Ask the Expert

Today's Expert

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(1) What methods are clinically available for the detection of breast cancer?
"Clinically" mammography and palpation-based exams are the most common. To some extent, ultrasound and magnetic resonance imaging is used but it is not performed in the mainstream "clinically". There is a dedicated breast CT scanner out in California, UC Davis which is experimental. There are also other MR and US imaging techniques being pursued in research.

(2) Are there any pitfalls associated with these methods?
Mammography is essentially X-ray. Women with dense breasts (young women primarily) have difficult mammograms to interpret. Women who have had previous biopsies or procedures can also be difficult to exam. Mammography can be painful as the breast is compressed as much as possible to allow the Xray to pass through the tissue. It certainly does not have 100% sensitivity (~80%) or specificity (~90%). Mammography has a positive predictive value of about 20% in women under 50 and 70% for those over 50. Self-exam is quite effective at finding lumps but usually they have to be of a significant size before they can be detected by self-exam. Ultrasound can be quite definitive at telling cysts from tumors but still do not necessarily detect cancerous tissue and certainly traditional ultrasound would have difficulty differentiating. MR is not specific for breast tumors but it can show anatomical changes that can give clues. Biopsy is still the gold standard of diagnosis.

(3) What new methods are being developed by researchers to detect breast cancer?
There are a myriad of methods being investigated for breast cancer. I cannot go into all of them, it would take too long. The primary way to think about these new methods is that they are trying to take advantage of other properties that tumors may have in contrast to normal breast tissue and using that for detection. For example, tumors are usually stiffer than normal tissue (not always though), they conduct electrical current different than normal tissue, they have altered optical properties, they have altered electromagnetic properties, as well as perfusion and vascularization.

(4) What are the potential benefits of these methods?
I am not sure if the word "benefits" is necessarily correct but the idea is to look at cancer signatures that are more specific and helpful in detection, and differentiation. As we characterize cancers, we may begin to understand what the most critical changes are that help us tell what type of tumor it is as well as perhaps the therapies that will work best for that type of tumor. There is a need to characterize to assist in detection, diagnosis, and therapy. All of these experimental imaging methods may lead to assisting in this.