

# Fox Chase researchers identify risk factors for the spread of breast cancer to lymph nodes

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Breast cancer, one of the most prevalent cancers in women, afflicts an additional 200,000 women each year and causes about 40,000 deaths annually. The disease often extends to neighboring lymph nodes, in part, through lymphovascular invasion (LVI) -- a process in which cancer cells invade blood vessels or the lymphatic system -- and can often translate into a poor prognosis for patients. Some scientists argue that evidence of LVI does not necessarily mean that the disease will recur in the lymph nodes after radiation to the breast alone, but research from Fox Chase Cancer Center now shows that the appearance of LVI in the breast tissue does in fact predict recurrence of breast in the regional lymph nodes.

By carefully examining recurrence patterns of thousands of women with [breast cancer](#) from records spanning more than 30 years, Wilhelm Lubbe, M.D., Ph.D., chief resident in Fox Chase's Radiation Oncology Department, and his colleagues have now shown that the appearance of LVI in breast tissue predicts the future recurrence of cancer to nearby lymph nodes. "The microscopic diagnosis of LVI is challenging which highlights the importance of excellent pathologists," says Lubbe, who will present the results this week at the Annual Meeting of the American Society for Radiation Oncology.

Knowing that the disease is going to extend to neighboring lymph nodes, such as those in the armpit, is important prognostically. But it has still been unclear whether supplementary [radiation therapy](#) targeting these

areas improves outcomes.

"There still is a lot of debate as to whether additional radiation to the regional lymph nodes is needed in a woman with LVI," Lubbe says.

In the study, Lubbe's team analyzed an extensive database of 3,082 breast cancer patients who underwent whole-breast radiation or minimal surgical resection of breast tissue between 1970 and 2009. This dataset, at least twice as large as many others of its kind, provided enough statistical power for the investigators to detect a subtle, yet significant trend.

"Luckily, at Fox Chase, we had the resources to maintain this huge database by meticulously following a large number of patients over the course of decades," Lubbe says.

The team searched for factors aside from LVI that determine outcomes. The disease was more likely to invade lymph nodes in women younger than 35. Also, additional radiation therapy under the armpit via a technique called a posterior axillary boost (PAB) lead to fewer breast cancer recurrences in these women's regional lymph nodes. Ironically, this extra procedure led to less regional recurrence even though the women were of higher risk than other treatment groups. Overall, the 10-year recurrence rate was only 1.4%. But it was 4% for women treated with radiation above the collar bone alone, compared to 0.5% for those who also received a PAB - the posterior boost of radiation under the armpits.

"Our data suggest that patients who are at higher risk of their cancer spreading can potentially benefit from additional radiation by a technique called a posterior axillary boost," Lubbe says. "But the recommendation to add radiation, and what technique is used, is very patient-specific, because with any intervention there's additional risk."

In the future, Lubbe would like to identify other objective biological markers, such as proteins or genes, which predict recurrence rates and patient outcomes. "Ultimately, we'd like to find a faster and more accurate process for assessing the risk of cancer spread to regional [lymph nodes](#) and the rest of the body," Lubbe says.

Provided by Fox Chase Cancer Center

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