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DESIGNING A BETTER DRUG TEST

What Can Zombies Teach Us?

CSMLS Call To Action

HHR Shortage of Technologists (MLTs)

Official publication of:
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PM #40063021

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The Time is Now

Christine Nielsen
CHIEF EXECUTIVE OFFICER

Happy New Year! Don't worry. We didn't accidently print a new year's message in our Fall Issue of the *CJMLS*. The leaves are changing colour, the air has a sharper edge and it takes a few more layers of clothes to head out the door. It's autumn, and to me it's always like the start of a new year. With the change in weather and clothing comes a fresh new mindset. This season, CSMLS is changing the game.

For years, we have been sounding the alarm on the impending shortages within the medical laboratory profession. Enough! We are moving to action. Within this issue of the *CJMLS*, you will see our plan for mitigating the impact of shortages across the country. We gathered data, crunched the numbers and came up with a tangible need that can be acted upon. We now know 400 new MLTs will need to be trained every year for the next 10 years in order to change this slippery slope of overworked and understaffed labs. Shocking, but not impossible. Turn to page 34 to see the Call to Action.

CSMLS isn't the only one concerned and ready for action. In fact, there are many stakeholders who are trying to come up with solutions. What we are seeing now is an unprecedented display of collaboration. We have employers, educators, students, regulators, associations and working medical laboratory professionals all moving in the same direction. With everyone on the same page – sharing resources, supporting each other and talking openly – the time for change has come.

Change can start off small, but what we have come to recognize is that progress is like a ripple in a pond. Throw a stone into the stillness and, before you know it, one tiny wave is followed by another, then another. The more people that join you at the edge of the pond to make their mark in the quiet waters, the more ripples you start to notice. The important part is to take that step to the edge, aim your hand just-so and throw. CSMLS is thrilled to see such active collaborators stand up and get creative to resolve the health human resource shortage crisis in MLS. It's our time.

Moving Forward to a More Inclusive Future

Lisette Vienneau
2018 CSMLS PRESIDENT

I am proud to belong to a society that values inclusivity in the medical laboratory profession. Over the first half of my 2018 CSMLS presidency, I have actively participated in exciting projects and initiatives to ensure that, in the near future, every patient and medical laboratory professional will be treated with the dignity and respect they deserve. It's a great responsibility, but I've never been one to shy away when faced with difficulty.

As President, I am excited that the CSMLS Board of Directors has taken the right step to move forward with the development of a position statement on gender identity and its impact on medical laboratory testing for patients. I had the opportunity to deliver a presentation on gender identity to a group of 24 individuals in my community and most of the attendees were surprised that sex and gender do have a tangible impact on medical laboratory testing. They were thankful for the information and went away from that presentation knowing that medical laboratory professionals do care about their patients. I went away from that presentation recognizing that the simple act of sharing knowledge is enough to spark change. You don't need to be a president or in a position of authority to start important conversations.

Change is a group effort. Everyone must get involved to ensure the future medical laboratory is inclusive. At the Annual General Meeting in Ottawa, ON, I was pleased to see that the CSMLS membership approved a bylaw change to allow the addition of a medical laboratory assistant position on the Board of Directors. Your active involvement and dedication to ensure all medical laboratory professionals have a platform is inspiring.

I am incredibly proud of the CSMLS staff for their efforts to develop the award-winning Mental Health Toolkit, which provides medical laboratory professionals with practical tools to help alleviate stress associated with increased workload. If you recognize a theme here, you're right. It takes a team to accomplish great things. The Mental Health Toolkit is beyond anything that I could have imagined. Great accomplishments don't happen overnight. Anything that is worthwhile takes time. Let's do this together.

I would like to extend my sincere gratitude to every member who makes the conscious effort to shape a more respectful, diverse medical laboratory community, for professionals and patients alike. Without you, change wouldn't be possible. Please feel free to connect with me at networking events, on Twitter (@MedLisetteTech) or through email at lisettevcsmls@outlook.com.

The Inbox

The Inbox is meant to provide a public forum for us to address questions, concerns or issues that are raised by members. CSMLS receives feedback through written correspondence, email and through our various social media portals. If you have a question or comment you would like to have addressed in an upcoming issue, talk to us on Facebook, Twitter (@csmls) or through email at editor@csmls.org.

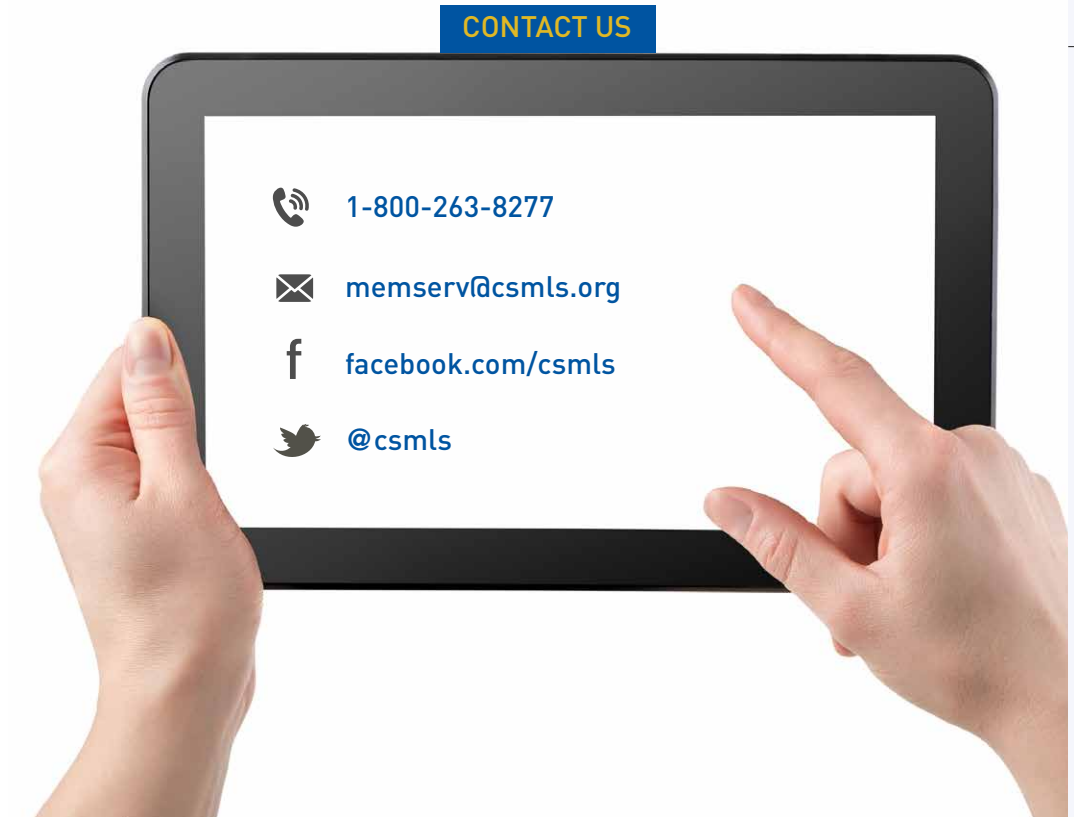
Question: "Cell phones in the lab. Does CSMLS have any directional guidance to offer on whether to permit or not through a safety lens?"

This is a great question. We spoke with Eoin O'Grady, Occupational Health and Safety Consultant to CSMLS, to learn the answer. The Canadian Biosafety Standard recognizes cell phones as a personal belonging, similar to a purse or a backpack. As such, cell phones should not be kept in environments in which infectious materials or toxins are stored or handled.

This helps to:

- Protect personal devices from contamination
- Avoid the decontamination process, which can destroy the functionality of personal devices
- Keep potential contaminates inside the containment barrier, where they belong

What does this all mean, exactly?
Medical laboratory professionals should be allowed to bring their cell phones to the workplace, as they would a winter coat or a hooded sweatshirt. They should be advised to keep their personal belongings in the designated area and never use their personal devices while performing lab duties.



canadian JOURNAL of medical laboratory science

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PUBLISHED BY:

DOVETAIL COMMUNICATIONS INC.

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30 East Beaver Creek Road, Suite 202,
Richmond Hill, ON Canada L4B 1J2
Phone: 905-886-6640
www.dvtail.com

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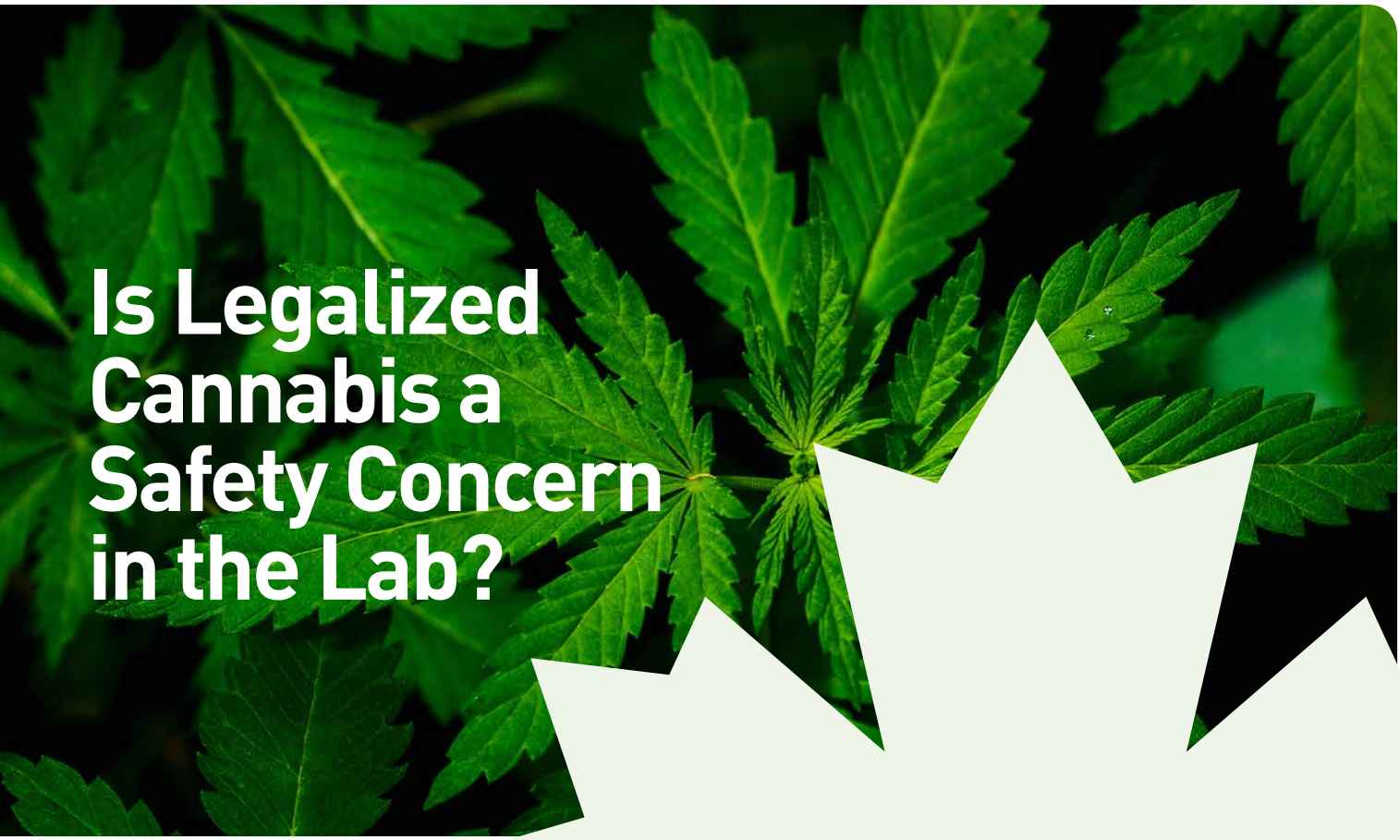
The *Journal* is a quarterly publication and is owned and published by the Canadian Society for Medical Laboratory Science (CSMLS). Canada Post Publications Mail Agreement #40063021.

For subscription information contact memserv@csmls.org.

Advertising inquiries can be sent to editor@csmls.org.

RETURN POSTAGE GUARANTEED

ISSN 1207-5833
Printed in Canada



Is Legalized Cannabis a Safety Concern in the Lab?

Cannabis legalization presents a new topic to be addressed in Canadian workplaces.[1] At the time of writing, the federal government has stated that legalization is due to come into effect in October 2018. Specific legislation will be put in place by individual provinces and territories, rather than the federal government. Cannabis legalization has sparked many new conversations across the nation, including those conversations related to workplace health and safety. It's important to be aware of how cannabis use affects your safety and that of your colleagues on a day-to-day basis in the lab. You can assist your organization by contributing to policy revision and preparing for discussions about cannabis use in the lab.

Since 2001, medicinal cannabis has been legal, well regulated and used to treat a wide variety of health conditions. While medicinal cannabis is legal, the legislation does not allow a worker to be impaired at work or to endanger their safety or the safety of others. This system is in place to prevent the introduction of additional hazards in the workplace as a result of cannabis use.

The two cannabinoids most commonly used for medicinal purposes are tetrahydrocannabinol (THC), the main psychoactive ingredient, and cannabidiol (CBD), which is non-psychoactive. It's possible to smoke, swallow or vaporize cannabis; each method of consumption affects the worker in a different way. Longer-lasting effects are found after swallowing cannabis. It is a cause for concern that some people have lower tolerances thus experiencing the effects of THC for longer periods. Screening for THC shows it is detectable for up to four weeks post use.

From a safety perspective, it's important that high quality information is widely shared and opinions that are biased or non-factual are purged. There are many resources available

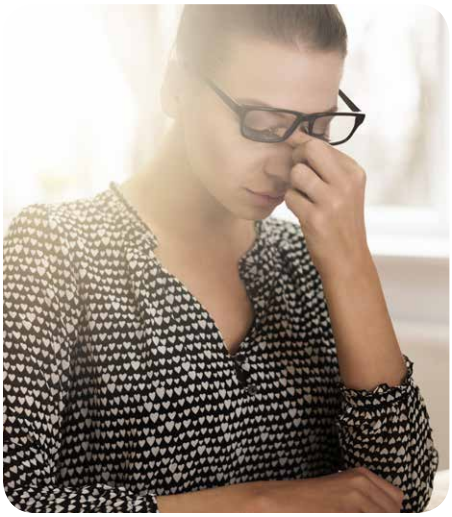
While medicinal cannabis is legal, the legislation does not allow a worker to be impaired at work or to endanger their safety or the safety of others. This system is in place to prevent the introduction of additional hazards into to the workplace as a result of cannabis use.

to Canadians that enable meaningful conversations. The Centre for Addiction and Mental Health has a resource website (https://www.camh.ca/) and has published "Lower-risk cannabis use guidelines".[2] Separately, the federal government has published information on cannabis impairment and safety risk.[3]

Cannabis use can impair a person's ability to drive and operate equipment. It's worth remembering that impaired driving is a criminal offence with serious implications.[4] If you are a medical laboratory professional (MLP) in a rural setting where driving is a part of your employment, it is especially important to be aware that recreational use may impact your employment. Your organization may also have policies in place regarding working while impaired.

Cannabis use also leads to increased risk of falls and other incidents because it affects:

- coordination
- reaction time
- concentration
- decision-making abilities
- ability to judge distances



Within your organization, it's likely that human resources professionals are leading a review of current policies against the new regulatory framework.[5] To be a part of the conversation, you can offer to be a worker, supervisor or health and safety committee representative. Your research and analytical skills will be highly regarded if you become part of such a working group. It will also give you the opportunity to engage with other professionals, including representatives from management, labour relations and legal. You and your colleagues are part of a team effort to maintain healthy and safe working conditions in the laboratory. We all know there are many factors that affect the safety of the workplace. Some of the more familiar factors are fatigue, alcohol, medications, substance use, etc. In addition to these factors, reducing the risks associated with legalized cannabis is a necessity in the modern working environment.

Some of the suggested safety tips for recreational cannabis use include:

- abstain
- reduce frequency
- use low-potency
- acknowledge high risks (e.g. cardiovascular disease and pregnancy)

At present, there are no accepted tools in place to measure THC in the system of a driver who has been stopped in their car on the road; these analytical tests are undergoing research and development. Looking to the future, there will be growing opportunities for cannabis testing programs across each jurisdiction. Some of those programs may involve private or publicly funded enterprises.[6] MLPs in these organizations may be directly dealing with cannabis products, derivatives, metabolites or other samples to determine product quality or as part of health surveillance programs.[7]

Before this takes place, lab personnel need to be fully involved in discussions regarding hazard assessment and control. As new practices are implemented, you may have an opportunity to set up equipment, validate assays and provide feedback on procedures. Look for that growth opportunity and ensure you're placing your safety and that of your colleagues front and centre. Using your skills and knowledge as a trained professional, you can play a role in reducing safety concerns surrounding legalized cannabis.

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EOIN O'GRADY
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WHAT CAN ZOMBIES TEACH US?

There is no denying that zombies have a prominent position in popular culture. Nevertheless, as the undead lurched and shuffled their way towards their victims, someone determined that zombies had valuable lessons to impart to the general public, educators, laboratory personnel and epidemiologists.

In the folklore of Haiti and West Africa, zombies are reanimated corpses and bear little relationship to the rotting and infectious brain-consuming monsters of today's pop culture.[1] Removed from its cultural context and appropriated by mainstream media[2], zombiism has been the subject of movies, television programs, books, graphic novels and video games.

Along the way, the zombie narrative has continued to evolve. In 1968, George Romero's film, *Night of the Living Dead*,[3] was released, and although it never used the term "zombie" when referring to the reanimated corpses, many devotees of the genre consider it the template for subsequent zombie horror films (though its zombies were not on the brain-centered diet now associated with the undead).[4] Written and filmed during the Cold War amidst fears of nuclear confrontation, the film suggests that radiation is responsible for the reanimation of dead humans who then go on a gruesome cannibalistic rampage.[5] Since that time, the world has faced the arrival of HIV, BSE, Ebola, SARS, bioterrorism and antibiotic-resistant superbugs. Not surprisingly, more recent depictions of a zombie apocalypse,

such as *28 Days Later*,[6] portray an infectious agent as the cause.[7] (Meanwhile, the zombies also happened to get faster). Whatever the source of their supposed reanimation, the brain-obsessed undead of horror films and popular culture have become an educational resource.

Perhaps it was inevitable that the zombies' persistent search for brains brought them to the website of the Centers for Disease Control and Prevention (CDC), in the form of a blog called *Preparedness 101: Zombie Apocalypse*.[8] While a zombie apocalypse is highly unlikely, the real aim of the CDC zombie blog is to promote general disaster preparedness, especially among young people. It even offers an online graphic novel (https://www.cdc.gov/phpr/zombies).

Answering the crucial question, "How do I prepare for a zombie apocalypse," the blog provides information that can be applied to a number of more likely disasters, including floods or tornadoes – like how much food and water to have on hand for emergencies. The blog also explains the CDC's role in disaster response and the organization's investigation, management and treatment of disease outbreaks. With zombies as bait, "[the strategy] was so popular that the blog's servers crashed nine minutes after the CDC" put out its initial tweet about the campaign in 2011.[9]

What started with a zombie outbreak in the CDC blog turned into an epidemic. The following year, for example, British Columbia's Public Safety & Emergency Services also featured a zombie outbreak on its website, as part of Zombie Preparedness Week.[10, 11] Its fictional account described a grave situation: "Media have confirmed the infected are attacking healthy people. The final symptom of infection? Overwhelming need to eat brains."[12] By February 1, 2013, the Canadian Red Cross presented a disaster readiness blog that referenced zombies.[13] Eventually, the states of Kansas and Illinois implemented "Zombie Preparedness Month."[14]

It shouldn't be surprising that this unorthodox public information campaign style met with some skepticism. Marjorie Kruvand and Fred B. Bryant of Loyola University Chicago studied the effectiveness of a CDC-style zombie preparedness effort.[15] Study subjects were divided into two groups: one group was shown the CDC's zombie-inspired blog post, while the other group was presented with more traditional preparedness information. Though Kruvand and Bryant acknowledge the campaign's popularity, their study determined that the use of zombies neither increased retention of information nor was it any more likely to motivate participants to prepare for disasters. The authors suggest that a starker differentiation between humour and factual material might have been more effective in educating and prompting people to prepare for possible disasters.

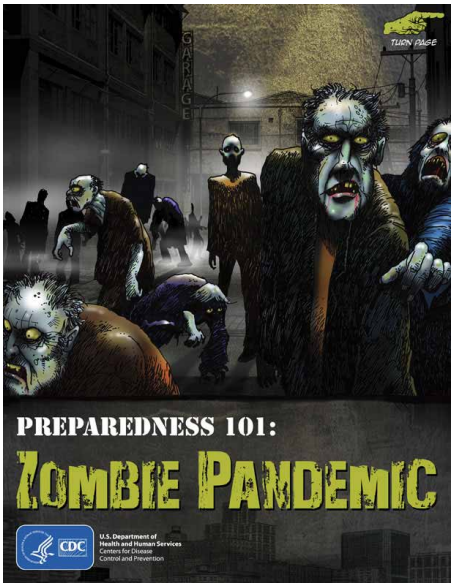

Photo credit: Office of Public Health Preparedness and Response, U.S. Department of Health and Human Services Centers for Disease Control and Prevention

Nevertheless, another group of researchers, writing in the journal *Emerging Infectious Diseases* and citing the CDC's use of zombies, argues that zombies can help the public develop an understanding of health issues arising from emerging or even re-emerging infectious diseases, such as rabies.[16] Their analysis, "Zombies – A Pop Culture Resource for Public Health Awareness," suggests that the popular image of zombies in public health initiatives can help the public confront fears of infectious disease, promote disease prevention and plan for disease outbreaks.

Of course, planning for disease outbreaks requires an understanding of disease transmission patterns. In a March 2016 article in the *Journal of Microbiology & Biology Education*, Eric T. Lofgren, Kristy M. Collins, Tara C. Smith and Reed A. Cartwright explain how zombie epidemics are already being used as an introduction to basic disease epidemiology.[17] Mathematical models of epidemics rely not only upon mathematical skills but also extensive knowledge of the characteristics of various diseases. Working with the popular concept of zombies, however, students don't need to know the specifics of a particular disease in developing the mathematical models. The zombie narrative is also extremely flexible, lending itself to various factors, conditions and interventions. This kind of program has been presented to public health workers as a one-day workshop, a semester-long course at Rice University and at public health outreach events. The paper also offers a web-based simulation program, White Zed (http://cartwrig.ht/apps/whitezed/), which helps students to examine and manipulate various zombie epidemic scenarios.

MATHEMATICAL MODELS OF EPIDEMICS RELY NOT ONLY UPON MATHEMATICAL SKILLS BUT ALSO EXTENSIVE KNOWLEDGE OF THE CHARACTERISTICS OF VARIOUS DISEASES.

In a similarly themed, though more mathematically challenging journal article, Ottawa mathematicians Philip Munz, Ioan Hudea, Joe Imad and Robert J. Smith? (who does indeed spell his name with a question mark) present mathematical models of various Zombie scenarios.[18] "When Zombies Attack!: Mathematical Modelling of and Outbreak of Zombie Infection" is based upon a zombie outbreak involving the classic slow-moving zombies who spread zombiism through their bites. The mathematicians consider the complications introduced by infection latency periods, the quarantining of zombies, the possibility that a cure for zombiism can be developed as well as the effects of an aggressive drive to eradicate zombies. A zombie epidemic, they grimly warn, "is likely to lead to the collapse of civilisation, unless it is dealt with quickly." (p. 146).

Zombies, in addition to finding their way into epidemiological simulations, have also staggered and lumbered their way into the laboratory. The University of Texas at Tyler, for example, offers Biology 1320: Zombie Apocalypse: Biology of Disease.[19] This undergraduate course for non-science majors uses the popular portrayal of a zombie outbreak to teach basic biological concepts, ranging from cellular metabolism to pathogenic organisms. Based on what they learned, students design their own laboratory experiment and present their results on a poster.

It also turns out that zombies can help to illustrate general laboratory safety practices. North Carolina Community Colleges BioNetwork uses faux schlock-horror, slapstick and zombies to teach laboratory safety through a ghoul-inspired website called *Zombie College: The 5 Rules of Lab Safety*.[20] It offers a short video, worksheets, a video game and a music video game to promote "a safety state of mind". The blend of zombies, humour and practical information is reminiscent of the CDC's zombie-inspired disaster preparedness effort.

Having appeared on the CDC site, in scientific literature, referenced in science-based course work and laboratory safety training, zombies seem to be very busy these days. Popular interest in this particular horror genre shows no sign of dying, so as zombies continue their relentless advance into science and public education, it's possible they will also find their way into your local college, technical institute, university or laboratory. ■

JOHN BUHLER,
MLT, BGS

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How Did They Not Know That?

Reflections on Interprofessional Interactions

I invite you take a moment and think about all the interactions you have every day, specifically those at work. Do you feel that you conduct yourself in a respectful and articulate manner? Even when a nurse asks you if it's safe to transfuse type O blood to their type A patient?

It can be difficult at times, especially when you get the same questions day in and day out, to answer these questions with respect and dignity. We have to remember we are medical laboratory experts and we have an obligation to conduct ourselves in a professional manner. We should be using these opportunities to raise our professional image and teach our colleagues about medical laboratory science. Answer each question with patience and respect, and remember it is the patient that we are ultimately helping.

I can remember getting a call from a pediatrician one busy Saturday afternoon. She asked me what polychromasia, which I had reported in her patient's blood smear, meant. I couldn't believe a doctor was asking me this question. Didn't she learn about this in school? Did she not see the reticulocyte count, which she had ordered, was incredibly high? I answered her question and told her that the polychromasia was in fact due to the high retic count. She could have easily Googled the term, but instead she relied on the medical laboratory expert to give her the correct answer.

After the call, I remember telling my coworkers about it. Can you believe that she didn't know that? Later, as I thought more about that interaction, I changed my way of thinking. I realized that I should feel flattered that she asked me that question. She admitted to herself and to me that she needed help. She reached out to the one person she knew would have the correct answer, the medical laboratory technologist who went to school for three years and learned exclusively about laboratory medicine. We sometimes have to remember doctors and nurses know a little about a lot of things, but we know a lot about this one thing.

The following is courtesy of Christine Bruce, Administrative Director, Pathology & Laboratory Medicine of Grand River Hospital and St. Mary's General Hospital in Kitchener, ON. It is something she shared with her staff and it highlights the importance of thinking about our interactions with other health care providers.

"As medical laboratory professionals, we have the unique opportunity to promote and provide laboratory knowledge and best practices every day. The level of information that we warehouse in ourselves is tremendous and so unique to our profession. Further, it evolves faster than we can publish or communicate to our non-lab colleagues. Having all of this wisdom is a blessing – but can also be a bit of a hindrance because when you are an expert, you get questions all the time – and very often the same question over and over – and that can be a challenge to tolerate some days. This challenge can occasionally translate into the occasional eye roll with the audience, or being somewhat condescending or short on the phone. That can put a damper on inter-hospital relationships that are so vital to fulfilling the circle of care.

I challenge you to look at these interactions differently. You are teachers and information stewards. You have the ability to promote the profession and your laboratory with every stakeholder interaction. Show off how much you know proudly. Provide and reinforce the guidance we know our colleagues are craving. Use this as a time to promote understanding, and the permeation of accuracy into our everyday. When you take the time to explain – even if it means doing it 20 times – it means that the patient experience will be better – because of something you did! It means the lab profile is heightened through interprofessional collaboration. It means laboratory professionals develop the respect they deserve for the sheer value they add to the healthcare system every day.

Occasionally we can feel undervalued. Every time you get a question it actually means we are valued, appreciated, and needed. Let's embrace, and help our colleagues 'know now.'"

The conduct expected from medical laboratory professionals is steeped in many CSMLS documents. It is in the Standards of Practice for Medical Laboratory Assistants and Medical Laboratory Technologists as well as the CSMLS Code of Professional Conduct.

Under the heading Communication and Collaboration in the Standards of Practice:

- Respect and support the role of patients and other health care providers.
- Articulate the role of medical laboratory professionals in planning, developing, delivering and evaluating patient care.
- Share relevant medical laboratory knowledge with patients, health care providers and the public.

As CSMLS certified professionals, we have an obligation to ourselves and the profession to comport ourselves appropriately. The next time you have an interaction with someone, remember those three simple points because, in the end, we are all trying to do the best thing for the most important person: the patient.

MICHELE PERRY
Manager, Learning Services
CSMLS

Addressing the Risks of Disinfection:

Let's Right those Wrongs

How many times has a medical laboratory professional (MLP) grabbed that bottle of disinfectant and wet their workspace to disinfect the area, without considering best practices for the disinfection process? Factors such as surface composition, personal protective equipment, amount of visible soiling, nature of soiling, wet contact time or temperature of the surface are just a few of the variables to be considered.

Disinfectants are tested in the lab using validated methods so that they can be used on hard, non-porous surfaces in the real world. All registered disinfectants are tested under very stringent conditions, and if it is a cleaner/disinfectant (known as a one-step disinfectant) it is tested in the presence of soil. If the MLP is using a one-step disinfectant, and there is visible soil (e.g. blood, stool and urine), they must still clean away any gross (visible) soil before they disinfect.

If you are using a disinfectant made from a concentrated solution, it is important to test the final concentration; for example, a simple 1:10 dilution of sodium hypochlorite (bleach), made fresh daily, probably does not need to be tested if discarded at the end of the work day. However, if using a concentrated disinfectant where a dilution station produces a final product, most manufacturers will recommend the diluted product be tested at least when a new bottle of concentrate is placed into the system, and possibly weekly, bi-weekly or monthly depending on the dilution system. During a study, Boyce et a1. discovered that none of the 33 diluting systems at their hospital were diluting the concentrate to the right parts per million (ppm).

If your disinfectant has a quaternary ammonium compound (quat) as the main ingredient, you will need to check for quat binding if you use a cotton cloth or a microfiber cloth and, possibly, disposable cloths.[1] Some cloths bind the active ingredient, removing it from solution, so that a weaker solution is applied to the surface, making the disinfectant less effective.

There have been many new disinfectants introduced in the last 10 years, with quicker contact times. The length of time a surface needs to remain wet to achieve the kill claims will be clearly indicated on the product label. Five- and 10-minute contact times are hard to achieve without re-wetting a surface.

The temperature at which disinfection is being done can be a factor, but probably only if trying to disinfect a functioning cryostat or ice pack. Most disinfectants are tested at room temperature (20°C) and, if used at temperatures outside of this range, you may want to discuss possible issues with the manufacturer.

Using single-use, disposable disinfectant wipes can overcome some of these issues, as they are ready-to-use, but the end user still needs to be aware of the limitations of the product, especially contact time. Products with high-alcohol content are flammable and tend to dry before the wet contact time is reached.

Use of spray bottles to apply disinfectants has been restricted in many health care facilities over fears of sensitizing staff to the chemistry used. Flip-top bottles of ready-to-use product are available to allow the user to wet the surface and then apply friction to clean and disinfect. This removes any risk of aerosolizing a disinfectant. Use of the pre-wetted wipe will eliminate the issue of sprays.

Keeping surfaces safe for MLPs is the goal of surface disinfection, and looking at some of these points will ensure the safest possible surface is present in the lab.

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Cover Story

Designing a Better Drug Test

"As deaths and hospitalizations due to opioid abuse continue to rise, a highly accurate, faster and more cost-effective drug screening methodology is in development."

Kristin Hauff, PhD, FCACB, a clinical biochemist at the Kelowna General Hospital, oversees chemistry for the Interior Health Authority in British Columbia, a network of 31 lab facilities within hospitals and community health centres serving a broad geographic footprint in the province. She has seen a marked increase in the volume of drug tests over the last several years due to the opioid crisis, especially after the British Columbia Ministry of Health mandated regular drug screening for patients taking prescribed opioids.

What Hauff has witnessed at Interior Health is just one example of the opioid crisis that has gripped many communities in Canada and continues to put increasing pressure on medical labs. Canada is the second largest consumer of prescription opioids per capita in the world after the United States.[1] In 2017, about 4,000 Canadians died from an apparent opioid-related overdose, up from almost 3,000 in 2016, while 29 per cent of Canadian adults reported using some form of opioid in the past five years.[2] The western provinces have been hit the hardest and the trends have generally spread across the country. The Canadian Institute for Health Information estimates that 29.3 people in British Columbia were hospitalized every day in 2017 due to opioid poisoning, an increase of about five per cent over 2016 and well above the Canadian average of 16.4 people.[3]

Current drug testing involves a two-tiered approach that starts with immunoassays, which use automated analyzers to detect the presence of drugs using antibodies, followed by mass spectrometry to confirm and identify known drugs and their metabolites. Immunoassays are fast and easy, but they can only identify substances that resemble target drugs. Moreover, the antibodies used in these immunoassays are only available for commonly known drug classes and take years to develop.

"For opioids, immunoassays look for morphine and two other opiates that look like morphine – codeine and heroin. Doctors are hoping to see oxycodone, fentanyl and other opioids that are out there, but immunoassay is blind to those," explains Hauff. "In the current environment, we're really struggling with the fact that immunoassays are not adaptive. With all of the different analogues and synthetic drugs coming out of basement chemistry labs, as soon as we develop a test to identify them, people have moved on to something different." Immunoassays are also prone to false positives due to antibody cross-reactivity for commonly prescribed opioids, illicit drugs and certain foods, and they also have high false negatives for certain drug classes like benzodiazepines.

Mass spectrometry – historically gas chromatography-mass spectrometry and increasingly liquid chromatography-tandem mass spectrometry – is considered the gold standard test because it is highly accurate and very specific. However, it requires expensive equipment, specialized training and more processing time compared to immunoassay. Interior Health does not have mass spectrometers at any lab sites, so they send samples for testing to health authorities in the Lower Mainland. Depending on the test, the turnaround times range from 72 hours to two weeks.

A new invention currently in development may provide a faster, more accurate and cost-effective test for drug screening in the future. Philip Britz-McKibbin, PhD, a professor in the Department of Chemistry and Chemical Biology at McMaster University in Hamilton, Ontario, has developed a novel drug testing methodology that can identify more than 50 specific drugs and their metabolites in a fraction of the time, as compared to the current two-tiered approach. The methodology is called multisegment injection-capillary electrophoresis-mass spectrometry (MSI-CE-MS). It couples high-efficiency electrophoretic separations to high-resolution mass spectrometry with full-scan data acquisition, enabling non-targeted screening of large numbers of drugs and their metabolites in human urine. This multiplexed platform analyzes 10 or more samples simultaneously, bringing the run time to under three minutes

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3,000

in 2016.

per sample with better accuracy, selectivity and coverage than conventional immunoassays.[4] Britz-McKibbin explains, "The first sample of the serial injection analyzed is an expanded drug panel mixture at the cut-off level. Each run after that contains randomized urine samples from individual patients that we compare directly with the first injection as the reference."

For more than 14 years Britz-McKibbin's group at McMaster University has been focused on developing new tools for clinically-based metabolomic studies, the comprehensive analysis of small molecules in biological fluids, as a way to discover new biomarkers for early detection of treatable diseases. He patented the MSI-CE-MS methodology in 2016.[5] To test the concept, he collaborated with Howard Lee, CEO of Seroclinix Corporation, a clinical and animal diagnostic lab services organization, and Marcus Kim, a mass spectrometry specialist at Agilent Technologies, a laboratory solutions company. Both organizations are based in Mississauga, Ontario. "We immediately recognized the value of the new methodology. The ability to do multisegment analysis to reduce time and cost is a tremendous benefit," says Lee.

In a proof-of-concept study using 117 de-identified urine samples, the collaborators are planning to demonstrate that the MSI-CE-MS can accurately detect and rapidly identify over 50 drugs of abuse at the recommended screening cut-off levels. Britz-McKibbin says, "The methodology is very specific: identification is confirmed by matching an illicit or prescribed drug's accurate mass or molecular formula together with its migration time for cases with concentrations measured above the cut-off level, including the detection of related drug

29%

of Canadian adults reported using some form of opioid in the past five years.

metabolites in urine. As a result, the chances for false positives are extremely small."

Among the drugs that can be detected are specific opioids, including oxycodone, tramadol, methadone and norfentanyl, as well as a wide range of benzodiazepines, antidepressants, stimulants and sedatives. The MSI-CE-MS does not detect synthetic cannabinoids or barbiturates since they are acidic drugs and therefore poorly ionizable in positive ion mode testing. However, Britz-McKibbin says that changing the mode to negative ion detection with alkaline buffer conditions for separation is currently under development. In their published paper, the researchers also note that the innovation can be used retrospectively to identify drug metabolites or emerging classes of synthetic opioids in situations where antibody reagents or reference standards do not exist.[4]

As luck would have it, one day at a clinical research symposium, Britz-McKibbin met Dr. Zainab Samaan, a psychiatrist at McMaster University, who oversees the Mood Disorders Program at St. Joseph's Healthcare Hamilton. As the only chemists in the crowd, they discovered their shared interest in metabolomics and a connection between their two disciplines. Together with Lee and Kim, they collaborated and conducted a pilot study to test the MSI-CE-MS using 220 de-identified and blinded urine samples from patients in the Mood Disorders Program.

Patients in this group take well over 150 different medications and a large number of them take multiple psychoactive medications, including prescribed opioids, antidepressants and antipsychotics. Therefore, the urine samples provided a robust challenge to determine whether the MSI-CE-MS could accurately identify drugs compared to the patients' medical records. The investigators also compared the new methodology with the standard two-tiered approach over a three-week period. Full results from the pilot study will be published soon, but Britz-McKibbin says, "The most surprising result with our untargeted method was the sheer number of non-prescribed drugs that were not indicated in the medical record."

Determining exactly what patients are taking is essential information for physicians. Accuracy is paramount to confirm adherence to prescribed medications and to identify undisclosed substances patients are using to self-medicate. Undisclosed substances may decrease the effectiveness of prescribed drugs or increase the risk of dangerous drug interactions. The MSI-CE-MS platform is untargeted and adaptive, meaning that it can screen for a virtually unlimited number of drugs provided they can be both resolved and detected. "The data can inform us if a designer drug is present. That's a big advantage over immunoassay alone which can only bind to a known class of drug and does not distinguish between single or multiple drugs of the same class," says Britz-McKibbin. "Our invention can also determine whether a urine sample is real or synthetic. On the Internet, people can purchase synthetic urine that is negative for any drug and passes routine specimen verification tests performed at most labs. We hope our invention will put the synthetic urine industry, that's been designed to evade drug testing and has direct impacts on human health, out of business."

At Interior Health, Hauff says that an important part of her role is educating doctors to ensure that they are using current drug screening tests appropriately. "Sometimes, they expect to see a drug, but when it doesn't turn up in the test, they automatically assume that the patient did something nefarious, like diverting their prescription. The truth is that the testing was not appropriate for the drug that they were looking for," Hauff says. One aspect of the pilot study for the MSI-CE-MS was to validate a proprietary software system developed by Seroclinix. The "middleware" analyzes the data, interprets it and provides physicians with actionable reports that include drug names, cut-off levels, indications of patient adherence, the names of any non-prescribed medications and guidance on potential drug interactions or adverse effects.

For the next step in the development process, this fall Britz-McKibbin, Lee and Kim are conducting a live beta test of the MSI-CE-MS in three labs owned by Seroclinix, the exclusive patent licensee. The Clinical Laboratory Improvement Amendments (CLIA)-accredited labs

> "In the United States, there are many more labs per capita, many people take multiple medications, yet current methods test for single drugs at a time, so costs are out of control. Insurance providers are looking for ways to reduce costs."

Philip Britz-McKibbin, professor, Department of Chemistry and Chemical Biology, McMaster University

are located in Buffalo, New York; Dallas, Texas; and Raleigh, North Carolina. "We are very interested in commercializing this new technology. Our plan is to beta test and launch in the United States first and then extend to other countries," says Lee.

Britz-McKibbin adds, "In the United States, there are many more labs per capita, many people take multiple medications, yet current methods test for single drugs at a time, so costs are out of control. Insurance providers are looking for ways to reduce costs."

Lee adds, "This is an exciting technology that would be beneficial in this country, too. Lowering costs would also fit in well with the more socialized approach to medicine in Canada."

If the MSI-CE-MS is commercialized successfully in the United States, the collaborators plan to expand it to Canada in the future. In the meantime, Hauff is looking to bring mass spectrometry to Interior Health within the next year or so. "The chances of us getting a mass spectrometer in every site is impossible and moreover, that's not ideal. The optimal drug testing strategy will continue to be a combination of immunoassay and mass spectrometry because there's currently no single method that can deliver on all four parameters of timeliness, accuracy, cost-effectiveness and adaptability," Hauff says. "But even if I can't deliver a mass spectrometer at every site, we would still be able to provide results before a patient is treated and goes home. The information won't be as timely, but it will still be useful for monitoring patients on a population scale."

She envisions a future where labs will aggregate population data on highly potent drugs, such as the fentanyl analogues that are currently behind a large majority of overdose deaths occurring in British Columbia and across Canada. In 2016, for example, 68 per cent of the 985 deaths due to illicit drugs in British Columbia involved fentanyl.[1] "It's not the polypharmacy from the doctors so much as the polypharmacy from the street. People are unknowingly getting highly potent fentanyl while thinking that they are taking another

drug, like cocaine or methamphetamine," says Hauff. "Sharing information among toxicology labs across Canada is starting to occur and will help us all become more adaptable to the newest drugs we need to detect and monitor so we can help more physicians improve patient outcomes."

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CSMLS SCSLM

Canadian Society for Medical Laboratory Science
Société canadienne de science de laboratoire médical

How safe are you in the lab?

Laboratories contain significant potential risks to your health and safety. The prevention of accidents requires great care and constant vigilance.

CSMLS has just launched a new section on our website, ***"Safety Central"***, completely dedicated to safety in the lab.

Listen to **"Safety Spotlight"** from CSMLS Occupational Health and Safety Consultant, Eoin O'Grady, PhD, CRSP

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csmls.org/safetycentral

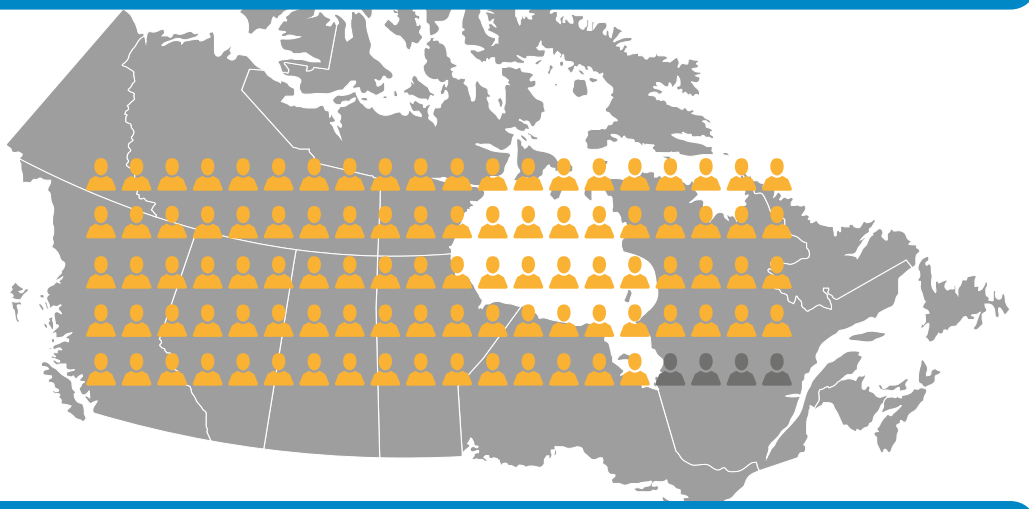
Canadian Public Opinion

of medical laboratory assistants

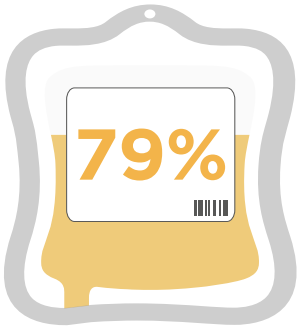
1 MLAs are Valued Across Canada

96%
believe that MLAs
impact patient care
in Canada

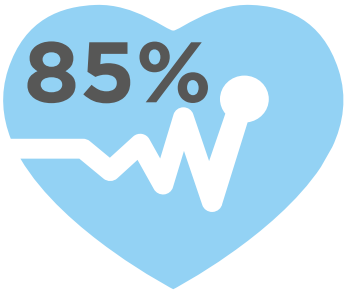
98%
believe the role of
MLAs is important
in Canadian Health care



2 Certification Increases Confidence

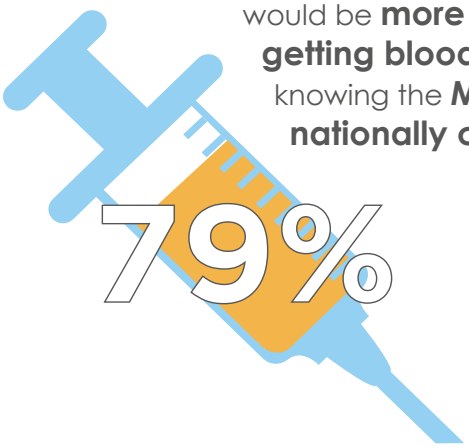


would be **more confident in care** received if the **MLA passed a national certification exam** vs. a provincial exam.



would feel **more confident in the abilities of the MLA** if they passed a **national exam.**

3 National Standards = Public Trust



would be **more confident getting blood drawn** knowing the **MLA was nationally certified**.

80%

would be **more confident** in **care received** if they knew the hospital **only hired nationally certified MLAs**.

csmls.org

The Canadian Society for Medical Laboratory Science (CSMLS) conducted a public awareness survey to gauge the public sentiment about medical laboratory assistants (MLAs).

Over 500 individuals from across Canada completed this survey.

Community

The Callback: A Different Perspective

Letter sent to CSMLS by Fred G. Melanson, MLT, of Nova Scotia on May 14, 2018

I found the article "The Callback" (Spring 2018) rather amusing. Allow me to give you a different perspective.

Imagine a small 10-bed hospital in northern Cape Breton, Nova Scotia. The catchment area spans about 100 km from one end to the other. The area is so vast that family members of critically ill relatives will actually take them to meet an ambulance en route because of the time it takes to travel the distance to the hospital. The nearest regional hospital is over a mountain and across a ferry two hours away in summer. Winter times may vary significantly.

There is a rather modern lab with one technologist who is officially/unofficially on call 10 out of 14 days. There are no equipment backups, no blood bank and the only help comes from a doctor, nurses or X-ray technologist (if they are not busy), or a desperate phone call to the regional lab hoping someone has the time to help troubleshoot. All this being said, technologists in northern Canada and the far reaches of Canada's provinces would find this setup rather lavish.

And now the dreaded callback. The phone goes off. You know why. The message is brief. Your blood chills. You're on your feet and out the door in seconds. A prayer springs from your lips. The equipment must work swiftly and perfectly. You must stay focused. Things here do not operate on nice, neat protocols. You do what you have to do. People that will survive in a nice, big regional hospital die here. The family is in the waiting room. Being a small community, you know them and the patient. The doctor is calm but he wanted the results an hour before he called you. You get the samples. You curse, pray, plead and beg there will be no issues with the samples or the equipment.

It's over. There are sighs and a "thank you" – or there are tears. You mark your time knowing the big wigs sitting in an office far, far away will complain to the site manager about the high cost of all these callbacks. You go home not knowing if you'll be back in a couple of hours. Tomorrow you'll be back in the lab at 7:00 am sharp. J

MEMBER SPOTLIGHT: NICHOLAS DIBDIN

Nicholas Dibdin is the Associate Director of the Canadian Blood Services' (CBS) Cord Blood Bank and its national Stem Cell Manufacturing Program. Cord blood is used in stem cell treatment. We sat down with Dibdin in Ottawa, ON, during LABCON2018 to speak about his career highlights and the Cord Blood Bank's mission and goals.

Photo credit: Biosafe (GE Healthcare), Sepax2 Users Manual

Where did you start and end up in this role?

I started as a general MLT and worked in core labs. I worked up north in Nunavut for four to five years. You get to do everything up there. It's so hands-on. It was an absolutely wonderful experience. I learned so much. My wife and I decided to come back south. I worked in transfusion in Halifax. There was a job offering at Canadian Blood Services. They were opening a new nucleic acid testing lab. They needed someone to run that, and I had some experience doing nucleic acid testing up north, so I was fortunate to get the job there. A lot of my background at CBS was working in the labs around infectious diseases markers, like HIV, Hep C and Hep B.

When I was working for CBS, I got involved in a lot of projects from a management perspective. Over time, I built up my resume of projects, got project management accreditations and kept studying. I worked my way up with bigger and bigger projects, while still working in the lab environment. My feet were always firmly rooted in the lab. In about 2012, CBS was looking for a senior project manager for the Cord Blood Bank project, which was just starting. It was a new opportunity, a different challenge, but still within the organization and the lab. Thankfully, I was given this opportunity, and I took it! After we implemented the project in 2014, the opportunity for the Associate Director position came up. I was fortunate to be given this opportunity as well.

> "Our staff at the hospital now have advance notice of who is potentially coming through the door and, as due dates aren't exact, approximately when they are coming."

What kind of campaigning are you doing for donation recruitment?

This year, we put into place a digital strategy for our recruitment of moms. In July, we implemented an electronic registration module so moms could register online in advance. Our staff at the hospital now have advance notice of who is potentially coming through the door and, as due dates aren't exact, approximately when they are coming.

Our ability to determine who can donate and when they can donate is not an exact

science. This is because we are only in certain hospitals, and we aren't in these hospitals 24/7 anymore. This has limited our opportunities.

Our goal is to try and get as many moms into the program and get as many cord blood units as we can into the bank over the next few years. We want to grow the bank and ship as many cord blood units as we can out the door to save lives.

Where is the lab in terms of the cord blood bank process?

On the collection side, we do have lab people who are collection specialists. The collection of cord blood is basically phlebotomy. In our processing facility, MLTs are integrally involved in the manufacturing process. We do a lot of testing: in-process QC testing, hematology, flow cytometry and stem cell cultures. In the processing itself, we're handling blood and blood products.

Our managers are MLTs. We have many supervisory and support staff that have MLT experience. MLTs have transferable skills they can bring to the table, and not just in the lab. Their skillset allows them to expand outside the lab as well. Having that background is really important.

Did you miss Nicholas' presentation at LABCON2018?

We are releasing "What you need to know about Canadian Blood Services' Cord Blood Bank" as a CSMLS webinar in October.
Visit webinars.csmls.org.

WE'LL BE THERE FOR YOU

Jason Tetro talks about how you can be the voice of your own profession

Jason Tetro, aka The Germ Guy, is a notable author and columnist who is active in science communication (better known online as #scicomm) to build the general public's understanding of microbes and health. He writes for *Huffington Post* and makes frequent appearances in national and international media. Follow Tetro on Twitter @JATetro. Visit his website at jasontetro.com.

At LABCON2018 in Ottawa, ON, we caught up with Tetro to speak about his presentation, "We'll Be There for You! Showing the Public that MLPs Are Their Best Health Friends," and the critical role of medical laboratory professionals in health care.

Can you discuss the primary stigma of the medical laboratory profession?

It really comes down to being a hidden entity within a much larger health care context. It's easy to understand that when you look at doctors and nurses. They are the front liners, and they like that attention. That's understandable. At the end of the day, they are not going to know how many working mechanisms there are behind the tests that they require. They order the tests, and they get the results. The proficiency of the test, the ability of whatever equipment you are operating to work properly within specified margins, that's something they don't understand. And it's the most integral part of what kind of testing is necessary. Medical laboratory technologists really are the people who need to be understood as the ones who are making us aware of what is happening inside of us. A doctor and a nurse will only be able to assume, and they are going to need a test to confirm. They also will be able to read the output, but they won't know how the output came to be. Without that middle component, neither the doctors nor the nurses, who are the faces of health care, are going to be able to operate effectively.

Can you talk more about the responsibility that every medical laboratory technologist and assistant has to make people aware of what they actually do?

There are two ways to go about this. One is to make it loud and clear within the health care facility and try and do everything you can to make yourselves known. That's very antagonistic, and it will get you hurt. Don't do that. Follow what the government does. They are not going to create policy until the public cares about that policy. If you want medical laboratory technologists to be cared about, you need the public to care about you. I want you to start at the dinner table. I want you to start with one-on-ones. You can use social media. It doesn't really matter how, but it needs to be in the public eye.

I have the opportunity to speak to politicians and to work on policy development, and if I'm hearing from the public that they want to learn more about medical laboratory technology, then I am more than happy to start talking about that at policy levels. We live in a society where public momentum is what drives what happens at the top. It's a long journey. I get that. I understand that it may seem incredibly difficult. But, as I also said in my talk, 66 per cent of people I encountered were germaphobes 10 years ago. I've been working diligently every single day as this entity known as The Germ Guy, and we're down to 33 per cent, and, who knows, maybe in a couple of years we might even be at a quarter. It works. We just have to stick with it. That commitment is absolutely necessary.

Talk a little about the WHO Essential Diagnostics List that came out.

The World Health Organization (WHO) had what was known as the Essential Drug List. Every country needs to have a certain amount of drugs in order to be considered viable in a health care environment. But how do we know to give somebody a drug? To figure out the drug itself, you're going to need to run a test because at the onset of a sickness a doctor may say, "Oh, it's blank" and prescribe you a drug. Is it going to work? If it's for a bug, is it going to be resistant? Is it even for the bug? Why would you give an antibiotic for a viral infection? You have to run a test in order to be absolutely sure.

WHO figured out that the only way that we can prescribe drugs effectively is if we have tests that provide us with the information we need to be able to make these smart decisions. There are 58 such *in vitro* diagnostic tests, as they call it, which they created as an essential list. Now, we have this Essential Diagnostics List, or EDL,

which goes alongside the Essential Drug List. Now what happens is that all the countries are being asked to incorporate these 58 different tests. Some of them are for bugs, HIV, tuberculosis, etc. Some of the most basic ones, like electrolytes, are in there. Only medical laboratory technologists are going to be able to run these tests.

Can you extrapolate on your talk where you suggested it's best to gently direct people who are less informed than use a forceful approach?

In as much as science communication is in my realm, this is where a collaboration with someone like Tino [Valentin Villatoro, educator at the University of Alberta] would be perfect. He actually has a poster here at the conference [LABCON2018] where it's talking about what we call directed learning. This is to help people develop

Medical laboratory technologists really are the people who need to be understood as the ones who are making us aware of what is happening inside of us. A doctor and a nurse will only be able to assume, and they are going to need a test to confirm. Without that middle component, neither the doctors nor the nurses, who are the faces of health care, are going to be able to operate effectively.

professionalism in the positions they have. This could be perfect in terms of developing a means of performing professional science communication that is respectful and can direct people to learn more. What if you could do the directed learning by just simply having some points that you always have on hand, so if you know you are going to be having these discussions, just remember a few points. And use that to direct the learning of the individual and so you're not sending them off to sea.

How can individuals develop effective conversations to advocate for the medical laboratory?

You want to have a really good base of knowledge. Very simple. Nothing difficult to understand. Just simple concepts that you can work with. Upon that, you can build any kind of discussion pieces and you can develop conversations. We had one example even just after I gave my talk of someone wanting to form collaborations between other societies because they finally saw their importance. Rather than being burdened with this stigma of being second class, they actually do deserve a seat at that table. This is the type of thing science communication can do. It really gives people the confidence to spread the word, and when you have that amount of information that you feel comfortable sharing, then you can take it to the next level and start incorporating other people into it.

When should people take the first step to become a medical laboratory advocate or ambassador?

People just simply say, "I'll do it tomorrow." We can always diet tomorrow. We can always stop drinking tomorrow. We can always be better people tomorrow. We can have a whole bunch of things tomorrow. But if you can do it now, just do it now.

Interested in learning more about #scicomm?

Visit podcast.csmls.org to listen to Jason Tetro in Episode 11 – "The Attack of the Goop" on The Objective Lens #podcast.

Need more tips to achieve your advocacy goals? Check out Tetro's 4 Es of Science Communication:

1) Education

ESTABLISHING THE BASE

- Confirm critical evidence
- Present facts neutrally
- Use newer evidence as much as possible

WHAT YOU NEED

- Ask yourself why the information you want to present is important
- Imagine the steps needed to get from question to answer
- Adhere to the SOPs (Introduction, Background, Process, Results)
- Use grade eight language and avoid technobable

2) Enrichment

- Give people useful knowledge that is relevant to their own world
- Entice them to do their own research
- Make sure your audience learns by avoiding jargon without context

3) Engagement

- Encourage and provide opportunities for involvement
- Foster a two-way relationship: ARC (Appreciation, Respect and Commitment)
- Know the scope of collaboration

4) Entertainment

- Keep the audience interested using known genres of entertainment
- Your perspective matters
- Practice until your message is extraordinary

Top 10 Reasons
to Apply to the Leadership Development Institute Scholarship

LDI Class of 2018. Photo credit: Phyllis Williams

This past June, I was given the opportunity by the CSMLS to attend the Leadership Development Institute (LDI) in Ottawa. For three days, I worked through an intense leadership development program alongside MRTs and MLTs from across Canada in this unique program sponsored by the CSMLS and hosted by the Canadian Association of Medical Radiation Technologists (CAMRT). The goal of the program is to take individuals in the early stages of their careers and help develop them into more confident leaders.

Upon meeting our facilitator for the weekend, Sylvie Lapointe, Organizational Development Consultant of L2 Emergence (l2emergence.com), I knew that the next three days were going to be eventful, fun and exciting because of her positive energy and attention to the group. Sylvie used personal stories to tap into her radiating energy when describing a concept. I found myself easily captivated by not only how she taught the content, but with the ease at which she transitioned between different facilitation techniques.

The group was one of the most diverse in which I have ever worked. Geographically, there were attendees from coast to coast, from British Columbia to Newfoundland and Labrador. In addition, a wide variety of workplaces were represented, including large academic hospitals, community hospitals as well as private clinics. There was also a complete set of professions as both CAMRT and CSMLS were well represented. This diversity allowed for engaging discussions to be had.

In order to give CSMLS members a better understanding of the potential benefits of this program, I have compiled my top 10 reasons to apply to the LDI program.

Top 10 Reasons to Apply to the LDI

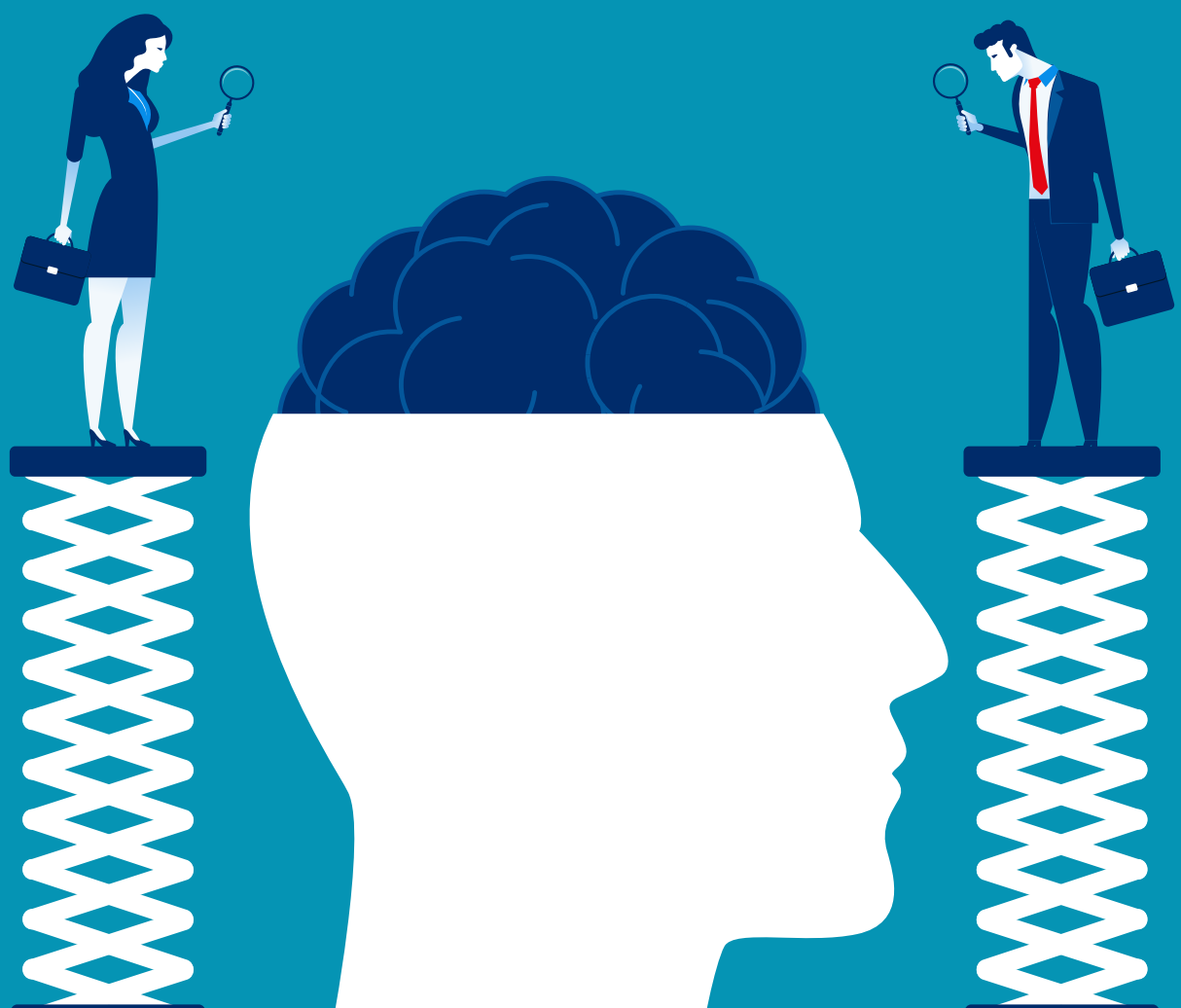
1. To have the opportunity to network with 19 other health care professional leaders from across the country.
2. To gain a deeper understanding of personality types and personality assessment tools.
3. To obtain tools that will enhance your self-awareness.
4. To gain a better understanding of how to approach difficult conversations.
5. To gain an appreciation of the variety of individual learning styles and how they are applied.
6. To learn and practice a variety of facilitation techniques for adult learning situations.
7. To understand better how to motivate and manage change effectively in the workplace.
8. To obtain a clearer vision and a set of specific professional goals for the near future with tools to help achieve them.
9. To travel to a new city (Ottawa), with all expenses paid.
10. To learn and work with promising health care leaders and participate in engaging discussions.

I would like to thank the CSMLS for providing members with such an amazing opportunity to develop themselves both professionally and personally. As fellow CSMLS members, I know that you value professional development and I encourage you to take advantage of this unique program. Do you want to learn more about the CSMLS Leadership Development Scholarship? Visit the Professional Development section on our website at csmls.org.

JEAN-PAUL NADEAU, MSc, MLT
University Health Network (Toronto General Hospital)

DISCOVER YOUR POTENTIAL WITH SELF-ASSESSMENTS

Whether you are a new graduate or an established manager, it is important to take time every once in a while for self-discovery and self-assessment. Taking time for honest self-discovery is essential to helping you understand your personality, preferences, values, preferred work environments, career and occupational choices, interests, factors that influence satisfaction, your leadership style and how you attempt to influence others.



Research demonstrates that when managers clearly understand their values, they tend to act more consistently, helping to build trust with others.[1] Self-understanding helps you create and select goals that matter to you and that can help you maximize your personal and professional influence and impact. Self-awareness can also help you develop a career path that builds upon your relevant skills and interests. More importantly, results from reliable standardized self-assessments often provide you with the vocabulary necessary to better articulate who you are and identify your focus. Being able to communicate this information will allow people to better assist you with your needs and career development.

Self-assessments are not only critical for learning about yourself, but also provide you with a foundation for learning about others and developing yourself as a leader. As Peter Miller, former associate professor at the Southern Cross University Business School in Australia, states: "Self-understanding also provides a sound basis for understanding other people – how could a leader be conscious of another's need or have empathy with others without first having awareness of their own self?" Understanding what you bring to a team and what your team's strengths and limitations are, can help you learn to work together more effectively. Knowledge of how you and others on your team prefer to work or communicate can help you anticipate how to best overcome challenges and problems before they even arise.

SELF-ASSESSMENTS

There are many different types of self-assessments available, but here are a few to help you get started:

Myers-Briggs Type Indicator (MBTI)

The MBTI is a psychometric questionnaire that was originally developed by Katherine Briggs and Isabel Myers to help make use of C.G. Jung's theory of psychological types and assist new workers in identifying job "fit" during World War II in terms of comfort and effectiveness. The MBTI is one of the most well-known self-assessments and personality tests. It is unique because it helps identify inborn predispositions (preferences), while other personality assessments often measure behavioural habits (traits). The MBTI measures four pairs of opposite preferences or dichotomies: Extraversion (E) or Introversion (I); Sensing (S) or Intuition (N); Thinking (T) or Feeling (F); and Judging (J) or Perceiving (P). For each pair of letters, one letter will score higher than the other, indicating your preference. The result is a four-letter type; these four preferences combine into 16 different patterns or types. The MBTI is available for a fee; however, there are other assessments listed in the references (TypeFocus and 16 Personalities) that are available online for free based on the same theory.

Life Styles Inventory (LSI)

The LSI is a paid test that is available as a self and/or 360-degree assessment, incorporating feedback from up to 12 colleagues/peers,

"Self-understanding helps you create and select goals that matter to you and that can help you maximize your personal and professional influence and impact. Self-awareness can also help you develop a career path that builds upon your relevant skills and interests."

managers and/or subordinates. The LSI assesses one's behaviour, thinking styles, personal effectiveness and satisfaction, both at work and at home. The results are extremely thorough and provide information about known and unrecognized strengths, "blind spots" and potential "stumbling blocks" or areas for development. There is a corresponding Group Styles Inventory that helps measure and assess the particular styles of groups or teams following a real problem-solving session. The results also include research findings about groups with that particular style and suggestions and strategies for increasing or minimizing certain group styles and behaviours.

Personal Values Assessment (PVA)

The PVA provides you with insights about what is most important to you, what motivates you and what values drive your decision-making process. It requires you to select 10 words from a list of values and behaviours. The results include self-development exercises and prompts that help you gain a deeper understanding of how your values influence you.

MY OWN EXPERIENCE WITH SELF-ASSESSMENTS

One of the most valuable outcomes in doing self-assessments is learning to recognize the impact of different personality types on communication styles and teamwork. An aspect of leadership that I have come to appreciate was the ability to fully engage people who may have different or even opposite preferences and values than their own. For example, consider a meeting with a team composed of mostly people who prefer extraversion and are therefore typically more outgoing and outspoken. What strategies can be taken to engage and incorporate the thoughts of those who have a preference for introversion and who may require more time to reflect upon the presented information?

The other primary insight I gained from self-assessments was learning to anticipate how others may receive information and respond or react to certain situations. This has not only made me more aware of whom I am communicating to, but also how I choose to communicate to others. For instance, while taking the course, Fundamentals of Leadership Effectiveness, there was a discussion about communication of updates to medical laboratory professionals (MLPs). Some individuals preferred weekly updates via email, while others mentioned that they were often busy because of the large workload and did not have time to check their emails on a regular and timely basis. Some preferred hearing about updates at laboratory meetings, while other MLPs mentioned their frustration with the lack of communication about these updates if they were working during off shifts. Team assessments can help laboratories address some of these potential communication issues by ensuring that communicated information is well-received and is tailored in a way that suits the preferences of those in your laboratory.

SELF-REFLECTION

While self-discovery and self-awareness are often interesting and helpful to learn, much of their value comes from putting this information in context through self-reflection. Reflective learning is a grounded theory based on an individual's capacity to reflect upon their words, tone, body language and actions and, in doing so, to undergo a learning process. One strategy to help with this task is to engage in double-loop learning, which involves questioning your underlying values, assumptions and beliefs in order to understand why we do what we do.

The path to genuine self-discovery and self-assessment depends on one's ability to be open and honest with yourself and things that could be limiting you. Results from standardized self-assessments should be used as a stepping stone or tool to help you start a plan to develop yourself, both personally and professionally, and to help you reflect upon your career and yourself.

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JUDY TRAN
MBA Candidate, HBSc, MLT
University Health Network

Society News

Simulation and Clinical Placement Grants

Is your accredited academic program or health care organization planning to conduct in-depth research or develop quality assurance projects to enhance simulation and clinical placements in the Canadian medical laboratory? At CSMLS, we are excited to offer grants to support these efforts.

Eligible projects must increase the CSMLS body of knowledge in:

- Enhancing simulation education and curriculum for medical laboratory science students;
- Understanding how to relieve pressures from clinical placement sites in relation to supporting student competency or through the evaluation of new clinical placement models; and/or
- Identifying gaps in knowledge associated with health human resource issues impacting academic programs and/or employers.

The funds received through this grant must directly contribute to CSMLS knowledge production efforts for members and support streamlining of knowledge exchange for simulation and clinical placement discussions.

A total of two grants valued at $500 each will be awarded. Open to CSMLS members only.

All submissions are due Monday, October 15, 2018. All submissions should be sent to Miriam at MiriamG@csmls.org.

Should you have any questions regarding the application or submission process, please contact Laura Zychla, CSMLS Researcher, at research@csmls.org.

The Standard of National Occupational Health and Safety in the Medical Laboratory Profession

Medical laboratory professionals should be acutely aware that their laboratories and clinical environments represent high-risk hazardous settings both in preanalytical and analytical phases. Workers are exposed to numerous potential hazards, including chemical, biological and radioactive threats, in addition to other physical and psychological impacts, such as musculoskeletal and mental stressors. For example, prolonged standing, neck bending, stress, exposure to sharp instruments and exposure to infectious materials are commonplace. The work of medical laboratory professionals allows for limited control over their environment, coworkers and patients, resulting in a workplace that can never be considered 100 per cent safe.

A national study published in 2008 (a collaboration between CSMLS and McMaster University) determined rates of occupational health and safety compliance for exposure to bloodborne pathogens and the rationale for such behaviors. The respondents were CSMLS members. They reported high rates of exposure to bodily fluids and poor rates of compliance with personal protective behaviors among other findings. As the study concluded, the data provided a baseline for compliance with safety precautions among laboratory workers across Canada. A decade later, CSMLS set out to see if this occupational health and safety standard had improved.

In the late spring of 2018, a survey replicating and expanding on the 2008 version was disseminated to members. The current results have been analyzed and provide comparative data. For the complete report, go to View Research Reports under the Research tab on the CSMLS website (csmls.org).

Results from the 2018 survey

Do you have annual workplace safety and training for your lab?

16% NO
11% UNSURE
73% YES (MLAs and MLTs)

The occupational health and safety culture in my lab is positive.

82% MLT AGREED
67% MLA AGREED

Do you have a formally recognized occupational disease due to your work as a medical laboratory professional?

2% AGREED (MLAs and MLTs)

Managers/Supervisors demonstrate a commitment to occupational health and safety in my organization.

81% MLT AGREED
72% MLA AGREED

Nationally, the medical laboratory profession has room to improve the occupational health and safety culture in labs.

76% MLT AGREED
70% MLA AGREED

Do you believe you have an occupational disease due to your work as a medical laboratory professional that has not been formally recognized?

11% AGREED (MLAs and MLTs)

The results demonstrate our profession's improvements across time as well as identify areas that can be improved upon. Above all else, the data highlights the importance of our continued diligence in all matters associated with health and safety.

LAURA ZYCHLA
Researcher
CSMLS

CSMLS CALL TO ACTION: HEALTH HUMAN RESOURCE SHORTAGE OF TECHNOLOGISTS (MLTs)

The Call to Action addresses national, regional, immediate and long-term efforts required to change the health human resource (HHR) shortage of medical laboratory technologists (MLTs) within Canada.

Background

The MLT shortage is at a transformative tipping point. CSMLS believes that an intensified effort by Canada's medical laboratory stakeholders can push the agenda forward into real and meaningful change.

In 2010, the Canadian Institute for Health Information identified that approximately half of all MLTs would be eligible to retire in 10 years, with the greatest impact felt in Canada's rural and remote communities.[1] As it stands today, approximately 40% of MLTs in Canada are 50 years of age or older. The greatest loss within the MLT workforce is associated with those who are 21 to 30 years post-graduation.[2] Additional CSMLS data sources are being examined for comparator data. Based on national data[1,2] and internal CSMLS data[3], projections do not show MLT students offsetting retirements in the next 10 years as it currently stands. The greatest bottleneck in securing more students is the lack of clinical placements available for training.[4,5]

Provincial governments are not collectively increasing MLT student seats to offset the retiring workforce. Without a national effort, effort, medical laboratory professionals (MLPs) will experience greater hardship in the workplace. Other health professionals will need to overtake some of our responsibilities (task shifting) to provide optimal patient care. Alternatively, our patients will see a decline in laboratory testing services, with a potentially negative impact on their health.

- An additional 400 student seats need to be created immediately (41% increase nationally).
- At a minimum, 20% of all students should expect rural or remote employment after certification.
- Half of Canadian MLT accredited programs utilize less than 1,225 student hours for clinical placement training, representing a benchmarking opportunity for training optimization.

Call to Action

The Call to Action focuses on ways medical laboratory stakeholders can contribute and how MLPs can be employed more effectively. CSMLS recognizes the hard work and collaboration conducted by many individuals to date and asks for extended efforts as we forge into a critical period over the next 10 years.

In addition to the information presented and views expressed within the associated CSMLS position statement[6], the following actions are required:

1. **Public and private laboratories should recognize the negative impact precarious positions and workload burdens have on the employment of current and future workforces and work towards a brighter future for their organizations and MLPs.**

   a. Recognizing the problem of fiscal constraint in today's health care system, CSMLS asks that you evaluate your human health resource and infrastructure budgets under a long-term lens and continue to advocate for permanent full-time positions, create new collaborations with academic partners for clinical placement student spots, reserve positions for new graduates using formalized mentoring models with experienced MLPs and address the mental health issues in the workplace that are plaguing our profession.

2. **We need to increase the number of students received by quality clinical placement sites to support and enrich competency obtainment. This includes building a financial and resource infrastructure to allocate dedicated training time for clinical instructors and preceptors.**

   a.CSMLS recognizes the importance of hands-on experience for students and appreciates the work by laboratories and academic programs to achieve this. We acknowledge that new clinical placement models are required and welcome evaluated innovation to meet student competency needs for CSMLS certification.

In 2010, the Canadian Institute for Health Information identified that approximately half of all MLTs would be eligible to retire in 10 years, with the greatest impact felt in Canada's rural and remote communities.

b. Laboratories not previously accepting students should evaluate their ability to contribute to the Call to Action and determine their ability in collaboration with academic programs.

c.Academic programs have reported evidence that specific competency sign-off can be obtained within a simulated environment. In alignment with accreditation requirements, academic programs should explore the possibility of models that involve such sign-off and network with other programs to identify steps and evidence to accomplish this. Such efforts would facilitate new models for clinical placements and a potential reduction in clinical hour requirements.

3. **Starting immediately, we need an unparalleled increase in MLT academic student seats to combat the current and future HHR shortage. Academic programs, clinical placement sites and non-clinical placement site laboratories need to formally evaluate their programs with administration and determine how to enhance student clinical placement training and increase student throughput (increase total numbers).**

a. CSMLS recognizes the shortage is regionally, provincially and nationally relevant, ranging from remote to urban locations, and we recommend that academic programs collaborate, collect and share evidence for seat increase allowances under a multifocal lens.

b.The use of system models that include enhanced or new collaborations between programs and laboratories, including pan-Canadian considerations (e.g., inter- and intra-provincial partnerships), shorter clinical placement hours and/or alternative models of and within clinical training (e.g., simulation, standardized objective structured clinical examinations (OSCEs), buddy system and student-to-student exercises), should be considered to meet clinical placement site needs.

c.The use of simulation to support hands-on practice in order to complement clinical placement training is encouraged and should be incorporated into academic programs where expertise and infrastructure have been or will be dedicated.

d. In line with the *Truth and Reconciliation Commission of Canada:*

Calls to Action[7], attention should be paid for the inclusion of Aboriginal students in all medical laboratory programs, including designated seats, clinical placement options in Aboriginal communities and collaborations to create guaranteed employment after CSMLS certification. Consideration for other underrepresented populations of students should be considered locally.

e. The integration of internationally educated health professionals (IEHPs) into the workforce has been identified as a promising strategy for addressing HHR shortages in many countries. Using best-practice information for the creation and enhancement of medical laboratory bridging programs as well as for other recruitment and retention strategies is vital.[8]

f. Academic admission requirements and processes differ across MLT programs and that contributes to student retention variance. An evaluation of MLT admission requirements and processes should be conducted to ensure that the retention of students entering a program is at optimal capacity. Given that there is not a shortage of individuals wanting to enter the MLP profession, consideration for a formal screening process, compared to a 'first come first qualified' process, should be implemented.

4. MLAs and MLTs working in the clinical environment with students help shape the professional pride and practice of the future workforce. Efforts to create a working environment that is supportive of this and the Call to Action are imperative to the change process. CSMLS asks that you continue to support each other locally during this critical period, identify areas for change and communicate innovative projects/solutions to your peers nationally.

a. CSMLS will support the dissemination of efforts to members in accordance with CSMLS policy.

b. Ensure best practice methods are used when training students in the clinical environment. When this cannot be achieved, notify your supervisor/manager (in accordance with local policies) as soon as possible to seek solutions that support your work as well as the training of students. Provide the supervisor/manager with a copy of this Call to Action to support your case for change.

c. It is the professional's responsibility to uphold their actions to the Standards of Practice, Code of Professional Conduct and Code of Ethics.

CSMLS firmly stands by the need for large-scale transformation to combat the MLT shortage and the impact it has on MLPs, patients and other laboratory stakeholders. Above all, CSMLS is focused on supporting its members and the profession to meet the needs of Canadians, ensuring high functioning laboratory teams and the proactive, safe, effective and affordable promotion of laboratory services that are informed by evidence and delivered in a timely manner across our nation.

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LISTEN AND LEARN WITH THE OBJECTIVE LENS PODCAST

Learning has never been easier. The Objective Lens podcast is here to help you navigate the medical laboratory profession, and plans are in the works for Season Three to hit the airwaves in 2019. We spoke with medical laboratory professionals to develop topics of most interest to you.

Catch up on past episodes. We recommend:
- Mental Health, honestly
- Northern Health: Obstacles and Understanding
- Leadership and Latin Phrases for 200

Need CE hours? After you listen to an episode, take a short quiz to earn professional development hours.

Subscribe through iTunes (itunes.apple.com/ca), Google Play (play.google.com/music/listen) and Stitcher (stitcher.com).

Follow us on Facebook and Twitter (@csmls).

PARTNERS FOR LIFE

CSMLS is proud to participate in an ongoing partnership with Canadian Blood Services' (CBS) Partners for Life. It's a national program to save lives through blood donations.

Throughout the first half of the year, we have been encouraged to see our membership actively join the cause to roll up a sleeve and donate blood. So far, 26 active members have participated in this program to donate blood, four of whom donated blood for the first time. CBS recognizes this effort as a great start for a new partnership. Thank you for doing your part to save lives.

As a CSMLS member, you can use the **"Partner for Life" code CANA160391** the next time you book an appointment to donate blood.

CSMLS SCSLM

Canadian Society for Medical Laboratory Science
Société canadienne de science de laboratoire médical

Become a member of the CSMLS Nominating Committee

The Nominating Committee recruits CSMLS members for open Board of Directors positions.

They prepare the slate of nominations and review the final ballot before it is released.

Positions available (2019-2021 term):

- **British Columbia/Yukon**
- **Ontario**

Interested in applying?

Submit a letter of application to:
Mary Costantino, Chair 2018 Nominating Committee, CSMLS, 33 Wellington St. N, Hamilton, ON L8R 1M7

Or email:
Miriam Gracey, Executive Assistant (miriamg@csmls.org)

Must be a member in good standing to apply.

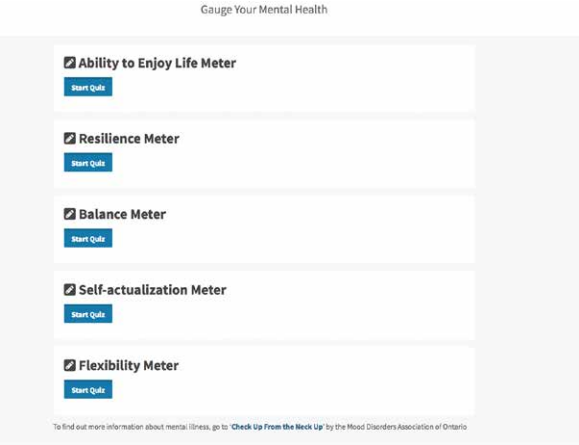
Application Deadline: October 15, 2018

csmls.org

MENTAL HEALTH TOOLKIT

Have you visited the CSMLS Mental Health Toolkit (mentalhealth.csmls.org) recently? We have updated the toolkit to include new and improved tools to provide members and organizations with the means needed to identify, monitor and implement change for the betterment of the medical laboratory profession. This includes updated links and new articles.

You and your organization do not stand alone in trying to work through mental health issues in the workplace. This online toolkit is a great way to obtain information on mental health issues and can be a resource for individuals, employers and organizations.



As medical laboratory professionals, a great way to support mental health in the workplace is to celebrate World Mental Health Day on October 10 in your lab.

NATIONAL VOICE

As the national voice of Canada's medical laboratory profession, CSMLS represents the needs and concerns of medical laboratory professionals when working with laboratory and health care-related organizations. CSMLS Board of Directors, staff and volunteers attend meetings, conferences and events on behalf of CSMLS members and the entire medical laboratory profession. Here is where your voice was heard recently:

June

Conference Board of Canada: Leaders Roundtable on Immigration
OTTAWA, ON

CSA Technical Committee on Medical Laboratory Quality Systems
TELECONFERENCE

University of Ontario Institute of Technology – Exploring Sim: Appropriateness and Need in MLS Education
OSHAWA, ON

Health Action Lobby (HEAL)
OTTAWA, ON

Research Canada – AGM
OTTAWA, ON

EQual Canada Program Council Meeting (Accreditation Canada)
TELECONFERENCE

Coalition for Public Health in the 21st Century (CCPH21)
TELECONFERENCE

Program Visit/Presentation – The Michener Institute of Education at UHN
TORONTO, ON

Program Visit/Presentation – Westervelt College
KITCHENER, ON

Canadian Network of Agencies for Regulation (CNAR) – AGM
TELECONFERENCE

July

Oulton College – new MLT program meeting
TELECONFERENCE

Canadian Association of Pathologists Council meeting
QUEBEC CITY, QC

LifeLabs – Call to Action (Exploring Simulation)
TORONTO, ON

Program Visit/Presentation – Westervelt College
LONDON, ON

CSMLS SCSLM

Canadian Society for Medical Laboratory Science
Société canadienne de science de laboratoire médical

Supporting you every step of your career

Connect to the Industry

with eNEWS, CJMLS, LabBuzz, The Objective Lens podcast and more

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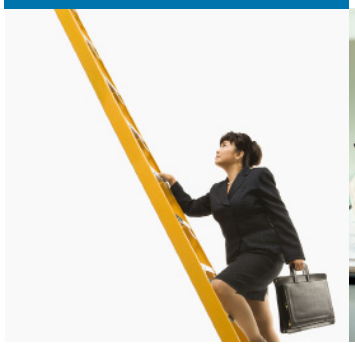

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renew.csmls.org