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EHDI – Florence

Are We There Yet? Diagnostic Audiology Reporting through HIE

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[Live captioner is standing by].

>> We're going to get started. Hello, everyone, thank you for coming this afternoon. My name is Heather Durham. I work at the Oregon Health and Science University and Children's Hospital. I see a few faces that were in our presentation this morning and a few new faces. Welcome... thank you. If I fumble ‑‑ it's because my brain is just gone right now. Focusing on all the stuff that I've heard and doing.

So... we, Meuy and I are going to talk about our system in Oregon a little bit. So... are we there yet? This will start to make sense. Some of our objectives will give you information about our system, where we've been, where we are, where we want to go and hopefully identify some possibilities for you and then also, some of the issues that we are facing with using electronic health records for reporting our data.

So... for years, I think everybody's in the same boat with us... we manually enter hearing screening results into a database. It's mind‑numbing, kills me. I would constantly say, this is killing me, it'd be so nice to take this data from the health record and send it to you, rather than me spending all these hours reportk this data.

So... in 2011... we were able to get a grant and take a look at OHSU's process, I gladly volunteered, of where ‑‑ from the moment we laid hands on that baby and entered into the database and reporting to EHDI if we missed somebody and then on the follow‑up process, it was all this manual entry and tracking. We did this nice summary of how nice and efficient it'd be if we could direct information electronically, directly from the Electronic Health Record. That kind of sat there for awhile. Then we got another grant to see if we could implement it. By God, we did. We looked at different ways to send that data. We pulled it and sent it different ways to our state database. We found that it worked and it was really efficient and it totally eliminated a lot of my data entry. It improved the timeliness of the results and improved the accuracy of the results. That was a big bonus for my hospital in particular.

So... in 2016, my hospital, we just agreed, we're moving forward. Let's do this... this is what we're doing now. We entered into Electronic Health Record and it just goes and it's fantastic.

Then... in 2018, we had another hospital that followed suit. So... that was great. We're hoping to get more hospitals on board. So... with that, where we're wanting to look forward is we mastered this to a degree, we have little things to work out. Where can we take this? Now that we know this is possible, where can we take this? This is what this is about.

So... we're looking at the electronic health records, the state EHDI system and the national standards that are required, just in the electronic data reporting, nerdy stuff I don't understand, that Meuy knows what the coding ‑‑ how does that all work together? I don't know. Meuy explains it all to me.

So... at the same time all this is going on, I had the opportunity to work in this national audiology working group with this vendor. The vendor we use is Epic. That's the electronic health system. Through phone calls and e‑mails, they were gathering data from audiologists, how do you guys report information? How do you report information? Here's screens we developed. What do you think about this? What does this look like on your end? What about a Pediatric setting versus an adult setting. They were collecting a lot of information from all the audiologists. It was cool to see, nobody does a lot of stuff the same way. But the whole point was to determine if they could develop something that was standardized in the reporting system of Epic.

Meuy happened to be on some of these conversations and we just kind of looked at each other like... site visit!

So... I contacted the guys from Epic and said "dude, dude... man, you can make my life a lot easier if you come out and look at what we're doing in Portland. We're an Epic‑heavy state." Most of our big hospitals are using Epic. It'd be nice if we were doing things the same way in our state.

So... they came out, it was awesome. They had a big group and they went to four different hospitals that are using Epic. They took a look at our work flow. How do you put this audiogram? Are you scanning your audiogram? What's going on with that data?

They wanted us to look at their newly‑developed screens and see, does this work for you? What do you think about this? They got on hand, in‑person feedback from all the audiologists at these different places and we're trying to figure out, can we really capture all the data and extract the diagnostic information that those providers are needing?

So... what they came away with, which we all knew, that is currently in Oregon, hearing information resides everywhere. In the chart. It can be written out, in progress notes, mild hearing loss, from 2,000 to 500 hertz. It can be in a problem list, or customized flow sheet or what we call a classic smart form, a scanned document into the chart. They solidify there's no standardized documentation and they also found that there was varied IT support between the different hospitals. As far as looking at this data potentially making changes to their own epic system.

So... in the spring, hopefully, there'll be an upgrade coming to epic that has an audiogram in it that actually contains electronic data on the backside, Meuy is going to talk to it, because I don't understand it.

There's some code that is associated with my threshold, my X at 40 decibels, 500 hertz for the left ear ‑‑ versus a different code that exists for 15 decibels at 2,000 hertz for the right ear.

So... with that... we're hoping to be able to pull that data, electronically, and send that to our EHDI system. And have it be received electronically, much like our hearing screening results are so... that that is just, basically... an audiogram and a table ‑‑ or maybe I can't figure out how to replot it on the audiogram at the state database, that's EHDI's magic. The other thing too, they're hoping to do with this upgrade, I can't speak for them ‑‑ but my my impression was there'll be multiple audiograms you can see. So... where we would open a progress note, see the audiogram, close the progress note, open another one, see the audiogram, I believe you're supposed to be able to flip through the audiograms so you can have two side‑by‑side and compare your data that way. That allows for my population of children, much more ease and monitoring if I have a child going through chemotherapy and being able to flip through those audiograms and see if there's changes, makes a world of difference, that usability and that system. We can analyze it ‑‑ and research so much opportunity for that.

Okay, Meuy.

>> Meuy Swafford, I'm the EHDI data quality coordinator. With the EHDI system ‑‑ I help design the EHDI database that helps facilitate this electronic health data exchange. So... where do we begin when we talk about diagnostic audiology, transfer through either information exchange. What we want to do is, now that Heather has talked about how the vendor's making a standard solution to collect audiograms, diagnostic information, so... what I'm going to talk about how to extract that and transmit it to the state EHDI system.

So... where do you begin? First you have to look at data standards. When I talk about data standards, I'm referring to inoperability and I do have to apologize, I'm going to use some jargon you may or may not understand. Interoperability means it's a process, it's the ability to extract data from information systems, such as EHRs and you have the ability to package it, send it, internally or external organizations, and it uses standardized language, or terminology, so... that it means the same thing ‑‑ no matter who sends it or receives it. So... that's where your data standards come from.

So... the next step is, well... what data do you want to send? According to the diagnostic audiology results ‑‑ type of degree ‑‑ the audiogram ‑‑ which... Heather referred to as the frequency and decibel. The X and Ys. What we did was look at the CDC hearing screening follow‑up survey and it addresses the type and degree loss, so that's our dataset. That's what we wanted to transmit to ‑‑ from, extract from the AHR and transmit to the EHDI system. Once you have your data set, you want to compare that or match it between the EHR and EHDI system. You want to look for discrepancies between what's being asked and what's being collected. Sometimes it doesn't mean the same thing, or it does, but it's open to interpretation. That's where you want to identify discrepancies. And what you want to do is, in addition to data mapping or matching, you want to actually look at national standards, to identify what's existing nationally. And what doesn't and what needs to be submitted for consideration to be added on there.

And... with the national standards, I'll actually group it into categories. One is the terminology and the coding system and the other one is the data transmission type.

So... within the terminology and coding system, we're talking about LOINC, SNOMED, UCUM and ICD‑10. The message, transmission type is the structure, how you build it, so... that includes like the HL7, includes the CDA, Fire, which is an XML mark‑up language.

So... lastly ‑‑ what you want to do is actually look at your internal system to see if any of the message structure exists within ‑‑ for example, we have this survey system that uses HL7. We mirrored that structure and did it for the newborn hearing screening. Since OHSU and the EHDI‑IS has been successful in transmitting newborn hearing screening, we're aligning the diagnostic audiology piece to the newborn hearing screen and I'll show you what that looks like as far as the two. .

I talked about the terminology and coding system. These are four we found, a standardized multilingual terminology used by physicians and Health Care providers. LOINC is a clinical terminology for lab test orders and results. And then UCUM is a unified code for units of measures. Decibels and hertz would be included in the UCUM, if that makes sense and ICD10, it's the international classification of diseases. This is to document diagnoses.

So... one of our objectives was to map the data and this is a risk factor table that we did the mapping for, for example, an audiologist would code to the last column on the right, so... if other chart structures, due to birth injury. Behind the scenes, they'd be grabbing the ICD‑10, the LOINC and SNOMED. Depending on which terminology you'll be using, that'd be submitted to your state EHDI system. We do have a complete if you're interested of the JCIH risk factors and how it's mapped, ICD‑10.

This table represents the type and degree. This is the part two of your CDC hearing screening follow‑up survey.

So... again, an audiologist would chart, for example, conductive hearing loss here... but your IT would be grabbing the SNOMED code. It's a national code. If I send that to somebody in Chicago ‑‑ they should be able to identify what I was trying to relate to.

The one code, this one I'm pulling for the hertz. The reason this is color coded, it's not complete. So... I'll explain what that means later in ‑‑ when I talk about considerations. And then, UCUM, again, this is the decibels and hertz testing for the audiogram.

Here we have our ‑‑ this looks intimidating, right? Just a bunch of pipes and carrots and information in between them. So... this is actually a newborn hearing screening message in HLC version 2.6 form. I'm a data geek, I like this, you might not like it, but it has a lot of information. It has the patient's demographic information, phone number, address, MRN number, their race and also has next of kin. If mom or dad wasn't there, they could do the next of kin ‑‑ maybe a parent. This one actually like... for the segment that says PB1, we, we added this, because... Heather wanted to know her NICU babies from the well‑baby unit. We were able to extract that for her and keep it in our database, so... that's a segment that we added for her.

So... the next few lines are OBRs and OBX. OBR is just like the result. This represents a newborn hearing screening panel. The OBX is the result of it.

So... this one's a left pass and right refer, which is the bottom line. So... this is a newborn hearing screening. This is what we've been able to transmit between the EHR and to the EHDI. This is what it will look like if you only transmitted diagnostic results.

It's coded in green and red. Green represents these codes exist in the national database ‑‑ the problem with this one is that in the red, we only have newborn hearing screening, we don't have one for diagnostic audiology testing.

So... I'll talk about that in consideration, but... this is only result ‑‑ this one represents bilateral sensorineural loss and both ears are severe.

This slide is if you are to send the result plus the audiogram ‑‑ so the X and Y, the hertz and decibel. If you kind of skip down to the middle section... that's what it will look like. You have your hertz testing, through the LOINC code and then the green would be your response to that test. And since this is fake ‑‑ I just put testing for 500 and 2,000 hertz and the response of it, so... it's just for show, not in actual reality, but... this is what it will look like. This is ultimately our goal between OHSU and EHDI. We want both of these. The reason we haven't implemented this, there's consideration we need to discuss as both sides of the party before we even actually do it.

It's semantic. There's hearing examination versus hearing assessment. I'm not an audiologist ‑‑ I don't know what that means. But... we have an audiologist consultant and she says "let's do examination." That's more meaningful.

So... that's what we're going to elect to use. If your state decides to do this, you can use assessment or examination, they do exist in the national standards. You can choose one or the other.

The second and third bullet is in red. Because... I mentioned that we only have the newborn hearing screening panel and the newborn hearing screening left ear right ear. We don't have one for diagnostic.

If we look at this at a national level ‑‑ we'd have to submit for new codes, they'd have to go through a review board and then, who knows when to assign the code? There's a waiting game. The local definition, however, we can implement right now, the only problem with the local definition is that if a baby transfers and I'm giving this information to Chicago, Oregon to Chicago, it's going to go and... they're going to have to decode it. If they receive 50 local definitions from 50 states ‑‑ that's a lot of work. Our goal is to do national. Then it's a one‑time thing. The last bullet talks about the hertz. It's an incomplete list. It doesn't have 125 or 250 hertz testing. If this matters to your state, we have to submit it for a code. If it doesn't matter and you want to start at the next testing, then you're good. They have it up to 8,000 or 6,000. Question back to our original ‑‑ are we there yet? We're actually almost there ‑‑ we're on the cusp. It's just ‑‑ we need to figure out what we want to do versus national standards and local ‑‑ ultimately our main goal, so that everybody can take our process and mirror it, is to actually submit the codes for national recognition, so... if other states are willing to work with us, let's get it defined and then everybody can use it.

So... and then, Heather mentioned that the EHR is actually going to do an upgrade, hopefully in spring, so that will be our determining factor, whether we want to wait for national standards or do a local definition.

So... we're almost there. I'm at the end of my presentation, so... any questions? Comments?

>> Sorry... I'm not nearly as much of [indiscernible] as you ‑‑ I just need a little clarification. You enter your audiogram into Epic, just like you always would, and you decode it and send it to the EHDI program?   
 >> I'm EHDI ‑‑  
 >> Or... you're EHDI, so... how does it work? How does an audiogram turn into the code you showed me? You don't do anything different than you normally would?   
 >> Nope, because the upgrade has the audiogram. They already created the electronic code. It's a matter of some trigger happening and collects that code and sends it to the EHDI database.

>> What is your trigger? How do you determine ‑‑ I'm sorry.

>> Those are things we haven't figured out yet. We haven't had an audiogram or the possibility of this working ‑‑  
 >> So... you have yet to extract the data?

>> So... yes. So... she will do ‑‑  
 >> There's never been an electronic code before. Now there is a code, so... we're saying this is where we're hoping this will all go and we need audiologists on board at hospitals on board ‑‑  
 >> We're in the process of trying to do that, but... because there's no code ‑‑ we're looking for triggers to where. Our newborn hearing screening data comes across electronically, but... the ‑‑  
 >> Not an HL7 ‑‑  
 >> We have a separate system ‑‑ yeah. Our state session ‑‑  
 >> Yeah.

>> But in terms of that, are you willing, as an audiologist, to send all kids or do you want to be able to dictate what kids you send to EHDI?   
 >> We were having this conversation earlier, we all know, there's a lot of kids, but... because everything is being filtered electronically, Meuy was like "no problem." I said "might be a problem." These are things we need to figure out, for sure.

>> Yeah... and I just want to add that I said no problem because with the newborn hearing screening, she sends me all records. If it doesn't match according to our algorithm, it sits in a no match report and that's where she needs to go and rectify them. If you send me all diagnostic record ‑‑ it's going to match. If it doesn't match ‑‑ it'll sit there. We don't necessarily do anything with it until she says "it's this baby."  
 >> By a match, it might be that the trigger is, if there's missing diagnostic information at the EHDI database and there's a flag on it, if that eventually comes in, then it will pull it and match it.

>> Our audiologists aren't willing to give up every button ‑‑  
 >> Yeah.

>> I only want to send you what you need to know ‑‑  
 >> Absolutely.

>> With our discussion ‑‑ you mentioned something about closing the encounter. You don't want to do it prematurely.

>> That was my suggestion, whether or not that's possible. It is totally possible ‑‑ everything's possible.

>> You were talking about Epic rolling this out... is that nationwide? We have a lot of hospitals and audiology, you know... systems using Epic as well.

>> That said an upgrade is coming out in the spring. Whether or not the hospital chooses to upgrade at that time or... it is ‑‑ they're still working on upgrading their current version before they go to this new version... every hospital in every state is in a totally different place. There hasn't been a release date, there hasn't been anything... but it's coming.

>> What's the version number?

>> Yep... I don't know.

>> How would we know ‑‑  
 >> Can you speak into the microphone for the captioning?

>> What if you do not have Epic and your hospital has no ‑‑ they don't want to join Epic?   
 >> For newborn hearing screening, we do have another hospital that is non‑Epic. I forget what it's called, Solearian or something. They're a small hospital, their resources are small, but they made it work. If they're willing to kind of code it, map it in the back end, so... you're recording a refer or pass or a type of loss or degree. If they're willing to map it in the back end, and put it in the HL7 structure, then it can ‑‑

>> Instead of having ‑‑ even if it's I free‑typed refer, it already knows to code it like that ‑‑ it didn't select from a ‑‑  
 >> Your IT should be able to map it. The only problem with free text is if you misspell refer, because... sometimes it's double F. It depends ‑‑ you'll have errors with free text that it can't map. Hopefully your IT will figure out some algorithm that looks for an R. Then that will work. Because it's refer and P for pass or whatever.

>> I was going to say one thing to cover my butt.   
[laughter]

>> So... for the Epic, I would say contact your IT people and find out if they're interested in the upgrade ‑‑ because they have to be interested to purchase it to begin with. I think it's putting ‑‑ the epic people don't know what we need, what we want and what will be beneficial. I think, talking to them, and we're done ‑‑ but talking to them and trying to get them on board and make them aware of this is where you'll make movement. Heather, are you going to step outside and answer questions? I'm willing to be outside ‑‑  
 >> We have to set up for the next session, but you are more than willing to continue the conversation in the hallway. Thank you.  
[applause]

[Presentation concluded at 3:10:00 p.m. ET].

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