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Cash Cow

Leading Breast Radiologist Wins 2019 RSNA Accolade

Prof. Fiona Gilbert is a leading light in the field of breast imaging with her contribution to the field being marked with Honorary Membership at Radiological Society of North America (RSNA) annual meeting in Chicago this December. Since her graduation from Glasgow University in 1978 she has built an illustrious career in the UK in multiple areas of clinical research and writing, breast screening, and lecturing. She is Vice-President of European Society of Breast Imaging becoming President next year. She is Chair of the breast scientific programme committee of RSNA, past Chair of the research committee of the Royal College of Radiologists and past Chair of the NCRI Imaging Advisory Group. Her current research interests are using multimodal imaging to better understand the tumour environment, supplemental imaging for dense breast and risk based screening, non-FDG radiotracers in cancer, and breast MRI. Prof. Gilbert is also Professor of Radiology and Head of Department at Cambridge University and Honorary Consultant Radiologist at Addenbrooke's Hospital in Cambridge. HealthManagement.org caught up with her in her busy schedule to discuss what she sees for the future of breast imaging and how she feels about RSNA recognition.

At the Radiological Society of North America (RSNA) annual meeting this year, you will receive Honorary Membership for your services to radiology. How do you feel about receiving this accolade?

I'm really surprised and absolutely thrilled. The annual scientific meeting of RSNA is one of my most favourite meetings and I've been going to it since I was a registrar. I have loved my career in Radiology and feel so fortunate to have been in the specialty at a time of amazing technological innovation. Receiving honorary membership is a huge honour. It is wonderful recognition for all the teams of people with whom I have worked delivering trials and undertaking research over many years.

One of your interest areas is using imaging to better understand tumour physiology. How do you think the current screening methods/modalities can be better leveraged individually or together to improve insight into tumour make-up?

One of the problems with screening programmes is that we want screening to pick up all of the disease but, the problem is, we pick up some cancers that a woman would never have known about – this is termed 'overdiagnosis.' Overdiagnosis can cause alarm and anxiety and labels someone as a cancer sufferer – if she had not attended for screening she would never have known about the cancer. With new technologies we need to ensure we are reducing overdiagnosis and only finding the biologically aggressive cancers that are going to cause harm. We need to try to identify those individuals who are most at risk of developing a cancer that's going to kill them. We think that we can do this by using the genetic information, breast

density and other risk information. The other thing we can do as radiologists is use different imaging modalities that are more likely to pick up the aggressive cancers. We know that high-grade cancers tend to be more vascular. We think that a vascular imaging technique where you inject contrast, such as MRI or contrast-enhanced mammography, will be more likely to pick up the aggressive cancers than the less aggressive cancers. Now we have a long way to go to prove that, but that's the rationale about shifting towards using a vascular-based technique to try and identify abnormalities, so that we find the killer cancers instead of the less-worrying cancers.

How far off do you think we are from this?

There is some evidence from the MRI studies like the DENSE trial and Abbreviated MRI studies. We need to look at those screening MRI studies and look at what kind of cancers are being found – the size of the cancer, the grade and type of the cancer. Following this, we need an analysis of all the published MRI studies to see the type of cancer being detected by MRI rather than mammography, ultrasound or contrast-enhanced mammography. Are there differences in the cancers found with the different imaging modalities or are they just the same? In theory, those modalities with an intravenous contrast injection should be more likely to pick up the aggressive cancers that are more vascular.

What do you think the future holds for tomosynthesis? Does it have potential to work by itself or is it better if it works in alliance with other modalities?

There's a huge amount of evidence around tomosynthesis. The companies are now producing high-resolution tomosynthesis images. The processing is now much better compared to the earlier studies and we can now see microcalcification more clearly. There are tools to help us read the large numbers of images in the data sets. Women with mixed density breast tissue gain some benefit from tomo compared to 2D mammography but those with extremely dense breasts probably don't and they need supplemental imaging.

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How will AI develop in breast imaging and is it a tool which will add value in your opinion? What are the risks?

I am very excited by AI. I think it presents huge opportunities and we can use it in different ways. The good thing is that there is a lot of research going on in the mammography field to help us read mammograms, triage the examinations and sort those examinations into those which are highly likely to have an abnormality where the radiologist should be really focusing their attention and their efforts so that they don't miss something. Compare this to those cases with a very low likelihood of an abnormality being present. With AI, we can read them at the end of a busy afternoon, not so much that we pay less attention to them but more if we find nothing in the batch with the very low probability we're not anxious about it, we are reassured that a machine has also read them. I think it's useful to have marks bringing your attention to a particular abnormality but it's not useful if there are too many marks. This discourages us from using the tool because we lose confidence in it and start ignoring the marks inappropriately. A large study showed that the performance of radiologists working with Computer Aided Detection (CAD) is worse than those not using CAD. So, I think that some people benefit more from AI tools than others. Some work has shown that with radiologists who are low-volume readers, performance can be enhanced by using the CAD systems, whereas there's less of an impact on high-volume readers. Some countries have double reading – two people looking at the images. With adoption of AI this could replace one of the readers. We will use it in some way to save manpower or redistribute the manpower.

What's exciting you the most about your current research?

One of the things that I really want to do is move screening to a risk-based, stratified system where the most appropriate imaging is given to a particular individual so they have their own personalised screening at a frequency according to their risk.

Can we personalise the care for those with cancer?

Absolutely. I would like to find ways to integrate the functional information that we can get from our amazing MRI scanners and PET scanners. We can better identify biomarkers that say 'this woman would respond better to this treatment' or 'this woman would respond better to that particular drug.' After only one course of chemotherapy, you can see what's happening in the tumour with imaging – which areas are responding and which areas aren't. People who undergo chemotherapy have such a difficult time. We need to try and tailor it much better; I believe imaging can contribute to this much more than we're using it at present.■