



**Article:**

Adetoun A Ejilemele, Ila R Singh.

*Toward Sustainable Clinical Chemistry: Waste Quantification and Reduction Strategies from Testing on 4 Commonly Used Automated Analyzers.*

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**Guests:** Drs. Toun Ejilemele and Ila Singh, both from Texas Children’s Hospital and Baylor College of Medicine in Houston, Texas.

Randye Kaye:

Hello, and welcome to this edition of *JALMTalk* from *The Journal of Applied Laboratory Medicine*, a publication of the Association for Diagnostics & Laboratory Medicine. I’m your host, Randye Kaye.

Automated chemistry analyzers run the majority of testing in the clinical chemistry laboratory. One of the most commonly ordered panels is the basic metabolic panel, or BMP. The BMP is an 8 test panel that includes glucose, calcium, blood urea nitrogen (BUN), creatinine, carbon dioxide, and the electrolytes sodium, potassium, and chloride. The collection of blood samples and the running of these tests produces a considerable amount of solid and liquid waste that needs to be disposed of.

The March 2026 issue of *JALM* features an article that investigates the amount of waste generated from four automated chemistry analyzers performing the BMP. In this study, the authors evaluated the waste generated during both the pre-analytical and analytical phases of testing. This includes the waste generated by phlebotomy when the samples are collected and transported, as well as the waste generated when testing the samples on the automated chemistry analyzers.

This was done to get a better understanding of the waste the laboratory generates during routine testing in order to identify sustainability enhancing improvements. Today, we are joined by the article’s two authors, Dr. Toun Ejilemele and Ila Singh. Toun Ejilemele is the Associate Director of Clinical Chemistry at Texas Children’s Hospital and an Associate Professor of Pathology at Baylor College of Medicine. Ila Singh is the Chief of Laboratory Medicine and Pathology Informatics at Texas Children’s Hospital and a Professor of Pathology at Baylor College of Medicine. Welcome Drs. Ejilemele and Singh. Dr. Singh, why did you decide to study laboratory waste in the first place? This isn’t something most of us think about day to day.

Ila Singh:

That’s exactly why we did it. Clinical labs are essential for patient care. We run millions of lab tests every day. We’ve almost never stopped to ask ‘What is the environmental

footprint of these tests?’ And healthcare is a major contributor to waste and emissions, but we usually need diagnostics out of these sustainability conversations. By doing this study, we wanted to make the invisible visible. And we wanted to ask a simple question. How much waste does a common lab test generate? Once you start measuring it, you realize that labs are a meaningful and addressable part of healthcare’s footprint.

Randye Kaye: All right. Thank you. I have to admit as a patient when I get a lab test done, I don’t often think about the waste that’s involved. So you’re right. Make the invisible visible. So Dr. Ejilemele, sustainability is an increasingly important topic in the healthcare space so this is very impactful work. In this study, you focused on the basic metabolic panel. Why that collection of tests?

Adetoun Ejilemele: So the basic metabolic panel is one of the most commonly ordered tests in patients. We also noticed that it’s a standardized test. It has a standardized workflow across various laboratory sizes and it’s easy to replicate. It generates waste across multiple streams so you have a solid waste, the liquid hazardous, and also the plastic waste. And again, when we thought about it, that about 25% of tests may be unnecessary, it allowed us to look at how small inefficiencies repeated tons of times can add up waste really quickly. So we thought it was a perfect test that would also allow us to derive units, simple units, that we can use in quantifying waste.

Randye Kaye: Well, that makes sense. Now in this study, you measured waste from four of the most commonly used chemistry analyzers. What made you choose those analyzers and what surprised you most from your data?

Adetoun Ejilemele: So, we chose those analyzers because they were the most common analyzes used by laboratories in the US who subscribe to the College of American Pathologists Chemistry Challenge. And the first thing that surprised us was just the sheer magnitude of the waste that was generated. And the 100,000 basic metabolic panels generates more than four metric tons of waste. And then the other thing that we saw was that there was a lot of variation between the analyzers.

For example, there’s a 20-fold difference between solid waste and more than a 30-fold difference in the liquid waste across analyzers. And what that tells us is that the waste generated really, it’s dependence on the design of the analyzer as well as the instrument itself.

Randye Kaye: Okay, thank you. Now, I would think that most people would assume that the analyzer would be the largest contributor to

waste, but in this study you emphasized pre-analytical waste, why?

Adetoun Ejilemele: The reason we emphasized that is we found that from a study that most of the waste is accounted for by phlebotomy supplies, more than 60%. And that quantity is more than five times greater than the solid waste from even the most solid waste producing analyzer. And so what that means is we can't solve the problem by choosing a more green instrument. We need to rethink the number of tests that we do. So, get rid of unnecessary testing. We need to rethink how we collect specimens. We also need to redesign our workflows.

Randye Kaye: Thank you so much. Dr. Singh, what would you like laboratorians, health systems, or even vendors to take away from this study?

Ila Singh: We hope that people recognize that labs are in a unique position to lead. We've always led in quality and safety, and sustainability feels like the next frontier where leadership really matters. Our paper is a first step, providing data where there's been very little, and once environmental impact is measurable, we can treat it like any other lab quality metric—something that we can compare, monitor, measure, improve, and we can then build sustainability into procurement standards or into regulatory guidance. We feel that sustainability is the next frontier where labs can lead again.

Randye Kaye: All right. Thank you so much. Very important. Thank you so much for joining us today.

Ila Singh: Thank you for having us.

Adetoun Ejilemele: Thank you.

Randye Kaye: That was Drs. Toun Ejilemele and Ila Singh describing the *JALM* article "Toward Sustainable Clinical Chemistry: Waste Quantification and Reduction Strategies from Testing on 4 Commonly Used Automated Analyzers." Thanks for tuning in to this episode of *JALMTalk*. See you next time and don't forget to submit something for us to talk about.