New Frontiers in Hand Hygiene Promotion and Measurement

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Coordinator: Good afternoon everyone and thank you for standing by. At this time all participants are in a listen-only mode. After the presentation we will conduct a question and answer session and to ask a question please press star 1.

Today's conference call is being recorded. And if you have any objections you may disconnect at this time.

I would like to turn the call over to your host, Miss Ward-Cameron. And you may begin, Ma'am.

Conne Ward-Cameron: Thank you and good morning or good afternoon depending on where you are today. We are delighted to welcome you to today's conference call from COCA, the Clinician Outreach and Communication Activity of the Emergency Communications System at the Centers for Disease Control and Prevention. We're very pleased to have Dr. Kate Ellingson, epidemiologist in CDC's Division of Healthcare Quality Promotion and Chris Hlady, graduate

student from the University of Iowa Department of Computational Science presenting the New Frontiers in Implementation and Measurement of Hand Hygiene Practices.

The video portion of this call is available through Live Meeting. If you need help accessing the video, the URL CAN be found on our Web site, (emergency.cdc.gov/coca/callinfo).

The objectives of today's call are that the participants will be able to discuss how changes in incidence and prevalence of epidemiological – I can't even say that today, excuse me , important pathogens impacts implementation of hand hygiene recommendations to identify the challenges to hand hygiene adherence monitoring and discuss the latest technological advances including a novel iPhone application for hand hygiene adherence monitoring and to describe national and global hand hygiene campaign activities and resources to promote hand hygiene.

If you have questions the presenters will take those at the end of the call. Dialing star 1 will put you into the queue for questions.

In compliance with continuing education requirements all presenters must disclose any financial or other relationships with the manufacturers of commercial products, suppliers of commercial services or commercial supporters as well as any use of an unlabeled product or products under investigational use. This presentation will not include any discussion of the unlabeled use of a product or products under investigational use.

CDC, our planners and our presenters, wish to disclose that we have no financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services or commercial supporters. There is no commercial support for this presentation.

Our first presenter this afternoon is Dr. Kate Ellingson. Dr. Ellingson began her CDC career in 2006 in the Epidemic Intelligence Service where she spent two years investigating the transmission of infectious pathogens in healthcare settings and evaluating prevention initiatives designed to reduce such infections.

She has worked on several projects specific to MRSA including an evaluation of an initiative to reduce MRSA transmission in Virginia hospitals, an assessment of antimicrobial resistance on the U.S./Mexico border and a policy analysis of a state mandate for public reporting of hospital-associated MRSA infections.

Dr. Ellingson has worked internationally in Kenya and Uganda to build infection control capacity and reduce amplification of outbreaks in East African hospitals. She's also led domestic investigations into quality of care for dialysis patients and for transfusion and transplant recipients. Her current position emphasizes qualitative -- excuse me -- quantitative statistical analysis and the translation of CDC guidelines into feasible practices.

Our second presenter is Chris Hlady. Chris is the iPhone developer for iScrub Lite and iScrub Pro, a pair of applications for the Apple iPhone and iPod Touch.

He is the first author on a related communication for ICHE that is in press, was the first author and presenter on related posters at IDSA in 2009 and the SHEA/IDSA/APIC Decennial in 2010.

Thank you for being with us today Kate and Chris. And we'll start with Kate.

Kate Ellingson: Thank you Conne and thanks to everyone who's joined the call today. So tomorrow is May 5 which marks an annual call to action for the global community of healthcare personnel.

The SAVE LIVES: Clean Your Hands campaign is a global campaign that was initiated by the WHO to improve hand hygiene among healthcare personnel. And this campaign really centers around the Five Moments for Hand Hygiene. So we have five moments, five fingers and hence the day, May 5. And later on in the call we'll discuss how hospitals can participate, what some states have done to rally around this initiative and how we can embrace this global momentum as a nation right now.

As you guys know, hand hygiene is likely the single most important preventative measure healthcare personnel can take to prevent the acquisition and transmission of healthcare-associated infections. But still adherence to recommended practices is unacceptably low in healthcare settings. So given the momentum around this May 5 it's a good time for us to take stock of where we are with hand hygiene, what our challenges are, what resources are available to us and most importantly how we can mobilize.

So today we'll be actually going through this presentation in three parts. The first will be hand hygiene and the changing epidemiology of certain

healthcare-associated infections. And I'll touch briefly upon MRSA, Clostridium difficile and H1N1. And then we'll move on to hand hygiene measurements in healthcare settings. We'll talk about the traditional and cutting-edge methods for measurement of hand hygiene adherence including a demonstration of the iScrub application for iPod Touches and iPhones. And finally we'll talk about campaigns and resources available to all of you for hand hygiene promotion followed by Q&A at the end.

So before we get started let's do a quick rundown of hand hygiene agents that are commonly used. First is the traditional soap and water which reliably moves dirt and organisms from hands -- in healthcare settings it's been associated with skin irritation after repeated use -- and alcohol-based hand rub or ABHR, which is active against a very broad spectrum of gram-positive and gram-negative bacterias and viruses but it's not active against certain spores of concern in hospital settings. But taken together soap and water and alcohol-based hand rub are the primary agents that are recommended by both WHO and CDC as acceptable in healthcare settings.

Soap and water is recommended with hands that are visibly soiled or when exposure to spore-forming organisms is suspected. And alcohol-based hand rub is suggested for other - every other routine hand hygiene indication.

Other products that you may have heard about and I'm welcome to entertain questions about after the call if you'd like to talk about them are Quaternary ammonium compounds or quats. An example of this is Benzalkonium Chloride.

These products have weak activity against gram-negative bacteria. And for this reason we don't recommend them in healthcare settings because they've been associated with outbreaks. However, there is a lot of industry focus on these compounds and more research to come on those.

Another product you may have heard of particularly recently is triclosan. This product has a broad range of activity but it's relatively non-effective against certain gram-negative bacteria. It does have persistent activity but it's not recommended in healthcare.

And you may be seeing this in the news recently because a Congressman from the state of Massachusetts, Edward Markey, has actually been very active in petitioning that products containing triclosan as an active ingredient be removed from certain products. And they're very common in consumer antibacterial soap.

So why hand hygiene? You know, it starts with the disease transmission model that you've all seen before but it's worth just going through quickly. An organism has to leave its original host, survive in transit on surfaces or hands, be delivered to a susceptible host, reach a susceptible part of the host and escape host defenses.

So hand hygiene can actually intervene at any one of these transition points. So healthcare workers by practicing hand hygiene after patient contact can basically eliminate the potential that it will even survive in transit and also performing hand hygiene before treating patients obviously can prevent it reaching a susceptible host.

And one other component that particularly at WHO campaign focuses on is reaching a susceptible part of a host. Now hand hygiene you may perform it before treating a patient but if an aseptic task is performed during care it's possible that an organism be transferred from a patient's skin for example to a central line which is directly accessible to the blood supply. So there are many points at which hand hygiene can help.

You've probably all heard of Ignaz Semmelweis. And he is considered the father of infection control for his discovery of the role of hand hygiene in preventing what was called, termed, Child Bed Fever back in 1847 where one ward which had delivering mothers had a 13% mortality rate and this was because it was discovered through some investigation that the medical students working on this ward had handled corpses before delivering.

Semmelweis recommended hand-washing with a chlorinated lime solution before examining patients. Mortality rates dropped quickly and significantly.

And this type, these type of studies actually follow us into modern day. For example in 2009 a review was published on the association between increased hand hygiene adherence and reduced healthcare-associated infections. Over 20 studies showed significant associations.

And oftentimes these interventions to increase hand hygiene adherence involved a multi-modal approach including administrative support, increased accessibility of hand rub, training and education, and data collection and feedback. And you'll notice that a lot of the tools we talk about later in the presentation really focus on this multi-modal approach.

But unfortunately also in a recent review published this year in Infection Control and Hospital Epidemiology 96 studies of hand hygiene adherence in industrialized nations have shown a very low overall adherence rate of 40%.

So let's focus for a minute on MRSA. So resistance to methicillin has been acquired in hospital settings. And here's one cartoonist's theory on how that might have occurred.

We can see that in 1940 there was absolutely no resistance to penicillin for Staphylococci but of course this increased over time as did resistance in the community setting. And then you'll see that in 1970 methicillin resistance was acquired in hospital settings followed in the '90s by resistance in community settings.

And this slide just shows Staph aureus carriage by body site. So you'll see on the left side this represents the general population. And just over 1/4 of people are colonized with Staph in the navel cavity.

And of those people who are colonized -- on the right-hand side -- 90% of them could have Staph aureus recovered from their hands. So this really indicates that MRSA can live on hands and therefore sort of enhances our focus on hand hygiene as an intervention.

So we know MRSA in healthcare settings is a very important organism. Over 94,000 invasive MRSA infections are reported annually in the U.S. And these are associated with over 18,000 deaths per year. And 86% of these invasive infections are healthcare-associated. And in our CDC surveillance system we

see that 49% to 65% of hospital-associated Staph aureus infections are methicillin resistance.

And MRSA is a problem because there are fewer effective treatment options and higher morbidity and mortality for patients when you compare to susceptible Staph aureus infections. And this high prevalence of MRSA influences unfavorable antibiotic prescribing. And this can lead to further resistance.

So the good news is that MRSA prevention is possible in healthcare settings. In fact our own CDC surveillance systems have shown the rates of central line associated bloodstream infections or CLABSIs that are caused by MRSA declining by nearly 50% in the past decade.

And CLABSI prevention efforts are basically the reason why we think that these rates have declined in the past decade. And a key part of these prevention efforts have been an emphasis on hand hygiene before insertion of central lines as well as hand hygiene during routine maintenance of catheters.

And for MRSA infections overall, not just bloodstream infections, several single and multicenter studies have demonstrated that MRSA prevention programs can be effective. And most of these programs included increased availability of alcohol-based hand rub and feedback of hand hygiene adherence rates as well as infection rates to healthcare personnel.

And so this is one study that was conducted at the University of Geneva hospitals demonstrating the impact of hand hygiene on MRSA rates. It was published in Annals of Internal Medicine in 2000 by Didier Pittet.

And as you can see in this graph here the rates of hand hygiene adherence increased over time. So the - each bar represents a hand hygiene observational study conducted throughout the study period 1994 to 1997.

So you can see that overall compliance increases over time. However, the proportion of hand hygiene events involving hand-washing declined. So this is really - this slide demonstrates that the increased use of alcohol-based hand rub has really helped increase rates of hand hygiene adherence overall.

And then when we look at this same time period and look at rates of all nosocomial infections, the axis on the right and the incidence rates for MRSA on the left you can see significant decreases associated with the increase in hand hygiene. So that was great news for MRSA. And we really see the impact of this increased availability of alcohol-based hand rub, etcetera.

And then we turn to a very important healthcare-associated pathogen, Clostridium difficile, which causes,which actually makes us kind of reexamine our approach to hand hygiene recommendations. So C. difficile has been increasing in its burden over the past ten years.

And you can see in this graph that since 1997 the number of hospitalizations associated with a C. diff diagnosis has increased dramatically. And over 165,000 cases of C. difficile associated disease have been reported annually in hospital settings so these are hospital-acquired, hospital-onset infections. And these are associated with 1.3 billion in excess costs and over 9,000 deaths annually.

Likewise we can see that these C. difficile cases also occur in nursing homes in large numbers at high cost and high mortality. And many of these infections have onset post-discharge.

So hand hygiene in the area - in the era of C. difficile infection gets a little bit complicated because alcohol-based hand rub is not efficacious against C. difficile. So the 2009 WHO guidelines accommodates this issue by recommending soap and water if exposure to potential spore-forming organisms is strongly suspected or proven including outbreaks of C. difficile.

For all other situations alcohol-based hand rub is recommended for routine hand hygiene use. So this becomes a little bit difficult when we talk about how to most effectively apply guidelines because alcohol-based hand rub increases hand hygiene adherence but there's a concern that the shift to soap and water could decrease adherence.

This slide basically just shows some of the studies that essentially demonstrate the superior efficacy of soap and water to alcohol-based hand gel for removing C. diff spores. And we also know from a very recent publication that C. difficile spores can readily be transferred through hand-to-hand contact subsequent to hand hygiene with alcohol-based hand rub.

So some experts have been very concerned that the increase in C. diff could possibly be due to this increase in the use of alcohol-based hand rub. However, a study published by John Boyce in 2006 showed that there was a dramatic increase in the use of alcohol-based hand rub as you can see from this chart in the early 2000s. And during the same time period there was no

increase in Clostridium difficile detected at this particular hospital. And these findings have actually been backed up by a number of other studies as well.

One thing we need to consider with C. diff is the role of asymptomatic carriers. So if you look at this chart you see that for patients with C. difficile associated disease the large majority of them have skin contamination with C. diff. But even asymptomatic carriers, the second set of bars, have a high rate of skin contamination.

So if healthcare workers are not able to identify people as being carriers then this becomes difficult to know what's the optimal mode of hand hygiene. Likewise on the bottom row you see environmental contamination which follows a similar pattern. And so this has actually prompted some experts to think about the role of universal gloving during outbreaks of C. diff.

And so really we need to balance what we know about alcohol-based hand rub -- it's available more often at the patient's bedside, requires less time with no hand-drying, is well-tolerated on the hands of healthcare personnel and is associated with decreases in important HAIs including MRSA -- with some of the uncertainties about Clostridium difficile such as how it - how is it possible to readily identify colonized patients and what is the incremental gain of using a alcohol-based hand rub versus soap and water if gloves are worn for patient care.

So these are questions that we're actively thinking about at CDC. Many of our academic partners are addressing these. And we really need to stay on top of this issue so that we can optimally implement hand hygiene guidelines

without taking any steps back in the progress we've made by increasing adherence with alcohol-based hand rub.

So I'm going to touch very briefly on pandemic influenza H1N1 because this has been an issue that we have dealt with at CDC for much of the past year. So we have recommendations in our hand hygiene guidelines.

And basically the logic behind them is pretty straightforward. We know that there's evidence to support contact transmission of respiratory viruses. And there's also good evidence to support that hand-washing in healthcare settings or use of alcohol-based hand gel is very effective against influenza viruses.

So we really thought during H1N1 that we would not be dealing with a lot of hand hygiene questions. We had bigger fish to fry. We have to decide about respirators versus surgical masks, et cetera, where we thought we were home free in terms of hand hygiene.

However, we did encounter a lot of issues with hand hygiene in community settings. So there's no CDC guideline for hand hygiene in community settings and therefore a lot of people were concerned about our recommendations for healthcare settings.

So there was a lot of media about keeping your hands free of flu virus. And in fact our flu division was consulting with us on, you know, what should we recommend in terms of hand hygiene and, you know, our guidelines recommend use of alcohol-based hand rub but there's some concern about using this in schools and certain institutions where, you know, there may be fire danger. I mean you name it, we had - we heard it here.

And so the official message out of the CDC was wash your hands often with soap and water because we know that that's effective against flu, it's effective if your hands are visibly soiled, it's effective against spore-forming organisms. And because some of the same issues don't occur in the community with repeated hand hygiene activity, you know, this seems to be the best recommendation for the public.

But I just wanted to mention this because you as healthcare personnel interested in hand hygiene may also encounter questions about what to do in community settings. And this was our message. So there was also a lot of - there's some data to show that hand-washing doesn't stop H1N1.

And finally one thing I wanted to mention is that a lot of companies became very aggressive in their marketing of the non-alcohol-based hand sanitizers during the H1N1 pandemic both to communities and to healthcare settings. So the FDA actually issued a warning letter to several of these companies asking them to stop claiming that their product was effective against H1N1.

And so I just wanted to mention that to you as something you may encounter. And know that both CDC and FDA are looking at data with regard to these non-alcohol-based hand sanitizers. But our recommendation still stands about use of alcohol-based hand sanitizer as the preferred mode of hand hygiene.

So we're going to shift gears and talk about hand hygiene adherence measurements. So there're basically four methods for measuring hand hygiene adherence. The first is direct observation which is our gold standard, measuring product use, surveys or self-report which is generally considered a

extremely poor method and finally automated oversight technology which is sort of the cutting edge now.

And I'd like to refer everyone to this link at the bottom of the page to a Joint Commission document which is very well done and discusses all of these different types of measurements.

And there's no standardization currently in hand hygiene measurement in the U.S. which is a problem because without standardization we can't properly benchmark hand hygiene adherence, we can't assess adherence nationally and it becomes difficult to compare published study. So we need consensus on how to train observers and how to aggregate data.

This is one form that the WHO has published. The - and it basically works in conjunction with their five moments for hand hygiene.

The WHO has also developed a one-moment observation form to simplify things. And in the U.S. we oftentimes measure before and after patient care because it's sometimes difficult to see inside rooms when you're doing direct observations.

So without further ado I'm going to turn it over to Chris, who is going to talk about the iScrub application.

Chris Hlady: Okay. Thank you Kate. My name is Chris Hlady. I'm a doctoral candidate at the University of Iowa in Computer Science. And I work with the Computational Epidemiology Research Group there.

Along with two other graduate students, Donald Fries and Jason -- sorry, I mixed those up -- Donald Curtis and Jason Fries I am working on a project called iScrub. iScrub is an iPhone and iPod Touch application for collecting hand hygiene adherence data.

So before I get into what iScrub can do let's talk about what the current - what's currently done. So a typical situation would be that an observer will grab a clipboard, they'll pull up a chair, they'll sit down for maybe half an hour to an hour and watch people go in and out of rooms and mark down opportunities. Then when they're finished they'll had the clipboard off and someone will transcribe those observations. They'll enter it into a program like Microsoft Access or Microsoft Excel.

And then from there, not right away but eventually some reports will be generated. Perhaps this might be a bar chart that will get posted on a wall in a workroom.

And there's a few problems with this process. The transcription process can be time-consuming and it's error-prone.

It would be ideal if you could get the feedback very quickly. But what we've heard from nurse managers and infection control professionals is that you might have - like I said you might have an institution that's very efficient and they can do this in a week or two but you'll see that in a lot of cases it's actually three to six months before this data is fed back. And at that point we think that the - it's much less valuable than if the data were fed back right away.

So let's talk about what iScrub can do. iScrub is meant as a replacement for this pen and paper based collection. It has intuitive touch interface so the observations are recorded using taps and slides. It has a built-in mechanism to record - sorry, to minimize data entry errors. And it can be easily customized on the device to suit the needs of many institutions.

Another notable thing is that it's an iPhone application but it also works on the iPod Touch. And what that means is that you don't need a phone contract that has a month-to-month bill. It's just a one-time hardware purchase.

So now I'm going to show a short demo on how to - how you actually make observations on the device. So Conne, can you hook me up with that?

Conne Ward-Cameron: Yes, getting ready to start that. And we apologize upfront. The audio and video may not be perfect but you'll be able to download this video from our Web site within 24 hours. So here goes.

((Video))

Man: This is a short demo to show you how easy it is to make observations with iScrub. For this demo I'll be using iScrub Lite. I'll go ahead and tap that icon to open the application.

From the main menu simply tap Record Observations. Now choose where you'll be observing. For this example I'll say that I'm in the surgical intensive care unit.

Now I'm ready to make observations. Let's say I see an opportunity. A nurse walks into a room and uses alcohol rub. I'll simply tap Nurse, tap In Room, and then I'll tap Rub. Now I'll just drag this confirmation slider to the right to confirm the observation.

That's all there is to it. I'll do a couple more so you can see how quick it is. As you can see it's not very hard to enter observations.

((End Video))

Chris Hlady: Okay. Thanks Conne. And unfortunately the video was a little choppy there so all you heard at the end was a bunch of clicks. But I was making observations there. And it was, you know, takes about two to three seconds per observation.

So as you can see it's pretty easy to make observations in iScrub. It's just a series of taps and then a flick to confirm the observation.

And it's also easy to attach notes to observations. So in the screenshot to the right you can see next to Rub there's a paper icon with a plus on it. And you just tap that to attach a note.

And so when you tap that button you'd be presented with a list of notes, for example patient coding or intervention taken or improper mask usage, things of that nature. And then you'd just tap that to add the note. And then again you just flick to confirm the observation.

iScrub also has support for isolation precautions. So as you can see it knows what type of personal protective equipment is necessary for contact, droplet and airborne isolation.

So for example here we have contact and droplet isolation precaution selected. And it knows that that means that you need - that the healthcare workers should be wearing gloves, gown and a mask. And then to indicate adherence with each of those you would just tap yes or no and then again just flick to confirm.

So iScrub has always been able to - has always had support for in and - to record in and out-of-room opportunities. But new in iScrub 1.5 we've added support for the World Health Organization's Five Moments of Hand Hygiene.

iScrub remembers the time and location that observations take place so that you can later go back and do some sophisticated analysis of the data. Each observation is also tagged with the device name. For example you might name your iPod Touch Pat's iPod or Pediatrics iPod Number 1. And that's included in the exported data so you can go back later and figure out, you know, if you have one iPod per observer -- that's probably an uncommon situation -- but you could figure out exactly who made the observations or more generally you could, you know, you could check out the devices and get a sense of who is making observations and how many observations they're making, et cetera.

We've also made it easy to do - to train new observers on iScrub. Observations that are entered for training purposes can be cleared prior to exporting.

Another benefit of iScrub is that you can conduct observations discreetly. For example you can just pretend you're listening to music or checking your Facebook status rather than doing productive work.

iScrub, there's two versions of iScrub: iScrub Lite and iScrub Pro. iScrub Lite exports via email to Excel for analysis. So that's probably pretty similar to what you might be doing in your institution right now. You have an Excel programmer there that takes some data and generates some plots for you. iScrub remembers the last few data sets that you've exported so in case an email gets lost you can go back and resend observation data.

And in iScrub Lite the customization is done directly on the device. And I'll talk a little bit more about that in a second.

And best of all iScrub Lite is available free. And at the end of the presentation or at the end of my set of slides I will have a link where you can actually go and get a copy of iScrub.

So now I'll talk a little bit more about the customization. iScrub comes with default lists for locations, and that would be surgical intensive care unit, medical intensive care unit; job roles, and that's the screenshot you see here, for example, physician, nurse, consultant, etcetera; and then these observation notes. And as a reminder that would be improper glove usage, things of that nature.

And you can edit all of these lists to suit the needs of your institution. You can delete any of these entries by tapping that - the red icon. You can add a new entry. You can add a new job role here by just tapping add a new job role at

the bottom. And you can do that for, like I said, locations, job roles and observation notes.

So that's iScrub Lite. iScrub Pro shares many of the same features but it also has a companion Web site that allows you to do some data management.

iScrub Pro makes it even easier to aggregate observation data. You just tap Sync and the latest observations are uploaded to the iScrub companion Web site.

And on this companion Web site it's easy to kind of print whatever charts you want. You can drill down. You can say I only want to look at this type of healthcare, I only want to look during this period of time, I only want to look at in-room opportunities. You can do anything like that. And it doesn't require any Excel knowledge to do that.

iScrub Pro also allows you to do the - allows you to customize the locations, job roles and observation notes on the Web site itself. And then that configuration can be distributed to all of your institution's iPod Touch devices rather than doing it on a per-device basis.

You might have seen iScrub Pro presented at the 5th Decennial International Conference on Healthcare-Associated Infections back in March. And here's a picture of our setup. And it's a picture of me and my colleague, Donald, standing in front of our poster.

And then on the left you can see that we have a monitor hung over our poster. And what you see on that monitor is what we call our slideshow. And that's a

way to feed back data very quickly to healthcare professionals. They have - right away they know how they're doing.

And during the conference we actually had a demo. And we handed out iPod Touches to anyone that came by our poster and they could make observations and then in near real-time see that data get updated on a slideshow.

So I'll go ahead and go through a couple of our different types of slides. So we call this our summary slide. And it gives you a very quick sense of what's going on today, what happened yesterday and what's been happening this week. For example today there were 109 observed opportunities and the adherence rate was 62%.

Here's our job role slide. So for every job role that your institution is tracking - and again you can go back and customize this. This is the default list we're showing here but if you went and added your own type of healthcare professional they would show up on this screen. So - and it breaks the data down by job role. So for example physician they had 45 opportunities and they took advantage of those opportunities 67% of the time whereas physical therapists had 32 opportunities and their adherence rate was 72%.

This slide shows adherence broken down by opportunity type. The data here was gathered using in-room and out-of-room. And if you're using - if your institution was using the five moments rather than in-room, out-of-room there would be a separate slide for that and it would show, you know, the similar breakdown.

And our last type of slide is a personal protective equipment slide. So for here, here you can see that gloves were required 14 times but they were only worn 57% of the time. And then there's similar data for masks, gowns and respirators.

So that's how iScrub works. Where can you find it? Well iScrub Lite is available now from the iTunes app store. To find it in there the easiest way is probably just to open up iTunes, go to the app store and then there's a search bar. And you could just type iScrub in there and hit search and, you know, it'll come up pretty quickly there.

Alternatively you can visit our Web site. And the address is (http://compepi.cs.uiowa.edu/iscrub/).

And iScrub Pro is currently in pilot deployment. We're currently looking for applicants from institutions interested in participating in expanded pilot. And if you are interested in that please visit our Web site or email us at (iscrub@compepi.cs.uiowa.edu) for more information.

Okay. Thank you.

Conne Ward-Cameron: Thanks Chris. And before we go back to Kate, Chris, we have a couple of questions in the Q&A format for our - for Live Meeting. Will you take a minute to answer those?

And don't forget, folks, if you - our participants, if you have a question that's a good place to put it while you're waiting for the Q&A at the end of the call. And now back to Kate.

Kate Ellingson: Thank you Conne, and thank you Chris. So in addition to things like the iScrub application which is basically a technological mechanism to assist with direct observations there are a number of other types of technological advances that aid in monitoring hand hygiene.

And one of those is the electronic monitoring of product usage. So there's several of these products out there.

One example that's in an article published by John Boyce in 2009 is the iSIGNOL devices which are placed within alcohol-based hand rub dispensers. And "hand hygiene events" are time- and date-stamped. And data can be downloaded wirelessly and analyzed. You can look at trends in the use of hand hygiene products.

And an industry has really developed around hand hygiene adherence monitoring so hand hygiene oversight technology allows institutions to monitor hand hygiene in the absence of direct observers. And this helps alleviate the time and expense and potential Hawthorne effects associated with direct observation. However, the validity and acceptability of this type of technology has not been broadly assessed.

And here at CDC we're actively engaged in research to evaluate the sustainability, cost effectiveness and optimal use of this type of data. For example we recently conducted focus groups among frontline healthcare workers, ward managers and hospital leadership at several hospitals to assess their knowledge of and attitudes towards the use of this technology.

Now before we get to questions and answers -- I'd like to leave as much time as possible -- I'd like to just talk about some of the hand hygiene resources available to you whether or not you have an iPhone or an iPod Touch and also some of the innovative campaigns that have sort of sprung up around the nation.

And so first on our Web site which I'll show you in a second you'll have access to our CDC guidelines. These were released in 2002. It was a collaborative effort between HICPAC, SHEA, APIC, IDSA professional associations.

In 2009 the WHO guidelines were published. And almost to the author there's the same authors as the CDC guidelines so it was the same authors participated heavily and developed the new WHO guidelines.

Obviously they contain updated literature reviews and backgrounds. The difference really is that the WHO guidelines are applicable to a much broader audience. So there's a lot of recommendations and discussions in there that are relevant to resource-limited settings including developing world. And in addition the WHO guidelines come accompanied by a lot of implementation tools.

And so if you go to the WHO Web site -- and you can see here this is their sort of homepage for the May 5 campaign -- you can find easy, quick links to these resources. So towards the bottom of the webpage shown here you can see a link to the WHO hand hygiene guidelines as well as the guide to implementation. In addition, at the top you'll see a link to tools and resources.

And just an example of the types of tools you can find there, you know, at the top you see a guide to local production. And this tool is really meant for resources - resource-limited settings where there may not be access to running water and the cost of purchasing alcohol-based hand rub may be prohibitive. So WHO has actually published two easy formulations and a step-by-step process is delineated. So in some of our collaborations internationally we're actually using this tool to help jumpstart this type of intervention.

Also if you look at the bottom of this page you see a tool for sustaining improvement, additional activities for consideration by healthcare facilities. And this tool is really meant for facilities that have made improvements in hand hygiene, perhaps have all the resources that they need but really need to sustain the behavior change needed. So some of the things addressed in this tool include, you know, e-learning, use of webinars, et cetera. So that represents sort of a totally different type of tool for a different setting.

And then of course on that Web site you can also find sort of the how-to posters and documents that are useful across any settings.

For this May 5, you know, annual initiative the CDC has decided to launch a new Web site on hand hygiene. So this will be launched on May 5, tomorrow. And the link is www.cdc.gov/handhygiene.

If you go there now you will see our old webpage. So if you want to see before and after go ahead and go there.

But between now and tomorrow morning this new Web site will be posted. It includes updated guidelines, interactive training and education materials, links

to all of the WHO implementation tools, some tools for measurement including the iScrub application plus some other information under the measurement link, and also a special section for patient empowerment because that's something specifically, in the U.S. we have - we've really started to move in this direction of empowering patients to ask their providers to wash their hands.

So we have videos, training modules, information on state-specific campaigns and then hand hygiene promotional materials relevant to U.S. settings. So I would say the WHO Web site has a ton of stuff. You should definitely visit. The CDC Web site will try to integrate a little bit more of the activities that are happening here in the U.S. and try to make our Web site relevant to settings in the U.S.

And we're actually participating in this WHO global campaign so as of March 31 there were nearly 8,000 hospitals registered with WHO worldwide and over 1,600 of those were healthcare facilities in the U.S. And so when participants or hospitals sign up for this campaign they are basically committing to improving hand hygiene adherence.

And, you know, they can - they're invited to adapt WHO resources to the local means of their institution. And there's actually a place where they can share their experiences with facilities around the world. And so this has become sort of a repository for successful interventions in hand hygiene.

And there are 38 countries that have national coordinated hand hygiene campaigns based on WHO materials. And the U.S. Health and Human

Services department is to sign on with the WHO in global partnership this year.

So one example of a state that's really taken the WHO tools and adapted them for their own needs is South Carolina. So you can see here their campaign is GSI or Grime Scene Investigation South Carolina. This is spearheaded by the South Carolina Hospital Association. And you can see at the bottom here they've adapted the WHO materials into their own campaign.

The state of Maryland has also embarked on a similar hand hygiene collaborative. And so this picture here is of the collaborative kickoff meeting which occurred in November of 2009 where over 200 attendees came from more than 40 acute care and specialty care hospitals.

And this kickoff meeting was followed by a series of webinars. And in these webinars they did things like train observers to assess hand hygiene in the same way for all the hospitals and the collaboratives. And then in their second webinar they also discussed, you know, a place where everyone could come and enter their hand hygiene data so they could either do it via mobile upload and some people were using iPhones or they could do it via desktop.

And so I just wanted to emphasize with our new Web site that we're launching tomorrow we really want to hear what's going on in your states. If your state has a campaign that we should know about, email us. If your hospital is doing something really innovative, email us. And, you know, we'll try to incorporate those campaigns into our Web site so that we can all continue to learn from each other.

And before we take question and answers I'm going to leave you with a short video. This is the patient empowerment video that's available on our Web site. The real video is five minutes. We're going to watch here a 30-second clip.

VIDEO PLAYS: no audio played

Okay, so I'd like to thank everyone for attending our call. And this is officially the end of this series of slides. I'm going to turn it back over to Conne.

And just one quick note on that video, the quality through this webinar interface is very low. But you can download the actual video which has great quality from our Web site.

Conne Ward-Cameron: Well thank you Kate, and thank you Chris. We still have questions in the Q&A block and Chris is continuing to answer those but we'd like to take your questions over the phone as well.

Kathryn, do we have anybody in the queue.

Coordinator: Yes Ma'am, we do. The first question is from Dr. Will Sawyer. Your line is open, sir.

Dr. (Will Sawyer): Hi. How are you today? I am a solo practice family doc in Cincinnati. And I still admit patients to the hospital. And I'm impressed by the increased incidence of C. diff that exists in the ICU and then in the medical floors.

My question is could - I think if we rate the list of infectious disease types that are on the floor, not names but numbers, it may increase the compliance with known guidelines just because we're letting everybody in the nurses' station know that there's C. diff of five cases and VRE of two and MRSA. So I want to know who across the country has done this or are we the only ones thinking about this in Cincinnati?

Kate Ellingson: Thank you very much for your question. This is actually the feedback of rates of specific hospital-acquired infections is actually a key component to some of the more novel interventions that people have been doing across the nation.

So there have been several prevention collaboratives established that have worked on this. I know one clinic in particular, the Billings Clinic has really kind of - they've taken on this positive deviance approach which actually is sort of a behavioral approach to changing behavior. But really kind of what it emphasizes is giving people the data to make changes themselves.

So - but it's not just positive deviance. There are all kinds of interventions that are occurring. But...

Dr. Will Sawyer: Could we do this nationwide to help C. diff because it's only hand-washing, not sanitizing that helps?

Kate Ellingson: Yeah. I will say that with our surveillance system here, the National Healthcare Safety Network or NHSN, we have launched an MDRO module that includes C. difficile so we may be in the future years, you know, as that module is ramping up and we're getting more and more people participating but we'll likely have more national data on that soon. So, you know, by

sharing that data and opening the discussion up nationally about how we should approach this I think we can come up with a more reasonable approach based on data.

Dr. Will Sawyer: Okay. Well thank you.

Coordinator: The next question is from (Linda Russell). Your line is open.

(Linda Russell): Hi. I was wondering is this going to be available for other smartphones such as the BlackBerry in the future or is it just going to be for the iPad?

Chris Hlady: So this is currently a research project so we have limited resources and we're focusing on the iPod Touch for now because it's available without a phone contract. So, you know, BlackBerry, Droid, et cetera, those all require a monthly fee, you know, 70 bucks whereas the iPod Touch is just a one-time purchase. So that's why we chose to go with the iPhone operating system first.

And at that point - at this time that's all we have the resources to support. But we're definitely thinking about those other platforms. And we would like to be on them.

(Linda Russell): Thank you very much.

Chris Hlady: Thank you.

Coordinator: Next question's from (Russell Rubin). Your line is open.

(Russell Rubin): Thank you. Chris, as a follow-up to that last question do you have any research that shows how common, you know, iTouches or iPhones of any type are in the healthcare settings? And furthermore is it - do you have any research that says it's common to use mobile devices in healthcare setting?

Chris Hlady: No I don't. I don't have numbers for healthcare in particular. But I know that Apple has sold I believe it's something like 60 million of them in the last three years so there's a lot of them out there. Whether they're concentrated or not concentrated in the hospital though I don't know. But that's a good question and we would like to know the answer to that.

(Russell Rubin): Thank you.

Chris Hlady: Thank you.

Coordinator: The next question is from (Michelle Samaratim). Your line is open.

(Michelle Samaratim): Good afternoon Kate, calling from the Somerset County Department of Health in New Jersey. And I just love seeing so much enthusiasm and new apps and resources for hand-washing education.

You were talking about, you know, what the World Health Organization has done and what the CDC has done and asking for some information from the states. As a local department of health we'd like to become a partner and like to know how we can go about doing that.

Kate Ellingson: Great. That's wonderful to hear. We actually have been interacting more with state health departments than we ever have in the past primarily because of Recovery Act funding that's gone to states for HAI prevention.

And so currently we're working more with states. But certainly I love that there's enthusiasm at the local health department levels. So I would encourage you to contact us through our Web site. There's a link where you can email us. And, you know, we'd love to learn about, you know, what you're doing and perhaps, you know, you could help be a pioneer in involving local health departments in these types of efforts.

(Michelle Samaratim): Well wherever I can you've got me. Thank you so much.

Coordinator: The next question is from (Carla McFaddin). Your line is open.

(Carla McFaddin): Hi there. I have a question that I'm not sure if you guys will be able to answer. But looking at hand hygiene mostly in long-term care settings, nursing homes, assisted living where, you know, medication administration is occurring and looking at hand hygiene during the medication administration process specifically and this question has come up in regards to, you know, a lot of nurses and nursing assistants and medication aides are using the alcohol-based hand rub frequently and is there after so many applications of the alcohol-based hand rub do they then need to wash their hands after, you know, a set number of applications? Or I don't know if there's any guidance like that at all but we're hearing that from some state surveyors in long-term care settings.

Kate Ellingson: That's very interesting. We actually do get that question often. And you're right that we actually don't have any official CDC guidance about how many

times you need to or how often you should wash your hands after multiple applications of alcohol-based hand gel.

And one of the reasons we don't have a good answer for this is that there are many different products out there. You know, the only part of our recommendation is that they be, you know, 60% to 95% alcohol as an active ingredient. But in terms of the other ingredients in that hand gel product you'll have different levels of buildup on the hands.

So when we get asked this question we generally say yes, if, you know, there is buildup of any kind of product on your hand it is a good idea to wash them. And basically I think that it's something that we can potentially ask manufacturers to address in their instructions. But it would be difficult to give a universal solution.

(Carla McFaddin): And so as far as you know there are no universal guidelines regarding that matter?

Kate Ellingson: No.

(Carla McFaddin): Okay. And do you know of any manufacturers that have stated a certain, you know, guideline like that in their information?

Kate Ellingson: I don't. But that doesn't mean that they're not out there.

(Carla McFaddin): Okay.

Kate Ellingson: I have not seen them. But I've heard sort of various people have called and asked and say, oh I heard somewhere that you should, you know, wash your hands after every ten applications.

And again I'm not sure exactly where they're getting that. But we'll - we certainly are getting that question so we'll look more closely into it.

(Carla McFaddin): Thank you.

Coordinator: And that was the final question.

Conne Ward-Cameron: Wonderful. Thank you, Kathryn. Thank you for your help and thank you everyone. We're concluding right at an hour, so perfect timing.

Thank you all for being a part of our call today. We would be happy to take any more questions through our web - through our email coca@cdc.gov. You see that slide on the screen now.

If you have a question that did not get answered this afternoon please send it to us. Either put hand hygiene in the subject line or either Kate's name or Chris's name so we'll be sure to direct the call to them. Thank you very much.

The PowerPoint slides for today's call as well as the link to Chris's video are going to be posted to our Web site within 24 hours. The recorded version of the call should be available within the next two days.

For those of you wishing to obtain continuing education credits you have a year or so to do so. All continuing education credits and contact hours for

COCA conference calls are issued online through the CDC training and continuing education online system at www2a.cdc.gov/tceonline/. Thank you again for being a part of today's call.