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The Cost-Benefit Calculus of CT Angiograms

You are listening to ReachMD, The Channel For Medical Professionals. Welcome to Heart Matters where leading cardiology experts explore the latest trends, technologies and clinical developments in cardiology practice. Your host for Heart Matters is Dr. Janet Wright, Senior Vice President for Science and Quality for the American College of Cardiology. Measuring risk in medicine can be a tricky proposition. Factoring risk and the cost of benefit analyses can make the situation even less clear. In many ways this is where we stand with coronary CT scan. In emergency situation, this scan can be immediately helpful. At other points in the clinical care spectrum, the value of that scan is more difficult to estimate. How can we balance the medical aspects of these tests with the money we spend on them? Our guest is Dr. Mark Hlatky, Professor of Medicine and Professor of Health Research in Policy of Stanford University School of Medicine. Dr. Hlatky also directs the Stanford Kaiser Cardiovascular Outcomes Research Center.

DR. JANET WRIGHT

Welcome Dr. Hlatky.

DR. MARK HLATKY

Thank you.

DR. JANET WRIGHT

I think we are to start today with a description of coronary CT angiogram. Tell us what that test is and why is it causing such controversy?

DR. MARK HLATKY

Well, you know that the coronary angiogram done with the cardiac catheterization has been the reference standard for diagnosis for years, for coronary artery disease and it takes picture of the inside of the coronary artery of the lumen with injection of contrast directly into the artery and this has demonstrated you know whether there are obstructions and if so where they are and to what degree. Now one of the main limitations is always been the need for invasive procedure to do that angiogram and with the development of CT scanners, there was a thought that you could go ahead and do the same thing, noninvasively with the venous injection and then just take a CT scan at the right time. While this worked well for large arteries that did not move, it does not work well at all for the smaller coronary arteries that do move and they really needed to develop CT scanners that were fast enough and had high enough resolution to be able to take a picture freeze the coronary artery motion and take a picture. So its only what the most recent generations CT scanners

that this has become technically possible and so now that the CT scanners have been developed, there is a lot of different ways to measure them, to talk about 16 slice in a 64 slice CT scanners, its not so much the slices, but the speed that makes the difference and now its feasible to do an angiogram via peripheral injection and reconstruct the coronary arteries using computer algorithms and then have a nice picture of the lumen of the coronary artery disease.

DR. JANET WRIGHT

They are focused on every side of the scanner that is interested in CTAs, by that I mean, radiologist who might own a CT scanner or might certainly interpret the CT scans. Cardiologists also have moved into ownership positions for these scanners and in some cases are the interpreting physicians. The patients I think can get a handle on their CT scan easier than they can on coronary angiogram. The pictures are so beautiful that they are actually able to appreciate their own anatomy so to speak. Can you speak to the intersection of all of these interests and then how has science helped guide the selection of these test.

DR. MARK HLATKY

I think that there are several aspects that are issues with the development of CT scanners that now allow us to do coronary angiograms noninvasively; before although the invasive angiogram made wonderful pictures too, it was that barrier of doing an invasive procedure, that would keep a lot of people from going ahead to get that information and now in fact you know you have lowered the cost in terms of the risk by doing it noninvasively. So this makes it really possible to do the test in many, many more people. The other thing that is of concern is just for you said the intraperineal aspects of the whole CT scanning business where a lot of people now, you can own one of these things and there is a concern that people go out and buy them. They will spend millions of dollars and then once they have a CT scan in an office somewhere that there is doing to be enormous pressure to use the CT scan to pay back all the investment and that might lead to a lot of unnecessary and inappropriate test, so I think that the concernable a lot of people in the policy world is that this would be greatly overused in terms of the CT scan. So you know the issue in some sense is not how prettier pictured it takes, but who has chosen to have the test done and what happens is the result of the pictures that you do take.

DR. JANET WRIGHT

This we then I think pretty naturally to a discussion of guidance from various organizations, ACC American College of Cardiology is one of those that issued appropriate use criteria for selection of CT scanning and MRI. Could you speak to how helpful that is and also the gaps that exist in the research?

DR. MARK HLATKY

I think this is a very fast moving field so we are all scrambled to keep up a little bit and I do think that further practicing physician that this is an important role of professional societies to help evaluate the evidence that is out there way, have experts come in and say come up with recommendations for when test should be used and when they should be ordered and how the result should be used. So I think that this is a very important thing that the ACC has done in establishing some criteria for looking at CT angiography. There is also an expert consensus document that is currently under development on CT angiography that will hopefully be coming out soon that will provide additional information to the practicing clinicians. I think that there is a lot of feeling that you know, you need to pick the right people in order to do this test and may be I should say who I think there is a general agreement that's inappropriate to do which is, is to use this as a screening test somehow in a totally asymptomatic person. I think, there is a lot of feeling, but that is not an appropriate use of the technology.

DR. JANET WRIGHT

If you are just joining us, you are listening to Heart Matters on ReachMD, The Channel For Medical Professionals. I am your host, Dr. Janet Wright. Our guest today is Dr. Mark Hlatky, Professor of Medicine and Professor of Health Research in Policy of Stanford University School of Medicine. We are discussing the cost benefit analysis of CT angiography.

Talk to us about what we do not know yet about the benefits of CT scanning and as you know in health reform now the conversation often turns to value. Talk to us about the value proposition of this test.

DR. MARK HLATKY

Well, I think that the value proposition of this test is what is the biggest unknown. There has been a feeling in the past that for a lot of diagnostic tests or prognostic tests, all we have to do is show that there is some information in a statistical way. There is some statistical association between the test result and either the final diagnosis or the test result in ultimate outcome and that has been good enough forever basically, but now there is more of a feeling as the technology is proliferating and CT angiography is not the only such test. I mean we see this now, there is new biotech information that is coming out for biomarkers that circulate every week where we are reading about new biomarker, there is new genetic test, there are companies that are promoting genetic test for heart disease and other diseases and now there is all kinds of new imaging test that are coming out and so we have this incredible proliferation of sources of information about patients, and so the question is how do we evaluate whether this is really a good thing or not and so the pure information or statistical association is necessary thing. It has to have some information about diagnosis or ultimate prognosis, but there is an increasing move towards saying what we really need to do is show that using this test in some group of patients actually makes a difference, the change is what doctors will do to treat the patient and as a result of that treatment change smarter and better treatments, the patients actually do better, as a result and so there is I think more interest in saying that these should be the standards for evaluating such a new test like CT angiography. Not just because it is going to take a pretty picture but given that we have that information or patients being treated in a better way and by a better way I mean to having better outcomes. So the thing that we don't know in short is whether using a CT angiography test actually improves outcomes for patients.

DR. JANET WRIGHT

And do we know yet whether the CTA is used in clinical practice as a substitute for another test or as a layer. I am afraid as a practicing cardiologist, I often end enamored of the pictures that I can get, whether its with an ultrasound or the CT or an angiogram and there is a temptation to gather information that may not have necessarily additional incremental value.

DR. MARK HLATKY

I think that is very, very important question. Historical experience has been the tests tend to be added on to one another and not necessarily to be replaced. I mean sometimes, you know, we do replace a test in completely and it's not done anymore. I think, you know, the head CT for instance, replaced the pneumoencephalogram, which some of your listeners might remember as a fairly barbaric test, but the only way that anybody could really see what was going on inside the skull until we developed the CT scan, but that is the exception rather than the role. Usually, we are layering test onto other tests and there is very many people who may well get a stress test, then get a CT angiogram, then get invasive angiogram, all three and not just get a single one of those test or seeing you know multiple testing and often were getting second test to figure out what the first test meant. So I think that there is a lot of concern that, you know, we are just going to be using this as an additional test not as a replacement test, but that is where we need data. If you look in the literature now for diagnostic studies and I have been on panels where we review this information. What we have is a tremendous number of small studies that have a couple of 100 patients that just report the correlations between the CT angiogram and an invasive angiogram. Very, very few tests and studies have actually looked at what happens to patients after they get a CTA or whether they get a CTA versus some other kind of a test and those are the kind of studies that we nearly need to do in order to understand what the

ultimate effects of getting a CT angiogram.

DR. JANET WRIGHT

Well, in speaking of that, I would love to hear your comments about the complimentary role perhaps of clinical trials and imaging and the use of registries.

DR. MARK HLATKY

I think in general, I see registries as being extremely complimentary to trials. I think trials are really a very good way of getting the best answer that we can in a rigorous way comparing use of either test or a therapy in a group of patients and the criticism of trials though that they are somewhat artificial and that we often exclude patients from getting into the trials because they have other illness or they are too old or there are some other issue about that and it is not necessarily a random sample of the kind of person who would get these tests in practice and that's where the registry comes in handy to show what is being done in practice and what the results of that are. So I think that we have seen that in other areas of cardiology where we have had clinical trials and then we also have large registries that we can see what's going on like with revascularization procedures. There has been clinical trials and then there are large registries such as the American College of Cardiologies registry and various state registries and so on, as well as the society of thoracic surgeon. So those things I think are wonderfully complementary. What we don't yet have though is a registry of CT angiograms and I know that there has been a plenty of discussions about this and I certainly hope that we develop one soon, but the fact to the matter is that there is no national registry at the present. I know that there is one in the state of Michigan that is being sponsored by the Blue Cross and Blue Shield, Dr. Gill Ralph is leading this effort to develop a registry of procedures in the State of Michigan and I think that is good step to see what is being done in actual practice.

DR. JANET WRIGHT

What I would see in this was a fabulous opportunity for cardiologist and radiologist and their primary care colleges and referring network to work together around capturing that data and beginning to understand what happens to patients that are just in their normal lives as opposed to those that subset that can make it through the hurdles of participating in the clinical trial.

DR. MARK HLATKY

Absolutely, and in fact our output in a little plug here for the work that we were trying to do between in our Stanford Kaiser Cardiovascular Outcomes Research Center, which is something we have just started with the support of the American Heart Association and we are planning to do our registry in the Kaiser System here in Northern California to see what happens to patients as a result of CTA angiograms and the beauty of this is that we also know what happens to people who got other kinds of imaging test and we can see what happened to them overtime because of the wonderful records that they keep in this system. I think that is the big challenge to us in a lot of these registries is to not just say what happened at the time of the test or the procedure, but also what happened to that individual over the next couple of years and those are the most valuable kinds of registries and the once that are linked to followup information. So I think that those could be very helpful. I think that, you know, your question was to just getting a CTA replace some other test or is just add to it, that is an empirical question, and I think we need some information about whether that happens or not.

DR. JANET WRIGHT

We have been talking about the cost of benefit calculus of CT angiography with Dr. Mark Hlatky.

Dr. Hlatky, thank you for being our guest today.

DR. MARK HLATKY

My pleasure.

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