Article:
Thomas JS Durant, et al.
Impact of COVID-19 Pandemic on Laboratory Utilization.
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Guest: Dr. Thomas Durant is an Assistant Professor of Laboratory Medicine and an Informatics Researcher at the Yale School of Medicine, and the Medical Director of Chemical Pathology and Laboratory Information Technology at Yale New Haven Hospital.

Randye Kaye: Hello and welcome to this edition of "JALM Talk," from *The Journal of Applied Laboratory Medicine*, a publication of the American Association for Clinical Chemistry. I'm your host, Randye Kaye.

The COVID-19 pandemic has led to unprecedented shifts in healthcare resources. While hospitalizations and acute illnesses have increased, many institutions have postponed elective surgical procedures and transitioned outpatient appointments to telehealth visits. These trends have undoubtedly impacted clinical laboratory testing and have altered needs for laboratory personnel, analyzers, and reagents. Better understanding these trends may provide guidance for laboratories in making operational decisions and planning for future COVID-19 case surges or other future pandemic scenarios.

An original article in the November 2020 issue of JALM characterizes observed changes and the demand for laboratory testing following the COVID-19 outbreak at a tertiary care clinical laboratory near one of the United States' epicenters of the pandemic. The first author of the article is Dr. Thomas Durant. Dr. Durant is an Assistant Professor of Laboratory Medicine and an Informatics Researcher at the Yale School of Medicine. He is the Medical Director of Chemical Pathology and Laboratory Information Technology at Yale New Haven Hospital and the Associate Director for Yale's ACGME Chemical Pathology Fellowship. Dr. Durant is our guest for this podcast. Welcome, Dr. Durant.

So, tell me, why did you decide to investigate laboratory test utilization trends during the COVID-19 pandemic?

Thomas Durant: You know, any research project that we end up doing these days when we're doing a lot of clinical work is that we hear something that's happening in the lab and then we say, "Oh, let's look into that a little further." We heard that we were running out of blue top tubes and there are also reports from other institutions in the literature saying that there is an increased frequency of ordering blood cultures. So, that inspired us to sort of look at our own data, to look and see if the latter was happening in our institution and to sort of figure

out what's going on with the blue top tubes, what's driving that increase in demand.

And to be honest, we also just kind of saw it as an exercise in informatics-driven quality improvement project in terms of saying to ourselves, how easy is it for us to pull data to find out what our supply chain is doing, what the demand of our lab services are, et cetera. So, it's kind of multi-faceted, you know, to answer the question itself and also to figure out how hard is it to ask these questions of the data that we're supposed to have so readily available to us.

Randye Kaye: So, how hard was it? How did you obtain the utilization data and was it easy to compile?

Thomas Durant: Yeah. So -- yes. I mean, it was a combination of sources for us. We had to go to an application within our LIS to do some of the export, but that application tends to have difficulty with large data exports, so we had to combine that. We used our LIS workbench report system for getting some of the data, then we used another tool that is set up for the institution, the healthcare delivery organization, that maps data from the backend database of Epic, which is called Clarity, into a data model for people to access more readily through a graphic user interface called Lab Universe.

And then we also did some exports from the LIS build itself. And then we had to map all three of those data sources together to get all the answers that we were looking for. The one that I think that probably gave us the most trouble was on the container type. If we look at our Table 3, it looks like yeah, we talked a little bit about the container utilization and that data, I think we mentioned in the paper, is representative of the default container type that's associated with that orderable.

I think one of the things we learned from this was there's really no easy way to say how many blue tops have been used precisely. You have to just sort of use these configurables for the test build in the laboratory information system to say, "Yeah, 95% of the time when this test is ordered, it's going to be blue top tube." And if you sort of cross-validate that with the ordering frequencies and what you're seeing with your boots on the ground in the lab, you can assure yourself that it makes sense, at least enough to make some conclusions from the data.

Randye Kaye: Okay. Thank you. So, that's I guess one of the major findings. Were there any other major findings of your study? And with which test did you see the most extreme changes in demand?

Thomas Durant: I think that the major findings that we are trying to communicate is mainly that your overall volume in lab in response to a global pandemic can drop.

But you can have these specific and significant pressures put on lab services. And that's mostly highlighted in Table 1 of the paper where you can see particularly in the send-outs, we had a cytokine panel that was ordered, only five times pre-pandemic, and it was ordered 1,300 times in the observation period. So, it was a relative difference of 26,000%. And then we also had instances where there were treatment protocols for the patient-facing side of the hospital wherein we would have an algorithm that was sent out to all the physicians to say, when a patient with COVID enters a hospital, these are the tests that you need to get.

And as a result of that, we saw the tests that were listed out on those algorithms be ordered way more often than they were pre-pandemic. So, things like that included, C-reactive proteins, troponin T, procalcitonin, ferritin, D-dimer, Fibrinogen, PTT, PTIR. You know, that was something that we didn't really appreciate that, yeah, you know, if we have a huge influx of patients that had COVID be admitted to the hospital, we're going to see a massive spike in -- we know exactly what tests are going to spike because they on this treatment algorithm that everyone's going to be following.

Randye Kaye: Okay, yeah. Thank you. And as we're recording this on December 7, where there is a lot more testing ahead, I would imagine, were there any other testing or utilization challenges that your labs encountered that maybe were not reflected in your data?

Thomas Durant: Yeah. I'd say one of those was if you look at blood gas in Table 1, we didn't see a tremendous change in the volume either in the order frequency or if you look at Table 3, the difference in blood gas syringe usage. But because of supply chain issues with the manufacturing of blood gas syringes, we had a pretty significant issue, if I can remember over the summer, where we ran out of blood gas syringes essentially, in specific units in the hospital. So, people had to -- nurses had to go run down to the 9th floor to bring blood gas syringes up to the 12th floor just because the one that we were -- that they were using, we ran out of, and the manufacturers said, "Yeah, you know, we're out of them, our supply chain is broken and we're not be able to get you anymore for another three or four weeks."

And as they would say three to four weeks, what they really meant was we don't know when we're going get you some. And I know there's other people in other institutions that had that problem as well, so I don't know if there was something specifically going on with the blood gas syringe supply chain

but that was something we certainly felt in our institution that wasn't necessarily reflected in the data that we presented.

Randye Kaye: All right, thank you. So, you know, this doesn't get the same kind of press as PPE and toilet paper, but it's certainly very important as we move forward through this pandemic. So, what would you say is the overall take-home message from your study? Any lessons you learned that could help labs experiencing future case surges or other pandemic scenarios?

Thomas Durant: I think the overall message that we're presenting and I think a lot of labs kind of got themselves just through practice was, don't be complacent when these things happen with your -- from a supply perspective. You need to have some prescience going forward to keep your lab operational, particularly from a supply chain perspective. I think if I were to do this again, hopefully we won't have to, but if something like this would happen again, I'd talk to my managers, my lab managers, very early as soon as we catch wind of something like this coming, and tell them to keep an eye up for which tests are going up in terms of frequency, keep a very close eye on your par-levels, or the level of supply that you basically say below which we are in trouble, and then it would be sort of my job to coordinate with clinical operations to make sure we as a lab have a good handle on treatment and testing protocols that I can circulate among our managers and coordinators in the lab. From our experience, that was a leading indicator of what tests we were going to see go up in terms of volume. And also then, what test we may end up seeing have difficulties with supply chain if all the other hospitals across the country are testing their patient population similarly.

Randye Kaye: All right. Thank you, thank you so much for joining us today.

Thomas Durant: Yeah, absolutely.

Randye Kaye: That was Dr. Thomas Durant from the Yale School of Medicine, describing the article from the November 2020 issue of JALM entitled "Impact of COVID-19 Pandemic on Laboratory Utilization." Thanks for tuning in to this episode of JALM Talk. See you next time and don't forget to submit something for us to talk about.