MYRIAD GENETICS, INC.

Predictive Medicine products provide vital information to help people with a family history of disease to understand their own risk of developing disease. With this information, they can take steps to prevent the disease, delay the onset of disease, or catch the disease at an earlier stage where outcomes are better.

Many cancers are caused by genes we inherit from our parents. The discovery of genes involved in cancer allows us to test for cancer causing changes in these genes. If you have certain genetic changes passed on from your parents, you are at much higher risk of getting cancer than people who do not have these changes. Because of this higher risk, you may choose with your doctor to do something to reduce your risk. There are very effective options to help lower your risk of cancer such as more intensive screening for cancer, preventive medication and risk reducing surgeries. By identifying your risk, you have the information you need to work with your doctor to choose the best way to delay or even prevent the development of cancer.

Myriad's predictive medicine products have been used to help thousands of people with a strong family or personal history of cancer. These families usually have cancers that occur at an earlier age (e.g. below 50), occur in several family members or occur multiple times in the same individual. These cancers can be found on either the father's side of the family or the mother's side. Myriad offers predictive testing for several inherited cancers including cancers of the breast, ovaries, colon, uterus and skin (melanoma). Doctors and their patients use the information provided by Myriad to make better healthcare choices. This has the potential of improving health and quality of life, reducing healthcare costs and, most importantly, saving lives. ***http://www.myriad.com/products/predictive.php***

BRAC*Analysis*®

MYRIAD®

Sincere thanks to Myriad Genetics, Inc.
for their continued financial support. ***http://www.myriad.com***

John W Nick Foundation, Inc
Dedicated to Male Breast Cancer Awareness

November 2011

SPECIAL EDITION

In Loving Memory of John W. Nick
who died of breast cancer 20 years ago

April 17, 1932 – June 11, 1991

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THE ROLE OF MRI
FOR BREAST CANCER SCREENING

There has been a great deal of debate regarding the use of magnetic resonance imaging (MRI) to detect breast cancer. Unlike mammography, which uses low dose x-rays, MRI's do not expose the patient to ionizing radiation. Additionally, the false-negative (missed cancer) rate for mammography is around 10%. However, MRIs have high rate of false positives, which, like a false alarm, can lead to unnecessary biopsies.

Although some studies indicate that MRI may be better able to detect certain breast cancers compared with mammography, the cost, high rate of false-positives, and inconsistent standards for performing MRIs have made broad use impractical. New guidelines, however, provide guidance about how MRI should be used for breast imaging: the American Cancer Society released those guidelines stating for the first time that evidence supported routine MRI screening for patients at high risk of developing the disease - those with a 20% or greater risk of developing breast cancer over their lifetime, including individuals with strong family histories of breast cancer, certain genetic mutations, and other known risk factors.

A study found that MRI is significantly more sensitive than mammography for detecting ductal carcinoma in situ (a non-invasive, precancerous condition in which abnormal cells are found in the lining of a breast duct). MRI was particularly effective at finding those tumors that are more likely to be biologically aggressive and have the potential to turn into invasive breast cancer.

BREAKING NEWS!
A Message from the Founder

Nancy E. Nick

In 2007 I was watching the Doctor Oz Show and learned about Biomedical Hormones. Because of the show I went to a doctor who did special hormone testing and discovered that I had high iron levels in my blood. I learned for the first time about my family's hemocromatosis gene. Because of this, I hope to help future generations of my family be cancer free.

In March 2011, through DNA testing, scientists discovered that I have "Jewish ancestry." Neither my family nor I had any idea. After 20 years of research I can validate an additional reason my father John and his mother Myrtle had breast cancer. Another risk factor has been discovered - the genetic link of "Jewish ancestry."

Nancy E. Nick
Founder, President, CEO
John W. Nick Foundation, Inc.

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www.malebreastcancer.org and www.johnwnickfoundation.org

BREAST CANCER STUDY: MANY HISPANIC WOMEN HAVE JEWISH ANCESTRY

A Journal of American Medical Association study reveals a high incidence in Hispanic-American women of a genetic mutation – the breast cancer gene BRCA1 – similar to the high incidence of that gene in *Ashkenazic Jewish-American women. This may indicate a high incidence of Jewish heritage among Hispanic-American women.**

The JAMA BRCA1 gene study found in this population-based series of women with breast cancer (diagnosed at age younger than 65 years) estimated prevalence of pathogenic BRCA1 mutations was as follows:

- **Ashkenazi Jewish patients 8.3%**
- **Hispanics 3.5%**
- **Non-Hispanic Whites 2.2%**
- **African Americans 1.3%**
- **Asian Americans 0.5%**

Among African American, Asian American, and Hispanic patients in the Northern California Breast Cancer Family Registry, the prevalence of BRCA1 mutation carriers was highest in Hispanics and lowest in Asian Americans. The higher carrier prevalence in Hispanics may reflect the presence of unrecognized Jewish ancestry in this population.

Crypto or "Secret" Jews:

Because of the Spanish Inquisition, a number of Spanish Jews who came to South America, Cuba, and southwest America practiced outwardly as Catholics and secretly as Jews, even in North America. They were known as "*Crypto*-Jews," meaning "Secret Jews." (Inquisition-era Jews who converted to Catholicism to save their lives were called "*Marranos*" and "*Conversos*.")

http://www.debbieschlussel.com/16322/breast-cancer-study-many-hispanic-women-have-jewish-ancestry/

DNA TESTING FOR HEMOCHROMATOSIS

If you have a Celtic heritage, ancestors from Ireland, Wales, Scotland, or Great Britain, then you are at high risk for carrying the HFE mutations for hereditary hemochromatosis (HH), also known as iron overload or iron storage disease.

HH has been dubbed the "Celtic Curse" by Sandra Thomas, President/Founder of the American Hemochromatosis Society. It is the most common genetic disease in the U.S. and Ireland.

Most people think that Celtic means Ireland, however, the Celts of 40-60,000 years ago covered Ireland west of Moscow, north to the upper reaches of Scandinavia, south into Spain and Portugal, and southeast across the Italian peninsula and north of Greece and Turkey/Iraq. People with northern European ancestry are highest at risk with family bloodlines that go to France, Germany, and the Scandinavian countries. Other ethnic groups can also have the mutations but it is much more infrequent (i.e. Asian or Jewish).

Symptoms: Toxic levels of iron accumulate in the vital body organs causing: chronic fatigue, diabetes, early menopause, impotence, infertility, arthritis/joint replacement, heart disease, hypothyroidism, liver cirrhosis, (with or without a history of alcohol consumption), liver cancer, premature death. With appropriate treatment, these symptoms can be avoided.

You can protect yourself by finding out your genetic risk with DNA testing and having your blood tested by your doctor. By practicing preventive medicine, you and your doctor can protect future generations through awareness and proper treatment of HH. ***http://www.americanhs.org/celtic.htm***

INCOME, EDUCATION AND BREAST CANCER

A study was conducted by the California Breast Cancer Research Program to determine if wealth and education matters when it comes to breast cancer.

The study found:

- **One-fifth of white women with the *highest income and most education* get breast cancer 27% more often.**

- **One-fifth of white women with the *lowest income and least education* have a lower risk for breast cancer.**

- **One-fifth of African American women with the *highest income and most education* get breast cancer 22% more often…**

- **… than the one-fifth of African American women with the *lowest income and least education*.**

- **One-fifth of Hispanic women with the highest *income and most education* get breast cancer 83% more often than the one-fifth of Hispanic women with the lowest *income and least education*.**

- **The one-fifth of Asian/other women with the highest *income and most education* get breast cancer 65% more often than the one-fifth of Asian/other women with the lowest *income and least education*.**

Higher income and more education do not in themselves cause breast cancer. Researchers don't know why women who are wealthier and more educated get more breast cancer, but they have some educated guesses:

estrogen (female hormones). Therefore, they have a higher risk of developing gynecomastia (breast tissue growth that is non-cancerous) and breast cancer. Klinefelter syndrome is a condition present at birth that affects about 1 in 1,000 men. Normally men have a single X and single Y chromosome. Men with Klinefelter syndrome have more than one X chromosome.

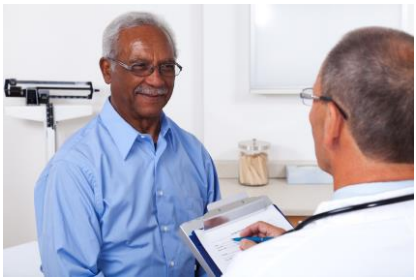
A strong family history of breast cancer or genetic alterations: Family history can increase the risk of breast cancer in men — particularly if other men in the family have had breast cancer. The risk is also higher if there is a proven breast cancer gene abnormality in the family. Men who inherit abnormal BRCA1 or BRCA2 genes have an increased risk for male breast cancer. This risk of developing breast cancer by age 70 is approximately 1% with the BRCA1 gene and 6% with the BRCA2 gene. Overall, that's about 80 times greater than the lifetime risk of men without BRCA1 or BRCA2 abnormalities. Also, a family in which male breast cancer has occurred has a 60% to 76% risk of having an abnormal BRCA2 gene. An abnormal BRCA2 gene accounts for up to 40% of male breast cancers. Because of this strong association between male breast cancer and an abnormal BRCA2 gene, first-degree relatives (siblings, parents, and children) of a man diagnosed with breast cancer may want to ask their doctors about genetic testing for abnormal breast cancer genes. Still, the majority of male breast cancers happen in men who have no family history of breast cancer and no inherited gene abnormality.

Radiation exposure: Having radiation therapy to the chest before age 30, and particularly during adolescence, may increase the risk of developing breast cancer. This has been seen in young people receiving radiation to treat Hodgkin's disease. (This does NOT include radiation therapy to treat breast cancer.)

http://www.breastcancer.org/symptoms/types/male_bc /risk.jsp

Frequently Asked Questions Continued…

Q. If I am diagnosed with male breast cancer, what is my prognosis?



As in women with breast cancer, tumor size and the presence, as well as number of involved lymph nodes, are the most important prognostic factors for male breast cancer. Men with tumors measuring between 2 and 5 cm have a 40 percent higher risk of death than those with smaller lesions. Similarly, men with nodal involvement have a 50 percent higher risk of death than those with node-negative disease. In two reports involving 335 and 397 cases of MBC respectively, the following ten-year disease-specific survival rates were reported:

- **No spread to lymph nodes** — **77 and 84%**
- **Spread to one to three nodes** — **50 and 44%**
- **Spread to four or more nodes** — **24 and 14%**

In summary, if MBC is detected before it has spread to the lymph nodes, your chance of living for 10 years is around 80%.

Q. Do men have cosmetic surgery after a mastectomy?

A man generally faces fewer cosmetic and psychological needs in this case than women do.

There are, however, relatively simple procedures to reconstruct a man's chest.

YOUR CHANCE OF INHERITING BRCA1 and BRCA 2 GENES

Know the genetic relationship and medical history of your family. Prevent or manage hereditary diseases.

Every person has two copies of a BRCA1 and BRCA2 gene. When these genes work right they help protect us from cancer. One copy of each gene comes from your mother. The second copy comes from your father. If you inherited one mutated or non-working gene you are at a much greater risk for certain types of cancer including breast cancer.

If you have a BRCA gene mutation, other relatives in your extended family may also be at risk including grandparents, aunts, uncles, nieces and nephews. It is important to share information about your BRCA test results with everyone in your family.

To have the testing done, visit Myriad Genetics at *http://www.myriadtests.com* to find a health care professional near you.

To find a genetic counselor in your area visit the website of the National Society of Genetic Counselors at *http://www.nsgc.org*.

> **Genetic counselors help people ". . . understand and adapt to the medical, psychological and familial implications of genetic contributions to disease." The process of genetic counseling ". . . integrates the following: interpretation of family and medical histories to assess the chance of disease occurrence or recurrence; education about inheritance, testing, management, prevention, resources and research; counseling to promote informed choices and adaptation to the risk or condition." *(National Society of Genetic Counselors' Definition Task Force, 2006.)***

MALE BREAST CANCER SYMPTOMS

As with breast cancer in females, male symptoms usually include the presence of a hard, painless lump and nipple discharge. The nipple may also be inverted, and accompanied by local pain or itching. Symptoms to watch out for include:

A firm mass directly beneath the nipple - most common.

Swelling of the breast.

Redness or scaling of the nipple or breast skin.

A change in skin texture, such as dimpling or puckering.

Of course these symptoms don't necessarily mean that you have breast cancer. Some of these symptoms can be caused by other conditions – gynecomastia being the most common. However, it is important to see your physician if you have any of these symptoms.

Since symptoms in men tend to be ignored for longer periods, the disease is usually in a more advanced stage when diagnosed. A man should never hesitate to see his doctor if he notices these symptoms.

What if a doctor tells a man there's nothing to worry about upon discovering a lump? The man should get an immediate second opinion.

Remember, not all doctors are aware of male breast cancer, and if your doctor isn't aware, make sure to send him or her to our website to start some research.

FREQUENTLY ASKED QUESTIONS

Q. How will my physician confirm whether I have male breast cancer?

The same way he or she would confirm it in females. A biopsy is performed either by needle aspiration or standard excision/incision. Tissue evaluation is essential if there's concern regarding possible malignancy.

A physical examination with complete medical history, blood studies, mammogram and scans is used to establish the extent of the disease. If tests show up positive for male breast cancer, a mastectomy (removal of the breast) is usually performed.

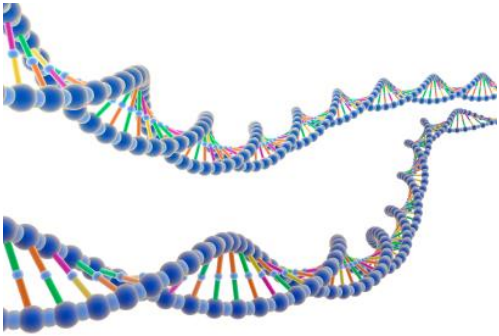
Q. How is male breast cancer treated?

Treatment of localized early stage breast cancer in men follows the same general principles as for female breast cancer. The primary tumor is usually treated surgically, with adjuvant systemic therapy administered in most cases. Because the majority of MBCs are hormone receptor-positive, five years of adjuvant tamoxifen is recommended for most men following mastectomy.

For advanced (metastatic) MBC, hormone therapy is usually the first approach for men. Systemic chemotherapy is generally reserved for treatment of men with rapidly progressive or symptomatic organ involvement, those who become refractory to hormone therapy, and for the treatment of hormone receptor-negative tumors.

HEREDITARY CANCER GENES BRCA1 & BRCA2

The chance of identifying a BRCA1 or BRCA2 mutation for a man regardless of family history is 12.8%. This is approximately 1 in every 8 men diagnosed with breast cancer. Should there be additional family history of breast or ovarian cancer, the risk increases.



Additionally, BRCA mutations are more likely in some groups of people than others, i.e., people with Ashkenazi Jewish ancestry from Eastern and/or Central Europe.

Approximately 1 in 40 Ashkenazi Jewish individuals has a BRCA mutation.

In considering men with breast cancer who are of Ashkenazi Jewish Ancestry, the prevalence of a BRCA mutation is approximately 15% regardless of family history.

Other people also may benefit from testing. For example, three specific mutations in the BRCA1 and BRCA2 genes are especially common among Ashkenazi Jews whose ancestors come from Central or Eastern Europe. About 90% of American Jews are Ashkenazi.

If you are Ashkenazi and you know or suspect blood relatives have had breast or ovarian cancer, or if you have had breast or ovarian cancer yourself, you may wish to consider genetic susceptibility testing.

HEREDITARY BREAST CANCER RISKS

"RED FLAGS"
Beware of Your Genes!

Has there been ovarian or breast cancer in your family? Should you worry about your chances of developing breast cancer?

- **All first degree relatives (your parents, siblings and children) have a 50% chance of inheriting the same gene mutation.**
- **Have you or anyone in your family been diagnosed with *ovarian cancer*?**
- **Have you or anyone in your family been diagnosed with *ovarian and breast cancer*?**
- **Have you or anyone in your family been diagnosed with *breast and prostate cancer*?**
- **Do you have a male relative diagnosed with *male breast cancer*?**
- **Do you have a relative with *Ashkenazi Jewish heritage*?**
- **Do you have a relative with a known *BRCA mutation*?**
- **Have two or more family members *under the age of 50 had breast cancer*?**
- **Do you have unknown Jewish ancestry?**
- **Do you have hereditary or acquired iron overload?**

MALE BREAST CANCER RISK FACTORS

It's important to understand the risk factors for male breast cancer — particularly because men are not routinely screened for the disease and don't think about the possibility that they'll get it. As a result, breast cancer tends to be more advanced in men than in women when it is first detected. A number of factors can increase a man's risk of getting breast cancer:

Growing older: Risk increases as age increases. The median age of men diagnosed with breast cancer is about 67, meaning half the men diagnosed are over 67 and half are under.

High estrogen levels: Breast cell growth — both normal and abnormal — is stimulated by the presence of estrogen. Men can have high estrogen levels as a result of:

- **taking hormonal medicines**
- **being overweight, which increases the production of estrogen**
- **having been exposed to estrogens in the environment (such as estrogen and other hormones fed to fatten up beef cattle, or the breakdown products of the pesticide DDT, which can mimic the effects of estrogen in the body)**
- **being heavy users of alcohol, which can limit the liver's ability to regulate blood estrogen levels**
- **having liver disease, which usually leads to lower levels of androgens (male hormones) and higher levels of estrogen (female hormones). This increases the risk of developing gynecomastia (breast tissue growth that is non-cancerous) as well as breast cancer.**

Klinefelter Syndrome: Men with Klinefelter syndrome have lower levels of androgens (male hormones) and higher levels of

Income, Education and Breast Cancer Continued…

Women with more money and education may have better access to health care. This means that when they get breast cancer, their tumors are more likely to be detected and reported.

A low-income woman may be more likely to die of another cause before her tumor is detected, and so she wouldn't be counted in the statistics.

Another possible cause is that something in the environments or lifestyles of high-income, highly educated women may lead to more breast cancer.

Women who have children, especially if they have children at a young age or have many children, are less likely to get breast cancer. (Low-income women with less education may have more children, and at younger ages.)

However, even when the figures are adjusted to take childbearing into account, women with higher incomes and more education are still more likely to get breast cancer.

Differences in education and income do not explain why women from some ethnic groups are more likely to get breast cancer, and others are less likely. However, some or all of the reasons why income and education make a difference may also be part of the explanation why women from some ethnic groups get breast cancer more or less often.

For now, the questions of why income and education are related to breast cancer – and why they make more difference for some ethnic groups than others – are a medical puzzle that can only be solved with more research. *http://www.cbcrp.org/publications/papers/BCinCA/page_07.php*

MaleBreastCancer.org

CONTRIBUTING FACTORS FOR JOHN NICK'S BREAST CANCER

- **John's mother, Myrtle Nick, had breast cancer.**
- **Jewish DNA – A breast cancer genetic link (John's mother's family).**
- **Paget's Disease – An uncommon type of cancer that forms in or around the nipple.**
- **Gynecomastia – The enlargement of the male breast.**
- **Estrogen Positive – Estrogen Receptor positive (ER+) means that estrogen is causing your tumor to grow.**
- **Alcohol Consumption**
- **Hereditary Hemochromatosis – Iron overload.** ***(See below)***

IRON OVERLOAD AND BREAST CANCER (HEREDITARY AND ACQUIRED)

Iron transports oxygen in your blood and generates energy. However, high iron levels may contribute to breast cancer as recent research suggests. Two types of iron overload are the hereditary kind (Hemochromatosis) and the acquired form. Unused iron is stored in the body as ferritin (in the liver, muscles, spleen and bone marrow). High amounts of stored iron can possibly be carcinogenic.

Factors that increase the risk of Hereditary Hemochromatosis: **having two copies of a mutated HFE gene, family history, ethnicity, being a man.**

Factors that increase the risk for Acquired Iron Overload: **excessive ingestion of red meat, unnecessary iron supplements, iron fortified foods, iron cookware, tap water, alcohol, cigarette smoking, oral contraceptives, lack of exercise, taking vitamin C with foods which can increase iron absorption.**

Iron levels tend to rise with age. Once you absorb too much iron it stays with you for life unless you get treatment. There is no easy exit except through phlebotomy, giving blood, or medical treatment like chelation.

CANCERS ASSOCIATED WITH BRCA1 AND BRCA2

BRCA1 and BRCA2 are major genes related to hereditary breast cancer.

Women who have inherited certain mutations in these genes have a high risk of developing breast cancer, ovarian cancer, and several other types of cancer during their lifetimes.

Men with BRCA1 mutations also have an increased risk of developing breast cancer.

Additionally, BRCA1 mutations are associated with an increased risk of pancreatic cancer.

Mutations in the BRCA2 gene are associated with an increased chance of developing male breast cancer and cancers of the prostate and pancreas.

An aggressive form of skin cancer called melanoma is also more common among people who have BRCA2 mutations.

It is important to note that people inherit an increased risk of cancer, not the disease itself. Not all people who inherit mutations in these genes will develop cancer.

http://ghr.nlm.nih.gov/condition/breast-cancer

MAMMOGRAPHY FOR MEN

If a man finds a lump, a mammogram should be an automatic routine for physicians. A mammogram is essential to early detection of breast cancer, and also serves to help diagnose noncancerous breast diseases.

If a lump or abnormality is found during a self or doctor's clinical exam, an accurate mammogram reading can indicate if there is need for further investigation.

There are no guidelines for mammography for men, and no study on male lump sizing with mammography.

HISTORY

John W. Nick Foundation, Inc. was founded November 9, 1995 by John's daughter Nancy E. Nick. The Nick Foundation is the oldest Male Breast Cancer Foundation in the world.

June 11, 2011: 20-year anniversary of the day John W. Nick died of Breast Cancer, at the age of 58.

Myrtle Nick

John Nick

John W. Nick
April 17, 1932 - June 11, 1991

(John's mother, Myrtle Nick, had breast cancer too.)

John went to see doctors three times in eight years. Each time he was told his symptoms were nothing to worry about. Eight years later his symptoms were recognized and a mastectomy was performed.

The diagnosis was Male Breast Cancer with "Paget's Disease." John's treatment granted remission for only six months and then he lost his battle as the cancer spread to his bones.

The event that surrounded John's late diagnosis and lack of awareness was his daughter's catalyst to begin her male breast cancer awareness campaign. Nancy Nick's crusade began in 1994, just as she had promised her father, letting men know that male breast cancer does exist.

MISSION STATEMENT

To educate the world about the risk of breast cancer in men, and to provide preventive and reactive measures to cancer through advocacy, education and research.

HOW TO DO A SELF BREAST EXAM

1. **Make yourself soapy.**
2. **Place your left arm above and behind your head. With the three middle fingers of your hand, press your breast against your chest wall.**
3. **In a circular motion feel small portions of your left breast, going around until you have covered the entire breast and underarm. Make sure you do it slowly.**
4. **Repeat it again with your opposite arm.**

This is only one of many methods to help you detect changes or lumps in your breasts or underarms.

If you have suspicions, make an appointment with your physician immediately!