



## **Interview with Dr. Kristin Manning, Seattle Radiology Pitfalls in Cancer Imaging**

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**Dr. West:** I'm Jack West. I'm a medical oncologist at Swedish Cancer Institute in Seattle, Washington. I'm also the President and CEO of GRACE, the Global Resource for Advancing Cancer Education. I'm here today with Dr. Kristen Manning, who is a radiologist at Seattle Radiology and she's actually a perennial winner of our Best Doctors in Seattle in her field. She has a particular expertise in body imaging and is one of my favorite go-to people for lung cancer imaging. So, she's kindly come in to agree to cover some questions on the management of imaging issues in oncology.

**Dr. West:** We generally prefer to obtain a head MRI as opposed to a head CT to look for brain metastases in our staging. How much of a difference does that make? How much more sensitive is it in detecting brain metastases?

**Dr. Manning:** Well, the studies have shown that a contrast-enhanced head CT versus a contrast-enhanced brain MRI are fairly equivalent in detecting the presence of metastases, although it certainly has been shown that you will detect smaller metastases and more of them with an MRI. But if the question is just whether there are metastases or not, a contrast-enhanced head CT can be considered quite a good study. But a brain MRI will be more helpful in detecting smaller amounts of tumor and can give a better idea of the overall volume of disease.

**Dr. West:** What are some of the tradeoffs with getting a head MRI? What are some of the downsides of getting an MRI instead of a head CT?

**Dr. Manning:** There's very little downside to getting an MRI other than the cost. An MRI is an expensive exam. But there's no radiation involved. Both studies will require an injection of a dye of contrast. And an MRI requires that the patient hold still for a longer period of time and be in the machine that feels smaller to the patient. But there are new MRIs out there available that can really do beautiful imaging in machines in which the patient doesn't feel claustrophobic.

**Dr. West:** Another setting where we at least talk about and think about an MRI is to evaluate questionable bone lesions. Is an MRI of the spine usually or always enough to really know what's going on when you have questionable findings on plain films or a PET scan or bone scan?

Dr. Manning: A spine MRI will be very helpful if you have questionable findings on a bone scan or on plain film. But once you have questionable findings on a PET/CT, frankly it's still a bit questionable on the MRI. Once you're dealing with a difficult lesion, it's going to be difficult to image on all modalities. MRI may add some helpful information but it may not necessarily answer the question if you're dealing with a tough lesion.

Dr. West: Nowadays, most people get a PET scan as part of their initial staging unless they have clear evidence of metastatic disease elsewhere. We don't as often get bone scans. How completely does a PET scan substitute for a bone scan, or are there still indications for bone scans in oncology these days?

Dr. Manning: Well, for lung cancer there have been studies done that show that more metastatic disease is detected in patients who receive a PET/CT than in patients who receive a bone scan and a conventional CT. The same patient population also detected more false positives. So there's a tradeoff. So you're going to have a more sensitive study but it's going to be maybe less specific. But, a PET/CT is supposed to be a better staging study than just a CT and a bone scan.

Dr. West: So there really is not generally anything added by doing a bone scan on top of a PET/CT?

Dr. Manning: For lung cancer not typically. Breast cancer and prostate cancer, particularly breast cancer where sometimes they're not as PET-avid then a bone scan may be helpful.

Dr. West: We often get CT scans where there will be an incidental mention of a questionable liver lesion. Can you tell us something about what you often see and how you try to determine whether an ambiguous liver lesion is significant or benign?

Dr. Manning: Now that CT and MRI imaging has become so advanced, we see liver lesions in more patients than not. So chances are even if you're the most healthy person, you're going to have something in your liver. And typically these ones that are what are probably just little cysts and are not concerning they tend to be small and fairly easy to see. So we really base it on size and the appearance on imaging as to whether we're concerned or not. But as we're learning, as we improve our imaging, just about everybody has at least one lung nodule and just about everybody has at least liver lesion.

Dr. West: How about kidney lesions? Do you see a lot of those or is that still something that is not as common?

Dr. Manning: Kidney lesions are pretty common. There's a fair number of people out there that have small cysts or stones in their kidneys and they're very common to see.

Dr. West: How about questionable findings around the adrenal glands which are often a little bit enlarged and we scratch our heads sometimes about whether that's significant; maybe even complicated by the finding that they have a little bit of PET uptake. So, how questionable are those, how commonly do you see ambiguous adrenal issues?

Dr. Manning: Oh, that's a very good question, because it's certainly something that we see everyday. We see a lot of small adrenal nodules that again the overwhelming majority of these are benign and are not tumors.

But unfortunately even some of the benign lesions can be a little bit abnormal on PET. So in those cases, we may have to do some special imaging features with CT or MRI to help to try differentiate the nodule and to whether we think that it's something that's concerning and possibly tumor or something we think can be safely watched.

Dr. West: Is an MRI often a very helpful study for that?

Dr. Manning: Well, again, the problem is that by the time you're getting to the MRI you're probably looking at a lesion that was pretty tough to figure out by CT and PET and so you're getting kind of towards the end of your line as to what you can use. So tough lesions are tough.

Dr. West: I've got the same adage about hard cancers are hard to treat by anybody.

Is what we have now what we're going to be dealing with in the next five years and maybe just higher resolution? Or are there potentially new fundamentally different modalities like the fusion of PET scan and CT that really changed how we do oncology staging?

Dr. Manning: Well, I think imaging is advancing rapidly at all time. Certainly, what was once an uncommon piece of equipment such as the 64-slice CT is now pretty ubiquitous; but now there's a 256-slice CT out there. And part of where CT is improving is the amount of radiation the patients are receiving, modulating the dose and trying to get the optimal images with the least amount of radiation possible.

Dr. West: Let's talk about the radiation exposure and there are people concerned about that. How much of an issue do you perceive that to be in (a) the setting of surveillance after surgery, or chemo and radiation in a potentially cured patient; and (b) routine followup of someone who has more advanced disease?

Dr. Manning: I think its extremely appropriate to be concerned about radiation exposure in medical imaging. And certainly radiologists are very aware of the issue and work very hard to limit the amount of radiation a patient may receive. For example, MRI doesn't use any radiation exposure at all; same with ultrasound. But CT certainly, CT and PET/CT certainly do give the patient radiation exposure.

Dr. West: How much is really known about this? Is this really something that there are data about, or is this mostly one estimate with many variables versus another estimate with many variables?

Dr. Manning: That's the problem with figuring out how much radiation a person receives, because there are so many different variables depending upon the machine, the size of the patient because a larger patient is going to require essentially more juice than a smaller patient to optimally image them.

So there's so many different factors and there are certainly some machines now that turn the machine on and off only at certain times so correlating all these together, its difficult to even figure out how much radiation somebody has received. Then on top of that, the studies in which we look at radiation exposure are very difficult to interpret, because they all go back to the atomic bomb survivors and try to extrapolate data from that, which, you know, is very interesting and its great but there's a lot of persons, a lot of detractors from that who say you can't really –

Dr. West: This is a little different from one huge exposure.

Dr. Manning: Exactly, so its very difficult to figure out what the risk.

What is known is that the risk of developing cancer from radiation exposure is a known risk. It tends to occur 20-30 years after the exposure has occurred which in a fair number of oncologic patients maybe approaching what was considered to be their life expectancy.

Dr. West: So probably not a worry for somebody who is being followed with scans for metastatic cancer.

Dr. Manning: Certainly.

Dr. West: Thank you.