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Tuberculosis Training Series for LHJs and Community Partners
Transcript for Webinar #2: DOT in a Time of Diminishing Resources

Slide #1: Hello everyone, this is Sheanne Allen, TB Controller for the Washington State Department of Health TB Program. Catherine Kroll, Clark County Public Health's Program Manager, and Josh Van Otterloo, a CSTE Fellow, are joining us today to share Clark County, Washington's experience using electronic DOT. The title of the presentation is DOT in a Time of Diminishing Resources. It's really comparing in-person and electronic DOT for tuberculosis. So please, Josh, take it away.

Slide #2: Alright, thank you Sheanne and thank you to DOH for setting this up. I originally presented this with Catherine Kroll, our previous program manager but, she has since moved on. As Sheanne said, I am the CST fellow with Clark County Public Health.

So, just giving a brief overview of what we are presenting today; I want to talk a little about TB in Clark County, how we do DOT in the 'couve, which is Vancouver and greater Clark County, do a brief demonstration of video DOT, talk about our evaluation, and look a little bit into the future.

Slide #3: Alright so first, a little about Clark County. We have about 425,000 people in SW Washington, we are part of the Portland metro area. We have some larger immigrant populations from Asia, Eastern Europe, and Central America. On average, we see about 12 cases of active TB a year. About 65% of these are pulmonary, about 35% are extra-pulmonary.

Slide #4: First of all, a little bit of a primer on what is DOT. At its core, it's observing a person taking their medications. Now, of course, it's more than that. It's doing everything we can to make sure that people are taking their medications and then watch them. This is a standard of care for TB globally. It has been shown to better prevent resistance and increase cure and completion rates for TB treatment.

Slide #5: DOT to us, at the local health jurisdiction, can be a significant burden in terms of time and resources. When we start looking at a minimum treatment, four months: that's fifty-six doses that we have to watch. As that goes to six months, nine months, twelve months- that's of course more doses and more burden. Of course these estimates, 6 months or 76 doses, that's assuming there is no drug resistance, no treatment interruptions, no medication changes, nothing complicated that is happening- that's a minimum. Some cases can get really complicated. We have had a few cases that have done a 12 month treatment- that's more than 250 doses; each one, we're going to have to observe. So, that can be a significant burden.

Slide #6: Who gets DOT in Clark County? I know this can change a little, I guess, county to county, but we do DOT for all of our active pulmonary cases and all of our active extra-pulmonary cases, children who are on window prophylaxis, and 12-dose Latent INH/Rifampin or INH/ Rifapentine LTBI regime.

Now there are some other LTBI regimes that you could do DOT on, but we have generally not used those regimes.

Slide #7: Usually when we are talking about DOT, we are talking about traditional models. It's in-person. It's one of our staff watching someone taking the medication, one at a time, generally. We will generally do that at the patient's home, doctor's office, school, workplace- we've done it in parking lots. Basically, we will go wherever the patient wants us to, as long as it is safe.

Slide #8: Traditional DOT isn't necessarily for everyone. It is a significant burden for patients as well. They have to usually do this during business hours. We are not going to send someone out at 9:00PM, or that sort of thing. It is an interruption in people's lives. The second thing is international travel. Since we know that in the U.S., a lot of our TB patients are foreign born, they have family, friends, and jobs internationally. They do want to travel. If they are overseas, we can't go across state lines or different countries to do DOT on them. They'll often miss doses and add those doses to the end.

The third thing we've seen commonly is that these medications do have side effects and fatigue is one of them. When people take them at 7 in the morning, and they're tired all day, they don't like to take their medications. If we can accommodate that by having them taken really late or really early DOT, that's better, but it's not exactly for everyone.

The last one we want to go over is the stigma. Especially in some of our populations, having a health care worker or county staff show up to someone's house every day, during the initial phase especially, can be quite stigmatizing and socially disruptive for some of our patients.

Slide #9: So, one of the proposed things to lessen the burden on health departments and on patients is electronic DOT. This started with video phones. These were specialized devices you could connect to your modem. It showed a picture of someone, and as long someone else on the other hand had the same video phone, you could communicate. I think Washington did some stuff in the early 2000s with video phones. What we are talking about today is using the internet, either in real time or recorded, to talk about electronic DOT. There's a bunch of popular programs out there like Skype, Go-To meeting, Live Meeting, or Google hangouts where you can do this sort of thing in real time. It's one person taking their medications, and on the other end of the line is a staff person watching you take the medications, all at the same time. Now recorded internet transmission; you can do things with skype and other programs as well. Where, instead of doing it in real time, you can take the medications when you want. It is date and time stamped and then you then send that recording of your DOT to your health department whenever you have an internet connection. We prefer, of course, that you do it right then. You have to do it on your own time, you send it when you want, and the staff person on the other end of the line is able to view the DOT whenever they want.

Slide #10: So, we are going to talk today mostly about real time and recorded internet DOT. When we started doing this, we had to think about who would be an ideal electronic DOT candidate. When we were going through this, our first consideration was, we want this to happen in the continuation phase. We already know if they have medical intolerances or if they'll have adherence problems- those sorts of things. They are already down with the routine. We felt way more comfortable with them doing this in

the continuation phase. The second criteria was not multi-drug resistant TB, just because those cases can get, of course, very complicated. The third point was they didn't have any adherence concerns in the initiation phase. We know that some people we treat don't believe and will never believe they have TB. We didn't feel that doing electronic DOT was a good idea for them because there may be more opportunities to cheat. The fourth one was that they have an internet connection. We are working on this. This is a teaser for a little bit later in the presentation. Originally we were working with people on their own equipment. And the last point, which is the most important point, is if they are willing to do it. There are some people who do not want to do this for whatever reason. Whether it's privacy or whether they like the social interaction that DOT gives them, especially the elderly patients. We really wanted people to view this almost like an incentive. This is a patient-centered thing. If they wanted to do it, awesome. If not, that's up to them.

Slide #11: I want to talk about case management of these cases. The basic thing is that it continues exactly the same as if we were doing it in person. If we were using incentives or enablers before, we continue to do that. We do a weekly case conferencing with our health officer, just the same as in person. And just like in person, they receive an in person visit once a month. It's a nursing visit where we deliver the medications. We also do a nursing assessment, looking for medication tolerance and weight checking our dosing.

Slide #12: When we stop. So, if we think there is an adherence concern: they are either not showing up, sending us their DOTs, not doing it when scheduled, we will generally give them a warning. After that, if it isn't working, then it isn't working and we take them off. The second one is medications not being tolerated- we go back to in person DOT. And the last reason is a client decides they don't want it. This could be a permanent or temporary thing. As I'll show later, these people that did e-DOT; some of them used it every day, and some of them didn't. Some of them were going on vacation again and wanted to do it electronically. We did this whenever people wanted.

I'm going to show a quick video of a sample e-DOT. This is me and this is Halloween candy.

(Video playing of Josh Van Otterloo pretending to take medication via e-DOT – no audio)

Alright, that's it. That would be my DOT for the day. Notice how this was taken with my nurse's iPhone. You can send it to the health department. They can do this and that. If this were an actual DOT, the nurse would have said, please don't reach off the screen for your water. We do a little bit of coaching as far as for ideal demonstrations.

Slide #13: The next thing I'm going to talk about is our evaluation. We figured, we think this is a good idea, but we need to show it's a good idea. We had three really big questions. Was e-DOT as good as in-person DOT? The things we measured were things like treatment interruptions, missed doses, hospitalizations, and treatment completion.

The second big question was: Were there cost savings? And, if there were, how much were they? The things we looked at were travel costs, staff costs, and of course, time saved by staff.

The third and final thing was: What are some program benefits and challenges we faced?

Slide #14: What did we do? We did a chart review of all the TB cases that we've seen since 2009, which is the first year we started doing e-DOT. We used a common abstraction form, which you can see on the right. It measured all sorts of things from treatment completion and interruption, number of doses completed, number of doses missed, whether that dose was electronic or in person, and demographics and other clinical measures.

Slide #15: When we look at our population of TB patients since 2009, we found a grand total of 52 who had active TB in that time period. Twelve of them did at least some of their continuation phase electronically. When we start comparing those who did e-DOT and in person DOT, we noticed especially that those who did e-DOT were more likely to be male and they also skew younger. I think the younger bit was expected, but the male bit was not especially expected. If you start looking at the age breakdown, the 65 plus, there wasn't very many folks who did e-DOT, but we do have a lot of elderly TB patients.

Slide #16: The next thing we wanted to do was look at how people used electronic DOT. The yellow here is an in-person DOT dose during that week. The purple is an e-DOT dose during the week. The hash ones are a mix of in person and electronic. So you can see that people really used this in a whole bunch of different ways. There's a bunch of people who used only electronic DOT for their entire continuation phase. Then there are others who mixed and matched. And then there's the interesting case of patient number 8, who you see the regular spaced, mixed because they chose to use in-person DOT when they had a nursing visit, which was every four weeks. But, there are some others that did it intermittently; they went overseas or they went out of state. When they did that, they did it electronically. Otherwise, they did it in person. People used it in all sorts of different ways.

Slide #17: We noticed there were only 12 people, but there were a lot of doses. Our main effectiveness measure was the rate at which people missed doses, whether in-person or electronically. This is every single dose, broken out by whether they only did in-person DOT, they mixed their DOT, or they only did recorded DOT. We can go back to this slide later and I believe these slides will be available online. The take away was, when doing in-person DOT, people missed about 2.5 percent of their doses, and in electronic DOT, people missed 3.8 percent of their doses. Everyone who did electronic DOT completed treatment. We know 2.4 versus 3.8... is that different? Especially since we know that the populations are different; who did electronic DOT versus those who did in-person. So, what epidemiologists like to do is run regressions, and as an epidemiologist, I did that. That is the next slide.

Slide #18: There are two big models here. One that compares in-person DOT to electronic DOT. We got an elevated odds ratio, but it is not statistically significant. So really, there's not a real difference between the rate of in-person DOT and electronic DOT missing their doses.

If we looked closer at that last slide, there weren't many people that did real time DOT, and they missed a bunch of their doses. So, is there a difference in real time electronic DOT and recorded electronic DOT. We see for recorded electronic DOT an odds ratio of 0.79 and it's not significant. But real time electronic DOT was elevated and significant. There's an extenuating circumstance regarding real time electronic DOT, and the numbers are really small. But we saw for the recorded electronic DOT especially, there is no real difference in the rate that people miss doses when we were doing recorded electronic DOT.

Slide #19: The next question we moved on to here in the evaluation is cost. The three things we looked at were time spent driving, time spent observing DOT, and travel miles spent. So measuring time, we did drive time by Google maps from the health department to each patient's home. To measure how much time we spent actually observing DOT, we did interviews with staff, and people thought they did ten minutes for an in person visit, and five minutes total in an electronic visit. For travel spent, we calculated distance between the health department and people's homes on Google maps. The big caveat here is that this assumes that the software is free. And for this time period, our software was free. We were using Skype and Oovoo. Spelled O-o-v-o-o. They were both free programs that we were using. Of course, that assumption might change if you had to buy software to do this.

Slide #20: Here is an example of how this works. This is a hypothetical patient who is a pan-sensitive pulmonary TB example. I'm trying to break down costs by initial phase and continuation phase. In the initial phase, all the doses should be in person so you can see they are exactly the same between someone who is going to eventually do e-DOT and someone who is doing in-person. That all changes in the continuation phase. The time spent doing individual DOTs in cut in half. There is no travel time to the patient's house, and we are also not paying for mileage. In this very simple and straightforward, only six months, non-complicated case, you can see the difference in costs being about 668 dollars over 36 doses. That's about 20 dollars a dose.

Slide #21: So now when we did this for everyone, we went through everyone's individual records. We took out how many doses they did, how many doses electronically, what was the travel time to their house, and the mileage to their house, it started to add up. 2,500 dollars in just DOT time. 10,000 dollars in travel time. A mileage savings of 27,000 miles; 15,000 dollars' worth in savings. Grand total, we calculated in this time period from 2009-2013, we saved over 28,000 dollars. Over a 1,000 doses, that comes to 28 dollars a dose.

Slide #22: Beyond cost and effectiveness, we looked at program benefits and program challenges as well. The first is program benefits. The clients really enjoyed electronic DOT. They could do it from their own home. They didn't have to have someone come in. A lot of clients felt they had to clean up when a health care worker came to their home. They could treat it like their other diseases; like diabetes, like taking your pills early in the morning. It's not having to accommodate someone coming to your house. The second benefit we found was people have lives and they want to be able to travel and not have to be in the same house for six months. Especially when their family lives overseas. You can do an electronic dose from anywhere. Anywhere, unless the government blocks Skype, which has happened. You don't have to add doses to the end of treatment. You don't have to have these massive treatment interruptions. We are not an especially mountainous county, but there are some areas that are in the hills and on top of the mountains. We do get wintery weather, so there have been instances where people have done an electronic DOT when the road to their house has been impassable, which has been awesome for both the patient and our staff. Our third point here is greater staff flexibility, especially applies to recorded doses. Our staff doesn't have to schedule a DOT visit or wrangle with patients to schedule a time for DOT. They can, whenever they have a moment, pop up their computer and watch that 45 second video. It has been really simple and our staff has loved it as well. This last point is really cool because we noticed that we had cost savings, and that has allowed us to use the 12 dose LTBI

regimen to high risk clients. We previously thought we only had the resources to give this regimen to contacts of active cases. We've started doing electronic DOTs for these LTBI patients.

Slide #23: Now we get into the barriers and challenges. Number one on the list is IT departments. They especially don't enjoy giving county employees access to things like Skype. It's on a list of banned programs for liability reasons, but also because they don't want people goofing off on Skype. There are also confidentiality issues with some of these programs as well, which I will get to in the next point. IT departments have been a constant; it takes a lot of work to bring them on board.

The second issue we are having is HIPAA and confidentiality. Security rule interpretations will vary. This is the rule that says that if you're doing electronic things, like electronic recordings, they need to be encrypted. These interpretations do vary. Over the last few years, we've had a couple of different general counsels with the county. We've had a couple of different opinions. This may vary county by county, based on how your prosecuting attorney decides to interpret this security rule. Currently in Clark County, the interpretation is the security rule does not apply to the real time communications, but they do apply to the recorded DOTs. So, it's complicated and you have to go through your general counsel on this one.

We've done some things to mitigate HIPAA concerns, such as making every patient who does this do an informed consent. You can't always assure that things you send over the internet are secure. For that reason, we generally don't discuss the case over the internet. If they have something to discuss, we tell people to call us. Otherwise, there could be a very large HIPAA concern.

The last point is reimbursement. At least in Washington, we've had trouble getting reimbursed for these electronic visits. I've heard there's change afoot but, that's an ongoing issue as well.

Slide #24: In conclusion, when we did this evaluation, it looks like electronic DOT doses are no more likely to be missed than in person DOT doses. Now, there may be a difference between real time doses and recorded doses, but we didn't have very many real time doses in this time period. When we looked at costs, costs were a lot lower when we did electronic DOT compared to in person DOT. That will change based on if you assume software is free, or if you're providing equipment to patients, or how far away your patients live from the health department. A lot of our savings was in driving there and mileage reimbursements as well. If you do have people really far away, you can save a lot of money. If people are right next door then that's less money. There were significant program benefits other than effectiveness and cost. Things like staff flexibility, not having to add doses to the end of treatment because of travel or bad weather. The ongoing confidentiality concerns are an ongoing challenge with us, and I foresee them being an ongoing challenge. But we are still doing electronic DOT.

Slide #25: So, I want to talk about looking into the future. On the horizon, we've been looking at doing a loaner program. So, loaning tablet computers out to patients who don't have an internet connection. I noted earlier, you have to have an internet connection to do it. We will be willing to pay for it because even you saw that six month example, we saved 650 dollars. Tablet computers don't cost that much. Smart phones cost even less. You can do DOT from them. So really, we could even give somebody a tablet computer and let them keep it, and we'd save money. Now, we aren't doing that, we are doing a

loaner program. Where we purchase the hardware and purchase the data plan that we can turn on and off. IT, of course, you have to work through them. They limit the apps and the websites people can visit. But, because it is an unlimited data plan, they can use the tablet for other things if they want to. So that's why you put parental controls on it, put the ability to wipe it remotely on the tablet, that sort of thing. We decided that the TB team would make the decision on who would be a good candidate. It's basically anyone who meets the criteria for doing e-DOT; willingness, not multiple drug resistant, and no adherence concerns. Those are the big ones. It's going to be a TB team decision to see who gets these things.

Slide #26: Final thoughts, looking at everything. I think a big point here to remember is that there's always going to be a need for in person DOT. Especially at the beginning of treatment, during the initial phase. And there are just some people who are probably going to do better on in-person DOT rather than electronic DOT. But this is a really good option that you could consider. The second point is that we're really considering electronic DOT as a patient centered way to do DOT. Don't make patients chose between their life and DOT, because you might not like the answer or, at least they may make it challenging for you. I feel like electronic DOT can fit into people's lives a lot more easily than having a healthcare worker go to their home, or they have to go to the clinic, or any of these other things. This really removes a lot of the practical life barriers to DOT. The next point was don't take no from your IT department. Obviously, the first time we asked if this was a good thing to do, the answer was a straight no. This leads to the next point. Leadership buy-in goes a long way because when we can say, or when our director can say to the IT department, "hey this is actually a good idea," the answer changes from no to 'let's figure out some way to make this work'. That went a long way with the IT department and the general counsel as well. Even talking to legal, leadership buy in has helped a lot. That's a big thank you to our leadership team. I think the big take away point here is that technology has come a long way since video phones. When we did video phones, at least in Clark, we had things that didn't connect to the network very well, the resolution wasn't very awesome, it was jerky internet, and all those sorts of things. We haven't had a problem with here in Clark doing this electronic DOT. I honestly think this is a really good option for some people, and it has worked really well for us. I think it is a good option that other people should at least look into.

Slide #17: So, that's our presentation and our experience with electronic DOT. This is our CD and TB team. You have my contact information, as well as our CD team's phone number. Please give us a call, or shoot me an email. We are more than willing to answer any questions about electronic DOT. If any of you guys have questions, please give me a ring.

Sheanne: Thank you so much, Josh. That was a great overview of the project and the hard work, and innovative work, you guys are doing down in Clark County. I think along with this presentation, would you be willing to share the forms you guys have developed through this process?

Josh: Absolutely. We have been developing user agreements and consent forms. I can absolutely get that and pass it on to you guys.

Sheanne: Fantastic. Also, how long do you think it took your team to get buy in from leadership and IT? I know you said it took a couple discussions with IT, but did leadership buy into it right away?

Josh: I think we were really fortunate. Leadership bought into it quickly. We had a TB meeting where it was brought up. This was actually suggested by a patient who was very comfortable with the technology first. Our nurse and community health worker thought 'Sure, why not? Let's bring this up.' We got leadership buy in from the beginning. But it did take a couple weeks between the suggestion and getting it set up, and having everyone talk to each other.

Sheanne: Great. Lindsey, did you have other additional questions?

Lindsey: I did. I know that you mentioned that on the recorded ones, there was a time stamp with the video. Was that something that Skype always did, or was that something special you had to do? In relationship to that, did you store the video in a certain place or keep it for a certain amount of time?

Josh: The first question about the time stamp: it was automatically done. It is an option in Skype. Most of our recorded ones were done through the other program, Oovoo. Oovoo automatically time stamps them. The second question about storing the videos was a big point of contention with our legal department. Besides them being relatively large files, they didn't want those hanging around. Since we view our chart as the definitive record, we don't hang on to them after they're viewed.

Lindsey: We were going to ask about the personal use of the loaners, but if you can put restrictions on them that's great. You said you didn't have a lot of older folks who did electronic DOT, even though they're the biggest population that you do DOT with. Have you thought of training them, or have you had some that are elderly that it does work with? How did that go?

Josh: There are some very tech-savvy elderly folks out there. Some of the things like the tablet and smart phones are way more intuitive than using Skype on computers. With every single patient, during their last in person dose, we'll do a test run on the software. They should have some knowledge going into it. As people start getting older and more use to the technology, I'm sure we'll see more older people doing these recorded and real time doses.

Lindsey: Thank you. Those are all of my questions.

Sheanne: Thank you so much Josh. Again, we are really proud that we have a county in our state that is cutting edge with this type of technology and adapting to all the changes and resources, and everything else that we're facing. It's great work!

Josh: Thank you. It helps having the state supporting you too, which has been awesome on your end too.

Sheanne: Thank you.

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