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This medical industry feature, titled "**Targeted testing for GI Infection: Alignment of diagnostic testing to recent guidelines**" is sponsored by BD, Advancing the world of health.

Dr. Caudle:
Each year, millions of patients present to hospitals and outpatient settings with symptoms of infectious diarrhea caused by bacterial, parasitic, and viral pathogens, and this infection can be especially dangerous in children. In fact, infectious diarrhea is the second leading cause of death of children under the age of 5 and is extremely contagious, which can lead to community outbreaks like the ones you hear about on cruise ships and at daycare centers. Unfortunately, the symptoms for these illnesses are similar, which can make it challenging for physicians to determine the most appropriate diagnostic testing approach. On today's program, we'll examine new guidelines helping direct this approach and, by extension, improve care decisions going forward.

This is ReachMD and I'm your host, Dr. Jennifer Caudle. Joining me today is Dr. Mark Murphy, an infectious disease physician at Cincinnati Children's Hospital. Dr. Murphy will be sharing how his team applies recent guidelines from the Infectious Diseases Society of America, or IDSA, to inform diagnostic testing for these cases. Dr. Murphy, welcome to the program.

Dr. Murphy:
Thank you for having me and I'm happy to be here.

Dr. Caudle:
We're happy that you're joining us, as well. So, let's get started. As an infectious diseases physician, Dr. Murphy, you know, what challenges do you face in managing patients with GI infection symptoms?

Dr. Murphy:

I think you summed it up really nicely in the introduction that gastrointestinal infections is the leading cause of morbidity, mortality and risk for outbreak. As a pediatric infectious disease fellow, this really hits home for me due to its severity. In the US, it's obviously not as bad as the rest of the world, but I think that statistic about being the second leading cause of deaths in under the age of 5, highlights the severity of something that is preventable and treatable. In our hospital, it's always paramount to quickly identify patients with acute gastro and to assist with early placement into isolation to stop the potential spread to other patients. As I'm sure you can imagine, diarrhea is unpleasant to add on to any other ailment that already brings you to the hospital. For us, diarrhea cases are season dependent, meaning for our infectious disease consultations, our spectrum is a little bit more on the severe cases, but we can see roughly three to four cases in a peak. With the symptoms, it can be really challenging to discern the actual causes of illness, especially in our immunocompromised patients. The other big challenge that we see is having positive C. diff testing, which can be really difficult in children, knowing that up to 15% of children can be colonized, especially in an age less than 2. And, a more and more frequent call that we are getting from the outside hospitals is asking us to interpret lab testing for "shotgun testing" of GI pathogens with the question of does this positive need antimicrobial therapy, which we are – since we're getting more and more positive tests, it's kind of leaving us, what do we make of this? And I think a good analogy is in our Microlab when the molotov went live a few years back – and that's a test that tests for bacterial identification from blood cultures – is that we had increased calls for – well, classically just called coagulase-negative staph species, but were actually given a name – and we were just getting a ton of phone calls saying does this need therapy? The social challenge of pediatricians – we have a difficult time of wanting to provide answers to families and families definitely want answers, but it's a hard balance, given that most diarrhea is self-limited and many pathogens don't even have an indicated treatment versus being able to provide those families with an answer, I think also has to be considered.

Dr. Caudle:

Okay, excellent. And, you know, how have the recent IDSA Guidelines for Infectious Diarrhea helped in your efforts to determine the appropriate diagnostic testing for these patients?

Dr. Murphy:

You know, reviewing the IDSA Guidelines for Diarrhea, which came out in 2017, was the last time it has been updated, the first part of the overall recommendations is the biggest key point is to take a good history and to review the potential exposures, say daycares, healthcare workers, food industries, swimming pools, travel – to name a few of those exposures. And it may seem intuitive, but they also recommend that fever and bloody diarrhea should definitely get more of a workup, looking specifically for pathogens that we can actually provide treatment for, such as shigella, salmonella, Shiga toxin-producing E. coli, and Campylobacter. The overall theme of the guideline was to do more selective testing when able, especially based upon people's exposure. So, you know, recent antibiotics exposure and hospitalization would be relevant for testing for C. diff versus testing for everything and anything. And I would highly recommend going through that guideline because they have a great table that goes over the exposures of what should be selected and tested for for each specific exposure. The big question we always get is how good is this molecular testing? And I think the guidelines address that pretty nicely. Molecular testing is incredibly sensitive, so when it is a negative, it is a true negative. The issue I think time will tell a bit more is how specific it is. So, when it is a positive, is that a real test – or is that a real positive or is that a false positive? And the thing that we're seeing more and more with these large panels is we get multiple positives and likely there is a component of shedding that happens with viruses or bacteria that are not an actual part of the disease that will impact how specific the test is. The takeaway points I would take away from the guidelines would be that diagnostic testing should be more selective and limited in settings in which we are able to do something about. So, provide therapy or, from a health department standpoint, if there's an outbreak, and that large german panels may not be clinically relevant for everything and can definitely have impact on healthcare costs.

Dr. Caudle:

Excellent. Thank you for that. So, for those of you who are just joining us, this is ReachMD. I'm your host, Dr. Jennifer Caudle, and today I'm speaking with Dr. Mark Murphy about targeted GI infection testing.

Okay, so moving along, Dr. Murphy, you know, now that we've covered the key points of the recent IDSA Guidelines for Infectious Diarrhea, why don't we take a look at these guidelines and why don't you tell us a little bit more about how you apply these guidelines to your daily practice.

Dr. Murphy:

You know, I think that was a great question and at Cincinnati Children's we have implemented different order sets to include different GI panels. So, we have one for viral, we have one for bacterial, we have one for parasites, and we have one to have more collected for our immunocompromised hosts. By breaking down different panels, we end up not doing the shotgun testing, but still allow for the appropriate testing when necessary. And when we were first making those changes, we thought we might have some clinician pushback, knowing that sometimes clinicians want to test for everything and anything, but we have had an overwhelming acceptance of this testing modality within our own department of infectious diseases; everyone's been very happy with only going for selected testing based upon the IDSA Guidelines. And I think the best example I can give is we recently had a child that was admitted for severe diarrhea. She recently had a liver transplant, and we were able to use our molecular testing to be able to diagnose her with norovirus early and started her on a treatment of nitazoxanide soon after she was admitted. Without that quick turnaround time, we would not be able to start her on this targeted therapy. With anyone with immunocompromise and neurovirus, they can have very prolonged symptoms. From an antimicrobial stewardship standpoint, we come from a whole different angle. We have been working on care algorithms for appropriate use of C. diff testing, and we've also eliminated C. diff testing from our larger bacterial panels, and with this, we've seen a dramatic drop in our overall positives, especially in children less than the age of 2, which is helping reduce our antibiotic use as well as making our infection preventionist very happy.

Dr. Caudle:

Excellent. Dr. Murphy, can you talk about what you do in a situation where you get multiple positive results?

Dr. Murphy:

That is a million-dollar question. Those situations are always very difficult and it's always very patient-dependent. For example, in our immunocompromise host, we know that once they get positive for a virus, say norovirus, they can shed it for a very prolonged period of time, but it may not be actually giving them symptoms, and they come in for diarrhea and they have a new positive of something else, say salmonella, you're probably going to address the salmonella aspect more than the norovirus. When it comes to multiple positives in immunocompetent hosts, such as a previously health person, it's very difficult to know which one is actually causing the real disease, and it's probably going to come down to are one of those positives something that you actually can intervene on? Like you're not going to ignore a salmonella-positive test with someone that has bloody stools, even if they're positive for norovirus, just because the severity of potentially missing that is a bigger ordeal.

Dr. Caudle:

So, Dr. Murphy, when you get a positive virus result, what do you do in this situation?

Dr. Murphy:

That's another great question. And I would say that a lot of clinicians ask that to us for what is the, kind of, point of ordering vital testing when there's not a lot of treatment modalities for them? My response would be, there's a time and place for everything so, again, in immunocompromised hosts, we definitely want to know if it's a virus, just because we want to know and there are potential therapies that we can provide them versus if you're immunocompetent, it should be self-limiting. The overall double-edged sword of saying, why do I want this test, and so from a public health standpoint, it provides a ton of information. Because if you're seeing norovirus in your community and you see

10 patients in your clinic and they all have norovirus, that's something that needs to be reported to the health department so they can investigate what's really happening, and that's how you get all the things you hear on the news about people from cruise ships and they're getting all these norovirus outbreaks. It's very beneficial from a public health standpoint. Looking at the patient specifically for something – a virus that is typically a self-limited disease, it doesn't really provide much in the change of your therapy. You're still going to be addressing them with hydration and that's not going to change because norovirus versus Norwalk virus. You're still going to treat them the same, but from a public health standpoint, if you're noticing this in your clinic where you're just like, man everyone just keeps getting hit with this diarrhea, someone has to be patient zero and be tested for it. That kind of should be the cue of saying there's something different in the community right now.

Dr. Caudle:
Wonderful, and finally, Dr. Murphy, as we wrap up today's session, what advice would you give to physicians as they work with their lab teams to direct targeted testing for GI infections?

Dr. Murphy:
I think my best advice would be to emphasize the importance in having a close relationship with your institution's infectious diagnostic team, which has been incredibly helpful here in Cincinnati with knowing what are the appropriate testing diagnostics that we have as well as the limitations of some of these tests that are out there. Working on that relationship helps bridge the connection between the lab and clinicians to help determine appropriate testing algorithms and to improve patient care, as well as reduce unnecessary testing and the associated costs.

Dr. Caudle:
Excellent. Well those are all great pieces of advice to take with us as we come to the end of today's program. And I want to thank my guest, Dr. Mark Murphy, for helping us better

understand how the recent IDSA Guidelines inform diagnostic testing procedures and approaches for GI infections. Dr. Murphy, it was great speaking with you.

Dr. Murphy:
Thank you for having me.

Announcer:
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