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Onsite drug checking technology purchase and partnership considerations

New onsite (i.e., point of care) technologies for overdose prevention drug checking are being developed and introduced with the intent to improve service accessibility, turnaround times for results, and detection of drugs in very small amounts. Known as "emerging drug checking technologies," these are novel instruments in the early stages of development or pilot testing that have not demonstrated consistent or reliable performance and have not completed rigorous testing and evaluation to determine their limitations – or, if they have, this information is not publicly available. For the most part, these technologies are being developed by for-profit companies from outside the harm reduction space. Increasingly, these companies are approaching community organizations to promote the purchase of or seek partnership to pilot their technologies.

The purpose of this resource is to equip community organizations to make informed decisions about partnering with a for-profit drug checking venture or purchasing an emerging onsite drug checking technology. As we learn more about these emerging technologies, this resource will evolve to include advice on what ideal answers to many of these questions may be.

It is important to remember that overdose prevention drug checking is in its infancy. Incredibly sophisticated and sensitive technologies continue to be required to effectively check highly contaminated drugs that are most likely to contribute to overdose (i.e., opioids). At this time, there is no perfect drug checking technology or model. All have trade-offs in terms of quality of results, turnaround times for results, and cost. **What is most important is that service providers understand that all technologies have limitations, understand what the limitations of the technologies they use are, and are able to clearly communicate those limitations to service users**.

Here is a list of **questions you may choose to ask for-profit companies that approach you to purchase or pilot their technology**:

Company-related	• Describe your organization's mission, motivation, management team, legal structure and ownership, and revenue model. • What experience does your organization have in the field of harm reduction?

	• Describe your knowledge of the unregulated drug supply. • Describe how your organization in embedded within the drug checking community. • What value do you believe access to drug checking services brings? • How does your organization give back to the community of people who use drugs? • Who would be our primary point of contact within our organization? What is their role? What experience do they have working with community agencies and people who use drugs?
Technology-related	• Describe how your technology works in lay terms. • How has your technology been validated? Describe validation using reference standards (i.e., pharmaceutical grade known compounds in known amounts), as well as drugs from the unregulated supply. Provide reports, peer-reviewed publications to back claims related to your technology's performance. **Please note that drug checking technologies are considered consumer products in Canada and are not assessed by Health Canada to determine their safety, effectiveness, or quality before being authorized for sale in Canada (something that is a requirement for medical devices). For this reason, it is critically important that claims made about what a drug checking technology can do (specifically, which substances it can detect) are backed by concrete evidence.** • Provide detailed limitations for your technology. • Has your technology been piloted in the community? If so, how, where, and could you provide a community contact we could connect with to learn about their experience? • What do those using your technology like about it? What don't they like – or do they think could be improved? • Is your technology new or does it build upon a technology already used for drug checking? • How much does your technology cost? What are upfront and ongoing costs related to subscriptions and supplies? • How is your technology serviced? What are anticipated service and maintenance costs? • How do we access instrument support? How long do we have to wait for instrument support? Are there costs associated with accessing instrument support?

	• What qualifications or training are required of those that conduct drug checks using your technology? • How much physical space does your technology require? Is your technology portable? How durable is your technology (i.e., could it be used outdoors)? • Can your technology be used in a vehicle? What are mobile-specific considerations? • Should your instrument be used in combination with test strips?
Sample-related	• What sample types can be checked using your technology? E.g., drugs (powder, crystals, rocks, pills, blotter, liquid), residue on used drug equipment. • Are samples checked in raw form or are they diluted? If diluted, with what? • What expected drugs can be checked using your technology? • Does your technology destroy the sample that is checked?
Results-related	• How long are turnaround times for results? • Which substances are in your library? Please share your library with us. • Which substances has your technology accurately detected using samples of reference standards? • Which substances has your technology accurately detected using samples from the unregulated drug supply? • Can your instrument detect non-drug fillers? If so, which ones? • How well does your instrument differentiate between drugs that have very similar chemical structures? E.g., between the many fentanyl-related drugs, benzodiazepine-related drugs, nitazene opioids, etc. • Does your technology report information about how much of a substance is found in a checked sample (i.e., quantified results)? If so, within what range of precision (i.e., how accurately)? • What is your technology's limit of detection (i.e., the smallest amount of a compound that can be detected with confidence)? Provide proof of claims made. **The limit of detection for a Fourier-transform infrared spectrometer (FTIR), which is currently the only validated and most commonly used onsite drug checking technology for overdose prevention drug checking in North America is around 5%**. This means substances that account for less than 5% of the sample are likely to be missed by the instrument. For this reason, FTIR is paired with test strips, which are more likely to pick up certain drugs in trace amounts. **Emerging drug checking technologies that prioritize overdose prevention and claim to**

	be improvements to existing onsite technologies should therefore have a limit of detection less than 5%. • How often are "new" substances added to your technology's database or library of substances it can detect? How do library updates take place?
Data-related	• What data, if any, does your technology collect from service users? How is that data stored? Where is that data stored? What does your organization do with that data? • How do we access the data associated with samples we check using your instrument? Can data be downloaded? • Are we free to do what we want with the data collected and generated by our samples? • Do you plan to share your drug sample analysis data with existing networks of publicly funded drug market monitoring systems for public dissemination?
Partnership-related	• What benefits do community partners receive (e.g., free or discounted instruments)?

Please note that the most important substances overdose prevention drug checking services can detect are what we call "noteworthy drugs". Noteworthy drugs are drugs that (i) are linked to overdose or other adverse effects, (ii) are highly potent or related to highly potent drugs, or (iii) may not be desired by some service users. **Emerging drug checking technologies that prioritize overdose prevention and claim to be improvements to existing onsite technologies should ideally be able to detect many of the noteworthy drugs found by Ontario's Drug Checking Community**: fentanyl and related drugs (4-fluorobutyrylfentanyl (4-FBF)/4-fluoroisobutyryl fentanyl, acetyl fentanyl, bromofentanyl, butyryl fentanyl/isobutyryl fentanyl, carfentanil, fluorofentanyl, furanyl fentanyl, furanylethyl fentanyl, methylfentanyl-related, N-methyl norcarfentanil, valeryl fentanyl, β-hydroxy fentanyl), nitazene opioids (5-aminoisotonitazene, butonitazene, etodesnitazene, etonitazene, etonitazepyne, isotonitazene/protonitazene, metonitazene, N-desethyl isotonitazene/N-desethyl protonitazene, protodesnitazene), benzodiazepine-related drugs (alprazolam (Xanax), bromazolam, clonazepam, clonazolam, desalkylflurazepam, desalkylgidazepam, deschloroetizolam, diazepam (Valium), ethylbromazolam, etizolam, flualprazolam, flubromazepam, flubromazolam, flunitrazepam, flurazepam, lorazepam (Ativan), meclonazepam, nordiazepam, temazepam), veterinary tranquilizers (medetomidine, xylazine), synthetic cannabinoid-related drugs (4F-MDMB-BUTINACA, AB-FUBINACA, ACHMINACA, AMB-FUBINACA, BZO-HEXOXIZID, MDMB-4en-PINACA), other (levamisole, phenacetin).

Our **advice to for-profit companies promoting or seeking partnership for their technologies** is to:

1. Be honest about what your technology can achieve at its current stage. It is understood that checking drugs is complex and challenging – and that all technologies have limitations. Transparency builds trust.

2. Focus your time and energy on building a solid technology. Leave program delivery and translation of results to harm reduction and drug checking experts.

We are here to help! We appreciate you may be new to drug checking and the answers to these questions may be overwhelming. We are learning too but are a resource to the community and could attempt to assist with translation if that would be helpful to you. You can reach us at **hello@drugchecking.community**.

About Ontario's Drug Checking Community: Ontario's Drug Checking Community is a national leader in drug checking service delivery and community-led unregulated drug market monitoring and education. It involves scaling the offsite drug checking model designed and in use by **Toronto's Drug Checking Service** since 2019 to other jurisdictions in the province. The primary reason for doing so is to inform evidence-based responses to the worsening toxic drug supply crisis by educating people who use drugs, community health workers, public health units, clinicians, first responders, policy makers, public servants, forensic science and toxicology laboratories, coroners, researchers, and others about what's circulating in the unregulated drug supply and anticipated harms.

Our program is comprised of a group of members, including collection and analysis sites, as well as small central team that operates from within St. Michael's Hospital in Toronto.

Our work would not be possible if people who use drugs did not donate their drugs to our program in an effort to reduce the harms associated with using unregulated substances and facilitate community-led drug market monitoring and education.

(website) **www.drugchecking.community** | (email) **hello@drugchecking.community** | (IG) **@drugchecking**