

Welcome to the forensic toxicology podcast. My name is Dr. Sanela Martić. I am an assistant professor in the Department of Forensic Science at Trent University. This podcast is about toxicological interpretation and reporting. Following the data collection and analysis, the toxicologists that needs to interpret that data and report it. There are several key questions that toxicologists needs to answer with, given, a specific case, Was a person exposed to a specific drug? Was the presence of the drug detected due to intentional use, or unintentional use? What was the size of the dose? What was the route of administration? What was the elapsed time between the last dose and sample collection? Was the subject and naïve or chronic user of the drug? Is the presence or concentration of an analyte, or a drug, a violation of a statute of regulation? Did the drug or chemical cause or contributed to the actual adverse event or accident? There are many factors that influence the interpretation of analytical data. This podcast will showcase several CanLII cases where these kinds of questions are raised. But they are very important questions to consider. Let's consider our first case, R. versus Sukhdeo 2019 ONCJ 150. On April 2017, Mr. Sukhdeo was charged with having care and control of a motor vehicle while his ability to do so was impaired by alcohol or drug, contrary to the section 253 of the criminal code. The drug recognition evaluation was carried out by a qualified officer to assess impairment by the drug. A part of evaluation involves the officer not only identify an impairment, or disability in this case, but also to identify a general classification of the type of drug and placing the drug into one of the seven categories of the DRE table. And as a result, a rolling log is generated, and that rolling log is a form where evaluating officer records all kinds of information. One type of information that's recorded is officer's conclusion, as well as the results of the subsequent urine analysis by the Centre of Forensic Science. So at the heart of this case lies the conundrum where the opinion of the evaluating officer's from DRE evaluation is not in alignment with the results of the urine analysis performed by a toxicologist at the CFS. Jean-Paul Palmentier is a CFS toxicologist. At the time he worked there for more than 18 years. He's really qualified. He's an expert in providing testimony in relationship to any type of toxicology, absorption, distribution, elimination of drugs and alcohol and so on. However, Mr. Palmentier is not qualified as an evaluating officer, but he's familiar with the DRE program. And in his experience, the evaluating officer's classification of the category of drug usually aligns with the toxicological results of the urine sample. He mentioned that in less than 5% of the cases there is discrepancy or non-alignment between the DRE results and toxicological findings. So, what are some reasons for that lack of alignment? Because that leads to interpretation and conclusions that one can draw from the data. Mr. Palmentier testified that it is possible that an evaluating officer may classify a drug incorrectly. But, he also mentioned there are many other variables to consider when there's a discrepancy of this kind. For example, drug effects may vary between individuals and the tolerance to drug. The effects could be dependent upon the dose, methods of administration and time elapsed since the last use. The specific effects of some drugs have not even been characterized fully. And the drug effects may also be dependent on their interactions with the other drugs that the person may be taking. In addition, the polydrug use complicates the task of the evaluating officer to classify all drugs present in a subject body, when there's a combination of drugs used. For example, a stimulant and depressant may effectively cancel each other out in terms of some of the symptomology, Some drugs that are eliminated more quickly than others. So it becomes an issue of which drug is dominant at the point that that evaluation is taking place. Mr. Palmentier's opinion is that there is a non-alignment between the DRE and tox screening, but that doesn't mean that the evaluation is not reliable. Examples of non-alignment from a rolling log are not contradictory. In order to find a contradiction, you need much more information about every case in which the evaluating officer conducted the evaluation. There is no scientific method available to apply any of the information in the rolling log to any particular case before the court. This is very interesting statement. As part of the tox testing, Mr. Palmentier reviewed the face sheet and evaluation report of

evaluating officer in order to determine whether he should test for any specific drugs are just any drug. He reviewed the synopsis, which suggested that cocaine, traces of cannabis and alcohol were found in Mr. Sukhdeo's vehicle. So then naturally, he processed the urine sample and tested it, and reports are as follows. Ethanol, a byproduct of alcohol, or, ethanol is the alcohol, was present. Cocaine was present, as well as the metabolite of cocaine called benzoylecognine, which is the inactive part of the cocaine, Cocaethylene was detected. This is really interesting because this metabolite of cocaine is found in the liver only when alcohol is present as well. In addition, Levamisole was also detected. This is a drug used in the treatment of parasitic infections and so on. This kind of drug has also been detected in illicit cocaine preparations. The two other drugs which were unlikely to produce impairment of an individual's ability to operate a car, were also found in the sample. So in comparing the tox findings with the opinion of evaluating officer, the toxicologist noted that toxicology findings supported two out of three categories of the officer, specifically alcohol category and cocaine category. Cannabis was not detected by that officer. Therefore, two of the three calls made by the evaluating officer were supported by the toxicology findings. Both alcohol and cocaine, or a combination of the two, can impair the ability to operate a motor vehicle. And that's the conclusion of that case. You can clearly see that in certain instances, the interpretation is being challenged because it conflicts with another data point which in this case was rolling log of DRE, contradicting in part, or not being in alignment with, toxicological analysis via CFS. There are several CanLII cases where you can see this kind of discrepancy. Let's consider the second case where the DRE conclusions overlap or match the toxicological findings. Again, several key points were raised about the impairment at the time of the incident and a causative agent leading to that impairment. R.C.M. (Re.), 2015 ABTSB 422 Appellant drove a motor vehicle while impaired by alcohol, drug, or a combination of alcohol and drugs. Contrary to the sections 253, 255, 255-3 of the criminal code, Canada. Constable R. called for a drug recognition expert to do a drug influence evaluation. And the DRE conducted the drug influence evaluation at a time, which included an eye exam, balance test, walk and run test, one-legged stand test, finger to nose, as well as the demand for a sample of urine or oral fluid for testing. The DRE was of the opinion that the appellant was impaired, by cannabis, and the appellant admitted to smoking cannabis about a month ago. Let's see what the toxicological report says, and how is that used to interpret this case? The tox report from the Forensic Science and Identification Services Lab detected hydroxy-THC, an inactive THC metabolite, and this is the compound detected in urine when an individual has ingested a cannabis product. THC is the active component of cannabis product. Carboxy-THC has a very long residence time in the body and, as such, can be detected in urine for long periods after use of cannabis products. In addition, MDMA, ecstasy, detrimental effects of MDMA or driving have been reported as reckless driving including behavioral changes and so on. MDMA, inactive metabolite of ecstasy also was detected. In addition, ephedrine and pseudoephedrine, which are non-prescription medications used the nasal sprays and so on have been found. Xanax is a prescription medication. It was also found. Toxicological reports states that the presence of drugs in the appellant's urine merely confirms prior drug use, but no direct inference can be made with respect to a degree of impairment, or the time of drug use based on these findings alone. Moreover, the report states that the general effects that could be expected from ingesting cannabis include drowsiness, distortion of time, impairment of concentration, and so on. Mild cognitive and motor impairment as well, leading to inability or impaired ability to perform complex tasks. So, the report states that the cannabis may result in the adverse effects on perception and so on. The detrimental effects of cannabis and driving last up to four hours. On the other side is the appellant. The appellant's agent submitted that the urine test was limited. It showed use in the past, and the appellant was not necessarily under the influence of a drug, or drugs, at the time. Cannabis is excreted through the urine for some time after ingestion, three days to two weeks, by the report. So, the appellant's agent further submitted that

MDMA-MDA is also detectable for considerable period of times. So, no information was provided in the tox report as far as any level detected. The appellant's agent also submitted that the pupils were dilated, and that was because of the energy drinks, which contain ephedrine and pseudoephedrine, for example. The appellant was not impaired by drugs at the time he was stopped, just over-tired, and attempted to compensate with the energy drinks. The appellant had a heavy workload, and a he travelled often, and was often over-tired. Council for the registered noted that appellant one was uncoordinated off-balance, slurring speech, and not following instructions during DRE, and had carboxy-THC metabolite, along with other drugs in the appellant's urine as confirmed by the tox report. The DRE's opinion is that the appellant was impaired by a drug, and that was corroborated in this case by the presence of THC metabolites and other drugs in the appellant's urine, post-tox analysis. These cases that were quoted here, (Re) JWM, 2013 ABTSB 135 and the case (Re) JRS, 2013 ABTSB 182. These cases are cited as precedence for concluding that it tox report can indeed corroborate a DRE's opinion of impairment. So, in this case, you clearly see that the conclusions of the DRE are in match or matching with the toxicological reports, to strengthen that case. However, you also see questions about just because the drug was detected doesn't mean that it is the drug that caused the impairment at a time. And because of the certain drugs, and because they can exist in a system for a long time, they persist in the body for a long time. They're detection, does, cannot be directly related to an amount used prior to the accident. And so that's the conundrum that toxicologists face in this case as well. Let us look at the case three. In this case, R. v Fisher 2006 NSSC 206. Here you find Kyle Fisher who was charged with six offenses arising from his actions in 2005. The question is, what has generated or contributed to these actions, to these offenses? Were the drugs taken and that's what induced that action or psychosis in this case? What you will hear is from a various professionals, clinicians, toxicologists, and so on, who will contradict, back-and-forth, and discuss and argue what kind of chemical was in Mr. Fisher's system. And so we will start with Mr. Johnstone, who is qualified expert in toxicology. He has been involved in the study of drugs and chemicals since the 70s, and he states that cocaine is generally ingested by any route other than edible. And so in his opinion is that if cocaine is taken, for example, as a drink or in a drink, about 95 to 100% would be destroyed when passing through our liver and our intestinal tract, and know how it would be experienced. And so Mr. Johnstone's evidence that states that longer than 20 minutes, it would take longer than that for cocaine to be eliminated if it was ingested in a drink. In addition to Mr. Johnstone, who has commented on cocaine, and if the cocaine was really ingested, that you should see no effects of cocaine and of course no, likely no evidence of cocaine. The second report here from a professional is Dr. Kronfli, who in his report states that overall, there is a possibility that Mr. Fisher was responsible for the substances that he ingested, and that this is what caused the psychosis and ultimately the offenses. So, this opinion of Dr. Kronfli ignores the fact that no drugs other than cannabis were found in the tox screen. It also ignore the inconsistencies in various statements made by the accused, but how he'd taken or not taken cocaine or something else. In addition, Dr. Kronfil's report states that screening of drugs in 2005 revealed positives for THC and PCP. Well, nowhere in the medical documents presented in evidence is there a reference to a PCP ingestion. So, of course, Dr. Kronfil was cross-examined. He appeared upset that he's questioned and challenged. He was prepared to disregard evidence which was against his opinion. such as tox report. Dr. Kronfli did testify that he put no weight on the tox report because it did not respond to clinical observations. And so it would appear that the basis for Dr. Kronfli's opinion, that the accused was in a state of psychosis induced by his ingestion of drugs, was that the accused had in the past abused drugs. And that, according to the accused's family members, that his behavior was out of character. More important, error is contained in Dr. Kronfli's report and that report under the heading of facts considered an opinion, Dr. Kronfli notes that screening for THC cannabis and the PCP, or phencyclidine was positive. There was no PCP found in the accused's system through the tox

screen, nor was there anywhere in any of the medical reports of the accused self-reporting of drug ingestion, any mention of the accused using this drug. Also Dr. Kronfli's explanation for not taking into consideration tox result was flimsy. He disregarded the tox screening because it did not correspond to clinical observation. The tox report, however, itself states that the results can be used for medical purposes. So why didn't Dr. Kronfli consider that? Here comes Dr. Theriault. He's opinion is supported by the tox screen, which was negative for drugs such as cocaine, amphetamines, and PCP. Dr. Theriault testified that certain drugs such as LSD, amphetamines, cocaine, and so on, can cause persons to become psychotic. But, he says, that here there's a really little evidence that drugs, such as alcohol and marijuana can cause problem with psychotic states, and that are not likely to lead to psychosis. Dr. Theriault also commented on Mr. Fisher, and his theory that Mr. Fisher was not criminally responsible for his actions. He also noted that there's a difference in opinion between various psychiatrists whether Mr. Fisher's psychosis was due to drug-induced or naturally occurring, and it's Dr. Theriault's opinion it was naturally occurring, and it was supported by the negative tox screen and lack of evidence about the substances seized from Mr. Fisher by the police. And so here in this final case, you see discrepancies between experts and their opinions. You also see how tox report has been used as a supportive argument in one case. And the second expert ignored the tox report, and focused on the clinical observations. So, analysis of drugs and metabolites in biological fluids is the one step that toxicologist has to worry about. But the second part is really data interpretation and reporting in court. Thank you for joining me. You just heard Forensic Toxicology Podcast, by Dr. Sanela Martić. This podcast was on the interpretation and reporting in CanLII cases.