



# COMMONWEALTH of VIRGINIA

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### Office of Integrated Health Health & Safety Alert/Information

## Vital Signs Health & Safety Alert

### Introduction to Vital Signs

The human body constantly struggles to maintain a stable state of being or homeostasis, which is central to life. Vital signs are measurements of the body's most basic functions and are an extremely useful tool to monitor homeostasis and measure physiological normal functions within the body (25).

When someone is ill, the body's strength is challenged and vital signs will go out of their normal range to restore the body's stability (homeostasis). Vital signs can provide objective (factual) proof a change has occurred, which can reveal the body's stability or instability when interpreted by a healthcare professional (7) (25).

The measurement of vital signs provides data driven documentation of an individual's decline or improvement, and in this way, can assist healthcare professionals to make informed clinical decisions and an accurate diagnosis (7) (25).

Vital signs are the first measurements taken by healthcare professionals when initiating care in all healthcare settings: primary care, emergency care, urgent care, specialty care, surgical care and acute care. Vital signs are such an important tool in acute care settings to assess the body's stability, they are sometimes measured on an ongoing basis using wearable monitoring devices.

- Vital signs can help determine major changes in basic body functions.
- Vital signs are highly responsive to abnormalities and changes within the body.
- The sensitivity of vital signs to even subtle changes in a person's health condition is highly effective.
- Vital signs are not influenced by personal feelings or opinion. Example: *"I don't think she's sick, I think she just doesn't want to go on the outing."*
- Vital signs are based on factual data, which can be compared to prior vital sign readings or shared with a healthcare professional (29) (28).



## The Five Main Vital Signs

The five main vital signs routinely monitored by both caregivers and medical professionals include the following:

- Body temperature.
- Pulse rate or rate of heartbeat.
- Blood pressure.
- Respiratory rate or rate of breathing.
- Oxygen saturation level in blood (9) (25).

## Body Temperature

The normal body temperature of a person can vary depending on:

- Gender.
- Recent Activity.
- Food and Fluid Consumption.
- Time of Day.

Normal body temperature for an adult can range from:

- 97 degrees to 99 degrees F.
- The average is 98.6 degrees F (24) (25).



A person's body temperature can be taken in any of the following ways:

**Orally** - Temperature can be taken by mouth using either the classic glass thermometer, or the more modern digital thermometers that use an electronic probe to measure body temperature.

**Rectally** - Temperatures taken rectally (using a glass or digital thermometer) tend to be 0.5 to 0.7 degrees F higher than when taken by mouth.

**Axillary** - Temperatures can be taken under the arm using a glass or digital thermometer. Temperatures taken by this route tend to be 0.3 to 0.4 degrees F lower than those temperatures taken by mouth.

**By ear** - A special thermometer can quickly measure the temperature of the ear drum, which reflects the body's core temperature (the temperature of the internal organs).

**By skin** - A special thermometer can quickly measure the temperature of the skin on the forehead (24) (25).

## Variations in Body Temperature

- Body temperature can be abnormally high (hyperthermia) or low (hypothermia) due to infection.
- A fever is indicated when body temperature rises about one degree or more over the normal temperature of 98.6 degrees Fahrenheit, according to the American Academy of Family Physicians (13) (24).
- A fever is a change from the normal temperature of 98.6 degrees and should be reported (per your agency's policy) to the individual's PCP.
- Hypothermia is defined as a drop-in body temperature below 96.8 degrees (13) (24).
- If you measure an individual's temperature and determine he/she is experiencing hypothermia (a body temperature below 96.8), wait five minutes and re-check the individual's temperature to make sure it is accurate.
- If the individual's temperature is low, and you measured the individual's temperature orally, try checking the individual's temperature using an alternate method, such as axillary (under the arm), the ear or the forehead. If the individual recently consumed a cold food or beverage, it can alter the reading for a period (24).
- If the individual's temperature is still below 96.8, take the individual to the hospital ER or call 911.

| NORMAL BODY TEMPERATURE RANGES |             |              |               |            |
|--------------------------------|-------------|--------------|---------------|------------|
| °F                             | 0 - 2 years | 3 - 10 years | 11 - 65 years | > 65 years |
| Oral                           | —           | 95.9 99.5    | 97.6 99.6     | 96.4 98.5  |
| Rectal                         | 97.9 100.4  | 97.9 100.4   | 98.6 100.6    | 97.1 99.2  |
| Axillary                       | 94.5 99.1   | 96.6 98.0    | 95.3 98.4     | 96.0 97.4  |
| Ear                            | 97.5 100.4  | 97.0 100.0   | 96.6 99.7     | 96.4 99.5  |
| Core                           | 97.5 100.0  | 97.5 100.0   | 98.2 100.2    | 96.6 98.8  |

## What is Blood Pressure?

- Blood pressure is the force of the blood pushing against the artery walls.
- Each time the heart beats, it pumps blood into the arteries, resulting in the highest blood pressure as the heart contracts.
- One cannot take his or her own blood pressure unless an electronic blood pressure monitoring device is used.
- Electronic blood pressure monitors may also measure the heart rate, or pulse (5) (1).



## Systolic vs. Diastolic

- Two numbers are recorded when measuring blood pressure.
- The higher number, or **systolic pressure**, refers to the pressure inside the artery when the heart contracts and pumps blood through the body.
- The lower number, or **diastolic pressure**, refers to the pressure inside the artery when the heart is at rest and is filling with blood.
- Both the systolic and diastolic pressures are recorded as "mm Hg" (an abbreviation for "millimeters of mercury").
- The numbers represent how high the mercury column in an old-fashioned manual blood pressure device (called a mercury manometer) is raised by the pressure of the blood (5) (1).

**What are Systolic and Diastolic Blood Pressures?**

An illustration of a female doctor in a white lab coat pointing her right hand towards a large digital display showing the blood pressure 120/80. A male patient in a red shirt is standing in front of the display, looking at it. The background is a light pink color.

**Systolic Blood Pressure**

- Pressure exerted when blood is ejected into arteries
- Normal systolic blood pressure is 120 mmHg or below

**Diastolic Blood Pressure**

- Pressure blood exerts within arteries between heartbeats
- Normal diastolic blood pressure is 80 mmHg or below

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## What is Hypertension?

High blood pressure, or hypertension, directly increases the risk of coronary heart disease, heart attack, and stroke (brain attack).

Hypertension means the arteries have an increased resistance against the flow of blood, causing the heart to pump harder to circulate the blood.

According to the National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health, high blood pressure for adults is defined as:

- 140 mm Hg or greater systolic pressure,  
**OR...**
- 90 mm Hg or greater diastolic pressure (22) (1).

## What is Hypotension?

Hypotension can be defined as:

- The presence of a systolic blood pressure (the top number) of less than 90 mm Hg,  
**OR...**
- A reduction of more than 40 mm Hg from the individual's baseline (22) (1).

## How to Use a Home Blood Pressure Monitor

- **Make sure the person is calm.** Do not take blood pressure if the person has smoked, drank caffeinated beverages, experiencing any type of stress or exercised within 30 minutes before measuring their blood pressure. Make sure the person does not need to use the bathroom and ensure at least 5 minutes of quiet rest before measurements (1).
- **Position.** Preferably, the person needs to sit up in a relaxed position. Provide seating that will allow the person to sit with their back straight and supported if possible (on a dining chair, rather than a sofa). Their feet should be flat on the floor and legs should not be crossed (if possible). Provide a flat surface for arm support (such as a table) with the upper arm at heart level. If the person is lying down and unable to sit up, the arm should be along their side, leveled with their body (1).
- **Placement of the cuff.** Gently feel for brachial pulse located in the bend of arm with middle and index finger. Place the cuff smoothly and snugly around the arm to ensure an accurate reading. Make sure the bottom of the cuff is placed 1 inch above the bend of the elbow. The arrow on the cuff should be aligned with where the brachial pulse was felt. Check the monitor's instructions for an illustration or have a medical professional show you how (1).



- **Measure at the same time every day.** It's important to take the readings at the same time each day, such as morning and evening. It is best to take the readings daily or as recommended by the doctor (1).
- **Take multiple readings and record the results.** Take two or three blood pressure readings one minute apart (if the person allows) and document the results. If the monitor has built-in memory to store the readings, take the monitor to individual's follow-up physician appointments (1).
- **DO NOT** take the measurement over clothes.
- **DO NOT** take the blood pressure in an "injured" arm: an arm with an IV access; an arm with "AV" (Arteriovenous) Fistula; an arm with an "AV" Graft (shunt) placement (for people receiving dialysis); and/or in the arm on the side in which an individual has had a mastectomy (breast removal) (11).



## What if an Individual Has One High Blood Pressure Reading?

A single high blood pressure reading is not an immediate cause for alarm. If you check an individual's blood pressure and it is slightly or moderately higher than normal, wait a few minutes and re-check their blood pressure. Repeat the process a few more times and record the readings. If the blood pressure readings are still higher than the normal range, let the individual's primary care physician know, and schedule an appointment to see if the individual needs some form of treatment for high blood pressure, or if there may be an issue with the monitor (22) (1).

- ★ If the blood pressure readings exceed 180/120 mm Hg, wait five minutes and test again. If the readings are still unusually high, **seek medical advice immediately**. This could be a hypertensive crisis.

If the blood pressure is higher than 180/120 mm Hg and the person is experiencing symptoms such as chest pain, shortness of breath, back pain, numbness/weakness, change in vision, difficulty speaking, do not wait to see if the individual's blood pressure comes down on its own, **call 911 immediately**.

The American Heart Association recommends home monitoring for anyone diagnosed with high blood pressure or hypertension to help their healthcare provider determine whether treatments are working. Monitoring blood pressure at home can reduce repeated visits to the physician's office, can help encourage better control, and can reduce the number of false high readings due to physician-inspired anxiety aka "white coat hypertension". Home monitoring can also reveal fluctuations or patterns of high/low readings, and as a result, can help physicians make better-informed adjustments to dosages, etc. for individuals diagnosed with hypertension. Home monitoring (self-measured blood pressure) is not a substitute for regular visits to the physician (National Heart, Lung, and Blood Institute (22) (1).

| BLOOD PRESSURE CATEGORY                                  | SYSTOLIC mm Hg<br>(upper number) |        | DIASTOLIC mm Hg<br>(lower number) |
|--|----------------------------------|--------|-----------------------------------|
| NORMAL   | LESS THAN 120                    | and    | LESS THAN 80                      |
| ELEVATED   | 120 – 129                        | and    | LESS THAN 80                      |
| HIGH BLOOD PRESSURE<br>(HYPERTENSION) STAGE 1            | 130 – 139                        | or     | 80 – 89                           |
| HIGH BLOOD PRESSURE<br>(HYPERTENSION) STAGE 2            | 140 OR HIGHER                    | or     | 90 OR HIGHER                      |
| HYPERTENSIVE CRISIS<br>(consult your doctor immediately) | HIGHER THAN 180                  | and/or | HIGHER THAN 120                   |

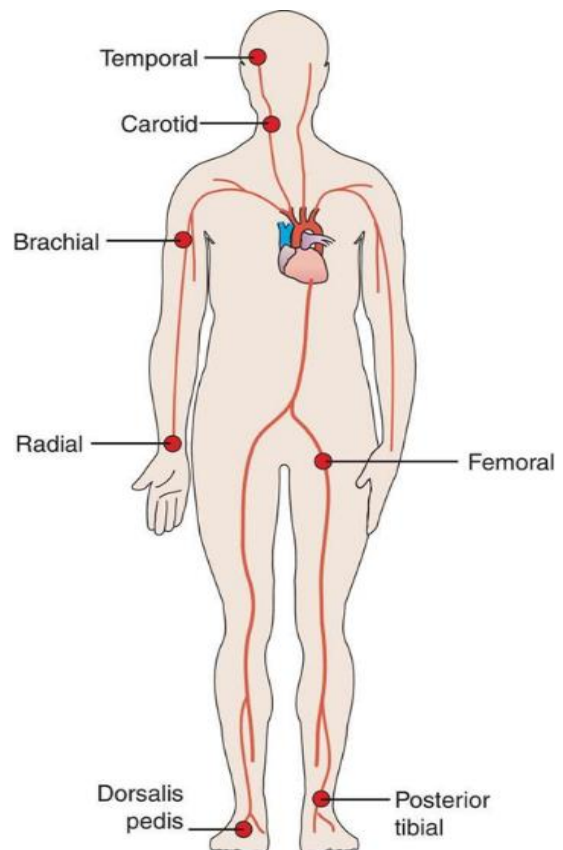
## Pulse Rate/Heart Rate

- A pulse rate is a measurement of the heart rate, or the number of times the heart beats per minute.
- As the heart pushes blood through the arteries, the arteries expand and contract with the flow of the blood.
- Taking a pulse not only measures the heart rate, but can also indicate the following:
  - Heart rhythm.
  - Strength of the pulse (9).

## The Body's Pulse Points

As the heart forces blood through the arteries, you feel the beats by firmly pressing on the arteries, which are located close to the surface of the skin at certain points of the body.

- Your pulse can be felt in various places on the body (the neck, on the inside of the elbow, at the wrist, etc.)
- For most people, it is easiest to take measure heart rate/pulse at the wrist (9) (25).



The Body's Pulse Points



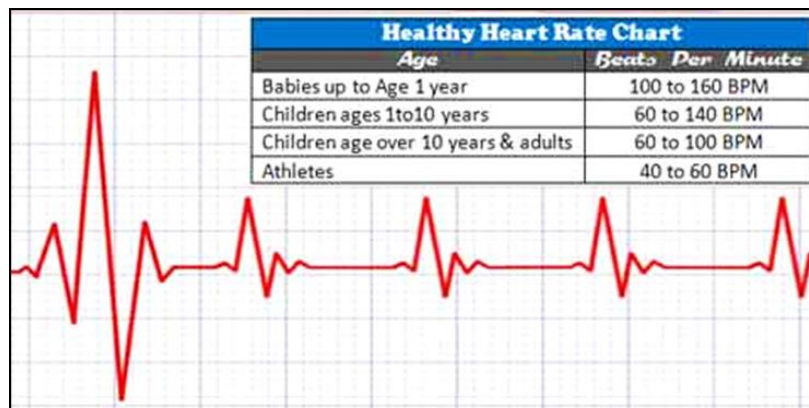
## Tachycardia – A Fast Heartbeat

### What Can a Change in Heart Rate Indicate?

It is normal for the heart rate to rise during exercise, but if an individual is not exercising, a fast heart rate can be a sign of a health condition or illness.

A pulse rate above 90 may indicate:

- Sepsis.
- Infection.
- Dehydration.
- Shock.
- Anemia.
- Drinking too many caffeinated beverages.
- Drinking too much alcohol.
- Fever.
- High or low blood pressure.
- Electrolyte imbalance.
- Extreme anxiety.
- Medication side effects.
- Overactive thyroid (hyperthyroidism).
- Smoking.
- Sudden stress, such as fright.
- Use of a stimulant drug, such as cocaine or methamphetamine.
- A pulse rate lower than 60 may indicate internal bleeding, declining health (9).



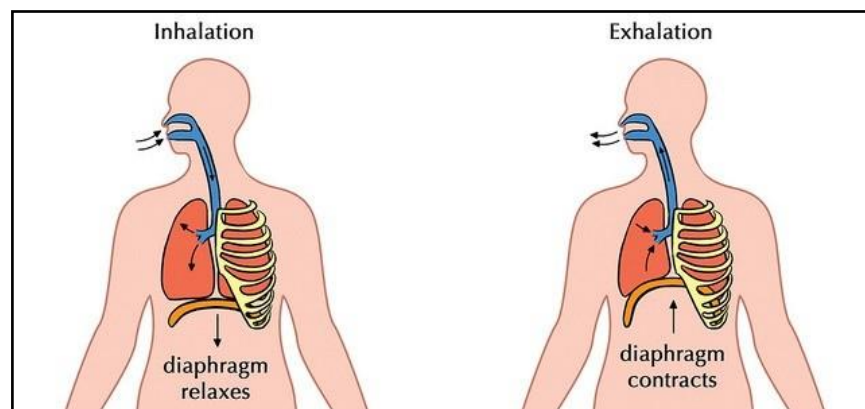
## How to Measure Heart Rate/Pulse

- Using the first and second fingertips, press firmly but gently on the arteries until you feel a pulse.
- Begin counting the pulse when the clock's second hand is on the 12.
- Count your pulse for 60 seconds (or for 15 seconds and then multiply by four to calculate beats per minute).
- When counting, do not watch the clock continuously, but concentrate on the beats of the pulse (9).



## Respiratory Rate/Breathing Rate

- Respiratory rate is the number of breaths a person takes per minute.
- The respiratory rate should be measured when a person is at rest (not moving around, but not asleep), and simply involves counting the number of breaths for one minute by counting how many times the chest rises.
- Respiration rates may increase with fever, illness, hypoxia and with other medical conditions (asthma, COPD, etc.).
- When checking respiration, it is also important to note whether a person has any **difficulty breathing**, also known as **respiratory distress**.
- Normal respiration rates for an adult person at rest (not moving around, but not asleep), range from 12 to 16 breaths per minute (9) (25).

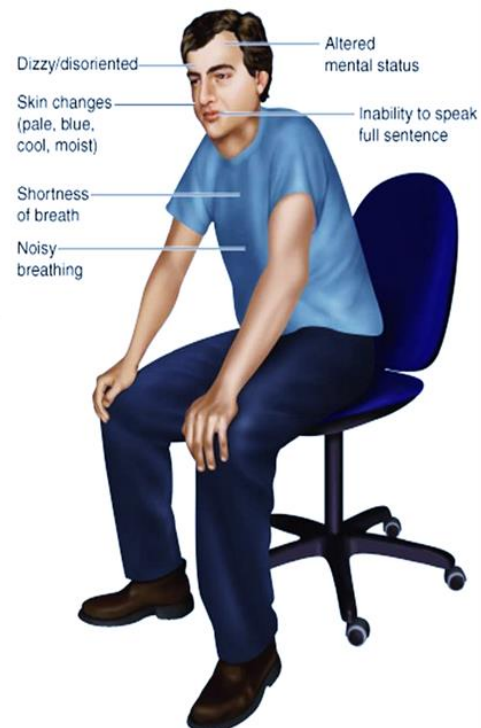


## Signs and Symptoms of Respiratory Distress in Adults

When a person is having trouble breathing (for any reason), they may not be getting enough oxygen for normal bodily functions. When the body senses oxygen levels/oxygen saturation dropping, the brain sends signals to the body to “right” itself, by increasing oxygen levels in the blood. The body responds by triggering its respiratory distress response. Below is a list of some of the observable signs of respiratory distress, which indicate that a person is working harder to breathe and may not be getting enough oxygen. It is important to learn the signs of respiratory distress, so you will quickly recognize them and will seek help from a healthcare professional immediately (9). Breathing rate - increased number of breaths (greater than 20 breaths per minute in adults) when sitting still/resting.

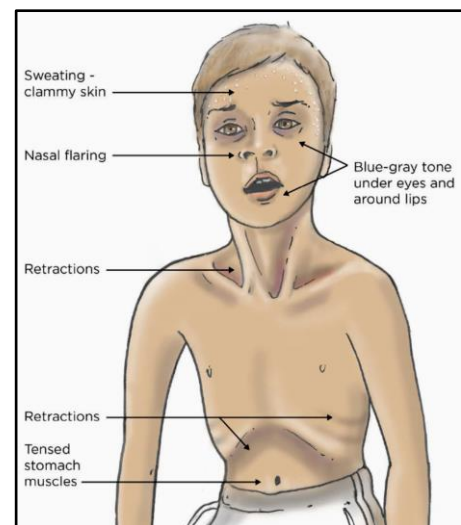
- Hypoxia/Hypoxemia – low oxygen saturation levels <95%.
- Tachycardia – fast, rapid heart rate (above 100).
- Color changes – cyanosis (skin color is ashen, pale or bluish).
- Grunting – sounds made when having difficulty breathing.
- Nose flaring – spreading nasal passage.
- Sweating – increased moisture on the skin (in room temperature).
- Inability to speak a full sentence without pausing to breathe.
- Leaning forward to breathe.
- May appear distressed or panicked.
- Confusion.
- Noisy breathing (raspy, gurgling, wheezing, etc.) (9).

★ It is better to err on the side of safety, if your observations lead you to believe someone is experiencing respiratory distress, **Call 911**.



## Signs and Symptoms of Respiratory Distress

- Breathing rate - increased number of breaths when sitting still/resting (see chart below).
- Sweating or clammy skin.
- Nasal flaring.
- Cyanosis (pale, ashen, blue or grayish coloring around eyes, mouth, lips, or under nail beds).
- Muscle retractions in neck or abdomen when breathing.
- Nasal flaring.
- Look of distress.
- Tense stomach muscles.
- Hypoxia/Hypoxemia – low oxygen saturation levels <95%.
- Tachycardia – fast, rapid heart rate (see chart below (9)).



If the individual's respiratory rate is way out of range of their normal baseline, wait a few (3-5) minutes and re-check it, before seeking emergency help.

| Age             | RR (Breaths/Min) |
|-----------------|------------------|
| Infant < 1 year | 22–55            |
| 1–3 years       | 22–30            |
| 3–6 years       | 16–24            |
| 6–13 years      | 16–22            |
| Adults          | 12–20            |

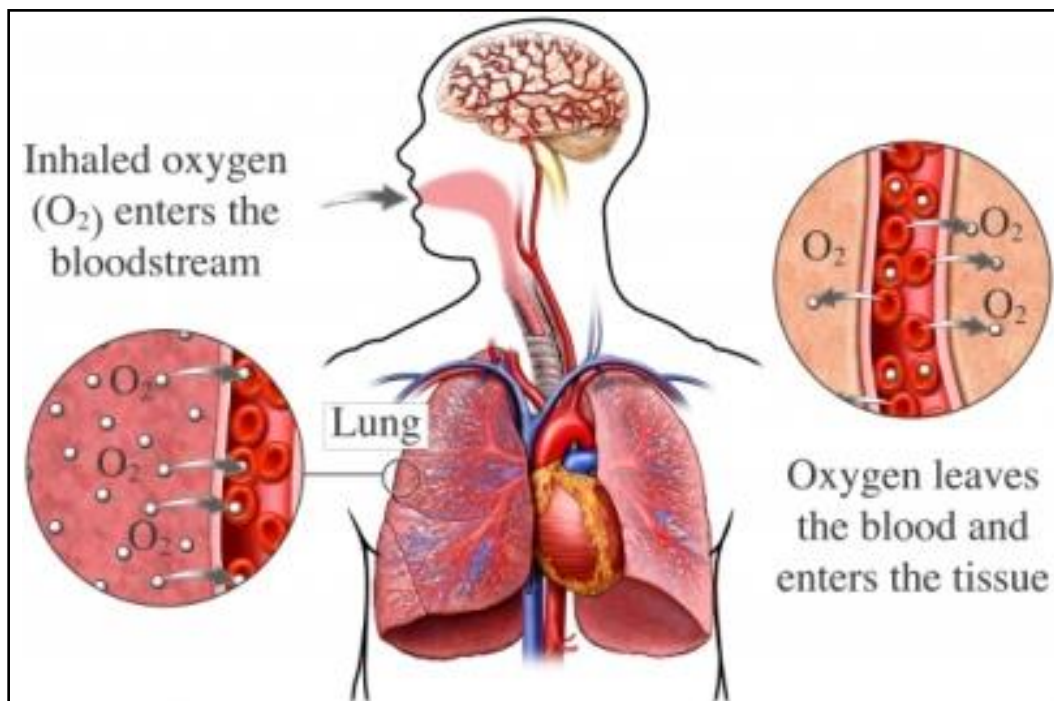
**If resting breaths are higher or lower than the numbers above while an individual is awake, for each age category, (after checking the measurement twice), seek help immediately or call 911.**

## Oxygen Saturation Levels

### Use a pulse oximeter to measure oxygen saturation levels.

During a pulse oximetry reading, a small clamp-like device is placed on a finger, earlobe, or toe. Small beams of light pass through the blood in the finger, measuring the amount of oxygen. The pulse oximeter will then display oxygen saturation levels (SpO<sub>2</sub> and pulse/heart rate. Measuring blood oxygen saturation levels via a pulse oximeter is easy and painless.

- Pulse oximeters measure oxygen saturation levels in the blood.
- They can detect the slightest change in oxygenation.
- Quick and easy to use.
- Can be purchased at a local pharmacy.
- Made to be used by a layperson.
- Most commonly put on a finger.
- Instructions are simple to follow (27) (12).



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## Hypoxia/Hypoxemia

When the body senses oxygen levels or oxygen saturation dropping, the brain sends signals to the body to “right” itself, by increasing oxygen levels in the blood. As mentioned previously, the body responds to low oxygen levels by triggering its respiratory distress response:

- Increasing the rate of breathing (the respiratory rate).
- Increasing heart rate (pulse).
- Please refer to the respiratory distress section for more detailed information (9).

## How Hypoxia/Hypoxemia Affects the Body

Hypoxia and Hypoxemia are very closely related. Hypoxia occurs when the body’s tissues do not have adequate amounts of oxygen. Hypoxemia occurs when levels of oxygen in the blood are lower than normal. If blood oxygen levels are too low, the body will not work properly.

Blood carries oxygen throughout the body to keep it healthy. When levels of oxygen in the body are too low, a person may experience headaches and symptoms of respiratory distress. Low oxygen levels in the body can also affect heart and brain function. How long can a person survive oxygen deprivation (low oxygen saturation levels)?

**Within 1-2 minutes:      Brain damage may begin.**

**Within 5 minutes:      Death of brain cells accelerates.**

**Within 10 minutes:      Death is likely.**

- People who experience hypoxia/hypoxemia will experience extreme mental confusion and/or will lose consciousness.
- People who survive a hypoxic episode may experience lifelong effects.
- Monitoring oxygen saturation levels via a pulse oximeter can identify low oxygen levels. (Ask the individuals PCP if their oxygen saturation levels should be routinely monitored, and if so, how often.)
- The blood carries oxygen to the body’s cells to sustain life.
- If proper oxygen levels within the body are not maintained, hypoxia occurs.
- Hypoxia is a condition in which the body is deprived of enough oxygen.
- Death of cells in the body begins within minutes of the body not having enough oxygen (9).



## Cyanosis

Cyanosis occurs when oxygen-depleted (deoxygenated) blood, which is bluish rather than red, circulates through the skin. Cyanosis can be caused by lung disease, heart disease, respiratory distress or any other condition, which causes levels of oxygen in the blood to be low (2).

- Cyanosis is a visual sign of hypoxia.
- Cyanosis is a bluish, grayish or darkened coloration to the skin.
- Typically appears first around the lips, mouth, fingertips, hands, or under the nail beds, but can appear anywhere on the body.
- Cyanosis can lead to respiratory failure, cardiac failure, tissue, organ and brain death (2).



## Vital Signs Can Provide Factual Proof of a Change within the Body

The importance of monitoring vital signs is indisputable, but how to best monitor, interpret and how frequently they should be measured is still unclear (4).

Specific guidelines for monitoring vital signs based on a specific diagnosis, or post-acute care discharge, etc. do not exist. This is true even among patients who have spent extended periods of time in ICU, those on respiratory support (ventilator, CPAP, etc.) or those who have been hospitalized repeatedly, those over 65 years of age, and/or those who are medically frail (4).

Vital signs are tools which caregivers can use to detect when an individual might be experiencing declining health. Caregivers and DSPs are the first-line of defense for identifying illness early via close observation of changes and prompt reporting of those changes noticed (4).

Caregivers do not need an order from the PCP to take a set of vital signs if they discover an individual has a change in condition, and/or is not feeling well (4). However, in order to measure vital signs at regular intervals, an order from the individual's PCP should be obtained.

Even though physical deterioration can be accurately predicted by vital sign changes, inadequate recording or inappropriate responses to abnormal vital sign values, can still result in treatment delays (4).

### **Physician Orders for Vital Sign Monitoring During/Post Illness**

If a person you are caring for is seeing their PCP for illness, ask the PCP if the individual's vital signs should be monitored during the illness. If monitoring of the individual's vital signs is ordered, ask the PCP for guidelines (orders) specifying how often vital signs should be monitored and the length of time they should be monitored (during their illness, post-illness, etc.). Make sure the PCP specifies clear parameters for reporting changes and follow those orders. Remember:

- All vital signs taken, must be documented in the individual's chart.
- Change from the individual's "normal" should be immediately to a healthcare professional, per the PCP's orders and your agency's policy (25).

### **Some Individuals May Need Regular Vital Sign Monitoring**

Ask everyone's PCP for guidelines on how often vital signs should be taken for each person you are providing care for, and follow those orders. Individuals who have no chronic conditions or disorders will probably not need their vital signs monitored regularly, but your agency may have a policy in place for monitoring vital signs. Check with your supervisor, program manager, or agency nurse to be sure.

If you are a family caregiver, it is still best to ask the individual's PCP for recommendations on how often vital signs should be monitored, documented and reported. Those individuals who *may* need regular monitoring of their vital signs, (per their physician's orders), are those individuals who:

- Have a current illness, or have had a recent illness or infection (this includes COVID-19).
- Have a chronic condition or multiple chronic conditions such as diabetes, cardiovascular conditions, respiratory disorders, etc.
- Have a chronic or recent immune system dysfunction (lupus, HIV, mononucleosis, genetic disorder, sickle cell anemia, etc.).

- Have had a previous bout or multiple bouts of sepsis or cellulitis.
- Have had a recent hospitalization or hospital discharge due to any kind of illness or infection, especially one which included a stay in the ICU or PACU.
- Have had multiple hospitalizations due to any kind of illness or infection, especially one which included a stay in the ICU or PACU.
- Have had recurring bouts of pneumonia or urinary tract infections.
- Are medically fragile/frail.
- Have had any recent surgical procedure(s) (in-patient or out-patient), including any dental/oral surgery.
- Are currently being catheterized on a regular basis or those who have a suprapubic catheter.
- Currently have a central line, a swan catheter, pulmonary catheter, etc.
- Are currently receiving ventilator, CPAP therapy or oxygen therapy.
- Are currently being treated for cancer or chemotherapy (25).

## Normal Vital Signs

### Normal Pulse

### Resting Respiration

### Blood Pressure

| Age     | Normal  | Age                  | Normal | Age     | Average |
|---------|---------|----------------------|--------|---------|---------|
| Newborn | 100-170 | Newborn              | 30-50  | Newborn | 80-60   |
| 1 year  | 80-170  | 1 year               | 20-40  | Infant  | 90-61   |
| 3 year  | 80-130  | 3 Year               | 20-30  | 3 Year  | 99-65   |
| 6 year  | 75-120  | 6 Year               | 16-22  | 6 Year  | 100-56  |
| 10 Year | 70-110  | 14 Year              | 14-20  | 10 Year | 109-58  |
| 14 Year | 60-110  | Adult                | 12-20  | 14 Year | 118-61  |
| Adult   | 60-100  | Gluc. 70-100 (mg/dL) |        | Adult   | 120-80  |

## Protocols for Vital Signs

### Vital Signs Order and Protocol for:

First Name \_\_\_\_\_

Last Name \_\_\_\_\_

Vital signs should be measured \_\_\_\_\_ per day for \_\_\_\_\_ days.

Vital signs should be measured \_\_\_\_\_ times per day, until order is rescinded.

Body temperature should be measured using the following method:

\_\_\_\_ orally \_\_\_\_ axillary \_\_\_\_ rectally \_\_\_\_ forehead \_\_\_\_ ear

| Check<br>If<br>Ordered | Vital Sign       | If Lower Than:              | If Higher Than:             | If Lower Than: | If Higher Than: |
|------------------------|------------------|-----------------------------|-----------------------------|----------------|-----------------|
|                        | Blood Pressure   |                             |                             |                |                 |
|                        | Respirations     |                             |                             |                |                 |
|                        | Body Temperature |                             |                             |                |                 |
|                        | Heart Rate       |                             |                             |                |                 |
|                        | O2 Sat Levels    |                             | N/A                         |                | N/A             |
|                        |                  | Call Physician<br>Indicated | Call Physician<br>Indicated | Call 911       | Call 911        |

Physician's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Office Address: \_\_\_\_\_

\_\_\_\_\_

Phone #: \_\_\_\_\_

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## Resources

### **Vital Signs Competency Checklists -**

<https://www.hopkinsmedicine.org/health/conditions-and-diseases/vital-signs-body-temperature-pulse-rate-respiration-rate-blood-pressure>

**Johns Hopkins Oral Temperature Checklist -** <https://ictr.johnshopkins.edu/wp-content/uploads/2015/01/Competency-checklist-oral-temp.docx>

**Johns Hopkins Blood Pressure, Pulse Oximetry and Infrared Thermometer Checklist -** <https://www.hcpa.info/wp-content/uploads/V3-Competency-Checklist-for-electronic-Blood-Pressure-Pulse-Oximetry-and-Infrared-Thermometer.doc>

**Johns Hopkins Respirations Checklist -** <https://ictr.johnshopkins.edu/wp-content/uploads/2015/01/Competency-Checklist-for-Respirations1.doc>

**Johns Hopkins Apical and Radial Pulse Checklist -** <https://ictr.johnshopkins.edu/wp-content/uploads/2015/01/Competency-Checklist-Apical-and-Radial-Pulse.doc>

**Blood Pressure Competency Checklist -** <https://ictr.johnshopkins.edu/wp-content/uploads/2015/01/Competency-Checklist-for-Blood-Pressure.doc>

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