Good morning and Thank you for joining the New England Nursing Home Quality Care Collaborative, NENHQCC. My name is Kate with the New England QIN-QIO. This is our third webinar, *Navigating Infection Control and Antimicrobial Stewardship and Long-Term Care*, brought to by the Massachusetts Department of Public Health and Tufts medical center. Today’s webinar will focus on antimicrobial stewardship strategies for implementation.

Before we begin today’s program, I have a few housekeeping items to review. This webinar will be recorded. The presentation, recording, and transcript will be posted to the event page. The phone lines will be on mute for the duration of the presentation. Feel free to use your phone’s manual mute button but please do not put your line on hold. If you have a question, please enter it in the chat to the right of your screen. Please make sure to send your comments to all participants. Sarah from the QIN-QIO team in Massachusetts will be monitoring and responding to questions. We will also have time for questions at the end of the presentation and we will open the phone lines for questions at that time. Lastly, if you find the presentation appears a little cut off, please use the plus or minus icon in the top right of the presentation window to fit your screen. I will now mute the lines. Speakers, please unmute yourselves after the message by pressing pound six.

Now to introduce our speakers, I will turn it over to Melissa Cummings from the Bureau of infectious disease and laboratory sciences in the Massachusetts Department of Public Health. Melissa.

Thank you so much. Good morning everyone. On behalf of the Massachusetts Department of Public Health, I would like to welcome you to today’s presentation and to thank you for your commitment to quality improvement and infection control and antimicrobial stewardship. Our speakers today are a team from Tufts medical center. The first is Doctor Shira Doron. She is a position in the division of infectious disease and laboratory sciences at Tufts medical center. She has been the physician head of the antimicrobial stewardship program there since 2005 and is also the associate hospital epidemiologist. Also presenting is Doctor Kirthana Beaulac. She is the pharmacist head of the antimicrobial stewardship program at Tufts medical center as well as the infectious disease pharmacist for the institution. And third, we have Doctor Gabriela Andujar who is also a position in the division of infectious diseases at Tufts. She is also part of the Tufts medical center antimicrobial stewardship team and has a special interest in rapid diagnostic and stewardship in the outpatient setting. With that, I will turn this slides over to our presenters. Thank you.

Hello. Good morning. It is Gabriella. I will be starting the lecture today. So the objectives of this lecture are we are going to review the landscape of antimicrobial use and resistant and long-term care and regulatory requirements around the stewardship. We’re going to define the elements of a successful stewardship program, outline the role of each member of the care team in carrying out the goals of stewardship, explore resources for policy and protocol development and describe examples of stewardship interventions that have been successful at other long-term care facilities.

So we are going to start with a polling question. How confident are you that the antimicrobial stewardship policy and practices in your facility are adequate to reduce unnecessary antibiotic use? A, I
am completely confident that the antimicrobial stewardship policy and practices in my facility are adequate. B, I am somewhat confident that the antimicrobial stewardship policy and practices in my facility are adequate or C, I have no confidence that the antimicrobial stewardship policy and practices in my facility are adequate. So you have on the right side of your screen, you can click which of your answers would it be ABC and you can submit your question.

All right. While we wait for the answers, I will move on to the next slide. So starting with the incidence or prevalence of antibiotic overuse and how prevalent it is in the long-term care facility? This is a study showing the incidence of infections and long-term care facilities and this is extrapolating to the population of the US. Here are the types of infections. The bottom one is all these infections taken together. Basically, this number is ranging from 1.8 to 13.5 and is showing you the incident rate per 1000 resident care days. Then extrapolate that into millions of patients or cases in the US that they are assuming they are on antibiotics because they have some type of infection while in the long-term care facility. So, it shows you how antibiotics overuse can be very prevalent in the long-term care facility.

From our polling question, it seems like most of the people are in the middle. They are somewhat confident that the antimicrobial stewardship policy and practices in my facility are adequate. So not that bad. They are in the middle. Not completely confident or have no confidence but somewhere in the middle, which is good.

Just to have a little bit of context on how much antibiotic overuse is in the long-term care facility, it is estimated that 50 to 75% of long-term care residents in the US have at least one antibiotic prescription per year. Of these, 25 to 75% of all systemic antibiotic prescriptions and 60% of topical antibiotic prescriptions are inappropriate or unnecessary in the long-term care facility. It is a lot of the burden of antibiotic overuse on the long-term care facility.

So why is it that we are doing so poorly or what is it that may be affecting all of this? There are a couple of things that could be contributing to it. The first is workflow related. We know that physicians have limited time to taking care and evaluating each single patient and long-term facilities. They do not have readily available references. They do not have -- many of the long-term care facilities are lacking institutional prescribing guidelines. They do not have oversight or expertise readily available to help guide the antibiotic therapy and also, lack of special diagnostics in the lab that will help be more confident in whatever diagnosis it is that you are trying to achieve their antibiotics. And also culture related. A lot of patients in the long-term care facilities are elderly and with multiple co-morbidities. They are very frail and you feel like if you missed something, they will very quickly get very sick if you do not start the antibiotics very quickly or if you have a family member that is very demanding and really wants their family member to be on antibiotics for some reason or there is fear that if you miss something that there will be institutional litigation consequences.

Talking about consequences, this is a study basically showing the factors that are associated with the acquisition of multi-drug-resistant gram-negative bacteria. These are the variables that they looked into. At the bottom, the data you see circled, it basically highlights that the only statistically significant factor
associated with acquiring a multi-drug-resistant gram-negative bacteria was internal antibiotic exposure which had an odds ratio of 5.5. None of the other things they looked into was significant.

So what can we do to try to overcome these barriers? The CDC came up with the core elements of antibiotic stewardship for nursing homes. They are mainly composed of seven pillars which is the first one being leadership commitment. Realistically, this is someone in your institution that demonstrates, or I guess everyone in your institution that demonstrates they are committed to trying to combat antibiotic resistance and antibiotic overuse. Accountability. Someone identified in your institution, what we call a champion, either physician, nurse or someone from pharmacy that will promote antimicrobial stewardship concepts in the institution. Having access to drug expertise - whether it is a consultant pharmacist or expert in training and antibiotic stewardship - for your facility to help guide decisions based on their expertise. Action, basically implementing at least one policy - whether it is small or big, but at least one - and then tracking. That policy is trying to measure the process and also measure the outcome. And finally, reporting, providing feedback on antibiotic use to prescription clinicians because if you do not provide them feedback, they do not know how they are doing and educating them is the key; trying to get clinicians and staff involved and educated, but also families and patients that can know and be aware of the issues with antibiotic resistance and the opportunities to improve antibiotic use.

So we have five ingredients for a successful program. The culture change, provider education, use of metrics and benchmarking, use of microbiology laboratory, mainly antibiograms, and use of technology and informatics. We are going to touch in this webinar, we will talk about the first two and then the other three, we will go more in depth in the next webinar in the future.

So the first one culture change. It is basically educating and trying to get clinicians, physicians to understand the issue, be aware of the problem. And ultimately, we know that a lot of physicians are very reluctant to give up their autonomy and have someone else trying to question maybe or dictate their decision. So in order to get through that barrier, you need champions and patient services. People that create a multidisciplinary, or everyone from a multidisciplinary perspective who tries to create a culture change in this facility. Try to use concepts like behavior change theory and feedback. Feedback is very important so you know what will be working and what would not be working in your institution. Each institution is particular to their needs.

The second ingredient would be provider education. A lot of doctors and medical school and even in nursing school and other healthcare providers, they do not have concept of stewardship in their training so this is sort of a new concept that may be for them. They may not be thinking of trying to really be more conscious of their antibiotic use and choice. Try to remind yourself that even the smallest interaction with any provider can be an education opportunity. Focus on trying to discern between colonization versus infection. Whether it is really a community acquired infection versus a hospital acquired one. We want to de-escalate. The fact that the patient is being transferred with antibiotics doesn't mean that you just reflectively continue it. You can question: “is it really necessary to keep it or is this an appropriate antibiotic that the patient came in with?” And every day, try to think about each antibiotic, how long do we really need to continue it, and try to think about early discontinuation.
So this is basically showing a study my colleagues here did with three different -- basically surveyed three different hospital providers including house staff and attendees, this graph is basically showing you here the proportion of healthcare practitioners with higher knowledge scores regarding carbapenem-resistant enterobacteriaceae and the percentages of the knowledge scores based on years of experience. This is showing you the years of experience where there is less than three years out of training between five and 10, more than 10. This basically shows you that you are less likely to know what a carbapenem-resistant enterobacteriaceae is the farther you are away from your training completion. If you are taking more than 10 years out of training, there is an odds ratio of 2.3 that you will most likely will not know what a carbapenem-resistant enterobacteriaceae is. So this is showing you that education, provider education and constant talking about all these issues are important to combat antibiotic resistance.

Now I'm going to pass you to my colleague Kira who will keep talking about what you can do in your facilities to combat antibiotic resistance.

>> I want to empower really everyone on the call here. I know that based on our higher feedback, we have a lot of pharmacist and nursing and clinician representation. So I want to empower each of you to do your part to help prevent antibiotic resistance and participate in these antibiotic stewardship programs.

I'm going to first start by focusing on what long-term facility administrators can do. These guys are at the top of the chain and really can direct everyone at the facility to really fall in line and get on board with the fact that resistance is coming and we need to do something as a healthcare institution to combat that. So we encourage long-term care facility administrators to establish these multidisciplinary teams that address antibiotic stewardship and optimize drug use. Not only is that something that is strongly recommended from a lot of governing bodies, but it is now a requirement per CMS criteria. This is something that the administrators really need to help coordinate. We also need to make sure that that multidisciplinary team does create some sort of protocol that are going to outline the appropriate circumstances around antibiotic use. Also, these administrators really should create some sort of an infrastructure to review the antibiotic culture data to identify whether there is a worsening resistance problem. That can involve trending changes in your antibiogram if you have one or if you just noticed a cluster outbreak of a certain bad bug. Administrators should also not only create these protocols about antibiotic use but also create some sort of a protocol to make sure that if there is a culture sent, making sure that it is being checked and that the antibiotics are adjusted based on those culture results. There is really no utility in taking a culture if you are not really going to follow up on the results anyway. It is challenging with care - it changes every day. One person covering this day, another person covering for the weekend. Sometimes, some of these results can get lost in the shuffle but making sure that three days later when these results come back, having some infrastructure to make sure that they get followed up on. Lastly, we encourage our administrators to create some sort of program that provides for periodic review of antibiotic utilization. Kind of more of a 10,000-foot view. Doing some sort of drug utilization analysis, seeing if there are any problem spots.
Moving on to our long-term care facility nurses. Nurses really are our champions here. Nurses for several years now from national Gallup polls, nurses are viewed as the most trusted profession of all of the professions. They really need to be our voice of reason here and help encourage rational antibiotic use because they are really the champions at the patient's bedside. We encourage our long-term care facilities to be familiar with some of these protocols around testing and treatment for our bacterial infections. That way, they can help intervene early for patients that do have true bacterial infections and to help encourage holding off on antibiotics when it is appropriate for these protocols. Our nurses are really responsible for educating our patients and families because they are the ones that are at the bedside and having our nurses empowered to educate about not using antibiotics for respiratory viral infections and not inappropriately using antibiotics for a suspected UTI or asymptomatic bacteriuria, those are things where you really need our nurses to step up to the plate. Many nurses have really well demonstrated how effective they can be and limiting these. Also, we ask that the long-term care nurses help identify advanced directives for patients who do not really have antibiotics as part of their goals of care and also help coordinate with transferring, referring facilities about pending lab results. As I mentioned, sometimes patients can get lost in the shuffle and our nurses are often at the bedside – bedside advocates that help put the pieces together.

Moving on to our prescribers because they are the ones that have the power of the pen. We encourage our prescribers to use some sort of screening tool protocols so that way it can help direct the use of antibiotic to optimizing appropriateness. And prescribed judiciously. We also encourage our prescribers to educate each other, educate other clinicians, educate the patients and family members and other staff and really tried to involve themselves in some sort of peer review process. As Gabriella mentioned, there really isn't much feedback once you're in practice and providing feedback to each other is really useful for improving and standardizing and prescribing practices. Lastly, we really need to work with the prescribers to implement some sort of measures that can help reduce the need for even using antibiotics. Avoid the use of a urinary catheter which can then prevent urinary tract infection. Immunize patients whenever possible so that way they do not develop those bacterial infections. Also prevent skin breakdown and then wound infections and things like that.

Lastly, our long-term care facility pharmacists are really important as kind of the backbone as expertise to help put a stewardship program together. So not only is it recommended, but it is also required that our pharmacists review antibiotic utilization and provide feedback about appropriateness and identify opportunities for prescribing to bring up at QI meetings. Also our pharmacist can educate physicians and nurses about appropriate antibiotic use, how to narrow the spectrum of antibiotics based on cultures. They are expected to be involved in preparing these antibiotic use protocols that are indicated for the mega rule. Also, we encourage our pharmacist to use their pharmacist training and apply pharmacokinetic principles to antibiotic use. One example here is for the facilities that do provide IV medications to help apply pharmacokinetic principles to complex drugs like vancomycin and maybe spacing out divalent cations. We also hope that our pharmacist can help make sure that the drugs that a patient receives are compatible with their allergy history and always strongly encourage the use of oral drugs whenever possible rather than having patients unnecessarily on IV therapy.
Lastly, I mentioned what each specific role can do but we need to work together. As a facility, the expectation is that you are able to develop communication tools that are going to share critical pieces of information at the time of transfer and those could be culture results from their prior history or some pending results that you have sent off prior to transfer. What the patient has been treated on in the past, if they require any precautions including if they have a history of C. difficile, or any medications they have or may need. Also, it can help improve the use of antibiotics if we ensure that the contact information is provided for follow-up as well as any pending results. Create these cross facility teams that are going to help address some of these antibiotic stewardship and infection prevention issues.

So I have listed -- I mentioned a lot of things that each role can do and some things that we can do together. Given your role, each of your roles here on the call today, which would you rank as the largest barrier to implantation of a successful stewardship program at your facility? Would it be provider attitude, provide training, potentially having providers that are not trained in stewardship on antibiotic - - appropriate antibiotic use, patient/family, access to technology and diagnostics, access to clinical expertise specifically IV consultants, having dedicated time for your stewardship program, or something else. The poll is open and we look forward to hearing what you foresee as the biggest barrier not only because that can help us tailor these materials to you but we are curious to hear from the boots on the ground, what are you seeing and what battles are you facing? So the poll is just about closing. As the results -- I'm sorry, this is a 45 second pole. We are getting your answers for the next few seconds.

As the answers are tabulating, I'm going to move into the next thing which is it is nice for me telling you all of these great things you should be doing but we recognize you have a lot of things on your plate. I want to give some tangible examples of what you can do to turn some of this great theory into action. I'm going to incorporate some of the requirements from the CMS regulation as well as some of best practices from the CDC.

In terms of barriers that most people are facing, we see patient and family demands as well as having dedicated time as the two largest barriers that people are facing. Having adequate training for providers or their attitude kind of comes in second place. All of those are things that we will make sure we focus on in future webinars.

So as I mentioned, there are some new requirements that you need to have in terms of antibiotic stewardship. One of them is that you need to have a policy that dictates your antibiotic stewardship committee. You need to have antibiotics stewardship committee for your facility that is going to include either your medical director or your medical director can designate another clinician to be the stewardship position. You should have involvement with your infection preventionist and your consultant pharmacist should be a part of this committee. Those are the three required members. There are some other recommended members that you can include like the director or assistant director of nursing, including some frontline staff who can give you some real world perspective as you are creating these policies and procedures, it is also recommended to have some administrative staff either a board member or maybe a designee from a board member and lastly a representative the resident and patient family Council. That is one that I especially think is really useful to have as we have so many people
mentioning that the patient and family demands are the biggest barriers to having a successful stewardship program. Maybe being able to hear from them directly and being able to educate them directly would be a useful tool in improving antibiotic use.

So this is the makeup of your antibiotic stewardship committee and that committee is responsible for managing at least two policies. One of them is antibiotic stewardship policy which is going to dictate an outline how you have dedicated time to carry out the stewardship activities and it is mandated that there is dedicated time separate from infection control responsibility. And with that dedicated time, what is going to happen? Who is doing what? There needs to be very clear outline of what the responsibilities of the consultant pharmacist is - which is going to include assessing monitoring and which is communicating about antibiotic use, as well as where the expectations of the medical director or their designated clinician are in terms of accountability, policy development, and being that educational resource. Within this required policy, you need to outline what is your infrastructure? What is the system that you are going to have for antibiotics - whether it is routinely reviewing patient records or using some sort of data tool, electronic tool. Whatever it may be, it just needs to be outlined in those policies. Both of this and any drug use policies need to be reviewed at least annually.

As I mentioned, the stewardship committee is responsible for at least two policies. One of them being this policy and one of them being drug use policy. So as I mentioned, the antibiotic stewardship policy -- the antibiotic committee has to maintain those antibiotic use protocols and develop and maintain that system for antibiotic use. It is also falling on antibiotic committee -- subcommittee to be responsible for the antibiogram, to coordinate education on antibiotic stewardship, and it is expected that the antibiotic stewardship committee meets at least quarterly. Many stewardship committees are just tacking this onto their quarterly QAPI meeting. There are some very clear responsibilities for the medical director, as I mentioned previously, but they really need to serve as the primary medical point of contact for the committee, really spearhead the development of these antibiotic use guidelines, play an active role in these educational activities and provide individual feedback to other prescribers because many prescribers do not realize that they are overprescribing. The consultant pharmacist, although they are not technically on staff, they really need to play a huge role in these committees. Reviewing the antibiotic during their medication reviews and really assessing appropriateness or assisting appropriateness and helping to make those policies and procedures and making recommendations to the stewardship committee.

As I mentioned, the other piece of this policy development is having these antibiotic use protocols. They need to be reviewed at least annually and there is no specific guidance on exactly what they need to be. They can be focused on clinical conditions, things you'll have a guideline for: the treatment of upper respiratory tract infection and treatment of urinary tract infection. They can focus on durations of therapies: what facilities are going to do about patients who are on antibiotics for greater than one week or greater than two weeks. Or your policies could focus around certain drugs: how you want to handle patients that are on certain high-risk medications or broad-spectrum medication. They should provide some sort of guidance, not only the treatment choices but as well as diagnostics that we do to those antibiotic treatments, and should provide guidance on the appropriateness of duration of therapy.
Moving on to the tangible things that you can do as improving antibiotic use. One thing that is really easy that can be done, consider it low hanging fruit because it is a simple thing to do, is for patients who are on antibiotics and really any drug that have good oral bioavailability, we get them off the IV product and onto the oral one. Here I have listed some common ones like your fluoroquinolones. Also, things like H2 blockers and PPIs and a lot of your antihypertensives. Whenever something can be given PO, it should be given orally. It decreases length of stay, decreases cost of care. It decreases the risk for having a line related infection. It also is associated with much more patient satisfaction. Patients do not want to have an IV if they do not have to. Also, working with your consultant pharmacist, really use pharmacokinetic principles to optimize patient dosage that are going to incorporate a patient’s age, renal function or wait to make sure they are on the right dose. Make sure they are on antibiotics that are really focused on the causative organism as opposed to inappropriate therapy that just got started and keeps on rolling. Making sure that the drugs that you are using are actually going to get to the presumed site of infection. We try to use drugs that concentrate in the urine for urinary tract infections, for pneumonia and for CNS infections, we try to make sure we have antibiotics that are going to get to that site. Working with your consultant pharmacist can really make sure you’re capitalizing on that. Lastly, for patients that do require IV antibiotics specifically penicillins, giving them overextended infusions or running them just over a longer period of time can help them work more effectively. So these are all some kind of a low hanging fruit that you can do. Simple small interventions that you can take easily but then I will turn it over to Shira who will talk about some more intensive but feasible interventions.

>> I have a few examples to share with you of programs that were implemented and long-term care that were successful. There are three very differently approached programs. I think they will illustrate for you some of the potential options for implementation. The first one was published in the prestigious Journal, Journal of antimicrobial Chemotherapy. It was a study that was in the UK. Obviously, different in terms of resources from what we have available, but the study was on the impacted imitation of a novel antimicrobial stewardship tool antibiotic use in nursing homes. It was a prospective cluster randomized control pilot study. They called the program the resident antimicrobial management plan (RAMP). There were 30 nursing homes between them, 1832 beds. They utilized a two-part tool: initiation of treatment part and the review of treatment part. During the 12-week intervention, 1628 residents were given antibiotics pre-intervention and 1610 were given antibiotics post-intervention.

So, the first part of the tool was designed to make sure good practice points were used at initiation of antibiotics. I think any facility could do something like this. So those good practice points are that clinical signs and symptoms of infection have to be present in order for the patient to qualify for antibiotics. We are going to talk a lot about that in later webinars. The second is that the resident must be examined by a physician. That a diagnosis and site of infection must be documented. So antibiotics in general for example should not be prescribed for a fever. One has to assess the patient and come up with at least a suspected diagnosis and site; clinical specimens should be sent. Antibiotics should be appropriate for the indication, allergies, and the co-morbidities. And the antibiotic should be initiated promptly. All of those things are checked off at the initiation of antibiotics.
The second part of the tool happens at 48 to 72 hours after initiation of antibiotics. There is a document review at that time. At that point, the provider documents whether there is a stop date or a plant review date. Whether the resident is re-examined by the physician, the results of the cultures are noted, and the outcome of treatment is assessed. Is the patient getting better on the current antibiotics? All of those are really, really important that those happen at 48 to 72 hours.

So these were the results. This is over a 12-week period, so there is not a lot of potential for giant changes here. What we did see is statistically significant decreases between the pre-intervention and the post-intervention period in the amount of antibiotic use. That was quantified by defined daily doses which is an international standard for quantifying antibiotic use. You can see that in the control group, there was actually a significant increase. There was no intervention happening but over the same time period, there was a significant increase in antibiotic use.

This next study was done in the United States, specifically in a VA nursing home. This was in a prestigious Journal, *Infection Control and Hospital Epidemiology*, and written by a very experienced stewardship team of heavy hitters from Cleveland. The study was on the effective antimicrobial stewardship in a long-term care facility using an infectious disease consultation service which they called the LID, long-term care, infectious disease, service.

What they did is provided ID services for a long-term care facility with 160 beds. I see that there is a question on what time is necessary to dedicate to stewardship and I think this gets at that question to some extent. The LID service saw patients or residents in the nursing home only once a week but they were available for remote consultation the rest of the week using electronic medical records, so accessing it from wherever they were and telephone calls. That service saw, on average, seven patients during that one day a week visit and fielded only five to ten phone calls every week. So over a week, that is not a lot of time. They actually found that nearly 1/3 of the consults that they did required only one visit. The remaining patients required an average of 3.6 visits ranging from 2 through 20 visits. Here is what they found.

This is a complicated figure but the top graph represents the nursing home. The bottom is the hospital affiliated with the nursing home where no intervention was done. The hospital is serving as the control group here. So, the black filled in shapes represent the pre-intervention, before the LID service was supplemented for both the long-term facility and the hospital. The top line is total antibiotic use, followed by oral antibiotic use, followed by IV antibiotic use. You can see particularly in the hospital, a very flat line for antibiotic use during the pre-intervention period. After the intervention (which did not happen in the acute care hospital) the antibiotic use stays pretty flat for all categories. In the nursing home, pre-interventions, we saw a little bit of an increase over time in IV antibiotics and a little bit of a decrease in total antibiotic use. But, once the intervention was implemented, you see more sloped downward curves here representing decreased antibiotic use. So what you can very clearly see visually is that you have decreasing trends in antibiotic usage in all three categories compared to the directions that they were going pre-intervention.
You also see some interesting things happening here. In this figure, the filled in shapes represent pre-intervention in the open shapes represent post-intervention. The top lines represent the acute care hospital, and the bottom lines represent the long-term care facility. So what you can see is, pre-intervention: both the acute care hospitals and the long-term care facilities had increasing C. difficile rates from a period of October 2007 until April 2009. Once the LID service was implemented, what you can see is that the hospital where there was no intervention continued to have a very rapidly increasing rates of C. difficile infection whereas the nursing home started to see a downward slope.

The third example is one of ours. So this was a successful stewardship program that Kira and I and some other members of our team implemented at a long-term acute-care hospital in New England -- at New England Sinai hospital. We were approached by facility leadership. We were recruited to implement stewardship at their facility because of their commitment to quality, patient care, particularly surrounding the treatment of infection and antibiotic usage. They had an ID consultant there who saw patients several days a week but that consultant did not have the interest or the inclination or time to do stewardship. That is why they decided to get us involved as outside consultants.

So, we worked with leadership. The IT consultant was present for the first meeting or two and then stepped away from the process. The infection preventionist was there and the pharmacy director. We came up with a plan. They were already doing end dates and indication as a requirement by pharmacy for all antimicrobials. Any order that came down to pharmacy that omitted those two things was rejected. So the next thing we did was we came up with what we called the “great eight.” Or the eight antimicrobials, we thought that was a good number to start with, that had the biggest impact in terms of cost, frequency of unnecessary use, in terms of the ability to promote resistance. We put that into our report. Our team consisted of an ID physician and an ID pharmacist and we were off site. We sometimes came by the hospital to do educational activities and grand rounds and things like that. For the most part, we were off-site and we reviewed the data Monday through Friday. What that consisted of was the electronic records and we were lucky that the hospital did have a fully-accessible electronic medical record. We logged on, generated a report of patients on antimicrobial stewardship for at least seven days on the “great eight” antimicrobials. We looked at those patient's medical records. We made all of our recommendations by email. We sent an email to the infection preventionist and she disseminated the recommendations to the appropriate providers. In the context of doing that, we came up with ideas for clinical pathways that we felt were needed, and we developed those together with the clinicians at the facility so that we could standardize care.

We conducted a program from April 2011 through March 2014. In that time period, we made 885 recommendations on 734 patients. Again, this gets the question that was asked about timing and resources. We spent approximately one to two hours per week reviewing cases and providing recommendations remotely. I think you will all agree, that is not a lot of time commitment to conduct an antimicrobial stewardship program. Certainly, at the beginning and development of the program, we spent more than one for two hours per week, but once it was up and running, that was the entire obligation and we are talking about 150 beds in the facility. The residents had a mean age of 68 years with a mean length of 56 days.
Just to give you a sense of the types of infections. The most common infection we made recommendations on was colitis. The second was urinary tract infections.

Our recommendations were as follows. We agreed with the management of the patient in 45% of the cases. And the others which we did not agree, we did an analysis, and about half of the recommendations were followed. Our goal was to have recommendations followed within 72 hours.

Our recommendations consisted of a number of different things, and you can see here that the most common recommendation was to stop antibiotics now. The second most common was we need more information with which to make a determination about the appropriateness of this antibiotic. So the chart does not reflect for example why the patient started on antibiotics. Does the patient have symptoms was often a question. And 10% of the cases, we actually thought the patient needed to be seen by an infectious disease specialist. The other recommendations, you can see there.

Half of our recommendations were followed within 72 hours but over time that number changed. As people became more and more accustomed to our interventions and our presence and gained -- trusted us more and more, we gained their trust. You can see that recommendation acceptance improved. By the end, they were about 100% of our recommendations were accepted within 72 hours.

As I showed you before with the Cleveland program, we did get to enjoy the fruits of our labor. Here is the C. difficile rate at the hospital which was pretty flat pre-intervention and then actually saw an immediate drop with our intervention. A lot of this stuff was some of the low hanging fruit that we described. There were some really bad practices that we got on top of right away. Than a downward slope throughout the rest of our involvement with that facility. Here are the antibiotic usage statistics.

So antibiotic usage total was going up - so things like C. difficile antibiotics and you can see that at the time of the intervention, there is an immediate drop and a slip downward -- a slope downward.

Striking results here if you break it out. And we were happy that at the end of that time period, the reason that we stopped working with this LTACH was that they realized that the investment was so fruitful and that in fact, they were seeing such a return on that investment in terms of resistance to C. difficile and antibiotic usage that it made sense for them to bring those resources in house. It made sense for them to dedicate on-site FTE to antimicrobial stewardship and I think that time and time again, that has been proven in studies whether in acute care or long-term care. So the general themes that we have covered today.

Antimicrobial stewardship does require resources and that you can consider contracting for help from outside experts it needed. You will be surprised that it may not take as many hours as you think. We were charging New England by the hour and they were pretty happy with paying us for one to two hours per week. The cost of additional resource input is consistently offset by the cost savings of using less antibiotics with additional benefits. Lowering the rates of C. difficile, resistance medication, improving patient safety. Small interventions can have a big impact.
So don't be afraid to start. It may seem like what we are asking you to do here is insurmountable but if you take one step at a time, if you got started with a small test of change and then a small intervention, what you will find is that you can reach your goal.

We are going to open up the lines for questions and while that is being done, we are going to turn it over to QIN-QIO to go over some of the future plans and some of the housekeeping items.

>> We are going to open the lines of four questions first. To unmute your line, please use pound six or hashtag six on your phone and the line will open for you to join us. While we wait for folks to join us on the line, let's check with Sarah for any questions in the chat.

>> We have a few questions for you. The first comes from Gail. Is there an example policy that can be shared for implementation?

>> I do not have an example policy but the idea was because each facility is going to have their own policy, I can try to work in any future webinars a little bit more guidance about what that is supposed to look like.

>> Excellent. Thank you. We have another question from Ruth. What is the suggested time amount to set aside for antibiotic stewardship?

>> I think that is what we were trying to address a little bit. Again, it is going to be different depending on the size of your facility. It certainly is going to be an initial time commitment to set up the program, but what we have found is that the week to week, day to day requirement is not that burdensome. Often, you can overcome that issue of lack of time if I bring in an outside consultant.

>> Great. Any questions from the phone lines?

>> I see one question from the checkbox about which regulations. I was mainly referring to this CMS mega rule because that is the major care for most of the long-term care facilities on the line here. There are also some long-term care facilities are going to be accredited by the joint commission but they are in the minority, and they have similar, but mirroring requirements. They are a little bit more comprehensive than the mega requirement.

>> We have a couple more questions from chat box. One listener asked if the tool from the study is available to share with them?

>> Yes. That is a good idea. We could do that. I believe it is an appendix within the published study. We could definitely share that with the group in the follow-up email.

>> This is Melissa with the QIN-QIO, I think example policies are probably a good idea and I was wondering if we could reach out to the group and see if people are willing to share their policies. We could collect those and take some of the representatives once or some of the best ones and maybe if people are willing we could share that amongst everybody.
That is a great idea. We can make the ask in the follow-up email and then collect them and share them with you to review and go from there.

I also see a question in chat about MRSA isolation. The next webinar is infection control prevention and I think we will probably talk a lot more about isolation precautions there. It is a tricky question because every facility in the world does isolation in a different way. This particular question is about MSSA so that would be non-MRSA and those patients in general would not require isolation precautions.

There is a question about intervention. Yes, that word is pretty vague. You are right. So in the context of the studies that we described, we meant sort of the implementation of the full program. The interventions specifically though in each of those studies were different. So in the UK study, it was simply the ramp tool, that two-part tool. In the case of the Cleveland study, the intervention itself was simply the involvement of an ID position with nurse practitioner with one weekly rounding or consulting on infected patients and taking curbside questions by phone. In the case of our study in Massachusetts, the intervention was us reviewing the charts of patients on antibiotics. So really different, three completely different approaches to stewardship, all valid, all effective.

As for educational programs available to doctors or specialists. I would say that the power points and recordings of this webinar series and our last webinar series are probably your best resource to provide to doctors and specialists that have not enrolled in this program because this is not on their radar screen which is understandable. I guess we could think about some concise versions, PowerPoint presentations, that might be targeted just two positions. We certainly have our own archives. It might not be a bad idea to put together -- I'm just reading between the lines in your question here -- if you're looking for something concise, like 30 to 40 slides that would be a one-time deal for doctors and specialists, that is a good idea and something we could work on.

We have another question on how do we approach recommendations for urine samples to rule out UTI related behaviors without antibiotic stewardship?

We have a whole webinar on that coming up. I do not have a clean and concise answer but I will say that behavior is not necessarily a UTI. And we have a lot to talk about that on May 8. It is probably almost never related to UTI. So it really requires a major mind shift. It does involve getting your psychiatrist educated which I know is not easy.

The question about how to use and antibiograms, we have another whole webinar dedicated to that on September 11. In terms of monitoring and tracking your data, we are going to talk about how to use the antibiogram for that.

Right. Evidence-based, Donna asked about evidence-based de-escalation criteria for antibiotics for primary care. I think we will certainly get into that on the July 10th webinar which will focus on selection de-escalation and duration. I think there are two key pieces there. one is utilizing that culture results. Once you have the culture, it is then narrowing to the narrowest spectrum agent possible to cover that organism. Than the other is to understand what the appropriate durations are for certain conditions. We
have guidelines for most infectious diseases that tell us what the appropriate durations are and yet we know that most patients are treated for an excessively long period of time. So we will go over all of that in the July webinar. Jessica asked about what do you do about the fact that you sent a patient to the ED. Let’s say they slipped on a banana peel and they need an elbow x-ray and they come back with a diagnosis of UTI. You did not send them for UTI. You do not think they have a UTI and they come back. We hear that all the time. That is why we had our whole slide today on developing strengthening those relationships between facilities. Developing inter-facility transfer guidelines. If you are the expert on stewardship, and that is what we are seeing is that the nursing homes are educating themselves on what the stuff is and to the ED’s maybe not. And you need to have the confidence to use your own clinical judgment in there and stop the antibiotic because that is the right thing to do for the patient.

>> We are getting close to the end. If we have missed any questions in chat, we will address them and include the responses in the follow-up email. I’m going to turn it over to Kate for some final announcements and for folks for Massachusetts, if you could stay on the line after Kate is done with announcements, Melissa from the mass Department of Public Health will be making a few additional announcements for folks in Massachusetts.

>> Thank you all for the great questions. We appreciate your time and hope you found this information helpful. I’m going to highlight some additional resources we have available. When you close out of this webinar, an evaluation will automatically pop up on your computer. As for resources, don’t forget to mark your calendars for the remaining webinars in this series. As you can see, webinars take place monthly through September. Check our website for more information or contact your state lead for help registering. Contacts are listed at the end of this presentation. Don’t forget to follow us on social media to get important alerts news and more. We also have a free virtual learning system, the learning center at Learning4Quality.org. Many courses have continuing education credits. Course topics include infection prevention training, mobility, antibiotic stewardship, CDI prevention, communication modules, team management, reducing antipsychotic drug use, medication reconciliation and much more. If you have questions, please send an email to learning@healthcentrcadvisors.org. For support on your quality improvement initiative, contact information for your state lead is listed here on the screen. This concludes the general session. Massachusetts participants, please stay on the line for an important update from Massachusetts Department of Public health. Thank you all for joining us for today’s webinar and have a great day.

>> Back over to Melissa.

>> Thank you so much. So for Massachusetts facilities, I know it is getting late. I will just take a minute more of your time. Thank you again for your commitment to the program. Just a couple of quick reminders, we just want to remind all facilities that in order to receive recognition from the health department for full program completion and commitment, you do need to submit monthly antibiotic start data and participate in all webinars. If for any reason you missed one of the earlier webinars and you are joining the program late, that is okay. We have links posted. They are here and also on the QIN-QIO website. You can access those previous webinars. You can view them, and we can see that you
have viewed them. You will get credit for viewing and attending. I just wanted to make a couple of notes with regard to submitting antibiotic start data. We received data from many facilities for the month of January. Thank you so much for that. There were some questions about calculating the number of resident days and we had to follow-up with a few facilities. I just wanted to clarify when we talk about resident days, what we need for you to do is add up to daily census for every day in the run -- in the month to get the resident days for the month. We are not looking for an average daily census. We are looking for the total number of resident days for the month. So just wanted to make that clarification.

Just another quick clarification regarding calculating percent occupancy. In order to do that, you would need to divide the number of beds occupied by the total number of beds and multiplied by 100. That will give you your percent occupancy. If you are one of the facilities that is unable to provide the resident days, you can do this. Leslie, I just wanted to mention that we are in the process of assembling a virtual infection control antibiotic stewardship toolkit which will include many of the resources that have been discussed in all of these webinars. Also, a reminder that your monthly antibiotic start data can occur beginning on the first day of each month for the prior month. So for example, for January, we were accepting data through the end of February for the month of January and for those facilities that submitted January data, we have generated reports for you, and they will be sent to you by email within the next one it to today's. So you can look for those. It is also time now to start submitting February data. You have until the last day of this month to submit your February data, and then we will begin issuing the February reports and we will continue on that track. So any questions, don't hesitate to reach out. My contact information is there and I would just like to thank you all again for your time and your commitment to the program.

Thank you so much.

>> We have one question. Could you repeat how to calculate the census per days again?

>> Sure. I don't think we are counting bed holds. I think we are counting an actual resident present in a bed. So your daily census. So that would be residence present in the building for each day for the month. So let's say just for the sake of explanation you have 100 residents present for every day in the month of January. You would multiply 100 by 31 because there are 31 days in the month and that would give you your total resident days. Now we know each day, your census is probably a little bit different so you are going to have to add up each day.

>> This is Kira. We should not be including bed holds.

>> Thank you.

>> No additional questions so today's webinar has officially concluded. Thank you all and have a great day.

>> Thank you. Bye bye.

[ Event concluded ]