



## **2018 NCSBN APRN Roundtable - The Role of the RN and APRN in Diagnosis Video Transcript**

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### **Event**

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### **Presenter**

Mark Graber, MD, Senior Fellow, RTI International, President, Society to Improve Diagnosis in Medicine

- [Mark] Good morning, everybody. It's a real pleasure to be here. I usually talk to doctors, but I'm really honored to be speaking with you today, and I hope this is the first of many speaking engagements with nursing staff, we have a lot in common. I'm here on behalf of our Society to Improve Diagnosis in Medicine.

We're focused on getting rid of diagnostic errors. Our vision is someday we'll have a world where nobody is harmed from these diagnostic errors. We think diagnosis should be accurate, timely, and above all, safe. So, raise your hand if you know who this is. I saw one almost, almost.

One back there? Okay, maybe one or two people in the room. Well, this is, if we're all lucky, the most influential person in the history of nursing education since Florence Nightingale. This is Thomas Duncan, the first person to have Ebola infection in the United States.

He presented to a hospital in Texas with symptoms of fever and headache, GI symptoms. The nurse who interviewed him got a history that had recently traveled to an endemic region in Africa, put that in her note, but when he was seen by the physician, the physician didn't get that travel history, didn't talk to the nurse, didn't read her note, sent him home with a diagnosis of sinusitis.

He returned two weeks later, died of his Ebola infection, and in the meantime, exposed 24 people to the infection. This was a diagnostic error that happened because the nurse was not an effective part of the diagnostic team, and that's what we're trying to change. So here's what I'd like to accomplish, I'd like to talk over with you how likely it is that there will be a diagnostic error, why do these happen, and to understand that, we'll have to back up a little bit and talk about how we come up with a diagnosis, how do doctors and nurses think, and what can we do about all this?

And most importantly, what is the role of nurses, RNs, and APRNs in improving the diagnostic process? So let me tell you about a different case of diagnostic error so you'll have the sense of what we're talking about here. This was a famous case in New York City, it was all over the newspapers, and not because it



And that's why I'm here, what each of us can do and needs to do to improve the diagnostic practice, we each can do something. The National Academy gave us a new definition of diagnostic error, failure to establish an accurate and timely explanation of the patient's problem and communicating it.

The communication phrase was very controversial, you know, people were saying, "Well, that's not part of the process." But I'm so glad it's in there, because if you look at the surveys of our health care

are wrong 10% to 15% of the time.

And when we first saw that number we said, "That just can't be, that doesn't comport with my experience practicing medicine." But the more you stay in this field and the more articles you read and the more stories you hear, I'm now pretty convinced that Arthur had it correct. I think the most reliable data comes from studies using standardized patients. So these are like the secret shoppers, they go out into practices in the community with classic symptoms and presentations of COPD or rheumatoid arthritis, and the doctors get it right 87% of the time, they got it wrong 13% of the time.

Case studies, there are hundreds of these. Whatever is your favorite disease you can find a case study that has looked back to see how we do, and they're all scary bad, the diagnosis is delayed 10%, 20%, 30%, 50% of the time in every single one of these studies. The gold standard is autopsies which we don't do anymore in the United States, but they are still done routinely in some areas and in some countries, and the incidence of major, unexpected findings has really not changed very much over the decades despite all our sophisticated stuff, major discrepancies 10%, 20%, 30% of the time.

understand the system and how people proceed through it. This is kind of the big picture that I use when I'm looking at this, I have a...this is my definition in the middle of a diagnostic error, it's one that was wrong, missed, should have been made much earlier.

And by and large, most of them result from some breakdown in the diagnostic process, and Gordy has a wonderful study on that, that shows that we don't do a great job with any one of those steps, we're not perfect with getting the history, missings in the physical exam, we have trouble putting things together. A few of them result from what I call "no fault" conditions, and these are patients where things are just so nonspecific that nobody can figure out what's going on, or the patient doesn't follow up with having their test done, whatever.

And it's easy to ignore these, but these are actually the future of medicine, this is how we're going to get better. Someday we're going to have tests that allow us to pick things up at an earlier stage where it's still too nonspecific to diagnose it from the symptoms. At any rate, here's your diagnostic error, and what happens? Well, 99.999% of the time nothing, you're fine, and thank goodness, you know, you got better anyway, or the treatment I gave you worked for whatever you had even though I didn't know what you had.

But there's some tiny fraction that results in harm, and if you multiply that by the tens of millions of diagnoses being made every day in our country, that's where those very high numbers of patients who are harmed by diagnostic error comes from. And, diagnosis is just so hard, it just really is, I think it's the most complicated, cognitive task that humans face, because there is so much variability at every step and every part of the process, it involves our patients and our diagnosticians, and our health care systems that are getting more complex by the day.

There's just complexity and uncertainty everywhere in the diagnostic process. And how many diseases are there, for goodness' sakes? If you look at the ICD system, there's over 12,000. The National Library of Medicine has their own way of counting, they say there's over 8,000 diseases. And it's fun, you can go to the National Library site and see the new diseases that are added every year.

How good am I going to be at diagnosing a disease that just got added last year, that I've never seen before, I may never have heard of it? So, if there is a diagnostic error, how do we understand what happened? This is the approach I use, and if you're involved in root cause analyses, you can use this. So here's Rory Staunton going along his clinical course, here's the diagnostic error, it's perfectly appropriate to say, "Mark, why didn't you think of sepsis when you saw him in clinic?"

And it gets at the cognitive causes of diagnostic error. And these are the ones that are most interesting to me because this is what's under my control, as a clinician I should be able to, you know, do a good job with diagnosis. But the Institute of Medicine would actually say, "You know, don't bother with the sharp end, if you can fix something in the blunt end, you've really done the world a favor because you fixed  
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both factors easily identified.

Or if you ask how often is there a cognitive problem? It's the sum of the blue and the yellow. So, like, two thirds of the time there's a cognitive issue. How often is there system problem? It's the sum of blue and red. So three quarters of the time there is a system problem. And every once in a while there is one of those no-fault things going on.

And if you've been practicing for any length of time, all the things on this list will be familiar to you. So in terms of the system problems that contribute to diagnostic error, there's just so many ways that our systems can break down. We all know about problems with communication, for example, lab tests that just, like, fall between the cracks, you've seen every single one of these things.

The phenomenon that was new to me was this one at the bottom, this business of normalization of deviance, I didn't know what that was. But it was going on just as I was learning about this at my own hospital, I worked at a kind of a small VA hospital, and on nights and weekends we had no radiologist to read the films. So if you came into my ER with shortness of breath, your X-ray was read by a moonlighting, endocrinology fellow.

And if you had a knife in your chest, he would have seen it but every year we had two or three diagnostic errors where the radiologist would come in on Monday and say, "Hey, you missed this pneumothorax," or whatever it was. We knew that we didn't have a radiologist, we were told we couldn't afford to have a radiologist, and we just got used to it, that was just the way it was.

And that's how we all practice, we all run into things every week that annoy us, that we say, "Oh, that shouldn't be that way." And there's just a thousand of them, and we just, we know we just don't have time to bring them to attention. So, big issue. Let's go back to the cognitive things because they're a little harder to understand.

So why are there cognitive errors? It turns out that it's really not in the cases we looked at a problem with knowledge. So, medical school works, nursing school works, the problem, the huge chunk of the pie is in putting it all together, if you have all the facts, coming up with the correct diagnosis. And it gets to this question, how do doctors think and nurses?

The question that Arthur L. Stein studied his entire life. And, Arthur didn't answer the question but he simplified it a little bit because... You know, he's saying to himself, diagnosis is so important, doctors and nurses, they want to get it right.

And he was sure that when we're doing this diagnosis business we're really careful, and when we hear a story we're going to think about all the possible conditions it could be, make a careful differential diagnosis. And you know what, that is not what Arthur saw, he did not see that. This is what he saw. So let's say we're in clinic, and here comes a patient who, at springtime, he was cleaning out his yard last weekend between snowstorms, and now a week later he's got this really itchy, wicked rash on his legs, where they were exposed when he was wearing his shorts, and it's vesicular, and it's in linear streaks, so what does this patient have?

Help me out here. Everybody okay with poison ivy? Yeah, and probably no dermatologists in the crowd,

but we can all make this diagnosis. And how do we do that? Well, we just recognize it, and that's what diagnosis is all about, and that's the chief lesson of Arthur L. Stein's 20 years of studying this, it's the business of recognition.

So this is the current paradigm for how doctors and nurses think, and it's the exact same paradigm for how we all solve every problem in life. When we're faced with a new problem, there is a little part of your brain, the recognition center, that lights up, and if you recognize what's going on, you, within milliseconds, know the answer, you know the diagnosis.

And this is the top pathway, it's called system one by cognitive scientists. And it's wonderful, it's effortless, it's fast, it's how experts think, and it's almost always correct. And we've learned to trust it because it gets us through our everyday lives so well.

If we don't recognize what's going on, you have to stop and think, and that's system two, that's when you have to deliberately, rationally consider what might be going on, and we can all do that but we don't like to do that, it's effortful. So, quick test, what's that thing in the upper-left? Telephone, right? We recognize it. Even though none of us had a phone that was quite that ugly or maybe, you know, not that color, but it's got the features of a phone.

We know that's a telephone, we recognize it. Upper-right? Can opener. Lower-right? We have to stop and think, that's a can opener, too. Lower-left? -

[Male] [Inaudible].

- I don't know, I don't even know what that is. I think it's a modem. Anyway, this is system one and system two, we recognize things or we don't. So Arthur L. Stein would tell us, the way we made that diagnosis of poison ivy was something called the availability heuristic, which is a fancy way for saying we recognize it, it was available to us. And why is this a good thing? It's fast.

It's effortless. It approximates the base rate of disease in our population, which is why it's so often correct. In other words, the vast majority of people who have those linear, vesicular, itchy eruptions on exposed part of their skins have contact with poison ivy. But, and there's a but for every single one of these little, automatic, subconscious things there are major drawbacks, we did not stop to make a differential diagnosis, we didn't do that.

Our experience may be limited, maybe we hadn't seen some of the other things that were on that list. And just because we think it's right doesn't mean that it is right. And this was a tough concept for me.

But this is a wonderful boo7e7(d s)2ne di13c7a7(us)6e7(w)6e70 0 1 86.12 792 reW\*nBT/1(s)276p7(d2i-20i28020h210





So how do we think? Well, by and large we use our intuition and it's nice but it's not perfect, there's many things that detract from it. And I would propose to you that diagnosis is too important a process to rely on intuition. So now you know how doctors and nurses and all of us think, and we can go back and see what happened to Rory Staunton.

So let's think about the system things down on the bottom there, well, it would have been great if that

Have you ever had the experience, you come out of the movie and you're looking for your car, and you walk up to a car and you're trying to get in but it's not your car? That's a context error. Okay, what's premature closure? Anybody have a dog? Any dog people? Yeah, lots of dog people. I am guessing you did not go look at five litters, just guessing.

We don't do that, you know, we go look at one litter and we fall in love with a puppy, and we're done, that's how we are as humans. Herbert Simon got a Nobel Prize for this concept in the field of economics, he called it satisficing. It's a great word, satisficing. And that's what we do as humans. It's the opposite of optimizing.

So instead of going to look at five litters, instead of making the differential diagnosis, we are happy with the first answer that comes to mind that makes sense, we satisfice instead of optimize. And that's just how we are, we are humans, and that's how doctors and nurses are in the diagnostic process. We are humans and we satisfice, and we are subject to context errors.

Okay, but don't feel bad about this because this is just everywhere. You can look at the literature in any field you like, and these context errors play out in exactly the same ways, the same things, context problems, premature closure, all those 150 other cognitive and affective biases are seen in every single one of these, and it's because we are all human.

And if you just keep track of your own everyday life, you will see in the next month dozens of context and premature closure events if you care to keep a diary. So that's the story, that's why we have so many diagnostic errors. - [Audience] [Crosstalk].

- Yeah, you know, our systems are a mess, we're human, we have all these human failings. And what are we going to do about this? Well, this is what we're doing in our society, we've convened something called The Coalition to Improve Diagnosis, and we've now enlisted 36 major professional societies to help us address this. And it's fantastic because our society is tiny, we only have 200 members to tell you the truth, but through the coalition we can reach 100,000 medical professionals.

And if any of you are in positions to influence whether your organization would like to join us, please do that, we would really welcome your participation. And to us nursing is the next frontier for where diagnosis can improve. What can we do as individual practitioners? Well, I made a big deal out of pointing out all these cognitive errors and pointing out all our problems, but it turns out the solutions are pretty simple, and free or relatively free.

So if the problems are the things on the left, it turns out that any of the things on the right we think would be pretty good solutions. So just practice reflectively, you know, take a diagnostic time-out, "How did I come up with that diagnosis? Am I in the right context? Is there something else I should be thinking about?"

Try to be comprehensive. So, you know, creating that differential diagnosis we all learn how to do that. If we just did that in every case, how different life would be? The universal antidote is to ask, what else could this be? Stop and think, that's really what it boils down to. This is a little poster we have up in the room where we discuss cases in my hospital, you know, so after we're done discussing a case it just takes a second or two to glance at this, and maybe it'll bring to mind some other context from what

you're originally thinking.

Checklists, I'm a big fan of checklists. A colleague of ours, John Ely, put together a really nice set for primary care, it's the top 99 symptoms that people could come in with and you just...he carries it around in his lab coat pocket, he flips it open. So if somebody came in with a complaint of chills, that was Rory Staunton's chief complaint, here's what you'd see, well, there's sepsis right in the first column.

You can use John Ely's checklists for free, you can download them from our website, and they can live on your smartphone, you just go click, click, and then you've got John Ely's checklists. And there are some really elegant tools now available on the internet to help with differential diagnosis. I don't have a commercial interest in any of these, but I think they are all great.

Let me show you how they work, so this is one called Isabel, and what you do is you put in the key findings. So on the left here's Rory Staunton with his fever and his mottled skin and his vomiting, and within a second it gives you some things to think about over on the right. And what's the number three thing on the list there?

Group A, streptococcal infection, which is exactly what he died from. This hospital did not have Isabel available, and who knows if that would have made a difference? This is a study of Isabel, was done in a teaching hospital in the pediatric ICU, and left to their own devices the residents got the diagnosis right 89.4% of the time, and with Isabel it went up to 92.5%.

And you can look at that and say, "That's not much of a difference." I don't know if that's statistically significant. But if you're a parent, or if you're a patient safety person, or if you're the doctor or the nurse taking care of those kids, you will look at that and say, "Before Isabel, there's 10 kids at risk for harm from diagnostic error, and with Isabel, it's down to 7 or 8."

And I will take that any day, this is exactly where we are in medicine today, if you ask me, we get it right 90% of the time. How are we going to get to 92%? How are we going to get to 95%? We have to do something a little different like using Isabel, like take a diagnostic timeout, like use a checklist, etc. How about getting a second opinion?

Fantastic, great advice, we know it works. If a second radiologist or pathologist looks at a study, the diagnosis changes 2% to 5% of the time, and internal medicine it's much higher, 10% to 20% of the time the diagnosis will change from a second opinion. If you are faced with a serious condition that you've just been diagnosed with, get a second opinion.

So this is the advice we give to physicians and APRNs, what can I do? Be thoughtful, be reflective, learn why these errors happen, and now you know. Always construct a differential diagnosis, not just on the tricky cases, do it on the ones where you're really sure what's going on, because you're just as susceptible to a diagnostic error there as in cases that are complicated, perhaps even more so.

Get second opinions, take advantage of that. Use these decision support things like Isabel. Make the patient your partner, that's so powerful, if the patient knows that he's part of the process and a patient knows that they have to get back to you if things don't pan out or if their symptoms aren't resolving, that's an incredibly important safety net that could catch a lot of these diagnostic errors.





about the medical record, you're absolutely right, it's right in the middle of everything we do in medicine today. And I guess I may be the only person in the world who actually liked their electronic medical records system, I worked in the VA, and the outpatient and the inpatient was all coordinated and you could actually get records from afar.

But I know that there is great dissatisfaction, and Gordy has actually written eloquently about all the problems that our medical records create. And, you know, kind of wish you could come back in 50 years when that's fixed, so right now you're absolutely right, it's a big communication barrier, it inhibits communication as much as it facilitates it, and we really need to envision a better system, that was the big debate about the Texas Ebola case.

Was this a reflection of how bad the EMR is, or does it reflect more on our culture, that the nurse wasn't a part of the team? So, maybe a little bit of both. And you're absolutely right, I mean, the nurse coordinator is the perfect person to be monitoring whether the diagnosis that was assigned looks like it's playing out in real life. And the middle point?

Remind me.

- [Inaudible].

- M&M rounds. Oh, thank you, absolutely. So, you know, I've given you advice on what doctors and nurses to do. We have advice for health care organizations, and the number one thing is to find and learn from diagnostic errors. So for that to happen we need patients, doctors and nurses to report these and then perfect, discuss them in an M&M conference with doctors and nurses and patients present, it's an excellent way to learn, so, absolutely, I completely endorse that, I would love to see that happen more regularly.

Please. - [Caroline] I'm Caroline. I have a [inaudible] down there, and one of the things that I've started using are the buccal swabs to help with alpha genomics, so I get a lot of patients that come in with psych medicine that I take care of, and they're like, "These medicines aren't working," and usually, they come in with a basketful of 20 medicines.

So when I run the enzymes, you know, I'm like, "Okay, this is why these medicines aren't working and this is why the statins aren't working." But the printout is about 30 pages long, and I'm just a generalist, and I'm like, "I'm not..." You know, I don't have the capacity, the staff to... And so the doctors are like, "You know, send me the stuff. Send me the stuff." But I guess the systems just aren't in place to share that, and I'm a one-person show, so I think that pharmacogenomics has a great potential to reduce medication error, cost, you know, make it more precise for the patient.

But not having it portable or exchangeable is a big barrier to what I do in my practice.

- Yeah, absolutely. And I'm a nephrologist, my average patient was on 23 medications, so I know exactly what you're talking about, it's so complicated. Actually, Gordy has written about that as well, we should have Gordy up here instead of me about all the problems with medications, and how often diagnostic error is really a reflection of a medication side effect that was misinterpreted as something else.



very quickly we're going to get into these scope of practice issues and reimbursement issues that there're going to be some major fights. And let me just say we're ready to stand by you and whatever organizations are willing to take up that battle. -

[Carol] I'm glad that... I'm Carol Hartigan, I'm from the American Association of Critical-Care Nurses, and I just love the description of nurses working with physicians and supplementing the information that they have so that they can work together on the correct diagnosis. And it reminds me of the early days in the '70s of critical care nursing and learning together and supplementing the information to come to the correct diagnosis.

We need more nurses to be able to do that because the nurses today don't even know what the diagnosis is of the patients that they have because they have too many, and they're coming in, and they're going out. And, you know, the unavoidable or the avoidable patient deaths should be the rationale to have enough nurses to be able to do that so that they do know who their patients are and what the diagnosis is, and to give the correct information so that they can come to the correct diagnosis.

- Thank you for that. Thank you, everybody.

- Thanks so much.