Article:
Jill S. Warrington, et al.
Keeping Up with Fentanyl: Failure to Do So Is Not an Option.
J Appl Lab Med 2018;3:148-151.
http://jalm.aaccjnls.org/content/3/1/148

Guest: Dr. Jill Warrington is Assistant Professor of Pathology at the University of Vermont College of Medicine.

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 rapid rise in the prevalence of fentanyl and fentanyl analogs has contributed significantly to an increase in overdose death rates in North America. Laboratories, healthcare providers, and government agencies struggle to effectively detect and reduce negative outcomes associated with fentanyl use in the absence of accurate data on prevalence and use.

"Keeping Up with Fentanyl: Failure to Do So Is Not an Option" was published in the July 2018 issue of *The Journal of Applied Laboratory Medicine*. This manuscript surveys the current landscape of available laboratory testing for detection of fentanyl and fentanyl analogs. Additionally, point-of-care testing of fentanyl and its analogs for the treatment of substance abuse disorder is discussed.

The first author is Dr. Jill Warrington. Dr. Warrington completed her anatomic and clinical pathology residency at Duke University School of Medicine. She is currently Assistant Professor in Pathology at the University of Vermont, College of Medicine. Welcome and hi, Dr. Warrington. First question, can you elaborate on the clinical importance of fentanyl and fentanyl analogs?

Jill Warrington: Sure. It's hard to open a newspaper today without some kind of reference to the opioid crisis, particularly the role of fentanyl and how it contributes so significantly to overdose deaths. The reason these compounds are what makes them so deadly is that fentanyl is approximately 50 times to 100 times more potent than morphine. And some fentanyl analogs like Carfentanil can be as much as 10,000 times more potent than morphine.

Due to this property, several of these drugs actually are actively mixed with small amounts of fentanyl. Things like heroin can be mixed with fentanyl, and these have a significant impact both in achieving the desired effect that

the patient may need for using these drugs, and also, unfortunately, for causing things like respiratory depression or death.

The challenging part is that many individuals that are using drugs like heroin are unaware that this drug of choice is laced with fentanyl.

Randye Kaye: You're right. I have read a great deal about it and it always does seem like fentanyl is involved somehow. So, what is currently available for the detection of fentanyl or fentanyl analogs?

Jill Warrington: Sure. Yeah, there are two types of testing for fentanyl or fentanyl analogs. The first is a laboratory-based immunoassay and the second is a confirmation testing which usually relies on a highly technical strategy called liquid chromatography-mass spectrometry. Unlike testing for cocaine or other common drugs, unfortunately, not all laboratories offer fentanyl testing as part of their basic immunoassay panels for drug abuse. Confirmation testing, is starting to increase—you'll see it more commonly in some laboratories—but it's limited still to the larger laboratories.

So, if fentanyl testing is desired, it's often sent out for referral laboratories. And the challenge with this is that many providers have to actually consider this drug actively. And since patients may not be aware that they've used it, it may not come to mind for either the patient or the provider to test for it.

On the upside, is that many of these antibodies that are targeted to fentanyl in these immunoassay tests appear to have cross-reactivities for the fentanyl analogs. This is actually a case where immunoassays' cross-reactivity, which is usually a negative, could be an advantage over confirmation testing, where targeted analysis is actually required and needs to be developed in the laboratory.

Randye Kaye: Okay. I see. Boy, a lot of interesting challenges here. Can you explain how current limitations in laboratory testing could prevent adequate detection of fentanyl and its analogs in patients?

Jill Warrington: Yeah. In the laboratory, there have some barriers to implementing fentanyl as a laboratory test. And the reason why we're behind as an industry is because fentanyl use has rapidly expanded. So, the field just hasn't kept up. For example, until recently, there was no FDA-approved fentanyl test, and that limited implementation only to laboratories that could offer what's known as high complexity laboratory testing. So, the average laboratory might not be able to offer it.

Fortunately, now, one manufacturer has received FDA approval. So, this is a barrier that's been surmounted, it just needs to be implemented more broadly. Another practical barrier is that some laboratory analyzers have only a limited number of what is called "open channels" in which they can perform this type of testing.

This doesn't allow for easy adaptability to new tests and kind of compromises how much we can introduce as a field. The development of some of these more extensive panels of fentanyl and fentanyl analogs for confirmation testing can be of value. But this, again, requires a high level of technical expertise and actually requires well-constructed safety protocols for a laboratory staff to make sure that they're safe with using these potent drugs.

Randye Kaye: I see. So, looking at the point of all of these, what role can fentanyl and the fentanyl analog point-of-care testing -- what role can that have in the treatment of patients with substance use disorders?

Jill Warrington: Yeah, this is an interesting one. So, we're pretty restricted in fentanyl testing these days to laboratory testing. Typically, point-of-care testing is used in the doctor's office right at the bedside and can be a very powerful tool to support testing. Unfortunately, for fentanyl testing, it's pretty much not available for that use. So, with that, we are somewhat restricted for use of point-of-care testing. There has been an interesting use recently for what are known as point-of-care tests for fentanyl that is for harm reduction only.

So, it can't be used for clinical testing but it can be used to actually test, let's say, heroin, in real time. So, if the patient wants to use the test drip for fentanyl test to see if their heroine contains fentanyl, they can do it that way, but it just can't be used to then look at the patient's urine and see if fentanyl is in it.

Randye Kaye: Wow. So, this gives them a real-time insight into whether they may be at increased risk for overdose with their drug use?

Jill Warrington: Exactly.

Randye Kaye: Great. Well, thank you so much. This has been fascinating. Thank you so much for joining us today.

Jill S. Warrington: Thank you.

Randye Kaye: That was Dr. Jill Warrington, assistant professor in anatomic and clinical pathology at the University of Vermont, College

of Medicine talking about “Keeping Up with Fentanyl: Failure to Do So Is Not an Option” from the July 2018 issue of JALM. Thanks for tuning in to “JALM Talk.” See you next time and don’t forget to submit something for us to talk about.