



natt

Stop the Clot™

NATIONAL ALLIANCE FOR
THROMBOSIS & THROMBOPHILIA

Letter from the President

My predecessor and first NATT president, Mark Jablonski, often says that NATT's goal is to reduce the death rate from blood clots. I couldn't agree more and that mission drives all of us to improve understanding and awareness about blood clots and clotting disorders. If we don't know about something that is terribly wrong, then we can't fix it. That's why this issue focusing on cancer and blood clots is so important. Cancer is a scary word to many of us and too often that fear blinds us, physician and patient alike, to other issues like blood clots that are closely associated with cancer diagnosis and treatment. These other issues need to be addressed to ensure the best care for the individual diagnosed with cancer.

I greatly appreciate the support of Eisai Inc. for this edition of our newsletter that is focused on the relationship between cancer and blood clots. NATT's partners help us reach out more effectively to people who want to understand the true dimension of the public health problem caused by blood clots and clotting disorders and we appreciate their help.

This is another step in answering the Surgeon General's Call to Action on blood clots. This call to action is intended to galvanize organizations like NATT to work aggressively with our partners in government, business and with individuals affected by clotting to overcome the burden this condition places on so many people.

Public interest in learning more about clots and clotting disorders

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Streaming News from Our Website:

CDC AWARDS NATT FUNDING TO PREVENT BLOOD CLOTS

On September 16, 2009, NATT announced that it received two major program grants totaling \$2.6 million over five years from the Centers for Disease Control and Prevention (CDC). These funds will support programs directed at curbing the devastating effects caused each year to over 350,000 Americans who develop a blood clot.

NATT will use these grants to conduct patient and healthcare professional education and awareness initiatives directed at preventing deep vein thrombosis (DVT – a blood clot in a limb) and pulmonary embolism (PE – a piece of a DVT that breaks off and travels to a lung). “A pulmonary embolism is a serious medical condition that each year kills at least 100,000 Americans,” explains NATT President Randy Fenninger. “We have a national public health crisis because few people recognize or understand the symptoms and risk factors of this silent killer,” Fenninger added.

He continued, “I want to express my deep appreciation and that of the entire NATT leadership to the dedicated volunteers and staff who prepared these successful grant applications. This teamwork is a hallmark of our nationwide efforts to reduce the death rate from blood clots.” “Equally important, is that not enough of our nation's healthcare professionals have a full understanding of the symptoms and the methods for preventing blood clots,” according to Jack Ansell, MD, Chair of

NATT's Medical and Scientific Advisory Board. Ansell said that “complications from clotting, occurring in more than half of those affected individuals, can often have serious consequences – as is evident from an annual mortality rate that is greater than the combined deaths from breast cancer, AIDS and automobile accidents.”

Blood Clot Awareness and Patient Education

Working with CDC, NATT will launch a three-pronged strategy to reach patients affected by blood clots with programs that will increase knowledge and awareness among patients and families. With this knowledge patients will be better equipped to make their own decisions about their health and their lives and better communicate with health care professionals

who are (or will be) managing their care. To achieve this, NATT will:

- Organize six Stop the Clot™ Forums across the U.S. These dynamic and interactive patient education seminars will provide basic information about blood clots (signs, symptoms and risk factors), prevention, and how to live with blood clotting disorders.
- Expand Stop the Clot™ Web-based programs (www.StopTheClot.org) and activi-

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Common Questions and Answers

Cancer and Blood Clots

By Elizabeth Varga, MS; Chair - Education Committee, NATT

Q: I have heard that often people diagnosed with deep vein thrombosis (DVT) are evaluated to see if they have an underlying cancer that triggered the clot. Why is that?

A: This does not happen often, because testing to detect cancer is done only in those patients who show signs that suggest cancer may be present, such as unexplained weight loss or infection. About 10% of people who have DVT/PE will be diagnosed with cancer within 12 months after a DVT or PE. In some cases, with blood clots that do not seem to have any known cause, there may be a need for a more extensive work-up to look for an underlying cancer.

Q: Why does having cancer increase the chance of developing a DVT/PE?

A: While this is not fully understood, it is thought that cancer may lead to tissue damage and inflammatory responses that lead to activation of the blood clotting (coagulation) system. Tumors also release chemicals which trigger clotting.

Q: Are certain cancers more likely to result in DVT/PE?

A: Yes. Cancers of the brain, ovary, pancreas, colon, stomach, lung and kidney have the highest risk of DVT/PE. Lymphomas, leukemia, and liver cancer are also more likely to lead to DVT/PE.

Q: Do cancer treatments, like chemotherapy, increase the risk for DVT/PE?

A: Yes, some chemotherapies are associated with a higher risk of blood clots. Some examples include Thalidomide and Lenalidomide to treat multiple myeloma, Avastin® to treat colon cancer, and certain chemotherapies that may be given in combination with others, including cyclophosphamide (Cytoxan®), chlorambucil (Leukeran®) and nitrogen mustard (Mustargen®). It is not well known why chemotherapy increases risk of DVT/PE, but it is suspected that this could be because they cause damage to blood vessels or reduce the production of proteins that protect us from clots. Women treated with tamoxifen to prevent or treat breast cancer are

also at increased risk. Erythropoietin, which is sometimes used to treat anemia and improve quality of life in cancer patients receiving chemotherapy, may also increase the chance of developing a blood clot.

Q: What other risk factors might make it more likely for a cancer patient to clot?

A: Having surgery to remove the cancer, particularly abdominal and pelvic surgery increases risk. Being hospitalized, immobile, or having a central venous catheter placed (for chemotherapy or other reasons) also increases risk. Risk goes up as age increases, and having a family history of DVT/PE or a pre-existing inherited or acquired thrombophilia makes it more likely for a cancer patient to clot.

Q: What can be done to help prevent DVT/PE in cancer patients?

A: Clotting risk should be assessed in all patients with cancer. Whenever a patient with cancer is hospitalized, s/he should ask about treatment to prevent DVT or PE. Treatment to prevent blood clots should be routine in any hospitalized patient, and usually consists of injections of heparin or low molecular weight heparin. Compression stockings or pneumatic devices are also used to help prevent blood clots. Patients with cancer who are home and can move around have a lower likelihood of developing DVT/PE. However, patients should be aware of signs and symptoms of DVT/PE and seek immediate attention when they notice them.

Q: If I have cancer and develop a blood clot, how is it treated? Am I at higher risk to develop a second blood clot?

A: Once a cancer patient develops a first episode of DVT/PE, he or she is typically treated with “blood thinners” (injections of low molecular weight heparin or with the oral drug warfarin) as long as the cancer is active, because the risk for another episode of VTE is high if blood thinners are stopped.

Blood Clots as a Warning Sign for Cancer

By Hope Galley

It was 2006, and I had just completed the greatest of my 12 marathons, the NYC Marathon! What an experience! I had never had so much fun at a race and I was determined to return in 2007! In addition to this huge achievement, I had just been promoted at work. I was now one of the few women within my company who was poised to make a run for the top. I could see it now...Hope Galley, Vice President...Hope Galley, Marathon Runner....Hope Galley, Super Mom! I felt as if all my hard work and dedication had paid off. And to top it off I was only 35 years old.

However, on June 22, 2006 my life took a drastic turn. I had just completed a 13 mile run, and upon my return home, I noticed my leg was hurting and beginning to swell. I thought it had to be due to jet lag, lack of sleep, and dehydration. Therefore, I put ice on it, elevated it, and took in plenty of fluids. The following day the leg was worse, so I made the decision to go to the emergency room (ER). At the ER, I was diagnosed with a blood clot! For me this was devastating news....How could I have a blood clot? I thought only elderly people and/or people who did not move could get blood clots. I was not in either of those categories so this news really threw me... I was told to get off my birth control pills, and begin to administer Lovenox® shots twice a day to manage the clot. I left the ER devastated...This was not in my plan. How was I going to get pregnant while I was on blood thinners? How could I have a clot with no family history?

I left the ER with the expectation that I would soon be through my blood clot ordeal. However, the ordeal was just beginning. For the next two months, my leg did not respond to treatment. I had great fatigue and the pain only became more intense. I returned to the hospital and they believed I had an infection. So I was admitted into the hospital for 10 days while my blood was stabilized and tubes put in the infected area to drain it. I went home with the tubes and was put on a daily regimen of IV drugs. Imagine being in your office with an IV pole, a PIC line in your arm, and trying to negotiate million dollar deals. I look back at this time and laugh! I laugh at my overwhelming desire to get to the top, and I laugh at the doctors' lack of knowledge of my true condition.

Finally, in September 2006, all of this madness came to an end. It was cancer! I had cancer! First a blood clot, and now cancer? How could it be? Actually, the blood clot was a warning sign for me and my medical team. My cancer, a squamous cell carcinoma, had wrapped around my femoral vein and was using the blood supply as a means to grow. My cancer was 12 centimeters in diameter and was wrapped around my



Hand cyclist Hope Galley competing in the 2008 NYC Marathon!

femoral vein, my sciatic nerve, and my psoas muscle. My doctors assured me that they would try and make me as comfortable as possible through chemotherapy and radiation, but that they did not expect me to survive. This was not an option for me. I had never been one to take no...and I wasn't about to start now.

So I pulled out all the skills which helped me climb the corporate ladder...I made a list of questions. I interviewed a number of doctors. I reached out to my support teams at work and home. I found references for each hospital. I was on the biggest sales call of my life and I needed to find the best of the best...

On September 16, 2006, Dr Robert Guintoli III, at Johns Hopkins Hospital removed my cancer. Once the cancer was removed, I endured several rounds of chemotherapy and radiation followed by more surgery and radiation. As a result of my treatment, I have lost almost complete use of my left leg. This has been a very difficult thing for an athlete like me.

However, I have found a new outlet for my energy. I'm now a hand cyclist and I was among the 60 hand cyclist competing in the 2008 NYC Marathon! Can you say comeback?

If I can stress anything to you, first, know your body, and make sure you don't ignore any symptoms, because they could be warning signs. Second, make sure you don't take no for an answer! Third, leaders and athletes come in all forms, so don't judge a person by a title or appearance....You never know what that person can bring to you and your life!

And in closing, my motto is, "When life throws you a "wild card," don't forget the rest of the cards in your deck!"

AND...Special "Shout Out" to my Dream Team....My Family and Friends! Thank you, Thank you, Thank you for your love and support!!!



Clinical Corner: Cancer and blood clots

Raj Kasthuri, MD
University of North Carolina at Chapel Hill

ACCORDING TO THE NATIONAL CANCER INSTITUTE, THERE ARE APPROXIMATELY 11 MILLION LIVING AMERICANS WHO HAVE BEEN AFFECTED WITH CANCER, AND ABOUT 1.4 MILLION WHO WERE NEWLY DIAGNOSED IN 2008.

Cancer is a risk factor for developing blood clots (or thrombosis), both in the arteries and veins. Venous thrombosis can occur in the deep veins of the extremities, referred to as deep vein thrombosis (DVT), or in the lungs, referred to as pulmonary embolism (PE). Taken together, DVT/PE are commonly referred to as venous thromboembolism or VTE. Approximately 20% of all VTEs occur in patients with cancer¹. The risk for VTE in cancer is determined by a number of co-existing factors which may be broadly divided into general risk factors [age, race, obesity, past history of VTE, coexisting medical conditions, inherited and acquired thrombophilias] and cancer specific risk factors [cancer site, stage, type of chemotherapy, hormonal therapy, surgery]. The goal of this article is to review the risk of VTE in cancer patients in different clinical settings, and to discuss strategies for prevention and treatment of VTE in cancer patients. These issues are discussed under commonly encountered clinical scenarios and I expect that most patients with cancer will fall under one or more of these scenarios.

The VTE patient without history of cancer

Should patients with newly diagnosed, unprovoked VTE be concerned about underlying cancer?

Unprovoked VTE refers to the situation where VTE occurs in the absence of known risk factors, such as prolonged immobilization, surgery, trauma, and estrogen use. Thrombosis can be the first sign of cancer. It is estimated that about 10-15% of patients with unprovoked VTE will be diagnosed with a cancer over the next 1-2 years. Does this mean all patients with a newly diagnosed, unprovoked VTE should undergo cancer screening? This question was the basis of a recent meta-analysis where data from 34 studies in the literature were evaluated to assess: 1) if screening for cancer in patients with unprovoked VTE was beneficial; and 2) whether there was a difference between limited screening (detailed history, physical examination, laboratory testing and chest x-ray) and extensive screening (ultrasonography or CT imaging of the abdomen and pelvis, measurement of tumor markers like prostate specific antigen, carcinoembryonic antigen and cancer antigen-125). This study found that 6% of patients with unprovoked VTE had a previously undiagnosed cancer at the time of the VTE. This increased to 10% at 12 months after VTE diagnosis. In addition, the extensive screening approach identified more undiagnosed cancers than limited

screening. However, this study was unable to answer two important questions: 1) whether a significant number of cancers detected with this screening approach were early-stage cancers, and therefore, more amenable to cure; and 2) if detecting the cancers earlier resulted in decreased cancer associated morbidity and improved overall survival in these patients². It is important to realize that such extensive screening is associated with adverse consequences, such as exposure to invasive diagnostic procedures, patient anxiety, potential for false positive test results, and increased cost. Therefore, the answer to the question of whether patients with unprovoked VTE should undergo screening for underlying cancer is, at the present time – NO. While cancer should be considered in selected patients, such as the elderly, those with recent weight loss, etc., routine screening in all patients with unprovoked VTE is not recommended.

The cancer patient without history of VTE

What does a person with newly diagnosed cancer who has never had a blood clot need to know about risk for VTE?

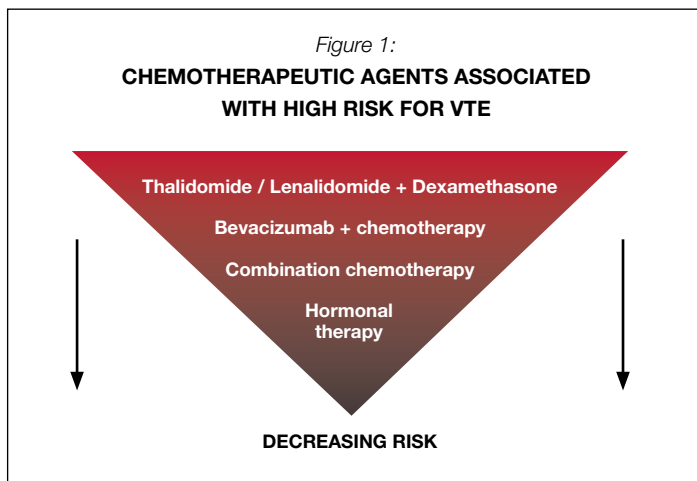
Cancer is an independent risk factor for VTE. Patients with cancer are approximately four times more likely to develop VTE compared to the general population^{3,4}. However, it is important to recognize that this risk varies depending on the type of cancer and certain

cancers are associated with higher risk for VTE than others. Cancers associated with the highest risk for VTE include brain cancer, pancreatic cancer, stomach cancer, ovarian cancer and hematological (blood) cancers like lymphoma and myeloma [specifically myeloma treated with certain types of chemotherapy]^{5,6}. Examples of cancers that are associated with relatively low risk for VTE include breast and skin cancers.

Another important consideration is the treatment for cancer. Chemotherapy can result in activation of the clotting system and confers additional risk for thrombosis. The risk for VTE in cancer patients receiving chemotherapy increases from 4 to about 6.5 fold higher than that in the general population³. Certain chemotherapy drugs, either alone or when used in combination, are more likely to provoke thrombotic events than others. Asparaginase, a drug used in the treatment of certain types of leukemias, is a well known risk factor for thrombosis^{7,8}. Other chemotherapy drugs that have been associated with risk for VTE include Cisplatin, Adriamycin®, 5-fluorouracil, Bleomycin, and Mitomycin. In general, the use of combination chemotherapy regimen, as is done frequently in the treatment of cancer, appears to be associated with an increased risk of thrombosis⁹. The risk associated with hormonal therapy is discussed later.

In some instances, medications that do not confer an increased risk for VTE when used alone can do so when they are combined with other drugs. A good example of this is the combination of high dose steroids and thalidomide for the treatment of myeloma in which VTE rates as high as 20-30% per year have been reported¹⁰. These patients are therefore simultaneously started on thromboprophylaxis (preventive blood thinning therapy) with low molecular weight heparins (Lovenox®, Fragmin®, etc.) or warfarin (Coumadin®, Januvia®), or the dose of steroids is decreased in order to decrease the risk for VTE.

A new class of anti-cancer drugs called anti-angiogenic agents bears special mention. This group of drugs is believed to act by preventing the development of new blood vessels in cancers. An example of an anti-angiogenic agent is Bevacizumab (Avastin®), which is frequently used in combination with other chemotherapy drugs for the treatment of colon cancer, among others. A recent analysis of studies using Bevacizumab found an increased risk for both arterial and venous thrombosis with the use of this drug¹¹. The chemotherapy agents associated with the greatest risk of VTE are outlined in Figure 1. As new and novel approaches are developed for the treatment of cancer, it is important to consider the potential unintended adverse events such as the development of thrombosis.



In addition to the risk for VTE associated with the cancer and treatment with chemotherapy drugs, there are additional risk factors for VTE in cancer patients. First, a number of cancer patients undergo surgery – either for removal of tumors or as part of the diagnostic work-up. Surgery in itself is a well know risk factor for VTE although the risk varies depending on the location and extent of surgery. For example, abdominal surgery and neurosurgery appear to be associated with greater thrombotic risks as compared to other surgeries. Secondly, a number of cancer patients have central catheters placed for long term venous access for administration of chemotherapy. Catheter related thrombosis can occur in such patients. A recent study found that catheter related thrombosis occurs in about 5% of patients with long term venous catheters¹². In addition to the adverse effects associated with DVTs in general, catheter related thrombosis in cancer patients can also lead to delay in administration of chemotherapy and transfusion of blood products. Finally, prolonged immobilization associated with surgery, frequent hospitalizations for administration of chemotherapy, and dehydration are also encountered in patients with cancer, all of which are risk factors for VTE.

Thus, patients with cancer have multiple risk factors for VTE. Therefore all patients with cancer should discuss preventive measures with their doctors to prevent blood clots.

The cancer patient with recently diagnosed VTE

What does the cancer patient recently diagnosed with VTE need to be aware of?

The development of VTE in patients with cancer has many implications pertaining to the treatment of cancer, risk for recurrence of VTE, and overall survival. As in any other setting, VTE in cancer is treated with anticoagulation (discussed later). A common side effect of chemotherapy is the development of low blood counts secondary to suppression of the bone marrow by these drugs. Although this decrease in blood counts is a transient phenomenon usually lasting no more than a few days, it still necessitates withholding of anticoagulation until blood counts recover given the associated increased risk for bleeding. Therefore, more often than not, anticoagulation is frequently interrupted in patients with cancer who are receiving chemotherapy. Despite this, the risk of bleeding complications is higher in cancer patients treated with anticoagulation (12.4% per year) compared to the general population¹³. The risk for VTE recurrence is also higher in cancer patients and about three-fold greater than in those without cancer (20.7% per year versus 6.8%)¹³. Both bleeding following anticoagulation and VTE recurrence appear to be associated with the severity of the cancer and tend to occur within the first 1-2 months of VTE diagnosis. Finally, the occurrence of VTE in cancer is associated with a worse overall survival compared to cancer without VTE. A Danish study compared the survival of patients with VTE and cancer to age, sex, and cancer-type matched control patients without VTE and found that the overall survival in cancer patients with VTE was 2.2 fold shorter at 1 year compared to those without VTE¹⁴.

Overall, the diagnosis of VTE in patients with cancer is associated with a poorer prognosis. This further underscores the need for aggressive thromboprophylaxis in cancer patients to prevent the development of VTE.

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Cancer and blood clots

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Treatment of VTE in cancer patients

Does the treatment of VTE differ among cancer patients compared to the general population?

The answer is – YES. Most patients with VTE are generally treated with warfarin (Coumadin®). In such cases heparin is used in conjunction with warfarin for the first 5 to 7 days for “bridging” purposes and is discontinued once the PT/INR (the test used to monitor warfarin therapy) is within the target range (usually an INR in the 2-3 range). The form of heparin used can be unfractionated heparin (UFH) given intravenously (in the vein) as a continuous infusion; low molecular weight heparins (Lovenox®, Fragmin®, Innohep®) given as subcutaneous shots (under the skin) once or twice daily; or daily fondaparinux (Arixtra®) given subcutaneously. Treatment of VTE in cancer patients is different in that low molecular weight heparins (LMWHs) are preferred over warfarin for the entire duration of anticoagulation. These recommendations are based on the studies that reported lower rates of recurrent VTE among patients treated with LMWHs for 3-6 months (7-10%) as compared to treatment with warfarin (16-21%)¹⁵. Therefore, warfarin should be used for the treatment of VTE in cancer patients only when LMWHs are contraindicated, such as impaired kidney function. Other situations where warfarin is usually used include instances where patients prefer an oral drug to the injections despite the added benefit with LMWH and in cases where patients cannot afford the cost of LMWH therapy.

How do we treat VTE in cancer patients?

The recommended duration of treatment is at least 3 months for most forms of VTE. However, the cancer patient is at increased risk for thrombosis for many reasons as discussed earlier. Therefore, it is recommended that anticoagulation be continued for at least 6 months¹⁵ in cancer patients with VTE. In addition, continuation of anticoagulation for longer than 6 months should be considered in patients who have active cancer and/or are undergoing treatment with chemotherapy. However, clinical trials have demonstrated that the dose of anticoagulation can be safely reduced by about 30% after the first 6 weeks of treatment.

Thromboprophylaxis (clot prevention) in cancer patients

Should all cancer patients receive anticoagulation to prevent VTE?

This is a fair question given everything that has been discussed about the risk for VTE in cancer. The evidence supporting the use of UFH or LMWH for prevention of VTE in patients with cancer is stronger for certain situations compared to others. Perhaps the most important distinction is whether the patient is hospitalized or not (i.e. is ambulatory). There is convincing evidence that thromboprophylaxis in the post-surgical period is beneficial in all cancer patients undergoing surgery. Current treatment guidelines therefore recommend that all cancer patients receive thromboprophylaxis with low dose UFH or LMWH for at least 7 to 10 days following surgery lasting longer

than 30 mins. In addition, patients undergoing major abdominal surgery and in those with high-risk features, such as residual tumor post surgery, coexisting obesity, and past history of VTE, extended thromboprophylaxis for up to 4 weeks is recommended¹⁵. The evidence for routine thromboprophylaxis in hospitalized, non-surgical patients is not as strong. Clinical trials have found that routine thromboprophylaxis in all hospitalized patients is beneficial and a small number of patients in these trials had cancer. Based on these results, it is recommended that all hospitalized cancer patients receive thromboprophylaxis unless there is a contraindication for doing so, or the risk for bleeding is significant. Finally, thromboprophylaxis is not recommended in non-hospitalized (ambulatory) patients except in certain special situations, such as patients with myeloma who are treated with dexamethasone and thalidomide or lenalidomide. Additional clinical trials are underway to determine whether the benefit of thromboprophylaxis justifies the risk (and cost) in certain high risk ambulatory patient groups receiving other forms of chemotherapy.

VTE risk associated with hormone therapy

Hormonal therapy plays an important role in the treatment of patients with breast cancer. The drugs commonly used include Tamoxifen, an anti-estrogen that has weak estrogen-like effects, and aromatase inhibitors (e.g. Anastrozole or Arimidex®), a group of drugs that inhibit the synthesis of estrogen.

The risk for VTE associated with Tamoxifen among healthy women is similar to that associated with estrogen use – 2 to 3 fold higher risk. When Tamoxifen is used for treatment of breast cancer (following surgery or radiation), the VTE risk is about 1.5 to 7 fold higher than the general population¹⁶. In addition, increasing age also factors into this risk and postmenopausal women have a higher risk compared to premenopausal women. Finally, the risk with Tamoxifen is greatest when it is used concurrently with chemotherapy, where it is about 20 fold higher than the risk in the age matched general population¹⁶. The data on VTE risk associated with aromatase inhibitors are less extensive compared to Tamoxifen. In the ATAC trial (Arimidex® and Tamoxifen, Alone or in Combination), Arimidex® was associated with a lower VTE risk compared to Tamoxifen¹⁷. However, the incidence of VTE associated with Arimidex® was still greater than that in healthy women, at about 1% per year.

At present, women who are on therapy with Tamoxifen or an aromatase inhibitor, do not need to receive routine thromboprophylaxis. However, the optimal management of high risk patients, such as those with past history of VTE, remains unclear and should be assessed on a case by case basis.

Risk associated with Erythropoietin Stimulating Agents (ESAs)

ESA are agents that are similar to erythropoietin, a hormone synthesized in the kidney, which stimulates the bone marrow production of red blood cells. ESAs are used to treat cancer and chemotherapy associated anemia. A recent study found that ESAs (epoetin and darbepoetin) significantly decreased the need for red blood cell transfusions in cancer patients. However, these agents were associated with a small increase in the risk for VTE¹⁸. While concurrent thromboprophylaxis with the use of ESAs is not recommended, care must be taken when treating cancer patients already at high risk for VTE with these agents.

Biomarkers of thrombotic risk in cancer

Is there a way to identify cancer patients that are at highest risk for VTE so that VTE can be prevented in this high risk group?

Identification of clinical risk factors and laboratory markers that can reliably identify cancer patients at high risk for VTE could lead to the institution of preventive measures, such as thromboprophylaxis. Along these lines, a number of clinical risk factors are already known and these are outlined in Table 1. A number of laboratory findings have also been associated with risk for VTE in cancer patients. These include an elevated platelet count, elevated white blood cell count, tissue factor expression in cancer cells and plasma tissue factor levels, and increase in coagulation markers (e.g. D-dimers). A risk assessment model for VTE in cancer was recently developed. This model includes a number of clinical risk factors and laboratory markers and uses a scoring system to estimate risk¹⁹. Clinical studies further expanding this model are currently underway and these efforts could lead to better identification of cancer patients at greatest risk for VTE in the near future.

Table 1: RISK FACTORS FOR VTE IN CANCER

General risk factors

- a) Age
- b) Race
- c) Obesity
- d) History of VTE
- e) Coexisting medical problems
- f) Inherited and acquired thrombophilias

Cancer specific risk factors

- a) Site of cancer
- b) Stage of cancer
- c) Type of chemotherapy (see figure 1)
- d) Surgery

References: 1. Heit J et al. Arch Intern Med 162:1245-8, 2002. 2. Carrier M et al. Ann Intern Med 149:323-33, 2008. 3. Heit J et al. Arch Intern Med 160:809-15, 2000. 4. Khorana A et al. Cancer 104:2822-9, 2005. 5. Blom J et al. Jama 293:715-22, 2005. 6. Khorana A et al. Cancer 110:2339-46, 2007. 7. Gugliotta L et al. Eur J Haematol 49:63-6, 1992. 8. Lee A et al. Semin Thromb Hemost 25:137-45, 1999. 9. Haddad T et al. Thromb Res 118:555-68, 2006. 10. Zangari M et al. Blood 98:1614-5, 2001. 11. Nalluri S et al. Jama 300:2277-85, 2008. 12. Lee A et al. J Clin Oncol 24:1404-8, 2006. 13. Prandoni P et al. Blood 100:3484-8, 2002. 14. Sorensen H et al. N Engl J Med 343:1846-50, 2000. 15. Lyman G et al. J Clin Oncol 25:5490-505, 2007. 16. Deitcher S et al. Cancer 101:439-49, 2004. 17. Baum M et al. Lancet 359:2131-9, 2002. 18. Bohlius J et al. J Natl Cancer Inst 98:708-14, 2006. 19. Khorana A et al. Blood 111:4902-7, 2008.

10 FACTS

YOU DIDN'T KNOW ABOUT BLOOD CLOTS AND CANCER

By Elizabeth Varga, MS; Chair - Education Committee, NATT

1. Each year in the US, approximately 1 in 200 cancer patients develop a VTE.
2. About 10-15% of all patients with VTE have cancer.
3. Blood clots are the second leading cause of death in cancer patients (infection is the leading cause).
4. Cancer patients who develop a blood clot have a higher chance of dying. Over 94% of people admitted to the hospital with cancer and VTE will die within 6 months, compared to 40% of people admitted to the hospital with cancer alone.
5. Approximately 1 in 7 hospitalized cancer patients who die, die from pulmonary embolism.
6. 40%-80% of cancer patients who have surgery will develop a DVT and 4-10% will develop PE without preventive treatment.
7. Once a cancer patient develops a first episode of VTE, he or she has 3 times the risk of developing a second clot as compared to non-cancer patients.
8. All cancer patients should be aware of the signs and symptoms of DVT and PE.
9. All cancer patients should discuss their risk of VTE and whether they would benefit from preventive treatment with their doctors.
10. Blood clots in cancer patients can often be prevented with appropriate preventive treatment.

Lee AY and Levine MN. Circulation. 2003; 107:1-17-1-21. The Surgeon General's Call to Action to Prevent Deep Vein Thrombosis and Pulmonary Embolism, 2008. Elting L. Arch Intern Med 204; 164:1653-1661. Prandoni P, et al. Ann Intern Med. 1996; 125:1-7.



As the nation debates the future of our health care system, NATT works to remind policymakers that reducing the incidence of blood clots should be a priority going forward.

Letter from the President

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is higher than ever. NATT's website sees more activity every day as we expand the information available to the general public and health professionals. I am particularly proud of the efforts of volunteers and staff to expand our Minneapolis chapter and increase chapter building in Washington, DC. NATT has increased its efforts to promote clotting awareness at the federal level. We have worked with Congressional committees to increase funding for key public health initiatives and have offered our expertise to federal agencies engaged in this important work. As the nation debates the future of our health care system, NATT works to remind policymakers that reducing the incidence of blood clots should be a priority going forward. If Congress and the President do act on health reform, a measurable reduction in the number of blood clots would be a good test of the success of their efforts.

Even more important, increasing numbers of people are coming to NATT and asking "how can I help?" These dedicated volunteers augment the efforts of our hard working headquarters staff, but there

is always a need for more help as we seek to enhance public understanding and awareness. Go to our website, www.stoptheclot.org, to see how you can work with NATT and support its programs.

No voluntary health organization can survive without the dedicated financial support from individual donors. I am very grateful to everyone who has contributed to NATT and thank you for your generosity and the confidence you have placed in us to use your gifts wisely. If you want to donate to NATT, instructions are just a few mouse clicks away on www.stoptheclot.org. If you would like to organize a local fundraising event, let us know so we can help. Whether it is a golf outing, a 10K race or a silent auction, experienced volunteers can help you make it a success.

NATT welcomes all comers who want to share in our mission. Whether you have had a clot or know someone who has, or even if you want to make sure you never have a clot, there is room for you in NATT and plenty of rewarding work helping others. Thanks to everyone who has already joined our volunteers and a hearty welcome to each of you who want to become part of the NATT family.

RANDOLPH FENNINGER

CDC AWARDS NATT FUNDING

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ties—maximizing educational content, usability, interactivity, patient self assessment tools, webinars, patient video diaries and expanding reach.

- Develop new Stop the Clot™ print-based materials to support education initiatives.

Education of Healthcare Professionals (HCPs) including nurses, nurse practitioners, pharmacists, and physician assistants, is critical to the health of patients with blood clots and clotting disorders. HCPs must be proficient in knowledge about risk factors, signs and symptoms, prevention,

treatment, and complications of blood clots and clotting disorders in order to ensure quality care. In addition to this knowledge, HCPs must develop the skills to motivate patients to adhere to treatment plans that include "blood thinners," frequent testing, and compression stockings, at times a burdensome challenge. NATT has already developed a series of six online lessons to fill any knowledge gaps in HCPs about venous blood clots and clotting disorders, and will evaluate the impact of this curriculum in the coming year. NATT is now ready to develop a series of webinars to develop communications skills of HCPs to promote a therapeutic alliance with patients to motivate adherence.

Using its Curriculum Development Team (CDT) comprised of experts in clotting, NATT will develop webinars on topics that HCPs have indicated are most needed, such as "Preventing Complications

of Blood Clots." These interactive webinars will include PowerPoint slides, video segments, discussion among HCPs, and aids for HCPs and patients to use together. Web-based seminars allow efficient and effective outreach to busy healthcare professionals.

NATT's CEO, Alan Brownstein, complimented the "proactive efforts of CDC, recognizing the need to fund a national public health program against blood clots and clotting disorders." Brownstein added that "CDC's leadership in addressing this issue is an important step towards implementing 'The Surgeon General's Call to Action to Prevent Deep Vein Thrombosis and Pulmonary Embolism', which was issued last September."

Under this five year grant from CDC, NATT's patient and HCP education programs will be carried out in cooperation with the NATT-Minnesota Chapter and the chapter-in-formation in the District of Columbia.

Glossary of Clot-Related Terms

Anticoagulants... medications, commonly referred to as “blood thinners,” that lengthen the time it takes for blood to clot, rather than actually “thinning the blood.” They are used to prevent or to treat blood clots, and may be injected either into a vein or under the skin (e.g., heparin, low-molecular-weight heparins), or taken by mouth (warfarin/Coumadin®).

Centers for Disease Control and Prevention (CDC)... government health care agency, located in Atlanta, GA, whose mission is to collaborate to create the expertise, information, and the tools that people and communities need to protect their health-through health promotion, prevention of disease, injury and disability, and preparedness for new health threats.

Clotting Disorders... term used to describe a group of inherited or acquired conditions in which there is an increased tendency for blood to clot. They are also called thrombophilias.

Coagulation... complex process by which clots form in the blood.

Coumadin®... brand name for warfarin, an anticoagulant (“blood thinner”).

Deep Vein Thrombosis (DVT)... blood clot that forms in the deep veins of the legs, pelvis or arms, although it occurs most often in the legs. Signs and symptoms include swelling, usually in one leg, leg pain or tenderness, reddish or bluish skin discoloration, and leg warm to touch. A DVT may break off and travel to other parts of the body, most commonly the lungs as a pulmonary embolism (PE).

Genetic Counseling... the process of helping people understand and adapt to the medical, psychological and familial implications of genetic contributions to disease. It includes interpreting family and medical histories to assess the chance of disease occurring or recurring; educating about inherited risk, testing, management, prevention, resources and research; and counseling to promote informed choices and adaptation to the risk or condition.

Hematologist... physician who specializes in the treatment of blood diseases and disorders. Many combine hematology with oncology (cancer specialist) and treat cancer and blood diseases.

Heparin... an anticoagulant medicine (“blood thinner”) used to treat blood clots, most often during hospitalization.

Hypercoagulable... an abnormally increased tendency to form blood clots, due to an inherited or acquired disorder.

Hyperhomocysteinemia... condition when homocysteine levels are abnormally elevated in the blood that may damage the lining of blood vessels and lead to the formation of blood clots. MTHFR mutation has been associated with an increased risk for hyperhomocysteinemia.

INR (International Normalized Ratio)... blood test that monitors whether the therapeutic or beneficial effect of anticoagulation is within normal range, usually between 2.0 and 3.0. It is calculated from the prothrombin time (PT), or the time it takes for blood to clot in a test tube. INR can be monitored by a lab, or done by selected patients at home with a self-testing device.

Low Molecular Weight Heparin (LMWH)... a form of heparin (“blood thinner”) that is injected right below the skin. LMWHs’ effects last longer and are more predictable, require less monitoring, and generally have fewer side effects than standard heparin. LMWHs are often used as an alternative to heparin or as “bridging” therapy for patients on oral anticoagulants such as warfarin/Coumadin®. Examples of brand LMWHs are Fragmin®, Lovenox®, and Innohep®.

Post-Thrombotic Syndrome (PTS)/Post-Phlebotic Syndrome... complication of deep vein thrombosis (DVT). Signs and symptoms of PTS range from leg pain and/or heaviness with occasional swelling to extreme chronic pain, persistent swelling and skin color and texture changes. The extreme, most severe symptoms associated with PTS are the development of chronic leg ulcers or open wounds that are difficult to heal.

Prothrombin Time (PT)... blood test that measures the time (in seconds) it takes blood to clot. This provides a control for long-term oral anticoagulant therapy. It is the basis to calculate INR.

Pulmonary Embolism (PE)... blood clot in the lungs, a serious complication of a deep vein thrombosis (DVT). Signs and symptoms include sudden shortness of breath, chest pain that is sharp or stabbing that may get worse with a deep breath, rapid heart rate, and/or unexplained cough, sometimes with bloody mucus. Pulmonary embolism may be fatal in about 1 out of 3 people.

Thrombophilia... hereditary or acquired predisposition to develop blood clots. It is also referred to as hypercoagulable state or hypercoagulability.

Thrombosis (aka thrombus)... blood clot that forms within a blood vessel.

Thrombus... medical term for a blood clot.

Venous thromboembolism (VTE)... collective “umbrella” term for deep vein thrombosis (DVT) and pulmonary embolism (PE).

Warfarin... oral anticoagulant or “blood thinning” medicine. Brand name: Coumadin®

This glossary has been adapted from “100 Questions & Answers about Deep Vein Thrombosis and Pulmonary Embolism” by Audra H. James, MD, Thomas L. Ortel, MD, PhD, and Victor F. Tapson, MD, Copyright © 2008, Jones and Barlett Publishers, Sudbury, MA.



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Stop the Clot™

What Every Health Care Professional Should Know

NATT plans to post an online curriculum for health care professionals on blood clots and clotting disorders soon at www.stoptheclot.org.

Last year, a survey of health care professionals conducted by NATT demonstrated a need for more information about blood clot prevention and treatment. NATT developed a curriculum that includes a series of self-paced, online lessons to address these stated needs as a product of its cooperative agreement with The Centers for Disease Control and Prevention (CDC).

Each of the six lessons in this series focuses on a particular topic relevant to health care providers.

- Basics of Clotting
- Basics of Thrombophilia
- Anticoagulant Medications

- Post-Thrombotic Syndrome
- Pulmonary Hypertension
- Prevention of DVT Recurrence

Each easy-to-use lesson contains examples and interactive items to check knowledge and progress, and each lesson can be completed in one sitting, or whatever pace is compatible with an individual's learning style.

Contact hours will be available with a fee (to be determined). NATT invites health care professionals to learn more about this upcoming and rich resource that will ultimately benefit thrombosis and thrombophilia patients, NATT's primary constituency.

This curriculum is supported by Cooperative Agreement U27 DD00326 from the Centers for Disease Control and Prevention.

Corporate Acknowledgment

NATT extends grateful appreciation to the following companies for their generous support:

Champions \$500,000 and above

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Blood Clot Busters – Become a NATThlete!

WALK

RUN

BIKE

GOLF

TO STOP THE CLOT™! Mobilize for Fun and Funds

By Kristen J. Holgerson, Director of Development - NATT

Double the value of any mini-marathon, marathon, ironman, swim meet, cycling race, golf tournament, or sports activity in which you participate!

When you exercise, you minimize your risk of venous blood clots, and you can maximize any sports event by raising money to stop clots in others. Commit to help NATT spread the word about the danger of blood clots in veins. Mobilize family, friends, and your circle of sports enthusiasts or couch potatoes to become a local Stop the Clot™ Team for NATT.

NATT will use donated money to alert people to the risk of blood clots and clotting disorders. Approximately 350,000-600,000 people have blood clots in the leg (DVT or deep vein thrombosis) or lung (PE or pulmonary embolism) that result in about 100,000 deaths each year in the US. This means that about 1 out of 3 people with venous blood clots die.



Roland Varga

Roland Varga, a triathlete from Columbus, Ohio, created the idea of an awareness program as he ran in marathons and competed in triathlons. “I wore a Clot Buster shirt, covered with red polka dots,” explained Varga, “and got a lot of attention! I also gave out a lot of information. If I could do this,

we could multiply by hundreds if we recruited others to work with us.” Known as “Clot Buster” to many friends and associates, Roland continues his goals of raising awareness and funds as he competes in events in the Midwest and other parts of the country. Roland also extended his reach to potential donors by being featured on his company’s website with a link to NATT. Liz Varga, Roland’s wife and a founding NATT board member, is also so committed to the program that she is fundraising as part of a half marathon she will run in October 2009.

We are partnering with FirstGiving to help us with our online fundraising programs this year. FirstGiving is the leading social fundraising platform. Their site gives us the tools and resources to raise more money and reduce our development costs. Raising money online with FirstGiving is simple and effective, and this is where you come in. In about 5 minutes, you can easily create a personalized fundraising page and email it to everyone you know. Here are two great examples: www.firstgiving.com/lizvarga and www.firstgiving.com/rolandtheclobuster. It’s easy to ask lots of people to support you by making a secure donation online. Donors can also leave supportive personalized messages right on your fundraising page, and you can track your fundraising progress in real time.

FirstGiving automatically processes these donations for us, saving you the hassle of collecting and forwarding checks. If you would like to partner with us in this important work, please go to www.firstgiving.com/NATT to set up your personal fundraising page. Or, for more information contact Kristen Holgerson at kholgerson@stopthecLOT.org or Judi Elkin at jelkin@stopthecLOT.org. Thank you for working with us to make a difference!

Here’s what you do:

- Register for an event and pass it on
- Complete and submit a waiver form
- Create a personal online fundraising page for donations and e-mail everyone you know!
- Train for your event
- Let us know how you did so we can acknowledge your efforts

Here’s what NATT will do:

- Promote your participation - before and after!
- Provide you with an event-day NATT singlet
- Assist you with your online fundraising page
- Link you to other NATThletes for support
- Recognize your efforts in support of awareness, prevention, treatment and support

Calendar of Events and NATT Happenings

Find out about the different thrombosis and thrombophilia related events and activities happening in your community. Also, please check our website for more details at www.stopthecLOT.org.

Healthy People 2020

Seattle WA, November 20, 2009

NATT Medical and Scientific Advisory Boarding Meeting

New Orleans, LA, December 6, 2009

NATT Board Strategic Planning Retreat

January 2010, TBD

NATT-MN Stop the Clot™ Forum

Twin Cities, March 6, 2010

National Conference on Blood Disorders in Public Health

Atlanta, GA, March 9-11, 2010

www.BloodDisordersConference.com

NATT contributes to the HEALTHY BODY, HEALTHY MIND

Public Television Education Series.

**Several NATT Board members and NATT CEO
Alan Brownstein were featured in the Public
Television series “Healthy Body, Healthy Mind”
on the episode entitled “Deadly Blood Clots.”**

**You can view this 26 minute,
informative video online at**

<http://www.healthybodyhealthymind.com/>

The contents of the NATT newsletter is for informational purposes only. It is not intended to be a substitute for professional medical advice, diagnosis or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition. NATT does not recommend any specific tests, physicians, products, procedures opinions or other information that may be mentioned in the newsletter. Reliance on any information provided by NATT is solely at your own risk.

Printing and distribution of this newsletter was made possible by



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