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NEWSLETTER

CMPT - A vision for the future

Dr. Lucy Perrone, the Donald B. Rix Professor of Laboratory Quality and Associate Professor in the Department of Pathology and Laboratory Medicine, joined the Faculty of Medicine at UBC on March 14, 2022. Dr. Perrone currently chairs the Canadian (formerly Clinical) Microbiology Proficiency Testing Program (CMPT) and is the Director of the Program Office for Laboratory Quality Management (POLQM), programs that were created and lead by Dr. Michael Noble, now Professor Emeritus, for more than 20 years.

Dr. Lucy Perrone

Since taking on these leadership roles in June, Dr. Perrone has been working with her team on several initiatives which are aimed at ensuring program sustainability and enabling growth. In June the team held a retreat which included team building activities, a SWOT analysis, and a strategic planning exercise which enabled greater visibility into the strengths and vulnerabilities of the programs and opportunities for growth. This series of meetings resulted in the team agreement upon several strategic goals for both programs encompassing: improving global visibility of our quality assurance services and education programs in laboratory quality; strengthening our laboratory processes to ensure sustainability of existing programs; and enabling growth of the proficiency testing and educational programs for laboratory professionals portfolios.

Professional Development for Laboratory Staff

New and exciting course offered in partnership with POLQM:

- ISO15189:2022
- Laboratory Quality Management
- Antimicrobial Susceptibility Testing

Check inside for more details

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Dr Perrone and her team envision CMPT as a leading service provider for Canadian and global testing laboratories and a highly valued and respected resource for external quality assessment in the field of microbiology. CMPT aims to expand its portfolio of services beyond the clinical laboratory to include programs that support public health and safety; to reflect that transition CMPT's name was changed form "clinical" to "Canadian".

In April CMPT recruited Denise Hilker as a program assistant working with CMPT Coordinator, Esther Kwok on customer relations. Following the success of the COVID-19 proficiency testing program, CMPT will begin offering an expanded respiratory panel to laboratory customers in early 2023. The foundational research and development for this panel has been led by Research Associate Dr. Selvarani Vimalanathan and Dr. Sammi Treagus, both of whom were recruited to CMPT in the summer.

CMPT is also launching a Cannabis microbiology EQA program in early 2023 in collaboration with Proficiency Testing Canada out of Ontario. Research and development for this new program is being led by CMPT's senior technologist, Caleb Lee, and Mahfuza Sreya, a graduate from UBC's BLMSc program.

A number of internal quality and process improvement initiatives including laboratory space realignment and digitization of documents and records have been undertaken by CMPT and we wish to thank departmental leadership for their support. In October CMPT turned 40 years old and marked this achievement during a two day annual general meeting which brings together all technical committee members and key stakeholders for a review of programs and strategic planning for the upcoming program year.

Dr. Perrone envisions POLQM (CMPT's sister program) to be a hub for educational programs for laboratory professionals in the area of quality and service. POLQM currently offers the UBC Certificate Course in Laboratory Quality Management (LQM) which is currently enrolling students for January 2023. POLQM will be developing and launching two new online courses in 2023. In August Dr. Perrone with support from professional staff Veronica Restelli and Maggie Ma was awarded a Continuous Learning Advancement Fund (CLAF) education award for a new proposal to develop an innovate online certificate course in antimicrobial susceptibility testing. The funding level of $66,000 will support the course development team and subject matter experts for the next 12 months. The new AST course aims to launch in September 2023.

Since joining UBC Dr. Perrone has dedicated significant time to public outreach to and including public and private partners in laboratory medicine services including all of the health authorities and laboratory enterprises under the BC Provincial Health Services Authority as well as other Ministry of Health and key stakeholders across Canada. In June Dr. Perrone joined a collaboration led by Dr. Michael Allard to address issues of diagnostic testing access and quality. UBC's Remote Communities Drone Transport Initiative will test the feasibility of enhancing access to physically necessary health care services (lab, pharmacy, supplies) for First Nations communities. The pilot project will serve as a model for long-term improvements in health equity for underserved Canadians.

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Dr. Perrone continues to conduct research and practice on diagnostic testing, laboratory systems, capacity building, and improving human resources for health with a focus on resource-limited countries. She continues to advise the World Health Organization and the Foundation for Innovative New Diagnostics in Geneva on country level adaptation and adoption of national essential diagnostics lists and be a champion of quality.

In June Dr. Perrone gave a virtual presentation at a the "Uropathology and Quality assurance in Pathology" conference held in Ulaanbaatar, Mongolia and hosted by the Mongolian Ministry of Health. In October Dr Perrone presented talks at two well attended national and regional meetings and attended one international conference:

- European Organization for External Quality Assurance Providers in Laboratory Medicine (EQALM), Athens, Greece
- Africa CDC, ASLM Regional Meeting on National Essential Diagnostics Lists for Western Africa.
- Canadian Diagnostic Executive Forum, Toronto, Ontario

ASLM—Regional Consultative Meeting on DEDL for ECOWAS Countries

CDEF—Toronto

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Issues with Piperacillin-Tazobactam (PIP-TAZ) Breakpoints

By Dr. Robert Rennie

In CMPT Challenge M221-5 (July, 2022), a simulated blood culture with Acinetobacter baumanii, antimicrobial susceptibilities for piperacillin-tazobactam (Pip-Taz) were ungraded due to lack of consensus by the participants. It was unknown what breakpoints were being used for reporting this agent. This short article will attempt to provide some direction going forward regarding changes in breakpoints so that laboratories can provide an accurate and clinically relevant test result for this agent.

For a long time – back as far as the early 1990's, Pip-Taz breakpoints were established at ≤ 16 mg/L (Susceptible), 32 - 64 mg/L (Intermediate), and ≥ 128mg/L (Resistant).

Times have changed both in our knowledge of antimicrobial agents, the testing methodologies, and methods used to better define the efficacy not only of this beta-lactamase- beta-lactamase inhibitor combination agent, but of many other antimicrobials.

Update studies on the appropriateness of Pip-Taz have been undertaken by a number of organizations (e.g. EUCAST, CLSI, and USCAST). These studies can be viewed on their websites and on their discussion pages. This brief article will provide a summary of those discussions with analysis on the re-setting of breakpoints for Pip-Taz.

Clinical

More recent comparative studies of Pip-Taz with other agents in the treatment of gram negative infections showed increased mortality with Pip-Taz in isolates at ≥ 16 mg/L compared to those at lower MICs[1]. These studies also showed that the MICs to Pip-Taz were greater in strains with both ESBL and OXA enzymes, and that these isolates were found in patients with high rates of morbidity and mortality. In one study, the authors showed modal MIC Increases from 2 mg/L to 8 – 16 mg/L in strains with OXA-like enzymes, suggesting that the affinity of tazobactam for OXA enzymes is diminished.[2]

Antimicrobial Testing

Earlier studies with both Pip-Taz E test strips and some automated methods revealed issues in the interpretation of susceptibility results. The studies showed that there were high percentages (in some cases up to 40%) of Very Major errors (reported falsely as susceptible when they were resistant) compared to standard broth micro-dilution testing. These systems have now been reformulated so that the Essential and Categorical agreements better reflect the true MICs of isolates tested against Pip-Taz. In addition, long-term MIC data from EUCAST has shown that the Epidemiological Cut-Off (ECOFF or ECV) value for Pip-Taz is 8 mg/L, which supports clinical data on increasing failures at higher MICs. Most laboratories will not or cannot routinely test for the presence of spe-

cific beta-lactamases, and rely mostly on MIC results only to report apparent susceptibility or resistance.

Measurement of Clinical Activity of Pip-Taz

More recent advances in understanding of antimicrobial activity in patients, using pharmacokinetic and pharmacodynamic principles (Monte Carlo simulations) and other criteria now clearly indicate that the original breakpoints were too high.

There are many variables that have led to this understanding. With differences in dosing, prolonged or extended infusion, and studies in patients with normal or impaired renal function, obesity, and other co-morbidities, it has now been shown that the most critical measurement – target attainment (at > 90%) - can be achieved with doses of Pip-Taz of 4.5 g every 6 hr. This dose can cover MICs up to 8 mg/L. The same dose with infusion over 3 hr can cover MIC values of up to 16 mg/L/.

With these parameters in mind EUCAST has now indicated breakpoints of ≤ 8mg/L (Susceptible) and > 8mg/L (Resistant). USCAST suggests breakpoints of ≤ 8mg/L (susceptible) with 16 mg/L (Susceptible-Dose Dependent(S-DD)), and ≥ 32 mg/L (Resistant).

These are considerably more conservative than the original breakpoints and will likely provide better outcomes for patients treated with Pip-Taz so long as these lower breakpoints are provided by testing laboratories and parameters for dosing in a variety of clinical conditions are utilized.

We will provide further updates as these data are utilized more widely. Readers should review and update their reporting for Pip-Taz and consult the appropriate breakpoint development organizations for updated information.

References

1. Harris PNA, et al. JAMA. 2018;320:984-994.
2. Livermore DM, et al. J Antimicrob Chemother 2019; 74:326-333.
3. EUCAST - Piperacillin-tazobactam Rationale for the EUCAST clinical breakpoints. Available at: https://www.eucast.org/fileadmin/src/media/PDFs/EUCAST_files/Rationale_documents/Piperacillin-tazobactam_rationale_Nov2010_v_1.0.pdf

Note. This brief summary lists only three important critical clinical and laboratory references to provide context. Many additional references are available through the breakpoint organizations (EUCAST, CLSI, USCAST).

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New Virology Program Expert Committee

CMPT would like to welcome our new Virology Expert Committee;

Nancy Matic, MD, FRCPC, D(ABMM

Dr. Matic studied Microbiology (Honours Bachelor of Science) at the University of Guelph and earned her MD from McMaster University in Hamilton, Ontario. She then completed a residency in Medical Microbiology at the University of Toronto. She is currently a Medical Microbiologist with a focus in virology and the Site Director for the UBC Medical Microbiology Residency Program at St. Paul's Hospital.

Agatha Jassem PhD, (D)ABMM, FCCM

Dr. Jassem holds a BSc (Hons) in biology from York University (2006). She completed her doctoral studies in the Department of Pathology & Laboratory Medicine at UBC.

She is a clinical microbiologist and the program head of the Virology Lab at the BCCDC Public Health Laboratory.

She is the president of the Canadian Association for Clinical Microbiology and Infectious Diseases, and the president of the British Columbia Association of Clinical Scientists.

David Goldfarb MD FRCPC

Dr. Goldfarb is an investigator and Medical Microbiologist at BC Children's Hospital.

Dr. Goldfarb completed medical school at Dalhousie University and Pediatrics, Pediatric Infectious Disease, and Medical Microbiology residencies at the University of Ottawa.

He worked on the pediatric wards of Gaborone, Botswana joining that country's newly established School of Medicine. Prior to coming to Vancouver he also worked as a member of the Division of Infectious Disease at McMaster Children's Hospital.

It is an honor to have such knowledgeable and experienced committee experts giving their time and expertise to help CMPT offer a Virology program that is clinically relevant and assists laboratories in achieving their best work quality.

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UBC Certificate course in Laboratory Quality Management

Registration opens Sept. 1, 2022

Completely on-line 22-week course designed to provide knowledge, discussion, and expertise for those interested in Quality Management for Clinical and Research laboratories

https://polqm.med.ubc.ca/

ISO15189:2022 Standard for Medical Laboratories

What labs need to know

Short, 4 modules, online, and on demand course describing the changes professionals can expect with the revised standard and how to interpret themin their labs.

https://polqm.med.ubc.ca/iso-15189

Starts February 2023

Antimicrobial Susceptibility Testing and Interpretation

Starts: Fall 2023

Completely online, 12 week, mentored, asynchronous, discussion based, UBC Certificate course, to provide students with an understanding of the core principles of AST and its interpretation.

https://polqm.med.ubc.ca/ast/

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News

New programs coming soon:

Virology

CMPT will be launching its Respiratory Panel program early 2023. This panel will include SARS CoV-2, Influenza A, Influenza B, and RSV viruses. For more information please contact CMPT.

Enteric Parasitology - Molecular

CMPT will be offering PT samples to be tested by PCR. Samples will consist of fresh stools in Cary Blair transport medium. Please contact CMPT if you are interested.

Many of our Proficiency Testing Programs have been a response to our clients' needs. CMPT prides itself of being customer oriented and of tailoring our programs to the needs of the laboratory.
If your laboratory is currently seeking for PT for a microbiology assay please contact us to see how we can help you.

Canadian Microbiology Proficiency Testing
Room G408, 2211 Wesbrook Mall, Vancouver, BC V6T 2B5
604-827-1754 cmpt.path@ubc.ca