Improving Care Disparities for Black Americans in Mississippi with Venous Thromboembolism

Dr. Charles Pollack: Good evening and welcome to tonight's accredited education program, *Improving Care Disparities for Black Americans in Mississippi with Venous Thromboembolism*. My name is Charles Pollack. I am a clinician-scientist in the Department of Emergency Medicine at the University of Mississippi School of Medicine in Jackson. I've been working in the thrombosis area for longer than I care to remember.

We're going to highlight tonight, some of the important issues around thrombosis and antithrombotics, particularly as they affect underserved populations within the state of Mississippi. I'm very honored to have, as co-faculty tonight, the three individuals, very eminent individuals, really know this stuff, who are joining me tonight. I'll let them introduce themselves starting with Dr. Hadley.

Faculty

Charles V. Pollack, Jr., MD, FACEP, FAAEM, FAHA, FACC, FESC, FCPP
Program Chair
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DeGail J. Hadley, DO
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Dynamic Wellness Medical Clinic
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Cynthia Harrington, DNP, APRN, FNP-BC, PMHNP-BC, NEd, MT(ASCP)
Family Nurse Practitioner
Choctaw Regional Medical Center
Louisville Medical Clinic
Louisville, Mississippi

Elizabeth Hood, PharmD
Director, Anticoagulation Clinic
Clinical Pharmacy Specialist
University of Mississippi Medical Center
Jackson, Mississippi

Dr. Degail Hadley: Good evening. I'm Dr. Degail Hadley. I'm board certified family medicine physician and I'm the founder and Chief Executive Officer of Dynamic Wellness Medical Clinic in Cleveland, Mississippi. Day-to-day, family medicine doctor, treating a variety of different illnesses, including VTE on a daily basis. I'm happy to be on board today.

Elizabeth Hood: Good evening, I'm Elizabeth Hood. I'm a pharmacist at the University of Mississippi Medical Center in Jackson. We have a large anticoagulation service there, where we manage patients in the hospital as well as outpatient. We have a lot of patients from around Mississippi that we manage. I'm happy to be able to join you tonight to share some of the experience.

Cynthia Harrington: Hi, my name is Cynthia Harrington. I'm a family nurse practitioner in a family medicine clinic in Lewisville, Mississippi. I also practice in a hospital ER as well. I'm happy to be with you.

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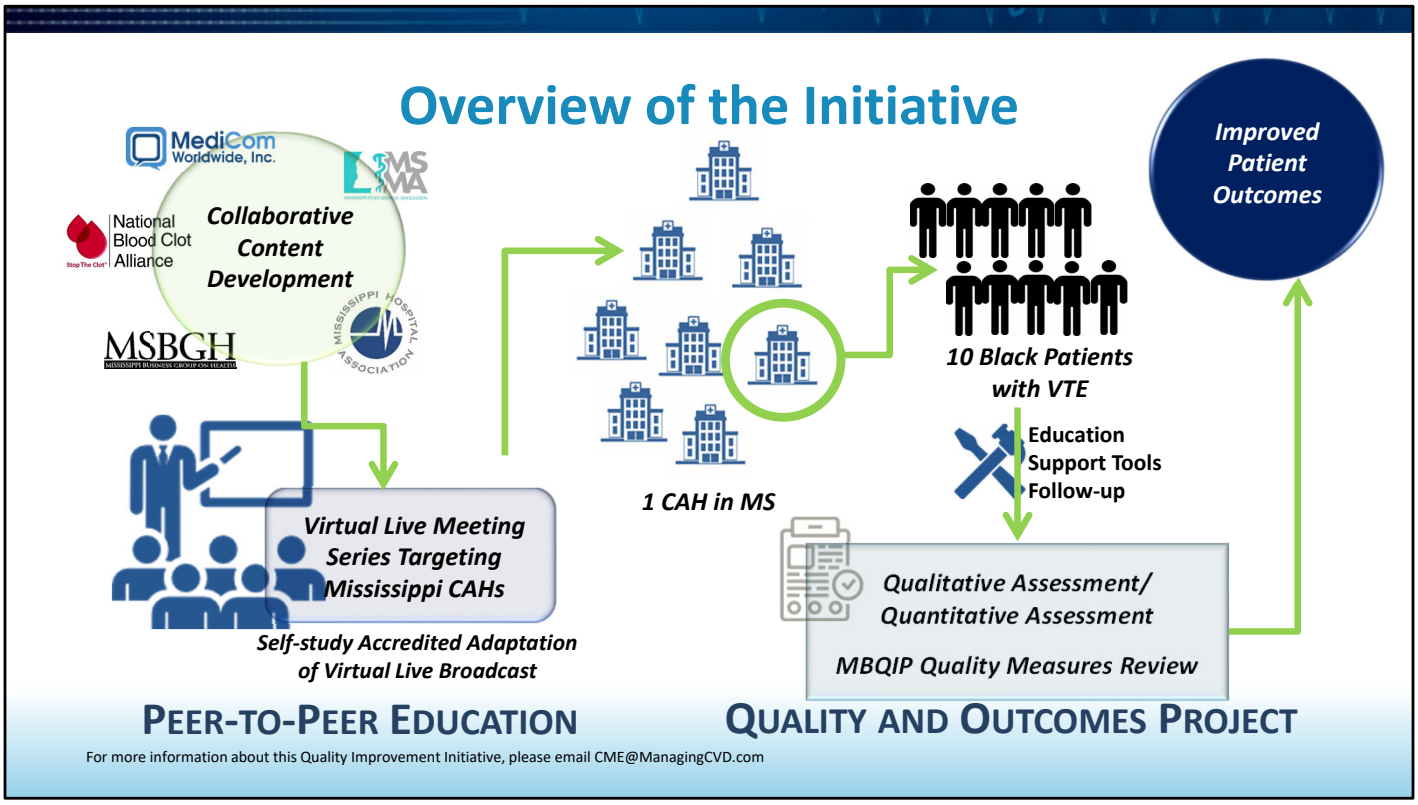


Dr. Pollack: Now that you've met our faculty, I'd like to start by briefly introducing you to this **comprehensive** series of educational activities that we're kicking off tonight. This initiative has been designed with the help of several collaborators who are identified on this slide and we'd like to thank them for their contributions and their dedication to improving the lives of our patients in Mississippi and elsewhere.

This education stems from the need to impact care and management of Black Americans in Mississippi with VTE, venous thromboembolism, and most importantly, to identify barriers and work towards improvement not only in their treatment but also address the challenges that sometimes occur during the transition from the hospital back to the community. We hope to continue to work closely with our collaborators, the community, and the Critical Access Hospitals that are involved in this to further understand and ultimately help meet these challenges.

The first goal of our initiative is what we're doing this evening, which is providing education. We'll be providing five live activities targeting care providers in the Mississippi region. Now let's continue with tonight's activity begins by discussing why we chose Mississippi to launch this initiative.

Why Mississippi?

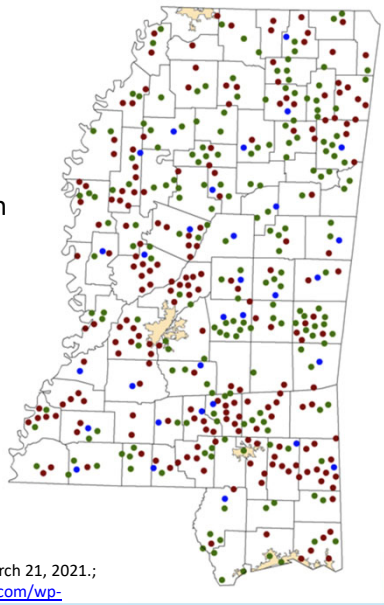
- Black Americans in Mississippi have a high number of comorbidities that place them at greater risk for both initial and recurrent VTE
- Mississippi ranks last, or close to last, in almost every leading health outcome. Evaluated within the context of nationally reported CAH data on care transitions, Mississippi CAHs also rank low
- Collectively, this body of information indicates a pressing need for clinician education, support tools, and resources aligned with hospital quality improvement initiatives and measures in CAHs in Mississippi. These efforts should lead to better clinician and hospital practices for care transitions among Black Americans discharged home on oral anticoagulant therapy

Dr. Pollack: So why Mississippi? Well it's no surprise, unfortunately, that health care outcomes in Mississippi and, in fact, across the deep south are not as good as they are in other parts of the country. Much of that is due to the comorbidity burden that they bear in multiple different disease states. Many of those comorbidities put them at greater risk both for initial venous thromboembolism, and let's be sure we understand that includes DVT and pulmonary embolism. Some people even include post-thrombotic or postphlebitic syndrome in the VTE sphere and pulmonary embolism. There's initial VTE. Doesn't have to be DVT leading to PE. Sometimes people just present with a PE with no known preceding DVT and then recurrent disease with either DVT or PE.

Mississippi ranked last, or close to last, in almost every leading health outcome available within the context of NASH reported Critical Access Hospital data on care transition. Unfortunately, our Critical Access Hospitals which do so much for the patients in Mississippi still rank low. Collectively, if you look at this information as objectively as we all can working in the middle of it, there's clearly a pressing need for better education of conditions. You see physicians, nurses, pharmacists on the speaker panel, that hopefully we've got all the professionals represented in our audience tonight, providing support tools, making people aware of resources that are aligned with hospital QI initiatives, and really give the Critical Access Hospitals and the very skilled and dedicated clinicians that work within them, the tools they need to improve these outcomes. We think that we can really impact clinician practices, hospital policies, and then care transitions, particularly among these underserved Black Americans who have been discharged home on oral anticoagulant therapy.

Critical Access Hospitals in Mississippi

- CAHs play a primary role in the care of rural Black patients
  - 22.7% of Blacks in Mississippi are rural; they constitute 36.5% of the rural population in the state
- CAHs underperform compared with urban counterparts, particularly on care transition and post hospitalization care
- 49% of rural hospitals in Mississippi are “at-risk” for potential closure
- Mississippi ranks last or close to last on all health care measures
  - Mississippi minorities, including Black Americans, are disproportionately impacted by poor health measures
  - Rural hospital closures will exacerbate this problem

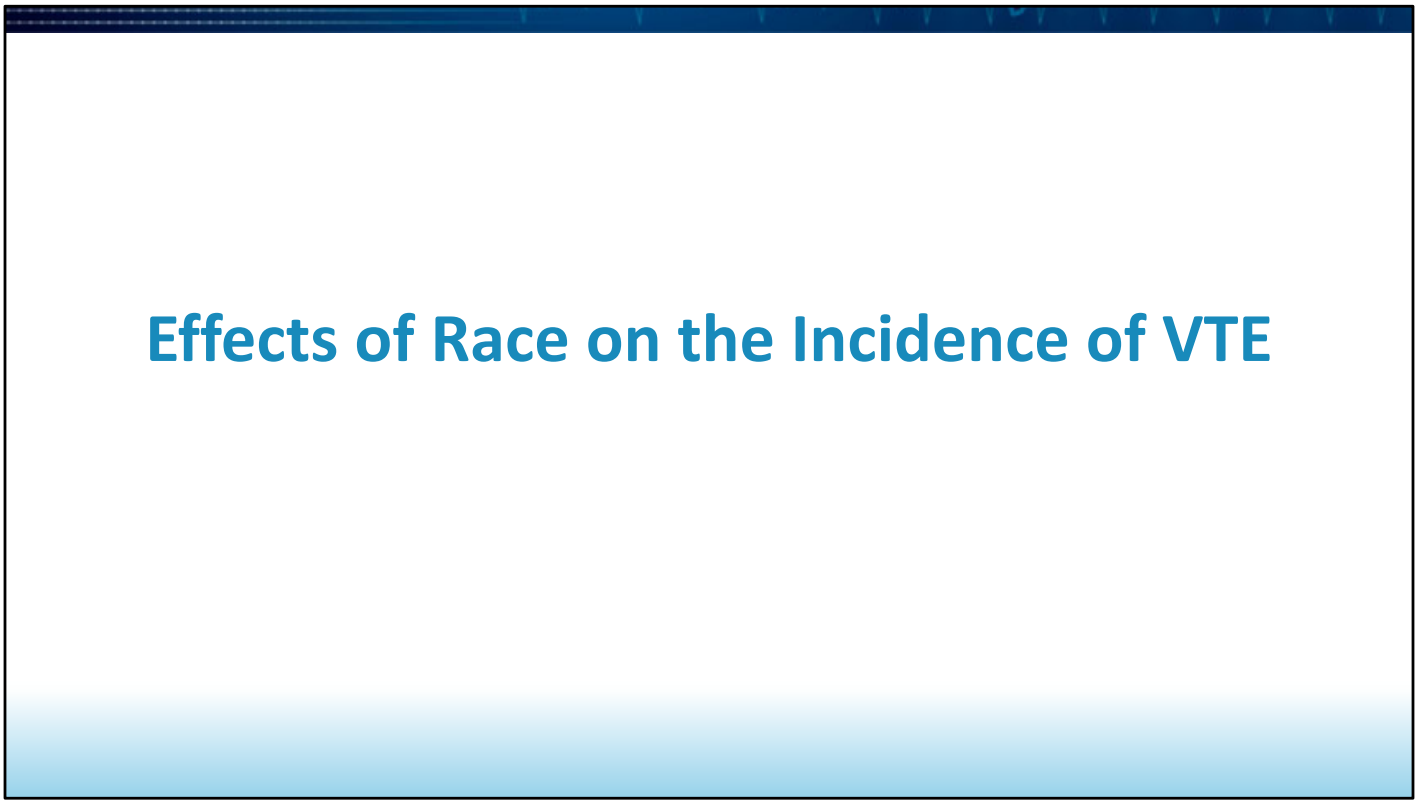


Health Equity - Mississippi State Department of Health. https://msdh.ms.gov/msdhsite/_static/44,0,236.html. Accessed March 21, 2021.; McDoom M, et al. The economic impact of potential closures of rural hospitals in Mississippi. 2015. https://mshealthpolicy.com/wp-content/uploads/2015/11/Economic-Impact-of-Potential-Closures-of-Rural-Hospitals-in-Mississippi_MSU-Aug15.pdf. Accessed March 22, 2021.

Dr. Pollack: These dots all represent Critical Access Hospitals in the state of Mississippi, and they have a primary role in the care of rural black patients. In fact, in Mississippi, nearly a quarter of blacks are considered rural, and they constitute more than a third of the rural population in the state.

I mentioned a moment ago, I'll be more explicit here, Critical Access Hospitals underperform compared with their urban counterparts, even when your urban in the state of Mississippi is an urban like we talked about in New York or New Jersey or Illinois, but even compared to urban counterparts within the state in Jackson, in Tupelo, in Hattiesburg, particularly in care transition and post-hospitalization care. Nearly half of rural hospitals in Mississippi are at risk for potential closure. Whether or not the new infrastructure funding activity may help with that, we don't know, we've got to assume that we've got to do the best we can with what
we got.

As I mentioned before, unfortunately, it's worth mentioning again, Mississippi ranks last, or close to last, on basically all healthcare measures, and black Americans within the Mississippi population, within the Mississippi minorities, are disproportionately impacted by these poor health outcomes. If we were to start losing some of those hospitals that would only make this problem worse.



Dr. Pollack: What about the effects of race? I've made it a point now to say that now, not just rural populations, but rural black population are at higher risk for these bad outcomes.

Venous Thromboembolism (VTE)

- A continuum of disease from deep venous thrombosis (DVT) to pulmonary embolism (PE) and potential nonfatal sequelae such as chronic thromboembolic pulmonary hypertension (CTEPH) and post-thrombotic syndrome (PTS)
- DVT typically starts in the lower extremities (less commonly in the upper extremities) or pelvis
  - Produces pain and distal edema
  - Can propagate, leading to further symptoms
  - Can embolize, resulting in PE
- VTE kills more Americans each year than breast cancer, HIV disease, and road traffic accidents . . . ***combined***
- Except when it occurs in inpatients, VTE is typically first evaluated and treatment is initiated in the emergency department (ED)

Bates SM, et al. *Chest*. 2012;141(2)(Suppl):e351S–e418S.
http://www.cdc.gov/ncbddd/aboutus/annualreport2012/documents/ncbdddannualrepor2012-full-report.pdf. Accessed 8/17/13.

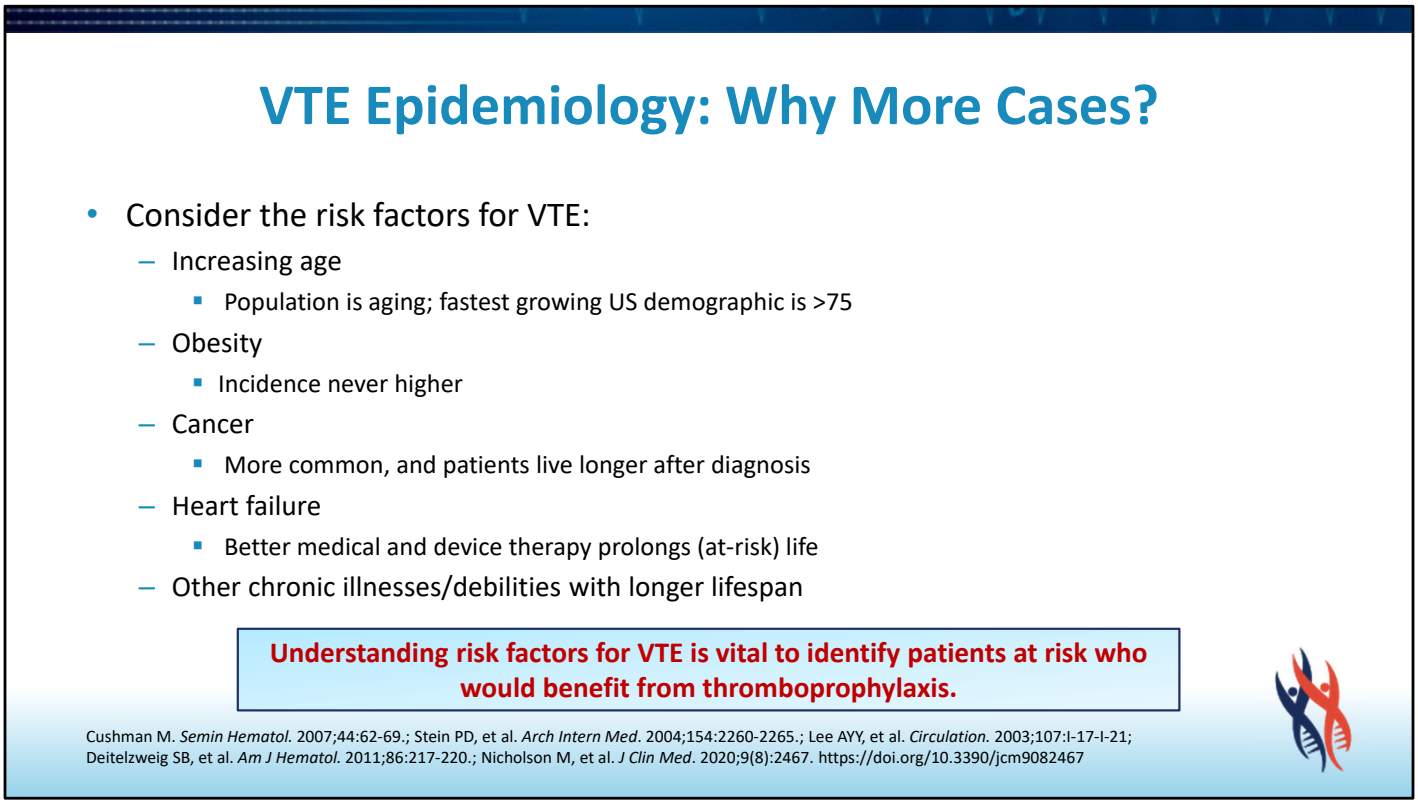
Dr. Pollack: Well, I spoke earlier about what VTE is, is this continuum of disease, DVT/PE, and I spoke about post-thrombotic syndrome, again, also sometimes called post-phlebitic syndrome. There's a special type of pulmonary hypertension called CTEPH, one of those times when the abbreviation actually helps a lot because it's easier than saying Chronic Thromboembolic Pulmonary Hypertension, which is a sequelae of repeated PEs, most of which are very small and by themselves don't do any damage, but over time, they start to create this pulmonary hypertension, which can be really disabling for patients.

DVT is usually the start, but again, it doesn't have to start at DVT. Patients can present first blush with a PE just like someone with coronary artery disease may not start with unstable angina and gone instantly to STEMI and then have a STEMI sometimes they come in with the tombstone ST elevation, the first time they have chest pain. DVT, what happens typically starts in the lower extremities, it does happen in the upper extremities, and there's no diminution of the risk of those clots embolizing if they form in the upper extremity, or in the pelvis, the pelvis is really problematic for us because ultrasounds don’t really pick them up well there.

Classically, DVT produces pain and distal edema. It can either propagate meaning the clot goes up proximally towards the heart or it can embolize. In fact, every DVT embolizes. If you've got a DVT, they're always little micro embolize flipping off and going north to the lungs, but genuinely they're small enough that they don't cause symptoms or pulmonary injury. It's only when a big piece

breaks off, and it may actually be the entire clot that breaks off and goes North-- then we have a PE.

Dr. Pollack: If we look at this continuum of disease of VTE, it actually kills more Americans each year than, get this, breast cancer, HIV/AIDS, and motor vehicle accidents combined. This is a real public health problem by any measure. I'm an emergency physician. I'm biased, but I will tell you that except when it occurs on the inpatient ward, most VTE presents to the emergency department. Why is that important? Because we better not miss it. We can't say, "Well, I think it's just a muscle strain or I think he's got a baker cyst behind his knee." We got to be sure that we know whether or not the patient has a DVT so we can initiate treatment because remember any DVT can embolize and create a potentially fatal pulmonary embolism.



Dr. Pollack: We all recognize in the public health world as well as in clinical practice, that we're seeing more cases of VTE than we've ever seen before. Why is that? It's really not hard to understand. If we look at the risk factors of VTE, they're all going up. VTE increases with increasing age. Well, the fastest-growing demographic in the US population right now is patients over the age of 75. Obesity is an independent predictor of VTE risk.

Well, you may have noticed, no matter where you practice, but particularly if you're Mississippi obesity is a real problem. The incidence has never been higher, people talk about an epidemic of obesity. It's a problem. In addition to all the other cardio, metabolic stresses, and sometimes economic stresses that morbid obesity puts on patients, it also significantly increases their risk of VTE.

Cancer is a very common comorbidity among patients with VTE and, in fact, sometimes it goes the other way around. Sometimes cancer is discovered because a patient develops a DVT and we don't know why. The cancer is figured out once the workup for the DVT or the PE goes along. Cancer is more successfully treated now than it has been in the past, but what that means is, these patients have a longer lifespan at risk for developing cancer-related VTE.

Dr. Pollack: Heart failure, oh my gosh, we got more drugs and procedures to treat heart failure than we've ever had before, but patients with heart failure, even if they do pretty well, that's functioning at a pretty high level, there's still a continuing risk for VTE. That's going up. There are many other chronic illnesses and disabilities, think about COPD, for example, that patients are being treated more successfully, they have a longer lifespan. For that entire lifespan, they're at risk of VTE.

If you think about that within your patient population, that's important to understand who might be experiencing a DVT in the face of nonspecific symptoms. Also, it helps us identify patients who would likely benefit from thromboprophylaxis either around a surgery or run an acute care medical hospitalization.

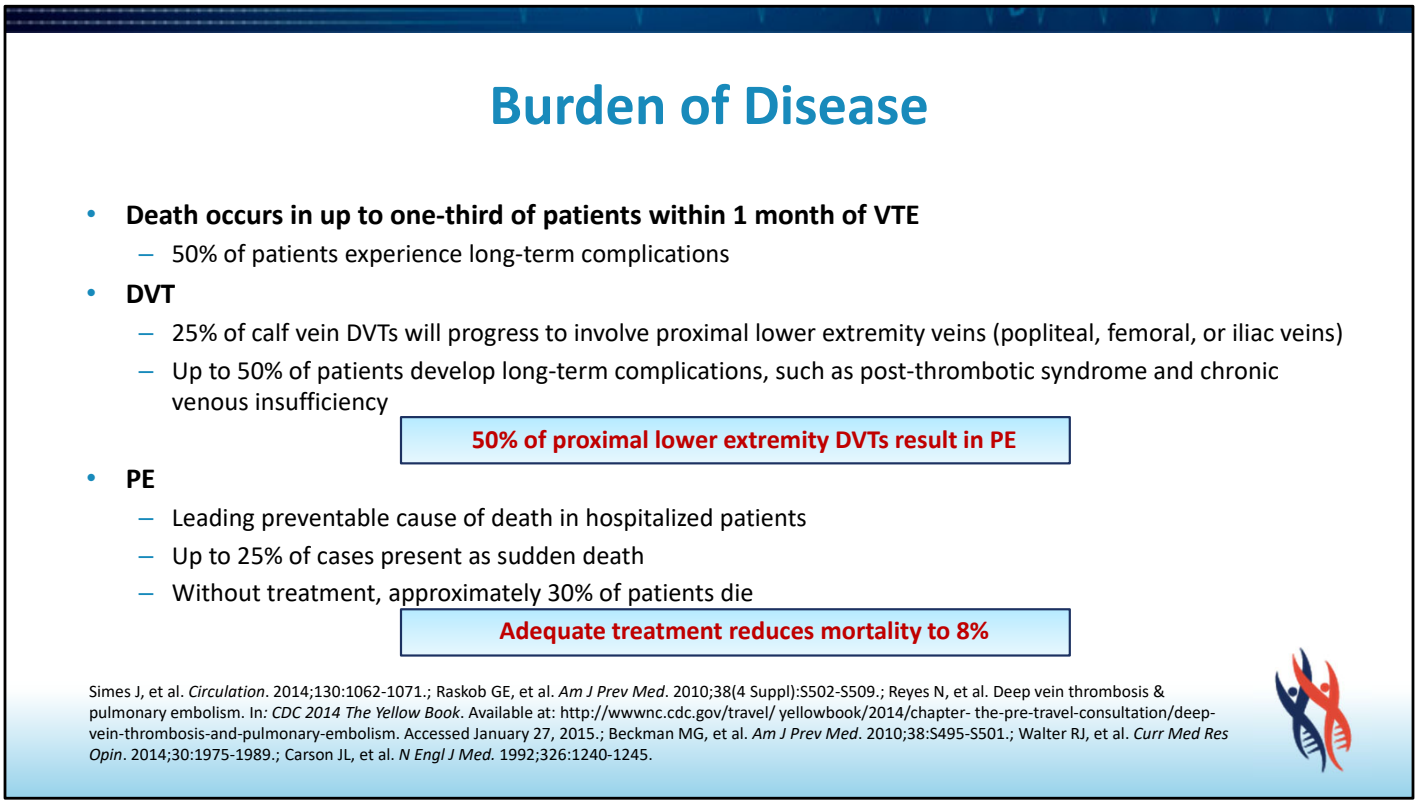
The Impact of VTE

- VTE is a serious health problem with a high mortality rate
  - One of the most common causes of death among hospitalized patients
- Each year, VTE affects as many as 900,000 Americans and 60,000-100,000 die of DVT/PE
- Sudden death is the first symptoms in 25% of PE cases
- 5% to 8% of Americans have one of several genetic risk factors for VTE

CDC. Data and Statistics on Venous Thromboembolism. https://www.cdc.gov/ncbddd/dvt/data.html. Accessed March 20, 2021.;
Lau B, et al. *Med Care*. 2015;53(1):18-24.

Dr. Pollack: The impact of VTE is pretty easy to quantify. High mortality rate if the patient has a PE. It's certainly one of the most common causes of death among hospitalized patients, probably one of the most, if not the most common cause of death in patients who die outside the hospital and never have an autopsy. So we don't know for sure what caused it. Each year venous thromboembolism affects about a million people. Somewhere between 60,000 and 100,000 die of PE, it says DVT/PE you don't really die of DVT, but DVT is often the source of PE. Sudden death is the first symptom of PE in 25% of patients. You're behind the eight-ball and at least one out of four patients when they have that disease.

They're also genetic risk factors, things like Factor V Leiden, hyper homocystinuria, these people are at increased risk genetically determined for VTE, and somewhere between one and 20 and 1 in 10, Americans have at least one of those risk factors. This thing is here to stay, it's going to be with us, we need to be sure we identify it, diagnose it definitively, and then treat it appropriately.



Dr. Pollack: The burden of disease when death occurs, it occurs typically fairly early within a month of the diagnosis. That's because PE again is a pretty effective killer. Those patients who don't die even if they just have a simple DVT, often experienced long-term complications up to half of them, for example, will develop, particularly depending on what age they have the DVT post-phlebitic or post-thrombotic syndrome.

We think about 25% of calf DVT will progress up to a proximal DVT. We define proximal, I'm not going to hold my leg up here, but we define proximal as the popliteal vein or higher. Popliteal or femoral or iliac at least a quarter of those will progress even if when they're first diagnosed, they're below the knee. That's why serial ultrasounds are important. Again, up to half of these patients will develop long-term complications.

We think once you get proximal once you get above the popliteal and I say we think because, of course, we can't track every single patient who has a proximal DVT, we think about half of those will embolize. Now, not all of those create a very dramatic presentation when somebody comes in sudden death or cardiac arrest or needing to go to the ICU and immediately get thrombolysis, but still, they'll have a definable PE.

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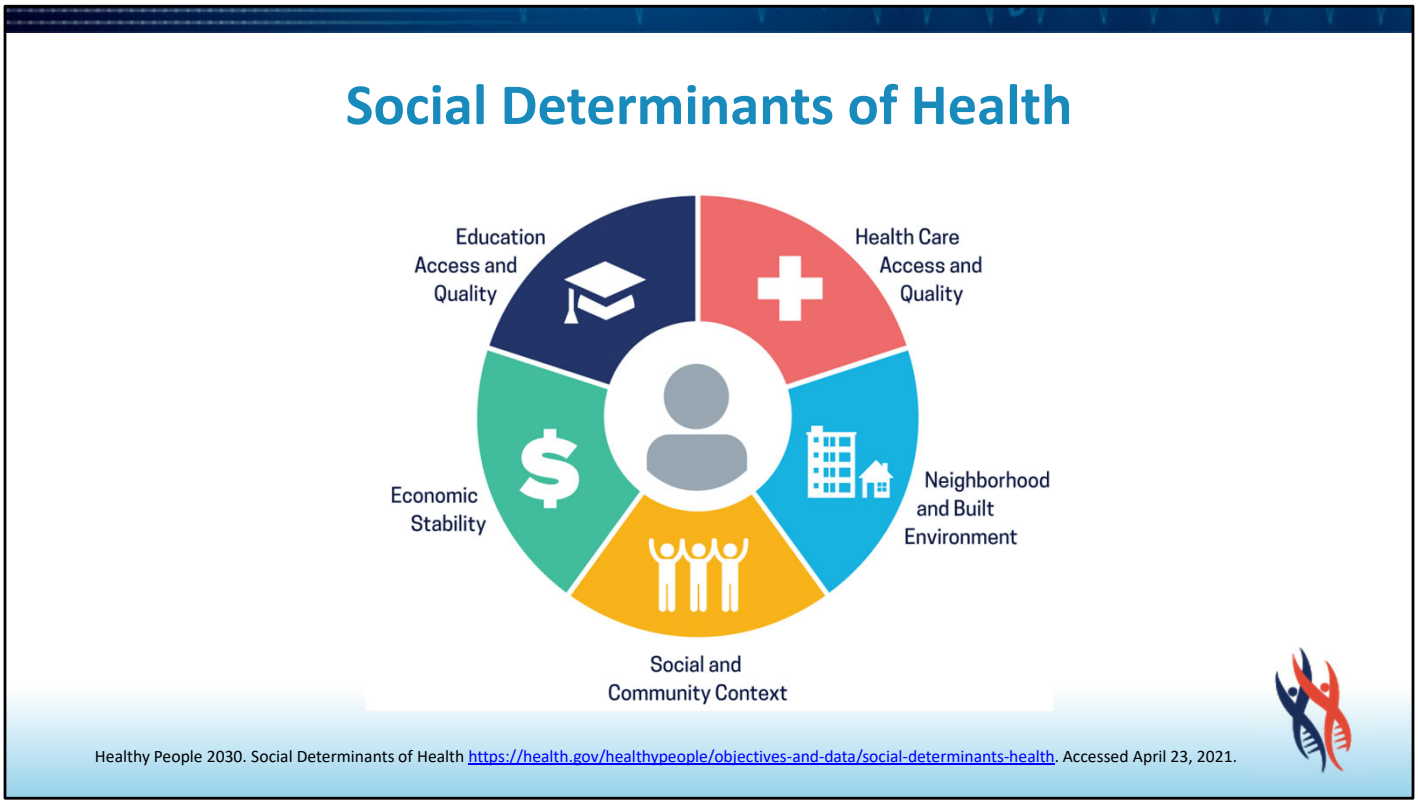
Dr. Pollack: PE, I mentioned on the last slide the leading cause of death in hospitalized patients, again up to a quarter present a sudden death and without treatment, which hopefully is never going to be the case but unfortunately, there's malpractice history to prove that it is sometimes the case about 30% of patients with PE will die, but adequate treatment reduces mortality down to the single digits. Again, very important, no matter where you work, small, Critical Access Hospital, a clinic, or a great big urban center, you got to recognize PE. It's a masquerader of sorts. It can look like heart failure. It can look like COPD. It can look like pneumonia. It could look like an MI. You've got to identify it because if you treat it, you can really save people a lot of long-term morbidity and potentially short-term mortality.



Dr. Pollack: There are issues around the social determinants of health. I alluded to some of them where the black Americans of whom we are primarily speaking tonight may have more issues with this disease, but I want Beth to take this slide and run with that a little bit.

Elizabeth Hood: Thank you. When we talk about social determinants of health, these are conditions in the environments where people are born and where they live and work and play and go to school that affect their health and functioning and quality of life and different risks that they're exposed to. These can be grouped into five domains, according to Healthy People 2030. When we look to have positive outcomes with our VTE patients in Mississippi, we have to understand that all of these domains plays a role for our patients. When we look at economic stability, one in 10 people in the United States live in poverty. In Mississippi, that's 20% of our population live in poverty. These patients are just not able to afford healthy food, their medications, doctors' appointments.

When you look at education access and quality, particularly in rural Mississippi, patients have less access to quality education, whether in high school or community college, or colleges, and they have less access also to job opportunities where they could get private health insurance. With healthcare access and quality, 13% of people in Mississippi have no insurance, and they are unable to get preventative health care services. A lot of them are unable to pay for medications to treat their chronic diseases. Even some of our patients that have private insurance or even Medicare, often cannot afford to pay their copays to see their doctor, or they can't find a qualified physician in their area that their insurance will cover.

Elizabeth Hood: When you think about the neighborhood and built environments, a lot of our patients don't have transportation. This is a big problem, especially in rural Mississippi. When patients don't have cars or not even public transportation for them to come to clinic or to the hospital when they're sick. This is a big problem in Mississippi.

Also, when you think about social and community context, this is when we're speaking of health literacy. In Mississippi, we have a lot of patients that have low health literacy. These patients require a lot more time to educate them so that they understand the importance of their medication. They understand why they need to take the medicines to treat their VTE in this situation and when to follow up with their physician. It requires you understanding your patient and all of these aspects if we're going to have a good, successful treatment of our patients with VTE in Mississippi.

Patient Advocacy

Leslie Lake
Board President
National Blood Clot Alliance
Philadelphia, PA

Elizabeth Hood: I want to introduce Leslie Lake of the National Blood Clot Alliance. She is a PE survivor and also a patient advocate, so we're going to hear from her today.

Leslie Lake: Hi, my name is Leslie Lake and I'm a pulmonary embolism survivor. What happened to me? In June of 2018, I was walking back to my apartment. All of a sudden had a really hard time breathing, going up a slight incline, and thought I was having a heart attack. I managed to make my way back to my apartment, holding onto the side of buildings, and called my doctor's office who had just retired and was told that I couldn't come into their office because I would be considered to be a new patient.

Long story short, I ended up in the emergency room. I really didn't want to go to the emergency room. That led me to a place called the National Blood Clot Alliance. The National Blood Clot Alliance is the only patient advocacy group in the United States focused purely on blood clots so, DVTs and PEs, and it's an online facility for patients to get information. The information was so good that I ended up actually joining the board. I'm now chairman of the board of the National Blood Clot Alliance.

Leslie Lake: Anyway, as the research continued, I started to learn that women and African Americans, in particular, were at much higher risk of blood clots, as high as 30 to 60% higher for African Americans than Caucasians. Is it because they're not treated the same? Is it because they have a higher incidence level? There are a lot of unknowns. The same thing with women, women tend to get treated differently. I was treated differently. I was having a hard time breathing. I couldn't breathe, but yet they insisted upon doing three gynecological exams on me.

If you were an African American woman and you're pregnant, it is one of the leading causes of maternal death for women, a pulmonary embolism. Much of this can actually be controlled in a hospital setting. We know that there's a tremendous level of disparities between who gets treated, how they get treated, and their outcomes over a certain amount of time.

Racial Disparities in Incidence of VTE

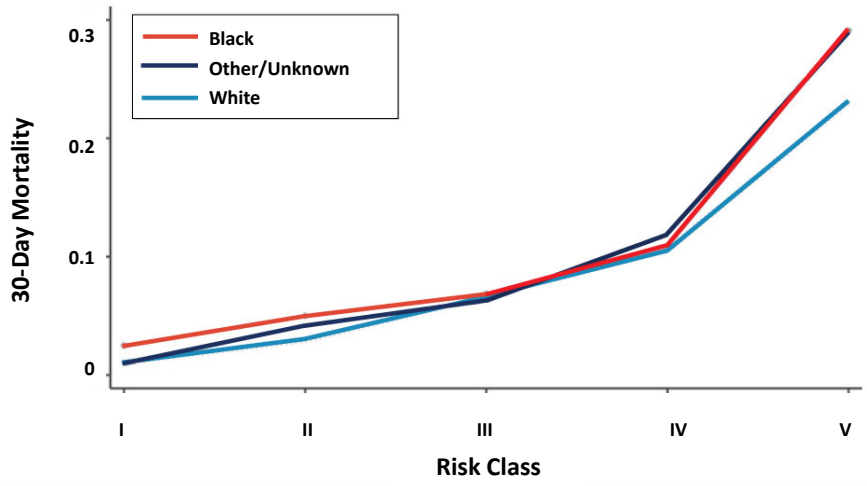
- Incidence of VTE, including DVT and PE, is 30-60% higher for Blacks than Whites
  - Sickle-cell trait associated with increased risk of VTE
    - Up to 8% of Black Americans carry the sickle-cell trait
  - Idiopathic VTE, especially idiopathic PE, is higher among Blacks (18% vs 10%)
  - Pregnancy related VTE rates are also higher in African American patients
- 30-day mortality 30% higher for Blacks
- Blacks who passed away for VTE were typically 9 years younger than Whites
- Incidence of out-of-hospital fatal PE was 3 times higher for Blacks than Whites
- Significantly higher incidence of VTE in Blacks in rural Southeast than in Blacks in the rest of the country, something not seen among Whites

Buckner T, et al. *Circulation*. 2012;125:837-839.; Zakai N, et al. *Circulation*. 2014;129(14):1502-1509.; Ibrahim S, et al. *Am J Public Health*. 2006;96(12):2161-2164.; Heit J, et al. Am *J Hematol*. 2010;85:467-471.; Frydman G, et al. *Clin Appl Thromb Hemost*. 2020;26:1-8.

Dr. Hadley: Racial disparities and incidence of VTE. The incidence of VTE, including DVT and PE, is 30 to 60% higher for blacks than whites. The sickle cell trait associated with the increased risk of VTE and up to 8% of black Americans carry the sickle cell trait. Idiopathic VTE, especially idiopathic PE is higher among blacks with 18% versus 10%. Pregnancy-related VTE rates are also higher in African American patients as well.

30-day mortality is 30% higher for African Americans. Blacks who passed away from VTE were typically nine years younger than whites. The incidence of outpatient or out-of-hospital fatal PE was three times higher for blacks than whites, significantly higher incidence of VTE in blacks in rural southeast than in blacks in the rest of the country. Something not seen among our white counterparts.

VTE Risk of Mortality by Race and Risk Class



Buckner T, et al. *Circulation*. 2012;125:837-839.; Zakai N, et al. *Circulation*. 2014;129(14):1502-1509.; Ibrahim S, et al. *Am J Public Health*. 2006;96(12):2161-2164.; Heit J, et al. Am *J Hematol*. 2010;85:467-471.; Frydman G, et al. *Clin Appl Thromb Hemost*. 2020;26:1-8.

Dr. Hadley: This graph shows the VTE risk of mortality by race and risk class and as you can see in African Americans, the 30-day mortality rate is much higher than our counterparts.

Barriers to Better Health Care in the Black Mississippi Population

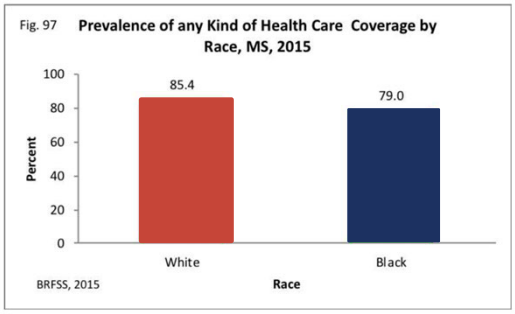
- Distrust of the medical profession
- Lack of health insurance
  - May be related to the high cost of insurance (as high as 20% of the average household income)
  - Lack of Medicaid Expansion and other subsidized programs
  - Coverage gaps - the person may earn too much to qualify for the traditional Medicaid program, but also may not earn enough to be eligible for premium tax credits under marketplace plans
  - Most states that have not expanded Medicaid are in the south (Mississippi is one of them)
- Blacks in Mississippi have the highest mortality rate from cardiovascular diseases, diabetes, renal disease, and cancer
- Nationwide, Blacks are less likely to receive a full course of anticoagulation after VTE or direct-acting anticoagulants than other racial or ethnic groups
  - Odds ratio 0.86

Annual Mississippi Health Disparities and Inequities Report. 2018. http://www.msdh.state.ms.us/msdhsite/index.cfm/44,8072,236,63,pdf/HealthDisparities2018.pdf. Accessed March 22, 2021.; Nathan A, et al. *Circ Cardiovasc Qual Outcomes.* 2019;12:e005600.; Buckner T, et al. *Circulation.* 2012;125:837-839.; Racism, Inequality, and Health Care for African Americans. 2019, Dec. 19. Taylor, Jamila. The Century Foundation.tcf.org

Dr. Hadley: Some barriers to better health care in the black Mississippi population. The first area is distrust of the medical profession. A lot of African Americans in our area don't trust the doctors and they don't trust the healthcare establishment just because of past experiences. That's something we've been actively working to alleviate in Mississippi. Lack of health insurance, There's a couple of different reasons for this. It may be related to a higher cost of insurance, which is as high as 20% of the average household income, lack of Medicaid expansion, and other subsidized programs in the state of Mississippi. Some coverage gaps and this means a person who earns too much money to qualify for traditional Medicare or Medicaid programs, but they also don't earn enough money to qualify for premium tax credits on the marketplace plans. Most states that have not expanded Medicaid are in the south and Mississippi is one of them. Blacks in Mississippi have the highest mortality rate for cardiovascular disease, diabetes, renal disease, and also cancer. Nationwide, blacks are less likely to receive a full course of anticoagulation after VTE or direct-acting anticoagulants than other races and ethnic groups. The odds ratio is 0.86.

Barriers to Health Care in Mississippi in Black Patients with VTE

- Barriers to better health care in the Black Mississippi population
  - Poverty
    - Food insecurities
    - Lack of safe and affordable housing
  - Inequities in education
  - Lack of access to HCP in their areas
  - Lack of transportation and transportation infrastructures
  - Racial bias



Of adult Mississippians, a significantly higher prevalence of Whites (85.4%) is covered by any health care in comparison to Blacks (79.0%)

Annual Mississippi Health Disparities and Inequities Report. 2018. http://www.msdh.state.ms.us/msdhsite/index.cfm/44,8072,236,63,pdf/HealthDisparities2018.pdf. Accessed March 22, 2021.; Nathan A, et al. *Circ Cardiovasc Qual Outcomes.* 2019;12:e005600.; Buckner T, et al. *Circulation.* 2012;125:837-839.; Racism, Inequality, and Health Care for African Americans. 2019, Dec. 19. Taylor, Jamila. The Century Foundation.tcf.org

Dr. Hadley: Barriers to healthcare in Mississippi and black patients. Also, poverty plays an instrumental role in the barriers that are placed in front of African Americans as far as access to healthcare, food insecurities, lack of faith in affordable housing, inadequacies in education, the lack of access to healthcare providers in their area, lack of transportation and transportation infrastructures, and also racial bias.

COVID-19 Increases the Risk of VTE

- VTE incidence among patients hospitalized with COVID-19 runs as high as 7.7% to 17%
  - Severe COVID-19 induces a prothrombotic state
- Black patients are 2.9 times more likely to be hospitalized with COVID-19 and 1.9 times more likely to die
  - Health care disparities and socioeconomic status play major role in this
  - Black patients less likely to be prescribed anticoagulants and when prescribed tend to spend less time within the therapeutic range for warfarin treatment

  - Despite increase in prescriptions of DOACs in the US overall, Black Americans less likely to receive them, even when controlling for socioeconomic variables
  - Black patient underrepresented in clinical trials: Only 4% of the clinical trial population for many of these anticoagulants has been Black

Jimenez D, et al. *Chest*. 2021;159:1182-1196.; Ramasamy R, et al. *Br J Haematol*. 2020;190(2):e78-e80. doi: 10.1111/bjh.16869. CDC. Risk for COVID-19 infection, hospitalization, and death by race/ethnicity. Accessed March 23, 2019.; Frydman G, et al. *Clin Appl Thromb Hemost*. 2020;26:1-8.

Dr. Hadley: COVID-19 increased risk of VTE. VTE incidence among patients hospitalized with COVID-19 run as high as 7.7% to 17% and severe COVID-19 induces a prothrombotic state. African Americans are 2.9% more likely to be hospitalized with COVID-19 and 1.9 times more likely to die. Healthcare disparities and socioeconomic status may play a role in this. Black patients, are less likely to be prescribed anticoagulants and when prescribed, tend to spend less time within the therapeutic range for warfarin therapy.

Despite increases in prescription of DOACs, in the US, overall, black Americans are less likely to receive them, even when controlling for the socioeconomic variables. Black patients are underrepresented in clinical trials, 0.4% of the clinical trial population for many of these anticoagulants have been black.

Mechanism of Thrombus Formation in COVID- 19

- Multifactorial
- Believed to be stimulated by endothelial injury caused by SARS-Co V-2 infection
- Leads to micro- and macro-thrombosis
- Causes:
  - Vaso endothelial dysfunction
  - Loss of anticoagulant properties
  - Associated with the increase of von Willebrand factor, Factor VIII, Angiopoietin 2, increased fibrinogen, presence of antiphospholipid antibodies, and dysregulated inflammation.
  - African Americans may have a high risk secondary to fact that they may have higher circulation levels of VWF, Factor VIII and fibrinogen

Iba T, et al. *Int J Hematology*. 2021;113(3):330-336.

Dr. Hadley: Mechanism action of thrombosis formation in COVID-19. It is multifactorial, is believed to be stimulated by endothelial injury caused by SARS COVID-19 infection, and it leads to micro and macro thrombosis. We all know about Virchow's Triad which includes injury to the endothelial of the vasculature. These all play a pivotal role in thrombus formation. Vaso endothelial dysfunction, loss of anticoagulant properties associated with the increase in Von Willebrand Factor, Factor VIII, Angiopoietin-2, increased fibrinogen, and presence of antiphospholipid antibodies and dysregulated inflammation, all play an important role. African Americans may have a higher risk secondary to the fact that we have higher circulating levels of Von Willebrand Factor, Factor VIII, and also fibrinogen.

Factors that Increase the Risk of Hospitalizations

- One study completed in a Louisiana Health System between March 1, 2020-April 11, 2020
  - 3481 patients who tested positive for SARS-CoV-2, the virus that causes COVID-19 were included in the study
- 76.9% of the patients who were hospitalized with COVID-19 and 70.6% of those who died were Black, whereas Blacks comprise only 31% of the Ochsner Health population
- Demonstrated the following factors that affected the rate of COVID hospitalizations
  - Race
  - Increasing age
  - Higher score on the comorbidity index
  - Public insurance (Medicare or Medicaid)
  - Residence in a low-income area
  - Obesity

Price-Haywood EG, et al. *N Engl J Med*. 2020; 382:2534-2543.

Dr. Hadley: Factors that increase the risk of hospitalization. There was a study completed in a Louisiana health system between March the 1st, 2020 and April the 11th, 2020 in which 3,481 patients who tested positive for COVID were included in the study. Approximately 76.9% of those patients were hospitalized with COVID-19, and 70.6% of those who died were black, whereas blacks comprise almost 31% of the Ochsner health population. this demonstrated the following factors that affected the rate of COVID hospitalizations. Race, increasing age, higher score on the comorbidity index, public insurance which is Medicare versus Medicaid, and residence in a low income area, and obesity all were factors in increased risk of hospitalizations with COVID-19.

Interactive VTE Case Study with COVID-19 Considerations

- Mrs. CJ is a 46 y/o African American female who presented to a local emergency department with chief complaint of having shortness of breath for the last 2 days. Subjectively she states that she has not been able to ambulate much. When she walks for short distances, she feels as if she is going to pass out. Patient also reports having a fever, chills nausea/vomiting, and some diarrhea. The patient states that she has been exposed to some relatives recently who may have been infected with COVID-19
- Past medical history
  - Hypertension
  - Diabetes mellitus
  - Morbid obesity
  - Diabetic nephropathy
  - History of CVA
  - Hyperlipidemia
  - Anemia

Dr. Hadley: We now have an interactive VTE case study. Ms. CJ is a 46-year-old African American female who presented to the local emergency department with the chief complaint of having shortness of breath for the last two days. Subjectively, she states that she has not been able to ambulate much. When she walks for short distances, she feels as if she's going to pass out. She also reports having a fever, chills, nausea, vomiting, and some diarrhea.

The patient states that she has been exposed to some relatives who recently have been infected with COVID-19. Her past medical history includes hypertension, diabetes mellitus, morbid obesity, diabetic nephropathy. She has a history of having a CVA within the last two years, hyperlipidemia, anemia.

Clinical Case Continued

- Social history: patient currently is disabled, she lives on a fixed income. She does not smoke drink or use any illicit drugs
- Allergies: NKDA
- Family history is positive of blood clots on her mother's side
- Upon arrival, patient was seen and evaluated; she subsequently was noted to have an elevated LDH of 734, a CK-MB that was normal at 0.22, a troponin that was normal at 0.012, and a D-dimer 5898. Hgb. She also had a hemoglobin of 6.2 and a rapid COVID test was positive
- Because of her D-Dimer being elevated, a CTA of the chest was obtained
- Chest CTA revealed:
  - Right middle and right lower lobe emboli
  - Groundglass consolidation considered consistent with COVID pneumonia and possible pulmonary infarct
- Patient was transferred to a tertiary facility for further management of her condition

Dr. Hadley: Her social history, she is currently disabled and she lives on a fixed income. She does not smoke, drink, or use any illicit drugs. She has no known allergies at the present. Her family history is positive for blood clots on her mother's side.

Upon arrival to the local emergency room, she was seen and evaluated, and subsequently, it was noted that she had an elevated LDH of 734. A CK-MB that was normal at 0.22 and a troponin that was also normal in 0.012. Her D-dimer was largely abnormal, with a value of 5,898. Her hemoglobin was 6.2 and she had a rapid COVID test that was positive. Because of her D-dimer being elevated, a CTA of the chest was obtained, and the CTA revealed right middle lobe and right lower lobe emboli, ground glass consolidations considered consistent with COVID pneumonia, and possible pulmonary infarct.

This patient was subsequently transferred to a tertiary facility for further management of her condition. Now, we'll have Charlie who will lead us into some discussion of this case.

Dr. Pollack: Thank you, Degail. That's a great case. Before we go to these questions, I just want to point out a couple of things of interest. This is a particularly sobering slide, and I just want to call your attention to it again. This is from Ochsner, a storied health care facility in the state of Louisiana. These numbers are just staggering. 77% of the patients who are hospitalized with COVID-19, and 71% of those who died were black. If you look at the catchment area of option, which is large across Louisiana, only 31% of them are black.

We've got to have our antenna up, our clinical antenna, if you will, for recognizing that these underserved minorities are at greater risk of bad things happening to them, and it's disproportionate to how often they present at the hospital.

I also want to point out in Ms. CJ's history here, she's got morbid obesity. Yes, that's the main VTE risk factor that shows up here, but her history is pretty suggestive. Now, the problem is in COVID times, you can say, "Well, this is probably just COVID pneumonia." Then, you got to think about the fact that she could have in this thrombo inflammatory disease that we call COVID-19, she could have clot, in addition, to COVID pneumonia.

The workup is certainly suggestive of that. Now, I think probably most of you on the call will recognize that an elevated D-dimer is nonspecific, but that's as Dr. Hadley said, that's a pretty significantly elevated D-dimer. That really should raise your concern for a venous thromboembolic event. Fortunately, she had a chest CTA done. She did, in fact, have the COVID pneumonia. That ground glass consolidation, I speak from experience, I had a bilateral COVID pneumonia. I still have ground glass consolidation in both the lower lungs. More importantly, that angiogram showed that she had a right middle and right lower lobe embolus. Fortunately, she was transferred to a tertiary care facility.

Let's assume that we've gotten her to the point with her very significant PE, that she's now ready for oral therapy. It used to be that the oral therapy, in fact, the only oral therapy we had for patients with PE once they were ready to be offered parenteral drugs was warfarin. Of course, by the time they were ready for oral therapy, they've been bridged with heparin or low molecular weight heparin. Now we have these DOACs available and there are four of them that are approved by the FDA. We're going to talk more about these later, for the treatment of venous thromboembolism. Two of them can be used directly without any heparin or low molecular weight heparin lead in. The other two do require lead in, which this patient would have had.

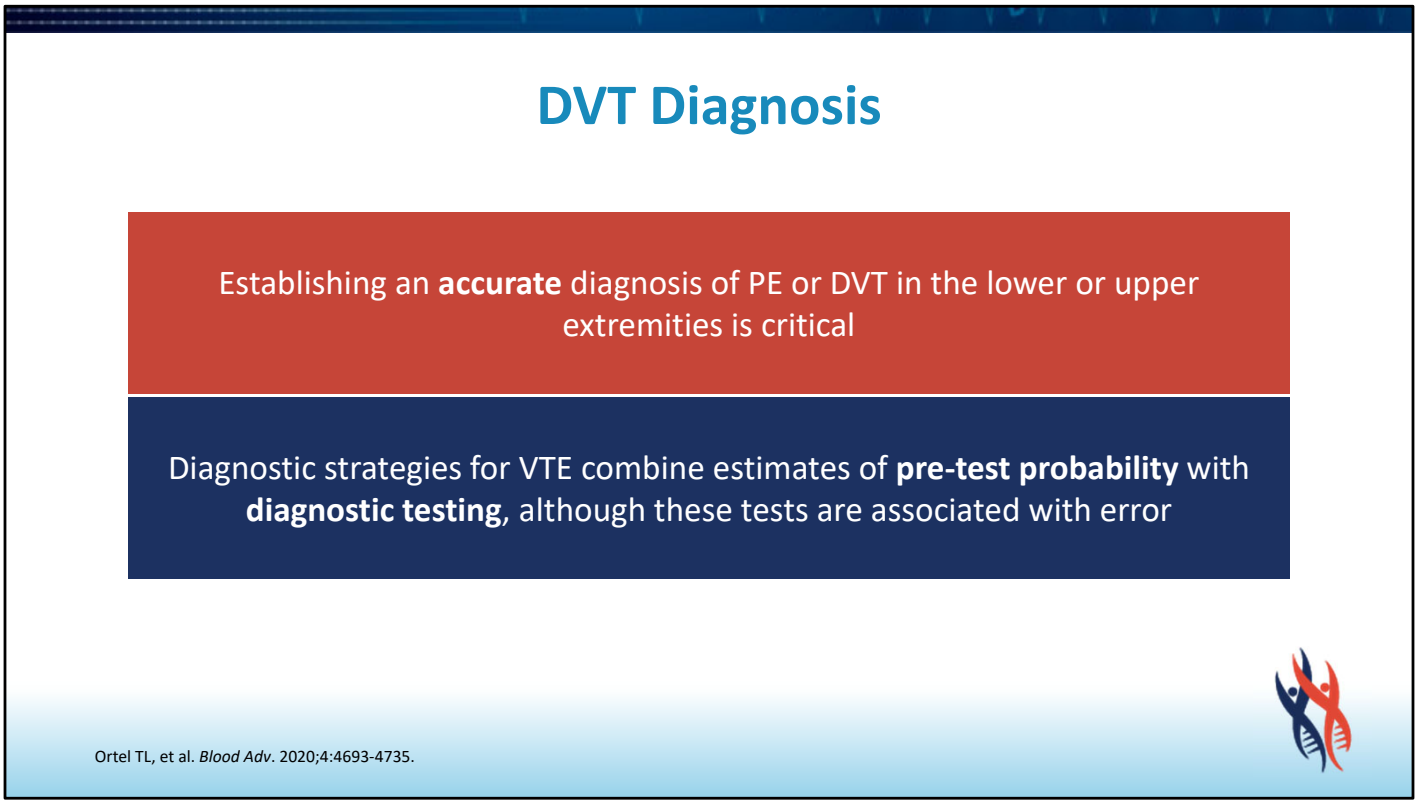
How do you make a choice? Well, you think about drug-drug interactions, the DOACs don't really have much in the way of drug-drug interaction. You think about dosing, they are, for the most part, twice a day, with the exception of edoxaban, which is once a day.

Dr. Pollack: What really comes down to in underserved populations who tend to be underinsured at a Critical Access Hospital is what can they pay for? What can we get coverage for through the social worker or case manager? Who is going to have the best indigent patient support program? There's no one answer to this question. It's going to depend on what hospital you're at, what county you're at whether or not the patient has insurance.

Degail, you see patients like this, unfortunately, with some regularity. What are some of the ways you make a decision on which DOAC to use if, in fact, you're not going to put the patient on warfarin, which I wouldn't do? I would much rather them be on a DOAC. How do you approach this?

Dr. Hadley: Well, we approach it by looking at what resources we have, that we can assist this patient with. Obviously, we look at the insurance to see like say, for instance, they're on Medicaid, look at the Medicaid formulary list to see which ones are available to the patient. That is the main lead into which ones we place the patient on. We also look at the compliance of the patient. Sometimes patients who may be on warfarin may be lost to contact when they have to come in and get PT/INR, and things of that nature. Does this patient have transportation to go into a lab and get a PT/INR? Do they have the financial resources to be able to afford this if they don't have insurance?

Those are some of the things we look at when we look at what anticoagulants we place the patient on. It's really based on that particular patient and is catered toward that particular patient and what their needs might be at that particular time.



Dr. Pollack: Let's move on to diagnosis and treatment. This is something that we're going to run through fairly quickly but it's foundational information that I think everybody needs to get a refresher on every now and then.

Really critical that we make that diagnosis early and accurately. This is one of those areas where there's a broad differential diagnosis. A patient with a swollen leg or a patient with shortness of breath. Think about all the differential considerations that come into play with those two chief complaints. You have to take this concept of pretest probability. That is, do I think this patient may actually be at risk of having a DVT? Well, we talked about the risk factors, if they're obese, if they're pregnant, if they have cancer, if they have heart failure, maybe if they have COPD.

That increases their risk, which means that increases their pretest probability, makes you more likely to check that d-dimer, maybe more likely to order an ultrasound. Likewise, more likely to get a CT scan if they're short of breath. The diagnostic testing can be lengthy, it can be expensive. We can't afford to do CAT scans when everybody comes in with shortness of breath. We need to think about pretest probability and decide who's most likely to benefit from further testing than just a clinical evaluation.

Prevalence and PTP

- Venous thromboembolism (VTE) diagnosis is based on an assessment of the clinical probability of VTE in a population, prior to diagnostic testing *(pre-test probability; PTP)*
- Patients are classified into *low/intermediate/high* probability **or** *likely/unlikely* to have VTE
  - *Low* PTP *(unlikely)* = *low* prevalence of VTE
  - *(Intermediate)/High* PTP *(likely)* = *high* prevalence of VTE
- Prevalence of VTE within a population influences predictive value of diagnostic tests

Ortel TL, et al. *Blood Adv*. 2020;4:4693-4735.

Dr. Pollack: Here's this concept, PTP pretest probability. There's a lot of work, much of it has been done. The reference here is from Lee Ortel but much of the pretest probability work has been done by a guy up in Canada named Phil Wells. I'm sure many of you have heard about the Wells score. There's a Wells score for DVT. There's a Wells score for PE. We'll talk about that in a minute. Basically, you as a clinician, doesn't matter whether you're a nurse or a nurse practitioner or a PA or physician, if the population you're seeing has a low prevalence of PE, then you're likely to approach that patient with a low pretest probability.

You got somebody who's not obese, who doesn't have cancer, who doesn't have chronic disease, who's never had a family history of a clot. That's a low pretest probability. Each one of the risk factors that lays in on top of that starts to increase your risk. Somewhere, there's a line between intermediate and high pretest probability. That is really going to be in your own mind as the provider. You're going to develop your own sense for that. As I'm going to show you, there's mathematical models that help with that.

Keep in mind that the prevalence of VTE within population influences the predictive value of diagnostic test. Again, a very low pretest-probability patient, you're unlikely to get a diagnostic test to help you predict that the patient actually has DVT or PE.

Optimal Approaches to VTE Diagnosis: Wells Criteria

Wells Score for DVT	
Clinical Parameter Score	**Score**
Active cancer (treatment ongoing, or within 6 months or palliative)	+1
Paralysis or recent plaster immobilization of the lower extremities	+1
Recently bedridden for >3 days or major surgery <4 weeks	+1
Localized tenderness along the distribution of the deep venous system	+1
Entire leg swelling	+1
Calf swelling >3 cm compared with the asymptomatic leg	+1
Pitting edema (greater in the symptomatic leg)	+1
Previous DVT documented	+1
Collateral superficial veins (nonvaricose)	+1
Alternative diagnosis (as likely or greater than that of DVT)	-2
Total of Above Score	
High probability	≥3
Moderate probability	1 or 2
Low probability	≤0

Wells PS, et al. *Lancet*. 1997;350(9094):1795-1798.

Dr. Pollack: I spoke about Phil Wells. These are the Wells criteria for DVT. I'm not going to go through the scoring system, you see it there on the slide. You recognize the risk factors. Active cancer, we talked about. Bedridden, either from illness or major surgery or trauma. The entire leg is swollen, as opposed to just part of the leg. Pitting edema, that's asymmetric. That's a red flag in terms of DVT. Previous DVT, really important. I didn't point that out on Degail's case earlier, but that patient did have I think a family history of DVT in the past. If a patient has a personal history of DVT or PE, then that patient regardless of anything else, carries a 15 to 30 times relative risk higher than a patient who hasn't had a DVT or PE in the past of having another one.

Assessing and Diagnosing PE

Clinical Feature	Score
Clinical signs and symptoms of DVT (minimum of leg swelling and pain with palpation of the deep veins)	3
An alternative diagnosis is less likely than PE	3
Heart rate >100 beats per minute	1.5
Immobilization or surgery in the previous 4 weeks	1.5
Previous DVT/PE	1.5
Hemoptysis	1
Malignancy (ongoing treatment, treatment within 6 months, or receiving palliative care	1

Wells PS, et al. *Thromb Haemost*. 2000;83(3):416-420.

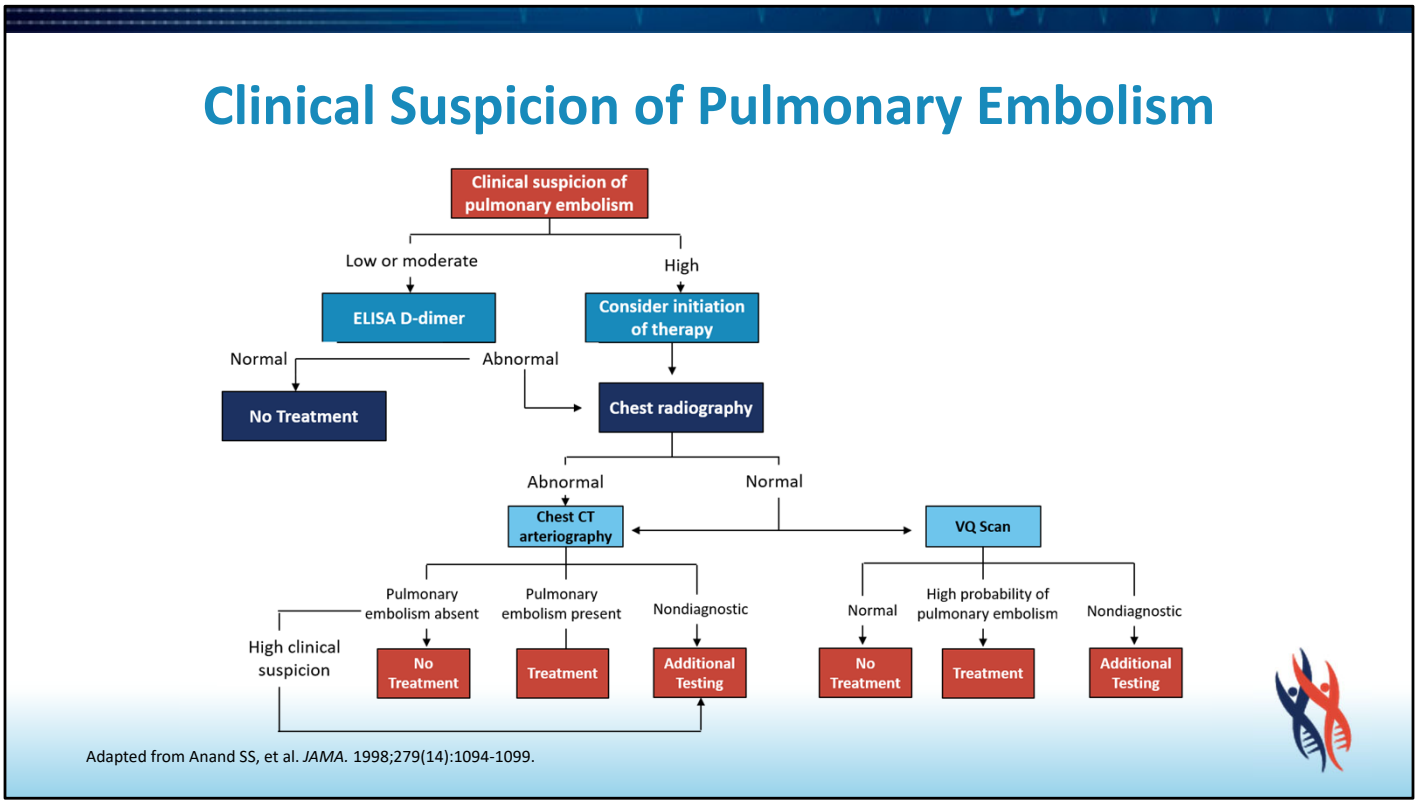
Dr. Pollack: Really important pieces of history to elicit for assessing and potentially diagnosing or at least raising the suspicion of PE. You see that the first one is clinical signs and symptoms of DVT. If a patient looks like he has a DVT, then obviously his or her risk of having a PE is that much higher. Likewise, if the patient has an alternative diagnosis that's less likely than PE, that's important towards making you think more about PE. If the patient has tachycardia, if the patient is coughing up blood, if the patient's got malignancy, these are all things that contribute again to the probability score that you're going to see in this case for PE.

Value of Assessment of Pretest Probability in DVT Diagnosis

- DVT was documented in 3%, 17%, and 75%of patients with low, moderate, and high pretest probabilities, respectively
- Serial ultrasonography was required in 28% and venography in 6% of patients; venous thromboembolism was diagnosed during a 3-month follow-up period in only 0.6% of patients thought not to have a DVT by this algorithm

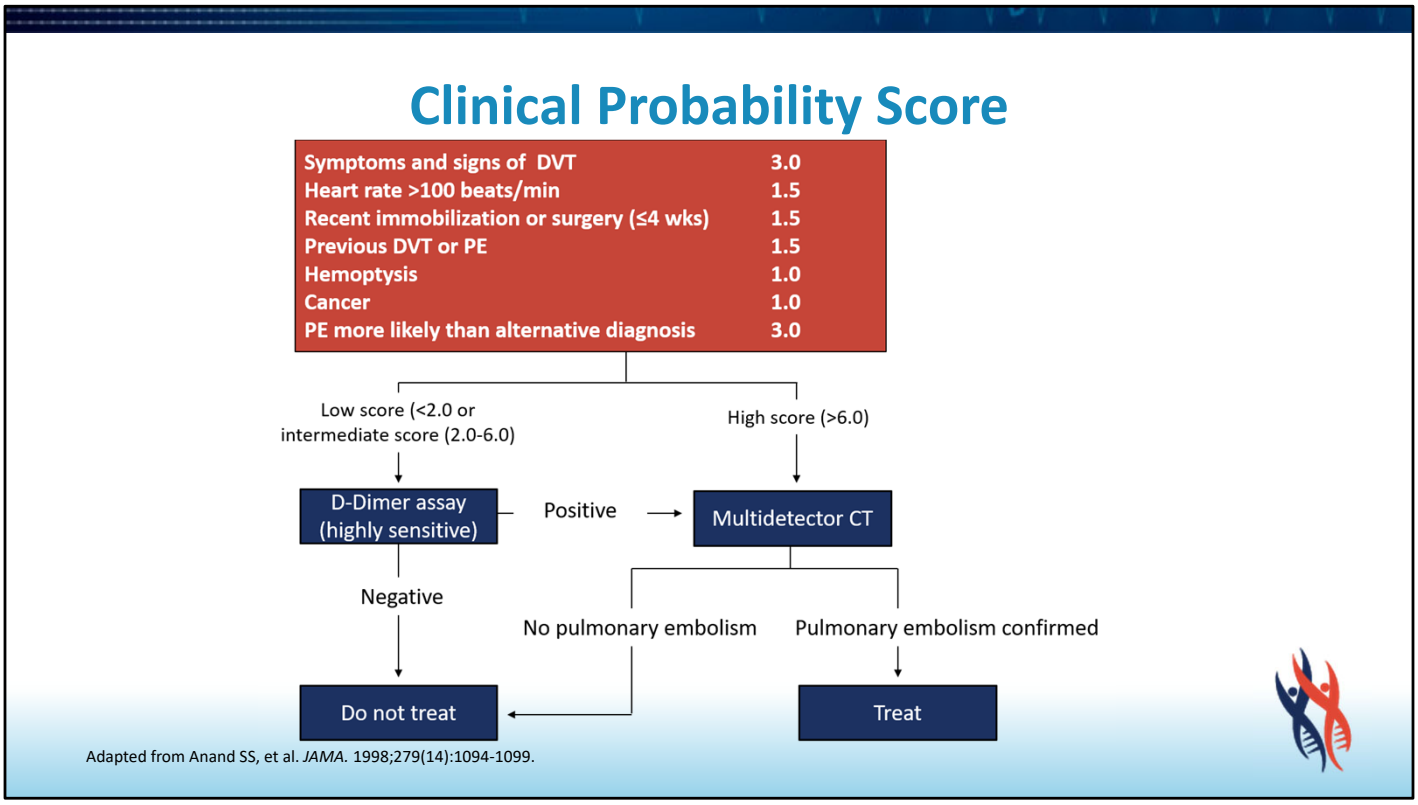
Wells PS, et al. *Lancet*. 1997;350(9094):1795-1798.

Dr. Pollack: In the initial study that Wells did, you see the date here. 1997, my gosh, that's 25 years ago. What he found with his system of dividing people in the low, moderate and high pretest probabilities, look how predictive his score was. If the patient with low probability, actually only 3% of them turned out to have DVT. If the patient was high pretest probability, 75% turned out to have DVT. The ultrasounds helpful, but man, that's pretty accurate right there just with clinical evaluation. They did serial ultrasonography in all of these patients, they did contrast venography in a lot of these patients, you don't do that in clinical practice, it's part of a clinical trial. Generally speaking, if they were low probability, then over the course of three months, only point 0.6%, 6 out of 1000 actually turned out to have a DVT. This is pretty highly predictive.

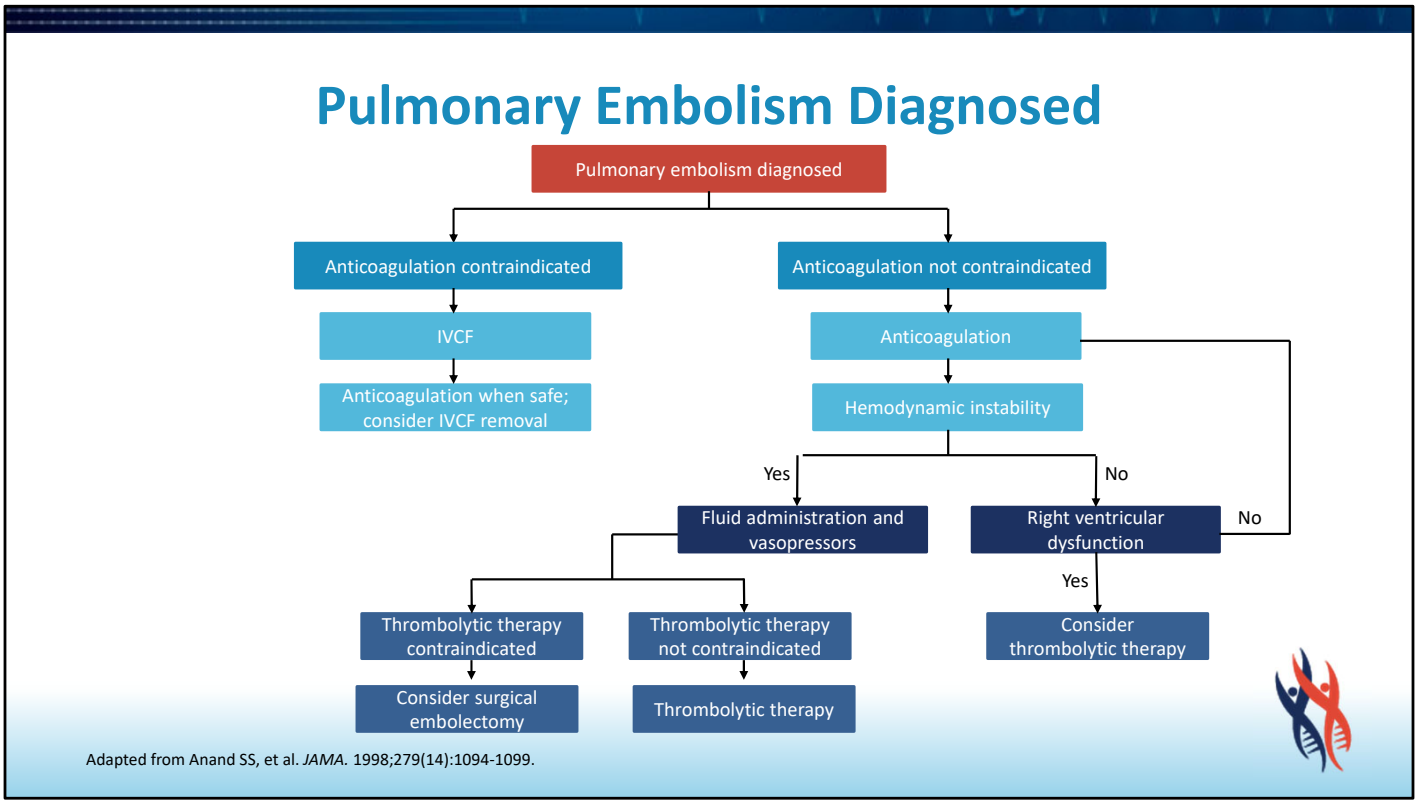


Dr. Pollack: This is the kind of a flowchart here of how to manage your clinical suspicion of pulmonary embolism. Look at that first branch point. It's your pretest probability. If you think the patient probably doesn't have a PE, then get a d-dimer. If you think they probably do have a PE, don't even bother getting a d-dimer. Go straight to some sort of imaging study and maybe even think about initiating therapy. Often a bad case is going to be with a parenteral agent first. A d-dimer can help separate out some of the low probability patients, you don't have to work with them anymore. If the chest radiography is abnormal, then you should go straight to CT. If it's normal, doesn't mean the patient doesn't have a PE, you still might consider doing a VQ scan or chest CT depending on what you have in your institution and how sick the patient is. Again, PE is a potentially mortal diagnosis. DVT is a morbid diagnosis. PE is a potentially mortal diagnosis.

If you're really thinking the patient may have PE, go ahead and initiate treatment. You can always pull it back. A lot easier to not give that next dose of low molecular weight heparin or turn off that heparin drip than it is to say, "Boy, I wish I had started this a half an hour ago before now, I've got to give them a thrombolytic."

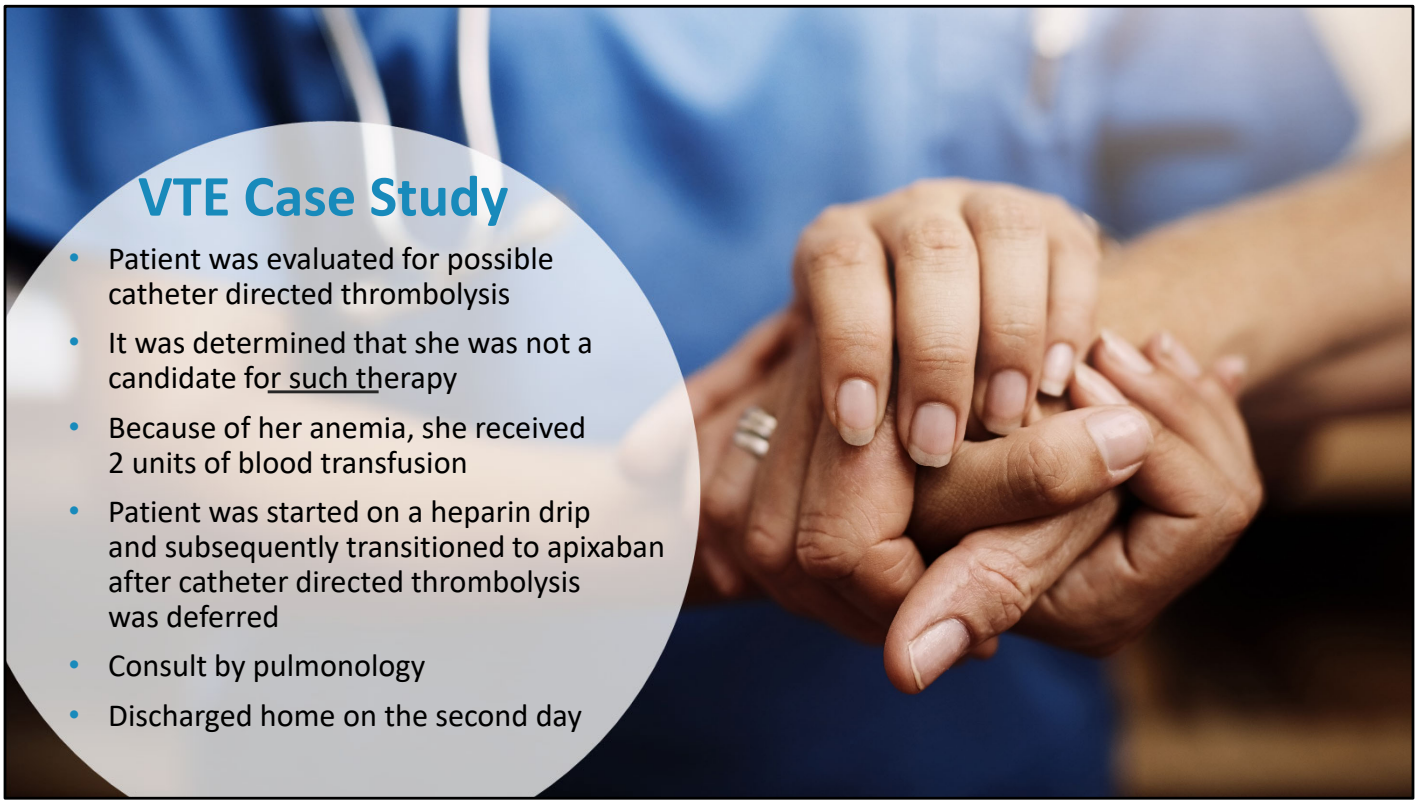


Dr. Pollack: This is just incorporating the Wells score into the diagnostic algorithm. Here again, differentiating with d-dimer for low probability or intermediate probability patients and straight to CT for high score patients. Once you suspect or confirm pulmonary embolism, go ahead and treat it.



Dr. Pollack: Once it is diagnosed, then there's a minority of patients who need thrombolytic therapy. Unfortunately, there's some in whom it's contraindicated like somebody who's had recent surgery or had a stroke in the past. Then those patients may need surgical embolectomy. Surgical embolectomy is a nasty procedure and it's got a high mortality. Hopefully, you're not going to see many of these patients anyway. If you do, you're going to be able to manage them with resuscitative measures and then lytic therapy, if it's needed.

I'm going to go back to DJ, who introduced us to our COVID positive patient earlier, who was confirmed to have a PE remember right, middle and lower lobe. He's going to take us through the rest of the course here.



Dr. Hadley: Thanks, Charlie. This patient was evaluated for possible catheter-directed thrombolysis. She was transferred to a tertiary care facility. The facility that she was initially triaged at did not have the capability. It was determined that she was not a candidate for such therapy. Because of her anemia, which created another dynamic in this case, she received two units of blood via transfusion. She started on the heparin drip and she subsequently was transitioned to apixaban. After catheter-directed thrombolysis was deferred, the capability of pulmonology coming in and doing a consult on her was initiated. This patient was discharged on the second day.

Dr. Pollack: Credit to the team that managed her there. This is a pretty sick patient coming in. Remember she's got COVID pneumonia in addition to her PE. They managed her well, they got her out. Very important question here that comes up in the discussion points, why did DJ make such a point to say that she was anemic and that she ended up being transfused? Well, because as I said a little bit ago, you cannot put a patient on an anticoagulant, any anticoagulant for that matter, any antiplatelet without having to give that patient some increased risk of bleeding.

If you wonder why this lady may have anemia, well, she's got a number of chronic diseases. Maybe it's just that. What if she's got a low-grade carcinoma in her colon and it's just oozing blood from day to day and over months and maybe in a couple of years, this tumor is very slow-growing and she hasn't really bled out or even noticed the melanoma that she might be having. You put that patient on an anticoagulant and suddenly that drip, drip is going to become stronger and more active and she may get into a lot of trouble. We do worry about patients who are anemic.

In fact, in both VT studies and in acute coronary syndrome studies, patients who initiate any thrombotic therapy, when they're already anemic, have a significantly higher risk of bleeding complications. There's something to think about. What are the contraindications of some of the agents? I think, we'll let Beth talk about that when she goes through the individual drugs.

Beth, let me let you from a pharmacy standpoint, talk about something that is often asked because we spent 50 years in the warfarin era, where we knew exactly where patients were at least on the day we tested them. We didn't know where they were between tests. On the day we test them, we can measure an INR and see just how many coagulated they are? What if they're on apixaban like this patient?

Elizabeth Hood: Well, there's really no reliable way to measure the activity of DOACs in most of our hospitals. It's just not something that we routinely do. Some patients will ask for that, especially if they've been on warfarin for a long time. They want to see a level. They want to know that it's working. Sometimes we would like to know if the patient is taking their DOAC. It would be nice to be able to check a level of some kind, but there's really no reliable way to do that in most hospitals.

Dr. Pollack: Yes, particularly with this program targeting critical access hospitals. There are specific tests that can be done to measure at a point in time, the intensity of anticoagulation with anti-Xa agent, which apixaban and rivaroxaban, and edoxaban are, but that's different from monitoring the anticoagulation, like we do with warfarin, which also serves as a compliance check. We have to accept that as one of the limitations of DOACs, even as we say, as I mentioned, a few slides back, these drugs are clearly a pharmacologic advance over warfarin.

VTE Treatment and Prevention: Non-Pharmacologic Measures

- External pneumatic compression
- Early ambulation
- A study found that intraoperative transcutaneous electrical nerve stimulation (TENS) had a significant effect in preventing DVT in patients receiving knee replacement surgery

- Avoiding sitting, particularly in women, decreases the incidence of PE

De Paolo V, et al. *Medscape*. Nov 5, 2020. https://www.medscape.com/answers/1267714-124603/what-are-the-nonpharmacologic-interventions-for-venous-thromboembolism-vte-prevention. Accessed March 23, 2021.; Izumi M, et al. *Knee Surg Sports Traumatol Arthosc*. 2015;23(11):3317-3323.; Kabrhel C, et al. *BMJ*. 2011;343:d3867.

Dr. Pollack: Let's briefly talk about non-pharmacologic measures, primarily for prevention of VTE treatment. You've probably all seen the pneumaboots and these sequential pressure devices that squeeze the blood out of the legs, particularly in postoperative patients, but also in ICU patients. Early ambulation after surgery, after trauma, ambulation, in general, not sitting on your rear end all the time, they say sitting is the new smoking, it also increases your VTE risk as well.

Then pain relief. If the patient is post-operative, then pain relief makes it a lot easier for that patient to start ambulating early and therefore decrease his or her risk of postoperative VTE.

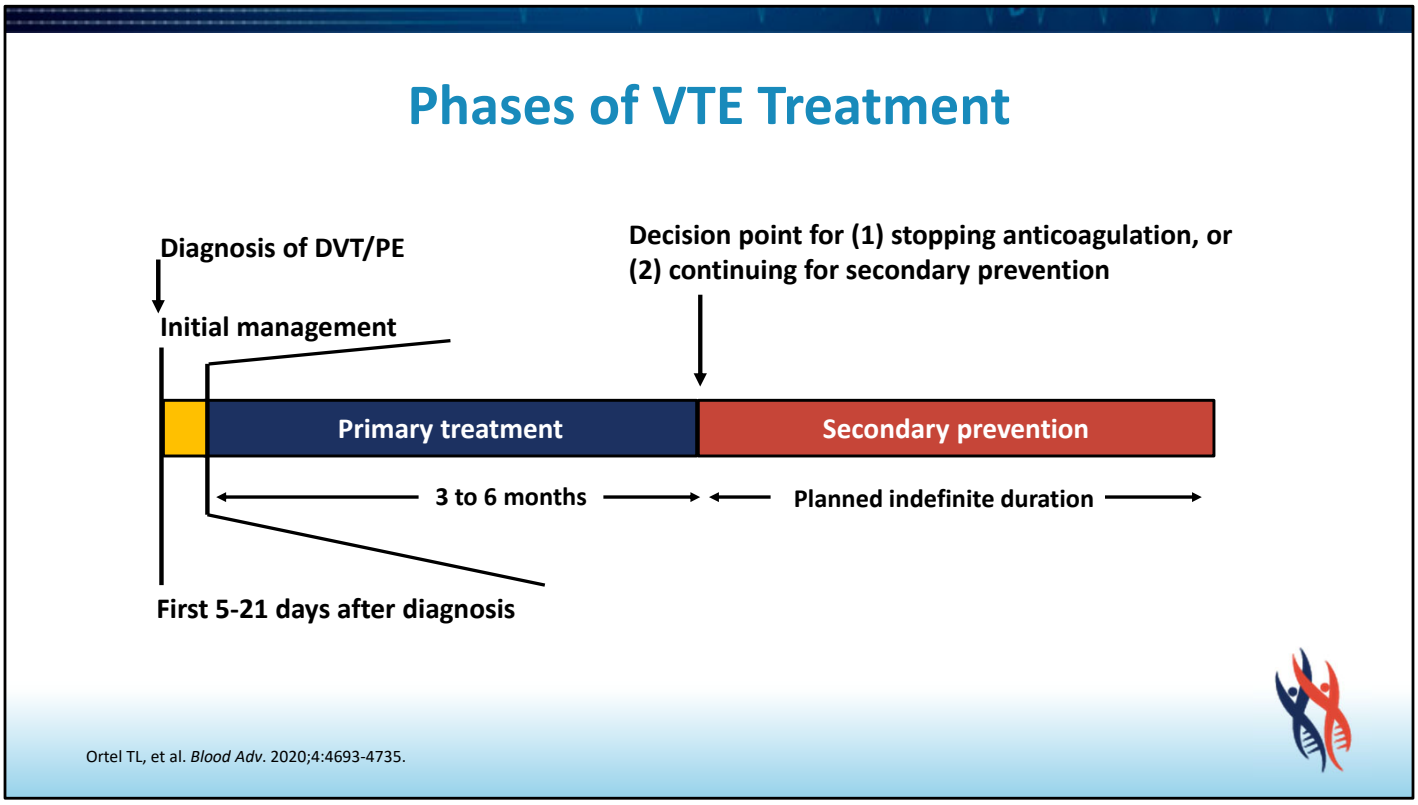
Guideline-Recommended Therapy for VTE

- American Society of Hematology Guidelines for VTE and PE treatment suggest DOACs as first-line over VKA
- DOACs preferred for most patients without severe renal insufficiency (creatinine clearance <30 mL/min), moderate-severe liver disease, or antiphospholipid antibody syndrome
- American College of Chest Physicians (CHEST) Guidelines for VTE without Cancer recommend DOACs as first-line over VKA
- VTE with Cancer, LMWH or DOACs preferred over VKA

Ortel TL, et al. *Blood Adv*. 2020;4:4693-4735.; Kearon C, et al. *Chest*. 2016:149(2):315-352.

Dr. Pollack: There are guidelines here for the management of VTE. There are lots of them, probably the most widely recognized ones with the exception of specifically cancer patients come from CHEST, the American College of Chest Physicians, they publish them every two, three years. Of course, now it's going online. I'm used to thinking of the red CHEST journal cover, but they recommend DOACs as first-line therapy over vitamin K antagonists, which is warfarin.

More recently, the American Society of Hematology or ASH guidelines you see here on the first bullet, recommend DOACs as first-line over VKA. Really the only drawbacks are patients who have severe renal insufficiency. We talked about patients with a prosthetic heart valve, basically moderate to severe liver disease are at risk with any anticoagulants, not just DOACs, but at least with warfarin, you can monitor them.



Dr. Pollack: The phases of VTE treatment, Beth, were you going to cover this?

Elizabeth Hood: Different phases of VTE, at the point of diagnosis, the patient is often in the emergency room. This is where the provider is going to decide whether it's safe for the patient to be discharged home for outpatient therapy, or if he needs to be admitted for parenteral therapy. This is the time where you evaluate your patient to see which oral agent may be the best for them based on their risk factors, maybe other medications that they're on. Also, this is when you would educate the patient about this therapy, how long you expect them to need to take it, and arrange quick follow-up with a primary care provider within the next week.

During the primary treatment stage, this is usually between three to six months. During this time, you need to periodically check in with your patient, as we were talking about a minute ago, make sure that they're not having any worsening symptoms of their thromboembolism, that they're not having any signs and symptoms of bleeding or any other complications from therapy. At the point where it's decided whether to stop the anticoagulation or continue it, this is usually done in a primary care physician office. Our primary care doctors usually make this decision based on a risk-benefit analysis looking at the patient's continued risk for thromboembolism, as well as their risk for bleeding. Sometimes you're able to just decrease the dose of DOACs, such as apixaban or rivaroxaban for secondary prevention indefinitely.

Summary of Evidence

- 24 systemic reviews and 12 randomized trials included patients with symptomatic proximal DVT or PE
- Randomized to DOACs or initial treatment with LMWH (5-10 days) with dose-adjusted warfarin (INR range, 2.0-3.0)
- Dabigatran and edoxaban given after 5-10 days LMWH
- Excluded patients with CrCl <25 mL/min (apixaban) or <30 mL/min (all others) and patients with high risk of bleeding
- Benefit – use of DOAC vs VKA does not impact mortality or risk of PE

DOAC use associated with decreased risk of major bleeding

DOAC use less burdensome for patients

Ortel TL, et al. *Blood Adv*. 2020;4:4693-4735.

Elizabeth Hood: The American Society of Hematology guidelines did a great summary of evidence of 24 systemic reviews in 12 randomized clinical trials, including patients with symptomatic proximal DVT or pulmonary embolism. These patients were randomized to DOACs or initial treatments with the low molecular weight heparin with dose-adjusted warfarin with INR range of two to three.

Dabigatran and edoxaban were given after five to 10 days of parenteral therapy with the low molecular weight heparin, patients were excluded if they had a creatinine clearance less than 25 for apixaban or less than 30 for all other DOACs. They were also excluded if they were at high risk of bleeding. These studies showed that a DOAC versus warfarin did not impact mortality or risk of PE. The DOAC use was associated with a decreased risk of major bleeding, which is really important to note. It's also less burdensome usually for patients.

Conventional Therapy—Warfarin

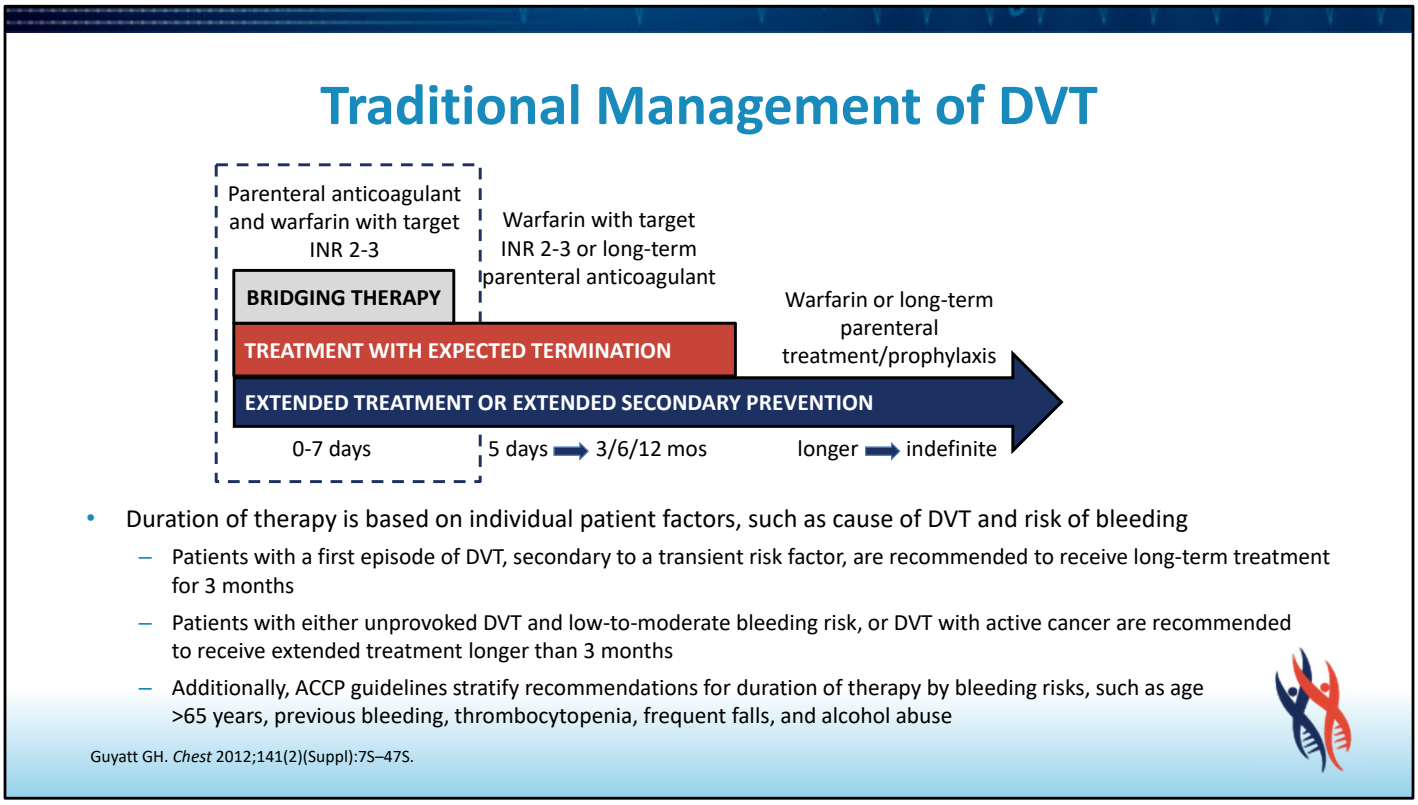
- Warfarin is effective for treating VTE and is often preferred option for patients with:
  - Severe renal or liver disease
  - Poor adherence to medication
  - A high risk for bleeding complications
  - Highly pro-thrombotic state such as antiphospholipid antibody syndrome or HIT
- But it has:
  - A narrow therapeutic index
  - Wide interindividual dosing variability
  - Numerous food and drug interactions
  - Requires frequent monitoring by experienced practitioners

Witt D, et al. *J Thromb Thrombolysis*. 2016;41:187-205.

Elizabeth Hood: Our conventional therapy with warfarin. We know that warfarin is effective for treating VTE, and sometimes it is the preferred option for patients with severe renal or liver disease and even those patients who have poor adherence to medication. Sometimes patients do better when they have to come into clinic to get an INR checked, their medications are reviewed, they get more counseling on the importance of compliance. Some patients do better with that.

Patients with a high risk for bleeding complications, sometimes warfarin is the better choice for them because of the ease of reversal and patients that have highly thromboembolic states, such as antiphospholipid antibody syndrome or heparin-induced thrombocytopenia, it's better for these patients but as we all know, it has a very narrow therapeutic index. Their warfarin is hard to manage. It has a lot of drug interactions, wide dosing variabilities. There's numerous food interactions such as vitamin K foods, as well as high-protein foods. Some fruits and juices interact with warfarin.

It does require frequent monitoring by experienced practitioners that understand these things. One thing that has been very helpful in the last several years is that more of our patients are able to get home INR meters. Medicare covers the cost of the home INR monitor. Unfortunately, Medicaid does not right now, but most private insurances do cover the cost of it. That's been very beneficial to some of our patients.



Elizabeth Hood: With traditional management of DVT with warfarin, we use a parenteral anticoagulant as bridge therapy until the INR reaches its goal of two to three. Duration of therapy is based on individual patient factors, such as what was the cause of their thromboembolism, as well as the risk of bleeding. A patient is usually treated for three to six months, but if the patient has had unprovoked DVT and they have a low to moderate bleeding risk, or if they have active cancer with their DVT, it is recommended to extend treatment for longer than three months, but if a patient has had a transient risk factor, they may only need about three months of therapy.

Direct Oral Anticoagulants—DOACs

- DOACs are safe and effective treatments for VTE and are preferred for:
  - Patients who have transportation issues, difficult venous access, inflexible work or school schedules or other reasons for difficulty complying with INR monitoring
    - ***But renal function should be monitored, and a CBC done at least annually***
  - Patients who reliably report all pertinent medical issues, including concomitant medication
  - Cancer-associated thrombosis
    - Must be able to hold down food and medication - use LMWH if not
- Be aware of specific dosing adjustments and drug interactions that may prohibit use

Burnett A, et al. *J Thromb Thrombolysis*. 2016;41:206-232.

Elizabeth Hood: All direct oral anticoagulants are safe and effective treatments for VTE. They're preferred for patients who have transportation issues and difficult venous access and other reasons where they cannot comply with INR monitoring, but it is important to monitor renal function in these patients and CBC at least annually for those patients whose renal function fluctuates a lot such as our advanced heart failure patients, these patients' renal function needs to be monitored more closely.

For cancer-associated thrombosis, your patient needs to be able to hold down food and medication. If they've just had some chemo and they're having a lot of nausea and vomiting, you may need to switch them to a low molecular weight heparin during that time. Be aware that there are specific dosing adjustments and drug interactions that could prohibit the use of a DOAC.

Direct Factor Xa Inhibitors

Drug	Dose	Reduced Dose	Cautions
Apixaban (Eliquis)	10 mg BID X 7 days then 5 mg BID	2.5 mg BID IF used with combined P-gp and strong CYP3A4 inhibitors (eg, ketoconazole, itraconazole, ritonavir)	• Avoid use with strong dual inducers of CYP3A4 and P-gp (eg, rifampin, phenytoin and carbamazepine) • Avoid use in patients with mechanical heart valves • Avoid use in severe hepatic disease
Rivaroxaban (Xarelto)	15 mg BID X21 days then 20 mg daily with meal	No reduced dose indication	• Avoid use with CrCl <15 mL/min • Avoid use with combined P-gp and strong CYP3A4 inhibitors or inducers (eg, ketoconazole and ritonavir) • Avoid in patients with mechanical heart valves • Avoid use in moderate-severe hepatic disease
Edoxaban (SAVAYSA)	60 mg daily **after 5-10 days of parenteral therapy**	30 mg daily IF CrCl 15-50 mL/min, wt ≤60 kg, or if taking verapamil, quinidine, azithromycin, clarithromycin, erythromycin, oral itraconazole or ketoconazole	• Avoid use with rifampin • Avoid in patients with mechanical heart valves • Avoid use in moderate-severe hepatic disease
Direct Thrombin Inhibitors			
Dabigatran (Pradaxa)	150 mg BID (if CrCl >30 mL/min) **after 5-10 days of parenteral therapy**	No reduced dose indication	• Avoid use with P-gp inducers (eg. Rifampin) • Avoid use with P-gp inhibitors if Cr Cl <50 mL/min • Avoid in patients with mechanical heart valves • Avoid use if CrCl <30 mL/min

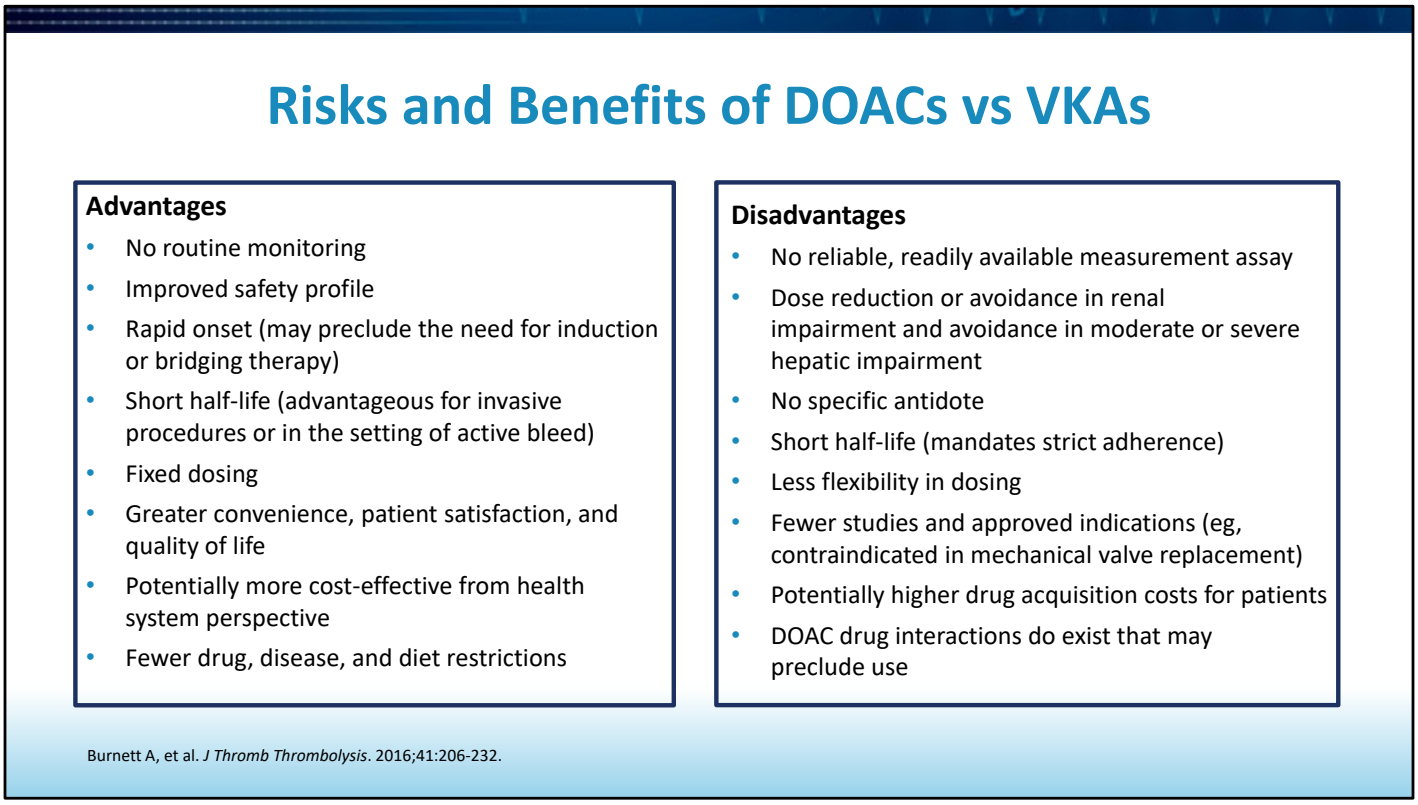
Eliquis: https://packageinserts.bms.com/pi/pi_eliquis.pdf.; Xarelto: https://www.janssenlabels.com/package-insert/product-monograph/prescribing-information/XARELTO-pi.pdf.; SAVAYSA:https://dsi.com/prescribing-information-portlet/getPIContent?productName=Savaysa&inline=true.; Pradaxa: https://docs.boehringer-ingelheim.com/Prescribing%20Information/PIs/Pradaxa/Pradaxa.pdf

Elizabeth Hood: When we look at this chart, there are three oral direct factors Xa inhibitors, apixaban, rivaroxaban, and edoxaban, and one oral direct thrombin inhibitor, dabigatran, that we have available to you us. With edoxaban and dabigatran as Charlie mentioned earlier, both of these required 5 to 10 days of parenteral therapy. This usually precludes the use of these medications in most of our patients mainly because nobody wants to pay for two anticoagulants at first. Maybe if they were already in the hospital and had already received parenteral therapy, those might be a choice for them, but most times we use apixaban or rivaroxaban if it's initiated in the emergency room.

Be aware that the dosing for atrial fibrillation versus venous thromboembolism are different for these medications and the reduction of the doses is different based on the indication. It's important to understand these things. We don't use DOACs in any patient that has a mechanical heart valve. We avoid use in severe hepatic disease. For apixaban, the dose is 10 milligrams twice daily for the first week and then the dose will drop to 5 milligrams twice a day. You will only reduce the dose to 2.5 twice a day if apixaban is used with combined P-gp and strong 3a4 inhibitors, such as ketoconazole, itraconazole, and ritonavir.

Elizabeth Hood: You will avoid use of apixaban with strong dual inducers of 3a4 and P-gp. These medications include rifampin, phenytoin, and carbamazepine. That's one of the biggest things that we see as pharmacists is that physicians sometimes forget that you should not use a DOAC when someone is on phenytoin or on carbamazepine. We know that in studies, the area under the curve is significantly decreased for DOACs and you would only get therapeutic levels about 50% of the time if you use those drugs in combination.

For rivaroxaban, 15 milligrams, twice daily for the first 21 days, and then you can drop the dose to 20 milligrams daily. This does need to be taken with food. There is no reduced dose indication. You would just avoid use if the creatinine clearance is less than 15, and you would avoid use if you were using it with any combined P-gp and strong 3a4 inducer or inhibitor. There's no reduced dose indication for rivaroxaban for VTE diagnosis. Fortunately, with apixaban and rivaroxaban, there's a starter pack that includes the 10 milligrams twice daily for seven days and 5 milligrams BID dose and the first month's dose of rivaroxaban. It's very helpful to be able to prescribe that because we can give a patient a free 30-day trial card and prescribe the starter pack for either apixaban or rivaroxaban and the patient can go to the pharmacy and you can get that for no cost to them. That's very helpful.



Elizabeth Hood: There's a lot of risk and benefits as we've already discussed of DOACs versus vitamin K antagonist. I won't go through all of these, but obviously, there's no routine monitoring with DOACs. They have a shorter half-life, which makes it advantageous for patients that need invasive procedures. There's no need to bridge somebody for a procedure if they're on a DOAC, you simply hold the dose one to two days, depending on their renal function and how invasive the procedure is and the risk of bleeding.

Most patients find it easier to use a DOAC and it usually is more cost-effective from a health system perspective. However, there is potentially higher drug acquisition cost for patients for DOACs and that's what we see a lot in Mississippi is patients just aren't able to afford them.

Barriers and Solutions to Optimal Treatment

Cost of DOAC therapy

- Covered by most insurance, including MS Medicaid
- Manufacturer patient assistance programs
  - Free 30-day trial cards
  - Copay card for patients with non-government insurance
  - Yearly patient assistance for qualified self-pay patients
    - Need patient advocate to handle paperwork

Transportation issues

- Mail-order pharmacies or delivery pharmacies
- Telemedicine follow-up appointments

Elizabeth Hood: Some of the barriers and solutions that we have for optimal treatment with the cost of DOACs, it is covered by most insurance, including Mississippi Medicaid, which is great for us. There are manufacturer patient assistance programs. Anybody can use a free 30-day trial card, even if they have insurance. There's copay cards for patients that have non-government insurance, and there's also the yearly patient assistance for qualified self-pay patients. You do need someone to handle the paperwork so this isn't something that the emergency room will do, but the primary care office will do it or a coag clinic can do this. The patient just needs this to fill out an application. The doctor signs it and the patient submits his financial records to send to the company to be approved for financial assistance and that's very helpful for a lot of patients. Patients that have transportation issues can use mail-order pharmacies or delivery pharmacies to get their medications and do telemedicine follow-up appointments.

Resources

- www.eliquisformulary.com – Can identify patient's insurance co-pay cost and print co-pay assistance card
- www.bmspaf.org – BMS Patient Assistance Program for Eliquis
- www.janssencarepath.com – Can access co-pay cards, Janssen select and J&J patient assistance for Xarelto
- Janssen Select – Offers assistance for Xarelto for patients with high deductibles, Medicare Part D coverage gaps ("Donut Holes") if copays are >$85/month
- www.sanofipatientconnection.com – Lovenox patient assistance
- 340B Programs – There are many federally qualified health clinics and hospitals in MS that have these programs to provide medications at discounted prices

Elizabeth Hood: Some resources I wanted to share that are very helpful to us. Eliquisformulary.com can identify your patient's insurance copay costs, and you can print a copay assistance card while they're in the hospital before discharge. The Bristol Myers Squibb patient assistance program for Eliquis can be found online. Janssencarepath.com, you can access copay cards, Janssen Select, and Johnson & Johnson patient assistance for Xarelto through this one website. Janssen Select is a great program that offers assistance for Xarelto for patients that have high deductibles, even your Medicare Part D coverage gaps, your patients that are in the donut hole if their copays are greater than 85 a month. Lovenox patient assistance can be found online as well.

Another thing to mention is your extra help for Medicare, that also can be accessed online. Your patient has to complete that themselves, but a lot of our patients in Mississippi qualify for extra help for Medicare, and this will decrease their copays for their medication. 340B Programs, there are many federally-qualified health clinics and hospitals in Mississippi that have these programs that can provide medications at discounted prices. Many of our hospitals throughout the state have access to these 340B Programs. If you do, you should contact the pharmacy and just see what your pricing options are for those patients.

Dr. Pollack: Again, there is an advantage to being able to measure anticoagulation intensity with an INR, no matter where you are at any given point in time, but generally speaking, the advantages of DOACs outweigh that ability that we attribute to warfarin. There are people though, who, because they started bleeding, or because they need to have surgery done, may need to have their DOAC therapy temporarily interrupted.

I think, Beth, you would agree that the various package inserts for the DOACs have been harmonized by the FDA, and so there are actually very useful tables in there to give you specific guidance on how to manage temporary interruption. Generally, it's understood that bridging is not required for these patients because they're so rapidly back to blood levels once you restart them.

You talked about the DOAC drug-drug interactions. Another thing that's in the package inserts that maybe would benefit from having a quick pharmacist explanation is transitioning patients between anticoagulants. Let's say that a patient changes insurance plans and gets new insurance, or has a problem with one anticoagulant and you want to switch them to another, where do you go for resources on how to transition patients between different anticoagulants?

Elizabeth Hood: Okay. Well, it does mention in the package inserts, but generally if you're switching from one DOAC to another one, all you have to do is just stop the first one and start the next one at the next dose. If they were on apixaban twice a day and they were switching to Xarelto, you would stop the apixaban that, you take the last dose one night, and you can start the Xarelto the next day. If you're transitioning between warfarin and a DOAC, which we do that a lot, with rivaroxaban, you want to make sure that INR is less than three, and then you can start the rivaroxaban. For apixaban and edoxaban and dabigatran, you want the INR less than two, and then you can start, but there's no bridging necessary, which is good.

Dr. Pollack: Let's approach our last major topic, which is strategies to improve transitions of care. Typically, what we mean by that, of course, is from the hospital back to whatever the home setting is, whether that's a transitional setting or the patient's actual home.

Components of a High-Quality Discharge System

- Effectively transitioning patients from hospital to home is complex
  - Requires coordinating care with outside physicians and educating patients
  - Both adverse events post-hospital discharge and readmissions are high
- A safe and patient-centered transition should:
  - Provide consistent, high-quality transitional care with follow-up appointments and easily understood discharge instructions
  - Be patient-centered, providing adequate notice of and preparation for discharge, resulting in high levels of patient satisfaction
  - In the case of VTE patients, they will need ongoing anticoagulation therapy appropriate for the underlying condition

Horwitz L, et al. *JAMA Intern Med*. 2013;173(18)1715-1722.; Lenchus JD. *Adv Ther*. 2016;33:29-45.

Dr. Pollack: There are multiple components of a high-quality discharge system that we can identify. Transitioning patients from hospital to home is never easy, but you see some of the issues here that are important; it's got to be consistent, it should be protocol-driven, it's got to be patient-centered, and please don't forget that patients don't remember anything you tell them.

You got to involve the family members and caretakers, and reinforce it over and over again, because the patients are only just happy to be getting out of there. They're not really listening to what they got to do afterwards, and so medication education, follow-up education, things to watch for. Again, with anticoagulation, you've got to inform patients and their caregivers, not only for worsening of the thrombosis problem, but also looking out for signs of bleeding. It's important that they recognize the importance of continuing their anticoagulation therapy, even though it may not make them feel any better, because it is treating what is potentially a very serious condition.

DOAC Discharge Checklist for Optimal Care Transitions

- ✓ Patient is an appropriate DOAC candidate
- ✓ Assess patient's eligibility for outpatient treatment
- ✓ Consistent access to DOAC (affordability, retail availability)
- ✓ If transitioning to rehabilitation or skilled nursing facility, ensure DOAC on formulary
- ✓ DOAC identified and understood as an oral anticoagulant by patient, caregivers, and providers
- ✓ Provision of thorough DOAC education to patient and/or caregiver in their preferred language and at an appropriate literacy level
- ✓ Safety net phone number provided to patient/caregiver (who to call with questions)
- ✓ Referral or handoff to appropriate provider (anticoagulation clinic, PCP, etc.)
- ✓ Time of last drug administration in current setting and time of next scheduled dose in new setting
- ✓ Prescribed strategy for appropriate dose change after initial therapy (either switch to DOAC or DOAC dose de-escalation)

Dr. Pollack: There's a checklist here that I won't belabor, but generally speaking, it all comes down to somebody doing some homework, and that's often going to be a pharmacist or a case manager. Physicians often either don't have or simply are unable to take the time to do this, but it's really important that you don't get too slick with this, too quick with this, because you can prevent a lot of bad events, whether they're thrombotic events or bleeding events simply by making sure you follow a discharge checklist to optimize that transition of care.

Barriers to Safe and Effective Anticoagulation During Care Transitions in Black Patients in CAHs in Mississippi

- Among 395 hospitalized patients, 95.6% reported understanding the reason for their hospitalization. However, a post-discharge interview found only 59.6% actually understood
- Of those discharged with a scheduled primary care or cardiology appointment, only 43.9% accurately recalled the details of their appointment
- Among patients in CAHs in Mississippi, only 54.4% indicated that they understood their care when they left the hospital

Potential Barriers to Safe and Effective Care Transitions
Level of patient health care literacy
Transportation Issues
Level of home support
Insurance issues
Ability to pay for medication

Horwitz L, et al. *JAMA Intern Med*. 2013;173(18)1715-1722.; Quick, et al. Patients' Experiences with CAHs: HCAHPS Results, 2018. https://www.flexmonitoring.org/publication/patients-experiences-cahs-hcahps-results-2018. Accessed March 22, 2021.

Dr. Pollack: The barriers to safe and effective anticoagulation. We've talked about, they've got to understand what they're being treated for. They've got to remember it later, a couple of weeks later, and they need a scheduled follow-up appointment when they leave, because counting on the patient to call and make an appointment after they leave the hospital is something that's not likely to work very well. Again, having a checklist where one of the things that should be checked is that the patient has a follow-up appointment in the next few days is important to do.

VTE Case Continuation

- Upon release from the hospital patient did follow-up with her PCP
- DOAC was continued
- Her symptoms subsequently resolved but she still had some issues with anemia secondary to her heavy menstrual cycles
- Three months after diagnoses of the pulmonary embolus, a VQ scan was obtained which showed normal perfusion
- DOAC was discontinued

Dr. Hadley: This patient, upon release from the hospital, did follow with her primary care physician. The DOAC was continued, her symptoms subsequently resolved, but she was still having some issues with anemia, and her anemia was secondary to her having some dysfunctional uterine bleeding from some heavy menstrual cycles. Three months after diagnosis of the pulmonary embolism, a VQ scan was obtained, which showed normal perfusion, and at that time, the DOAC was discontinued.

Dr. Pollack: Important to remember that, again, that three to six-month period which can be extended in high-risk patients, here was a good reason to stop it after six months. Cynthia, you want to come back to the care transition strategies here?

Successful Care Transition Strategies

- Retrospective chart study of a quality improvement intervention
  - Racial disparities in prescription of best-practice VTE prophylaxis in the pre-implementation period between Black and White patients
  - Implementation of a mandatory computerized clinical decision support (CCDS) tool eliminated racial disparities in VTE prophylaxis
- Randomized controlled trial of a care transitions intervention designed to encourage patients and their caregivers to take a more active role during care transitions
  - Intervention patients had lower rehospitalization rates at 30 days (8.3% vs 11.9%) and at 90 days (16.7% vs 22.5%) and at 180 days (8.6% vs 13.9%) than controls
  - Costs were lower for intervention patients ($2058) vs controls ($2546) at 180 days
  - Coaching chronically ill older patients and caregivers to ensure their needs are met during care transitions may reduce subsequent rehospitalizations
- The inclusion of a culturally appropriate peer support program to complement chronic illness management is recommended

Coleman E, et al. *Arch Intern Med*. 2006;166:1822-1828.; Lau B, et al. *Med Care*. 2015;53(1):18-24.; Okoro F, et al. *Front Pub Health*. 2018;6(340).

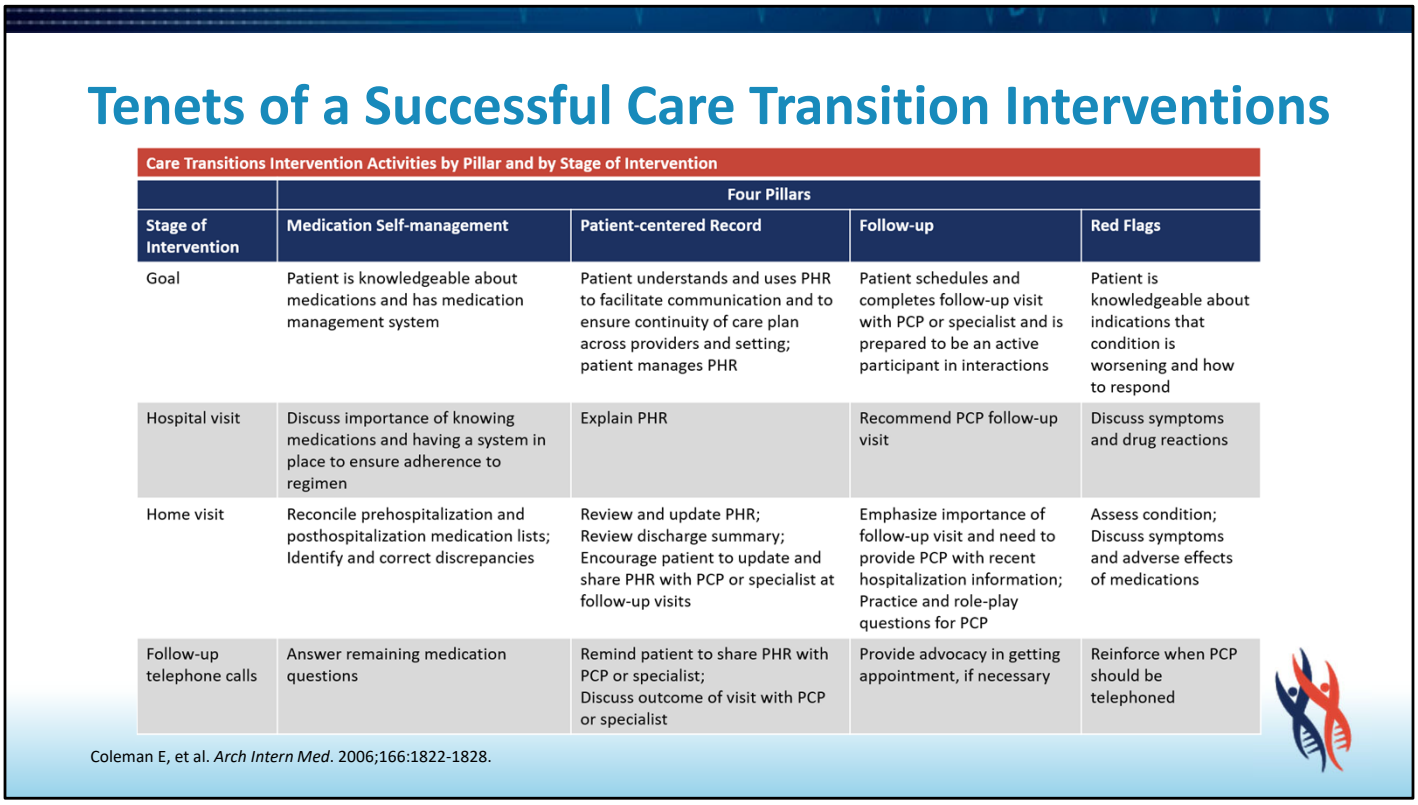
Cynthia Harrington: Successful care transition strategies should--as providers, PAs, nurse practitioners, physicians, everybody plays a role in this part, in getting the patient from hospitalization, to discharge, to home, for a good recovery. As we know, African-Americans sometimes do not have a favorable outcome. This slide here represents three studies that were conducted over a period of time. The first one is a retrospective chart study of a quality improvement intervention at a level-one center for VTE prophylaxis. Racial disparities in prescription best practice VTE prophylaxis in the pre-implementation period between Black and White patients were pretty significant, and that was because data was extracted prior to the VTE being initiated on those patients.

Percentages for that, I did jot that down. For trauma patients, it was 70.1% versus 56.6%, and for the medicine patients, it was 69.5% versus 61.7%. In this level-one trauma center, they implemented a mandatory computerized clinical decision support tool. In doing this, the admitting physician would be required to perform a VTE checklist and bleeding risk factors for their patient being admitted for trauma versus being admitted for medicines. It didn't matter, they just had to complete it. In completing that, the tool itself followed an evidence-based algorithm to generate a score from low to high and suggest a VTE therapy for these patients. The physician or the admitting provider, it was at his or her discretion to utilize that or use medicines if need be.

Cynthia Harrington: The second one is a randomized control trial of a care transition intervention program that was designed to encourage patients and their caregivers to take a more active role during care transition. This study was conducted in a non-profit hospital with about 750 patients that were age 65 and older. Using the care transition intervention, they used an advanced practice nurse as the transition coach to help transfer these patients from the hospital setting to home, and for follow-up, and we'll see that on the next slide.

In this study, it was determined that the intervention patients had a lower rehospitalization rate at 30 days, 8.3% versus 11.9%. At 90 days, 16.7% versus 22.5%. At 180 days, it was 8.6% versus 13.9%. Also, that was a lower cost for these patients as well, about $488 at the 180 days. Also, in the study, it was determined that coaching these patients and their caregiver to ensure their needs are being met helped make that transition a little bit easy and reduced the subsequent rehospitalization.

The next study was a qualitative study of about 20 African-Americans ranging from ages 30 to I think about 62. In the study, they looked at several different things for these patients trying to do a peer support program with them. In doing that, three things came out of this program. One was healthy behaviors, two was telephone calls, and the third one was the emotional support. What this study demonstrated was that the inclusion of a culturally appropriate peer support program to complement chronic illness management is recommended because sometimes patients want to know what they need to eat. Patients need to hear somebody calling and checking on them. Patients need that emotional support in order to better be able to take care of themselves.



Tenets of a Successful Care Transition Interventions

Care Transitions Intervention Activities by Pillar and by Stage of Intervention

	Four Pillars			
Stage of Intervention	**Medication Self-management**	**Patient-centered Record**	**Follow-up**	**Red Flags**
Goal	Patient is knowledgeable about medications and has medication management system	Patient understands and uses PHR to facilitate communication and to ensure continuity of care plan across providers and setting; patient manages PHR	Patient schedules and completes follow-up visit with PCP or specialist and is prepared to be an active participant in interactions	Patient is knowledgeable about indications that condition is worsening and how to respond
Hospital visit	Discuss importance of knowing medications and having a system in place to ensure adherence to regimen	Explain PHR	Recommend PCP follow-up visit	Discuss symptoms and drug reactions
Home visit	Reconcile prehospitalization and posthospitalization medication lists; Identify and correct discrepancies	Review and update PHR; Review discharge summary; Encourage patient to update and share PHR with PCP or specialist at follow-up visits	Emphasize importance of follow-up visit and need to provide PCP with recent hospitalization information; Practice and role-play questions for PCP	Assess condition; Discuss symptoms and adverse effects of medications
Follow-up telephone calls	Answer remaining medication questions	Remind patient to share PHR with PCP or specialist; Discuss outcome of visit with PCP or specialist	Provide advocacy in getting appointment, if necessary	Reinforce when PCP should be telephoned

Coleman E, et al. *Arch Intern Med*. 2006;166:1822-1828.

Cynthia Harrington: This is the slide from the previous one that I talked about using the transition coach, the advanced practice nurse in the hospital setting. There were four pillars there; the medication self-management, patient-centered record, the follow-up, and the red flags. As you can see to the left, we have the stage of intervention, the goal, the hospital visit, the home visit, and the follow-up telephone calls.

Basically, the goal was to get the patient, inform the patient about his medications, make sure if they had any questions, they can be answered. Then we would move to talking about the PHR, which is the patient health record that the transition coach would do during the hospital stay, informing them on what is expected, how to use it, the purpose of it, which is to facilitate communication between the specialist and your PCP if needed. Also, the follow-up recommending a PCP if they did not have one, or scheduling follow-up calls for the PCP, and again, discussing any symptoms of red flags, medication adverse reactions, or if your condition seems to be worse.

In the home visit, we have somebody going out, reconciling the hospitalization and pre- and post-hospitalization medication lists, trying to identify any discrepancies, and sometimes, duplication of medications. We're going to review that with them, we're going to update that with them, and we're going to encourage them to update it as well and share it with their PCP and their specialist. Again, emphasizing the importance and need of the follow-up visits as well as encouraging role-play so they could ask questions if need be that they want to ask their PCP. Again, assess the conditions, discuss the symptoms and adverse effects of the medication.

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Coleman E, et al. *Arch Intern Med*. 2006;166:1822-1828.

Cynthia Harrington: As far as the follow-up on the telephone calls, again, patients still have questions for these medicines, diagnosis, how long I need to take this medicine? Again, that's where that person comes into place in answering those questions. Again, reminding them to share their information with their PCP and their specialist, discussing their outcomes if they had any with them. Again, providing advocacy and getting an appointment if necessary, because sometimes, especially elderly people, if they call into the clinic to make an appointment and you give it to them, sometimes they forget, so sometimes their caretaker can help them to stay on track with it, and again, reinforcing when the PCP should be telephoned.

Transition of Care

- Begins once the patient has been discharged from hospital or emergency department to follow up with PCP
- Requires coordination and communication among health care professionals to ensure optimal outcomes for the patient
- Includes multidisciplinary communication, collaboration and coordination that enables the electronic exchange of information between health care providers is crucial at discharge
- Patient education is also an important component. This is done to help the patient understand their treatment and the importance of extended/long-term treatment
- Patient education and engagement is essential to improve adherence to therapy post discharge

Cynthia Harrington: For transition of care, for me, from a rural perspective, working in a clinic, again, I encounter all patients from all ages, race as well. What I try to do with my patients is--education is a big thing for me. Once that patient has been discharged from the hospital or the emergency room and they follow-up back with me, my goal is to continue educating, educating, and educating. Sometimes with her, like I said, it was good, but I've had some that have not went so smoothly over. It requires coordination and communication among healthcare professionals to ensure optimal outcomes for the patient.

Even though we're in two different settings, hospital, clinic, tertiary, whatever the case may be, it's very important that we as healthcare professionals communicate about patients that we both take care of, that we all take care of, in order to make sure they're going to have a good outcome. It includes multiple disciplinary communication, collaboration, and coordination that enables the electronic exchange of information between healthcare providers, because that's very crucial at discharge. Now, granted that the EMR that I use is not the best, so sometimes we do a lot of faxing in between, but again, communication, collaborating, coordinating that exchange of information is very important.

Again, as I said, patient education is also an important component. This is done to help the patient understand their treatment and the importance of extending long-term treatment. As we stated, some patients may be treated for three months, some maybe for six months, and some maybe for nine months. Every case is different, and in talking with my patients, I try to explain that to them.

Transition of Care

- Begins once the patient has been discharged from hospital or emergency department to follow up with PCP
- Requires coordination and communication among health care professionals to ensure optimal outcomes for the patient
- Includes multidisciplinary communication, collaboration and coordination that enables the electronic exchange of information between health care providers is crucial at discharge
- Patient education is also an important component. This is done to help the patient understand their treatment and the importance of extended/long-term treatment
- Patient education and engagement is essential to improve adherence to therapy post discharge

Cynthia Harrington: I also have the capability--this is off-subject, I do have the capability of having an ultrasound tech in the office with me sometimes. If we do detect a DVT, and if we're able to initiate medications in the clinic, that's a great thing, but I also have had patients come in that presents like a PE, sent to the local ER, and it was a PE, and then had to come back and follow-up with me as well.

Patient education and engagement is essential to improve adherence in therapy post-discharge. Again, I cannot stress the importance of--from discharge, from the hospitalization to discharge, to follow-up care, following those patients throughout, making sure that they do have the appropriate medication or have access to get the medication, encouraging their caretaker, husband, wife, child, whoever is providing the care for them to take part in their
care because they need to understand what's going on with them as well, being able to recognize adverse reactions from medications, or whether the condition has gotten worse
or getting worse.

Transition of Care

- Listen to the patient concerns, address their needs, inquire about medical coverage, discuss adherence to the medication, side effects, expected length of anticoagulation therapy, current medical diagnosis/medications and cost
- Barriers to care – literacy, finances, insurance, transportation, and follow up
- Patient safety is the responsibility of all who deliver care whether directly or indirectly
- Goal is to avoid preventable poor outcomes in all patients and especially those with multiple chronic conditions
- Continue to keep the patient, family, and/or caretaker involved in every aspect of the care
- Telephone follow-up
  - Answer any questions
  - Let the patient know you are available

Cynthia Harrington: Also, in my practice, I also listen to my patients' concerns. I try to address all their needs as much as I can, I inquire about medical coverage. Again, someone may have Medicaid, some may have Medicare, some may not have any insurance at all, and no ability to get any medicines. I want to discuss the adherence to the medications, the side effects. Again, the expected length of anticoagulation therapy, their diagnosis. Again, medications and cost is very important here where I am because a lot of people don't have insurance, and a lot of people don't have a job, so sometimes it's very difficult trying to get them started on a med.

Barriers to care, literacy is one for me. Again, finances, because most of the people are unemployed where I work, insurance is an issue. Transportation, especially for my elderly, if they don't drive and they require their granddaughter or their grandson or somebody to bring them to the appointment and follow-up. Patient safety is the responsibility of all who deliver care, whether directly or indirectly, because we're all responsible for that patient, and we want to make sure we are delivering the best appropriate care as we can.

The goal was to avoid preventable poor outcomes in all patients, and especially those with multiple chronic conditions. Where I am here, we have patients with diabetes, have patients with heart disease, we have patients that are obese, being that Mississippi is one of the fattest states, and I have a lot of obese patients. We have to take all that into consideration as well. Again, keep the patient, their family, or their caretaker involved in every aspect of the care from hospitalization, transitioning to home, and follow-up care is very important for these patients.

I also do a lot of telephone calls, as I stated earlier, to my patients, trying to answer any questions,

letting the patient know that I'm available. If I need to refer a patient to a hematologist, or a pulmonologist, or collaborate with them, I also do that. The goal is, again, as a team, we work together to make sure the patient has the best outcome. Back to you. Dr. Charlie.

Putting it All Together

- Treat early
- Individualize care plan
- Assess and plan for potential barriers
- Choose best therapeutic option at the correct dosage based on patient factors and home care plan
- Patient education and clear expectations on length of therapy
- Plan for follow-up after discharge with patient and caregivers
- Communicate with patient, family and care team

Dr. Pollack: Thank you, Cynthia. I really want to thank my co-faculty tonight for such an engaging and thoughtful presentation. I think we've covered a lot. I want to try to summarize it here briefly, I hope you've got a lot out of it. I've learned a lot just listening to my co-faculty about this very important issue that affects so many of our patients, and unfortunately, affects Black Mississippians disproportionately.

If I were to look at a few bullet points as seen here on this slide, putting everything together that we've talked about tonight, it would be to confirm the diagnosis early, which of course requires a high index of suspicion. That's an overused term, but again, it's all about that pre-test probability. You got to think about the diagnosis before you can make the diagnosis. The earlier you treat, the more likely you are to stop the propagation of DVT and improve the course of patients who've had a PE.

The care plan does have to be individualized. You just heard Cynthia talking about some patients get three months treatment, some six months, some nine months, some a year. Some patients because of their risk factors, again, individualizing the care plan may be on indefinite anticoagulation. Spend some time or have one of your people get assigned a case manager. Pharmacists are the best listeners in the world, get somebody to make sure that we've assessed for potential barriers to this patient's treatment, and then have a plan for it.

Dr. Pollack: Then you've seen that there are multiple options for treating venous thromboembolic disease, choose the best one for that patient. Make sure it's the right dose and fits with the overall plan for the patient. I think you've heard everybody in the faculty talk tonight about the importance of patient education and making sure that patients and their caregivers and their family members understand what they're being treated for, why they're being treated, what the potential complications of that treatment are, hint, it is bleeding. Explaining length of therapy, and then of course, making sure that there's a plan for appropriate discharge, which to some extent is also based on the therapy chosen, because as Beth told us, there's this transition point between the higher dose and lower dose anticoagulation with the anti-Xa DOACs, and that's got to be figured into the time of follow-up. Then again, all about communication. Just like every aspect of life, with more effective communication, you're going to have better outcomes.

Thank you, all of you audience for your dedication to working in the state of Mississippi where we're up against so many obstacles; societal, economic, cultural. Let's all work together to try to overcome those and give our patients the best care.