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Session: DaVINCI: Military Health Systems (MHS) Part 2 "The Data"

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Rob: I'd like to introduce our presenter today, Wendy Funk, who is Vice President, Senior Health Services Research, and Project Executive for the DaVINCI project at Kennell and Associates. Wendy, can I turn it over to you?

Wendy Funk: Well, good afternoon, everybody. I'm Wendy Funk, and this is the second session in a series of two about military health systems and the data that's in the Military Health System. The objectives for today are after attending the session you'll be able to describe the DaVINCI project and the DoD data that feeds it, describe the operational systems that are in use in the MHS, identify key strengths and weaknesses of operational data, describe management information systems or central systems in the MHS, describe the MDR and its role in supporting research, and describe the types of data that are available to use for research. So hefty set of objectives, so I'm going to get started.

So I'm going to turn it over to Rob real quick. We have three poll questions.

Rob: Okay, let me bring up that poll. And launch the poll. And the question is have you ever used the Military Health System? Yes or no. Answers are streaming in quite rapidly as you may expect. Give people a few more moments to answer. Okay, things have leveled off, so I'm going to go ahead and close the poll and share out the results. And Wendy, what we have is that 15% answered that they have used the Military Health System, 85% answered no. Back to you.

Wendy Funk: Okay, great. I've got two more poll questions.

Rob: All right, so I'll just launch right in. And the second poll question, have you ever used the Military Health System data? Answers are yes; no; and Wendy I added a maybe, I'm not sure to this one.

Wendy Funk: Awesome.

Rob: I'm going to go ahead and close that poll. It was about 80%, and what we have for answers are 25% answered that yes, they have used the Military Health System data; 58% say no; and 17% say maybe, I'm not sure.

Wendy Funk: Okay, and just one last one.

Rob: All right, poll question number three. Did you attend last month's MHS Basics session? Thank you, everyone, for playing along. You'll receive a lovely parting gift at the end. I'm going to go ahead and close. We're about 80-plus percent. And 57% answered that they had attended and 43% say no. Back to you, Wendy. You have control.

Wendy Funk: Okay, terrific. Thank you. I'm going to go ahead and get started. That gives me a good handle on where everybody is in terms of using this type of data. So let me just start out by talking about DaVINCI. So DaVINCI is a joint DoD and VA data warehouse intended to support research and also provide support for operational questions. Data are fed from the VA VINCI system and from a system called the MHS Data Repository, or the Military Health System Data Repository. The VA and the DoD data, since they're coded differently, they're not really collected in consistent fashion, a common logical model called the OMOP model is going to be used or is being used to put the data into a common structure to make it easier for people to use. I put the URL so you can learn a little bit more about the OMOP model there if you'd like on your own.

Initial datasets between DoD and VA have been exchanged, and the mapping work is ongoing. One of the really nice features of this DaVINCI project is I don't know if you've ever tried to get through governance to do a project with both DoD and VA data, and it can be very difficult trying to get approval from both agencies to publish your work and things like that. And so there's a Memorandum of Understanding in place between DoD and VA that streamlines that process significantly for researchers.

In this presentation, what I'm going to do is I'm going to focus on the DoD sources of data, and then I just wanted to encourage you if you were unable to attend the session that I gave last month, you can get that session on the web. And I've put the URL here. And one of the reasons that I encourage that is that the Military Health System benefit is very complex, and it's easy to use the data and misunderstand what you're seeing if you don't understand how the benefit works. So I would encourage you to look at that if you haven't had an opportunity to yet.

Okay, so many data files have already been sent to VINCI from DoD, and these will soon be available on the CDW. Analysts will be able to add DoD sources to their normal access form, so this will make it much easier for you guys to access. Files that have already been transmitted are laboratory and radiology, a professional encounters file. So this is the provider data, like CPT codes and things like that for what providers do. A pharmacy file, an eligibility file, an inpatient file, all of the claims data, and vital signs. There's many more files coming, but this is a status report of where we are right now. And so those files sit there. We have data dictionaries for them so you can start understanding how the fields are coded and what they all mean. And as I said, we're working hard to get everything mapped into a common model. But the data are there now.

All right, so operational systems. Like the VA, the MHS has relied on and does rely on many operational systems. We have a benefit system to keep track of who is eligible for care; what programs they're eligible for; their service history which, if you think about it from our perspective, that's their employment history; demographics and things like that. The Military Health System doesn't operate this system. It's actually a DoD personnel system. So it's a function of, sort of a human resources type function. There's another HR system that's used to keep track of where all the medical staff are assigned and what kind of skills they have and what hours they have to work in different places.

We have separate clinical and administrative systems that are being replaced by MHS Genesis. I'll spend a considerable amount of time there. We have claims processing systems, and we have pharmacy drug utilization review systems.

So I'm going to start with the benefit system. So the Defense Manpower Data Center in beautiful Monterey, California, DMDC, is a component of DoD. And they track who is on active duty in Guard. They track retirement information. They track separations. They track deployments, what benefits members have, who, what family members are sponsored. And there's a division of DMDC called DEERS, Defense Eligibility and Enrollment System, and they're the legal source of record for healthcare eligibility and enrollment. So the DEERS data is what we, in the MHS what is relied upon to be the source of truth.

DEERS has offices at service installations around the world, all over the U.S. and around the world, and this is where active duty and others can be added or updated. When information is updated in DEERS, it has to be official information so they won't, you don't just get to self-report, hey, I had a baby or something like that. The information is going to come from the services, from birth certificates, from death certificates, Social Security Administration, marriage certificate, Medicare, things like that, official sources.

Service information for active duty service members is really of quite high quality because the services, it's very important to the services that they know where the military are at all times, and so the service member data is of really good quality. But the beneficiary data isn't always as high of quality because things can be self-reported. So for example, I throw my mother on the bus, under the bus. She moved. She's a dependent of retiree, and she moved and she did not tell DEERS she moved. And I was like, mom, tell DEERS! Tell DEERS! And it took her a long time to tell DEERS, but there is really nothing that the MHS or the DoD could do about that. She's a private citizen. And the way that the DoD eligibility works, you don't really have to have a valid address to be eligible. So anyway, the service member data is always going to be of better quality than for some of the others.

So the types of health benefits that DEERS will maintain, they maintain direct care eligibility. What that means is you're eligible to go to a hospital like a Walter Reed or the hospital at Fort Hood or something like that. It also does health plan information. So there's a program called Standard Extra that actually stopped December 31st and was replaced with TRICARE Select. What that is, is traditional indemnity/PPO insurance. There's TRICARE Prime, which is a four and a half million member HMO. We have a program for reservists when they're not on active duty can pay a premium and get TRICARE. We have a TRICARE Young Adult program, which came about because of the ACA where people up to 26 can be covered. TRICARE For Life is a hugely important program to understand, and I expect it's very important for your population as well. Military retirees, if they buy Medicare Part B, have a free wrap-around called TRICARE For Life. So Medicare pays their claims first and whatever is left gets forwarded to TRICARE and TRICARE pays. There's also a program called TRICARE Plus, which really isn't a health plan, but it's preferred access to space available care at MTFs.

An important feature of the MHS data is the DEERS check. So when an MHS beneficiary wants to access care, there's an automatic transaction called the DEERS check to assess their eligibility and priority for care and then to determine coverage for what we call purchased care, which is what the term that the DoD uses for when a patient goes to a civilian hospital. And then the TRICARE picks up the bill. So what happens is a requestor, like a military hospital or a purchased care provider, will ask DEERS for healthcare coverage information and then DEERS sends an electronic transaction back. Sometimes those transactions break, and what that does is sometimes that makes the local data not as good of quality as what you might get directly from DEERS.

Okay, the next thing I'm going to talk about is DMHRS, the Defense Medical Human Resources System. So DMHRS is kind of the timesheet system. If you think about that, people have to go in every day and record their hours. It tracks medical staff at military hospitals, including doctors, nurses, technicians, admin staff, etc. It'll tell you where they're assigned, so what clinic, what ward, what hospital. By the way, Military Treatment Facility is the term used to identify a clinic or a hospital in DoD, and we use the acronym MTF for that, so I'm going to say MTF a lot. So that's what that means. This is an important file for understanding staffing, where people are located, for looking at provider to support staff ratios. It serves as a denominator for productivity measures. So it's an important file or important system.

Now when we get to the clinical and administrative systems, I'm sure by now you all know that the MHS is in transition with respect to the these types of systems. All of the historical legacy systems are being replaced by MHS Genesis. And MHS Genesis is a commercial off the shelf, an adaptation of Cerner's commercial off-the-shelf software, which the Veterans Administration has just purchased as well. The legacy systems that are being replaced by Genesis include an administrative operational system called DHDS, an electronic health record system, actually two of them. One is called AHLTA and one of them is called Essentris, and our dental system, which is the Corporate Dental Application.

So let me talk about CHCS really quickly. CHCS is the primary system used at MTF to conduct the operational and many clinical activities. It does appointing, registrations, scheduling, ordering, etc. One of the problems with CHCS is that there are 100 servers across the world, and these servers, one server can serve multiple MTFs that are in a local area. So for example, in D.C., I think there's 39 MTFs on the server. But one of the really big limitations about that is that the local hosts, or the local CHCS servers, only have visibility of the data collected within that server. And for the DoD, that's a very big problem because, you know, I was a military brat and my dad moved every two years. And so your data ends up spread out all over the world in all the different places that you've lived. And so it was really hard with CHCS to look at things like patient histories because you could only see what the data looked like when they were there.

There's also some data quality problems that occur because of the lack of connectivity. You might have a person entered one way at one CHCS server and entered another at another. A good example of that might be a child who both of their parents are on active duty, then they might have registered with mother under one server and with father under another server. And there's plenty of examples like that. I think we're going to talk about a few more of those in this lecture.

CHCS has a lot of good data files in it. It has a patient registry, an enrollment database. It has a file called the Ambulatory Data Module which holds all the professional services. It has what we call Admit, Discharge, and Transfer files. You can track patient movement on the wards. Lab, Rad, and Pharmacy Modules. A provider file, it's got provider schedules, an appointment file, a referral file, many, many others. But you can see there's a lot of good data in those types of files. One thing you're not seeing here is any type of electronic notes. When providers use CHCS, there is no feature for taking electronic notes, so that was quite a bit of a problem for the Military Health System.

So the advantage of CHCS is its real-time, raw nature of the data. At an operational level, that's what you need. But there are some limitations, like the no central access. If you want access to global data from CHCS, you have to get accounts on a hundred different servers. The demographic and enrollment update processes aren't always fail-safe. There's inconsistent data across CHCS servers. And it was built in the 80s, so it's missing a lot of features that modern healthcare systems rely upon.

Now I don't want you to get too worried when I say all of this, because these are problems with local data, but we have ways of "fixing" local data or cleaning it when it comes to be available centrally. So I'm coming to that part of the lecture in a little bit.

So here we have DEERS and CHCS. And what I have underneath it is kind of a list of the types of files that you'll find in the system.

Next is AHLTA, and AHLTA actually is not an acronym. It's a word now. So I'm not going to give you what it stands for, it's just a word. It's an MHS unique, office-based electronic health record system. And the word office-based is hugely important. It does contain many of the features of commercial EHRs, but the fact that it's only used in offices is a problem because there's other types of care like inpatient care, emergency room care, things like that that will not be seen in AHLTA. So you never want to just do a study with AHLTA alone or you're going to be missing a lot of data.

One good thing about AHLTA, so it does do the note taking and it also does structured note taking. So the DoD has this Tri-Service Workflow group that AHLTA gets built with these little clickboxes, and so if there's something that's really important to you that you don't want to have to go through clinical notes to try to mine, it's really very easy to look at the data collected in a TSWF form. And a good example of a TSWF form, if you study mental health, maybe some of those screening forms or some of the, like the PCL or stuff like that, some of those survey instruments that you give to patients could be structured that way. So those can be very helpful. And then AHLTA stores its data in a system called the Clinical Data Repository. We say CDR. So there's MDR, MHS Data Repository, and CDR, Clinical Data Repository.

AHLTA also contains many files; patient; appointment; encounter; lab, rad, pharmacy; provider, historical procedures, immunizations. I should have put the notes on here. The notes are there.

So now you can kind of look and see. I'm trying, I'm starting to paint a picture of really very disparate data collection because you can see there's CHCS there where you're getting the inpatient diagnoses and procedures being collected. And there's still some ambulatory diagnosis and procedures collected there because for the emergency room, for example, they would be collected in CHCS, not in AHLTA. Okay.

There's very significant interaction between AHLTA and CHCS. And I think I'm just going to show you a picture rather than go through that language. But you'll have that language when you want to review the slides later.

So what happens is DEERS and CHCS communicate regularly. When somebody wants to make an appointment, that happens in CHCS. And so when they make the appointment is when that DEERS check happens. And when the DEERS check happens, the local systems get updated with enrollment information, demographics, and eligibility. CHCS is the only system that talks to DEERS, though. So any other system that wants to learn about DEERS gets the information passed through CHCS into the other system. And so that's an important data flow, CHCS telling AHLTA here's a patient, here's their demographic profiles, and things like that.

The other thing that happens is AHLTA, when AHLTA is used to document care, coded professional encounter records are also written back to CHCS. You can see a lot of communication going on between these systems. Now one thing that I talk to people about, and it's sort of upsetting when people learn about it, especially if they've tried to use these systems to do research, is there was a fundamental flaw in the design related to the identification of a person in AHLTA. What they did is they, when they built AHLTA, they assigned a unique identifier to each individual was the idea, except it turns out that the unique identifier isn't unique if you have more than one reason to be able to access the Military Health System.

So I mentioned the child with two active duty parents. That child would very likely have two different "unique" identifiers. It's also very common for an active duty service member to be married to a Guard member or an active duty dependent who subsequently goes on active duty. Any time you have more than one reason to access the system, you can have this non-unique identifier, and this impacts, I would say right now it's about 700,000 people. So what that means is when somebody pulls up data out of AHLTA, they're only going to get data for the one identifier. They're not going to get all of the records for that person. And you can imagine that that could be a very big problem, both operationally and clinical, or, and from a research perspective. So when you're using AHLTA directly, the only person identifier you can really use is the Social Security number. A lot of people try to stay away from that because you know the government doesn't like you using that. But with AHLTA, it's really your only option if you're using data directly from AHLTA.

Now because AHLTA doesn't work outside of office settings, a second electronic health system was purchased, which is called Essentris. And this is also used at MTFs, and this is where they capture the electronic notes when it's emergency room, inpatient, or same-day surgery. Essentris was not implemented centrally and it's not connected to DEERS, CHCS, or AHLTA. And there are differences in Essentris implementation across MTFs, which makes it very hard for the DoD to get a central data feed out of that because you have to write different programs depending on the implementation.

So one of the big problems we have with the Military Health System that you'll have to understand and account for is that providers are going to, when they document their care in Essentris, they still have to go back and also document the CPT codes and diagnosis codes and things like that in CHCS. And if they don't do that, they've lost what they've done. The professional services information would not flow anywhere. We find that outpatient, ER, same-day surgery are very well captured in terms of professional services. But the inpatient professional services data are very incomplete. It's a big large hold in the MHS data. So sometimes when I want to do case finding or something like that, I can't actually use professional data with CPT codes. If it's inpatient care, I'll have to go back to the ICD-10 codes in the hospital records.

So now here's what we have is we have all of these four systems, excuse me, and these four systems are separate. And you want to, as a provider or as a researcher, be able to pull a cohort of people and get full healthcare data, but it's very difficult to do. And if you think about how many problems you [audio hiccup 23:52] hear about transition from the DoD into the VA, you can imagine when you're trying to get your service history together to present for those disability examinations to get your VA rating, your data is in all kinds of different places and it has to be pieced together in order to get a complete record to get a proper disability evaluation.

And this is just a picture showing you that Essentris stands alone. It doesn't talk to anything.

Okay, so this, so now I think I've probably made the case pretty strongly why MHS Genesis is desperately needed in the Military Health System. They need to be able to have everything in one place. And so MHS Genesis is replacing all three of the systems I just talked about, CHCS, AHLTA, and Essentris. The data collection is going to occur on one system. The only dental will be separate, but everything else is going to be on one system. This is going to give us less of a chance for inconsistency. It has, I'll be upfront with you, proven to be a major paradigm shift in daily operations because the MHS has been using these three systems that I just talked about for decades. And it's just hard to make change sometimes. That doesn't always mean change is bad. Change is good, but it's not easy. And one of the challenges we are having is getting data out of MHS Genesis. It's been hard to do that and kind of hard to understand. But good news is, is that the first several data files from MHS Genesis hit the MDR last week, so we're just starting to get some of that data out.

Here are the data domains in MHS Genesis, so anatomical path, blood bank. The clinical events is where you get some of the special types of laboratory work. There's documentation, encounters, maternity, pharmacy, procedure and diagnosis, schedules. I'm just reading it to you. I'll let you look at it for a second. Power Note is kind of cool, though. Power Note is where they take their notes.

Okay, so that's the direct care data, but as I said, TRICARE also has purchased care. And one of the things about purchased care that's super important to remember is that it represents more than half of the care provided to MHS beneficiaries. You cannot just go into MTF data and do a study. If you wanted to study something and then say, well, after this event, what was the readmission rate or what were their outcomes? Well, you might very well have seen these types of things in purchased care and not in direct care. And if you don't include the purchased care data you can really do some bad research. So whenever you study anything with the Military Health System, please make sure you try to coordinate or include both direct and purchased care unless your study is very, very specifically only direct care.

This is particularly important for people who live near small MTFs. So Walter Reed is going to be able to do most of the specialty care for their patients, but we have really small MTFs, some of them with daily censuses with like two. The only reason they exist is because they're in such remote areas they need to have a facility to support certain people. But purchased care is really big there. Another thing, too, is the MTFs have a priority for care, and active duty and active duty family member are the highest priority. But when you get to retirees and Medicare eligible, their priority is lower, and if those types of patients can't get into the military hospitals, then they tend to use purchased care a lot more.

So when TRICARE services are used in the private sector, a claim is filed with the fiscal intermediary, and the fiscal intermediary sends a record we call a TED record. And there's this TED operational system that validates, accepts, and processes the claim. This is only administrative data. It's very similar to what would be available for Medicare claims. We won't have lab results or radiology results or things like that. So this is going to limit the ability to use the data for some studies and for some cohorts. So that's important. Yeah, yeah, that's important to know.

The TRICARE claims come in for things like physician services, hospital stays, ancillary emergency rooms, durable medical equipment, pharmacy, home health, hospice, etc. And one note that I put here with the proceed with caution is that claims are only sent to TRICARE if TRICARE has a liability. If 100% of the allowed amount is paid by another payor, TRICARE is going to be blind to that fact. And that's really important.

I think I didn't, in the last lecture I gave, I gave an example of a study we did where we were looking at flu shots and we found that Medicare eligible patients had the lowest percentage of flu shots in the MHS when we looked at just the MHS data. And we said, well, why is that? Well, it turns out if you're Medicare eligible, you can use your Medicare benefit to get a flu shot for free pretty much anywhere that accepts Medicare. And so when Medicare is giving it to you for free, TRICARE has no liability. And so that means TRICARE doesn't get a claim, so TRICARE never knew those people got flu shots. So it looks like the Medicare eligible people only 21% got a flu shot. But if you take the Medicare data and include that, it's a much, much, much higher percentage. So you got to be a little bit careful. I've done a lot of work looking at some of the other health insurance variables and the Medicare variables and trying to come up with ways to minimize your risks of missing data, and that's something as you get more experience with the data you'll be able to do, too.

Okay, so individual claims are available. That means we're going to get diagnosis codes, procedure codes, dates, and locations. We have billing data, patient data, provider data, other administrative data. So you can do a lot with it, it's just not as good as having the notes and the results and things like that.

We also have the pharmacy utilization review system. So this is a real-time Drug Utilization Review System. If somebody wants to fill a script for an MHS beneficiary, they have to put data into the Pharmacy Data Transaction Service and then PDTS will respond back whether it's safe to dispense the drug. It includes a lot of programs related to opioid abuse, and it's used by MTF private sector pharmacies. We have a mail order program. The VA med centers actually use this service, too. If they're treating a military eligible beneficiary, they put a transaction into PDTS.

And also we have line units. Line units are things like military shipped or MASH units, things like that in that data. This is only used for outpatient prescriptions. It's required at an MTF or if TRICARE is paying a claim. And the overseas data is a little bit sparse in there.

We also have Theater Medical Data Store. There's CHCS/AHLTA-like systems that are used in the theater medical units. So this is how the military is able to see what's happening in Iraq and Syria and Afghanistan and things like that. And this data is really important because we deploy our service members, and we don't want to not have this TMDS data because if you don't have it, you don't know what happened to them when they were deployed. So it's stored separately, but it is what was happening when somebody is deployed. So these are the local type systems.

I'm going to talk about four management information systems for the last half of this lecture. So the first one I want to talk about is the Medical Expense Performance and Reporting System. I'm not always that good with VA systems, but I think DSS is your equivalent, but I'm not positive. It's a tri-service cost accounting system. The data sources for MEPRS, the workload data comes in from CHCS, the labor information comes in from the human resources system, and the expense information comes in from service-unique accounting systems. And then there's a standard methodology used to assign costs to clinical areas. So this is the way that the military health system is able to understand the cost of care. There are some significant limitations in the quality of the timesheet data, though, and that does impact cost. And we have sometimes been pinged negatively from the GAO for that.

The next thing I want to talk to you about is the MHS Data Repository. And that's probably the most important point for you to get out of this lecture is because this is where the data for DaVINCI is coming from. So the MDR was developed in 2000, so it's a very mature system. The idea was to provide a central location where all data could flow in and be processed one time, where some of these anomalies that I've been talking to you about could be corrected, and where useful information could also be appended that wasn't necessarily collected in the operational system. This was particularly necessary to put everything in one place, to correct errors, to reduce costs, and to improve quality.

So what is the MDR? It's the most robust source of MHS data centrally available. A lot of operational systems that operate in the Military Health System have data warehouses associated with them. But these warehouses, they're the type of warehouse that is intended to exactly mimic what's in the operational system. And the idea there is that you don't have to bang on the operational system all day. You can let it be free for the operations it was intended for. So that's a very common thing. And most data warehouse, or most operational systems in the world today do have warehouses. But the MDR, it's a warehouse, too, but it's kind of like a super warehouse. It was designed by data users for data users. If you've ever accessed the Medicare Chronic Conditions Warehouse, you might note how Medicare adds some value-added fields and does some cleaning and enhancements to the data. The same can be said about the MDR.

So it doesn't just simply display the original values that are received. When possible, it fixes them. So if there's a source system error, it's going to fix it. If data needs to be standardized, it's going to fix that. This makes the MDR a cleaner source of data than the other systems. Everything can't be corrected in the MDR, but what can be, is.

Okay, so person identification enhancement. So there's a master person index file that contains all known person identifiers and all known associations for every member. So if you look at John Smith, you see how John Smith is listed three times? And this is how John Smith's records would look in DEERS. So John Smith sponsored by mom, John Smith sponsored by dad, and then John Smith is his own sponsor when he decides to go on active duty after he grows up. So having these three representations of John Smith enables us to make sure we know who John Smith is, no matter how John Smith presents. So this gets applied consistently to assign a DEERS ID, and that DEERS ID is always the best field to use when you're studying Military Health System data. It also fixes that AHLTA issue completely.

Then once you know who the person is, we use DEERS because it's the legal authority to assign benefit, enrollment, and demographic information. And that's going to fix the inconsistencies I talked to you about where CHCS sometimes has transaction errors. DMDR groups, diagnosis, and procedures into DRGs, into major diagnostic categories, ambulatory payment classifications. We apply as an agency for healthcare research and quality clinical classification software. And TRICARE has their own risk adjustment model that gets applied. And that risk adjustment model, the reason it has to be unique is because our active duty use statistically significant amount more resources than somebody with a matched age/gender/disease profile. So we have to do something for our active duty.

Workload weights get applied, so relative value units, DRG weights. Financial risk scores get applied to the demographic data so that the military hospitals know how expensive people are predicted to be. Cost data is applied at the encounter level. So all of the data has both a fixed full cost and a variable cost, so depending on what your research question is, you have records costed. So that's very helpful, too. That it's not just at an aggregate level.

Deployment history is applied. So you can imagine if you're working in the Military Health System, deployment history is very important. Clinical episodes are developed, so ancillary services are linked, so that's really helpful for studying physician practice patterns. Purchased care acute care inpatient episodes have also been built so you can tie hospital and professional claims together to understand the full scope of care. AHRQ Prevention Quality Indicators, the New York University Emergency Room algorithm that looks at whether emergency room care is needed or not, was appropriate. So there's many, many more. There's literally hundreds of thousands of lines of code to take these files and clean them up and make them as good as they can be.

So the basic idea behind these enhancements is to get the most accurate data available to the users, apply consistent tools and logic to the data so you don't have apples and oranges, make the data easy to use with lots of convenient fields, and finally, transparency, transparency, transparency. And I really mean that. One of the things we found is when you have people collecting data at local sites, that becomes their source of the truth. And when you present back to them data that doesn't look like what they're used to seeing necessarily, they question that. And so we learned early on that we needed to do a lot of documentation about what we were doing. And so the URL that I'm giving you right there, we're front and center open about what we're doing to the data. So every flow of data is described. All of the business rules are described. This is the website that has the data dictionary on it. So you can go to this website, download the data dictionary, and get field level information about what files are out there, what fields are out there, what are their definitions and valid values, and things like that. So that's a great resource when you start to use the DoD data. There's some really good stuff on that website.

Here's the basic data flow. So you have these sources that I've been talking about represented by these little red folders. And so these sources are sending data to the MDR 24 hours a day seven days a week. And what the MDR does is batch up the data. It's not trying to be a real-time system. So data are either processed weekly or monthly. Then within the MDR, files are stored and there are a little over 300 users of the MDR. You have to be a VAST programmer to use the MDR. You have to have a data use agreement to use it. But really one of the main points of the MDR is now that you've paid all that money to clean up that data, let's go ahead and give it to everybody else. And so what happens then is the MDR sends data feeds out to all these other data marts and data systems, and then those data marts and data systems are much more user friendly. You don't have to be a programmer. You can point, click, drag, drop, and get information pretty quickly. And some of the other systems have dashboards and things like that, and they can be really easy places to gather data.

So the MDR, we use it in the MHS for all of the official things that get done. So determining the contribution from DoD to a joint DoD/Medicare accrual fund that pays for TRICARE For Life, that gets audited all the time. Management of purchased care claims payment, developing payment rates that are used by TRICARE, calculating risk sharing amounts on billion dollar managed care support contracts. These are contracts similar to your VA Choice contracts. Estimating costs of changes, calculating budgets, calculating payment amounts for you guys. So in the MDR, that is where the bills, when the VA refers a patient over to a military hospital, it's in the MDR where we're calculating the bills. Reports, and that's actually very new, so there have been some problems with that process historically, and so we're just starting to fix the problems by bringing it into the MDR.

The MDR is used for reports to Congress. It's used for hundreds, we have hundreds and hundreds of clinical research studies going on, including feeding DaVINCI, so those will be research studies through the VA, not just through the DoD. So the MDR is, I think what the point I'm hoping that I'm making with you is that this is going to be your best source of data, and that's why it's the data that's feeding DaVINCI. When we do get reviewed by IG or GAO or things like that, they've said some pretty favorable things about the transparency, the documentation, the quality review process, and things like that.

So there's a lot of extracts that go to the MDR, and I'm just going to spend a few slides. These are just a few little slides, but there's a lot of material in these slides. So in terms of person data, all of the files that I just talked to you about, the eligibility enrollment file is called the VM6. I know it's a silly name. But that's one record. They give it to us once a month, and it's one record every single person, and you can have more than one record per person as I noted, and then all of their status information. The Contingency Tracking System is the deployment data. So that's everybody who went to war for a contingency operation. So if you're wanting to study like anything that happened after 9/11, this is going to be the cohort of people who deployed. That's how you find that out.

Separation information, we get the separatee file, so that'll tell us when a service member separated and why. And for the work that I do, that's one of the most important cohorts for identifying who is going to go over to the VA. So when you're doing any kind of work for transition from DoD to VA, this separatee file is key.

The human resources file is there. So that DMHRS system sends a feed to us. There's a health risk file. This is a really nice file. If you've ever used CMS, CCW is kind of like the chronic conditions summary file, you have a record for each person and then you have 94 different flag variables indicating diseases or conditions that they've been identified as having. Some of the flags are able to risk stratify, like cardiovascular disease has four levels of risk. All of it is completely open sourced, so you're able to see how the disease definitions were made, so you can decide if you want to use them or not. And then there's also financial risks adjustment scores on that file, so if you want to adjust for risk, that's a good way to do that.

We have a death file as well. Deaths come in from Social Security Administration, from DMDC, so that's that system, the personnel system I was talking to you about, the DEERS data. And when a member dies, they're obviously no longer eligible for healthcare, and so they get deaths reported to them. We also have a group in the Pentagon called Casualty Affairs, and they keep track of every death. And when active duty people die, casualty, when I say every death, every death for active duty service members, Guard, or Reserve. And if they died after they left the service, it's not in there. It's deaths that occur while they're in the service.

Okay, so then let's talk about CHCS and AHLTA. So we have records that we call, so we use a lot of acronyms. See in the middle? And when you talk to Military Health System people, they'll just use these acronyms as if everybody knows what they mean, so I'm going to try not to do that. Standard Inpatient Data Record is an inpatient hospital record. So up to 20 diagnosis and procedure codes, who is the person, it's got the ward transfer information, it's got ICU, it's got bed days, it's got how they came in and how they got out of the hospital, costs, all kinds of good stuff, provider information.

Let's see, we've also got this, what they call the CAPER. It's the comprehensive professional record. So this is professional services, so this is all the CPT codes. So this is where you're going to find out what the doctors do. You can look at productivity, etc. It's also got diagnosis codes on it. You can look at the diagnoses made and things like that.

We have an appointment file. So the appointment file is good. It's got kept appointments and not kept appointments. There is a referral file so you can look at referral patterns and how long it takes for a patient to get a referral and things like that. There's a chemistry file that has chemistry exams and results. Microbiology file, a pathology, a radiology. There's the Schedulable Entity file. This is the provider schedules, so you can look at what's open in the future and you can look at how long it, yeah, well, anyway, what types of, we usually use it for what types of appointments are available in the future.

We have pharmacy, and this is unlike PDTS. This is both inpatient and outpatient pharmacy. We have the subjective and objective notes coming in. Those are only coming in, though, if the care was documented in AHLTA. We don't have any inpatient notes. We're not going to have ER notes. We're not going to have surgery notes. So it's more, really, primary care and medical care. We have immunization history. And then the vital sign file is more than just vital signs. It's vital signs, but it's also a lot of questionnaire type data. So the [unintelligible 47:08] is on there. I think some of the tobacco questions, some of the pain scales are on there as well.

Some other data products, we get the MEPRS file, so that's the financial accounting data. There's a separate file coming in from PDTS, that pharmacy data we talked about. The claims data, so we have institutional and non-institutional claims. An institutional claim comes from a hospital or an institution, and the non-institutional is everything else. We have the National Provider ID Directory in there. We just grabbed that from CMS, and we enhance it with a little bit of information if the provider is an MTF provider. We have another program we run called Designated Provider. It's an HMO program. It's a type of purchased care. So those files are there. The theater data I told you about. We have direct and purchased care dental. There's case management. We have this new Behavioral Health Data Portal system that just entered into the MDR, which is all the screening exams that are done in behavioral health clinics. Very, very helpful for the people studying mental health.

Okay, so that's the MDR. So that's a lot of data and that's the data you'll be able to touch. Just very quickly there's a few other systems to talk about. There's three different names used for this system, P4I, HSDW, and CarePoint. It all falls under a big clinical system umbrella that they provide HEDIS reports to the hospitals. They serve as the display portal for the MHS Enterprise Metrics. They provide registries to MTFs, so you could go there and get registry data. They receive data from the MDR. So the MDR is really their primary source of data, but they also have their own CHCS and AHLTA feeds. And they are pass-through from MDR to the VA for DaVINCI. So they're kind of the portal that's doing the data exchange for this project.

Now just very briefly and I'll be completed, the MHS has a long history of using data for research. There are active agencies within each service dedicated to conducting research. So for example, there's the Navy Health Research Center or there's the Armed Forces Health Surveillance Center, or each of the services has their own research agency. And those people, by the way, could be really good co-collaborators with you because they'll understand the system and the data very well. So just you know those groups are out there. There's quite a few of them.

One thing that's different about the VA, in the MHS, there really isn't a research mandate within the MHS. Up until DaVINCI, people have not been able to use MHS data as freely as they've wanted. There's a PAO office, a Public Affairs Approval Office, and when you get a project with the DoD before DaVINCI to do research, you did that research and the PAO office gets to approve whether that research ever sees the light of day. The DaVINCI MOU is intended to be different for that and is enabling the VA to use their own governance processes to deliver data. So this is going to be of considerable advantage to you guys to be able to use DaVINCI rather than going through the processes that you'd have to go through with the DoD. The DoD really doesn't let you use data unless you have a sponsor within DoD historically, but as I've said, DaVINCI is not like that. So DaVINCI is going to open up a lot of this data for you. So the intent is going to be to streamline and assist researchers and others in gaining much easier access to this combined DoD/VA experience. So I think this is going to really open some doors for you guys. And I'm excited about that, too. I've worked for the Military Health System for a very long time, and I've worked for the VA for a while, too, and you guys have some really good researchers that could probably bring a lot of the knowledge to the system.

So just a summary, the data files and fields that are needed for research are generally available, and by the way, there's a long history of this data with some of these files going back decades since the MDR was built in 2000, you can imagine. We have some data going back to the 80s even.

Using the MDR is the most complete source of healthcare information in one place about the MHS. Information in the MDR is of higher quality than the source system. The MDR feeds data to many other systems, both within and outside of the MHS. But there are still bits of information that aren't in the MDR that you have to consider when using MHS data. And this last bullet, again, is so important. The better that you understand the benefits and priorities for care when you use this MHS data, the more equipped you're going to be to apply the data to research. And so that presentation that I linked you to on my earlier slide will help you to understand that a little bit better.

And that's what I have today. I have my contact information, my phone number, and my email address, so if you'd like to contact me or ask me a question or something like that, you're more than welcome to reach out to me, and I can get back to you as soon as I can. And with that said, Rob, I've completed my remarks.

Rob: Okay, lots of information and a few questions pending, so I'll just jump right in.

Wendy Funk: Okay.

Rob: This first one the person is asking is AHLTA data processed CHCS data?

Wendy Funk: No. It's a completely separate system. So one of them is an administrative system and one of them is an electronic documentation, electronic health record system. And most of the electronic health record data is collected in AHLTA, but there is still some stuff that's collected in CHCS. So you sort of have to put the two together in order to get everything. So about 30 million encounters are captured in AHLTA, and I would say maybe seven million in CHCS.

Rob: Okay, thank you.

Wendy Funk: Mm-hmm.

Rob: Next up, will DaVINCI include information from VADIR, meaning the VA/DoD identity registry?

Wendy Funk: I'm not aware of that. I don't know of that system, so I don't want to say, it's not in the current, what's being worked on currently.

Rob: Okay, thank you.

Wendy Funk: Mm-hmm.

Rob: On routine MDR enhancements, oh, this is a question about slide, I'm not sure which one, probably around 49, 50, 51, 52 because you have a number of MDR enhancement slides.

Wendy Funk: Mm-hmm. Mm-hmm.

Rob: This person is asking if you could explain further how the records for acute care/hospitalization are linked.

Wendy Funk: So yeah, through the ordering modules. So in the, oh, you're talking about the purchased care data. Okay, yeah. In the...

Rob: Well, there's a follow-up on the same thing, so let me finish this. I didn't see it at first.

Wendy Funk: Okay.

Rob: Let me ask. This might clarify. Are direct care hospitalizations linked with aftercare in a purchased care environment, for example? [Unintelligible 54:55].

Wendy Funk: No. You'll have to do that yourselves, unfortunately. The linking that we've done in direct care, so it's linking in direct care links, everything that a doctor orders at an event to that event. So I can track when the appointment was made. I can link that to all of the coded data that resulted. So I can look in an episode of care and say the doctor ordered these, like I did a low back pain study where I looked at low back pain and then I looked at what kind of imaging modality the doctors ordered and classified that by the doctors and the types of tests they ordered. And so it's all through the ordering in CHCS that that gets linked. So that, it's more of like an event episode. So there's, when you think about episodes of care, there's two types of episodes of care. There's sort of an event episode of care. And there's a clinical episode of care. An event episode is a sub-set of a clinical episode, and what the direct care is doing is linking everything associated with an event. So if that event is a hospitalization or if it's an office visit or an emergency room visit, what happened while you were physically there, so all of that kind of stuff can be linked. Where it doesn't link, it doesn't go out and say, yeah, but you hurt your back and you went to a private sector ER and then you got physical therapy at the military hospital. You're going to have to use some logic to figure out how to link that kind of stuff together. So hopefully that answers the question. I will say, too, we have applied clinical episode groupers to this data successfully. So if you've ever used some of those commercial products to do episode grouping, you have to do some mappings and things like that, but you can reasonably do that with software if you want to if you don't want to develop those episodes yourself.

Rob: Questioner replied, makes sense, thank you.

Wendy Funk: Oh, good! Yah! You can never tell with a webinar.

Rob: Thanks. Next up, is the MDR part of DaVINCI or separate? Who would be a researcher's contact to request/use data on DX procedure codes?

Wendy Funk: Okay, so if you're coming in through the VA, I think that a couple of ways you can do that through the VA is the data files that we've placed on VINCI already, the professional encounters and the inpatient data are there, and that's where those diagnosis codes and procedure codes and stuff are going to be. So when those data are ready, and Dr. DuVall, who is the project sponsor for DaVINCI, is giving next month's webinar for this HSR&D series. And so he can talk more specifically about that, but what I've been told is that when you do your access forms to get onto CDW that you're simply going to have to request access to them, that's all. It's supposed to be a pretty easy procedure for you once we get this moving. But if we did not have DaVINCI in place, it's much harder because what you have to do then is find a co-collaborator within the DoD who is willing to support your research and sponsor you for a data use agreement. And then once you get through that process, which can take a long time, then you still have to find someone to pay to pull the data for you because there isn't a shop that just pulls data for researchers, and they don't have a situation like Medicare where you can have somebody pull the data for you and pay them. It doesn't work that way. So that's one of the reasons this data has been so closed holed is there really is no process to get to it. And so yeah, you guys are going to be really lucky because the data is over there and you can put it on your forms. And eventually the data will all be mapped and that'll be even better because then you won't have to learn two different coding systems.

Rob: Thank you. Everybody, it's the top of the hour now, but Wendy has already told me that it's okay to go a little bit late. But let me just say if you have to leave right now, please fill out the survey form that comes up when you close. We have a few more questions and we are going to stay a little bit late. So Wendy, these next two questions are very similar. I'm not sure, I can't tell the difference, but there be some subtleties. Is there an update on the timeline for DaVINCI? And when, tentatively, will the DaVINCI data become available for researchers to access?

Wendy Funk: Yeah. So I don't have the timeline, but I was told sometime in '18 and that it would be best for you to participate in next month's HSR&D. Dr. DuVall can make whatever timeline announcements he needs to make. I don't want to get out ahead of my clients or give you a wrong answer or anything.

Rob: Okay, thank you. You mentioned that overseas care is included. Does that include combat/in theater injuries?

Wendy Funk: Yes. Yes. I mean you have to ask for it. Depends on what file you ask for, but yes, we have combat injuries. Helpful, isn't it? Pretty exciting stuff.

Rob: This person missed the definition of P4I.

Wendy Funk: Oh, I think I just said it, something for improvement. I can't remember what the P stands for. But it's the dashboard. Probably the VA has a dashboard, I'm guessing, too, with high-level metrics that the VA Secretary looks at. DoD has high-level metrics that the Secretary of Defense looks at and the Service Secretary and things like that, so dashboard stuff. Sorry about that. You're right. I should have been pinged on that. I told you guys DoD likes a lot of acronyms.

Rob: Just like the VA.

Wendy Funk: Yeah.

Rob: This person also asked about what, she figured it out later, what TED meant on slide 54. The answer she found was TRICARE Encounter Data. I thought...

Wendy Funk: Yeah. Yeah. I think that's on the, yeah, exactly. It's on one of the other slides, it's spelled out. But yeah, that's the claims data. TEDs. It's our only data system that has somebody's name.

Rob: Well, those are the final questions at this time. If people have additional follow-up questions, you can go ahead and ask them. But if not, Wendy, maybe if you have a few closing comments?

Wendy Funk: Well, I'd just like to thank everybody for attending. There's a lot of data here and a lot of really good data. And over my experience, I've combined DoD and VA data for many studies, and you can do it. You just sort of have to learn it. And once you learn it, it's going to really make it, I hope, a big advancement to some of the work that you guys are doing. You can look at the people before they came to you.

Rob: Wonderful. Thank you.

Wendy Funk: I just thank you for time.

Rob: I'm sorry. I didn't mean to interrupt.

Wendy Funk: I was just saying thank you for your time.

Rob: I didn't read these, but you got quite a few, you know, this is a great presentation, thank you very much comments in the question pane.

Wendy Funk: Great. Thanks.

Rob: Yeah. Okay, well, thank you very much for preparing and presenting today. And for the audience, again, if you did stick around, please when I close the Cyberseminar, please do fill out the survey form that comes up. We really appreciate and count on your answers to those to continue to bring you high-quality Cyberseminars. Once again, Wendy, thank you very much, and have a good day everybody.

Wendy Funk: Thanks, everybody! Bye!

[ END OF AUDIO ]