

A letter from America

To my friend in echocardiography

I know exactly what you mean when you suggested that the practice of echocardiography might just not be so defined as we think. We have the same problem over here. There are so many echo machines, so many people doing echocardiography and, as we have discussed before, an ever shrinking amount of money to pay for the whole thing.¹

When I think more specifically, it is possible to get tied up in a whole series of questions: When should M mode, cross sectional, and all the different Dopplers be used? If all an examiner wants to do is take a quick look at the left ventricle, why all those training and quality standards?² And then there are all those measurements. Isn't it possible to practice "guilt-free" echo and simply take care of patients?

Right up front, let's establish the fact that there are plenty of people who will answer that you must do "everything" to practice good echocardiography. I am, however, not one of them. You would figure after 40 years of clinical echocardiography we would not have to be discussing such a topic. Could it be that there have been so many advances in echocardiography, maybe we just haven't matured at the same pace as the technology? Here are just a few items to consider.

Technology

First, we keep adding ways of looking at the heart without taking anything away. M mode (a nice way for recording wall velocity over time), cross sectional, pulsed and continuous wave Doppler, color flow, M mode color flow, automated analyses (that draw lines and calculate all sorts of things)—measurement after measurement—special tissue imaging colors (that turn tissues silly colors of blue or amber), capabilities for turning the walls different colors depending upon the speed of wall motion (another nice way for recording wall velocity over time, just like M mode). These days I think that echo machines, and their users, have become the equivalents of a 1957 Buick Roadmaster automobile (big, clumsy, trimmed with every feature imaginable and, worst of all, expensive).

Oh sure, the experts say that all these methods are "complementary" (what a nice word). In my mind "complimentary" is echobabble for the fact that some people can't make up their minds how to get to the bottom of patient's problems. I confess I once wrote such drivel years ago.^{3,4} but I hope you will forgive me for I was young and trying to publish without offending anyone.

There are all sorts of examples where we do too much for no useful reasons and it happens *all* the time. How about the case where a person performs a cross sectional echo on a patient with a huge, dilated poorly contractile left ventricle. You know the type of unfortunate patient I mean, nothing moving at all. Then, for some reason known only to the echo gods, they switch on the M mode. Maybe the M mode will magically see it moving? I don't know.

"No" they say, "I must do a complete exam *and* I must measure the LV diameter by M mode". So they drop the M mode line *diagonally* across the ventricle and proceed to make an incorrectly placed measurement. You chuckle. Well, when you see them perform a measurement of the mitral E point to septal separation (ESS) by M mode I hope you will join me in crying. I don't know why we can't just do away with M mode, save ourselves the time and money. Moreover, by measuring *directly* off the cross sectional display we might even assure the patient of a correct measurement. OK, I'll grant you a rare instance where you might use it to determine if some target is "oscillating". But why anything more than that?

Maybe the only technical advancement we've thrown away over the years is dual M mode (yes, that's two M mode lines at the same time). And talk about measurements! Do you know that there are still people measuring E to F slopes of the mitral valve? Yes, my friend, it is time consuming and expensive. To what end?

We echo people are staying with the *old* ways. Most people performing echo are younger than me and I don't even do all those things. Echocardiography has become like my mother's or grandmother's attic where nothing is ever, ever thrown away.

No definitions

Second, you say there is no definition for an echocardiogram, not even an agreement of what constitutes a complete examination. However, as always we Americans have provided an answer. Just read the special issue of the *Journal of the American Society of Echocardiography* published last fall.⁵ Therein are the new definitions for echocardiography that will, no doubt, satisfy everybody.

You remember this topic. "Quality" was all you wanted to hear about last year² and this paper was in press. Did you read it? It is really quite something, with lots of definitions and standards. It only took 40 years of practice, six years of serious discussions and debate, four years of writing, and about 10 gigabytes worth of drafts for a group of physicians interested in echo to agree. It gives times for doing studies and methods for recordings.

I know what you will say after you read the Quality Improvement document. You will tell me I forgot the facts of echocardiography. We made these lists before.

I agree that (1) echo is really useful and (2) echo machines are really expensive. Then I think we can agree that (3) some methods (like CW of the aortic valve) take a lot of skill and that (4) most operators are not highly skilled. Bad enough but let's go on. I think that (5) cardiologists like measurements, (6) there are many measurements one can perform with echo/Doppler, (7) measurement packages make machines more expensive, and (8) just because someone else can perform the measurements reliably does not mean that you or I can do the same. Yes, you're right, (9) reading wall

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motion is the most complex interpretive skill to master in *all* of echocardiography, but then why does (10) stress echo keep growing in use? Also consider that (11) image quality is generally bad in the average patient no matter what machine you use, (12) it takes a lot of time to perform a complete examination, (13) physician time is expensive, (14) you don't have enough time, (15) you probably don't have enough money to buy your next echo machine and (16) you *do not* have to fully understand diastole to practice good clinical echocardiography. Enough!

Sure enough, there are now recommendations and definitions for just about everything we do. Finally, somewhere it is stated that a "complete" examination is defined as "not every view" but "every chamber and every valve from more than one view". Think about it. As you will see, I think I understand why all the anxiety.

The promise of echo

Have you noticed that all this really means that echocardiography is dividing into two major branches. One branch, I'll call it *clinical echo*, will be driven by simple questions. It will be practical and straightforward, tied to the physical examination. When this happens our clinical maturity will finally keep pace with technologic development as there will be small machines (maybe the size of my notebook computer) with high quality images, available to use by physicians at the bedside at very low equipment cost (say \$5000–10 000). When we inspect the heart during a physical examination we will simply use ultrasound to extend our eyes. Just like we train students to use Dr Laennec's stethoscope, the echo machine will be available. No special charges, no special fees, no committees, no societies, just echo on demand, guilt free and associated with high quality patient care. We struggle with our hands and eyes every day. Echo will just be such an extension.

The second branch is what I will call *diagnostic echo*. I don't have a better name right now but it will comprise all the things we now think of as traditional echo. Here is where the detailed studies and examinations will be. Specialized (and the more expensive) machines and high level training will allow us to do TEE (or TOE as you call it), stress echo, myocardial contrast studies, intravascular, and all the special quantitative things we do today or have the promise of tomorrow. This will be rightfully be the realm of specialized Societies and standards. It will also be the realm of special charges, budgets, fees, and the like.

By now I've terrified you or you think I have gone mad and I have given over *clinical echocardiography* to the forces of darkness. Am I "over the top" in your mind? Just a moment before you reject this scenario completely. (1) The emergence of a two tiered practice echocardiography is a clinical imperative. It is already going on and those of us in the "upper" branch now just complain about those in the "lower". I've complained for 30 years. Maybe there is another solution. (2) Such separations have also occurred elsewhere in clinical medicine. There was a fight over here between the radiologists and the obstetricians for fetal ultrasound. It went on for decades. The radiologists lost. (3) You already know that half the world's cardiolo-

gy is practiced here in the USA and we have moved rapidly toward prepaid managed care. Here at Duke we increased our managed care volume 189% in the past 12 months. (4) This system strongly emphasizes the role of the primary care physician, thus reducing the demand for fancy specialists and fancy techniques. There are huge incentives in this system to reduce costs. From what I know, medical costs need reducing no matter where you are in the world. (5) The technology is clearly possible. Tell me all this is not true and I will tell you that there are those who probably still believe that disease is caused by earth, water, fire, and phlegm.

Absolutely, quality echo must be practiced in both branches. We all must be sure of this. How about introducing echo earlier in the physician training process (maybe at the medical student level)? It would make better diagnosticians of us all. We could even define standards to develop a more limited scope of practice for *clinical echo* (or whatever you want to call it). Just think, we could deliver accurate and cost effective diagnoses to more patients. Simple diagnoses would be made by simple means. Complex problems would be addressed by advanced means. Perhaps we have only defined *diagnostic* echo to date.⁵

You think I am wrong, just wait. Talk to me in five or ten years. It will all flow naturally. Like a teenager grows to an adult, it is time for echocardiography to do the same. We so-called experts must work with everyday practitioners to deliver the full promise of echocardiography to every patient we encounter. As my friend Dr Popp said, there are "confounding" problems in echocardiography.⁶ But I think I see the answers at hand.

The anxieties will be gone, for we will admit we must separate into these clinical and diagnostic branches. Then you will know precisely what to do when you face a patient. Someone once said something about gaining strength through admitting our own weaknesses. Maybe it is time for echocardiography to do just that.

Some people would say that what is good about echo (readily available and able to solve common clinical problems) is also what is bad about echo. But is there really a dilemma? What do you think?

Sincerely,



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