Venous Thromboembolism
Blood Clots in Veins and Lungs

This counseling tool was developed by the American Association of Nurse Practitioners. Supported by Bristol-Myers Squibb and Pfizer Alliance.
# TABLE OF CONTENTS

## INTRODUCTION

What Is Venous Thromboembolism (VTE)? ............................................. 1
Types of VTE .................................................................................. 2

## DEEP VEIN THROMBOSIS (DVT)

What is Deep Vein Thrombosis? ....................................................... 3
Risk factors for DVT ...................................................................... 4
Diagnosing DVT ........................................................................... 5
Treatment ..................................................................................... 6
  - Oral anticoagulants for DVT .................................................. 7
  - Other DVT treatments ......................................................... 8
  - Potential treatment adverse reactions .................................... 9
    - Minor bleeding .................................................................. 10
Monitoring ................................................................................... 11
DVT Dangers to watch for ............................................................. 12
  - Major bleeding events ....................................................... 12
  - Pulmonary Embolism (PE) .................................................. 12
Prevention ..................................................................................... 13

## PULMONARY EMBOLISM (PE)

Overview of PE ............................................................................ 14
Risk factors for PE ....................................................................... 15
Diagnosing PE ............................................................................. 16
Treatment ..................................................................................... 17
  - Oral Anticoagulants for PE .................................................. 18
  - Other PE treatments ............................................................ 19
  - Potential treatment adverse reactions .................................. 20
    - Minor bleeding .................................................................. 21
Monitoring ................................................................................... 22
PE dangers to watch for .............................................................. 23
Patient Resources ......................................................................... 24
What Is Venous Thromboembolism (VTE)?

- **VTE** stands for venous thromboembolism
  - **VENOUS** = veins in the body
  - **THROMBUS** = blood clot
  - **EMBOLISM** = blood clot that is formed in one part of the body that travels to another part

- VTE is when blood clots form in the “deep” veins and get pushed against a blood vessel

- VTE is also when these clots break free and travel to the heart and lungs
  - *This is a life-threatening situation, which requires immediate medical attention.*

- However, this condition is preventable and treatable
Types of VTE

- VTE has 2 main types
  - **Deep Vein Thrombosis (DVT)**
    When a blood clot forms in a large “deep” vein in the leg, pelvis, and sometimes arm
  - **Pulmonary Embolism (PE)**
    When a blood clot breaks off and travels in the blood to the lungs, causing a blockage there

Who Gets VTE?

- Up to 30% die within the first month of being diagnosed
- VTE is more common for women of child-bearing age than for men
- The risk of getting VTE increases with age for both men and women
- Having VTE increases the risk that VTE will occur again
  - Getting treatment (and following treatment instructions) for VTE reduces the risk that VTE will happen again
What Is Deep Vein Thrombosis (DVT)?

- DVT is when a blood clot (thrombus) forms in a large "deep" vein in the body.
- DVT usually happens in the leg or thigh but it can happen in other places like the pelvis or arm.

Why Do Blood Clots Form?

- Blood clots can form for different reasons:
  - Injury to the inside of a vein resulting from surgery or a serious accident.
  - Sluggish blood flow due to lack of movement (sitting or lying down too long).
  - The body’s response to inflammation.
  - A blood disorder that runs in the family.

What Are the Symptoms of DVT?

These symptoms can occur in the affected area of the body:

- Swelling
- Warmth or heat in the swollen area
- Tenderness or pain
- Redness or discoloration (bluish, purplish) of the skin
Are There Risk Factors for DVT?

Almost anyone can get DVT but there are risk factors that make it more likely to happen:

- Serious injury to a vein
  - From a broken bone or muscle injury
- Slow blood flow
  - From limited movement when traveling
  - Being on prolonged bedrest
- Increased hormones in the blood
  - Taking hormone therapy
  - Pregnancy or recently given birth
- Some medical conditions
  - Heart or lung disease
  - Current or past cancer
  - Inflammatory bowel disease
- Other things related to the individual
  - Previous DVTs
  - Increased age
  - Excess body weight
  - Smoking
  - Having a central venous catheter in a large vein
  - Family history of blood-clotting disorders
Diagnosing DVT

Healthcare providers (HCPs) use a combination of tests to determine whether someone has DVT:

- Physical exam
- Blood test (D-dimer blood test)
- Ultrasound
  - Ultrasound uses sound waves to create images of the flow of blood in the veins
  - Ultrasound is non-invasive, which means that imaging devices remain outside the body
- Other imaging tests with or without contrast dye
  - Computed tomography (CT) scan and magnetic resonance imaging (MRI) may be used to see veins and clots
  - Venography, which uses X-rays to take pictures of veins, is more invasive since it requires a continuous injection of contrast dye
DVT Treatment

• Most patients take an anticoagulant to treat DVT
• An anticoagulant is commonly called a “blood thinner”
  — Anticoagulants don’t actually thin the blood; they stop a blood clot from getting bigger and prevent future clots
• There are different types of anticoagulants to treat DVT
  — Some can be taken by mouth (a pill or tablet)
  — Some are injections (shots) into the skin or through an IV
• The type of anticoagulant prescribed depends on several things:
  — Size and location of the blood clot
  — Other medications that you are taking
  — How well your kidneys are working
  — Whether you are receiving treatment for cancer
• Your healthcare provider will work with you to decide which type of anticoagulant is best for you
Oral Anticoagulants for DVT Treatment

• There are several types of anticoagulants, which target different parts of the blood-clotting process (vitamin K, factor Xa, or direct thrombin)
• Medicines that block vitamin K have been used to treat DVT for many years
  — Routine blood tests are needed to make sure you have the right amount of medication in your blood
  — Their ability to work can be affected by what you eat
• Medicines that block factor Xa or directly block thrombin are newer treatments for DVT (Direct Oral Anticoagulant—DOAC)
• These new anticoagulants work as well as vitamin K treatments
  — Fewer blood tests are usually needed for these new anticoagulants compared to those focused on vitamin K
  — Their ability to work well does not depend on dietary restrictions
• Medical guidelines recommend patients take the new anticoagulants, when possible, instead of medicines that focus on vitamin K to treat DVT
Other DVT Treatments

- In rare cases, a procedure may be needed to treat DVT:
  - When anticoagulants cannot be used
  - When anticoagulants don’t work well enough to treat the clot
  - When someone has repeat DVTs
- These procedures may include:
  - Inserting a special filter inside the big vein that brings blood into the heart; the filter traps clots before they get to the lungs
  - Having surgery to remove the DVT
- Your healthcare provider will talk to you if a procedure is needed
Potential Treatment Adverse Reactions

- The most common type of adverse reaction of any anticoagulant is bleeding
  - Minor bleeding is common like nose bleeds or prolonged bleeding from a scrape or a cut
- All medications have possible adverse reactions:
  - If you experience an adverse reaction, contact your healthcare provider
  - Your healthcare provider will let you know what changes, if any, you should make with your anticoagulant
- You can minimize certain types of bleeding by:
  - Using a soft bristle toothbrush
  - Shaving with an electric razor rather than a blade
  - Avoid activities and sports that may cause injury (walking, swimming, and bike riding are safe activities)
- Less common adverse reactions include nausea, diarrhea or constipation, headaches, dizziness, and rashes or itchy skin
DVT Minor Bleeding Events

- When taking any anticoagulant, you may experience minor bleeding
- Minor bleeding can usually be treated at home and does not require a visit to the emergency department
- Examples of minor bleeding episodes include:
  - Paper or small cuts
  - Bleeding in the gums after brushing your teeth
  - Nosebleeds lasting <10 minutes
  - Bruising
  - Heavier-than-normal menstrual cycles
- If you’re not sure whether a bleeding episode is considered “minor”, contact your healthcare provider
DVT Monitoring

• Taking your medication as directed by your healthcare provider is the most important thing you can do
  — Never stop taking your medication without talking to your healthcare provider
  — Alert your dentist, surgeon, or other healthcare provider that you are taking an anticoagulant before any procedure

• Some medications require special attention to what you eat and drink
  — If you are taking a vitamin K anticoagulant, you need to be consistent with your intake of foods high in vitamin K, such as leafy greens (kale, spinach, turnip, & mustard greens) or brussel sprouts
  — You should avoid alcohol

• Ask your healthcare provider before taking aspirin, ibuprofen, other over-the-counter medicine for pain relief, and vitamin or herbal supplements, such as St. John’s Wort
  — These can reduce how well your anticoagulant works

• You may also need to have blood tests from time to time
  — The frequency of blood tests depends on the type of anticoagulant you are taking
DVT Dangers to Watch For

Go immediately to the emergency department if you have:

Symptoms of Bleeding in the Brain
- Severe pain in your head
- Sudden inability to move your arms or legs
- Unexpected changes in vision
- Memory loss or confusion

Major Bleeding
- You cut yourself and can’t stop the bleeding
- You fall and hit your head
- You hit your head against something (even if you are not bleeding)
- You are involved in a major accident
- You have blood clots in your urine, black “tarry” stool, or bright red blood in the toilet

Symptoms of PE
- Difficulty breathing that occurs suddenly
- Chest pain or discomfort, especially when taking a deep breath or coughing
- Irregular or faster-than-normal heart beat
- Sudden, severe back pain
- Unexplained dizziness or fainting
- Vomiting or coughing blood
Preventing DVT

• You can reduce your risk for getting DVT in several ways:
  — Reach and maintain a healthy body weight
  — Be active
  — Wear compression socks
  — Take an anticoagulant (if recommended by your healthcare provider)

• If you have to sit for an extended period (>4 hours):
  — Stand and walk around, if possible, after 2-3 hours
  — When sitting, raise and lower your toes while your heels remain on the floor
  — Raise and lower your heels while your toes remain on the floor
  — Squeeze and relax all the muscles in your legs
  — Wear comfortable (loose) clothing

• If you have been on bed rest following surgery or an injury, start moving around as soon as you can
Pulmonary Embolism Overview

Pulmonary embolism (PE) occurs when a blood clot that has developed in the body breaks free, travels through the blood stream to the lungs, and blocks an artery in lungs.

Why Do Blood Clots Form?

- Blood clots can form for different reasons:
  - Injury to the inside of a vein resulting from surgery or a serious accident
  - Sluggish blood flow due to lack of movement (sitting or lying down too long)
  - The body’s response to inflammation
  - A blood disorder that runs in the family

What Are the Symptoms of PE?

- Difficulty breathing that occurs suddenly
- Chest pain or discomfort, especially when taking a deep breath or coughing
- Irregular or faster-than-normal heart beat
- Sudden, severe back pain
- Unexplained dizziness or fainting
- Vomiting or coughing blood

Are There Risk Factors for PE?

Almost anyone can get PE but there are risk factors that make it more likely to happen:

- **Serious injury to a vein**
  - From a broken bone, muscle injury, or surgery

- **Some medical conditions**
  - Uncontrolled high blood pressure or heart disease
  - Certain cancers (lung, ovarian, pancreatic)
  - Cancers that have spread to other parts of the body

- **Lack of movement**
  - Traveling more than 4 hours by car, plane, or bus
  - Prolonged bed rest

- **Other things related to the individual**
  - Previous DVTs or PE
  - Increased age
  - Excess body weight
  - Smoking
  - Woman with breast cancer who have taken certain chemotherapies (tamoxifen and raloxifene)
  - Family history of blood-clotting disorders
Diagnosing PE

Healthcare providers use a combination of tests to determine whether someone has PE:

- Physical exam
- Blood tests
- Pulse oximetry, which measures the percentage of oxygen in blood by inserting a finger in a special clip
- Your healthcare provider may order special non-invasive imaging tests:
  - Chest x-ray
  - Computed tomography (CT) scan
  - Magnetic resonance imaging (MRI) of the chest
- Some invasive imaging tests may be ordered to determine whether you have PE:
  - A special CT scan, called CT angiography, that takes pictures of the arteries in the lungs
  - An advanced test, called a ventilation-perfusion (V/Q) scan, which involves the injection of special materials to assess breathing as well as the circulation of blood in the lungs
**PE Treatment**

- It’s important to get treatment for PE to avoid severe complications
- Most patients take an anticoagulant to treat PE
- An anticoagulant is commonly called a “blood thinner”
  - Anticoagulants don’t actually thin the blood; they stop the clot from getting larger or new clots from forming as easily
- Some people first receive treatment for PE in the hospital
  - This may involve an anticoagulant being administered through an intravenous (IV) tube, which is usually inserted in a vein in the arm
- There are different types of anticoagulants to treat PE at home
  - Some can be taken by mouth (a pill or tablet)
  - Some are injections (shots)
- The type of anticoagulant prescribed depends on several things:
  - The size and location of the clot
  - Other medications that you are taking
  - How well your kidneys are working
  - Whether you are receiving treatment for cancer
- Your healthcare provider will work with you to decide which type of anticoagulant is best for you
Oral Anticoagulants for PE Treatment

- There are several oral anticoagulants, which target different parts of the blood-clotting process (vitamin K, factor Xa, or direct thrombin).
- Vitamin K antagonists have been used to treat PE for many years:
  - Their ability to work can be affected by what you eat.
  - Routine blood tests are needed to make sure you are taking the right amount of medication.
- Anticoagulants that inhibit factor Xa or direct thrombin are new treatments for PE (Direct Oral Anticoagulant—DOAC).
- These new anticoagulants are just as effective as vitamin K treatments:
  - Their ability to work effectively does not depend on dietary restrictions.
  - Fewer blood tests are usually needed for these new anticoagulants compared to those focused on vitamin K.
- Medical guidelines recommend patients use new anticoagulants, when possible, instead of vitamin K antagonists to treat PE.
Other PE Treatments

- Sometimes, a procedure may be needed to treat PE:
  - When anticoagulants cannot be used
  - When anticoagulants don’t work well enough to treat the clot

- These procedures may include:
  - Continuous injection, through insertion of an intravenous (IV) tube in the vein, of a special fluid-based medication called thrombolytics
  - Use of a catheter, which is a thin tube inserted into the body, to either deliver thrombolytic medication directly to the PE or to remove the PE
  - Surgery, called an embolectomy, to remove the PE

- Your healthcare provider will talk to you if a procedure is needed
Potential Treatment Adverse Reactions

- The most common type of adverse reaction of any anticoagulant is bleeding.

- All medications have possible adverse reactions:
  - If you experience an adverse reaction, contact your healthcare provider.
  - Your healthcare provider will let you know what changes, if any, you should make with your anticoagulant.

- You can minimize certain types of bleeding by:
  - Using a soft bristle toothbrush.
  - Shaving with an electric razor rather than a blade.
  - Avoid activities and sports that may cause injury (walking, swimming and bike riding are safe activities).

- Less common adverse reactions include nausea, diarrhea or constipation, headaches, dizziness, and rashes or itchy skin.
PE Minor Bleeding Events

- When taking any anticoagulant, you may experience minor bleeding
- Minor bleeding can usually be treated at home
- Examples of minor bleeding episodes include:
  - Paper or small cuts
  - Bleeding in the gums after brushing your teeth
  - Nosebleeds lasting <10 minutes
  - Bruising
  - Heavier-than-normal menstrual cycles
- If you’re not sure whether an injury is “minor”, contact your healthcare provider
PE Monitoring

- Taking your medication as directed by your healthcare provider is the most important thing you can do
  - Never stop taking your medication without talking with your healthcare provider
  - Alert your dentist, surgeon, or other healthcare provider that you are taking an anticoagulant before any procedure

- Some medications require special attention to what you eat and drink
  - If you are taking a vitamin K anticoagulant, you need to be consistent with your intake of foods high in vitamin K, such as leafy greens (kale, spinach, turnip & mustard greens) or brussel sprouts
  - You should avoid alcohol

- Ask your healthcare provider before taking aspirin, ibuprofen, other over-the-counter medicine for pain relief, and vitamin or herbal supplements, such as St. John’s Wort
  - These can reduce how well your anticoagulant works

- You may also need to have blood tests from time to time
  - The frequency of blood tests depends on the type of anticoagulant you are taking
PE Dangers

Go immediately to the emergency department if you have:

Symptoms of Bleeding in the Brain
- Severe pain in your head
- Sudden inability to move your arms or legs
- Unexpected changes in vision
- Memory loss or confusion

Major Bleeding
- You cut yourself and can’t stop the bleeding
- You fall and hit your head
- You hit your head against something (even if you are not bleeding)
- You are involved in a major accident
- You have blood clots in your urine, black “tarry” stool, or bright red blood in the toilet

Symptoms of PE
- Difficulty breathing that occurs suddenly
- Chest pain or discomfort, especially when taking a deep breath or coughing
- Irregular or faster-than-normal heart beat
- Sudden, severe back pain
- Unexplained dizziness or fainting
- Vomiting or coughing blood
Patient Resources

• American Heart Association (www.heart.org)
  — Patient information sheets and videos
• National Blood Clot Alliance (www.stoptheclot.org)
  — Patient information, stories, and discussion community
• Centers for Disease Control and Prevention (www.cdc.gov)
  — Venous Thromboembolism: Know the Risks, Signs & Symptoms of Blood Clots
  — https://www.cdc.gov/ncbddd/dvt/infographic-risk.html
• North American Thrombosis Forum (www.natfonline.org)
  — Patient information, support groups, and patient advocacy groups
• anticoagulationtoolkit.org
  — Patient and provider resource on anticoagulation in English and Spanish