What happened when lab set sights on parasites

Anne Ford

March 2013—When Bobbi S. Pritt, MD, director of clinical parasitology and virology in the Division of Clinical Microbiology at Mayo Clinic, set out to improve test utilization among the physicians for whom her laboratory performs assays, she figured that knowledge was power. Simply educate the clinicians, she thought, and surely they would begin to order the most appropriate tests for their patients.

It took her some time to realize that while knowledge may be powerful, in some situations, it's just not powerful enough. That is, despite extensive educational efforts, she saw no decrease in order volume for the assay whose utilization she had hoped to reduce—ova-and-parasite testing.

"I don't think that they [the laboratory's educational efforts] really did much as far as changing ordering practices," Dr. Pritt said during "An Algorithm for Detection of Intestinal Parasites: Lessons Learned," a talk she gave last year at the American Association for Clinical Chemistry annual meeting. "Education is important. It helps establish the laboratory and the laboratorian as a subject-matter expert. It helps get you out of the laboratory, interacting with your clinicians so you can build up that trust … which is essential if you want to start implementing algorithms down the road. But it doesn't necessarily get you the impact you want."

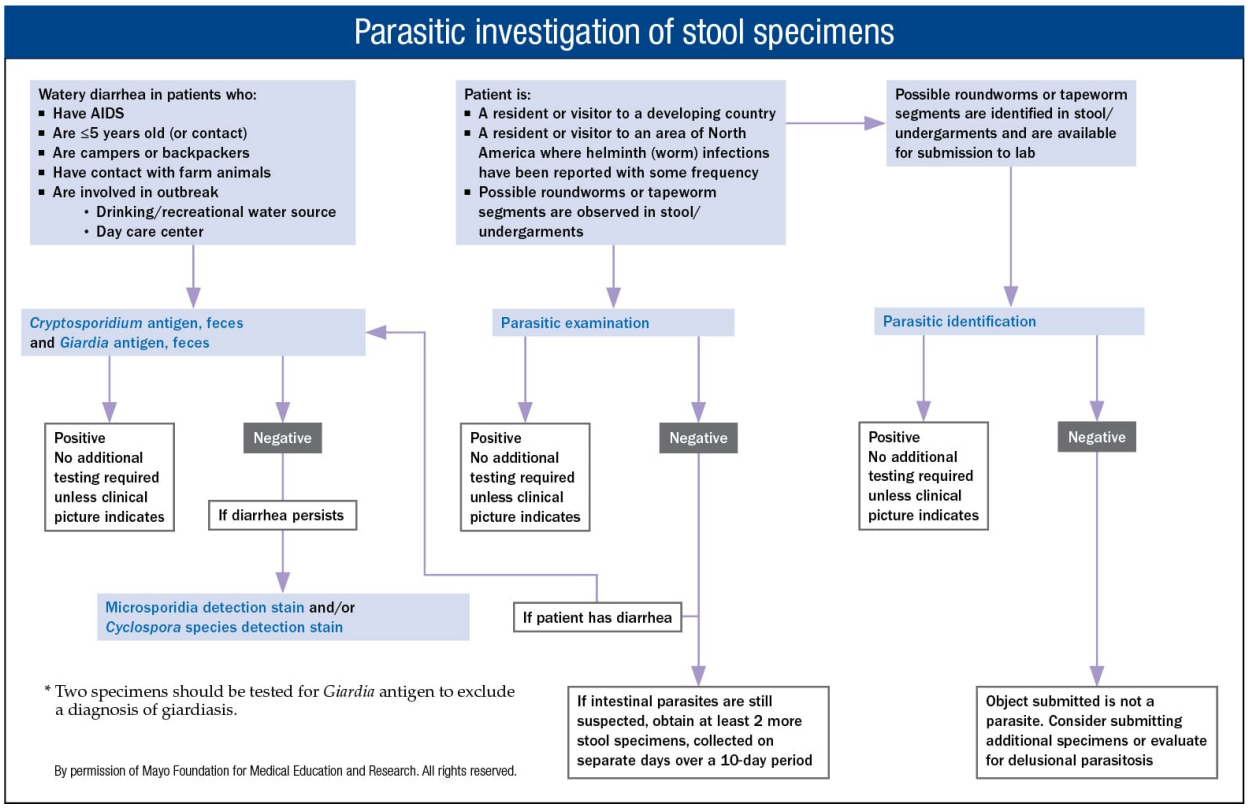
In her remarks, Dr. Pritt reviewed the prevalence of parasite-related disease in the United States as well as the most appropriate testing options for it, outlined her laboratory's efforts to improve utilization of parasitology testing, and supplied recommendations for other labs that might wish to do the same. Her hope: that "some of the principles I'm going to present would be very reproducible in other areas" of the laboratory, not just microbiology.

Dr. Pritt presented the case of a previously healthy four-year-old boy who, along with other children from his preschool class, experienced watery diarrhea of two days' duration after visiting a petting zoo. She asked her audience to indicate which test they'd choose: stool culture for Strongyloides and hookworm, parasitic examination of stool (ova-and-parasite exam), immunoassay for Giardia and Cryptosporidium, immunoassay for Entamoeba histolytica, or some combination thereof. Seeing a marked lack of consensus among audience members, she said, "I think that this is how the physicians feel … And I think sometimes they just say, 'Oh, what the heck, let's just order them all,' right?"

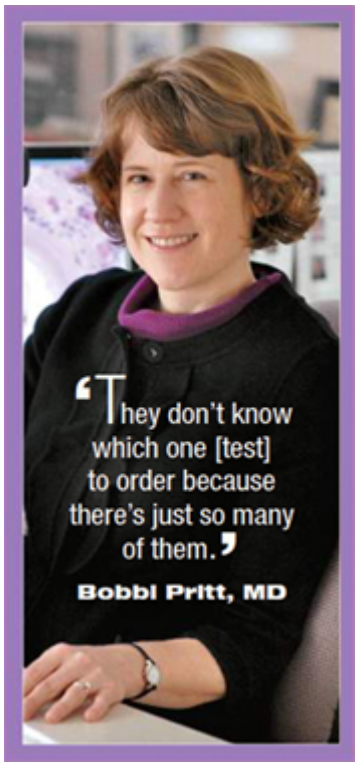
Actually, she said, the tendency is for physicians to order the ova-and-parasite exam, because it's "probably our most comprehensive exam as far as being able to detect the number of parasites." So what's wrong with that? To start with, "most of the time—I hate to say it—the parasites aren't even probably the main cause of the patient's diarrhea," she said. "It's probably viral or bacterial, so you're looking for a needle in a haystack, and … you don't even have a high pre-test probability that you're going to find a parasite."

"But you wouldn't know that if you just looked at public media," she added, "because we have all these really interesting television shows now, like 'Monsters Inside Me'" (a documentary series about parasites). "Physicians and their patients have parasites on the brain, so to speak, and so they want to order tests for parasites."

Then there's the fact that the ova-and-parasite test is not the most sensitive option for detecting North America's two most common intestinal parasites associated with diarrhea: Giardia and Cryptosporidium. Using ova-and-parasite to rule out Giardia as a cause of diarrhea, for example, could require as many as seven stool specimens. "Can you imagine asking your patient to come back in seven times with a stool specimen?" she asked. "Do you know how popular that will not be?" In addition, the ova-and-parasite test is "a subjective morphologic examination," she noted. "You need well-trained technologists, and they have to be highly experienced."



All that to say: Unless the patient has lived in or visited an area of the world in which helminths (parasitic worms) are common, an ova-and-parasite test would probably not be indicated. Better options, Dr. Pritt said, are "some special stains [modified acid-fast stain and modified trichrome stain], which are good in certain situations." There are also antigen detection assays, such as for Giardia and Cryptosporidium and for Entamoeba histolytica, although the latter is not common in North America. "We have some other methods: antibody detection using serum, a stool culture for Strongyloides and hookworm—again, not very common in the United States—and then in some research settings, we have PCR. But when you tell the physician all of this, and you say, 'These are your options,' they don't know which one to order because there's just so many of them."



That's why, she said, the preferred approach would be for physicians to use an algorithm to guide their testing, based on how the patient is presenting and what his or her risk factors are. As she presented the algorithm to the audience, it seemed simple enough: "If you happen to have a patient who has watery diarrhea who has AIDS, had contact with farm animals, or was involved in an outbreak, such as municipal water supply or a day care center, like our patient, you would want to consider ordering the Cryptosporidium antigen." (Indeed, the patient she mentioned earlier in her talk did test positive for Cryptosporidium.)

And if the patient is not yet five years old, or is a camper or backpacker who might have drunk out of a stream, "you'd want to also consider ordering the Giardia antigen." Given that the risk factors for Cryptosporidium and Giardia infection overlap, "we actually recommend that both antigen tests be ordered together" (see algorithm, left). In contrast, a select group of patients (travelers, immigrants, and people living in small pockets of the United States such as Appalachia) may have been exposed to intestinal parasites such as roundworms. "That's the main situation where you would want to order that ova-and-parasite exam," Dr. Pritt says.

Doesn't sound too difficult. "I should be able to convince all my physicians to do this, right?" she said. "All right, well, unfortunately, there's some challenges." First, she pointed out, "the initial selection of tests, and any sequential tests they may decide to do, all depend on clinical factors. And how many of you feel like you really get all those clinical factors you ask for?" Her laboratory used to include a form asking about the patient's travel history with every stool collection kit, for example, but repeatedly would get unhelpful answers such as "one hour in the car"—when they were filled out at all.

"So the problem you can see here," Dr. Pritt said, "is that [for the ova-and-parasite exam] the laboratory professionals have little control over ordering decisions. We can't even go in and cancel tests … or have an algorithm … where a single initial test will allow a cascade to happen." Usually just one test is ordered, "and we don't know if it's appropriate or not, because we don't know all of the inputs—all of that clinical background," she said. Instead of the laboratory controlling the algorithm, it's the clinician who controls the algorithm. "So because of that, if we're going to get them to use the algorithm, we need clinical acceptance."

Toward that end, Dr. Pritt and her colleagues not only sought clinician input when developing the algorithm, but also launched ongoing education for them. "We're a large teaching hospital, so we have trainees coming in every year, so it's going to be a large undertaking," she said.

Then, too, she had to grapple with the fact that 80 percent of her laboratory's intestinal parasite testing volume comes from reference lab clients: "So that's going to be a big challenge." She addressed it by attempting to educate the laboratorians at the outside labs, releasing an educational bulletin, a 30-minute educational video, and finally a live televised 60-minute educational program. The result? "Our volumes [of ova-and-parasite testing] actually went up to higher than they had ever been," she said. Rather than help physicians be more selective in placing specific orders for intestinal parasites, it appears "the educational efforts only served to increase

awareness of intestinal parasites and prompt more orders."

Her conclusion: "Educational efforts are not enough by themselves to sufficiently change ordering practices." That's probably for a number of reasons, she said. "We're not reaching the right people, habits and patterns are hard to break, and every year there's a regular influx of new trainees and clinicians, not just at my institution but at all of those outreach institutions." In addition, education is time-consuming. "It's a lot of effort, and the yield isn't necessarily sustainable after that initial educational impact. And it turns out, we are not the first persons to see this," she said, pointing to a 1984 study (Schroeder SA, et al. The failure of physician education as a cost containment strategy. JAMA. 1984;252:225–230).

Fortunately, the literature also held a potential solution: giving clinicians monthly feedback comparing their test-ordering practices with those of their peers, in conjunction with educational efforts resembling those Dr. Pritt had tried. In a 1990 study, doing so resulted in inappropriate test ordering volume falling by at least one-fifth during the intervention period, a reduction that persisted for two years (Bareford D, Hayling A. Inappropriate use of laboratory services: long term combined approach to modify request patterns. BMJ. 1990;301:1305–1307).

"No one ever wants to be the person who isn't following the guidelines, or isn't performing up to an expected level," Dr. Pritt said. "So this actually was pretty powerful. And what I thought was interesting from this paper is they actually said that most of the people, up to a third of the trainees, didn't even attend the educational conferences, and some of them didn't even know the algorithms were available. So without the algorithm, without the education, that puts it mostly on the peer feedback that must've been driving a lot of this decrease they saw."

And so, Dr. Pritt said, she and her colleagues planned to begin providing peer performance data in addition to making changes to their test-ordering systems, beginning with the outpatient system that Mayo clinicians use. First, "We've tried to put common procedures on the top and additional procedures at the bottom, with the thought that people might be more likely to order the Cryptosporidium and Giardia instead of the parasitic examination [which is lower]."
Second, "I'm going to group these two tests together under the heading of 'fecal parasite screen for diarrhea,'" she said. "I think people like screens. They like that terminology. It makes them think that's the first test they should use." Finally, "We're now going to say, 'See guide for testing algorithm,' with the guide being on the left-hand bar."

This is a relatively straightforward change to the ordering system, she notes. A more aggressive approach to changing the ordering system with potentially larger impact is to require the ordering clinician to fill in boxes indicating whether the patient has any risk factors for intestinal parasites other than Cryptosporidium or Giardia before allowing them to place an order for the ova-and-parasite exam. She has decided not to pursue this option because of the complexity of parasite risk factors. But "requiring certain pieces of information can be very helpful in other types of tests such as coagulation cascades, in which medication history may be essential for accurate interpretation," she says.

Dr. Pritt acknowledges that many labs do not have strong IT support and the staff it takes to change an ordering system, and thus she cites other possibilities for the laboratory to gain some control over test ordering: Remove a test from the ordering system altogether (if demographically appropriate) or require a specialist's approval for testing.

"Now, I think my infectious disease physicians would probably boycott me and protest if I had them approve every single ova-and-parasite test, since it is a high-volume test ordered by family physicians, internal medicine, ED physicians, a whole spectrum of people," she said. "But again, extrapolating this idea to other areas of the laboratory, I think this could be very appropriate for some special genetics tests, for example." Small labs might also consider having trainees review every request for an ova-and-parasite test. "Have them call the clinician or look up the medical record, and even cancel at that point if it's not appropriate."

Contacted in February, Dr. Pritt said that after making changes to the test-ordering system last August, the laboratory saw an immediate drop in ova-and-parasite test orders. "September is usually our peak volume, but from August to September, we saw our monthly volumes decrease by 100 orders per month, for a total 30 percent

decrease compared with volumes seen in September 2011," she told CAP TODAY. (The peer performance feedback program has not yet been fully rolled out.) She calls the initial results encouraging but says they will monitor to see if the trend is sustained.

The key lesson she learned? "Education is a logical choice. It's what most of us think of when we want to make a change. We say, 'Let's go out and educate everyone.' It might be easy for a small group, and it might have good short-term impact, but overall it's probably going to have limited impact and limited long-term staying power." Instead, she said, education needs to be part of a larger, planned, multipronged approach.

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