CRITERIA BASED DISPATCH (CBD)

Key Concepts of CBD — Critical/Non-Critical

Criteria Based Dispatch (also referred to as CBD) is centered on two dimensions that characterize all pre-hospital emergency response. These include:

- The level of care
- The urgency of care

Using CBD allows you to expand or contract the levels of care in your pre-hospital response plans. You can use ALS, BLS Red, BLS Yellow, Nurse-line, Community Medical Technicians, or any combination of these resources.

There are two types of medical emergencies:

- The first type is **Critical** – In this case rapid medical intervention is crucial to the patient outcome.
- The second type is **Noncritical** – This means that rapid medical intervention will likely not affect the patient outcome.

The Criteria Based Dispatch program operates under the following assumptions:

- The severity of illness or injury should determine the level of response.
- Telecommunicators are professionals with critical thinking skills, capable of eliciting information from callers and making decisions based on that information.
- Telecommunicators should have flexibility in how information is obtained, because emergency calls vary greatly.
- Information comes to 9-1-1 in many ways. Upset and frantic callers may not easily adhere to a structured set of questions, and when those questions are based on the need for a "yes" or "no" response, it can be impossible to move forward efficiently.

CBD differs from question-based emergency medical dispatch programs. It uses medical criteria to determine the level of response, and allows the telecommunicator to obtain that information in any way. In other words, there will be calls to 9-1-1 that do not require many, or any questions, in order to determine the response level and provide appropriate pre-arrival instructions. **You don't need to ask many questions, just the right ones.**

Key Concepts of CBD — Guidelines vs. Protocols

Protocols define specific treatment, questions or actions.

Guidelines give direction and assist in decision-making without limiting the course of action.

What's the difference?

Protocols generally define very specific questions or an algorithm to be used during the patient interview and triage. Guidelines, however, provide direction and assist the user in the decision-making process without restrictively structuring the course of action or limiting the ability to quickly gather critical information and take appropriate action.

In CBD, guidelines are used to define appropriate levels of care in order to assist telecommunicators in determining whether to send ALS or BLS units.

The foundation of the CBD program reinforces the use of these guidelines with a focus on the critical systems and the need to quickly identify patients that are unstable or "SICK".

Key Concepts of CBD — Key Concepts

There are five key concepts or pieces that represent parts of the pie that make up the Criteria Based Dispatch EMD program. They include the following:

1. Time is critical.
2. Quickly identify unstable patients.
3. Use the All-Caller Interview to identify sudden cardiac arrest.
4. Send responders immediately.
5. Provide effective pre-arrival instructions.

SICK/NOT SICK for the EMD — SICK

A SICK patient is one who appears **physiologically unstable** as indicated by key clinical signs. This patient has what you think may be a life-threatening condition and needs immediate BLS care and advanced life support *(ALS)*. The SICK patient can die quickly unless there is aggressive treatment and rapid transport.

The key clinical indicators are:

- Respirations
- Level of Consciousness
- Body Position

Sick/Not Sick for the EMD — Not Sick

- A NOT SICK patient is someone who appears physiologically stable as indicated by adequate respirations, pulse, mental status, skin signs and appropriate body position. He or she may be ill or injured, but the condition is not life threatening at the moment.
- The key clinical indicators are:
- • Respirations
  • Level of Consciousness
  • Body Position
- "NOT SICK" does not mean there is nothing wrong with the patient.

Three Critical Body Systems — The Nervous System

In the pre-hospital triage environment, there are three body systems used to determine whether a patient is SICK or NOT SICK. They include:

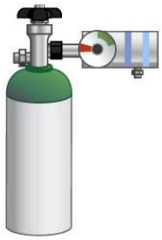
- The Nervous System
- The Respiratory System
- The Circulatory System

There are four basic things that the brain needs to keep a person conscious and alert: sugar, oxygen, intact neural pathways and an intact reticular activating system *(RAS)*. Anything that disturbs or disrupts these can cause a decreased level of consciousness.

Sugar *(in the form of glucose)* is the fuel on which the brain runs.

Oxygen is needed by brain cells to carry out metabolism. The brain uses 25% of the body's oxygen and 20% of its sugar. This is because there are billions of brain cells and they are very active and require a constant supply of energy.

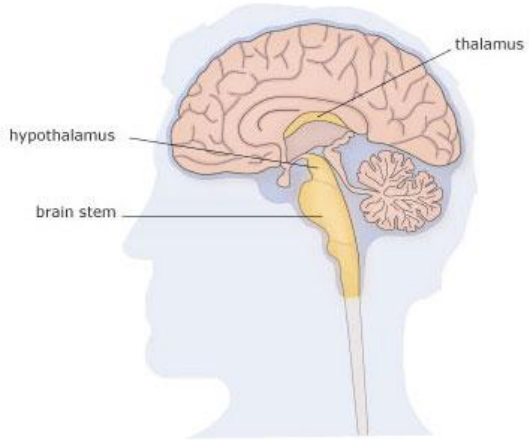
Sugar



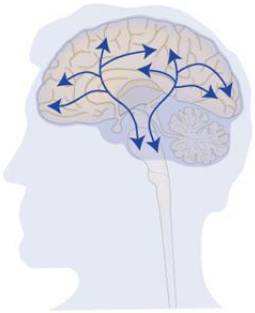
Oxygen

The brain is one of the first organs to shut down when either of these two elements is in short supply. A sudden lack of blood flow to the brain or lack of oxygen will shut the brain down in 5 to 10 seconds.

Neural pathways are groups of nerves that run through the brain. They carry signals from the brainstem to various destinations in the brain. These pathways can be disrupted by trauma, tumors, chemical *(drugs)* or electrical interference *(that which cause seizures)*. When someone has a seizure, the neural pathways through the brain are disrupted.

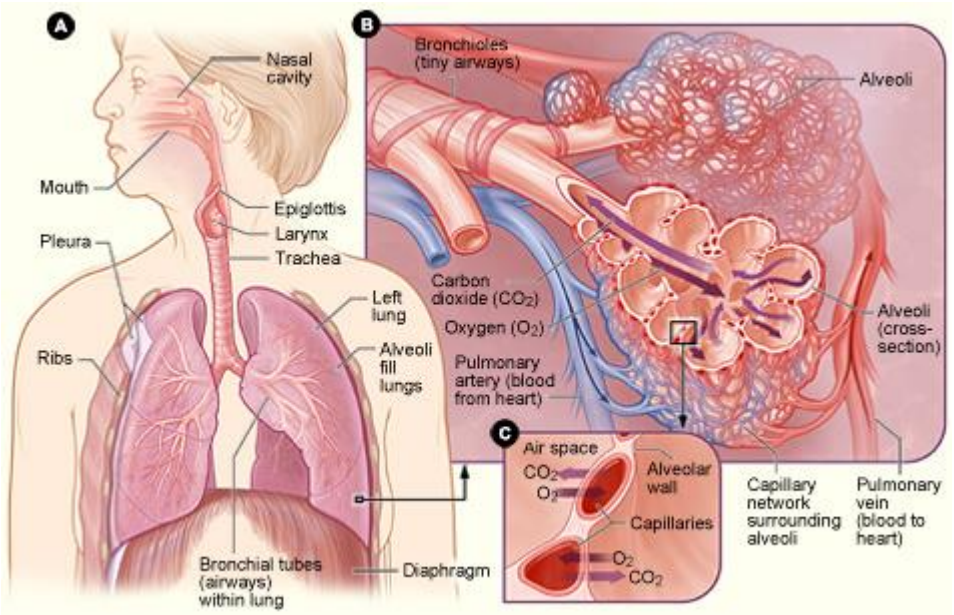


The **reticular activating system** *(RAS)* is the consciousness center of the brain that maintains wakefulness. It is a thimble-sized area of nerves in the brainstem, thalamus and hypothalamus that controls consciousness. Insults to the RAS may result in an altered level of consciousness. A concussion, and the brief loss of consciousness associated with it, is due to disruption of the RAS. Reticular Activating System *(RAS)*



Three Critical Body Systems — The Respiratory System

Respiratory distress is an indicator of a SICK patient. The key to determining whether a patient is in respiratory distress is to decide whether the respirations are adequate to maintain the needed exchange of gases — oxygen and carbon dioxide. **A good way to make that determination involves speaking directly to the patient whenever possible and listening for clues reflecting the work of breathing and body position.**



Clues to determine breathing difficulty may include:

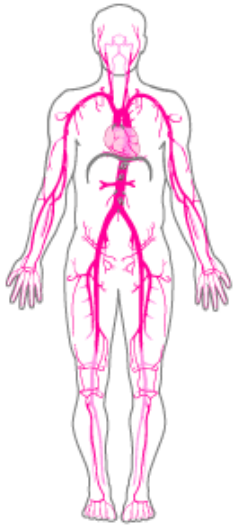
- Speaking normally or without unusual effort
- No gasping or wheezing
- A relaxed body position *(such as sitting comfortably)*

Clues to determine respiratory distress may include:

- Attempting to maximize air intake *(such as being in the tripod position)*
- Severe work of breathing
- Loud gasping, wheezing, stridor or rales

Three Critical Body Systems — The Circulatory System

- The circulatory system, including the cardiovascular system, is a closed system that needs to maintain volume, resistance and the ability to pump. If any of these components, the pump (which is the heart), the pipes (which includes the arteries, veins, and the pressure within), or the fluid (in this case the blood) is adversely affected there is the potential for a very SICK patient.



- It is not important to diagnose the condition but it is important to recognize that the signs and symptoms of shock are the key indication that there is an issue with the circulatory system. EMDs rely on determining whether the patient can sit or stand without passing out, or feeling like they will pass out. Body position is important in making this determination.
- In this example, we see how gravity tries to do its part when our blood volume is no longer able to support our standing or sitting position.

Key Clinical Indicators of the SICK Patient

The patient who is SICK and in need of immediate care and/or rapid transport, will likely present with one or more of the following signs or symptoms that can be used as key clinical indicators. They include:

- Respirations – Is there an effort to breathe effectively (work of breathing)? Are they wheezing, gasping, or in a tri-pod position?
- Level of Consciousness – Is there a decreased level or are they unconscious?
- Body Position – Are they unable to sit or stand without passing out or feeling as if they will pass out?

Pediatric Sick/Not Sick — Developmental Differences

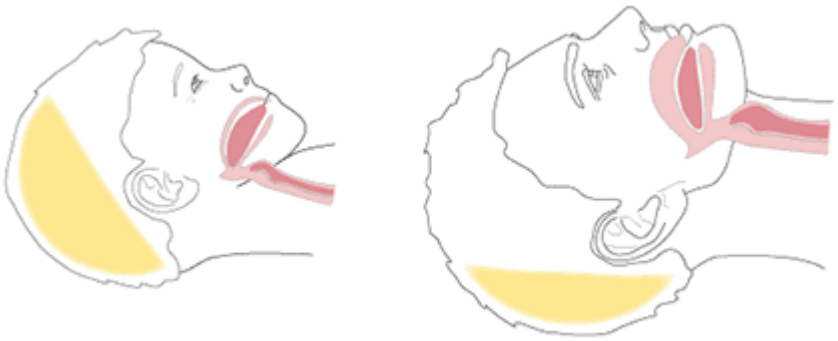
Children are not just "little adults" and should not be treated as such. Their bodies respond to significant injury and shock differently than adult bodies. These differences may be subtle and difficult for the inexperienced provider to recognize.

The **physical anatomy of a child differs from an adult in 4 significant ways**:

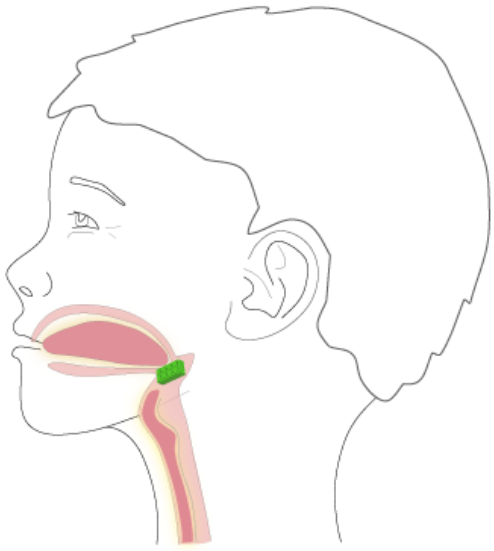
1. The head and skull of a child is proportionately larger.
2. The tongue takes up a proportionately larger amount of space in the mouth and is also located further back.
3. The diameter of the trachea is smaller.
4. Infants and children have a much smaller volume of circulating blood.

These differences are all significant to the assessment and triage of the pediatric patient.

Head positioning requires more care with an infant or small child. Notice how the child's neck is "flexed" because of the larger back part of the head/skull *(occiput)*.



The tongue of an unresponsive child can cause airway obstruction.



With a smaller trachea, there is more chance of a partial or complete obstruction either from a foreign body *(Lego, hot dog etc.)* or from swelling due to trauma that can completely prevent the exchange of air.

In adults, the progression of shock usually includes a steady reduction in blood pressure with an accompanying increase in heart rate. By contrast, children maintain blood pressure and cardiac output by increasing heart rate and vasoconstriction, even with a loss of a significant volume. This means that blood pressure does not drop until much later in the progression of shock. A child can lose up to one-third of their blood volume before a significant drop in blood pressure occurs.

Infants and children have a **relatively smaller blood volume** when compared to that of an adult. A good rule of thumb is that there is approximately 70 cc of blood for every 1 kg (or 2 lbs) of body weight. This means a 20 pound child has about 700 cc's of blood — approximately the volume of a medium sized soda.

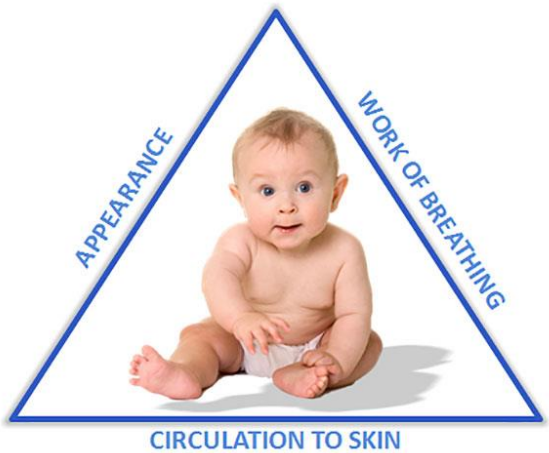
All of these differences lead to one very important fact:

KIDS GET SICKER QUICKER! We must be very conservative in our assessment of children. If in doubt, send advanced life support.

Pediatric Sick/Not Sick — Pediatric Triangle

There are three things you need to assess in a pediatric patient in order to determine SICK or NOT SICK. They include **appearance, work of breathing** and **circulation to the skin**.

You can likely make a SICK/NOT SICK decision based on these three things alone. These three clinical indicators reflect the overall status of a child's cardiovascular, respiratory and neurologic systems. Together they are called the **Pediatric Assessment Triangle**.



Pediatric Sick/Not Sick —Appearance

Appearance tells you a lot about oxygenation, brain perfusion and central nervous system function. By asking the right questions you can collect the information you need to assess appearance.

Asking the Right Questions	
Question	**What it tells you**
Is she able to respond to you?	Alertness
Does she show any interest in a toy, or television?	Distractibility
Is she comforted by you at all?	Consolability
Does she look at you when you speak?	Eye contact
Is the way she's talking or crying normal for her?	Speech/cry
How does her skin look?	Color

Pediatric Sick/Not Sick — Work of Breathing

Three obvious signs of increased work-of-breathing and respiratory distress are:

- Abnormal position
- Retractions
- Audible breath sounds

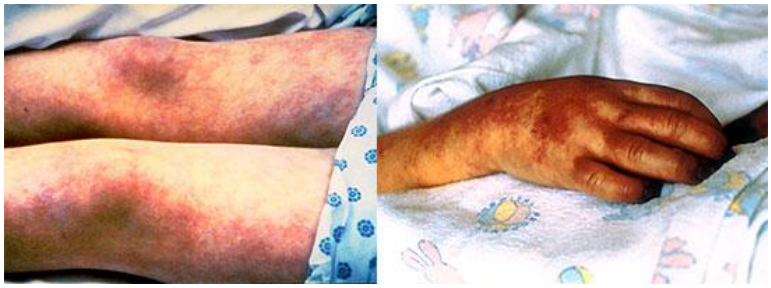
A patient in the sniffing position is attempting to open the airway to a path of least resistance. The patient in the tripod position is attempting to recruit all of the muscles of respiration in order to move air in and out of the lungs.
Retractions, visible sinking-in of the soft tissues, in the chest wall or neck muscles mean that the child is using greater muscle effort in order to move air.

Pediatric Sick/Not Sick — Circulation

Skin signs are a direct reflection of the overall status of the circulatory system. Skin signs can include:

- Color
- Temperature
- Capillary refill time *(not generally used in phone triage)*
- Pulse quality *(not generally used in phone triage)*

Skin color is an important sign with the pediatric patient, and for the most part, the one that we use most as an EMD. Cyanosis is a very late sign – just because a child isn't turning blue does not mean he/she is NOT SICK. Any change in normal skin color indicates a lack of proper perfusion and/or oxygenation.



Skin temperature tells you information about circulatory status. Although this is difficult to use over the phone, responders will feel the skin on the child's trunk for indications of coolness, as this is an early sign of shock.

Capillary refill time is also used by responders. Blanching *(the technique of gently compressing a finger nail bed until it turns white)* and then releasing the pressure to determine how long it takes to pink up again, will tell them whether the patient is shunting blood away from the extremities to vital organs.

First responders will check the pulse at the wrist or elbow. If a pulse cannot be detected or is weak at either of these sites, it may indicate abnormal circulation.

Remember, the pediatric patient in shock will maintain blood pressure much longer than an adult – they may look "fine" and within moments lose consciousness or the ability to breathe effectively.

Pediatric Sick/Not Sick — Stable / Unstable

You must recognize the SICK child within the first minute or so of triage. Much of the information you need to make a decision can be obtained by the parents or caregiver as they know what "normal" looks like for that child.

Pediatric – SICK

A SICK child is one who you believe is **physiologically unstable** based on observable clinical indicators. This means you recognize a significant abnormality in appearance, work of breathing or circulation to the skin. A SICK patient requires immediate and aggressive BLS and ALS care.

SICK: unstable based on observable indicators

Pediatric – NOT SICK

The NOT SICK child is one who you believe is **physiologically stable**. He or she has no significant abnormality in appearance, work of breathing or circulation to the skin. They do not need immediate ALS intervention - but may require BLS care or evaluation.

The All-Caller Interview — The Questions

The **All-Caller Interview is used on ALL medical calls** to quickly identify the patient in cardiac arrest. Because of this, the **answers to these questions must be obtained as quickly as possible and prior to asking any other questions** (with the exception of location).

The purpose of the All-Caller Interview is to determine whether or not the patient is in cardiac arrest and in need of CPR. It is **ONLY** after that is done that you move onto other questions to identify the chief complaint etc.

The first question in the All-Caller Interview is:

1. Is the patient conscious (awake, responding to you)?

If the patient is conscious the very next thing we must do is ask to speak directly to the patient. This is done for two reasons. First of all, it confirms whether or not the caller answered the first question correctly. Therefore it provides a safety net to catch those times when the caller said "yes" the patient is conscious or awake but actually they are not. Secondly, it will allow us to retrieve the rest of our information on a first hand basis, directly from the person experiencing the signs and symptoms. Only after this question is answered are we able to move onto question 2.

If the patient is not conscious or awake, ask:

2. Is the patient breathing *NORMALLY*?

We must obtain the answer to this question on any patient that is or might be unconscious. If the patient is not breathing *"NORMALLY"*, immediately provide CPR instructions.

We use the term "NORMALLY" because patients that experience sudden cardiac arrest often present with something that can be identified as breathing if we are not careful in our assessment.

The All-Caller Interview — Agonal Respirations

Agonal respirations are an ineffective brain stem response to lack of oxygen. They occur commonly in patients who are either about to experience sudden cardiac arrest (SCA) or immediately after the SCA occurred. They are MOST concerning for EMDs because our triage occurs over the telephone and we are not given the opportunity to assess respirations in person. Therefore we are very conservative when starting CPR and do so whenever breathing is described as not normal whenever the patient is unconscious.

Decades of review of cardiac arrest calls by Seattle/King County Emergency Medical Services revealed a high incidence of agonal respirations in out-of-hospital cardiac arrests. Callers described agonals in a variety of ways, often using multiple descriptions. Here are some examples:

- He takes a breath every once-in-a-while.
- She is barely breathing.
- Heavy or labored breathing
- They have problems breathing.
- It is noisy breathing.
- They are gasping.
- They are snorting or snoring.
- They are gurgling.
- They are moaning.
- He is groaning.
- She can't get air.
- They are breathing occasionally.
- He just took another breath.

It also revealed in a third of the patients with agonal activity, respiratory "activity" of some sort lasted an average of 4 minutes total and the frequency of the agonals decreased with each minute after arrest.

Asking, "Is the patient breathing NORMALLY?" saves time if the caller immediately recognizes the breathing sounds/activity as abnormal. Be sure to listen carefully when the caller describes the patient's breathing and if you are unsure whether the breathing is normal or not, START CPR!!

Review & Reflect — Summary

Criteria Based Dispatch is centered on two dimensions that characterize all pre-hospital emergency response. These include:

- The level of care
- The urgency of care

There are two types of medical emergencies:

- The first type is **Critical** – In this case, rapid medical intervention is crucial to patient outcome
- The second type is **Noncritical** – This means that rapid medical intervention will likely not affect the patient outcome

The CBD Guidelines give direction and assist in decision-making without limiting the course of action for EMDs. This allows for more prompt identification of critical patients.

The foundation of the CBD program reinforces the use of these guidelines with a focus on the critical systems and the need to quickly identify patients that are unstable or "SICK".

The Key Concepts in the use of CBD are the following:

1. Time is critical.
2. Quickly identify unstable patients.
3. Use the All-Caller Interview to identify sudden cardiac arrest.
4. Send responders immediately.
5. Provide effective pre-arrival instructions.

These five pieces represent parts of the pie that make up the Criteria Based Dispatch EMD program.

Using the EMD SICK/NOT SICK concept helps to quickly identify unstable patients and provide appropriate pre-arrival instructions.

A SICK patient is one who appears **physiologically unstable** as indicated by key clinical signs. This patient has what you think may be a life-threatening condition and needs immediate BLS care and advanced life support. The SICK patient can die quickly unless there is aggressive treatment and rapid transport.

A NOT SICK patient is someone who appears **physiologically stable** as indicated by adequate respirations, pulse, mental status, skin signs and appropriate body position. He or she may be ill or injured, but the condition is not life threatening at the moment.

Key Clinical Indicators

- Respirations
- Level of Consciousness
- Body Position

In the pre-hospital triage environment, there are three body systems used to determine whether a patient is SICK or NOT SICK. They include:

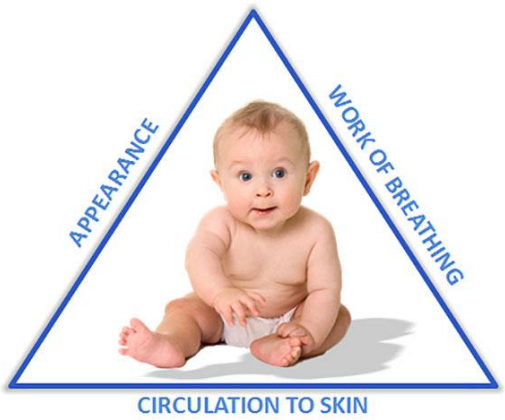
- The Nervous System – to assess level of consciousness
- The Respiratory System – to assess work-of-breathing and
- The Circulatory System – to assess possible shock

The patient who is SICK and in need of immediate care and/or rapid transport will likely present with one or more of the following signs or symptoms:

Key Clinical Indicators

- Respirations – Is there an effort to breathe effectively (work of breathing), are they wheezing, gasping, or in a tri-pod position.
- Level of Consciousness – decreased level of consciousness or are they unconscious.
- Body Position – Are they unable to sit or stand without passing out or feeling as if they will pass out?

Because a child is better able to compensate due to their vascular structure it can be more difficult to identify the "SICK" child. **The Pediatric Triangle** is used as a guide to help recognize the critical child as quickly as possible.



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The purpose of the All-Caller Interview is to determine whether or not the patient is in cardiac arrest and in need of CPR. It is **ONLY** after that is done that you move onto other questions to identify the chief complaint etc.

The **first question** in the All-Caller Interview is:

Is the patient conscious (awake, responding to you)?

If the patient is not conscious or awake, ask:

Is the patient breathing NORMALLY?

Patients experiencing sudden cardiac arrest may present with agonal respirations. Agonal respirations are an ineffective brain stem response to lack of oxygen. They occur commonly in patients who are either about to experience sudden cardiac arrest *(SCA)* or immediately after the SCA occurred, and are not at all "respirations". They are often misidentified by callers so it's important for EMDs to be vigilant when asking if the patient is "breathing normally".