CDC *Vital Signs* Town Hall Teleconference

Improving Antibiotic Prescribing in Hospitals
March 11, 2014
2:00 pm EDT

Operator: Welcome and thank you for standing by. At this time all participants are in a listen only mode. During the question and answer session, please press star 1 on your touch tone phone. Today's conference is being recorded. If you have any objections you may disconnect at this time. Now I'd like to turn the meeting over to Dr. Dan Baden. Thank you. You may begin.

Dr. Dan Baden: Thank you, Diane. Good afternoon everyone. I'm Dr. Dan Baden, the associate director for External Partner Outreach and Connectivity in CDC's Office for State, Tribal, Local and Territorial Support. Welcome and I'm glad you could join us today. We'll be discussing the latest *Vital Signs* report on improving antibiotic prescribing in hospitals. Before we get started though I'd like to go over some housekeeping details.

You can go online and download today's PowerPoint presentation so you can follow along with the presenters. The web address is www.cdc.gov/stltpublichealth. Again, that's S-T-L-T, public health. There's a link directly to the *Vital Signs* Town Hall webpage under the highlighted products and resources on the lower right side of the page. On this town hall webpage you can also view bios for each of the presenters.

This is where we'll add the audio recording and transcript from today's teleconference. They should be available next week. Back to our topic, Improving Antibiotic Prescribing Practices in Hospitals is a call to action for everyone involved in healthcare. More than half of hospital patients receive an antibiotic and doctors in some hospitals prescribe 3 times as many antibiotics

as doctors in other hospitals. Although antibiotics can save lives, they also put patients at risk for *Clostridium difficile,* an infection commonly known as *C.diff* and which causes at least 250,000 infections and 14,000 deaths each year in hospitalized patients.

There's a couple of ways that health departments and community organizations can help such as facilitating efforts to improve antibiotic prescribing and preventing antibiotic resistance and providing educational tools to facilities to help prescribers improve practices. On today's call, we're going to hear from 3 colleagues. First we'll hear from Dr. Scott Fridkin, a captain in the US Public Health Service and a medical officer in the Division of Healthcare Quality Promotion in the National Center for Emerging and Zoonotic Infectious Diseases here at CDC.

He will provide a summary of this month's *Vital Signs* report. Dr. Fridkin will then hand the call over to Angela Jackley, the Healthcare Associated Infections coordinator in the Office of Disease Prevention at the South Dakota Department of Health. Ms. Jackley will take us on a trip aboard the South Dakota StewardSHIP where she will discuss the top-down approach and the system impact of forming multidisciplinary stewardship teams within the state.

She will then hand the call over to Jeanne Negley, the director of Healthcare Associated Infections Surveillance in the Division of Health Protection at the Georgia Department of Public Health. Ms. Negley will discuss Georgia's plan to improve antibiotic use across the state. There will be time for questions after our presentations today. But you can get in queue at any time to ask a question. Just press star 1 and record your name when prompted. And now I'll turn the call over to Dr. Scott Fridkin.

Dr. Scott Fridkin: Thank you, Dan. For those of you looking at the slides, let's just turn to slide number 4 right now. And before we go onto some of the results, I just wanted to summarize a little bit about where the data comes from and what we did in the *MMWR* that's tied to this month's *Vital Signs*. So just to reiterate, this month's *Vital Signs* is a call to action. And we're trying to get across 3 main messages to hospitals especially. The first is that antibiotics are used a lot in hospitals. And they're often not used appropriately.

The second is that excessive use of antibiotics has bad consequences for patients. And by that, there's potentially deadly diarrhea or *Clostridium difficil*e infections or subsequent infections with antibiotic resistance organisms. The third message is there's tremendous benefits to improving the use of antibiotics in the hospital setting. So to get these 3 messages communicated, we hope that there will be a call to action to hospitals and their organizations for all providers to actively participate to reduce incorrect inpatient antibiotic prescribing through implementation of antibiotic stewardship programs.

So to get these messages across, we really did four main key analyzes. I'm just going to briefly go through these four analyzes on a very high level. We wanted to describe the magnitude of antibiotic use during hospitalization. Second, we wanted to describe how antibiotics are used or what they're being used for. Third, to describe the variability in prescribing of antibiotics in hospital and fourth, a modeling exercise to estimate what the benefit of changing antibiotic prescribing would be on patients.

And to do this, we utilized 3 data sources. We used a proprietary data source on antibiotic use tied to hospitalization. We used a CDC program, the Emerging Infections program to evaluate how and why antibiotics are used during hospitalization. And we used CDC's National Healthcare Safety Network where 19 different hospitals were submitting antibiotic prescribing

data through their electronic health records to CDC over the past year. So if you turn to slide 5, it's a high level summary of one of the key analytic outputs.

And that is that prescribing practices do vary and errors are common. We found that overall more than half of hospital patients receive an antibiotic at some time during their hospitalization. But this maybe for prophylaxis. It might be for targeted empiric therapy or targeted therapy. But what did surprise us was that even after controlling or accounting for the areas of the hospital where patients were receiving antibiotics, doctors in some hospitals prescribe 3 times as many antibiotics as doctors in other hospitals.

This variability in antibiotic prescribing definitely surprised us. And we think this is evidence of room for improved antibiotic prescribing. The next slide, slide 6, summarizing the key high level points about the potential harm that can come to patient related to antibiotic prescribing. This was through some mathematical modeling where we estimated that by decreasing the use of antibiotics, broad-spectrum antibiotics which are those antibiotics that are most closely tied to subsequent infection with *Clostridium difficile.*

If we reduce these broad-spectrum antibiotics by 30% this would lead to 26% reduction in the incident of *C.diff* infection in these patients. We also identified through peer review literature that patients getting broad-spectrum antibiotics are up to 3 times more likely to get another infection from an even more resistant germ. So these pieces of evidence support the message that improving antibiotic use will improve patient's safety.

And harm comes to patients when unnecessary antibiotics are being used. As we turn to slide 7 which leads with CDC Recommends All Hospitals Implement Antibiotic Stewardship Programs, this is the core message that comes out of the data points that we put into the *MMWR*. We identified 7 core

elements that every hospital should utilize to improve antibiotic prescribing among their inpatients. This is a definition of what an antibiotic stewardship program is.

And this is what we think every hospital should have in place to reduce unnecessary antibiotic use and improve the safety of patients. The seven core elements include leadership commitment. The hospital needs to buy into the concept of a program to improve antibiotic prescribing and stand behind that program. There needs to be accountability. We need to have expertise and leadership within the hospital. Usually this is accomplished by a physician leader who is accountable for the success and failure of that stewardship program.

There needs to be a subject matter expert who is an expert in the area of these antibiotics. Usually this is a pharmacist. This is someone who can help design and help implement the specific actions to reduce unnecessary or incorrect prescribing. The fourth component is to have at least one action. And there's several different types of actions that programs can put into place to reduce incorrect prescribing. A common one that is popular being utilized today is reassessing the dose duration and indication for a particular therapeutic agent after 48 or 72 hours of use, basically a pause and reassess.

The fourth component is tracking of antibiotic use and tracking of antibiotic resistance. And fifth - I mean sixth, reporting these sorts of data back to the providers. Collecting the data is not enough. You need to report back on this data to provide some feedback to the prescribers so they have some context to understand the prescribing practices and how it relates to others in the area. And the last component is some ongoing educational component. We need to be able to educate providers around aspects of correct and incorrect prescribing so they can make rational changes to their practice.

These core elements are outlined in the *Vital Signs* in the supplemental material. And we also have a very detailed description of these core components on our website. And this is all located at the later part of the presentations. Slide number 8 summarizes three general areas that we believe state health departments can affect and improve prescribing in inpatient facilities.

Health departments can gain an understanding of antibiotic stewardship activities in their state, understand the diversity of these programs, understand the completeness of them, and understand even just the presence or absence of them. States can facilitate efforts to improve prescribing and preventing antibiotic resistance through multiple modalities. The states can help facilitate communication between successful and unsuccessful programs and be a good shepherder of information between facilities. Thirdly we think state health departments can provide educational tools to facilitate and help prescribers improve practices and be a resource for especially the smaller hospitals that might not know which direction to go and which steps to take.

So clearly antibiotic use, and I'm on slide 9 now, clearly antibiotic use in hospitals is complicated. These are very sick patients. And there's really very little room for error on the side of avoiding antibiotics in sick patients. However, based on the data presented in this *MMWR* and other data that's been published in literature recently, we believe all hospitals can improve on some aspects of the prescribing process. And now we will hear from two people who have successfully filled some capacity at the state level to improve antibiotic prescribing in hospitals. So we're going to start with Angela Jackley who's the Healthcare Associated Infections coordinator in the Office of Disease Prevention in the South Dakota Department of Health. Angela.

Angela Jackley: Thank you, Dr. Fridkin. I appreciate it. And thank you for letting us share our efforts with you today. So on slide 11, essentially our stewardship efforts grew out of an aggressed response to a Carbapenem-resistant *Enterobacteriaceae* (CRE). It was really our opportunity to show the correlation between multidrug resistant organisms and the need to steward antibiotics across our state. We started by sending a survey to all healthcare facilities across South Dakota asking whether they had any CRE cases within the last 12 months.

But in addition to that, we wanted to know what efforts individual facilities were involved in to curb multidrug resistant organisms in general. We asked if they had antimicrobial stewardship program and found that only 22% of facilities were engaged in any stewardship activities. Slide 12 please. In an effort to increase the awareness and implement prevention activities we hosted a "Bugs and Drugs" seminar with subject matter experts from the CDC.

We focused not only on CRE prevention but on the underlying need to steward our antibiotics across the state. At this conference, Dr. Lorie A. Pollack held an afternoon workshop on antimicrobial stewardship. And afterwards there were breakout sessions where pharmacists, infection control, microbiology, and ID positions gathered into individual groups to share their experiences, their challenge, and what efforts they were currently involved with.

With over 300 people in attendance, we had an overwhelming response from the healthcare community in general wanting to know what they could do in their facilities to have stewardship efforts. So leaders from across the state emerged and we started by forming a CRE collaborative. Slide 13. Knowing that we had this great momentum, we discussed options to from an antimicrobial stewardship workgroup. Now we already many physician champions on board from the CRE workgroup.

However we knew that to really effect the change within the organization, we needed to focus on the C-suite. So the decision was made that we would focus on the top-down approach in South Dakota. Our Secretary of Health, Doneen Hollingsworth sent an invitation to healthcare administrators across the entire state asking for them to choose a representative with the ability to effect change in their organization. We then included infection disease physicians and pharmacists, physician champions, microbiology, nursing, infection control, all those participants on our work group and they met for the first time last June.

Slide 14 please. So we focused initially on inpatient hospital stewardship with our 3 largest systems of care to work on improving antibiotic utilization. And although they have competing interests, our systems frequently work together on statewide collaboratives to focus on patient care. So each flagship with their multidisciplinary stewardship teams have worked towards their chosen stewardship activities while continually sharing their expertise and their best practices with the work group.

We have some systems that have implemented their activities throughout many of their additional hospitals. Now South Dakota's landscape poses a few challenges to stewardship. Our state is vast area. It covers approximately 77,000 square miles with a population of roughly 843,000 people. So we have many rural hospitals making stewardship challenging including limited opportunities even for a consultation with an infectious disease physician. To add to these challenges, we have only a handful of infectious disease physicians in South Dakota.

So to address this, one of our systems, Avera Health, they utilize a telehealth system which provides ID consultants in rural hospitals and clinics and infectious physician conferences in via video on difficult cases. And they have seen a reduction in broad-spectrum antibiotic utilization through telehealth.

This effort is part of their fluoroquinolones reduction project which stems from a review of over-utilized classes of antibiotics. And to engage physicians in this project, they have provided very robust physician education and training throughout their facilities.

They've modified their electronic order sets moving away from fluoroquinolones. Now through these efforts, they have realized a 50% reduction in utilization of this antibiotic class. They've also created electronic pneumonia order sets throughout their system and continue working towards their stewardship activities. Slide 15 please. So another system of health is Sanford Health. And they've developed several clinical guidelines and order sets for physicians to use throughout their system of care.

They focused on guidelines for *C.diff*, MRSA, UTIs and all upper respiratory infections. These guidelines are very thorough and they're available electronically to their prescribers. They've created and widely distributed educational handouts for prescribers and patients including an antibiotic utilization during cold and flu season for parents. They've also worked to increase patient awareness through newspaper ads during infection prevention week. They've created a multidisciplinary team in other hospitals within their systems working to address stewardship activities at the local levels. Slide 16 please.

Regional Health has enjoyed a long standing stewardship program that's been in place for many years under one of the state's stewardship experts. They have been conservative with broad-spectrum antibiotics for years. And as a result they see a low prevalence of multidrug resistant organisms and *C.diff*. Certain classes of antibiotics require preauthorization throughout their entire system. And they work closely with their laboratory to optimize reporting of culture results.

They conduct prospective audits and they provide ongoing real time oversights. They have ID consultations that are available to hospitals within their system. And they're working towards implementing the same strategies within long-term care facilities over on the western half of the state to address stewarding the antibiotics through all of the transitions of care. Slide 17. So the Great Plains area, Indian Health Service, they formalized the stewardship program at the area level this year with each service unit having an identified physician and pharmacy champion to refer to.

The infectious disease pharmacists are available as area consultants. And each service unit received an antimicrobial guidebook you know featuring guidelines and general microbiology information. Each service unit is required to report their stewardship activities to the chief medical officer. Slide 18. So what is the impact then of statewide organizations and partners? Well we work very closely with all of the statewide healthcare organizations to provide insight and support around these activities.

We've heard from universities and have had discussions around curriculum and current teaching practices. Through the various healthcare organizations, the stewardship members are featured at almost every yearly or quarterly meeting around the state to promote our agenda. And we have opportunities to speak to medical directors, administrators, prescribing practitioners, infection control, and nursing staff on numerous occasions and presentations and have brought in patient advocates such as the Alliance to present to the various practitioners across the state.

We are provided with booths at the annual conventions and our education and training opportunities are widely disseminated through our colleagues through their list-servs or mailing lists. We also have stewardship consultation services that are available by our leading stewardship ID physician. Slide 19. So what is the DOH role in our next steps? Well the South Dakota Department of

Health serves as a neutral facilitator to the statewide work group. We're engaged in all of the activities that I mentioned earlier in addition to a few additional activities on this slide.

Although South Dakota is not a funded state for stewardship activities, we've really pooled other resources and we maximize our network opportunities. The work groups made great strides and we have plans to gain further momentum, understanding how to steward our antibiotics across the continuum of care is complex. But we're attempting to do so in our future efforts. We'll continue to focus on education including midlevel providers, disseminating the guidelines and the materials, and then as well the practical application and feedback on these guidelines.

Our partners will continue to explore electronic capabilities including the benefits of telehealth for rural communities. Slide 20. So in South Dakota we really found that taking a top-down approach has been successful to us. It's really easier to find champions along the way when they know that their organization is already behind them. We have learned it's important to be flexible. Balancing the momentum and the measurement, that can be an ongoing challenge. While momentum's a good thing, it can also on occasion be a barrier to quantitative data. Sometimes you can miss opportunities to measure the impact of an activity. Another important component is to really insure that you have strong IT support and that they're included in on all of your activities.

So in closing, while the rural nature of our state creates challenges, it also provides many opportunities in that we have a small population base. By cultivating our working relationships with our leaders who are often engaged in other public health collaborative, it provides us the opportunity to affect a culture of change. And I would just encourage all of the other states to consider stewardship as a public health priority as well. Thank you and

Jeanne, I would like to turn it over to you to hear about the great work in Georgia.

Jeanne Negley: Thank you, Angela. We are slide 22 now. In contrast to Angela's story for South Dakota, in Georgia we were not responding to an outbreak of a multidrug resistant organism. Rather we noted we did not have a program. While several states have successfully embarked on antibiotic stewardship programs. However we had some questions as to what stewardship would look like in our state and how it would be implemented. Slide 23. To answer the question of what stewardship would look like in Georgia, our first step was to convene a multidisciplinary committee with a purpose of designing Georgia's approach to address antibiotic resistance.

The advisory committee including key stakeholders from throughout the state including infectious disease physicians and infection preventionists from hospitals, hospital pharmacists, members representing our quality improvement organization and hospital association, a consumer representative, public health staff as well as CDC subject matter experts. The committee identified that the state should create a 2 to 3 year strategic plan for stewardship.

As we began to develop this plan, we identified four potential barriers and formed solutions to address them. First, we had limited resources for this project, the situation that often applies to public health programs. We thought to address this potential barrier by developing partnerships to extend the reach of our program and by focusing our efforts on specific targets so that our efforts would not be diluted. Second, we felt it would be challenging and time consuming to pass a statute regarding antibiotic stewardship which has been successfully done in California.

So our plan was to implement policy through shared values of the partners we attracted to our program. Third, it's difficult to measure the outcomes of stewardship particularly on a state level. As such, we sought to measure the process of adoption rates of stewardship by using our assessment tool and to use data on multidrug resistant organisms and *Clostridium difficile* in our state data from the National Healthcare Safety Network. And finally, we recognize that healthcare facilities have competing priorities.

And we had concerns it would be challenging to motivate healthcare providers to engage in stewardship. We thought to address this challenge through a recognition program which I'll discuss later in the presentation. Slide 24. Our strategic planning prepared to take advantage of an opportunity to attain an HAI (healthcare associated infections) capacity grant from the Association of State and Territorial Health Officials which provided modest funds to move our program forward. With this capacity grant, we conducted antibiotic stewardship training programs through pharmacists and physicians to lead programs in their hospital across the state.

Our advisory committee recommended we create an in-person training program for pharmacist. Eighty two pharmacists across the state attended. For physicians, we offered a webinar in stewardship. Over 75 physicians and clinicians in the state participated. Our evaluation measurement consisted of an assessment tool adapted from the tool created by CDC. The assessment tool included 42 items on leadership, staff involvement, stewardship activities, and monitoring. As I will show on subsequent slides, the assessment tool provided us with a baseline of stewardship activities in Georgia for the first time.

We also conducted a focus group with pharmacists representing 7 hospitals after the pharmacist training. The purpose of the focus group was to determine current barriers to stewardship and what the potential role the state could be in

addressing those barriers. We also developed a number of partnerships as a result of these training programs including the Atlanta Chapter of the Society of Hospital Medicine which represents hospitals in the state, the Atlanta Infectious Disease Society, the Georgia Society of Health System Pharmacists, and the Medical Association of Georgia.

All these partners supported our goal of increasing stewardship activities in hospitals and helped with marketing efforts to increase participation of their membership. Slide 25. When we reviewed our data from the stewardship training, we learned quite a bit. For example of the 48 facilities represented in our stewardship training, less than half, 22 out of 48, had a multidisciplinary committee dedicated to stewardship. We also learned that 72% of those with committees had a pharmacist or physician leader which we know is important to effect change in prescribing practices.

In addition we found that 27% of facilities did not have a physician or pharmacist leading their stewardship activities. And 9% did not meet regularly which was defined as meeting at least twice a year. Slide 26. Our assessment also provided information on stewardship guidelines. We asked if facilities had guidelines to assist in the selection of antibiotics for 3 conditions, surgical prophylaxis, community acquired pneumonia, and urinary tract infections. We learned that the majority of facilities had guidelines for surgery and pneumonia in alignment with federal regulations.

However, a much lower rate of 36% was reported for urinary tract infections. Our assessment tool also identified a number of additional opportunities for improvement in terms of stewardship practices in the state. Slide 27. Our focus group with pharmacists represented 7 hospitals in the state, provided insight on the role of the state health department in antibiotic stewardship. During our focus group we asked with the state health department could do to support pharmacist stewardship efforts.

And the response was that they wanted more education on stewardship and a stipend that would support release time for the pharmacists to attend the training. We also obtained feedback on the honor roll concept during the focus group. Respondents expressed interest in participating and that the honor roll could serve as a "good starter" for antibiotic stewardship activities and could represent an opportunity for hospitals to share information. Respondents also indicated the guidelines for the honor roll needed to be flexible to recognize different resource levels at various hospitals.

Slide 28. Based on our planning and training activities the Georgia Department of Public Health is poised to assume a leadership role for antibiotic stewardship in the state. Our commissioner is issuing a call for action for Georgia hospitals to use antibiotics appropriately and to apply for recognition through the honor roll for antibiotic stewardship. We have launched our honor roll which defines state expectations for antibiotic stewardship.

Our stewardship subcommittee recommended two tiers to the honor roll. The first tier is engagement and requires facilities to submit a letter stating its leadership support stewardship, identifying the stewardship team member names and roles, and outlining a recent staff education on stewardship. This letter needs to be signed by a senior executive staff and a board member. Our second tier is implementation which includes all of the engagement activities plus implementation of a stewardship activity and data collection.

We're excited that hospitals across Georgia are applying for the honor roll. And we have the means to incentivize their activities and recognize their efforts. The honor roll requires participating facilities to complete the assessment tool. Our advisory committee has discussed that requirements may be revised annually to foster increased activities across the state. And finally,

we have identified a means to provide more training and stipends to hospitals to support pharmacists training, a need that was identified in the focus group.

Slide 30. I would like to thank all the individuals that have contributed to this program including staff at the Georgia Department of Public Health, the Centers for Disease Control and Prevention, the Association of State and Territorial Health Officials, and the Georgia Antibiotic Stewardship Subcommittee. Slide 31 is actually my last slide. And I just wanted to talk about antibiotic stewardship no longer being the elephant in the room. I adapted this slide from Dr. Emily Lutterloh of the New York Department of Health.

In the Spring of 2013, I attended one of her presentations and on *Clostridium difficile* and she presented this slide without the circled line through it and talked about antibiotic stewardship as being the elephant in the room because as health professionals, we're all talking about it. But we didn't have a lot of information on how to implement it particularly for resource limited facilities. I have used that slide in several of my presentations on stewardship. And today, I feel we have some additional practical guidance with CDC's checklist for core elements on hospital antibiotic stewardship programs.

And in Georgia, we have our honor roll for antibiotic stewardship for hospitals. In addition, we have the example from South Dakota that has set their expectations and yielded positive results. This concludes my presentation and I would like to turn the call over to Dr. Baden.

Dr. Dan Baden: Thank you very much to all of you for those great presentations.