing. With dry hands, PEEL BACK the foil backing of 1 blister and GENTLY remove the tablet. IMMEDIATELY place the ZOFTRAN ODT Tablet on top of the tongue where it will dissolve in seconds, then swallow with saliva. Administration with liquid is not necessary.

**Bottles:** Store between 2° and 30°C (36° and 86°F). Protect from light. Dispense in tight, light-resistant container as defined in the USP.

**Unit Dose Packs:** Store between 2° and 30°C (36° and 86°F). Protect from light. Store blisters in cartons.

**TRAINING MODULE FOR NAUSEA AND VOMITING  
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NAUSEA AND VOMITING  
TEST**

**NAME:** \_\_\_\_\_ **UNIT:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

1. You are at the home of an older patient who has a complaint of abdominal pain and who appears to be dehydrated and very dirty. He states this has been ongoing for 5 days and he has not been eating or drinking fluids. He has a history of diabetes, heart failure and lung disease. You may implement the nausea and vomiting standing order on this patient.
  - a. True
  - b. False
  
2. A 17-year old boy has ingested a large amount of alcohol and barbiturates, and has vomited once per his friend. He tells you he is feeling like he is going to “throw up”. You may implement the nausea and vomiting standing order.
  - a. True
  - b. False
  
3. Which of the following patients may be given Ondansetron for nausea?
  - a. A pregnant 14-year-old who states she doesn’t know her due date or how many weeks along she is
  - b. A 70-year-old woman who fell and hit her head last night getting out of bed
  - c. A patient complaining of gastroenteritis, nausea and diarrhea since yesterday
  - d. A patient with chest pain and a heart rate of 150 palpable
  
4. You are called for a single car roll over MVA with 5 patients reported on scene. The driver is an anxious 75 year-old man complaining of mild abdominal discomfort with nausea. He has stable vital signs and you package him for transport. You may implement the nausea and vomiting standing order on this patient.
  - a. True
  - b. False

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5. You respond to a 30-year-old patient that is suffering from dehydration after experiencing episodes of nausea and vomiting for 3 days. He states he has lost 6 lbs and now he is 150 on his scale this morning. Despite a normal pulse rate, this patient is severely hypovolemic. He denies and medical history or allergies. Circle all that apply:
  - a. You package patient for transport to the nearest hospital
  - b. Start an IV of NS and start a bolus of 1360 cc of NS
  - c. Give Ondansetron 4mg IV over 1 minute
  - d. Call for medical direction because of the hypovolemic state
  
6. Ondansetron works on which receptors:
  - a. Dopamine
  - b. Histamine
  - c. Serotonin
  - d. Opiate
  
7. What could cause vomiting in a child 3-months-old? Circle all that apply:
  - a. Accidentally ingesting a drug or poison
  - b. Intestinal obstruction
  - c. Food allergies
  - d. Gallstones
  
8. Digestive enzymes attack the pancreas when you have a peptic ulcer.
  - a. True
  - b. False
  
9. You should use caution when giving Ondansetron to patients in liver failure.
  - a. True
  - b. False
  
10. CNS adverse effect(s) of Ondansetron can include which of the following? Circle all that apply:
  - a. Headache
  - b. Extrapyrimal symptoms
  - c. Seizures
  - d. All of the above

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11. You respond to a 16-year-old patient who is having an anaphylactic event due to a bee sting. You are following the allergic reaction standing order and administer epinephrine (through an auto injector) into the left thigh. The patient now is complaining of nausea. You may implement the nausea and vomiting standing order.
  - a. True
  - b. False
  
12. You respond to a 911 call for 40-year-old female by her co-workers. When you arrive the patient tells you she is a diabetic and felt like she was becoming hypoglycemic. She has not eaten, but did take her morning insulin. She was given some crackers by her co-workers and vomited right after eating them. She continues to be nauseated. You start your assessment and note that her blood glucose level is 42. You implement the Hypoglycemia Standing Order and want to give Ondansetron. You:
  - a. Call for medical direction for orders to give Ondansetron
  - b. Give the patient oral glucose, start an IV with NS and give Ondansetron per standing order
  - c. Instruct the patient to call her doctor for an appointment
  - d. Package the patient for transport to the hospital of her choice
  
13. Nausea and vomiting are diseases and patients should be told to see their primary physician as soon as they can for a diagnosis.
  - a. True
  - b. False
  
14. Nausea and vomiting can sometimes be caused by more serious diseases such as heart attacks, kidney or liver disorders and pancreatitis.
  - a. True
  - b. False
  
15. Morphine is thought to induce nausea vomiting by a direct action:
  - a. Blocking dopamine-2 receptors in the brain
  - b. Acting as an anti-psychotic medication
  - c. On a chemoreceptor trigger zone
  - d. Blocking dopamine receptors in the brain

# TRAINING MODULE FOR NAUSEA AND VOMITING STANDING ORDER

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