



PUGET SOUND QUARTERLY

Oncology Nursing Society

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What's So Important About Vitamin D?

*Patti Kwok ARNP, MN
David Lerner L.A.c, M.TCM.*

Why is it that one vitamin is getting all the attention? 1,25 dihydroxyvitamin D₃, (calcitriol) the biologically active vitamin D metabolite is now known to exert many important physiological effects on different tissues, independent from the regulation of calcium and bone metabolism. Vitamin D is a prosteroid hormone with anti-proliferative properties which promotes cell differentiation. Interestingly this has led to discovering its possible role in cancer chemo prevention and reducing risks of many other life threatening illnesses.

Once discovered in the early 1920's that a prevalent disease, rickets, was due to vitamin D insufficiency, foods were fortified and an obvious disease went

away. Over time important implications of vitamin D were hypothesized with the discovery that most tissues and cells in the body have a vitamin D receptor. The idea that sunlight and vitamin D inhibit growth of certain cancers is not new. In 1915 the researcher Hoffman first described the possible relationship between cancer mortality and latitude. The purpose of writing this article is to share insights from a traditional medical viewpoint but also to collaborate with an alternative medicine colleague who has spent more of his career studying effects of nutrition and prevention. Traditional medicine all too often ignores this perspective.

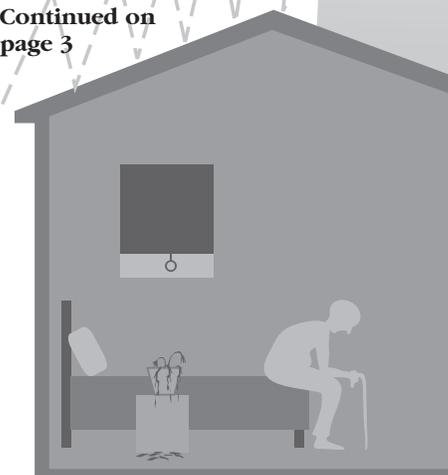
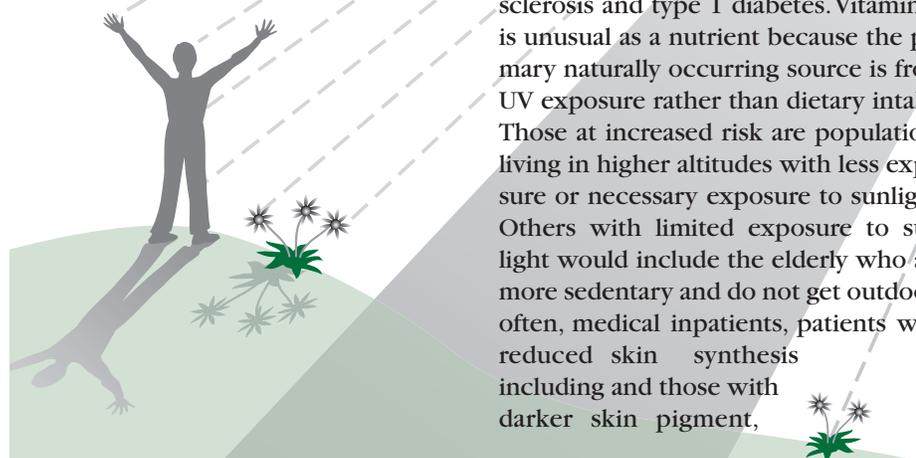
There is growing awareness that vitamin D sufficiency is required for overall optimal health. Research during the past two decades has shown important connections to vitamin D deficiency and certain illnesses such as cancer, multiple sclerosis and type 1 diabetes. Vitamin D is unusual as a nutrient because the primary naturally occurring source is from UV exposure rather than dietary intake. Those at increased risk are populations living in higher altitudes with less exposure or necessary exposure to sunlight. Others with limited exposure to sunlight would include the elderly who are more sedentary and do not get outdoors often, medical inpatients, patients with reduced skin synthesis including and those with darker skin pigment,

those covering more of the body with clothing when outdoors, and patients with skin grafts for any reason-plastic surgery, skin burns etc. Sunscreen use, season, latitude, and time of day of skin exposure will also affect adequate solar vitamin D sufficiency.

Vitamin D Synthesis and Metabolism

During exposure to solar UVB radiation 7-dehydrocholesterol in the skin is converted into pre-vitamin D₃. This former compound is then immediately converted to vitamin D₃ in a heat-dependent process. Vitamin D in the circulation is bound to the vitamin-D-binding protein, which transports it to the liver where it is hydroxylated to produce 25-hydroxycholecalciferol which is the major circulating form of vitamin D and the best indicator of overall vitamin D status. This form of vitamin D however is the biologically inactive storage form and must be converted in the kidneys by 25-hydroxyvitamin D-1alpha hydroxylase (1-OHase) to the biologically active form 1,25-dihydroxyvitamin D (1,25(OH)₂D). This biologically active form once converted by the kidneys then binds to vitamin

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PRESIDENT'S MESSAGE

Get Involved with PSONS and Share in Our Growth

Renita Vance RN, MSN
PSONS President

As I anticipate what will be a year of personal growth for me as President of PSONS, I'm excited about the opportunities for growth for our chapter. We are fortunate to have a legacy of oncology nurses who had a passion for networking, education, community service and support to pave the way for us today. We have a responsibility to continue that legacy. I feel the weight of that responsibility but know that I am not carrying that weight alone.

We have a tremendously talented board that represents YOU, and most importantly we have over 300 members in our chapter. What a wealth of talent and ideas! Because we DO represent you, we are interested in your concerns, ideas and participation. What's important to you? What does PSONS need to do to for you to remain a member and

more importantly, what needs to happen to get you to actively participate in this organization? We all go through seasons in life when participation in anything outside of our family life and work is just not possible. However, there are other seasons when we are ready to stretch and grow and maybe do something we are a bit uncomfortable with. Getting involved in PSONS may be one of those things. I've heard some of our members say, "you have to have a master's degree to be on the board" or "I'm just a staff nurse—I don't have anything to offer." Both of these statements couldn't be further from the truth! We have board members who don't have an advanced degree and some who don't have a BSN. We have staff nurses, clinical specialists, educators and some people who don't even work primarily in oncology but have a passion for oncology patients. We NEED you!

At the symposium we spent our



Renita Vance

board meeting time having discussions about some of the issues that affect all of us in PSONS—education, research, etc. We got a lot of valuable information and there are patterns to the information. The board will be seeing that summary on May 5 at our board meeting and brainstorming where we go from here with that information. Look for the summary in the summer symposium issue of the Quarterly. Do YOU want to be

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GUEST EDITOR'S NOTES

Co-Morbidities and Their Effect on Cancer Treatment

Patti Kwok ARNP, MN

As guest editor I was asked to help put together an issue having to do with co-morbidities and their effect on cancer treatment and outcomes. It is generally acknowledged from existing literature that co-morbidity has a significant impact on treatment selection and outcomes for elderly patients with cancer. In my practice as an ARNP probably two-thirds of my patients are considered elderly. Aging-related health problems are common in newly diagnosed older cancer patients

given that the median age range for most tumors is 70-74 years. Adjuvantonline is an example of a helpful tool for making therapy decisions based on a patient's age, stage and biology of their cancer and impact of their underlying health status. In the near future I predict, due the aging population, a surge of important research results in the area of geriatric oncology research.

Common co-morbid conditions that occur in those over age 65 include diabetes, congestive heart failure, coronary artery disease, hypertension, and obesi-

ty. Older patients are also at increased risk for DVT and stroke, two conditions which are affected by the administration of chemotherapy causing vascular damage. Many of our patients have central line catheters and are at additional risk for clotting. Not infrequently older patients are on wafarin for atrial fibrillation which has many potential drug interactions. Breast and prostate cancer are often treated with hormones which can also increase the risk for blood clots. The aromatase inhibitors can increase risk of osteoporosis and hip

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The opinions expressed in this newsletter are those of the authors. It should not be inferred or assumed that they are expressing the views of ONS or PSONS.

Vitamin D: Lack of Sun Exposure Increases Cancer Mortality

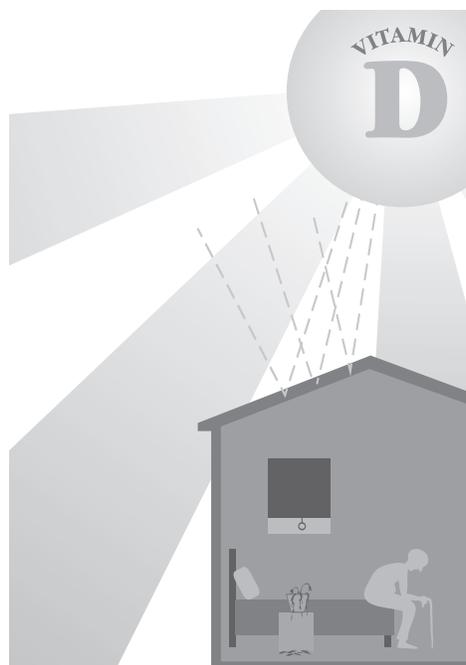
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D receptors in target tissues such as the mammary glands, muscle, bone, nerve tissue-wherever there are vitamin D receptors. It is a complicated process interacting with the immune system, other hormones, (and) serum phosphorus, calcium and parathyroid hormone, increasing or decreasing through a feedback system the renal production of 1,25 (OH)₂ D. The kidneys tightly regulate production of 1,25 D and blood levels do not rise in response to increased intake. Therefore when ordering a blood draw to check vitamin D levels the clinician should be requesting 25 (OH) D (calcidiol) and not 1,25 (OH)₂ D (calcitriol). A 1,25 D test should never be used for detecting deficiency status as levels can be normal or even elevated (while vitamin D status is actually insufficient) as a result of secondary hyperparathyroidism.^{7,12}

Chronic Illness and Vitamin D

As early as 1941 an inverse relationship between sun exposure and cancer mortality was documented by Apperly. Several studies since then have shown that those living at higher latitudes are more likely to die from cancer as compared to those living at lower latitudes. People living at higher latitudes are at increased risk for many cancers such as Hodgkin's lymphoma as well as colon, pancreatic, prostate, ovarian, breast and other cancers. Timing of diagnosis may also have an effect on survival i.e., summer and autumn diagnosis were associated with highest survival, thought to be related to higher circulating calcidiol levels. Deficiency of vitamin D has also been associated with osteoporosis and fracture, congestive heart failure, depression, osteoarthritis, diabetes and many autoimmune diseases-predominately multiple sclerosis which is increasingly prevalent among those who live in Northern latitudes)^{7,16}.

There is mounting evidence that vitamin D helps lower risk of breast cancer. Lin, J et al. found that higher intakes of total calcium and vitamin D were associated with a lower risk of developing pre menopausal breast cancer¹⁷. Benefits were not observed in post menopausal women. They hypothesized



that the protective effect may be more pronounced against more aggressive tumors which tend to be the majority of tumors in pre menopausal women. Knight, et al,¹⁸ found that the effective window of exposure to adequate vitamin D for prophylaxis may be limited. In their population-based case control study they found that those who had more sun exposure and dietary vitamin D intake between ages 10-19 had the lowest risk of breast cancer. For intakes or exposure during middle age (45-54) these associations disappeared. Other studies show no association between vitamin D intake and breast cancer risk^{19,20}. The inconsistencies are thought to be due to different methods for selecting cases and controls, and differing dietary intake data collection tools-many are by recall which has its disadvantages. It is possible they may simply indicate no real association. Another study found strong evidence to support the theory that vitamin D lowered risk for development of breast cancer, but that timing of exposure, particularly during breast development might be most critical¹⁸. Both in vivo and in vitro data show that vitamin D can shrink large breast tumors, mainly by enhancing apoptosis and reducing proliferation of tumor cells^{21,22}. Vitamin D has also been shown to slow progression of breast cancer by inhibiting secretion of

proteins that might be responsible for increasing metastatic deposits in bone²³.

In 1990 Schwartz and Hulka showed that a high prostate cancer mortality might be related to vitamin D deficiency²⁴. Frequent sun exposure was actually found to reduce the odds for abnormal levels of serum prostatic specific antigen¹⁶. Many studies have demonstrated the inverse relationship between vitamin D and colorectal cancer risk. Kana et al. looked at this relationship based on data suggesting that metabolic transformation of 25 (OH)D to 1,25(OH)₂D might take place not just within the kidney, but within the colon as well as several other sites. The authors conclude that adequate vitamin D levels, as measured by 25(OH)D, in the range of 33ng/mL might be associated with an approximately 50% decreased risk of colorectal cancer²⁶. It is possible that higher intakes of vitamin D levels might have a greater beneficial effect in those whose vitamin D levels are lower, such as in African Americans and the elderly.

Sources of Vitamin D

Vitamin D can be only be obtained from UVB exposure (sun or tanning bed), diet and nutritional supplements.

Food sources of vitamin D are limited. While certain fatty fish offer a healthy dose, you'll notice from the list below, options are very limited, and diet by itself will not meet vitamin D sufficiency. One trial showed that not one adult or child received the current RDA's of vitamin D from diet alone⁵. Cod liver oil also delivers a therapeutic dose and is one of the best sources of vitamin D, however it is really a nutritional supplement rather than a food source.

Supplemental vitamin D is available in 2 distinct forms - ergocalciferol (vitamin D₂) and cholecalciferol (vitamin D₃). D₃ is the naturally occurring form and is made from sunlight or can be taken as a supplement. D₂ is synthesized industrially by irradiating yeast. It is not the form produced by sun exposure. Historically, the two forms have been considered interchangeable based on rickets studies that were done 70 + years ago. Since we now have a reliable

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Treatment Expectations for Patients with Herceptin and Doxorubicin Induced Heart Failure

Early Diagnosis and Treatment of Heart Failure Can Improve Outcomes, Avoid Exacerbations and Reverse Damage to the Heart

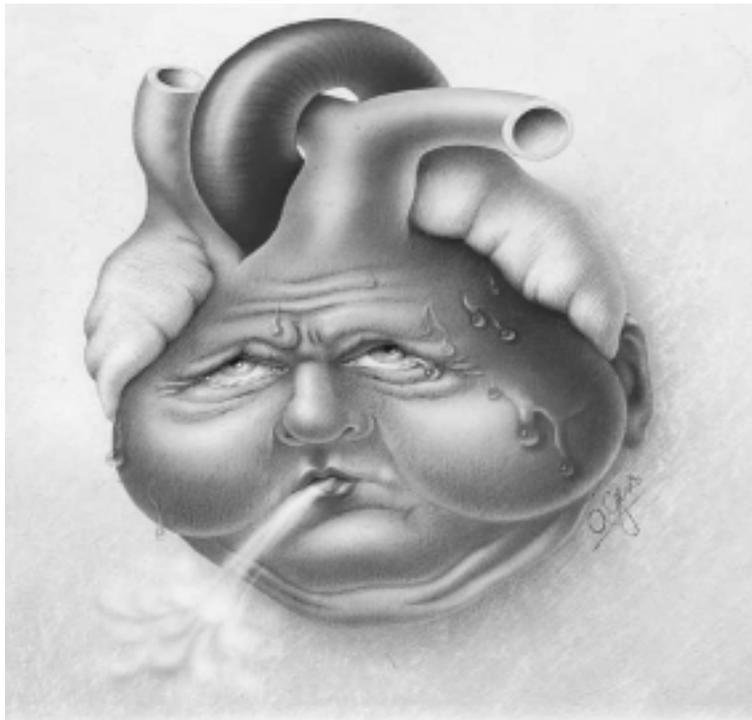
Gerda Cunningham, RN
Heart Failure Case Manager, Group Health Cooperative

While this article is not in any way a scientific presentation on drug induced heart failure or cardiomyopathy, it is based on my experience of more than 9 years as a heart failure case manager, managing hundreds of patients in all categories of heart failure. The purpose of this article is to increase awareness of risk factors for heart failure which can be caused by cancer therapies such as doxorubicin and herceptin. A general overview of heart failure is also provided since many cancer patients may be at risk based on pre-existing conditions or advanced age. The goal is to provide general information, early risk assessment, common interventions and treatments for this potentially life threatening disease, as well as guidelines for patient education. The patient's mental and emotional status, support system and social network also must be considered.

Congestive Heart Failure has been on the rise over the last 30 years and

remains a leading diagnosis for hospital admissions. This common morbidity is taxing to the healthcare system financially and causes grave personal suffering for patients and families.

Mortality for heart failure patients remains high. Currently there are more deaths from heart failure per year than from all forms of cancers. The total medical cost per year is estimated at 30 billion dollars. The majority of patients with the diagnosis of heart failure are



above 60 years of age, but smaller numbers below age 60 are sometimes also effected Many of the underlying causes leading up to this disease are chronic and degenerative in nature. In general, heart failure remains a chronic condition which is treatable but not curable. However, cardiomyopathy caused by herceptin or doxorubicin is often reversible with early detection and opti-

mal medical intervention and treatment. It is also important to understand that drug induced heart failure may not present itself with overt symptoms and may remain "silent".

It is important to understand the seriousness of this disease, make a correct diagnosis, and create a state of the art plan of care based on national heart failure guidelines. Early recognition of symptoms will support favorable outcomes, improve quality of life and decrease the burden of illness on patients, families and the health care system. Appropriate treatment can also lead to significant cost savings.

Changes in Cardiac Function

Heart failure effects physiology and hemodynamics causing changes in structural and functional status. These changes can involve the heart valves, blood vessels, heart muscle and the electrical system. Any malfunction in the cardiac cycle can decrease cardiac output

causing preload and afterload changes. Premature cell death or apoptosis can lead to irreversible muscle damage. Furthermore, there are inflammatory processes occurring that can eventually be damaging. The heart makes an attempt to meet the physiological needs of the body by working harder, which causes "remodeling"—a thickening of the heart muscle, which mostly occurs in the left ventricle. The renin-angiotensin system is then activated, leading to fluid retention with peripheral edema or pulmonary congestion. Herceptin and doxorubicin cause cardiac toxicity which can occur early on during treatment, or even post-therapy. The mechanism responsible for cardiac injury

with these drugs is not fully understood; however, lipid peroxidation and free radical generation by anthracycline-iron complexes are considered to be of pivotal importance. The combination of doxorubicin and herceptin together can increase risk of heart damage over herceptin alone. Less is known about the particular effects herceptin has on the

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heart. However, optimal treatment for heart failure should focus on the process known as “reverse remodeling”, which allows the heart to return to its prior state of normal function.

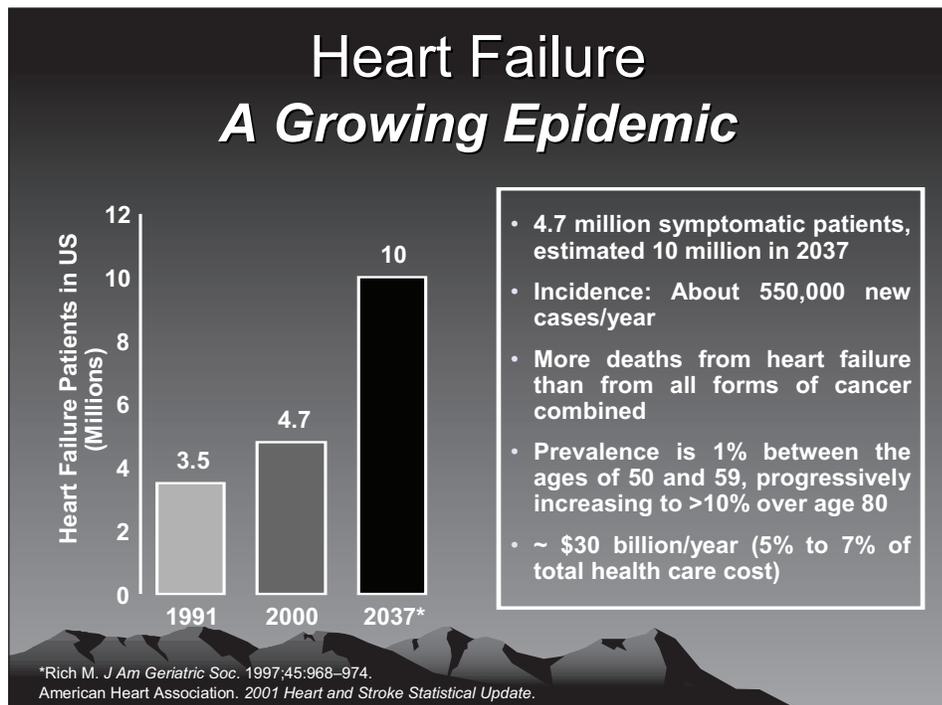
Diagnosis and Assessment of Drug Induced Cardiomyopathy or Heart Failure

The diagnosis of heart failure is defined as a clinical syndrome which is characterized by specific symptoms in the medical history, and signs on physical exam. There is no single test for heart failure because it is largely a clinical diagnosis based on careful history and physical exam. When the heart fails as a pump it is unable to meet the needs of the body.

A work-up for heart failure includes a thorough physical examination and assessment of neck veins, laboratory studies which should include a CMP (comprehensive metabolic panel), BNP or pro-BNP (b-type natriuretic peptide) depending on the lab, CBC with differential and iron studies if indicated, thyroid function and lipid panel.

A baseline ECG and CXR are also recommended. The most important assessment tool remains the echocardiogram for assessment of left ventricular systolic or diastolic function, valvular lesions, pericardial disease and pulmonary artery pressure. Alternative diagnoses such as pulmonary disease or nephrotic syndrome must be considered if heart failure is not the cause of the symptoms. Other reversible causes like coronary artery disease need to be considered.

An Ejection Fraction of $\leq 35\%$ presents severe LVSD (left ventricular systolic dysfunction), 35-40% moderate, 40-45% mild, and anything above is referred to as “preserved left ventricular function”. The latter may still indicate diastolic heart failure. There may be variability in the ejection fraction in patients with valvular lesions. Nuclear perfusion studies are sometimes used to confirm a diagnosis or for follow-up on a poor quality echocardiogram due to obesity or other issues. At times a TEE (transesophageal echo) is necessary to gain more detailed and accurate information about valvular function. Further cardiac perfusion tests or cardiac catheterization should be ordered if



CAD (coronary artery disease) is suspected.

There are several categories of heart failure which include left ventricular systolic dysfunction, left ventricular diastolic dysfunction, valvular problems and right heart failure. These differences may need to be considered when creating a treatment plan based on guidelines. It is common practice to obtain an echocardiogram or RNA prior to therapy with herceptin or doxorubicin. Either test can be used for ongoing monitoring usually every 3 months while a patient is receiving herceptin therapy. It is important for consistency and comparison purposes that the same test be utilized each time. Appropriate drug dosing is critical in order to decrease the risk of heart failure. Tracking accumulative doses of doxorubicin in a flow chart is important. The maximum lifetime accumulative dose should be no more than 450mg-500mg/m². Dexrazoxane is a cardioprotective agent available for patients receiving ongoing treatment with an anthracycline such as in the metastatic setting. Appropriate clinical judgment remains the cornerstone of a good treatment plan.

Heart Failure Etiology

Many of the underlying causes of heart failure are well known; some causes may be rare or not as well under-

stood. The most common causes are coronary artery disease, arrhythmias, hypertension, MI, sleep apnea, diabetes, viral or bacterial infections, ETOH or drug abuse, renal insufficiency, obesity, herceptin and doxorubicin induced cardiomyopathy, and pregnancy. Untreated anemia and depression can affect heart failure outcomes, as well as patient non-adherence and lack of knowledge about the treatment plan and self care. Chronic and untreated hypertension causes the heart muscle to thicken and enlarge, resulting in weakness. Coronary artery disease, one of the most common causes of heart failure, may require surgical intervention or stenting. Valvular defects may need surgical correction. Alcohol and drug abuse can have toxic effects on the heart muscle causing severe failure. Diabetes can lead to small vessel diseases and CAD. It is important to consider and treat all co-morbidities and risk factors when caring for those with heart failure in order to promote optimal outcomes.

Heart Failure Symptoms

The patient must be carefully assessed for potential heart failure symptoms especially with a history of the disease or while receiving medications that may cause or exacerbate the condition. Nurses are in a pivotal position to observe and educate patients receiving chemotherapy about

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***President's Message:* Help Formulate Our Strategic Plan for PSONS**

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involved in deciding what we do with that feedback? Come to the board meetings!

The dates, time and location are posted on the PSONS website.

This is the year we review our bylaws. Now I know that doesn't sound like a lot of fun (even to me!) but these are the guidelines by which our organization functions. That makes them very important and they need to reflect the desires/needs of the organization. Would you like to be involved in reviewing / updating them? Come to the board meetings!

We will also be formulating a strategic plan for the next 2-3 years for PSONS. This is where we determine what our priorities are for education, research, leadership development, financial priorities, recognition, etc. Do you have ideas about what you'd like to see from PSONS in these areas? Come to the board meetings!

I've been meeting with the board members individually and hearing their frustrations, ideas, and sharing some of mine. Here's what I'm currently thinking about for the coming year.

My goals for PSONS are that it will be a valuable and important tool for oncology nurses in our community. I want to support and continue to foster the professional aspects of the organization. One way to do that is to provide monthly educational programs that have continuing education credits for attendance and participation. This probably means fewer industry dinners but we have a

wealth of excellent speakers in our community and we can utilize our graduate programs in the community. If you have program ideas, send them to Janet Bagley (janet.bagley@swedish.org) (she is looking for committee members as well if you're interested!).

I would like to see greater membership participation in the work of the chapter. This is an organization that has a history of a relatively small group of individuals carrying the work forward from year to year and it's time for new blood!

I would like to see more community involvement. We have an active oncology community here in the Puget Sound area but we are virtually invisible to the public. This means visibility at community events. Maybe we participate in cancer screening or provide education at community events associated with Seafair.

I would like to see more of our members highlighted at the national level. There are many awards and opportunities for recognition nationally that our membership misses out on because we don't take the opportunity to nominate them.

I would like to see us use our considerable voice to promote cancer and health related issues to our politicians. We are in an election year that will have a major impact on the cost of health care, no matter who is elected. We have a strong and mighty voice that can be used to advocate for our patients and ourselves with those who represent us. There is a coming shortage of nurses and oncologists that has me worried about who will care for us? We can partner with our oncologist colleagues to

determine who will provide care and how that will be done in the future with a severe shortage.

This year the fall meeting of ONS, Institutes of Learning (IOL) will be in Seattle on November 13-16. Our chapter will have a major role in hosting nurses from all over the country to our beautiful city. It requires hundreds of volunteers to make this happen. It's a great opportunity to see first-hand how the national organization functions and a wonderful way to get involved locally without a huge long-term commitment. Martha Purrier (Martha.purrier@vmmc.org) is our local liaison with ONS for IOL. There is planning prior to the conference and volunteer opportunities during the conference.

Finally I would like to see more local recognition. We have incredible things happening in our oncology community that go unnoticed. May is Oncology Nursing Month. The ONS theme is "I AM...an oncology nurse" Let's take the time to recognize those we work with for the extra things they do for patients, for the extraordinary caring and support they provide, for the faithfulness to come to work and spend another day with patients who are fighting the battle of their life. If you would like to recognize someone please let me or one of the board members know. Recognition is an important goal in my plan for this year!

Thank you for all you do for oncology patients and the oncology community! Happy Oncology Nursing Month!



Guest Editor's Notes

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fracture. Darbopoetin and erythropoietin, used to treat anemia, can possibly increase risk of heart attack, stroke, heart failure and cancer tumor growth in some patients according to early data. One should consider using these medications even more cautiously in those with a history of any of these medical conditions. Both MS and diabetes have symptoms such as weakness and neuropathies that can be exacerbated by the taxanes, cisplatin and other chemothera-

pies. Dexamethasone is a steroid that is a very effective and inexpensive anti-emetic although should be used with caution in our diabetic patients and those with a history of depression. Other concerns include of course the anthracyclines and herceptin use in especially the elderly due to their potential to cause heart damage, some of which is irreversible. We need to be aware of our patients' underlying health conditions, potential drug interactions and the effect chemotherapy can have on their already existing health problems and quality of life. These are important aspects to consider before

we can ensure safe and high quality cancer care.

Finally I added an article I had the pleasure to write with one of my complimentary provider colleagues who is thankfully on the Group Health provider list-David Lerner, L.A.c, who provides acupuncture and nutritional counseling. Vitamin D deserves a lot of attention and if you read on you will see why. Deficiency of vitamin D in the Northwest is certainly a concern and has been linked to many of the co-morbid conditions I have mentioned earlier.



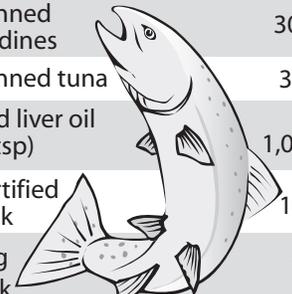
Vitamin D: Solar UVB Rays are the Primary Source of Vitamin D

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method (25(OH)D test) that can accurately measure vitamin D status in humans, it is clear that D3 is more potent (1.7 times more efficient in raising D levels), possibly less toxic and a superior choice for supplementation. Interestingly D2 continues to be the main source used in prescription vitamin D medications in the US^{1,2}.

Solar UVB rays are the primary source of vitamin D for most people, but this isn't the case if the skin isn't exposed or is covered with sunscreen. Sunscreen with an SPF of 8 or greater will block almost all vitamin D synthesis from the sun. The current medical mantra of "sun bad, sunscreen good" needs to be modified in light of the vitamin D data that has been published over the past 10 years, and it may be wise to consider the idea of regular "sensible sun exposure". The human body is well designed to only synthesize the amount of vitamin D that is optimal from sun exposure, and absorption stops after that point is reached; hence the reason there are no reported cases of vitamin D toxicity from solar rays. For most people, the saturation point is 20,000 IU, which is normally obtained from 20 minutes of full body exposure in the summer. The optimal time of day for sun exposure is solar noon as the ratio of UVB to UVA is highest. It is also thought that basal cell carcinoma (BCC) and cutaneous malignant melanoma (CMM) are more susceptible to UVA irradiation, and they are also linked more to intermittent UV exposure, not to sensible regular exposure. Exposure to one minimal erythema dose (MED, the amount of time it takes for the skin to start turning pink) is equivalent to ingesting 10,000-25,000 IU of oral vitamin D. A reasonable sun exposure recommendation for a fair skinned person would be 5 - 30 minutes of arms and legs without sunscreen (depending on time of day, season, latitude and skin pigmentation). For dark skinned individuals, such as African Americans, it's more likely 30-60 minutes. Tanning beds also offer an option as they emit 2-6% UVB radiation, and have been shown to boost 25(OH)D levels (30-50% of the recommended time,

Food source	Amt. of Vitamin D per serving
Wild salmon	400 - 740 IU (Depending on variety)
Farmed salmon	100 - 250 IU
Canned salmon	300 - 600 IU
Canned sardines	300 IU
Canned tuna	300 IU
Cod liver oil (1 tsp)	400 - 1,000 IU
Fortified milk	100 IU
Egg yolk	20 IU



with sunscreen on the face). For northern latitude states or countries, it's worthwhile to know that D3 from sun can be stored in fat tissue and released over a three month period during the winter, when synthesis is limited or sometimes impossible^{5,7,9,12}.

Are We Deficient?

While optimal levels of vitamin D status, as defined by serum levels of 25(OH)D, are still debatable the consensus of the scientific community is that a 25(OH)D level (ng/mL) <20 indicates a severe deficiency, 20-32 - insufficient, 32 - 100 - sufficient, 54-90 - normal in sunny countries, > 100 - excess, > 150 - toxic. Prior to 2006, the Labcorp parameters for normal were considered 9-42 ng/mL. They changed the parameters to 32-100 ng/mL, based on studies showing 32 ng/mL to be the lower limit threshold for optimal health. Based on the extensive body of literature that has come out since 1999, it is reasonable and conservative to view optimal vitamin D status in the range of 40 - 65 ng/mL.

Vitamin D levels studied in those living in the Northwest raise obvious concerns, especially when considering the new guidelines and implications. Based on a 2005 study that looked at 25(OH)D levels of male and female internal medicine residents residing in Portland, OR, the average vitamin D level in summer was 24.7 (ng/mL) and 20.4 in winter.⁵

Both levels showed an insufficient amount bordering on severe deficiency, and we can assume that the winter figures would be worse in Seattle since we're at a higher latitude. To make matters worse, it's assumed that we can't convert any sunlight into vitamin D at our latitude during the winter months, regardless of weather conditions. One study showed that people living in Boston were unable to produce any D3 via UVB rays from November through February, even on sunny days. In Edmonton, Alberta this period extended from October to March⁴.

Toxicity

Since Vitamin D is fat soluble, there has traditionally been a theoretical concern that we must be extremely cautious about the supplemental amounts we recommend. In reality, toxic dosages are much higher than previously thought. Vieth showed that dosages of 10,000 IU of vitamin D3/day for 5 months showed no signs of toxicity.¹⁰ All documented cases of D3 toxicity have been due to accidental overdoses that were not intended for human consumption¹². In published cases of toxicity where the dose and blood levels are known, all involve intake of greater than 40,000 IU/day of vitamin D for an extended time period¹⁰.

A few patients will have a higher sensitivity to vitamin D, which is often mistaken for toxicity (ie: primary hyperparathyroidism, sarcoidosis, oat cell carcinoma of the lung, non-Hodgkin's lymphoma), and their cases need to be followed carefully. This rare syndrome occurs when abnormal tissue subvert the kidney's regulation of 1,25D production. In addition to checking 25(OH)D levels, blood calcium levels should be monitored, and if high, 1,25D levels should be checked^{7,12}.

As Cannell states on the vitamin D web page that he created, "living in America today while worrying about vitamin D toxicity is like dying of thirst in the desert while worrying about drowning"¹².

Treatment and Monitoring

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Vitamin D: Recommended Daily Dose Guidelines May Be Obsolete

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The current dilemma for practitioners in the US is to determine the optimal dose for our patient population. The current recommended daily dose of vitamin D is 200 IU for children and young adults, 400 IU for ages 51-70 and 600 IU for those over 70. The upper daily limit is considered 2,000 IU.⁵ Based on the available medical literature, it is worth considering that these guidelines are obsolete and should be adjusted. Keep in mind how much we obtain from the sun in a short time period (typically 10-25,000 IU), as well as how much vitamin D we use daily (healthy men were shown to use 3,000-5,000 IU of vitamin D/day)¹³. Based on the most recent data our goal should be to try and keep levels of 25(OH)D in the 50 ng/mL range. To do this, it is reasonable to assume that individuals need between 4-10,000 IU/d from all sources of vitamin D (sun, food, supplements)¹².

Ideally, blood levels should be obtained, and a treatment strategy created to optimize vitamin D status. If levels are deficient, many practitioners suggest giving a loading dose of D3 for a certain time period to boost levels quickly, followed by an ongoing daily dose. For a loading dose strategy, one method is to give 100,000 IU a few times over a month or two. Others suggest giving 10-20,000 IU/day for 2-3 weeks, followed by a daily dose of 1-5,000 IU/day depending on season, solar exposure, weight and dietary intake. If initial levels are > 35 ng/mL, a loading dose is probably unnecessary. Serum levels, including calcium, should be monitored periodically (1-3x/year), to ensure that 25(OH)D levels stay around 50 ng/mL. For the majority of patients in the Puget Sound, this will probably require supplementing with 1-3,000 IU/day in the spring and summer, and 3-6,000 IU/day in fall and winter. If blood levels aren't checked, it's a safe assumption that 1,000 IU/day in the spring/summer and 2,000 IU/day in fall and winter are safe to recommend, but probably not optimal. If you're uncomfortable recommending dosages that greatly exceed the RDA's, consider referring to a provider who has experience

and comfort with monitoring and treatment. Based on prospective studies, we firmly believe this will become part of traditional medical treatment.

What Type of D3 to Use?

Supplemental D3 comes either from lanolin (from lambs wool) or from fish liver oil. A small amount of data exists supporting the theory that vitamin D requires other fat soluble vitamins, in particular vitamin A, in order to function optimally, and that high dosages of vitamin D can possibly deplete the bodies stores of vitamin A. In essence, vitamin D and A may have a synergistic and protective effect when combined together, as they sometimes are in nature. Fish liver oils would be a good example of this^{8,9}. Some practitioners prefer a D3 supplement from fish liver oil, which typically gives 1,000 IU of vitamin D and 3,000 IU of naturally occurring vitamin A. It is safe to recommend up to 6,000 IU of vitamin A/day for all adult patients (including additional supplemental sources), which would give a maximum of 2,000 IU of D. If additional vitamin D3 is indicated, at least one supplement company makes a liquid product that is emulsified, enhancing its absorbability. Each drop gives 2,000 IU from lanolin, making it easy for the patient to take an adequate dose. The product retails for \$13-\$16/bottle, which lasts 2-4 months.

If concerned about using vitamin A with patients undergoing chemo and radiation, it's fine to just use a lanolin based product. Please keep in mind that most clinical trials using vitamin A in combination with chemo and/or radiation show a neutral or positive effect, and the concern may be unwarranted^{27,28}.

Unless individuals are getting adequate sun exposure and supplementing with dosages well above the RDA's, it is a very safe assumption that the overwhelming majority of the patient population in the Pacific NW are deficient or severely deficient in vitamin D. It is our hope that more medical professionals will begin to utilize the blood test for vitamin D (25(OH)D) and make it a standard lab, similar to a chemistry screen or lipid analysis, and supplement adequately with vitamin D3. This safe, inexpensive and simple protocol has the poten-

tial to prevent and treat numerous degenerative diseases including multiple forms of cancer.

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NEWS FROM ONS HEADQUARTERS

Registration Now Open for Congress - Declare Yourself!

Connect with 6,200 of your colleagues at the ONS 33rd Annual Congress, May 15-18 in Philadelphia. Sessions are offered in various tracks and practice levels, offering something for everyone. Worth up to 20 contact hours, you're sure to gain valuable knowledge that will enhance your nursing practice and improve patient care. Plus if you register by April 15, you can save \$100 through an early-bird discount.
<http://www.ons.org/Meetings/congress08/register.shtml>

Unlock Your Leadership Potential - Attend LDI

Applications are now being accepted for the ONS Leadership Development Institute being held October 23-26 in Atlanta, Georgia. LDI will teach you how to take an active role as a leader in your job and in your field. You'll enhance your leadership skills so that you can help ensure that oncology nurses remain a driving force in cancer care. Applications are due June 3.
<http://www.ons.org/Meetings/Ldi08/index.shtml>

Oncology Nursing Forum Podcast Series Debuts!

Take some time today to listen to the first in a series of podcasts highlighting select articles from the Oncology Nursing Forum (ONF). The first podcast features ONF Editor Rose Mary Carroll-Johnson, MN, RN, interviewing Betty Ferrell, RN, PhD, FAAN, and Nessa Coyle, PhD, RN, FAAN, about their March 2008 ONF article "The Nature of Suffering and the Goals of Nursing."
<http://www.ons.org/publications/journals/ONF/podcasts.shtml>

New Myeloma Newspaper and Podcast Series for APNs

Are you a NP, CNS, or other ONS member

interested in myeloma? Well, you are in for a treat! We invite you to view the newest edition of The Myeloma Messenger and listen to the companion podcasts. This unique coupling of newspapers and podcasts share the kind of information you need to care for this patient population.

<http://www.ons.org/ceCentral/types/hematological/myeloma.shtml>

Get Ready to Celebrate Oncology Nursing Month

Recognize all that you do during Oncology Nursing Month. Set aside some time in May to celebrate you and your colleagues for your dedication and commitment to your patients and your profession. You deserve it! <http://www.ons.org/nursingmonth08/>

New Lung Cancer Research Grant Funding from ONS Foundation and National Lung Cancer Partnership

Applications are invited for lung cancer grant proposals that address high-priority topic areas identified by the 2005-2009 ONS Research Agenda. One \$50,000 two-year grant award is available. Applications are due May 1, 2008.

<http://www.ons.org/awards/foundawards/majorGrants.shtml>

ONS Connect E-Magazine Now Available!

Timely oncology-related news and information about ONS is just a click away with the new online ONS Connect. This enhanced, user-friendly version of the popular ONS news magazine makes keeping up with the latest in oncology nursing easier than ever.
http://www.nxtbook.com/nxtbooks/ons/connect_200803/

For All You Do, We Bring You All for HER!

ONSEdge in partnership with Genentech BioOncology will celebrate the special nurse-patient partnerships formed in

HER2+ breast cancer. Patients, patients' caregivers, and healthcare professionals may nominate an outstanding nurse for his or her exceptional work helping patients throughout the course of treatment.
<http://www.onsedge.com/>

New Handbook Highlights Role of Oncology Nurse Practitioner

The new, pocket-sized handbook, "So, You Want to Be an Oncology Nurse Practitioner?!" will help nurses understand what it means to take on this challenging position. Order now and save with a special introductory offer. <http://esource.ons.org/ProductDetails.aspx?sku=INPU0583>

Free Member Benefit - Connect With Nurses in Your Subspecialty

Cancer care encompasses many subspecialties. ONS special interest groups put you in touch with other members practicing in the same area as you so you can share ideas and knowledge with each other. All members can join one SIG for free.
<http://sig.vc.ons.org/>

ONS Offers Resources on Blood and Marrow Transplantation

Blood and marrow transplantation (BMT) is a complex, potentially life-saving therapy used to treat malignancies, including leukemia, aplastic anemia, multiple myeloma, immune deficiency disorders and lymphomas such as Hodgkin disease. It is important to know where to find information on the treatment. ONS offers a variety of resources on BMT, including:

ONS BMT Clinical Resource Area:
<http://www.ons.org/clinical/treatment/transplantation.shtml>

ONS BMT Patient Resource Area:
<http://www.ons.org/patientEd/Treatment/blood.shtml>

The ONS BMT Resource Directory:
<http://www.ons.org/clinical/treatment/directory.shtml>

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Heart Failure: Nurses Pivotal in Educating Patients About Symptoms

Continued from page 5

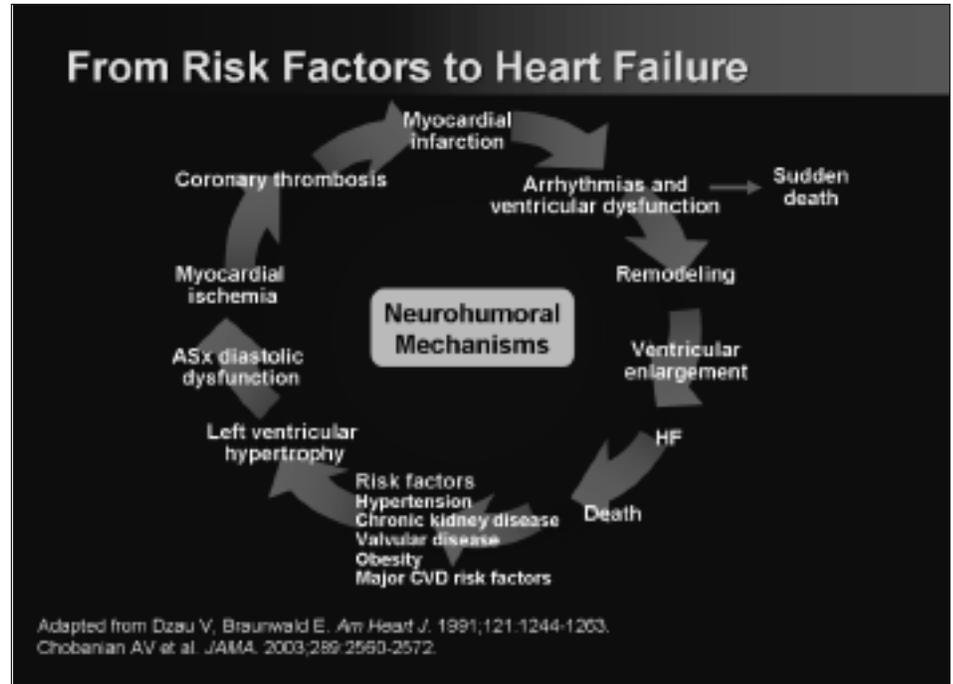
symptoms of heart failure. Frequently, patients are the first to notice symptoms or changes in their status.

Heart failure symptoms are classified into major and minor categories. Major symptoms can cause life threatening events and require emergent intervention. Major symptoms include paroxysmal nocturnal dyspnea, sudden onset of severe shortness of breath at rest, chest pain not relieved by nitroglycerin, rales in the lungs and frothy or pink sputum, cardiomegaly on CXR, pulmonary edema and S3 and S4 gallop. Minor symptoms include lower extremity edema and weight gain, and/or cough and dyspnea with exertion. Patients with heart failure are at risk for arrhythmias and may report symptoms such as heart palpitations. Not uncommonly, a patient may only report symptoms of fatigue.

Heart failure staging now focuses more on early detection and anticipatory treatment for patients with pre-heart failure conditions. Determining symptoms early can hopefully decrease the risk of developing significant heart failure. The focus should be more optimal control of hypertension and adequate treatment for coronary artery disease and diabetes.

Treatment of Heart Failure/ NYHA (New York Heart Assoc.) Guidelines for LVSD

Planning treatment for heart failure should involve a multidisciplinary team



approach. The patient requires adequate and thorough education in order to understand heart failure and its potential and significant impact on lifestyle. Assessment by a cardiologist results in the most thorough work-up, diagnosis and treatment plan. All patients diagnosed with heart failure should be evaluated in a cardiology setting.

The treatment of heart failure consists initially of medication, frequent medical follow up and laboratory monitoring. Additional treatments such as pacemakers are used for resynchronization therapy if traditional therapies have failed.

Medications prescribed include diuretics, beta blockers, ACE (angiotensin converting enzyme) inhibitors, and ARBs (angiotensin receptor blockers) if ACE inhibitors are not tolerated. Spironolactone and digoxin may be added if a patient does not respond to commonly prescribed medications. Patients of African American descent

have shown improvement with the use of hydralazine and isosorbide. ACE inhibitors, ARB's and spironolactone require routine BMP (basic metabolic panel) monitoring (creatinine, electrolytes, acid/base balance, glucose, calcium). Carvedilol and toprol are currently the only approved beta blockers for use in heart failure patients. They have been shown to decrease mortality in large trials.

Other treatments utilized if patients have shown no improvement on optimal medical therapies include: use of a defibrillator for patients with an ejection fraction of < 35%, biventricular pacemaker to treat dyssynchronicity, and LVAD (left ventricular assist device) for patients who are awaiting heart transplantation. Resorting to heart transplantation is rare due to improved drug and device therapies and efforts made by the medical team to treat patients per guidelines.

Diastolic Dysfunction

Currently studies are under way on how to best treat diastolic dysfunction, but no specific guidelines exist. Most Cardiologists agree that the same guidelines as for LVSD can be applied, keeping in mind treatment of the underlying causes.

New Classification of Heart Failure ACC/AHA Staging v/s NYHA Functional Class	
ACC/AHA HF Stage ¹	NYHA Functional Class ²
A At high risk for heart failure but without structural heart disease or symptoms of heart failure (eg, patients with HTN or coronary artery disease)	None
B Structural heart disease but without symptoms of heart failure	I Asymptomatic
C Structural heart disease with prior or current symptoms of heart failure	II Symptomatic with moderate exertion III Symptomatic with minimal exertion
D Refractory heart failure requiring specialized interventions	IV Symptomatic at rest

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PSONS PROFILE

Wayne Lucey, RN

There's a good reason that Wayne Lucey hasn't been a PSONS member for very long. While you might guess from his age that Wayne has been practicing oncology nursing for quite a while, you would be assuming that he has had the same career his whole life. In fact, for the first twenty years of his career, Wayne was a heavy equipment operator and safety director in the logging industry.

Growing up in Montana, Wayne did what many of his relatives and friends did and became a logger. He worked long hard and physically demanding jobs in saw mills and logging. It was also during this time that he met his wife, Nita who would later become his most valuable support in a dramatic career change. Wayne and Nita, who will be celebrating their 25th wedding anniversary in November, have three children ages 23, 21 and 10. It was during the birth of his first daughter in 1984 that Wayne had his initial immersion into the field of medicine. Wayne's daughter was born prematurely and weighed only 2 lbs. 6 oz. at birth. Wayne and Nita spent a significant amount of time in the neonatal intensive care unit with their first born. Today they have a healthy successful 23 year old who is a linguistics specialist in the Air Force.

A poor economic outlook in Montana around 1990 caused Wayne and Nita to relocate to the Northwest where at the time logging still seemed to be a going concern. In 1996, Wayne had his second dramatic brush with emergency medicine when his brother was in a serious automobile accident. Again, Wayne spent a significant amount of time in the hospital and was able to admire what a capable and passionate group of professionals the doctors and nurses were. It was about this time that in the back of his mind Wayne was thinking that nursing looked like something he may want to consider some day.

Just when you think life is going along fine, leave it to the economy to shake things up. In 2001, the logging company Wayne worked for closed liked many of

the others. But there was a silver lining. The North American Free Trade Agreement (NAFTA) was offering financial benefits to those whose job loss was tied to the Agreement. So, with a hugely supportive wife and three young children, Wayne turned his NAFTA benefits into nursing school tuition. Wayne went to Everett Community College and completed a four year nursing program in three years.

Wayne completed his clinical training in several places including Providence in Everett, Cascade in Arlington and Stevens in Edmonds. Two of his favorite mentors are Mary Jo Sarver, ARNP and Deidre Slaybaugh, RN. Wayne was so enamored of both role models saying, "They knew exactly what to look for and they knew what was expected". Little did Wayne know that later in his career he would be working side-by-side with his earlier mentors.

When Wayne finished nursing school, he worked as a skilled nurse in the Marysville Care Center, in Marysville where he and his family currently live. In September 2004, Wayne hired on at Northwest Hospital in the Northgate area of Seattle. Wayne started on the med/surg floor but quickly realized that his heart was in oncology nursing. Wayne definitely felt there was something steering him in that direction. "The whole aspect of nursing peaks in that (oncology) area" says Wayne. So as fate would have it, Wayne ended up with the 7:00 pm to 7:30 am shift on the oncology unit at Northwest, working alongside Deidre Slaybaugh, RN and Mary Jo Sarver, ARNP. "I still have her (Deidre) notes from my rotation at Steven's Hospital" says Wayne "She was pretty impressive as a nurse and then I come here (Northwest) and here she is!"

What does Wayne love about his job? "I'm still learning so much and I love becoming more proficient" he says. Wayne is even considering the possibili-



Wayne Lucey

ty of pursuing a BSN. Another thing that strikes Wayne, our staff meetings are so diverse, "it's like the United Nations". That's just one more thing that Wayne admires about health care. It brings together such a diverse group of people. And what's not to like? "Anything that is not directly related to patient care" says Wayne. Sentiments shared by many other healthcare providers today. "And my commute (from Marysville to Seattle)" says Wayne with a smile.

What advice would you give? In general, "Don't be afraid to try something new" says Wayne, and with regards to oncology nursing, "don't be afraid to work with patients who have a poor prognosis" since you can make such a difference in whatever time they have. Wayne acknowledges oncology can be a very stressful field but "you have to refuse to get stressed" and he relies on his family to help him keep a balanced life.

So when Wayne isn't on the unit, you can find him packing up the family and heading to a favorite fishing spot or ocean beach. With five day weekends, you can head down to Lincoln City, Oregon or just pop over to the Stillaguamish. With a wonderful career and family what's Wayne looking forward to next? "We are expecting our first grandchild this summer!" Any advice sage from you grandparents out there?



Heart Failure: Beta Blockers Have Decreased Mortality in Patients

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Medication and Mechanism of Action

Diuretics are used initially if congestion is present and should be used with ACE inhibitors or ARBs. Diuretics decrease pulmonary and peripheral congestion while ACE inhibitors or ARBs effect LVH (left ventricular hypertrophy) regression, decrease stress response and lower blood pressure.

Beta Blockers help with heart rate control and increase filling pressures, decrease O₂ consumption and decrease blood pressure and also effect regression of LVH. Beta blockers, ACE inhibitors and ARBs have all been shown to decrease mortality.

Digoxin improves cardiac contraction and may relieve symptoms and decrease need for hospitalization. Digoxin can sometimes also improve functional status.

Spironolactone use as adjunct therapy has shown to improve outcomes and decrease mortality.

Use of combination therapies results in the best outcomes regardless of the underlying etiology of the heart failure.

Common Problems in the Treatment of Heart Failure

Dehydration and Fluid Imbalance:

For patients on chemotherapy or other cancer therapies, nausea and vomiting can cause fluid imbalance with further risk of dehydration due to diuretic use. Daily weight check and assessment of an estimated target weight becomes even more important in this situation. The treating MD, RN or CHF case manager can help create an anticipatory plan of care where patients can use flexible diuretic dosing based on weight and symptoms. Close monitoring and support are advised to assist with symptom management. Diuretics may need

to be held due to fluid loss, or a cup of broth prescribed to avoid further fluid loss. With careful and prompt intervention, frequently IV re-hydration can be avoided. However, at times re-hydration is the only solution.

The most common reasons for heart

a treatment plan. The hematocrit should be kept between 35 to 38, and hemoglobin between 11 to 12 so as not to put unnecessary stress on the heart. Many patients require injections with erythropoietin, and some need transfusions. Correcting anemia in the setting of heart failure has been shown to improve heart failure symptoms, energy level and quality life.

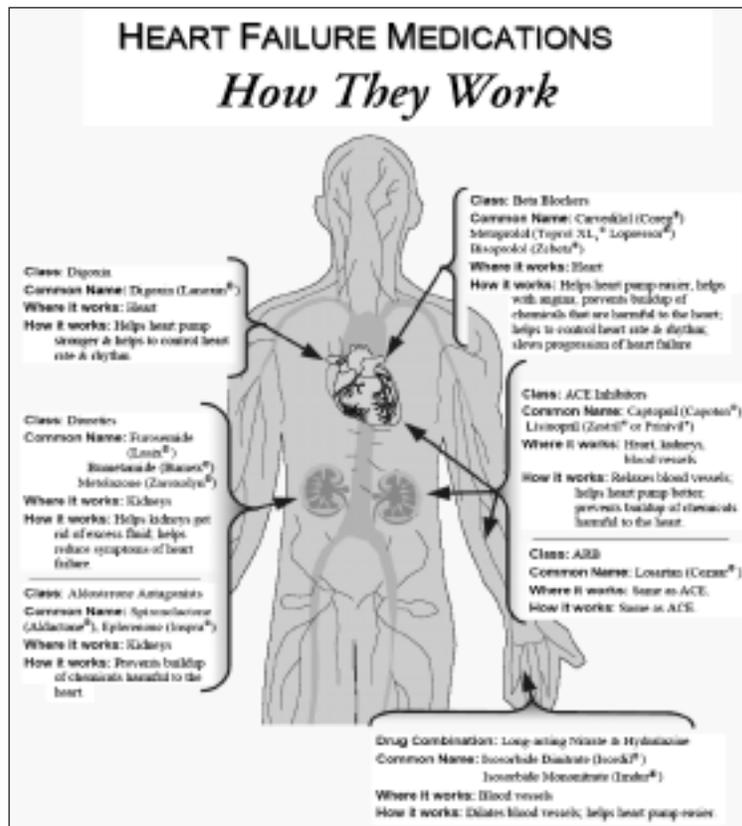
Patient Education and Self Care Strategies

Every heart failure patient including family members need to be educated about the disease process and important life style changes and signs and symptoms of progressive heart failure which need to be reported promptly. Patients need to know about medication side effects. In addition they need to learn not only about weight gain and fluid retention, but also about other symptoms like palpitations, chest pain and dehydration. Cancer and heart failure patients need to be aware of symptoms of anemia and depression, since both can

adversely affect heart failure and cancer treatment and outcomes. When a patient has gained some basic knowledge and tools which they can apply in their daily lives, exacerbation of illness can be avoided with early intervention. Appropriate education can lead to improvement in quality of life resulting in a decrease of acute care needs.

Following are brief descriptions of well-researched self care strategies. My colleagues and I have learned that by working closely with heart failure patients over many years, a patient's awareness and commitment to treatment supports the medical plan of care and outcomes. Education for the patient can best be supplemented with written material, internet education, and visual aids especially for those who have difficulty reading.

Continued on next page



failure exacerbation remain dietary indiscretion due to eating out, not following the low Na (sodium) diet and medication non-adherence. Other reasons for worsening heart failure include unawareness of symptoms, not reporting them promptly or mental status changes. Any kind of infection and illness can cause overt heart failure symptoms. All patients should get a yearly flu shot and receive the pneumovax. Some patients lack social support and may need help with self care.

Social Services should be involved in these situations for optimal care and support.

Anemia:

Low hemoglobin and hematocrit can worsen heart failure symptoms and make diuresing more difficult. A full anemia work up is required in order to achieve a correct diagnosis and develop

1. Symptom Awareness

Patients/family/caregivers need to know signs and symptoms of heart failure or changes in status and report them promptly. It is better to have one assessment call or office visit to assess for stability than having a patient end up requiring acute care which could have been prevented.

2. Daily weight checks and need for "target weight"

Every patient needs to record their weight every morning after they void. Fluctuations of 2-3 pounds of weight gain or loss need to be reported. It is extremely important to establish an accurate target weight which needs to be documented in the medical record so all practitioners have access to this information. A set target weight allows for optimal fluid management and symptom control. A patient always needs to be informed of his target weight!

A target weight is the weight where a patient feels stable and free of symptoms such as shortness of breath or edema. The BMP should be within the normal range or acceptable based on previous labs. Optimal signs of stable or controlled heart failure include relative euvoemia, flat neck veins, absence of abdominal distention and lack of edema. The target weight allows the "art of medicine" to be applied since careful clinical assessment, patient symptoms and lab results can determine the best target weight. When weight fluctuations occur, guidelines allowing for flexible diuretic dosing should be part of the plan of care.

3. Medication Management

Taking medications as prescribed and keeping a current medication list remains a challenge for many patients. Multiple prescription drugs, lack of organizational skills, declining memory, cost of medications and decreased social support are major challenges for the patient. Patients need to be educated about medication actions and side effects which need to be communicated promptly. Adherence to medications and outcomes are greatly improved with use of a weekly medication set system. A medication list is provided to patients and updated at every clinic visit.

NSAIDs are contraindicated due to their fluid retention effects. If there are no other options available, limited usage is possible with close monitoring of fluid status and weight gain. If symptoms arise, diuretics may need to be increased for the duration.

4. Important Dietary Guidelines/ (Low Sodium Diet (1500 mg/d)

This area presents the most challenge to patients since the American diet tends to be high in sodium. In addition, convenience foods like fast foods and packaged or processed foods are loaded with sodium and offer low nutritional value. Changing chronic poor dietary habits may present a huge challenge to many. Beliefs about food, dietary habits, cost or inability to cook also play a role. Ongoing education, reinforcement and support are required to motivate a patient to make the necessary changes.

Following are some simple examples for a healthy diet: Use of fresh or frozen vegetables and fruits without added salt or sugar, whole grain foods and low sodium cereals and breads, eggs, low fat meats, fish, dairy in moderation since Na content is high, and low Na cheese like Swiss and Mozarella. Healthy fats from olive oil, nuts, seeds and avocados are advised.

There are many low Na foods now available such as soups, herbs for seasoning, or use of lemon juice and Mrs Dash. Salt substitute is not advised due to potassium content.

Patients need to become skilled in reading labels; keeping a food basket in the office so patients can practice reading the labels is tremendously helpful. We also hand out a low Na food chart, and advise internet research. Low Na cook books are more available, and one of the best sources is the Low Sodium Cook Book published by the American Heart Association. Foods to be avoided are processed foods, foods brined like olives and sauerkraut, salted nuts, crackers and chips, and most canned and frozen foods.

Patients do not have to avoid eating out, but need to be aware of the high Na foods on menus. Learning to order foods without sauce and avoiding the

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Depression and Cancer

Patti Kwok ARNP

Depression coexisting with medical illness is a common and under-recognized problem. Depression presents as the most common affective disorder in cancer and has a major impact on quality of life. Symptoms are often attributed to cancer and/or its treatment. Some studies have shown that depressed individuals were at higher risk for cancer incidence although later studies have not confirmed this relationship. Psychological distress has also been correlated with several issues, including a desire to hasten death, increased healthcare utilization, caregiver distress and shorter survival. Bardell views depression as a “spectrum disorder in which increasing symptoms can have increasing impact on function”².

Many studies have explored the possible link between depression and shortened survival associated with a number of medical illnesses. Spiegel was one of the first to show that psychosocial intervention improved survival for those with metastatic breast cancer. Since then, the results have been conflicting regarding improved survival with appropriate intervention¹⁴. A majority of studies would support that recognizing and treating emotional distress and depression does improve quality of life in most patients. As nurses we need to recognize signs of depression and utilize appropriate resources and treatment.

Incidence

Most of the studies on depression and cancer have focused on women with breast cancer. It would seem they are more vulnerable to depression associated with the impact of diagnosis and treatment which is often disfiguring and sometimes causing long-lasting or even permanent metabolic/endocrine

changes. The literature would show that while most of these women do not have significant clinical depression, 15-30% report depressive symptoms that may be clinically important. Psychological distress in the form of depression and anxiety is prevalent 30-50% of the time in cancer patients. Some studies have suggested that 20-30% experience ongoing distress even years after initial treatment. I would intimate the incidence is even higher due to the reluctance of many patients admitting to depression and acknowledging the need for intervention or treatment.

Risk Factors

When reviewing the literature one does not find a consistent set of risk factors that are linked with depression in the cancer patient. Bardell and colleagues describe in their findings that objective aspects of cancer are not determinants of depressive symptoms in women treated for early stage breast cancer². One cannot predict incidence of depression based on the stage of disease or extent of side effects of treatment. As described in other studies, subjective psychosocial factors seem to carry the most weight. These factors have to do with how one has coped in the past with crises and other life stressors. Women reporting more depressive symptoms were more obese and reported worse physical functioning and more physical symptoms. Other related descriptors in the literature include social deficits, pessimism, lower self-



esteem, sleep disturbance, menopausal symptoms, pain and prior psychiatric history. Younger age, social isolation or unmarried and poorer overall physical health also put women with breast cancer at a greater risk for depression. From my experience, social isolation appears to put one at greatest risk for anxiety and depression. We need to be alert to risk factors but at the same time cannot rely on cancer-related variables. Depression may have little to do with the cancer itself². Our patients are much more than cancer survivors—they have survived many crises in life. I think to focus on the term “cancer survivor” trivializes all other suffering.

Recognizing Depression

Who hasn't been depressed in this life for some reason or another? We all have life stressors and have suffered what at times may have seemed like insurmountable challenges much like cancer. There are other aspects to life that are very threatening and certainly cancer for some is at the top of the list. Depression should be recognized and also respected for what it is—I believe it

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is part of a necessary alchemy or soul awakening not always to be fixed or resolved. Perhaps as nurses we can and should help to lighten the burden of distress which can often be immobilizing. I would highly recommend two incredibly insightful books— Thomas Moore's *Dark Night of the Soul* and Jean Shinoda Bolen's *Close to the Bone: Life Threatening Illness as a Soul Journey*. Spiritual and Depression assessment tools include the Beck Depression Inventory, Hospital Anxiety Depression Scale and the Hamilton Depression Rating Scale. One cannot overlook spirituality and its implications and effect

on emotional and physical well-being. The FACIT-Sp is a brief, reliable, valid measure of especially the role of non-religious spirituality on quality of life¹¹. I cannot stress enough the importance of spirituality and its potential impact on depression and all of life. There is an underlying depth and soul-making happening when one faces a life threatening illness that we can learn to assess and bring to the surface.

Depression may be prevalent although not always so obvious; however nor does it just show up when one would expect. A common time for symptoms of depression is with the ini-

tial diagnosis or when there is a recurrence of cancer. Ironically, the end of adjuvant treatment can also be distressing. Focusing on getting through the treatment and feeling like one is actively doing something can be a good distraction from the thought of illness, possible recurrence and death. Caregivers tend to be more sympathetic and supportive during the active treatment phase because an individual may look physically ill due to treatment side effects. When the systemic treatment or the chemotherapy and/or radiation have been completed often family mem-

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Heart Failure

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high Na fast foods, a patient may still find pleasure in eating out without getting into trouble. At times of celebration and holidays it is advisable for some patients to take an extra diuretic to avoid fluid retention.

Recent studies in Britain confirm and support the hypothesis that eating five servings of fruits and vegetables a day can add years to a person's life.

A Nutrition Therapy referral is indicated for most patients and in the meantime initial education regarding the importance of a low sodium diet is crucial.

While the main focus of a patient's care may be on the treatment of cancer and heart failure, treatments for other chronic illness like diabetes and sleep apnea need to be supported. Patients should be strongly advised to avoid smoking and stop consumption of alcohol.

5. Exercise

Daily exercise such as walking or treadmill walking or use of a stationary bike is advised for most patients. Housework or walking in the mall or outside are acceptable forms of exercise. The benefits of exercise include improved perfusion and oxygenation, improved muscle tone which also affects the heart muscle, fall prevention and improved mental function. Exercise has been shown to decreased symptoms of depression. Patients who exercise tend to experience a sense of more control and enjoyment in their lives. In some cases physical therapy is advised and hiring a personal trainer

can be helpful.

6. Emotional status

The assessment and treatment of depression and anxiety need to be addressed and treated. Patients who are treated remain more committed to their plan of care and enjoy a greater quality of life. Referrals to counseling and chronic illness classes can help patients cope with the challenge of their disease. Spiritual assessment and support can also be invaluable.

7. Advanced Directives/End of Life Care Discussion

All efforts should be made to treat and correct heart failure. The disease process can advance despite optimal medical therapies. It is important to communicate open and honestly so patients and families know what to expect. Programs like hospice and palliative care provide excellent care and support and have helped many patients and families to accept the illness and prepare for death with dignity.

All patients should have a durable power of attorney for healthcare. It is even more important to learn about a patient's wishes in the case of acute changes or times of life threatening conditions. This can help avoid problems and honor a patient's wishes. Advanced directives include a durable power of attorney for health care, a living will, and POLST form. The latter can be updated.

Conclusions

Heart Failure remains a serious challenge. However, careful medication guidelines in the treatment of heart failure have resulted in improvements

unimaginable 20 or 30 years ago. Correcting cardiac function and ejection fraction can have a substantial effect on outcomes and add years to a patient's life. Partnering with a patient and providing appropriate support remains a cornerstone of the treatment plan. While heart failure remains a chronic illness like cancer, it is treatable but not curable. In order to support the highest function possible, we as health care providers have a responsibility to offer to our patients the best options for assessment and treatment.

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Depression and Cancer: Fatigue is a Contributing Factor

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bers are more than ready to get on with a normal life. Sometimes these expectations of significant others can also cause anxiety in the patient who often has prolonged fatigue and other physical as well as emotional issues.

Often my patients have prolonged fatigue which might be due to menopausal symptoms, lack of sleep or just the lingering effect of treatment. I have found that being direct is most helpful. I might ask "could you be depressed" and explore common signs of depression so the patient might begin to recognize the manifestations. Also it is important to check one's thyroid functioning, CBC and chemistry panel. Anemia, low potassium, sodium or magnesium can be the cause of fatigue or depression. There are other signs of depression that often go along with fatigue including lack of ability to concentrate, lack of motivation, not finding pleasure in things that previously gave one pleasure or comfort, crying often, anger, weight loss or gain and/or change in appetite.

One patient told me the other day that she doesn't want to sit around in a support group for cancer patients because that's too depressing. As it turned out she admitted to being depressed and agreed to one-on-one counseling, which to her was much more helpful. Also revealed was that it wasn't the cancer that was making her depressed but actually other life-stressors that happened prior to her cancer. She declined medication to help her get through this difficult period, which was her preference. However, I might add this particular patient was very distressing to her caregivers including personal caregivers as well as our staff. We all wanted her to be on medication mostly for her anxiety and negativity but we respected her choice. Sometimes patients have either an issue with potential side effects or they worry about the stigma associated with medication. Antidepressants are extremely helpful although for most patients should not be the first and only treatment recommendation. Several studies have supported that cognitive therapy



by a trained counselor is at least as effective as antidepressants in the treatment of major depression.

Creating a safe space for a patient to express their distress is extremely important. High quality cancer care relies on effective communication especially between the patient and their oncologist. Emotional suffering can be intense particularly among patients with advanced cancer. When patients can express their concerns more fully they may cope better and be less depressed or anxious. Pollack and colleagues found that oncologists responded to patient emotion with empathetic language only 22% of the time. Oncologists who were younger or who rated themselves as socioemotional were most likely to respond empathically. They summarize that when oncologists do not at least respond with a brief empathic statement that they risk increasing patient distress. Most who entered this study were confident that they could address patient emotion but they were not confident they could recognize patient emotion when it occurs⁴. Not surprisingly when reviewing the literature, oncologists' recognition of patient distress is often poor. As nurses we can help patients be more direct and assertive which can help oncologists respond more appropriately. In my experience, patients who are open, can realistically discuss their situation, their fears, pain and what they are having difficulty coping with eventually find an outlet for their suffering by partly feeling "heard". If we can provide this kind of compassionate listening, the patient may have an overall higher functioning and better quality of life when going through the "cancer experience."

Treatment

Speigel has focused on depression and cancer for more than 30 years⁷. A frequent theme he describes related to risk for depression is one of social isolation. He suggests that patients who feel less socially isolated are less frightened and therefore less depressed. We live in a community that is rich in supportive cancer resources which advocate for group involvement and networking with other cancer patients.

There is the traditional support group format where other patients with the help of usually two facilitators discuss distressing issues related to their disease and ways to better cope. Speigel has found that helping patients confront fears of suffering, death and dying and expressing strong emotions in a support group setting is highly effective in helping both family and patient cope with the illness. I cannot underestimate getting support for the entire family. Cancer Lifeline works with families and has available counselors that coach parents how to discuss fears and concerns with their children. Fran Lewis and colleagues have done immensely important work with women with breast cancer studying its impact on the whole family⁶. The greater the demands and stress from the illness the greater not only the patients depression but also the spouses. Also when the parents are depressed they are often less emotionally available for their children. Nurses at the University of Washington School of Nursing are studying the effectiveness of an educational program for mothers with a recent diagnosis of breast cancer and who have an 8-12 year old child. This program is available at no charge. They can be contacted at ffrp@u.washington.edu. Gilda's Club is also a tremendous resource and support for our patients and their families.

Many times patients are not ready for support group either due to timing of the intervention or they do not want to discuss distressing issues in a group setting. Offering individual counseling is a very good alternative. Introducing similar patients to each other, in age and diagnosis, can also be extremely helpful.

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Diabetes and Cancer Care

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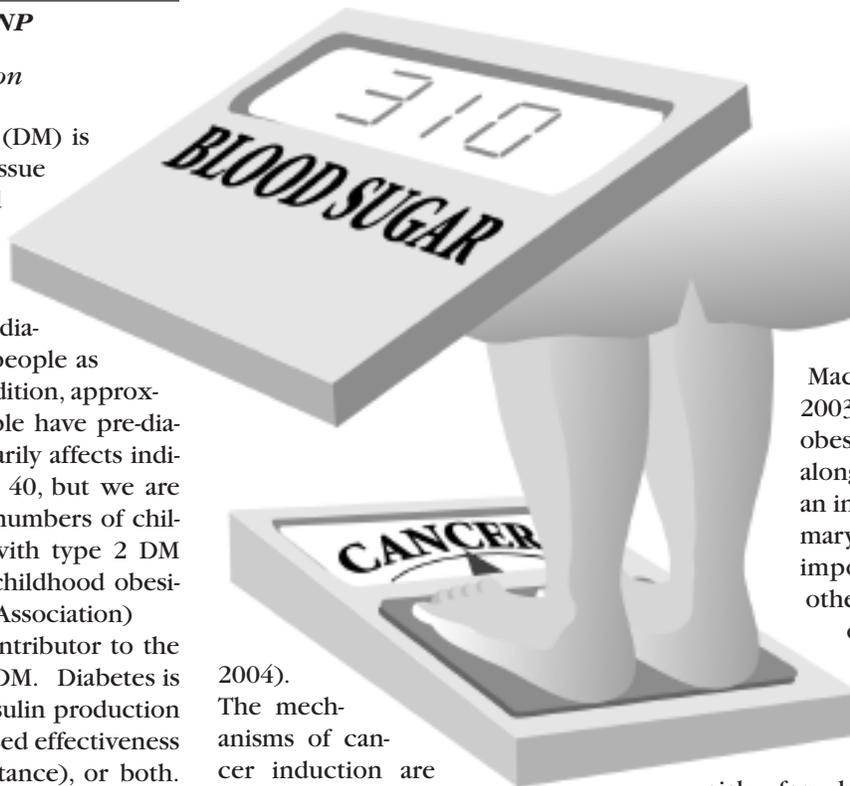
Diabetes Mellitus (DM) is a major health issue in the United States. The American Diabetes Association estimate that over 20 million Americans have diabetes, with six million people as yet undiagnosed. In addition, approximately 54 million people have pre-diabetes. Type 2 DM primarily affects individuals over the age of 40, but we are now seeing increasing numbers of children and adolescents with type 2 DM due to the increase in childhood obesity. (American Diabetes Association)

Obesity is a major contributor to the development of type 2 DM. Diabetes is a result of decreased insulin production by the pancreas, decreased effectiveness of insulin (insulin resistance), or both. Diagnosis is made by findings of a random blood glucose of 200 mg/dl or greater, a fasting blood glucose of 126 mg/dl or greater, or a plasma glucose of 200 mg/dl or greater two hours after a 75 gm oral glucose load (glucose tolerance test).

The metabolic syndrome is often associated with DM. This syndrome consists of abdominal obesity, hyperglycemia, insulin resistance, hypertension and dyslipidemia. In an insulin resistance state, hyperglycemia induces the pancreas to release more insulin into the blood stream in an attempt to normalize blood glucose levels. In diabetes, insulin resistance often occurs before depletion of insulin production by the pancreas. (Vona-Davis, McNett, & Rose, 2007).

Diabetes, the Metabolic Syndrome and Cancer

Both insulin resistance and DM are implicated in the development of cancer. (Hu, Meigs, Li, Rifai, & Manson,



2004). The mechanisms of cancer induction are not entirely clear. In the metabolic syndrome and DM, circulating insulin and insulin-like growth factor-1 (IGF-1) are increased. Both appear to directly promote cancer cell growth, angiogenesis and decrease apoptosis. The hormone leptin and adipocytokines are thought to be pro inflammatory and elevated levels, present with obesity, are also associated with cancer risk. (Giovannucci, & Michaud, 2007; Rose, Haffner & Baillageron, 2007)

Several cancers are closely associated with DM: Breast, colon, endometrial, pancreatic, liver and renal cell cancers. (Czyzyk, & Szczepanik, 2000; Giovannucci, & Michaud 2007; Vona-Davis, McNatt & Rose, 2007; Rose, Haffner & Baillageron, 2007). An analysis of the Nurses' Health Study in which 121,000 female nurses ages 30 to 55 were followed from 1976 to 1996, found an association between type 2 DM and postmenopausal women with estrogen receptor positive tumors. Interestingly,

premenopausal women with diabetes had a lower incidence of breast cancer. (Michels, Solomon, Hu, Rosner, Hankenson, Colditz, & Manson, 2003).

Having DM is also associated with an increased risk of cancer recurrence, metastatic disease and decreased survival. In a study by Meyerhardt et al of patients with high risk Stage II and III colon cancer, patients having DM had a five year disease free survival of 48% compared with 59% for non-diabetics. Five year overall survival was 57% for diabetics and 66% for non-diabetics. (Meyerhardt, Catalano, Haller, Mayer, Macdonald, Benson, & Fuchs, 2003). In a study by Sang et al, obesity and insulin resistance, along with smoking, incurred an increased risk for second primary cancers, emphasizing the importance of screening for other sites of cancer as well as on-going monitoring for the initial cancer. (Sang, Lim, Jung, Shin, Yoo, Yun, & Huh, 2007).

Patients with DM are at risk for both macrovascular and microvascular complications. Diabetic retinopathy, nephropathy, neuropathy and cardiomyopathy are the result of microvascular damage while cardiovascular disease and hypertension are macrovascular complications. Intensive treatment of DM to maintain a Hb A1c of < 6.5% and blood pressure < 140/85 decreases the risk of microvascular disease, but not macrovascular disease. (Diabetes Control and Complications Trial).

Because cancer incidence increases with age, older people with DM and cancer are more likely to have other chronic conditions such as chronic obstructive pulmonary disease, cardiovascular disease, hypertension, and arthritis. (Ogle, Swanson, Woods, & Azzouz, 2000) In addition, older adults may have malnutrition, depression, decreased mobility, cognitive and balance disorders. These co-morbidities make cancer treat-

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Diabetes and Cancer Care: Some Chemotherapy Drugs Cannot be Used

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ment more difficult for patients, their families, and providers. Patients with various comorbidities and functional impairments are likely to require more assistance with tasks of daily living, monitoring for and management of treatment toxicities. (Yanick et al 2001). Unfortunately, patients with breast, prostate, colon and head and neck cancers, and comorbidities are at an increased risk of death. (Read, Tierney, Page, Costas, Govindan, Spitznagel & Piccirillo, 2004).

Diabetes and Cancer Treatment

Delivering certain chemotherapy drugs may not be possible in diabetic patients due to pre-existing nephropathy or neuropathy leading to sub-optimal or non-curative treatment. Chemotherapy drugs that can cause peripheral neuropathy include: Cisplatin, carboplatin, paclitaxel, docetaxel, vincristine, oxaliplatin, thalidomide, etoposide, procarbazine, cytarabine and bortezomib. Cisplatin is contraindicated in patients with renal insufficiency, and anthracycline and Herceptin administration are not recommended in individuals with a low ejection fraction of < 50%.

Nausea, vomiting, loss of appetite, taste changes, and weight loss are common side effects in cancer treatment. Weight loss is generally discouraged during radiation and chemotherapy treatments, as significant weight loss before and during cancer treatment is a poor prognostic indicator for survival. Often high calorie, high fat foods are recommended for weight maintenance. Oral hypoglycemics and insulin therapy may be difficult to regulate during cancer treatment. Diabetic patients can be at risk of poor glycemic control and both hyper- and hypoglycemia. Patients may have difficulty dealing with the number of medications needed for cancer treatment. Medications such as antihypertensives, statins, and aspirin that are routinely taken by many diabetics may be the first to be dropped due to nausea, vomiting, dehydration, oral mucositis or thrombocytopenia.

Steroids are commonly used as part of anti-emetic regimens, or as part of cancer treatment. Steroids induce the liver to release glucose, but also decrease tissue sensitivity to insulin. They increase hyperglycemia in diabetics and may induce DM in susceptible individuals. Insulin therapy is the preferred method of treating steroid-induced hyperglycemia in diabetics. Insulin-dependent diabetics need reassessment and adjustment of daily insulin needs and may require two to three times their



normal dose. (Psarakis, 2006). Because steroids are immunosuppressive, their use can increase the risk of infection in diabetics.

There are several infectious complications that have a higher incidence in diabetics. These include: oral candidiasis, urinary tract infections, including fungal UTIs, foot infections, malignant external otitis, surgical site infections, skin and mucosal colonization with staphylococcus aureus and candida species, and increased risk of methicillin resistant staphylococcus aureus (MRSA). (Weintraub, & Sexton, 2008). Hyperglycemia is thought to affect the immune response through decreased phagocytosis, cell-mediated immunity and neutrophil activity. (Weintraub, & Sexton, 2008) Treatment with immunosuppressing chemotherapy, radiation therapy and steroids increases the risk for all types of infections.

Goals of cancer treatment

The primary goal of treatment for all cancer patients is to provide optimal treatment while minimizing toxicities. Medical and radiation oncology nurses excel at managing patients through their course of treatment. Working with diabetic patients offers unique challenges.

Whenever possible, maintaining glycemic control during treatment has the long-term benefit of reducing microvascular complications in diabetic patients. Encouraging activity or regular exercise will help control blood sugar as well as improve energy, strength and cardiovascular fitness. (Doyle, Kushi, Byers, Courneya, Demark-Wahnefried, Grant, McTiernan, Rock, Thompson, Gansler, & Andrews, 2006) The American Cancer Society recommends weight control, diet rich in fruits, vegetables and low in saturated fats, and regular exercise to decrease cancer recurrence risk, improve survival and quality of life. (Doyle et al, 2006).

On completion of treatment, diabetics should resume care with their primary care provider or endocrinologist. If routine medications such as antihypertensives, aspirin and statins have been held during treatment, they should be restarted as soon as the patient is able. Cancer survivors should also be reminded to undergo screening for breast, colon, prostate, and skin cancer, according to gender and recommended guidelines, and the site of original cancer.

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Depression and Cancer

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I would like to see greater availability of easily accessible counseling for our patients. Making a referral to an offsite location such as "mental health department" somewhat demoralizes depression or making it seem an almost abnormal adjustment to a life-threatening illness. Ideally I would like to work in a cancer center where there is onsite spiritual/mental health counseling available and considered a normal accessible financially covered resource.

Research shows that about 15-25% of American women use antidepressants after breast cancer diagnosis¹⁵. Far fewer women are already on an antidepressant at the time of diagnosis. It's important to get a careful history as often these medications need to be adjusted ideally by a mental health care professional when a patient has a new diagnosis of cancer. The SSRI's such as paroxetine and fluoxetine are good drugs for helping with depression especially in breast cancer patients due to their ability to also decrease hot flashes. The disadvantage with these drugs are the potential sexual side effects in a population already dealing with vaginal dryness, decreased interest in sex, fatigue, hormonal changes etc. Other alternatives with perhaps less sexual side effects are citalopram, venlafaxine and wellbutrin. Antianxiety drugs are also helpful such as lorazepam or other benzodiazepines which have the added benefit to help with sleep as well as nausea although may be addicting. Keep in mind other possible unwanted side effects of these drugs such as sedation, dry mouth and weight gain. Consider also the tricyclics such as nortriptyline or amitriptyline which often have another benefit and that is to help decrease neuropathies secondary to some chemotherapies. Gabapentin is also a good drug for both hot flashes and neuropathies. Mirtazapine, an alpha-2 antagonist is a preferred antidepressant drug to use in the elderly due to less side effects and overall better tolerance.

Another concern with the SSRI drugs is possible interference with tamoxifen metabolism. Certain SSRI's, particularly paroxetine and fluoxetine, inhibit the

enzyme CYP2D6 which metabolizes tamoxifen to an active form. There is also evidence from some laboratory studies that antidepressants might stimulate mammary tumor growth. Chubak and colleagues studied breast cancer recurrence in relation to antidepressant use at Group Health⁸. They did not observe an association between antidepressant use after diagnosis and risk of recurrence or increased risk associated with use of specific types of antidepressants. They also did not find an increase in mortality in those who used antidepressants after diagnosis but before recurrence. They conclude that the numbers of observations were too small and follow-up of 5 years was too short to make any firm conclusions. Their data also suggest that antidepressant users are slightly heavier and have slightly more co-morbid conditions than those who do not take antidepressants. I feel when appropriately used, the benefit of these drugs outweigh the risk for now as no large retrospective study has definitely shown an association of these drugs with breast cancer occurrence. A recent study did find that women who were poor tamoxifen metabolizers due to genetic variation and/or use of CYP2D6 inhibitors had a twofold increased risk of recurrence. They did not establish however whether increased risk was due to genetic variation, use of CYP2D6 inhibitors, or both.

Summary

Recognizing and treating depression in the cancer patient can significantly help the patient and families better cope with the illness and its demands. Many studies have shown that appropriate psychosocial intervention can significantly improve quality of life. Although there have been conflicting reports in the literature regarding psychosocial support and improved survival there may be important effects on the immune system by which could enhance the body's ability to resist disease progression. Finally when prescribing medications, it is paramount that the clinician understand not only the potential benefit but also possible drug interactions and side effects. These cautions should especially be considered in patients with already existing cancer or treatment-related symptoms and in

those with co-morbidities. Fortunately cancer patients are now far less likely to be coping alone emotionally because there is greater public understanding, acceptance and support.

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