HTI-1 PROPOSED RULE TASK FORCE 2023 MEETING

GROUP 3: ONC HEALTH IT CERTIFICATION PROGRAM UPDATES – INSIGHTS CONDITION, STANDARDS UPDATES, AND RFIS

May 11, 2023 10:30 AM – 12 PM ET

VIRTUAL

Speakers

Name	Organization	Role
Steven Eichner	**Texas Department of State Health Services**	**Co-Chair**
Steven Lane	**Health Gorilla**	**Co-Chair**
Hung S. Luu	**Children's Health**	**Group Lead**
Hans Buitendijk	Oracle Health	Member
Clem McDonald	National Library of Medicine	Member
Naresh Sundar Rajan	CyncHealth	Member
Fillipe Southerland	Yardi Systems, Inc.	Member
Michael Berry	Office of the National Coordinator for Health Information Technology	Designated Federal Officer
Dustin Charles	Office of the National Coordinator for Health Information Technology	ONC Program Co-Lead
Michael Wittie	Office of the National Coordinator for Health Information Technology	ONC Program Co-Lead
Sasha TerMaat	Epic	Discussant
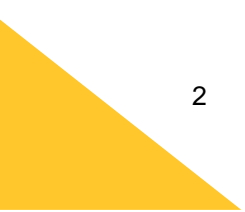
Call to Order/Roll Call (00:00:00)

Michael Berry
Good morning, everyone, and welcome to the HTI-1 Proposed Ruled Task Force. I am Mike Berry with ONC, and I would like to thank you for joining us today. All of our Task Force meetings are open to the public, and your feedback is welcomed, which can be typed into the Zoom chat feature throughout the meeting or can be made verbally during the public comment period that is scheduled toward the end of our meeting this morning. I would like to begin rollcall of our Task Force members, so when I call your name, please indicate if you are here. I will call with our cochairs and our Group 3 lead. Steven Lane?

Steven Lane
Good morning.

Michael Berry
Steve Eichner? Hung Luu?

Hung S. Luu
Good morning.

Michael Berry
Hans Buitendijk?

Hans Buitendijk
Good morning.

Michael Berry
Elaine Johanson? Meg Marshall? Clem McDonald? Naresh Sundar Rajan? Fil Southerland? All right, thank you, everybody. Now, please join me in welcoming Steven Lane and Hung Luu for their opening remarks.

**Steven Lane**
Do you want to kick us off, Hung?

HTI-1 Proposed Rule Task Force Charge (00:01:10)

Hung S. Luu
Sure. I would like to thank everyone for joining us for another meeting of the Task Force. We have a very full agenda today with our invited speakers, and I think this will be a very informative and productive meeting to help us move forward on our stated goals. Steve?

Steven Lane
Great. I totally agree. Thank you, everyone, for your time and attention this morning. We have a number of members of the public with us, a lot of the same folks who have been showing up every day for these meetings, so we really thank you for your interest and attention, and as always, as Mike mentioned, you are welcome to use the chat feature during the meeting, and please, also, if you are in the public and want to make public comment at the end, just raise your hand at any time during the meeting, and we will queue you up and have that ready. If multiple hands come up, we will make sure we have plenty of time to address
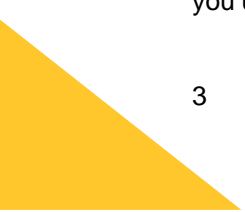
the issues. Fil Southerland has joined us. Thank you, Fil. Welcome. With that, you can go through the review of the charge, Hung.

Hung S. Luu

Okay. So, I am sure everyone is familiar by now. This is our charge, and highlighted are the charges that are most pertinent to the Task Force, to establish a new baseline version of the USCDI from Version 1 to Version 3, and also to implement the electronic health record reporting program as a new Insights condition and maintenance of certification for health information technology health IT developers under that program. Next slide. Also, we will be making recommendations on the FHIR US CORE implementation Guide STU Version 5.0 and the HL7 CDA R.2 implementation guide, the C-CDA template for clinical notes, STU R.2.1 companion guide release, and 3 US **[inaudible] [00:03:26]**. So, our overall agenda is to provide inputs into the subjects on your screen, and in addition, we will also be providing feedback on the ONC's request for information on particular topics.

Steven Lane

The other thing I would introduce before we get started here is that we do have a special guest with us to help provide feedback from the EHR Vendors Association, Sasha TerMaat from Epic. Sasha, do you want to introduce yourself?

Sasha TerMaat

Good morning, everyone. Thank you for letting me join from the EHRA to join Hans in presenting some of our suggestions on the Insights condition and certification.

Steven Lane

And if any of you do not know Sasha, she was previously a member of the HITAC, has been on a number of Task Forces and workgroups, and is a friend to all. The other thing that we are going to want to do is just collect from this group any specific topics at the end of the meeting, any specific items that we have been working on in this workgroup that we think should be highlighted to the HITAC on our presentation to them next week. We are making an interim presentation and update on the work of the Task Force, and I think that many of you have heard us say that we are happy to give HITAC a heads up if there are any topics that are particularly controversial or they need to give some prior thought to. I am not sure whether there is anything the work that we have done here that rises to that level, but maybe by the end of this meeting, we will find one. So, why don't we go ahead? Back to you, Hung.

Hung S. Luu

Thank you, Steven. So, as Steven stated, we have some special guests with us to provide some feedback on behalf of the EHRA on the Insights condition and maintenance of certification proposal. Sasha and Hans, do you have a formal presentation, or just comments?

Hans Buitendijk

This is Hans. We have basically a set of discussion points, but no slides for us, and we can have a little bit more of a free-floating discussion around them. So, if it is okay, we can jump in and give some of the perspectives, or would you like to go somewhere else first?

Hung S. Luu

No, I think you are first. Thank you.

Insights Condition and Maintenance of Certification Proposal – EHRA Feedback and Discussion (00:06:32)

Hans Buitendijk

Okeydoke. So, a little bit of background and introduction. Not everybody either on the call or on the Task Force workgroup might be as familiar, so I will give just a little bit of a backdrop. Both Sasha and myself are members and participants in EHRA. That is an EHR vendor association, and as the name says, it focuses on EHRs, but not only to that, we have about 30 members at this point in time, and the combination of that organization covers quite a few of the EHRs that you see certified on CHPL. Within that group, actually, both Sasha and myself are ex officio chairs of the EHRA and are active on the executive committee, plus, we are respectively very deeply involved in the discussions that are going on right now in the various workgroups around the NPRM and Insights in particular.

So, as we talk through this, we will be providing that perspective of a group of EHR vendors, which also means that in some areas, we may have a variety of opinions, and we might highlight some different perspectives, perhaps, and in other areas, there is consensus more strongly, and that is what we have done to put out more clearly and publicly as well. We are not at the stage yet where we say we have final recommendations. We are all working on it. There is a lot of material in there, 556 pages' worth, and Insights is a good portion of that in terms of depth and detail, so we want to make sure that our discussion today is put in that context, as well as based on our discussion so far, and some of the insights we got on the Insights. Before jumping in, I just want to pass it to Sasha for some additional backdrop, and then we are going to start with some general perspectives and highlight at least a number, though maybe not all, of some of the detailed feedback on the individual measures, but we might not go to each one because there are some common themes there as well. Sasha, before we jump in, is there anything you would like to introduce?

Sasha TerMaat

Hans, I think that was a good overview. In our conversation within EHRA, we have identified some themes of challenges or opportunities with the Insights program and the way it is structured, or things that are common across different proposed specifications, and then we had some suggestions about individual specifications. So, as Hans suggested, I think we will start with the general and then welcome discussion as we move into the specifics.

Hans Buitendijk

All right. So, starting with a couple of general observations and starting with some of the timelines that are being proposed, where we are looking at is, particularly with some of the dates that are around it, and since the rule came out fairly late, adjusting and suggesting adjustments to the reporting periods to start at least 18 months after the final rule date, and that comes into play particularly with the amount of work and effort that needs to be done. Depending on the organization, they may already have more information readily available. There are some areas that are aligned with CMS and others that are not, but there is still a substantial amount of work to be done.

Related to that timeline is where we are looking at simplifying that on the one hand, though it seems like you could report twice a year, running "the same reports," there is actually still a fair amount of work to be done across the client base to pull information together, given the kind of environments that we support, so it is not just a matter of running reports, it is also pulling them together and putting them out. So, we are looking at a simplified form to only do it once a year from that point forward, having, though, a six-month gap in between the end of the reporting period and the time that you provide that is reasonable because that particularly allows for ensuring that all that information can be pulled together. We are having some discussion around what should be the timespan that is being reported on. It does not make sense to do it for the entire year for what is intended to be obtained from it. If you take a certain part of the year, would that be sufficient?

But, part of that is that when you look at the timelines and what comes in there, directly tied to that is that we need to get the data from our clients, effectively. We do not own the data, clients do. Some of the data is managed in the cloud, some of the data is managed on premise, there is a variety of different models that are out there, and in order to provide this information, that typically means contracts need to be adjusted to allow us to do that with the data. So, that place is where we have concerns that it may take time before everybody is on board, particularly if it is ONC asking us and we have to work with contract updates and otherwise to have to write to use that data for that kind of reporting. So, that is a challenge there, so we are looking at how we can address it and what kind of flexibility we can consider that there is, particularly early on, a good potential for nonparticipation by a variety of providers because of all the steps we need to go through.

One of the ways we are looking at suggesting is to say there is the CMS program, and as part of the provider participation there, it may be considered as a kind of condition of participation and attestation to it that they will make that data available as part of that program. So, those are the first two that relate with timeline and being able to get access to the data to be able to provide the information of interest. I am going to stop there and see whether Sasha or others have any additional comments, and then we will flip over and go to the next couple of topics with Sasha. Anything to add?

Sasha TerMaat
Yes. I think the proposal is that data collection would begin in April 2024. If the final rule is finalized later in 2023, that does not even allow 12 months before data collection would begin, and there is a lot of activity that has to happen in that timeframe, including development of metrics, distribution of the metrics to the client site so they could be gathered, renegotiation of all of the contracts to get the permission to gather the data and use it, and certainly, it will be important to allow sufficient time for that work. One theme that I think we talked about a lot in EHRA is that many of the same experts at EHR development companies that work on other industry initiatives related to measurement, like CMS's digital quality measures or NHSN's quality reporting programs, analytics that healthcare organizations request of us, are also working on Insights, and so, we will want to make sure that the Insights efforts do not unduly distract from many of the other important initiatives happening in the measurement space across the industry.

Hans Buitendijk
So, from these first two, the timeline and engaging providers are important considerations to create a practical, useful, and implementable Insights program.

Sasha TerMaat

Agreed. To maybe expand on that theme, one of the recommendations that EHRA is making is that ONC permit reuse of the same measures between their existing Real World Testing requirements, which, in some cases, cover similar areas of interoperability and certified software, and the Insights program reporting, so that EHR developers and their client systems are not reporting similar things in a minorly different way, where there could be some alignment and reduce burden.

Steven Lane

Sorry, Sasha, you said reuse which existing metrics?

Sasha TerMaat

So, today, the Real World Testing program does not require specific metrics, but requires developers to report measurements of different interoperability criteria in certification. So, where there is a duplication of an interoperability element between Real World Testing, the existing program, and Insights, the new program, it makes sense that the same measure, for example, of API usage should be able to be reused.

Steven Lane

Got it. What I am doing is, since you do not have slides, I am taking notes as we go along, and we are going to have the Excel team show those notes so you guys can check my work and make sure I am capturing these things correctly. Clem, welcome. Nice to see you. Why don't you guys go ahead?

Hans Buitendijk

Sorry, I was on mute for once. Sasha, do you want to go to the last part in that section? She might be on mute too.

Sasha TerMaat

Oh, sorry, Hans. I mentioned that this reporting initiative… We want to remain balanced with other initiatives happening in measuring interoperability across the industry, and one thing that we have struggled with at EHRA with some of these measures is that it is not clear how we will interpret the data or what the data will mean to us. The numbers may be large or small, but it is not clear if that is good or bad, and before we invest effort in collecting a data point, I think it will be helpful if we have a solid consensus that it will be useful to us to have that data, or perhaps we should prioritize collecting the data points where I think we have consensus that it will be useful, given the complexity of the program and the need to phase in additional measures over time.

Hans Buitendijk

All right. Then, maybe go to a couple of the next parts, and from here, we are going to start to drill deeper a little bit. So, these were one of the more general ones, but as we go in, we are starting to look at some of the specifics. So, the way that the reporting and supporting documentation is being asked for does, in general, make sense that there is that documentation, but we would like to see that data can be reused.

So, when you go through all the measures, number of encounters is reused in all of them, and a number of other ones are potentially reused, so we are looking at streamlining the reporting approach, which is much more in detail, perhaps not something in need of highlighting from a HITAC perspective, but certainly something that we are looking at, and there are a number of other reporting and documentation

requirements that we are looking at to make sure that this is easy to do quickly to achieve, and in light of the comments that Sasha makes, where we have to have that additional documentation, it is helpful that we really understand that we are doing it for a very good and useful purpose.

We are also looking at that some of the information is appropriate there where requested and is being kept confidential, some of the underlying data and supporting documentation, so there needs to be some level of confidentiality for parts of the information that is being shared. So, we have a couple of different areas that we are looking at, particularly to make the reporting process as efficient as possible and that we can do it at a developer level and make sure that there is a level of confidentiality in the documentation that is needed for support. With that, I am going to pass back to Sasha.

Sasha TerMaat

I will just highlight that ONC proposes reporting at the product level, and in discussion with EHRA, a number of developers have integrated products that do not differentiate some of the actions, like an API call, to be measured between different certified applications, and so, if there is an ambulatory EHR and an inpatient EHR that share a FHIR API platform, it is not clear how you would differentiate a FHIR API call to the ambulatory EHR, the inpatient EHR, or both. That is part of why EHRA is recommending instead aggregating the reporting at a developer level. So, one of the things that I know we talked about in respect to the EHR reporting program, even back when I was in HITAC talking about this before, was how to measure a denominator concept, like how many visits or encounters a particular system has had to give context to some of the other measurements.

We took a look at the proposed value sets, SNOMED ones for inpatient and the NCQA value set for ambulatory, to determine the feasibility of using those for measuring encounters in this program. One of the things that I think is really positive is the alignment with how quality measures has approached defining encounters in the past, but one of the things that I know Hans has particularly called out is that there is not necessarily the same alignment with how interoperability standards, like FHIR, have defined encounters in their value sets. So, we are making a recommendation to try to bring FHIR and CDA encounter value sets in alignment with how quality measures define encounters for the purpose of CMS measurement so that a common set could then be used for Insights.

Hans Buitendijk

To add to that a little bit, what you can see is that there is a little bit of an ambiguity, whether it is just the encounters that have that particular code that are being proposed using SNOMED as the example, whether only those are counted or they are meant to be classifications, but then, by example, using FHIR as the reference point, it actually allows probably about 150 or so encounter types, of which the indication is that everything within a certain branch of SNOMED is permissible, yet of the list that is provided in the proposed rule, only one can be found in that tree, and the other ones cannot. If they are meant to be classifications or categories, then there needs to be good clarity as to what kind of encounter types need to be bunched together, which ones are the only ones we are interested in and none of the others, so there is a little bit more clarification that needs to be done that perhaps was fairly clear and straightforward in the quality measure space, but as you are working with the kind of data that is attempting to be obtained here, you would have to be aligned with the actual data that is being exchanged and shared where you would look at it to say, "Hey, how many of these encounters do I have that are marked X according to their type?"

So, alignment is important and we would like that, so we are certainly asking ONC to work with CMS to get to the alignment and have clarity on how to classify and categorize which ones are in and which ones are out, and then you could easily obtain it from the data that is actually being shared and utilized. So, with that, we are going to start to actually get into the space of the individual measures that have been proposed, and we are certainly not going to go through all of the details there of each one because there are ambiguities and clarifications that need to be provided. There are some areas where there is maybe some duplication of numerators and denominators, etc.

When you go through that, that will really speak back to that general comment that we made: Can we organize it such that the data points that you are looking for collectively are across those different measures that we collect them? Can we collect them once if they are being reused? In other ones, that is good, but then we can report them once and also make sure that we do not have any potential confusion about what potentially small variations are. So, highlighting just a couple of the big topics for them that jump out, on individual access to electronic health information, we are looking at particularly the app kind of categories that are being used. It is one of those areas where how much do we really know, as a developer, of how our providers use the systems and what kind of apps they are? For ones that we develop and work with, we have a good understanding of that, but in the ecosystem as it is evolving, using a variety of apps, any one of your choice, we may not always know exactly what is happening and what to use.

So, we know what access is being done, but for the kind of categories that are being asked to then divide the information into different buckets, we do not know which apps are necessary and in what categories, depending on which ones they are, and that would require a substantial amount of effort to work with our clients to understand what actually is being used and what those applications represent. So, that is where we are asking that we are looking at it from the context of what we own and control versus what providers then have to do more collectively together. So, that is the main topic in that space. Let's go to the next one, then. Sasha, do you want to go there?

Sasha TerMaat
Yes. So, the next measure has to do with C-CDAs, and I think there is a definition given of when C-CDAs are obtained, but there are also some measures that talk about C-CDAs being associated, which is not defined, so we were not sure if those were duplicative or needed to be better defined so we understood the difference. One of the challenges that pervades the C-CDA measure is the expectation of identifying duplicate documents. There is some discussion of this in ONC's proposal, and ONC identifies that if a document has the same identifier, it is easy to know that is a duplicate, and we agree. They imply that there might also be identification of duplicates by programmatically determining if the content is the same, which members of EHRA were much more concerned about being quite complex.

Continuing on the C-CDA theme, the third set of measures that ONC proposes have to do with reconciliation. This is a concept that is familiar from Promoting Interoperability and MIPS reporting, which have had measures of reconciliation for some time, but we think there is enough of a difference in how ONC proposes it that it could actually be quite complex to implement. One example of the complexity has to do with when systems have automatic reconciliation as well as human-performed reconciliation. Another complexity has to do with whether reconciliation is done document by document received or all at once, maybe for multiple documents that had been received prior to the reconciliation taking place, and those are

things that will make the measure more challenging and will require careful specification. Hans, do you want to take over for FHIR?

Hans Buitendijk
Sounds good. I have a couple of ones on FHIR. It starts with supported apps, and in supported apps, there is a scope question that comes into play. There is a measurement referencing FHIR resources, and to have a more consistent view, we believe that the scope should be the FHIR resources that you are actually certified against. We might have a variable amount of resources beyond that that we have available, as we certainly do, and that can vary greatly depending on the application so as to have a good sense of this kind of measure to understand its utilization. We should have a more common base, so what you are certified on is more consistent at this point, and therefore that seems to be a reasonable place to base supported applications on. There is the interest to collect information as part of the registration that can be meant for use, but we have to be careful making them required data.

So, we can provide that in our registration processes, but if somebody wishes not to include everything, and particularly if it is not critical to the performance and the operations of the app that we must have, otherwise we cannot connect correctly, but beyond that, we want it to be considered that if that is not provided, it does not impact our certification status. It will be a challenge to help ensure that these apps are all contributing the data they need to. So, that is a concern that we have from a process perspective and the implications, but we do not have a concern that we are enabling and providing the opportunity to collect certain data as part of the registration process. Part of it is that already, a lot of applications have been put in play, they have registered, and having to go back and recollect some of the data that we might not have been asking for before should not be an expectation that it is immediate and we can capture everything, rather that at time of reregistration and other natural points where that can be inserted, that that is a more reasonable flow for this.

So, that is one part of the FHIR environment that we are looking at and are concerned that the process is as efficient and straightforward as possible, and that we do it against a comparable set of FHIR resources. We have two more FHIR-related ones. There is the use of FHIR, which goes back to the same question and is another measure, but also, keep on looking in any of these measures at the scope that is consistent with what has been certified. There are a number of different clarifications when it is asking about the number of deployments that are out there. Is it really active at any point in time during the reporting period? Is it at the end of it? So, there are a number of straight clarifications that we need to obtain to make sure that we all measure it correctly, and that is where, in the use of FHIR, most of these situations are.

At the same point in time, there needs to be a general recognition that when information is asked about which FHIR US CORE IG one is using, typically, one is certified to using a version of FHIR server that is to a version of the core standard FHIR R.4, and we would not necessarily have… I am not actually aware of anybody, but it could happen. By and large, when you go to the next FHIR US CORE version in whole or in part, you are not changing and creating a new FHIR server. It is the same one. Therefore, information about which version of the IG is actually used for certain transactions and therefore stratified by it, it is almost an impossibility, so that is why we are suggesting that that be removed. We are not convinced that it is helpful information per se. In the CHPL, there is already information where one can see what one is certified against, but being able and needing to provide that information to stratify access and exchange, the is not a natural piece of information that we would have, and it would be hard to include it.

Steven Lane
Sorry, Hans, I did not quite get that. So, which requirement are you recommending removal of?

Hans Buitendijk
To have stratification, effectively, by US CORE IG use. So, are you using Version 3.1, 4.0, 5.0, etc.? That is information you can find based on certification and SVAP so far in CHPL, but to stratify volumes of transactions and access, etc. by use of the IG, that is a different question because we are not separating data out based on the IG that indicates what is happening.

Steven Lane
Thank you. Hans, again, as I said, I have been taking notes. I am hoping that when you are talking, Sasha is looking, and when Sasha is talking, you are looking, and that you will correct what I have here.

Hans Buitendijk
That is not a problem. Okeydoke. So, here we have a little bit of a tossup. I can go to FHIR bulk and EI export, or would you like to have one of those to pick up?

Sasha TerMaat
Why don't you finish those out? Sounds good.

Hans Buitendijk
Okeydoke. So, the next one is FHIR bulk. Same comment: FHIR resources as the scope to make sure that we are comparable, and here, there is an interesting part of what is considered "making it available." Is it making it available to access and download, or is it that it is actually accessed and actually downloaded? So, where do we draw that line? What exactly is the intent there? So, it is more of a clarification on what stage in the process of FHIR bulk production and downloading you sit and what we actually want to measure. The last one, EI exports, is an easy one to finish the FHIR components with. It is supportive, and we actually do not have any comments for that one. That one was straightforward, very clear, and we do not have any comments on it at the moment. That gets us to the last two. Sasha?

Sasha TerMaat
So, the final two measures that are proposed by ONC are related to immunizations. The first is immunization administrations, and the second is immunization queries. Both of them suggest stratification by age group and by IIS that is reported to, and the stratifications for these add significant complexity, and we would suggest considering deferring stratification and focusing first on establishing the measure in a simpler form. There are also some questions on these measures that ONC will want to clarify in their specifications around whether the administration has to happen in the reporting period, or the message has to go to the IIS in the reporting period, or both, since the actions that are being measured may not happen at the same time, especially if there is entry of historical data that does go to the IIS. So, some detail clarifications will be part of EHRA's comments to facilitate that reporting in a consistent way.

Steven Eichner
This is Steve Eichner. Just to add on, I think another challenge is perhaps looking at the denominator. You might know how many things were recorded in the EHR, but if people have not opted in or opted out of

registry participation, that would not be included in the data at all, so, again, that is not a developer issue, that is a data utility question in terms of looking at what is the end goal and what is trying to be understood here.

Sasha TerMaat
Yes. If patients opt out, the number of administrations given and the number of administrations sent to the IIS will be different, but when we look at the numbers, we will not necessarily have insight as to why those numbers are different, so it will be important to remember that the numbers being different does not necessarily mean interoperability failed. It could very much mean something else, such as that the patient's request is being respected. We will have to be mindful of that when looking at the data.

Steven Eichner
I was just bringing that up because, again, it is not so much a data collection issue, it is a data utility issue in terms of what is being compared against down the line.

Hans Buitendijk
And that is really also the general point of what is the main information we are trying to get from the data. Is it trying to see that the trend goes up generally? Where it is exactly in sync based on these kind of scenarios is not something that is of concern, but we want to see that things are going up, not down, or maybe we are in some other areas. But, that is really part of the question: What are we trying to achieve with it? It has always been in any of the conversations to date on measures. What are we trying to achieve? Be careful that volumes alone in terms of measuring interoperability may give a false impression that more is better, or that less is not good. At times, what we are also trying to get to is that more efficiently sharing data when you need it, we are actually trying to do less exchange, but you do the exchange when you need it for the amount of data that you need, not sending everything always.

So, I think that is the challenging part. On the one hand, it is good to measure, but we have to be very cautious that they are not going to be put in the context of an interpretation that is really not helpful and that is really not the intent of what we are trying to achieve here, and that is understanding that interoperability is improving.

Steven Eichner
I think another point in this space as well is looking at respecting patient privacy, and data collected in aggregate is one thing, but data with PII attached to it is a different matter entirely. From the concept of an immunization registry, if folks have opted out of participating in a registry, it is because they do not want their information to be shared.

Hans Buitendijk
Right. So, these were basically our main observations, so, three different areas: The general, overall construct of timeline, the construct of how information is being reported, and interesting alignments with CMS, but challenges on some of those key definitions, and then, many of the topics that you heard are clarifications, ambiguity, and feasibility of aspects of the different measures, and that is where our comments will be primarily focused, and I certainly think a couple of these would be good insight for HITAC to consider as comments as well.

I am not convinced that it needs to enumerate some of the very detailed statements that were made, but more the overall themes with some examples of where ambiguity is in play, that that needs to be resolved, feasibility needs to be resolved, timeline needs to be addressed, and alignment with CMS. I think those are among the key things that we want to address from a HITAC perspective as a suggestion from the EHRA. Sasha, anything else to add before turning it back over to Hung?

Sasha TerMaat
No, I think that was a good summary, Hans, and I have been watching the notes, and thank you, Steven, for capturing everything so diligently.

Steven Lane
Clem, your hand is up.

Clem McDonald
Yes. The question of the duplicate documents is important and difficult, and it occurs in many contexts in information exchange. So, what are we doing about that? Can we force a unique identifier on these documents? How can we deal with it?

Hans Buitendijk
That is a great question, and that is a challenge because the question becomes that there is one part that you say when you generate a new document, a new instance of that, it should not have a new identifier because it is newly created, but at the same point in time, when you newly create it at a different point in time, is it actually still the same content that you had before? So, you are challenged by the fact that on the one hand, you would like to have a document that contains the same content, that it has the same identifier, but that is not always easy. At the same point in time, if you want to identify duplicate documents based on content, you have to break open the document somewhere in the flow to establish how much of the data is different, and then, the question is how much is materially different to consider it a really different document? Is it just one character off in the header, is it now a different document? Is it a duplicate or not?

So, in some ways, you could almost argue how important is it to take those things out because you still have to process them. You still have to deal with that volume, and it is ultimately about how I use those documents and the content to present in a good and easy-to-manage fashion to the user that is going to use them, that they are not overwhelmed by the volume where there is actually content in multiple. I think that is more the interest, but be careful trying to be precise about figuring out duplicates in a count like this, as that is not the most natural way to go about it. It is how I manage it that the content is useful to the end user once it arrives, and the rest is just following of data that comes around. We are seeing a lot of data exchange, and that also experiences a lot of duplicate data that is a combination of duplicate documents as true duplicate documents, which are the same, versus different documents that have, to a greater or lesser extent, duplicate data because it was already shared before, but the context within which it is shared is changing. So, what is really considered a duplicate document? I think that is part of that hard, complex issue.

Clem McDonald
I think what is going to happen… The receivers will have such clutter that they will just give up. It is really hard to sort through these things for a provider when you are trying to match up what is the same and what

is different. I think the only way to be sure is some kind of identifier or some kind of a common identifier, something that makes this automatable.

Hans Buitendijk

Actually, what you see there, and there is work going on across a number of members that you can see, is that documents come in, and it is not necessarily the identifier that helps with deduping it, but again, that is only a portion of the data that needs to be considered because after that, once you have those taken on and say, "Okay, it is the exact same identifier, I already got it or not," that is easy, but then you still need to dedupe the rest of the content where you wish to ingest that and not just view it. So, from that perspective, there is also a lot of work going on to help with that so that the users can be presented with the data that is unique and different from what they had before and do not need to go through the clutter. There is a substantial amount of duplication of data that is the result of duplicate documents and duplicate content, and that is in the high percentage points, easily in the 90s.

Clem McDonald

Well, do we have an approach that is going to solve this? Is there something cooking? Shouldn't we get something cooking?

Hans Buitendijk

Depending now on which hat I am wearing, there are different solutions and approaches that different EHRA members are providing already and are working on to advance that, so there is definitely work in progress and available to help manage that to ease that burden of sorting through all the data that is being received to get that in and manageable. So, yes, there is a lot of effort going on there.

Clem McDonald

I think we have to be careful. We will destroy the value of interoperability by having so much clutter.

Hans Buitendijk

Correct, but the solution is not that everything has a unique identifier because that is only part of the content, but actually, the content to help that be improved to make it easier to find it and manage it is that there is good provenance data that is associated with it so that the content is well identified in its own parts, that it is using consistent vocabulary, and that the times are present, that provenance is available, and that combination of information can help identify either exact or likely duplication that can be teased out, and there is a fair amount of work going on to make that much easier than it is today.

Clem McDonald

Okay, thank you.

Steven Lane

Thanks, Clem. The reason my hand is up is because I just wanted to emphasize the fact that this is feedback that EHRA will be submitting to ONC. It is not our responsibility as a Task Force to parrot all of this feedback, or any of this feedback, for that matter. Hans, I know you wear multiple hats and are very engaged, both here and at HITAC as well the EHRA. I would be interested in your input as you go through my notetaking and develop and evolve recommendations in Column G, that we try to pull out those things that really

warrant and are appropriate to HITAC or Task Force feedback on this, as opposed to those things that we just know the ONC is going to hear from EHRA anyway.

Hans Buitendijk
Yes, and as mostly an example here and there to highlight, that is why we are bringing it up, as part of a larger theme.

Steven Lane
Okay. Ike, your hand is up.

Steven Eichner
Thank you. Just to that point, I think one area that probably would be in scope, in fact, not just HIT vendors, but the broader community, is looking at what is the goal of the data collection or the data analysis, and is the data being collected really useful in measuring what the current questions are or what the perceived future questions are. It seems to me that there is still a little bit of a gap, not just on the IIS measure, but on a number of them. Just making sure we are getting good and useful data becomes critical.

Hans Buitendijk
That is probably one of the questions we can look at within HITAC as well. Are there any of these measures that we say are providing the insight we are looking for?

Steven Eichner
Clem?

Steven Lane
Clem, your hand is back up.

Clem McDonald
Oh, sorry. I thought it said it was lowered.

Steven Lane
It can be confusing. No problem.

Clem McDonald
I will try again.

Steven Lane
Now it is back up again. There you go.

Clem McDonald
The toggle is inverted.

Steven Lane
Okay. Do any other workgroup members want to add here? Fil? Hung?

Steven Eichner

I guess the other thing that we might want to consider from a HITAC perspective is looking at the reuse of measures. Again, it is that context to a certain extent of what we are trying to measure, and I would go at looking at reusing or repurposing. That might be both a specific recommendation in this context, but also looking at a broader impact of, rather than duplicating data collection, for anything we are looking at collecting, doing a quick inventory of things we have already collected or are already collecting to make sure whatever we are doing is significantly different, or if we actually just need to change our original measure.

Hans Buitendijk

Hung or Steven, are there any other aspects that you want to highlight here? I will have a look and lift out the additional themes based on the discussion and the feedback along the lines that I summarized at the end, what some of the key major themes are.

Steven Lane

That is great. Hung, anything else?

Hung S. Luu

No. I would just like to thank Hans and Sasha for the well-thought-out presentation of their recommendation, and we look forward to seeing what Hans comes up with.

Steven Lane

Great. Shall we go on to the next presentation, even though we are a few minutes early?

Hung S. Luu

If Hans and Sasha have nothing to add, I think that would be a good idea.

Hans Buitendijk

I think we are okay, and we really appreciate the time to talk through these. It was a bit between the high level and the details, but we used the details to provide a little bit of backdrop and insight as to where some of those questions and suggestions come from. Thank you.

Hung S. Luu

Thank you again to Hans and Sasha. I think we have our next speaker available. Steven, are you sharing your screen?

USCDIv3, CCDA, FHIR US Core Revisions, and Standardized API Updates Recommendation Language (00:53:53)

Steven Lane

No, it is not me. ONC was sharing. So, next is the updates to USCDI V.3, C-CDA, and FHIR US CORE standardized API updates recommendation, so there is a lot to go through in a short period of time. Also, I just have a question for the ONC team. On our spreadsheet, it looks like these items are mislabeled as having been discussed on May 4th because as far as I can tell, today is May 11th. Do I have that right? I

just want to make sure we are in the right spot here. I do not think we already covered all this on May 4th, did we?

Michael Berry
I am not sure. The schedule got moved. Michael and Dustin, are these the topics that got pushed to today?

Michael Wittie
These are topics that got presented. The OTEC team came and presented last time, but there was not much discussion, so if you want to, give time today to finish that discussion if folks had things from last week.

Steven Lane
Great. Is there a presentation? Is anybody on ONC going to walk us through that, or do you just want us to go back and revisit them? You are just basically saying, "Hey, guys, you did not come up with any recommendations." Is that it?

Michael Wittie
It is the same presentations from last week. I can go find those if needed.

Hans Buitendijk
Steven, this is Hans. I think the way we talked about it with feedback, we probably still need to fill something in in G, but generally, I think there was support for C-CDA companion guides and FHIR US CORE that, at the time of the rule, are being worked on, were not there in the latest version supporting USCDI Version 3. As of May 3rd, they are, and I believe that the general comment was supportive of adoption with some clarifications that, particularly in FHIR, what we have seen in the past with 3.1.1 and coming up with 4.0.0, one of the reasons was there were some updates that needed to be made to better fit USCDI Version 1 at the time that were not just an errata, so be aware that such updates may still be needed, but still moving forward with the latest versions in support of USCDI Version 3.

Steven Lane
Sorry, Hans, you said that the latest version was published just recently?

Hans Buitendijk
May 3rd, yes, for both of them. It was 6.0.0 for FHIR and the companion guide R.4. Both were published on May 3rd, so they are out. I do not think anybody has implemented them yet.

Steven Lane
Sorry, you said FHIR 6.0.0?

Hans Buitendijk
Yes, and companion guide R.4. I would say that is reasonable to support that direction with the understanding that some updates still may need to be done, particularly in the FHIR space, as people are actually starting to implement against it, because this is fresh off the press.

Steven Lane

But my understanding is that ONC is planning on naming the latest published standard in the final rule, right? So, wherever we stand, be it 6.0.1 or .2, presumably, that is the one that they are going to cite, right? Because the proposed rule summary says, "We believe 6.0.0 will be published," and now that that has come to pass, "We believe," etc.

Hans Buitendijk
Yes, and we are generally supportive of that. There might be an errata that comes out, but like 3.1.1 went to 4.0.0, that kind of a change is not likely to happen before ONC finalizes the rule, assuming a full final rule, but it still may be needed in order to support certain things.

Clem McDonald
When is ONC likely to do the final rule? Does anybody know?

Steven Lane
Al, your hand is up. Maybe you can respond to that.

Al Taylor
We do not know, but the public comment period goes through June 20th, which is the routine comment period, and then, after that, there is an internal clearance process that we do that could take… I cannot tell you how long that is going to take and when the final would be published. I just cannot say.

Clem McDonald
Are the comments public as they come in?

Al Taylor
Yes, they are available on regulation.gov. Sorry, Steven. The reason I originally raised my hand was that I was just going to say with regard to the versions of USCDI, FHIR US CORE, and C-CDA, in the event that there is something other than 6.0.0 or Release 4 published, whether that is because of an errata or something else, that is why the exact versions of those are not finalized.

Steven Lane
That makes sense, okay. Again, I am now doing a better job capturing some of the discussion in our spreadsheet as we go, and we talked about the ONC team also helping with that as well. No offense taken if multiple people are adding to the spreadsheet at the same time. All right. Hung?

Hung S. Luu
At this point, we have six minutes. Maybe we should go to the spreadsheet and see what is there.
[Inaudible] [01:01:16]

Steven Lane
So, again, we have been working down the spreadsheet. Row 1 of the Group 3 recommendations tab is what we just covered, and our discussion of the Insights condition and maintenance, and the EHRA feedback. It is probably a good idea to go back and revisit some of the other member recommendations in Column G as we go and see if we can compile any of these into Task Force recommendations. Again, we have invited workgroup members to refine their recommendations in Column G as far as they can and to

try to phrase them in the "recommend ONC do something concrete" format. So, Hans, you have your name on the four recommendations in 2G. Do you want to say anything about those? Do these reflect your current thinking based on the EHRA discussions?

Hans Buitendijk
Correct, and I still need to go back in the HL7 meeting this week, as I got a little bit held up elsewhere, but it is on my plate. Later today or tomorrow, I have a good chunk of time to do that.

Steven Lane
Great, okay. Did anybody have any questions or comments for Hans on the suggestions that he has captured here? Again, Hans, if you can just rephrase these as "recommend ONC…"

Hans Buitendijk
Yes.

Clem McDonald
Well, I would like to thank Hans because he so often has the details needed to make the discussion work right.

Steven Lane
I could not agree more.

Hans Buitendijk
Thank you.

Steven Lane
There are a number of people who just add tremendous value to these discussions. Hans is certainly one of them. Okay, down to Row 2. This was the USCDI discussion of advancing to USCDI V.3, and I think this triggered a pretty substantial dialogue that we have had here about how USCDI should be managed, or if it could be managed differently, I should say, so as to encourage and incentivize more health IT applications to get certified and more vendors to participate in certification, particularly vendors of specialized systems that do not attempt to meet all of the needs of a complex hospital system or ambulatory practice. So, Fil, you put this into words for us. Do you want to represent that for the next couple of minutes until we go to public comment?

Fillipe Southerland
Sure, I am happy to, Steven. So, the thought here is we are trying to look at USCDI as we continue to add data points to USCDI, looking at the burden that that introduces to specialty EHRs that do not track some of these data points. For example, I work with Yardi, which is a vendor in the LTPAC space, and we target the senior living population, but in order to certify as an ambulatory, we have to now build pediatric measurements into our electronic health record, which caused a number of internal discussions and delays, and we are finally going ahead with the certification process, but it was really a major hurdle for us to get over to look at if we are going to track these metrics that are not within our population base.

This recommendation points to one of Hans's suggestions, where we look at if there is a way we can parse this out a little more for USCDI where, if the EHR is tracking and sourcing the data, it is required to include that in the USCDI set, whereas if they are not, they should be able to receive and consume the information. So, we certainly understand that the purpose of USCDI is to exchange a common data set, but what do you do if you do not track those data points as an EHR? I also think there is an equity aspect involved here, where we have a number of community support services under HCBS waiver that they may provide transportation services or meal services, and they are using software to allow that. I think we want to have those types of programs have the opportunity to certify so that the patients can access their data.

I see an opportunity here for ONC to really promote USCDI across a wide variety of specialty areas, and I do not want to see it become a barrier to doing that, so, as we advance USCDI versions, we need to really study what the burden is for the specialty providers, look at uptake within some of these specialty sectors outside of acute and ambulatory, and really make sure that we are promoting this into as many sectors as possible so that patients can access their data and that they are all participating in population health initiatives, etc., so, a wider net here. So, I was not sure. Hans, I thought you mentioned on the call yesterday that you wanted to take a crack at the formal recommendation here. I am happy to, if you would like. I can take a crack at it, but I wanted to give you first dibs, since you had made the proposal on maybe how we can fix this.

Hans Buitendijk
Either way, it is fine with me. I will have time today and tonight to take a crack at it, and we can go back and forth and make sure that we cover everything. So, either way, if you want to take step one or you want to wait until tomorrow morning, that would be fine too. Either way.

Fillipe Southerland
Hans, if you can take first, I will just review that, and then, I was going to refine some recommendations under Group 2, so, hopefully we can have some interplay there between both groups and get this resolved.

Hans Buitendijk
That sounds like a plan.

Fillipe Southerland
Thank you.

Steven Lane
Okay, I have just made some effort to refine the language slightly, just some clarity edits, and moved the justification off the recommendation, but I would really welcome, and I am sure Ike and Hung would also welcome, further work on the recommendation. We had discussed this as a possible topic to bring to HITAC next week, sort of giving them a heads up that this came up in our discussion of the recommended change to the standard for USCDI V.3. I think this is what engendered this discussion. Given, Hans and Fil, that you are what I think of the coauthors of this recommendation, do you feel that this is either meaty enough or controversial enough that it makes sense to raise it with HITAC next week?

Hans Buitendijk
I think a heads up, just the topic.

Fillipe Southerland

I would second that. We have had executive orders coming out around enhancing ACBS waivers, and really, I would like to see ONC put some more focus around some of these specialty sectors that are outside of acute and ambulatory and looking at the opportunities there, and I think we need some study around what the uptake is in certified HIT and what, if any, barriers are preventing that with USCDI. So, there may be a broader opportunity that HITAC could ask ONC to embrace.

Hung S. Luu

Clem, you have your hand up.

Clem McDonald

I think we have to be careful about how we say people should or should not support USCDI. For example, especially considering **[inaudible] [01:11:31]** shouldn't we say they should support USCDI if they carry any of that data, or something like that instead of them just being free to make their own choice?

Hung S. Luu

And also, I think the overall recommendation, though, is that the Task Force is supportive of the movement to USCDI Version 3. I think the point of discussion here is how the ONC approaches certification as it relates to all the data elements. I just do not want us to lose track of the overall recommendation, which is that we are in support of moving to Version 3. I have not heard any discussion about that not being supported.

Hans Buitendijk

I agree.

Fillipe Southerland

I agree as well. It is a fairly significant lift as we change each version, and I know for LTPAC, Version 4 contains a number of metrics of interest in our sector, so certainly, advancing these versions is important. I think there is certainly burden involved. By taking this one-size-fits-all approach, I think we need to start looking at that, where we do not want to start inadvertently excluding vendors.

Hung S. Luu

It sounds like for the purposes of the upcoming HITAC presentation, this would be a good topic.

Steven Lane

I tried to capture this, Hung, in the notes here, and any of you are welcome to comment or add to this as you like.

Hung S. Luu

I think overall, it might be… It appears we might be fortunate in that we have topics that are generally not that controversial or that have inspired much opposition, so I think, for the most part, most of our recommendations will be in agreement with the ONC, except for some nuances, such as the approach to how to retrieve data elements, but also how, of course, the EHRA recommendations as well, which are very nuanced and very specific.

Steven Lane

Great. Hung, insofar as you are helping to lead this Group 3, would you be comfortable representing this topic when we sit before HITAC next week, or would you rather invite Hans, Fil, or someone else to represent it, or one of the cochairs?

Hung S. Luu

I think it would be good to have Hans and Fil there to chime in.

Steven Lane

But in terms of actually presenting the evolving recommendations…?

Hung S. Luu

Yes.

Hans Buitendijk

This is Hans. I just heard my name. Do you mind if I…? I was disconnected, and I just got reconnected, so I did not catch that. Sorry about that.

Steven Lane

The question is just when we go to HITAC next week on the 17th, and I think we have agreed that it is worth giving HITAC a heads up, that this has been a topic of discussion, and the question was just who is the right person to make that presentation? Is it me or Ike as Task Force cochairs, is it Hung as the support group lead, or is it perhaps one of you guys as the authors, if you will, of the recommendation?

Fillipe Southerland

What about Hans?

Steven Lane

That was one of the options. That was Option 3.

Hans Buitendijk

I leave it to you, Steven, Ike, and Hung, to decide, but if you want me to do it, then I would be perfectly okay to do it, so if that is your preference choice, I would be happy to. If Fil would like to do it, I am happy to. Either way.

Steven Lane

I think my soft preference would be to have Hung or the Task Force cochairs do it, just so we do not overwhelm HITAC with more voices, and I think that is our responsibility in terms of our leadership roles here, so, Hans, if it is all right with you, why don't you work with Fil on the recommendation language that we would potentially put up on the slide next week, and we can just represent that? Again, it's primarily just to give people a heads up that this is a topic that came up that we are going to come back to in our final recommendations and we just want them to be aware.

Hans Buitendijk

Sounds good.

Steven Lane

Okay, and then, I think it is time for public comment, isn't it?

Public Comment (01:17:31)

Michael Berry

Okay, we are going to open up our meeting for public comment. If you are on Zoom and would like to make a comment, please use the hand raise function, which is located on the Zoom toolbar at the bottom of your screen. If you happen to be on the phone only, press *9 to raise your hand, and once called upon, press *6 to mute and unmute your line. Let's pause for a moment to see if any members of the public would like to make a comment.

Steven Lane

While we are paused, I want to acknowledge that we have almost as many public participants as we have panelists here, which is just wonderful, given the level of interest.

Michael Berry

I am not seeing any hands raised, so I will turn it back to you, Steven.

Steven Lane

Okay. Hung, do you want to take us home?

Planning for May 17th HITAC Meeting Task Force Update (01:18:18)

Hung S. Luu

Sure. So, I think the last part of our meetings… Are we set for the May 17th meeting? We have basically one topic of session discussion, but the rest would be just a presentation of the recommendations.

Steven Lane

We will take care of the meeting on the 17th. I think we are still waiting for a draft deck back from ONC, unless it is right in my email here, and then hopefully we will be able to manage that through the email. Let's look at what we have coming up here.

Hung S. Luu

So, it looks like we have the interim presentation on the 17th, and then we do have further discussion for the request for information, and then, from there, it is a sprint to provide the final recommendation for the 15th.

Steven Lane

Maybe on the next slide, we can go through the RFIs that have been assigned to our group.

Hung S. Luu

It looks like for our group, near and dear to my heart, of course, is laboratory data interoperability request for information, and then, we also have requests for information on pharmacy interoperability functionality within the ONC health IT certification program. FHIR subscription request for information, clinical decision

support HOOKS request, and FHIR standards for scheduling requests for information, and then, the SMART health request for information. So, that will, I think, generate quite a discussion, and I think we will have good recommendations there.

Steven Lane

I agree, that is a long list of RFIs, and we do have those all scheduled for next week. We thankfully have a little bit of wiggle room in the subsequent couple of weeks to dig into those, because I think largely, the recommendations coming out of our discussions to date are going to be pretty straightforward. So, I guess I will ask the ONC team here in public, for the benefit of all, what is going to be our approach for going through this meaty list of RFIs? Are we going to just have a slide outlining each one, or are we going to have somebody from ONC representing them and helping us with what they are looking for? Are we going to consider bringing in some people who have even more FHIR expertise than those who are typically on the line to inform us about subscription requests, scheduling requests, CDS HOOKS, etc.? Because there is obviously a lot of meat here. As a workgroup, we rely on the FHIR community to be taking care of this, kind of the way we are relying on EHRA to be taking care of this, and Hans, thank you for saving me and raising your hand because I think you know more about this than I do.

Hans Buitendijk

Of these ones, I think this is the most technically challenging, the subscriptions discussion. I think that is the one we want to be very considerate of, because there are quite a few open questions on how to address it. That all depends on some FHIR technology sitting behind it. So, the other ones can be elevated a little bit easier, but that is the one that has some very deep technical questions behind it that we want to be careful not going too far in this group, unless we have others joining us with substantial depth there. That is the hard one.

Steven Lane

Yes, and I think it is important for us to realize, that our role is to bring ideas to HITAC, and subsequently to the ONC, based on our perspectives and knowledge. I do not think we are expected to become experts in everything under the sun. We are expected to read the rule carefully and to look for insights and suggestions that we can make, so this is not to lay anything heavy on people, but I think if anybody here… Hung, as you have intimated, you have a deep knowledge, understanding, and passion for laboratory data interoperability, so I am hoping that between now and next week, you are going to look carefully at that RFI and make some suggestions.

We do not have anybody here who is particularly a pharmacy expert as far as I know, though any of us who are clinicians deal with medication data and pharmacy data, so we can add some useful input there. As you say, subscriptions is complicated, CDS HOOKS is also complicated and important, and it really touches on the decision support interventions that have already been discussed within the Task Force. And then, I do not know if it makes sense, Hans, to reach out to anyone from the FHIR community to ask them to give us a little tutorial on some of these detailed FHIR capabilities. I think it would be interesting, and I suspect that there are people out there who would welcome the opportunity to contribute to our discussion. Within HL7, as there is within EHRA, I assume there is a series of meetings going on and people preparing responses. Can you think of one or more people from that community who we might invite for next week?

Hans Buitendijk

I am thinking of connecting with Brett **[01:24:43].** He has been presenting. He is one of the cochairs of the US Round that particularly thinks of these things as well, but I will check with him and see who, and I have a couple of names in mind, that can provide some background and depth on these topics and address any questions that somebody might have.

Steven Lane

I personally think it would be great to have Brett and/or others come and give us a high-level, and if there are things in here that they have seen, kind of like what EHRA did, "These are the things we are concerned about and planning to provide feedback on," I think it would be helpful for us as representatives of HITAC to have that level of understanding, so, thank you, and Brett is always a great addition to any meeting.

Hans Buitendijk

Great.

Steven Lane

All right. Anything else, Hung, Ike?

Hung S. Luu

I think that is it.

Clem McDonald

Are these RFIs just going out to the public and asking for stuff, or are you talking requests for information?

Steven Lane

These are requests for information that were included in the NPRM where ONC specifically said, "We want information on this. Please tell us what we ought to do."

Clem McDonald

Okay. Does a FHIR standard already exist for scheduling? I was not aware of that.

Steven Lane

There are resources in FHIR, and there is an Argonaut older version for scheduling. There are appointment resources, so there is material available, and there has been talk about if Argonaut's should be uplifted because it is done on an older version, the STU 3, not R.4, so there are a couple things that are fundamentally there, but need to be updated depending on the use case at hand. If it is around CDS, that is clearly there. For subscriptions, there is a migration path that is very intriguing, to put it one way, that creates some challenges. On the SMART card, there is a lot there, so those are a little bit more straightforward.

Clem McDonald

Thank you.

Steven Lane

All right, Hung, do you want to close us out?

Hung S. Luu

Thank you, everyone, for attending, and we look forward to hopefully everyone's discussion next week.

Clem McDonald

Thank you.

Hans Buitendijk

Thank you.

Steven Lane

Bye-bye.

Adjourn (01:27:18)