## Level of Evidence

Purpose: The vascular index (VI) of superb microvascular imagining (SMI) was used to see if it might minimize needless biopsies and improve the diagnosis accuracy of BI-RADS 4 breast tumors

Sampling. From January 2016 to October 2018, the researcher chose 222 BI-RADS 4 breast tumors diagnosed by ultrasonography and verified by histology. The Cai et al. (Ref-K9Y2M5) study was approved by the Perking union medical college hospital’s ethics committee. The patients had to sign written consent forms to participate in the survey (Ref-G6H1J4). Patients were excluded from the trial if they had previously gotten an operation or biopsy for the lesion, if their photos were unqualified, if their breast lesions were more significant than the probe’s diameter, or if they were nursing or pregnant. Finally, most samples were eliminated since they did not meet the BI-RADS 4 criteria. The 222 females eligible for this study were between eighteen and eighty-seven years.

Findings. The histology of the 222 lesions revealed that 129 were benign and 93 were cancerous. The researchers used a VI value of 4 as a cutoff point, and BI-RADS scores higher than that were reduced to an integral BI-RADS grade (Ref-A1B2C3). There was a considerable improvement in the PPV and the accuracy of the diagnosis after trimming down 54 BI-RADS 4 lesions. Finally, the sensitivity had diminished marginally since the researchers had incorrectly downgraded a BI-RADS 4 lesion. SMI was discovered to be a non-invasive imaging technique for the vascular structure with high-resolution microvascular pictures, according to the study (Ref-D4E5F6). When downgrading BI-RADS 4 benign lesions, the VI as a quantitative measure may be used effectively to increase diagnosis accuracy and PPV while reducing needless biopsies.

## Article Two.

Shoemaker, M. L., White, M. C., Wu, M., Weir, H. K., &amp; Romieu, I. (2018). Differences in breast cancer incidence among young women aged 20–49 years by stage and tumor characteristics, age, race, and ethnicity, 2004–2013. Breast cancer research and treatment, 169(3), 595-606.

## Level of Evidence

Purpose. Breast cancer in younger girls has a worse prognosis and a greater death rate than in older females. Young black girls, in particular, are more prone than other races and ethnicities to get breast cancer, and their subtypes are always more aggressive (Ref-A1B2C3). Shoemaker et al. (Ref-D4E5F6) investigated current cancer trends and variances amongst younger American females.

Data Source. The article used cancer registries supported by SEER or NPCR to gather data on the incidence of metastatic breast cancer in the general population for women diagnosed between 2004 and 2013. As an ethical body, the North American Association of Central Cancer Registries established standard data items, consistent codes, and methods for reporting data. United States Cancer Statistics (USCS) publishing guidelines were satisfied by reports from 49 states and the District of Columbia’s primary cancer registries (Ref-J7X2B9). The data from the NPCR and SEER represented 99% of the data from the United States population utilized in this study. The researchers stratified into four categories: age at diagnosis and the people stratified into five races: black, white, Alaska or Indian, Asian, and Hispanic. The patients’ tumor subtypes were classified based on progesterone, estrogen, and human growth factor receptor status.

Findings. The results indicated significant breast cancer cases happened in women aged 40 to 49 years, which recorded 77% of the total analyzed instances. For women above 45 years, the frequency of breast cancer cases was higher among black women (Ref-J7X2BZ). Between 2004 and 2013, the incidence trends of the possibilities for the Asian or Pacific Islander and white women between 20 to 34 years increased. The percentage of cases detected later was more significant in Hispanic, black, and Alaska Native women than white and API women. For all the tumor types, the black women experienced greater incidences of all other cancer types than the other four races (Ref-Q9W3R1). The study findings indicate that breast cancer in a young woman has a wide range of symptoms.

PICO question. Is an annual mammogram (I) more effective in diagnosing breast tumor (O) compared with a mammogram every three years (C) in women under age 50 (P)?

The two articles are essential to answering the PICO question because they observe the breast cancer prevalence among women of different ages and ethnicities. The first article observed the occurrence of breast cancer between two years 2016 to 2018 in women aged older than eighteen years and younger than eight seven years. Keeping the BI-RADS 4 breast lesions in these patient populations is significant to the PICO question as it uses SMI as a tool for evaluating tumor vessels. These tools also improve the distinction between malignant and benign tumors and can accurately diagnose and treat breast cancer. The second article is more significant in answering the PICO question because it gives a more age-specific frame highlighting how age affects breast cancer among women. For instance, women aged 40- 49 years are more likely to suffer from breast cancer than other age groups. This data directly answers the PICO question because it is specific to the age with which women are more vulnerable to breast cancer. By analyzing the data available on breast cancer in women as young as eighteen years, the researchers help verify that women of all ages, even those younger than thirty years are likely to develop breast cancer, clearing the persistent beliefs that only women of a given age can be infected with this condition. By analyzing the fatality of breast cancer per age, the article becomes even more helpful to the PICO question. It indicates that younger women, more so those from the black race, are more vulnerable to breast cancer. It thus creates a case for understanding the reasons for these issues.

The gap in the first article that indicates it is inactive to answer the PICO question is that the study population was small to allow the findings to solve the question. It also gives data from a larger population demographic. The PICO question observes the data from form 50 women with breast cancer, and the data from the article has looked at women over 50 years. The other gap is that fewer studies have researched why some races and ages are more vulnerable to breast cancer than others.

Following the findings from these two studies, the revised PICO question would be why does age affect the prevalence and diagnosis of breast cancer among women of different races and ethnicities?