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The Growing Field of Forensic Pathology

The Hamilton Forensic Pathology Unit is one of seven regional forensic pathology units in the province of Ontario and is located at the Hamilton General Hospital. The forensic pathologists at the unit perform medicolegal autopsies as directed by coroners in order to determine the cause of death. The deaths are often sudden, unexpected, unexplained, unnatural or due to violence. The other forensic pathology units in the province are located in Sault Ste. Marie, Sudbury, London, Toronto, Kingston and Ottawa.

The facility first began operation in 1919 as the mortuary or “City Morgue”, administered by the City of Hamilton, and it operated as such under the direction of Dr. William Deadman, City Pathologist and Chief of Laboratories. In 1950, the administration changed and the morgue was no longer under direction of the city. It continued to provide public mortuary facilities for a further twenty years until the Forensic Pathology Unit was established in June 1970 under the directorship of Dr. Foster. Dr. Fraser Mustard, Chair of McMaster University’s Pathology Department, then proposed an affiliation between the Forensic Pathology Unit and McMaster University’s Pathology Department. In 1973, the Forensic Pathology Unit was established as a specialized regional laboratory facility after Hamilton’s district laboratory medicine program was established. In 1989, the facility was named the Chief Gordon V. Torrance Regional Forensic Pathology Unit, in honour of the Hamilton Police Chief.

In the subsequent few years, the referrals of coroner's cases for autopsy began to increase from regions outside of Hamilton-Wentworth. The unit had been performing approximately 600 postmortem examinations per year. Currently, the unit provides service to an area encompassing Kitchener-Waterloo and Guelph in the north, Niagara Falls in the south, Simcoe (Norfolk and Haldimand County) in the west and Halton in the east. The catchment area covers a population of approximately 2 million and includes urban centres, rural and farming communities, and industrial sectors. The number of medicolegal autopsies has increased steadily from 950 cases in 2016 to 1,249 in 2017 (an increase of greater than 30% in one year).

The Forensic Pathology Unit's position at the Hamilton General Hospital places it in an ideal situation to avail itself of the various laboratory services provided by the Hamilton Regional Laboratory Medicine Program (HRLMP). The majority of autopsies include microscopic examination of tissues. Additional testing includes special and immunohistochemical staining of tissues, biochemical testing of fluids for drugs and toxins, microbiology culture of tissues and molecular diagnosis of infections, hematology investigation for hemoglobin and coagulation disorders, and molecular testing for underlying heritable conditions.

One of the factors contributing to the increasing number of forensic autopsies is the ongoing opioid epidemic. The illicit drug market has had an influx of fentanyl and fentanyl analogues that have associated high mortality rates. There may be no specific findings during the postmortem examination to indicate that the death is due to the toxic effects of a drug and thus postmortem toxicology testing is critical. Currently, the HRLMP has screening testing available for drugs of abuse using random urine samples. The testing devices are based upon the principle of immunoassay with competitive binding. They test for fentanyl, amphetamine, barbiturates, benzodiazepines, cocaine, tetrahydrocannabinol, methadone, methamphetamine,

methylenedioxymethamphetamine, morphine, oxycodone and tricyclic antidepressants. The postmortem blood samples are submitted to the Centre of Forensic Sciences in Toronto for confirmation of the presence of drugs of abuse. These confirmatory results often take 6-8 weeks due to the high volume of cases processed by the Centre of Forensic Sciences. The Hamilton Forensic Pathology Unit is currently conducting a study to assess the validity of using the drug screening tests on postmortem urine and other postmortem samples such as vitreous fluid from the eye and bile. The screening tests provide rapid results (within minutes to hours). These results can then be shared with investigating coroners and police agencies in order to assist with the death investigation process and to alert staff of potential risks from the presence of drugs.

In collaboration with the Ontario Forensic Pathology Service in Toronto, the unit facilitates molecular testing for heritable conditions that result in sudden death. These conditions include hereditary primary arrhythmias and cardiomyopathies, aortopathies and connective tissue disorders, hereditary thrombophilias, and syndromic and non-syndromic causes of epilepsy.

Forensic Pathology is an area of growth for laboratory medicine. There has been a rapid increase in volume and complexity of postmortem examinations performed in the last five years. McMaster University and the Hamilton Forensic Pathology Unit were formally accredited by the Royal College of Physicians and Surgeons of Canada in 2011 as one of only three facilities in Canada that provides subspecialty training in Forensic Pathology. The fellowship training program in Forensic Pathology joins the educational opportunities already provided by the unit to residents in Anatomical Pathology and General Pathology, medical students, nursing students, and police cadets.

By: Dr. Linda Kocovski, MBBS, FRCPC
Forensic Pathologist
Hamilton Regional Forensic Pathology Unit

News from Administration



Ms. Denise Legeard's last day with the HRLMP was Friday, February 23, 2018. Denise was the HRLMP's Project Lead Lean Six Sigma.

Denise began her career as a registered technologist in the microbiology department at the Henderson Hospital in 1988. She then moved through a number of positions in the laboratory, IT, and in redevelopment between Hamilton Health Sciences and St. Joseph's Healthcare. Denise joined the HRLMP in 1999 as an LIS analyst, and then progressed through the positions of quality specialist and manager of the core laboratory at McMaster Hospital. She accepted the position of Project Lead Lean Six Sigma in 2009 and since then has also attained her Master Black Belt in Lean Six Sigma.

Denise has left the HRLMP to become the Director of Clinical Diagnostics at Norfolk General Hospital.

Please join me in thanking Denise for her many contributions to the HRLMP and in wishing her all the best in her new position.

Duane Boychuk, Director, Lab Operations, HRLMP

Education News



Please consider attending this year's CSMLS LABCON, which is being held May 25 – 27, 2018 in Windsor, Ontario. This is an excellent education and networking opportunity that focuses on medical laboratory science.

Click on the link below for all the details:

<https://labcon.csmls.org/>

News from Genetics

Flood in Genetics Laboratory

On Sunday January 7th, 2018, a ruptured pipe caused significant flooding on the 3rd floor of the MUMC site that caused major damage in the Molecular Oncology and Cytogenetics laboratories and office areas.

Genetics and contracted staff worked together to relocate the equipment and reagents to a new location on the 1st floor. Thanks to the resourcefulness and collaboration of everyone, there was no disruption of the clinical service and little impact on turnaround times.

Currently the Molecular Oncology lab and part of the Cytogenetics lab are on the 1st floor of MUMC in the yellow area, and part of Cytogenetics is in its regular location on the 3rd floor, purple area.

In addition, some of the offices of the clinical and professional staff have been relocated to the 2nd floor.

One unforeseen benefit is we are all logging more steps by making trips between these various locations.

Hereditary breast ovarian cancer panel update

We are also happy to announce that we have extended our comprehensive hereditary breast ovarian cancer panel by adding seven new genes (CTNNA1, GREM1, POLE, POLD, SDHB, SDHC, and SDHD). The updated requisition is available through the Laboratory Information Test Guide.

Genetics Education

CSMLS offers a wide range of continuing education opportunities in all areas of laboratory science. Educational formats include course-based, webinars, and other education strategies for all learners. Our colleague Anna Haasen, MLT and our former colleague Amanda Cocca, MLT, recently developed a “Genetics & Society” webinar exploring the ethical and social implications of genetic testing on patients, their families, and the public. It will be posted on the CSMLS’ webinar catalogue soon: <https://webinars.csmls.org/>

Congratulations!

The HRLMP Genetics Lab would like to announce that **Robyn White** was appointed to the position of senior technologist. **Congratulations Robyn!**

Hematology News

Dr. Mark Crowther was recently interviewed on *CHCH Morning Live*. Dr. Crowther discussed the Heart and Stroke Foundation and the great research going on in Hamilton!

Click on the link below for the full interview: <http://www.chch.com/heart-and-stroke/>

Microbiology News

Dr. Fiona Smaill attended the *5th Global Forum on TB Vaccines* in New Delhi in February and presented an update on **McMaster’s TB vaccine program** and on their Phase 1 clinical trial administering vaccine by aerosol that is currently enrolling locally.

For more information about the trial, click on the link below:

<https://www.mcmaster-tbstudy.com/>

Congratulations to **Dr. Marek Smieja** who is a co-author on a **New England Journal of Medicine** paper on the risk of myocardial infarction (heart attack) after acute influenza.

The authors reported that laboratory-confirmed influenza was associated with a six-fold increase in heart attack risk in the one week after testing. The NEJM paper is **Acute Myocardial Infarction after Laboratory-Confirmed Influenza Infection**.

Click on the link below for the link to NEJM article: <https://www.ncbi.nlm.nih.gov/pubmed/29365305>



News from Pathology



Dr. Martin Hyrcza, our Head and Neck cancer expert at the St. Joseph's site has submitted his resignation. The department will definitely miss Dr. Hyrcza's incredible expertise and engaging personality.

We are pleased to announce that **Dr. Ipshita Kak**, one of our recent graduates from the General Pathology program, has accepted a staff position at the St. Joseph's site. Dr. Kak is currently in Toronto completing a Fellowship in GI pathology.



Dr. Murray Potter, Chair (Acting), Pathology and Molecular Medicine, would like to announce that **Dr. Sarab Mohamed** has accepted the role of **Director, General Pathology Postgraduate Education Program** as of January 13, 2018.

Dr. Mohamed is an Assistant Professor with the Anatomical Pathology division in our department and is a pediatric pathologist with the Hamilton Regional Laboratory Medicine Program.

Dr. Mohamed is an experienced practitioner of general pathology and is an invested and enthusiastic educator of our residents.

We would like to thank **Dr. Vidhya Nair** for her excellent past service in this role and wish her luck in her new position in Ottawa.

Research News



Twenty-two McMaster University researchers were recently awarded \$19 million in health research funding from the Canadian Institute of Health Research (CIHR).

Included in these researchers were the HRLMP's own **Dr. Catherine Hayward**, **Dr. Waliul Khan** and **Dr. Peter Kavsak**.

Congratulations to all!

Click on the link below for the full story:
https://fhs.mcmaster.ca/main/news/news_2018/mc_receives_19m_in_health_research_funding.html



Denise Neutel, MLT, has accepted the position of Director, Certification and Prior Learning

Assessment with the Canadian Society for Medical Laboratory Science (CSMLS).

Denise has over 25 years of experience in the clinical laboratory, research and management fields. Denise worked in the Platelet Immunology laboratory and most recently was the Supervisor, Specimen and Supply Management with the Population Health Research Institute at the General site.

Combined with her extensive education, Denise has a considerable amount of experience working in the profession both in Canada and overseas in areas such as Uganda, Eastern Europe, the Caribbean and West Africa.

We wish Denise all the best in her role at CSMLS.

increased summer sun exposure are sufficient for most otherwise healthy patients.

HRLMP Data 2017 (Jan 1 – Oct 31)

Decision cut points (nmol/L)	n	%
<25 Vitamin D deficiency	259	4.9
25-75 Suboptimal Vitamin D status	2803	52.5
>75 Desirable Vitamin D status	2268	42.5
>250 Potential Adverse effects	4	0.1

The number of 25-OH-Vitamin D tests done tripled from 2006 – 2008 and have not decreased since then.

What can you do?

Laboratory testing is appropriate in higher risk patients when results will be used to institute more aggressive therapy (e.g., osteoporosis, chronic kidney disease, malabsorption, some infections).

Dr. Cynthia Balion, Clinical Chemist, HRLMP



Choosing Wisely Canada

Things Physicians and Patients Should Question

RECOMMENDATION:

Don't perform population based screening for 25-OH-Vitamin D deficiency.

<https://choosingwiselycanada.org/vitamin-d-tests/>

Why?

Vitamin D Deficiency is common in many populations, particularly in patients at higher latitudes, during winter months and in those with limited sun exposure. Vitamin D supplements and

