

Sudden Onset Symptoms

Hello again Clinical Problem Solvers! This is Gurbani Kaur, a second-year medical student. If sudden onset symptoms have you singing S.O.S. please someone help me, it's not healthy for my patient to be feeling this way, then I am so excited to share this schema with you.

The tempo of sudden onset symptoms is usually hyperacute, on the scale of seconds to minutes, or acute, on the scale of hours to days. Patients can identify the precise moment their symptoms began.

Before you reach for a delicious schema, it is essential to note that often sudden refers to the rapid or startling recognition of a previously subclinical problem. To clarify, let's make a line graph charting symptom severity versus time. We'll add a horizontal line to represent the symptom threshold. A symptom that is less severe than this threshold is not severe enough to present definitely or readily observably; this symptom is therefore subclinical. Once the symptom severity crosses that threshold, patient concern elevates prompting medical attention.

For example, syncope from aortic stenosis often occurs upon exertion when systemic vasodilation in the context of fixed forward stroke volume results in a decline in arterial systolic blood pressure and consequently transient decreased cerebral perfusion. Herein, exertion led to the **sudden recognition** of aortic stenosis through a syncopal episode.

This is in contrast to a true **sudden onset symptom** that will rapidly progress in severity and quickly cross the symptom threshold. For example, patients suffering from a stroke can experience sudden onset of speech difficulties, vision loss, loss of balance, weakness, and or numbness.

With this distinction in mind, let's reach for our schema to help us recognize the underlying etiology with a diagnostic tempo that mirrors that of the onset of our patients' symptoms as we are mostly dealing with emergent medical conditions. We can organize common etiologies of sudden onset symptoms into 4 buckets using the OREO mnemonic, because who doesn't get sudden onset cravings for milk's favorite cookie? To breakdown this cookie on our minds: O is for Obstruction, R is for Rupture, E is for Electrical, and the last O is for Other.

First, let's start nibbling on the first O for Obstruction. An Obstruction can be further subdivided into vascular and other.

For a vascular obstruction, consider acute coronary syndrome or ACS, referring to a range of conditions associated with the sudden reduction of blood flow to the heart. Examples of ACS include STEMI or NSTEMI, both of which can present with sudden symptoms of sub-sternal chest pain or pressure that radiates to the jaw, back, arms, associated with nausea, vomiting,

diaphoresis, and, or shortness of breath. Another vascular obstruction is stroke resulting from rapid onset obstruction of blood flow to the brain impairing cerebral perfusion. The sudden symptoms can help us localize specific vasculature obstructed with some application of neuroanatomy. Remember some common symptoms we mentioned earlier in strokes include speech difficulties, vision loss, loss of balance, weakness, and or numbness.

For non-vascular obstruction etiologies, consider bowel obstruction in a patient with prior abdominal surgery presenting with abdominal pain, vomiting, the inability to pass gas or bowel movements, and abdominal distention. Don't forget that internal hernias are serious causes of bowel obstruction even in the absence of the traditional risk factor of prior abdominal surgery, thus adhesions.

Finally, keep an eye out for acute angle-closure glaucoma, an ophthalmologic emergency wherein drainage of aqueous humor from the eye is blocked due to obstruction of the canal. The buildup of this fluid results in a rapid increase in intraocular pressure, therefore severe eye pain, red eye, reduced or blurred vision, and often vomiting. If not immediately treated, acute angle-closure glaucoma can result in permanent vision loss. Remember to treat with IV mannitol, acetazolamide, topical timolol, apraclonidine, and pilocarpine.

Next, let's take a bite into the R for Rupture. Rupture can also be further sub-divided into vascular rupture and other rupture. For vascular bucket, we have arterial dissections; these occur when there is a tear or damage to the inner wall or lining of an artery separating its layers and potentially leading to intramural hematoma. This decreases the strength of the artery, progressing to a life-threatening rupture or leak, and most often occurs in the aorta, carotid artery, and vertebral artery. Dissection can be spontaneous or secondary to trauma. Carotid dissection can lead to the sudden onset of eyelid dropping, ptosis, miosis, small pupil, loss of sweating, and anhidrosis, the famous triad of Horner's syndrome as well as other stroke syndromes.

Another topic in the vascular bucket is the rupture of an aneurysm. This occurs with the distention of a weakened arterial wall in the bridging vessels of the circle of Willis can result in a subarachnoid hemorrhage and with the sudden onset of a headache, otherwise known as a thunderclap headache, possibly followed by loss of consciousness and death. Ruptured abdominal aortic aneurysms similarly lead to life-threatening internal bleeding in the abdomen. Symptoms are usually notable for the sudden onset of sharp and severe, persistent abdominal or back pain with a tearing sensation.

For other sudden onset rupture etiologies, let's first focus on GI perforations. Bowel perforation exposes structures within the peritoneal cavity to gastrointestinal contents and is usually secondary to underlying inflammation, infection, obstruction, trauma, or subsequent to an invasive procedure. This results in injury to the mucosa of the bowel or gastric wall due to a violation of the closed system. Patients with a bowel or gastric perforation can present with

abdominal pain, distension, and abdominal wall rigidity. This is an emergency due to the risk of developing infections such as peritonitis and even mortality from post-repair complications, including adhesions and fistulas.

Another etiology of rupture to be mindful of are orthopedic injuries like bone fractures. These should be high on your radar when a patient presents with the sudden onset of pain following an accident or trauma. Usually, patients will have an obviously visible deformity of a limb or joint, but they can also show up with the presence of pain along with swelling, bruising/ecchymosis, hematomas, numbness or tingling, and the limited range of motion of a joint due to pain or swelling. Remember to x-ray above and below the injured joint and that when ordering x-rays, 2-views are considered NO views! Help your radiologists and try to get 3-views when possible.

Next, we'll chew on E for Electrical. First, arrhythmias occur when electrical impulses that coordinate contraction of the atria and ventricles occur in abnormal patterns leading to tachycardia, bradycardia, or irregular rhythms. Symptoms of arrhythmias can include sudden self-limited episodes of palpitations like supraventricular tachycardia, syncope from a non-perfusing rhythm like vfib or vtach, and chest pain or shortness of breath from almost any tachyarrhythmia like SVT or Afib with RVR.

Moving along, seizures refer to paroxysmal derangement of cerebral function due to uncontrolled, excessive discharges from an aggregate of neurons. Herein, patients may report no warning, or a sense of déjà vu, gastric rising, or mind racing followed by the sudden loss of consciousness, confusion, or witnessed staring off into space. The loss of consciousness is often associated with uncontrollable spastic movements of the extremities and could be accompanied by a lateral tongue laceration from biting or urinary or fecal incontinence.

Finally, let's sink our teeth into the last O for Other. Gram-Negative Rod Bacteremia has a significantly higher incidence than Gram-Positive Bacteremia to develop septic shock. Studies have shown them to be associated with higher levels of c-reactive protein and IL-6 levels. Patients with Gram-Negative Rod Bacteremia tend to present with abrupt onset fever and rigors, tachycardia, and hypotension. However, a portion of these patients may be hypothermic. The bacteremia often originates from the GI and GU tract flora, and other symptoms related to the affected organ system including those related to pyelonephritis and colitis, but sometimes patients can be relatively asymptomatic.

Similarly, a Jarisch-Herxheimer reaction manifests within hours of the first dose of antibiotics to a gram-negative bacteria, spirochete, louse, or tick-borne infection. It usually manifests with abrupt onset of fevers, rigors, hypotension, headache, flushing, and the intensification of skin rashes. These symptoms are likely caused by a non-endotoxin pyrogen and from spirochetal lipoproteins. This reaction was traditionally associated following the treatment of syphilis with penicillin, but we now know it can occur following the treatment from other infections like

Lyme disease, leptospirosis, and relapsing fever. We also know this can happen not only with penicillin but also from other antibiotics like tetracyclines and even Cephalosporins.

Anaphylaxis is a severe, life-threatening allergic reaction that occurs within seconds to minutes of exposure to an allergen resulting in distributive shock. It can feature bronchoconstriction and swelling of the tongue obstructing the airway. Thus, patients present with rapid, weak pulse, hives, flushed, pale skin, nausea, vomiting, dizziness, fainting, wheezing. Evidence of multi-organ system involvement like vomiting and hives is sufficient to justify epinephrine administration: 0.3-0.5 mg of 1:1000 in the anterolateral thigh.

Finally, opiate overdoses can be recognized by characteristic shallow breathing, confusion, decreased alertness, loss of consciousness, and pinpoint pupils. Don't forget to administer Narcan to these patients emergently. Start at 0.4mg, though you may need higher doses in patients suffering from fentanyl or carfentanyl overdoses.

In summary, first determine if your patient has a true sudden onset of symptoms or a sudden recognition of symptoms. Then reach for your emergency OREO stash, I mean schema. Sudden onset obstruction etiologies can be from vascular etiologies like acute coronary syndrome or stroke, with non-vascular etiologies such as bowel obstruction or acute angle-closure glaucoma. Acute ruptures include those of vascular origin, which include arterial dissections or aneurysmal ruptures or non-vascular causes like a bowel perforation or bone fractures. Abrupt electrical pathologies include arrhythmias and seizures. Finally, other causes of sudden onset symptoms include Gram-negative Rod bacteremia, Jarisch Herxheimer, anaphylaxis, and toxins like an opiate overdose.

Well, that's a wrap! We hope you can see that OREOs are not just milk's favorite cookie but also your favorite schema to reach for when working with a patient with sudden onset symptoms. Thanks for listening; it's been a real treat to share this schema with you 😊!!