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Breast Cancer in Women Ages 18-35, Awareness, Risk Factors, Research, and Prevention Are  
We Getting the Message Across?

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## **Background**

Breast Cancer will affect one in nine women at some point in their lifetime (Chalmers & Luker, 2010). Breast cancer is the second most common cancer diagnosed in women, and the second leading cause of cancer death after lung cancer (Breast Cancer Screening, 2010). In the year 2007 alone there were 180, 510 women diagnosed with breast cancer, and in that same year approximately 40,910 mothers, sisters, wives, aunts, nieces, and friends died of breast cancer (Arnold, 2010). Of those diagnosed six percent will be under the age of 40 (Johnson & Dickenson-Swift, 2008). Breast Cancers in younger women 20-39 are usually larger in size and much more aggressive than breast cancer in older women, with a mortality rate of 72.4% (Johnson & Dickenson-Swift, 2008).

## **Introduction...**

Throughout ones nursing career there will be many patients and experiences that will make us laugh, cry, and sometimes there are those who inspire us for a lifetime. One night in the spring of 2008 there was one patient that left an impact never to be forgotten. She was a 26 year old female with stage four breast cancer. Her name is Amber, and this is her story.

## **Amber's Story**

### **Time line**

**Initial Problems-** In fall of 2003 Amber, age 23, was weaning her first child and noticed crusting/dry skin on her left breast. She mentioned it to her mother and her mother told her that

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the same thing happened to her when she was breast feeding and not to worry about it. Amber would soak the breast or place warm compresses on the crusting/dry areas and the crusting would go away.

**Worsening of symptoms-** By May 2005 Amber's senior year in nursing school she was (24 years old), the crusting of the left breast had gotten worse. Amber researched her symptoms and decided her symptoms were similar with Paget's disease of the breast. She made an appointment with her Gynecologist and during her appointment shared her concerns. Her doctor laughed and said "where did you come up with Paget's disease?" She told him she was a nurse and researched her symptoms and said it looks just like Paget's disease. He told her it was just contact dermatitis and there was nothing to worry about. She was prescribed a steroid cream and sent home. The cream did help temporarily.

**Return Visit August 2005** -She went back three to four months later because the symptoms had not resolved and her GYN told her that it would just take a little more time to heal. She asked for a biopsy at that time and was told no by her doctor, he stated "you do not biopsy a 24 year olds breast because of dermatitis." She received more topical creams and was sent home.

**October 21, 2005-** Amber has a birthday and turns 25 years old. Over the next year Amber sought the opinion of several physicians. Amber is a registered nurse (RN) and asked one of the physicians she worked with (second opinion) for an appointment regarding her abnormal breast tissue. His opinion was the same dermatitis. She also sought the opinion of a dermatologist (third opinion) who came in the room opened the gown she was wearing and said "What have the other doctors been saying this is?" Amber stated "Dermatitis" The dermatologist

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said “yep that is what it is” closed her gown and left the room. Again she was sent home with more topical creams and again nothing diagnostic was done.

**November 2005-** Amber makes an appointment with her Gynecologist for a yearly exam. During this visit a breast exam was completed and the physician reported no lump or abnormality in the breast and again the skin condition was diagnosed as dermatitis. Amber does find out at this appointment that she is expecting her second child. Again there is nothing diagnostic done to rule out dermatitis.

**May 2006-** During Amber’s pregnancy she continued to have skin issues with the left breast. She again sought another opinion, this time of a surgeon (fourth opinion). At this time Amber’s left nipple was pointing downward, and the right nipple was in normal position. The surgeon performed a breast exam and said there is no lump come back after the baby is born. The skin condition is probably just hormonal.

**July 2006-** Amber gives birth to a baby girl she named Aniston. She breast fed the baby but began to develop issues with the left breast. Amber makes a second appointment with the surgeon and was told to return when she decides to quit breast feeding.

**September 2006** – Amber is at her mother’s home and develops severe breast/chest pain. Her mother (also a registered nurse) did a breast exam and felt a gravelly mass in Amber’s left breast. A third appointment was made with the surgeon, and Amber asked for a MRI (Magnetic Resonance Imaging) of the left breast. The surgeon declined to order the MRI, and said “I told her when she decided to quit breast feeding to come back and I would evaluate her then.” “She does not have breast cancer.” Amber’s mother was with furious and demanded an MRI to be done that day. The surgeon agreed to an Ultrasound but not an MRI. When the Ultrasound was complete the surgeon was looking at the results. After looking through slide after slide he

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suddenly became quite. Moments later the surgeon told Amber that they needed to do a needle biopsy that day. The next day (Tuesday) Amber came to the hospital to have a core biopsy of the left breast. She received a call the next day (Wednesday) from the surgeon requesting a nipple biopsy under anesthesia. She declined because she had a ceremony at church for the children's group that she taught, and she was going to be there. Approximately 48 hours after the core biopsy was obtained (Thursday), Amber returned to the hospital for a nipple biopsy. On the way back to the OR the surgeon looked at Amber and stated "you do realize this is probably breast cancer." Amber burst out in tears on her way to the operating room. After the procedure the nurse came in to give them their discharge papers and let them go and Ambers' mom said the surgeon told us to wait until we spoke with him. The nurse looked up and said well unless he has a crystal ball he isn't going to know anything about your biopsy. Amber's mom said we are waiting! A short time later the surgeon came back to the room and said "Amber its breast cancer." Amber was no longer able to breast feed her infant and she and her mom cried the whole way home.

**October 2006-** The biopsy confirmed that this was indeed stage IV breast cancer. The second week of October Amber made the decision to have a left mastectomy. There was an 8mm mass and 25 out of 30 lymph nodes were positive for cancer. The next morning after the surgery Amber complained that something didn't feel right. When the doctor came in to see her that day they determined that Amber had hemorrhaged and had to return to surgery..

**October 20, 2006** – Amber turns 26 years old and is informed that she has micro metastasis to her chest and back. Amber makes the decision to take radiation, chemotherapy, and Herceptin for 12 months. She had requested to be hit hard because she had two children and a husband to fight for.

**October 2007-** The year of treatment went fairly well she had good days and bad but all in all she had a happy year. Then in the fall of 2007 Amber began losing weight. She initially thought the weight loss was because of the strict healthy diet she had adopted and didn't think too much about the weight loss. Amber had just been told that everything looked good, and had just been tested for the breast cancer gene (only two were identified at that time) and she tested negative.

**December 2007-** In December 2007 Amber began feeling bad and had developed a cough. She had a Computerized Tomography of the chest that indicated interstitial changes in her chest and was told she was developing asthma. The radiation had scarred her heart and lungs. She was given medication to assist with the cough and asthma.

**February 2008-** Amber was admitted to the hospital the last week of February. She was admitted to ICU for difficulty breathing and congestive heart failure. Her lungs were full of fluid and were drained. Amber had bilateral chest tubes and was on a ventilator. The physicians told the family that Amber was not likely to make it out of the ICU. Amber had several procedures done in the ICU including talc procedure multiple times. This procedure is to prevent fluid from accumulating in the lungs. The family was asked several times if they wanted to take Amber off the vent and they said no she is fighter and we are not playing GOD. A few days later Amber showed signs of improvement and was weaned off the vent and moved out of ICU to the floor. After Amber was moved out to the floor she developed abdominal pain and nausea and had to have a cholecystectomy. After the surgery Amber's pulmonologist notified the family that the fluid from the lung tested positive for breast cancer cells and that the cancer was back. Amber began crying and said mom, "It's only the unknown that we are afraid of". She was crying and it was at that time that Amber told her mom that she knew she was dying.

**May 2008** –Amber is finally discharged from the hospital. Chemotherapy was not initiated at this time because Amber’s body was too weak.

**August 2008**- Amber’s respiratory status continues to decline. The pulmonologist could not determine if she had pneumonia or if it was lung cancer. A few weeks later Amber and her mom felt a lump in the right breast, and her respiratory status continue to deteriorate.

**September 2008**- Amber was admitted to the hospital with pneumonia. She was placed in ICU on the ventilator for two weeks. Multiple attempts were made to extend her life without success.

**October 2008**- Amber was not making any improvement and was transferred to a long-term acute care facility. Amber’s body continued to fail to respond to treatment. After two weeks at the long term acute care facility Amber lost her battle with breast cancer and died on October 21, 2008 one day after her 28<sup>th</sup> birthday.

Throughout Amber’s battle with breast cancer she remained a positive, good spirited individual who maintained her faith in GOD and love of family. She left behind a husband and two children, two sisters, a brother and mother/ step-father and father/step-mother. All of which supported her during illness.

Amber’s story is the inspiration for this paper, and the purpose is to identify awareness, risk factors, current research, and prevention. It is also to educate/remind all providers to always listen to their patients, diseases do not discriminate. Age is just a number.

### **Young Women’s Perception of Breast Cancer Ages 18-35**

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Many young women are into the latest fashion, music, or social media. Very few women in the age group of 18-35 are sitting around thinking about their risk of breast cancer. Most young women have little knowledge regarding breast cancer (Johnson & Dickenson-Swift, 2008). Their knowledge is limited to being aware that it was a serious disease and that it may require chemotherapy or radiation. Some of the women were able to identify two risk factors, those of which were family history and age (Johnson & Dickenson-Swift, 2008). Young women felt that breast cancer was an older woman's disease and that they did not need to be concerned with it. Often another contributing factor to the knowledge level of young women is the media. Breast cancer awareness campaigns are often targeting women of age 50 or greater leading young women to believe they are not at risk. This information had lead young women to believe that they have no risk of developing breast cancer.

Women who were diagnosed with breast cancer at a young age have a different perspective than that of the older women. Younger women have an elevated concern regarding body image, fatigue, and nausea (Coyne & Borsari, 2009). Those who are married or in a relationship may experience a loss of intimacy with their partner due to the radical change in body image and fear of possible sexual rejection or negative response from their partner (Cebeci & Yangin 2010). Younger women usually have a family to care for and do not want to be placed in the category of the "sick one" in the family. They are also not prepared for the toll it takes on them in such a short amount of time due to the aggressiveness of cancer in younger women. These women don't perceive themselves to be cared for; instead they see themselves as caregivers and partners, which compound the stress of the illness.

### **Potential Risk Factors, Hereditary Risk Factors, and Racial Trends**

## **Risk Factors**

**General Risk Factors-** Many factors can place an individual at risk for breast cancer. Assessment of risk factors should include age, hormonal factors (age of menarche, menopause, late age pregnancy, null parity, hormone therapy and duration of hormone therapy), hereditary factors such as family history and BRCA genetic mutations, exposure to radiation, and personal cancer history. Some other risk factors include increased stress, obesity, alcohol use, lack of exercise and possible exposure to environmental carcinogens (Association of Women's Health, Obstetric and Neonatal Nurses [AWHONN] , 2010).

**Consequences of sleep-** Women who have experienced poor sleep quality due to an interruption of the normal circadian rhythm have been found to have a greater chance of developing breast cancer( OR1.6, 95%, CI-1.0-2.6) Individuals who work during the hours of 7pm and 7am have greater difficulty adjusting to sleeping during the day due to frequent interruptions in sleep, inability to go to sleep or inability to stay asleep (Chung, Wolf, &Shapiro, 2009).. Breast cancer in shift workers is higher than those women who do not participate in shift work (RR-1.4, 95%, CI-1,1-3.0 ,P=0.02) Chung, Wolf, &Shapiro, 2009). The etiology is unknown at this time; however night shift workers are found to have a higher prolactin level which has long been associated with breast cancer. Another theory is that women who work at night and are exposed to light during night hours have a disruption of melatonin and reproductive hormones (Chung, Wolf, &Shapiro, 2009) In individuals who are blind have a 20% to 50 % decreased risk for breast cancer (Chung, Wolf, &Shapiro, 2009). Women who worked as little as one night shift a week for at least four years or more were at an increased risk for breast cancer (Chung, Wolf, &Shapiro, 2009). The longer the years of nightshift work the greater the risk of breast cancer (OR 1.6, 95% CI 1.0-2.6). Is there a relationship with one's circadian

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rhythm, clock genes, and cancer? There are at least nine circadian genes that are involved in the control of cell proliferation, apoptosis, and the processes crucial to tumor suppression (Chung, Wolf, & Shapiro, 2009). Clock genes are also associated with one's circadian rhythm and there is a relationship of clock genes and carcinogenesis (Chung, Wolf, & Shapiro, 2009). Breast cancer has been linked to altered melatonin secretion in association with shift work. Melatonin prevents mammary tumor growth and inhibits in vitro breast cancer growth. Melatonin has an anticarcinogenic protective role. Women who are exposed to light at night during their shift may suppress nocturnal melatonin (Chung, Wolf, & Shapiro, 2009). This allows estrogen to be released by the ovaries which increases the risk of breast cancer (Chung, Wolf, & Shapiro, 2009).

**Oral Contraceptives-** A common medication for women age 18-35 are oral contraceptives. Introduced in 1960 this medication gave women a whole new look at birth control practices. There are many benefits to taking birth control pills such as decrease in anemia, metrorrhagia, endometriosis, hypermenorrhea, premenstrual syndrome, dysmenorrhea as well as reversible fertility regulation (Narvaiza, Navarrete, Falzoni, Maier, & Nazario 2008). There are many other benefits as well such as regulation of menstrual period, decreased risk of endometrial and ovarian cancer, fallopian tube pregnancy, a reduction of ovarian cyst and a lower incidence of pelvic inflammatory disease (Narvaiza et. al, 2008). Wide spread use of OCP's and the increasing number of breast cancer incidence in young women have many researchers very concerned that there is a connection. Years of exposure to high levels of estrogen such as early menarche, late menopause (with replacement therapy) and delayed first pregnancy are all known risk factors. Most OCP contain ethinyl estradiol. This is a stronger antigonadotropic that has a higher affinity to estrogen which can cause estrogen to have a longer

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duration in the body. Progesterone (which is used in combination oral contraceptives) on the other hand can cause mitotic activity in breast cancer cells when alone or acting synergistically ( Narvaiza et al, 2008). There is a higher epithelial cell proliferation when using OCP's, however, age, phase of menstrual cycle, hormonal formulations (especially for women without children and those who have just given birth) (Narvaiza et al, 2008). Women who started using OCP's younger than age 18 were on average 17 years younger at the time of breast cancer diagnosis, than women who started using OCP's over the age of 30 (Imkampe & Bates, 2011). Breast cancer in women ages 18-35 is very rare however, there is a definite link to length of use of OCP's and age of diagnosis of breast cancer (Imkampe & Bates, 2011).

### Hereditary Risk Factors and Racial Trends

#### **Hereditary Risks-**

Risk factors for hereditary breast cancer include having a strong family history of having one type of cancer or several other types of cancer in the family. This can indicate a possibility of having hereditary syndromes. These types of syndromes are typically present in two or more first degree relatives, or one first degree relative and two or more second degree relatives. When these patterns occur they usually will span back for generations. Many individuals that have this family history do not wonder if they will get cancer, but they wonder when they will get cancer. Women with a family history of breast cancer tend to be overly worried about developing the disease. These women are consistently practicing behaviors for prevention and risk reduction of breast cancer (Loescher, 2003). Healthcare providers can assist those high risk patients by encouraging and promoting regular self-breast exams for early detection of abnormalities and breast cancer diagnosis (Chalmers & Luker, 1996).

**Genetic Testing-** BRCA1 and BRCA 2 are human genes that belong to a group of genes known as tumor suppressor genes. In healthy cells BRCA1 and BRCA2 can help ensure the stability of the cell's DNA and help prevent uncontrolled cell proliferation. Mutation of these genes has been linked to breast and ovarian cancer. Both men and women can inherit mutations in BRCA1 and BRCA2 which can also place them at risk for other cancers as well. When individuals are diagnosed, genetic testing is available to breast cancer patients to determine if their tumor histology has a high probability of having the BRCA1 & BRCA2 mutations. Human epidermal growth factor receptor 2 (HER-2) negative tumors have a 10% to 27% chance of becoming a BRCA 1 gene carrier (Ardern-Jones, Kenen & Eeles, 2005). Women with the presence of BRCA 1 & BRCA2 mutations have a high risk for other contralateral breast cancer in the future, such as ovarian cancer (Ardern-Jones, Kenen & Eeles, 2005). Information received from genetic testing can influence women regarding surgical decisions and treatment. The treatment options available to these women with information obtained from genetic testing could prevent future incidence of cancer (Ardern-Jones, Kenen & Eeles, 2005).

**Racial Trends and Mortality Rates-** In women 35 years and younger black women have mortality rates greater than twice that of white women (Mirabella & Layde, 2001). In women that were 70 years or older, the mortality rates for white women were higher than that of African American women (Mirabella & Layde, 2001). In all ages combined African American women had higher mortality rates in all age categories (Mirabella & Layde, 2001). Black women however had lower mortality rates than white women until 1993-1996; at that time mortality rate for African American women was significantly higher. In women under the age of 40 there has been a steady increase in both breast cancer in situ and invasive breast carcinoma 4.5% in white women and 10% in black women as of 2004 ( Han, Talbott & Donovan, 2011).

Black women had a higher mortality rate 7.5/100,000 compared to 4.2/100,000 in white women (Han, Talbott & Donovan, 2011).

### **Screening, Detection, and Treatment**

**Screening-** Women under the age of 50, who are in the high risk category, have varying recommendations for routine screening in regards to mammography. In the younger woman the breast tissue is dense which can make mammography more difficult to read (AWHONN, 2010).

Of the breast cancers detected by breast self exam, 20% are diagnosed in women under 50 and 6% in women under the age of 35. (AWHONN, 2010). Women of all ages should be encouraged to perform breast self-exams monthly. Being familiar with their breast tissue can assist in the discovery of abnormal verses normal lumps and bumps. It has been reported that as much as 90% of breast cancers were found by women themselves (Oluowatsin, 2010). Mammography is considered to be the cornerstone of breast cancer screening for low risk women ages 50 and older (Oluowatsin, 2010). Mammography has the capability to detect lumps in breast tissue before they can be palpated on a breast exam. In younger women as much as 25% of breast abnormalities go undetected by mammograms (Breast Cancer Screening, 2010). The dense breast tissue of young women, make breast cancer screening difficult which is why BSE and yearly clinical exams are essential.

**Detection-** Detection of cancer or breast abnormality is specifically why screening is important. Breast cancer when diagnosed in early stages has a very high survival rate, especially when there is no lymph node involvement. There have been reports that as much as 80 to 90% percent of patients with breast cancer could have a cure if the cancer is detected in the early stages (Oluwatosin, 2008). There are technical advancements that have assisted in early detection of breast cancer. Magnetic Resonance Imaging is highly sensitive for the detection of

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invasive cancers or cancer in situ (Oluwatosin, 2008). Film mammography does have limitations, for women under the age of 40 it is not sensitive for the detection of cancer in women with dense breast tissue and cannot be altered or adjusted for minute differences in tissue (Arnold, 2010). Digital mammography has been developed to overcome the disadvantages of film mammography; however it too has limitations. The cost of digital mammography is 1.5 to 4 times the cost of film systems (Arnold, 2010). Unlike film mammography digital mammography can be altered, the contrast of the image can be adjusted to note minimal differences in tissue to detect abnormalities. Digital mammography was significantly better in detecting breast cancer in young women (Arnold, 2010) Breast cancer screening, early detection, and treatment advances have had a positive impact on the lives of women over the past 15 years with a relative five year survival rate of 89% (Fernandes-Taylor, 2010).

**Treatment** A number of treatment options are available for breast cancer patients with shared or participatory choices in which the patient plays an active role regarding decisions surrounding treatment. Many decisions have to be made regarding treatment such as whether to undergo mastectomy, chemotherapy, radiation, and hormone therapies. Beyond the initial treatment choices there are also decisions to be made regarding reconstruction, implants, latissimus dorsi flap or transverse rectus abdominus myocutaneous flap (TRAM), not to mention psychosocial counseling (Fernandes-Taylor, 2010). Many treatment decisions women face are very intimate and are tied to their self-image. Often after decisions are made regarding treatment many women have regrets several years down the road. Approximately 43% of women have regret over their chosen treatment, actions, and inactions such as not having a bilateral mastectomy verses having only one breast removed. Choosing to do chemotherapy but not radiation or vice versa or doing both chemo and radiation when it may not have been necessary.

(Fernandes-Taylor, 2010). This indicates the need for psychosocial care for cancer patients, use of patient care navigators can assist patients with treatment decisions. Patient care navigators can help decrease post treatment regret as well as decrease the stress associated with treatment decisions.

## **Provider Knowledge and Prevention**

### **Provider Knowledge**

**Risk Assessment-**Identifying an individual at risk for breast cancer is important for those on the front lines, such as nurse practitioners. Increased education for NP's is warranted to improve knowledge and comfort levels in the assessment of those at risk for breast cancer (Edwards, Maradiegue, Seibert, Saunders-Goldson, & Humphreys 2009). A ten item knowledge survey was given to providers regarding risk assessment of breast cancer. Of those providers who answered the survey, 55% answered incorrectly to the knowledge questions and only six percent responded correctly to five or more questions (Edwards's et. at, 2009). Many NP's reported that they were not comfortable with breast cancer risk assessments, a total of 55% felt they could not accurately assess hereditary cancer syndromes (which is required in the breast cancer risk assessment) (Edwards's et. al, 2009). Continuing education programs to enhance the knowledge of NP's cancer risk assessment skill are important for the detection of breast cancer as well as the prevention. Providers who can utilize breast cancer risk assessment can offer preventative strategies (primary and secondary) for those at high risk. Such preventative measures may include taking tamoxifen, mammography, and diet and lifestyle changes. Breast cancer risk reduction measures can play a pivotal role in the prevention of breast cancer.

### **Prevention-**

**Research-** Research is the key to prevention, however it isn't free. Every state can assist with raising dollars for breast cancer research. Generating pink dollars through tax check offs, license plates, and lottery tickets are great ways to raise money for the prevention of breast cancer (Eyeler, Dodson, Ghalifour & Brownson, 2011). There are several states (18) that already participate in raising pink dollars the revenue generated yearly varies by state as does each program. Income tax check offs generate approximately 115,000, specialty license plates 4.1 million (there is usually an extra fee associated with each plate of approximately \$50.00), and specialty lottery tickets (scratch off tickets) 7.4 million annually (this revenue also assists in services and education for breast cancer patients) (Eyeler, Dodson, Ghalifour & Brownson, 2011). Not all of the 18 states offer all three options to raise pink dollars. In states that have a medium to high mortality rate were 2.5 times more likely to offer a higher revenue option such as a specialty license plate than states with a lower mortality rate (Eyeler, Dodson, Ghalifour & Brownson, 2011). The longevity of these programs is solely dependent on public support and awareness for success of breast cancer research.

**Calcium & Vitamin D-** Research on calcium intake through food and supplements has shown a protective relationship in the prevention of breast cancer. Epidemiological, cellular, and animal research has indicated a decreased risk of breast cancer related to the relationship of calcium and vitamin D (Shao, Klein, & Grossbard, 2011). In normal cells and tumor cells calcium is indicated to increase cellular differentiation and apoptosis (Shao, Klein, & Grossbard, 2011). Lower levels of vitamin D may promote the growth of cancer cells by changing the microenvironments causing mammary carcinogenesis (OR's 0.80 CI 95% 0.66-0.92).. The expression of Cyclooxygenase-2 (COX2) is an important factor in the prostaglandin synthesis in human breast cancer cells, the down regulation of COX2 is caused by adequate levels of vitamin

D. Higher levels of vitamin D intake have a 34% lower risk of developing breast cancer than those women with the lowest level of vitamin D intake (Shao, Klein, & Grossbard, 2011). There are a variety of ways to obtain vitamin D such as sunlight. Those women who have a greater exposure to sunlight also had a lower incidence of breast cancer diagnosis (Shao, Klein, & Grossbard, 2011). Women who were diagnosed with breast cancer in the summer had a better prognosis than those diagnosed in the winter. Other sources of vitamin D are salmon, eggs, oily fish and fortified dairy products; an optimal serum level of vitamin D is  $> 30$  (Shao, Klein, & Grossbard, 2011). Women with levels greater than 30ng/ml had a decreased risk of breast cancer (OR, 0.65; 95% CI, 0.42-1.00) and those with a level of  $<20$  have an increase risk of breast cancer (OR, 0.56; 95% CI, 0.41-0.78) (Shao, Klein, & Grossbard, 2011).

**Omega-3 Fatty Acids** Diets high in omega-3 fatty acid may decrease women's risk of breast cancer. Omega-3 fatty acids cause a concentration-dependent inhibition of breast cancer cell growth, and may cause inhibition of cyclooxygenase and p21 gene expression and up regulation of p53 gene expression (Shao, Klein, & Grossbard, 2011). There has been as much as a 62% to 68% decrease in breast cancer in women who consumed more than 0.101 g of EPA and 0.037g of DHA from fish daily (Kim et. al, 2009). Long chain fatty acids like omega-3' are essential in the diet, they have a protective cellular effect and decrease risk of breast cancer through nutrition.

**Indole-3-Carbinol-** Diets high in cruciferous vegetables have a direct link with lower cancer risks (Weng, Tsai, Kulp & Chen, 2008). In these vegetables a common phytochemical is found to have a chemo preventative affect to the antitumor activity it is called indole-3- carbinol. The derivatives of indole-3-carbinol suppress the proliferation of many different types of cancer; the range to achieve this outcome is 50-100uM daily (Weng, Tsai, Kulp & Chen, 2008). Indole-

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3-carbinol targets several different pathways by governing hormonal homeostasis, apoptosis, cell cycle progression, cell proliferation, and cell survival (Weng, Tsai, Kulp & Chen, 2008). Tumor genesis is inhibited spontaneously or chemically in the mammary gland, liver, lung, cervix, and gastrointestinal tract. Indole-3-carbinol inhibits the migration and invasion of breast cancer cells due to modulation and the expression of a series of signaling proteins (Weng, Tsai, Kulp & Chen, 2008). Indole-3-carbinol has great underlying potential for use in breast cancer prevention (Weng, Tsai, Kulp & Chen, 2008).

### **Conclusion**

Many women will be affected by breast cancer in their lifetime, either by developing the disease, or by knowing someone who has breast cancer. Over the years there has been progress in the treatment and detection of breast cancer. With all of the advances in technology and pharmacology there is still work to be done. Women ages 18-35 account for six percent of all breast cancer diagnosis each year. The mortality rate for individuals in this age group is 72% (Johnson & Dickenson-Swift, 2008). This is a mouth dropping statistic that deserves much needed research on cause and prevention. Maintaining a regular sleep schedule during normal sleeping hours (ranging from 7pm to 7am) can also play a role in the prevention of breast cancer (Chung, Wolf, & Shapiro, 2009).. A diet high in omega three fatty acids and indole-3-carbinol are also ways that may prevent breast cancer cells from developing (Shao, Klein, & Grossbard, 2011) (Weng, Tsai, Kulp & Chen, 2008). Education for prevention through nutrition is equally imperative in order to decrease mortality and eradicate such a deadly disease. There are several opportunities available for all communities to raise pink dollars for advancement through research (Eyeler, Dodson, Ghalifour & Brownson, 2011). Awareness and participation in

utilization of these opportunities are critical for finding a cure to save the lives of the young women..

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