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Clinical Assessment of Laboratory Data by Community Pharmacists Helps Prevent Patient Harm

As community pharmacists' scope of practice continues to expand in various jurisdictions across the country,[1] their review of laboratory data becomes a critical component of medication-related care. This bulletin explores how pharmacists can optimize health outcomes and prevent patient harm by using laboratory data to inform clinical assessment.

INCIDENT EXAMPLE

A patient with reduced renal function received a prescription for an anti-infective agent at the usual recommended dose (i.e., without adjustment for renal function). The prescription was filled at the patient's local pharmacy. After taking the medication, the patient experienced neurotoxic symptoms. They received emergency medical care, and the symptoms resolved with treatment. The dose for the anti-infective agent was subsequently adjusted according to the patient's renal function, without a return of symptoms.

BACKGROUND

Standards of Practice

In its *Model Standards of Practice for Pharmacists and Pharmacy Technicians in Canada*, the National Association of Pharmacy Regulatory Authorities (NAPRA) states that pharmacists are to assess the appropriateness of care, and to "order and/or interpret relevant laboratory, point-of-care, and diagnostic tests and other clinical assessments when required to optimize management of medication therapy."[2] Utilizing all relevant information when evaluating the appropriateness of a prescription or assessing ongoing therapy is a requirement of standards of practice in all jurisdictions.[2,3]

Using Laboratory Data to Inform Decision-Making

Pharmacists' review of laboratory data can guide medication management in collaboration with prescribers and patients. This includes dose adjustments, therapeutic drug monitoring, ongoing monitoring of long-term medication use, screening for and prevention of chronic conditions, and initiation of medication therapy. Example scenarios are highlighted below.

Dose adjustments

- Adjustments to the medication regimen based on laboratory markers of renal or hepatic function (e.g., creatinine, liver function tests) can minimize the risk of toxicity due to drug accumulation (e.g., reducing gabapentin dose with comorbid renal impairment).

Therapeutic drug monitoring

- During clinical verification of a medication with a narrow therapeutic index, review of drug levels can help the pharmacist determine effectiveness and safety of the existing regimen (e.g., monitoring tacrolimus blood levels following an organ transplant).

Ongoing monitoring of long-term medication use

- When assessing long-term use of a medication or conducting a comprehensive medication review, laboratory data can inform the need for a change in therapy, additional therapy, or discontinuation of therapy (e.g., reviewing glycated hemoglobin A1c [HbA1c] levels to evaluate long-term diabetes management).

Screening for and prevention of chronic conditions

- Pharmacists are well-positioned to provide screening and health education, including strategies for prevention and management of common chronic conditions. Laboratory data can provide necessary values to calculate risk, such as the risk of a cardiac event (e.g., evaluating the lipid profile in conjunction with other risk factors).

Initiation of medication therapy

- In a study conducted in Alberta, where pharmacists have the authority to order laboratory tests, laboratory monitoring has been used to support safe prescribing of antihypertensives by pharmacists; this approach has led to clinically significant improvements in patients' blood pressure.[4]
- With approximately 90% of all antibiotics prescribed in the community,[5] pharmacists can play a key role in antimicrobial stewardship, including selection of an antibiotic based on culture and sensitivity data.

DISCUSSION

In the incident example, it is unknown whether the pharmacist had access to or used laboratory data.

Access to and Ordering of Laboratory Data

Pharmacists' access to patients' clinical laboratory data varies across the country. In some jurisdictions, access has been in place for many years, whereas in others, pharmacists do not yet have routine access. In some provinces, pharmacists are now permitted to order and interpret laboratory data.[1]

Challenges with accessing laboratory data include a lack of integration between the laboratory and pharmacy information systems, which may require users to log in to separate programs to review laboratory data and prescription information, respectively.[6] Even in jurisdictions where pharmacists are permitted access to laboratory data, individual pharmacies/pharmacists may not have signed up with the laboratory information systems.

Effective Use of Laboratory Data

Clinical verification processes can be structured to enable routine assessment of laboratory data. To give pharmacists time to access and interpret laboratory data, the workflow must be carefully designed. For example, the pharmacist-at-intake workflow would permit the pharmacist to ask the patient for relevant clinical information early in the dispensing process.

Additionally, the complement of other pharmacy team members (e.g., registered pharmacy technicians) must allow for sufficient delegation of nonclinical tasks.

Barriers to using clinical data, such as lack of access, competing priorities, understaffing, lack of confidence in dose adjustments, and the need for additional training in interpreting results, may contribute to inadequate clinical assessments.

RECOMMENDATIONS

Provincial Health Authorities/Regulatory Bodies and Laboratory Information System Administrators

- Prioritize community pharmacist access to clinical laboratory databases to facilitate therapeutic assessment and monitoring.
- Advance pharmacists' expanded scope of practice to include ordering of laboratory tests as they relate to screening, assessment, and monitoring of medication therapy.

Community Pharmacy Team

- Ensure the pharmacy and its individual pharmacists have signed up for access to provincial/territorial laboratory information systems, where available.
- Assess current knowledge and skills needed to access and utilize laboratory data, including medications that typically rely on those results. Address gaps by providing additional educational resources (e.g., checklists, treatment algorithms).
- Ensure adequate staffing to give pharmacists time to access laboratory results and evaluate the appropriateness of a patient's medication regimen.
- Integrate review of laboratory data into clinical assessment processes to verify or adapt prescriptions, and for comprehensive medication reviews.
- Document renal or hepatic impairment (and other relevant clinical notes) in the patient's file, which can be readily accessed by other members of the pharmacy team when needed.
- Discuss with patients/caregivers the purpose of relevant laboratory tests, the benefits of regular monitoring, and how often tests should be done. Encourage patients to set reminders for laboratory appointments, to use patient portals for tracking results, and to ask questions.

Software Vendors of Electronic Medical Record and Pharmacy Management Systems

- Program the software to include alerts (e.g., relevant laboratory parameters) for medications that typically need assessment or monitoring of laboratory data.
- Integrate the various electronic repositories of clinical information, such that the information available represents a complete and up-to-date clinical picture of each patient.

CONCLUSION

Clinical verification of a prescription is a required aspect of community pharmacists' practice. Ensuring ease of access to and integration of laboratory data in community pharmacy practice enables pharmacists to better assess and monitor medication regimens.

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CMIRPS SCDPIM

Canadian Medication Incident Reporting and Prevention System — Système canadien de déclaration et de prévention des incidents médicamenteux

The Canadian Medication Incident Reporting and Prevention System (CMIRPS) is a collaborative pan-Canadian program of Health Canada, the Canadian Institute for Health Information (CIHI), the Institute for Safe Medication Practices Canada (ISMP Canada) and Healthcare Excellence Canada (HEC). The goal of CMIRPS is to reduce and prevent harmful medication incidents in Canada.

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