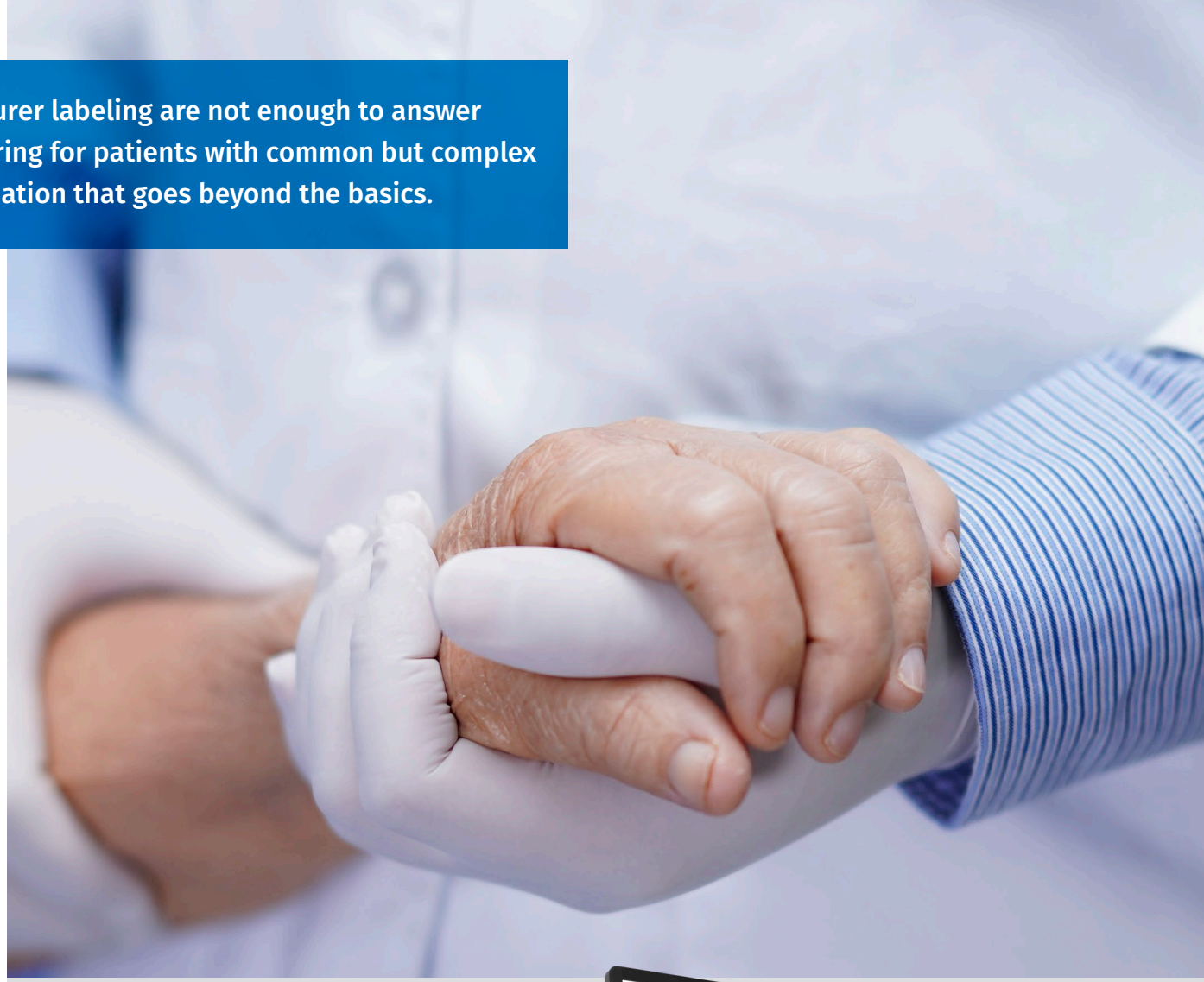
Wolters Kluwer

HEALTH

Beyond the Dose:

A Deeper Level of Clinical Drug Information

Literature citations and drug manufacturer labeling are not enough to answer point of care therapeutic questions. Caring for patients with common but complex conditions requires clinical drug information that goes beyond the basics.

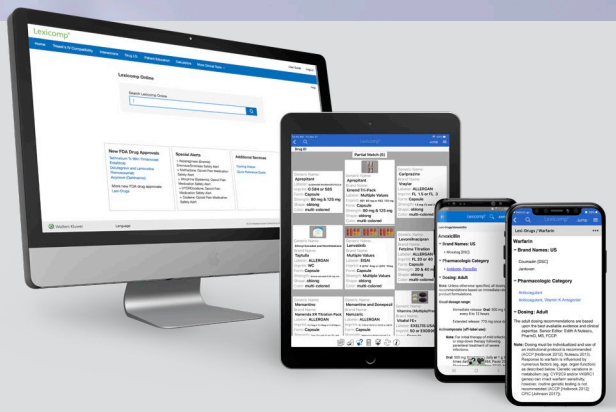


COVID-19 is exacting unprecedented demands on healthcare systems and pharmacies around the world. Clinicians are expected to make fast frontline decisions in the face of many unknowns and changing evidence and treatment recommendations, putting everyone on the care team under pressure for accurately and safely dispensing and administering treatment.

In the midst of this, there are the everyday challenges of caring for people with specific needs, such as elderly patients - many of whom take multiple medications - pregnant and lactating women, neonates and children, and those with chronic conditions.

When clinicians and pharmacists refer to disparate clinical and drug information sources or rely on standard label or dosing information that miss the clinical context, care suffers.

Concise, current and contextually relevant drug information at the point of care and beyond, helps clinicians and pharmacists enhance patient safety, reduce medication errors and drug spending.



"The results were clear. Lexicomp® was by far the preferred choice of our pharmacists, physicians and nurses alike. The Lexicomp solution surpassed our existing (resource), and there was also a significant cost savings without a compromise in value."

Alan Mutnick,
Corporate Director of Clinical Services for Mercy Health

Source: Mercy Health Surveys Pharmacists, Physicians and Nurses, and Lexicomp® Drug Information Comes out on Top Accessed September 9, 2020

Caring for people is a multi-disciplinary team effort. So is creating and updating clinical drug guidance.

Coordinated, well-informed teams are better able to deliver safe and effective care to patients. Yet even the most experienced clinicians, pharmacists, and nurses need support to stay on top of the vast amount of continually updated clinical and drug information. Information from regulatory bodies, such as the U.S. Food and Drug Administration (FDA), and resources that summarize evidence found in studies do not provide the level of insight needed.

Clinicians need trusted pharmacology information as well as pertinent clinical insights that can impact outcomes at every step in the decision process – at the point of care when treatment and drug management decisions are made, at the hospital pharmacy for confirming dispensation, and then again by nurses at the patient's bedside for administration guidance.

"When we look at evidence-based care, it's really important to step out of our silos. We're taking care of people, and healthcare is interdisciplinary, so we have to go beyond what is available 'to nursing.' To make the best-informed decisions, all healthcare professionals need access to the same set of evidence-based research that currently exists."

– Anne Dabrow Woods, DNP, RN,
Chief Nurse of Health Learning,
Research & Practice with Wolters Kluwer, Health

Source: Wolters Kluwer Survey: Mending Healthcare in America 2020
Accessed August 21, 2020.

In Vietnam, India and the Philippines, the extreme rate of medication errors is often at the prescribing and administration stages.

Source: National Center for Biotechnology Information, Medication Errors in the Southeast Asian Countries: A Systematic Review. Accessed August 24, 2020

Patients taking multiple medications or at risk of drug allergies and interactions

People with chronic conditions and co-morbidities, including the elderly, often take multiple medications daily, sometimes five or more. They also tend to see multiple clinicians, including a primary care provider, hospitalists and specialists, all of whom may be prescribing medications. Polypharmacy – whether prescription drugs, over-the-counter medications, vitamins and natural supplements, or combinations thereof – increases the risk of adverse drug events (ADEs), ill effects from medication nonadherence, and cognitive impairment. Patients taking multiple medications are also at risk of the prescribing cascade, where drug-induced side effects are viewed as new ailments and treated with another drug that can cause other side-effects. Adding to these drug risks are interaction concerns related to medications used in the management of COVID-19, such as remdesivir.

Pharmacists are on the frontlines when it comes to preventing contraindications and recognizing the potential benefits of deprescribing. Checking an expert reference helps to reinforce knowledge, double check possible treatment risks, and connect to practice-changing updates that may impact a patient's drug regimen. The database available in Lexicomp® integrates scientific and clinical literature, providing deeper insights into allergic mechanisms, concepts and categorizations, as well as information on idiosyncratic reactions which patients often confuse as a drug allergy.

Patient-specific guidance for IV Compatibility

Patients administered parenteral medications can be at risk of experiencing potentially dangerous incompatibility. Often, more than one medication is administered through the same intravenous line, which could affect the efficacy of one or more drugs as well as increase the risk of incompatibility. When explicit confirmation of Y-site compatibility cannot be found, a nurse may need to start a second line — sometimes adding to safety concerns and the dismay of the patient.

With the *Trissel's™ 2 Clinical Pharmaceutics Database* by Lawrence A. Trissel, nurses can find in-depth content on the properties of more than 850 drugs and solutions and over 76,500 compatibility results supported by more than 4,700 unique references. Our multi-disciplinary editorial team excels at continually updating Trissel's as new IV compatibility information is published in primary literature. The end result is trusted support for IV compatibility decisions and improved patient safety.

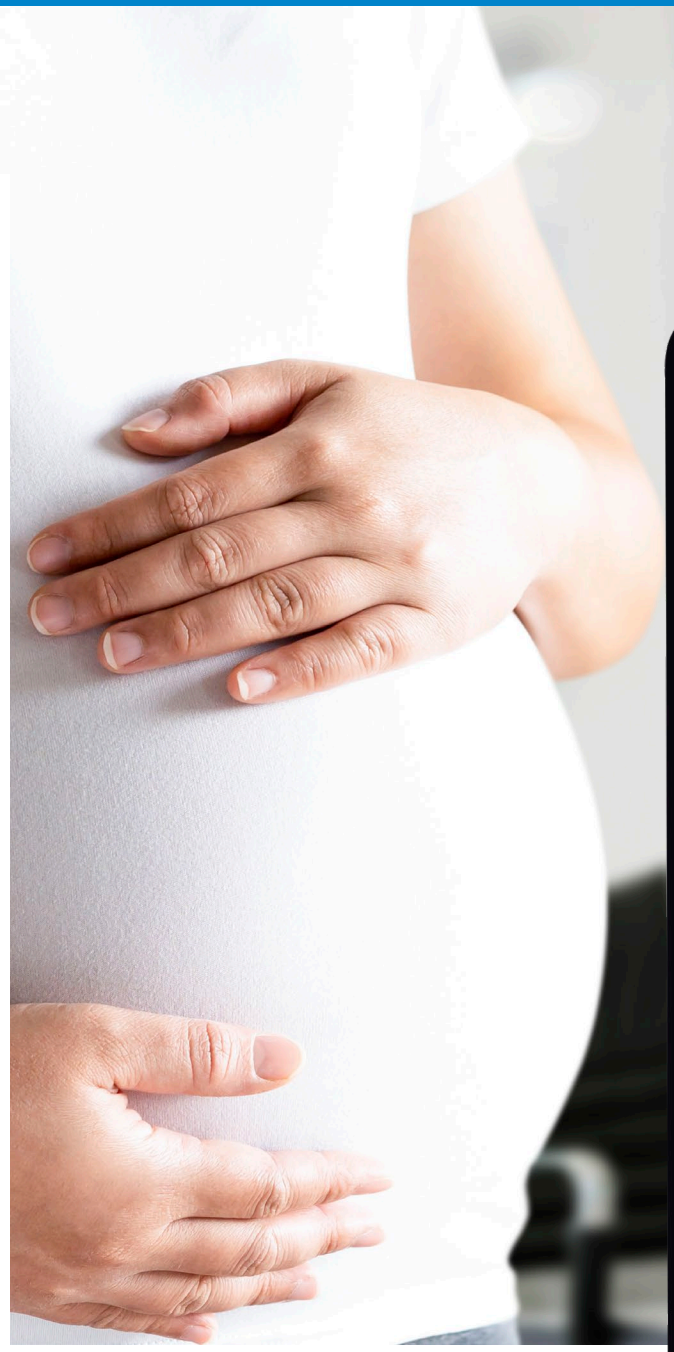
Ketamine
Administration: IV
According to the manufacturer, administer bolus/induction doses over 1 minute or at a rate of 0.5 mg/kg/minute; more rapid administration may result in respiratory depression and enhanced pressor response. Some experts suggest administration over 2 to 3 minutes (Miller 2010). When used for treatment refractory unipolar depression, administer over 40 minutes (Sanacora 2017). May also be administered as a continuous infusion.

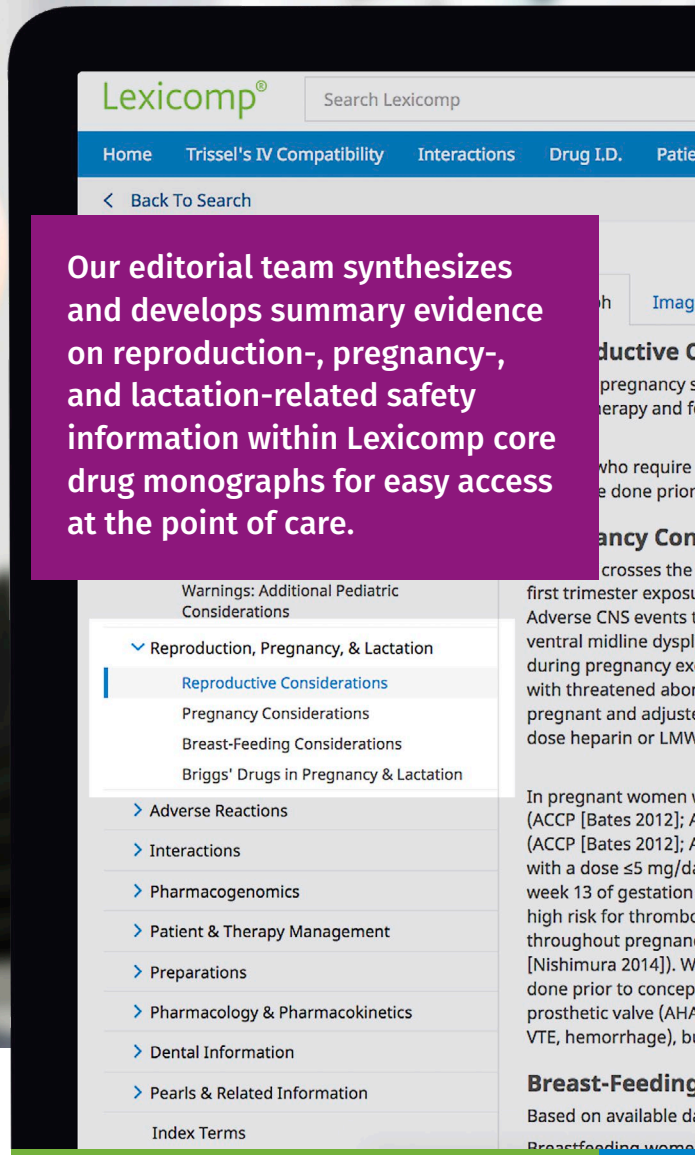
Source: Online.Lexi.com

Pregnant and Lactating Patients

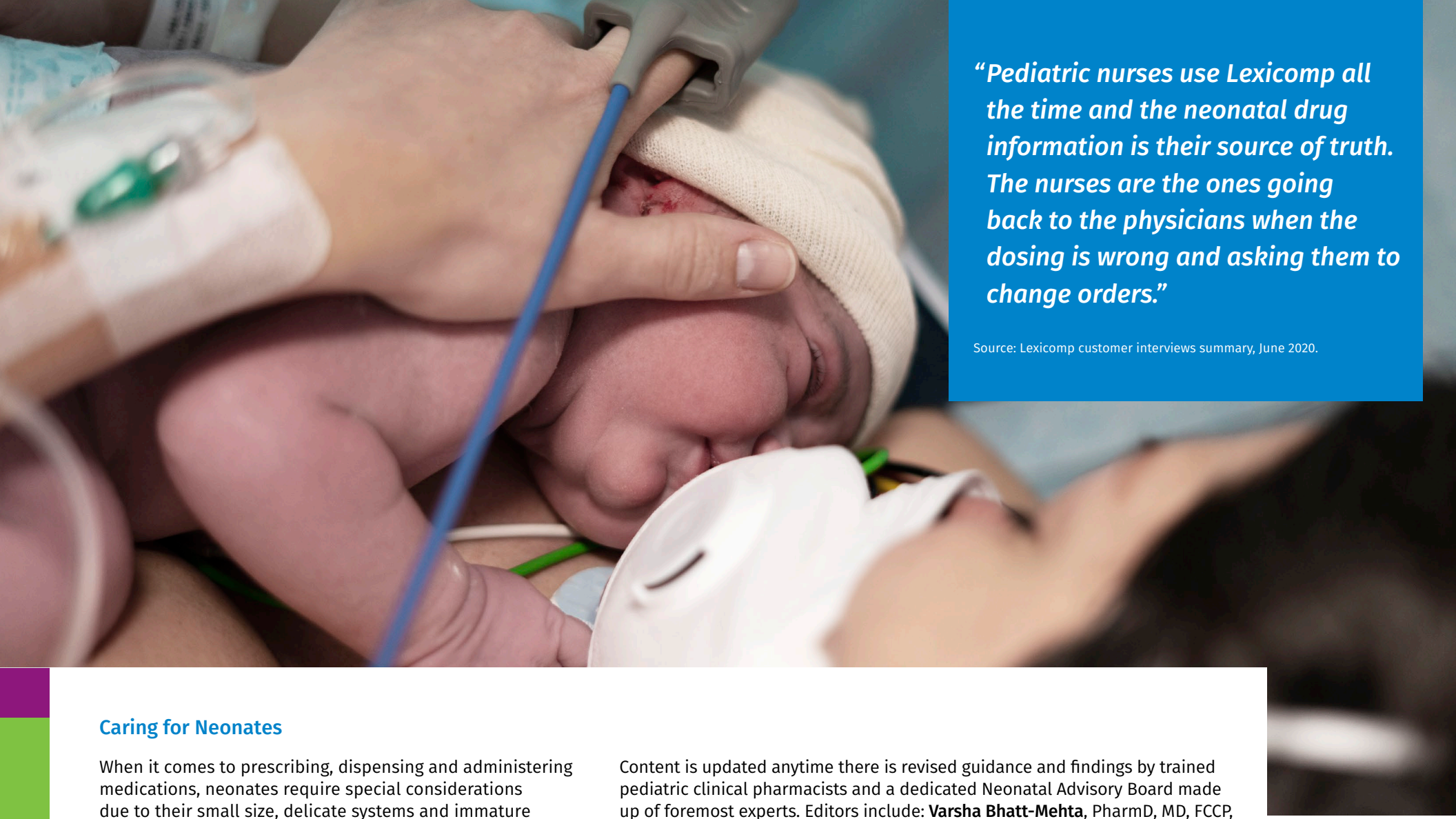
Medication risks associated with pregnancy and lactation pose great concerns and challenges for expecting and nursing patients and the clinicians who treat them. While the FDA guidelines under the *Revised Pregnancy Lactation Labeling Rule of 2014* help providers assess the risks and benefits of medications and vaccines during pregnancy, it is only a starting point for care teams who need guidance that keeps up with new evidence and recommendations.

Clinicians can find trusted support within the proprietary *Reproduction, Pregnancy & Lactation Section* of Lexicomp under Reproductive Considerations (both female and male), Pregnancy Considerations and Breast-feeding Considerations. These summary fields are updated in real-time to reflect current practice and data recommendations from peer-reviewed, evidence-based guidelines. For example, clinicians who are treating and prescribing for pregnant and lactating patients can find updated information on COVID-19 and the drugs being used to treat the disease, and that content is modified as studies are completed and new data is available. Within Lexicomp, clinicians can also refer to the respected resource Briggs' Drugs in Pregnancy and Lactation, which uses a risk summary format with a weighted evidence approach.





Our editorial team synthesizes and develops summary evidence on reproduction-, pregnancy-, and lactation-related safety information within Lexicomp core drug monographs for easy access at the point of care.



> *"Pediatric nurses use Lexicomp all the time and the neonatal drug information is their source of truth. The nurses are the ones going back to the physicians when the dosing is wrong and asking them to change orders."*

Source: Lexicomp customer interviews summary, June 2020.

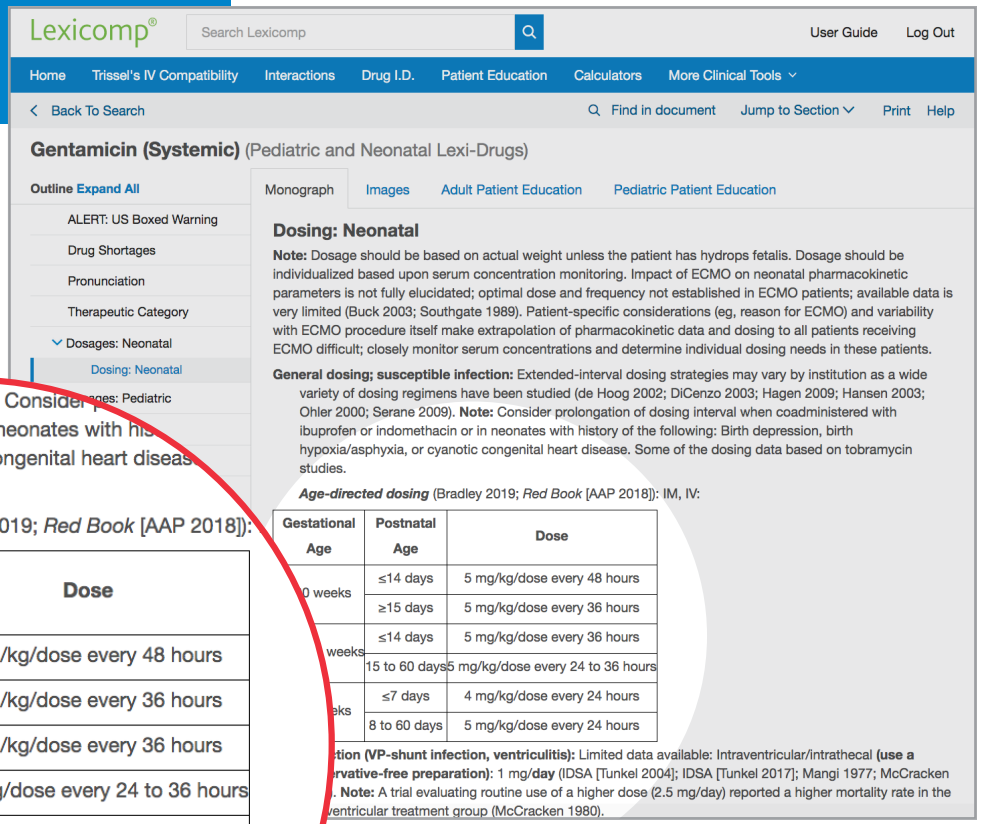
Caring for Neonates

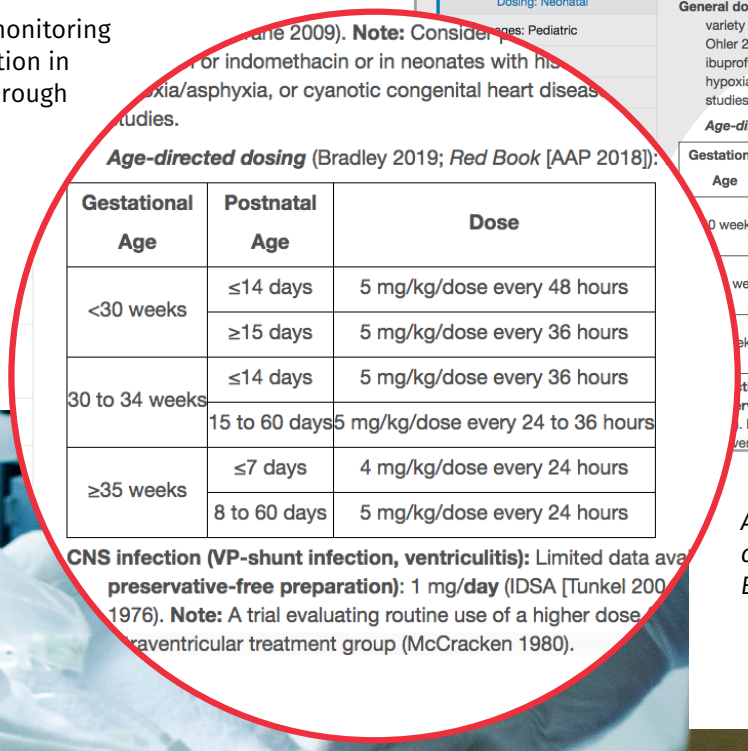
When it comes to prescribing, dispensing and administering medications, neonates require special considerations due to their small size, delicate systems and immature drug metabolism. Multiple challenges affect the safe and effective use of medications with neonates, including excipients to which neonates are susceptible to ADEs not seen in children. When pharmacists consult the fields for neonates in Lexicomp, they find expert guidance throughout the complete medication use process. The evidence-based neonatal dosing information also addresses the unique needs for specific conditions including extracorporeal membrane oxygenation (ECMO), congenital or central nervous system infections, and drug dosing adjustments with renal impairment.

Content is updated anytime there is revised guidance and findings by trained pediatric clinical pharmacists and a dedicated Neonatal Advisory Board made up of foremost experts. Editors include: **Varsha Bhatt-Mehta**, PharmD, MD, FCCP, NICU Clinical Pharmacy Specialist at University of Michigan Hospital, Clinical Professor, College of Pharmacy and Pediatric and Communicable Diseases at University of Michigan and recent recipient of the Lifetime Achievement Award by the Pediatrics Practice and Research Network of the American College of Clinical Pharmacy; **Deborah S Bondi**, PharmD, BCPS, BCPPS, Pediatric Clinical Coordinator/ NICU Clinical Pharmacy Specialist at University of Chicago Medicine, Comer Children's Hospital; **Mary Petrea Cober**, PharmD, BCNSP, BCPSS, FASPEN, Clinical Coordinator- NICU at Akron Children's Hospital and Professor of Pharmacy Practice at Northeast Ohio Medical Center; **Christopher McPherson**, PharmD, BCCPS, NICU Clinical Pharmacy Specialist at St. Louis Children's Hospital and Assistant Professor Pediatrics, Washington University School of Medicine.

Comprehensive pediatric & neonatal information **in one place**, including:

- Selected guidelines, clinical and technical reports, and recommendations of expert organizations and panels applicable to neonatal and pediatric dosing
- Dose, preparation, administration, and monitoring for labeled and off-label uses of medication in pediatric patients from day one of life through 18 years of age
- Additional considerations essential to pharmacists such as warnings and precautionary information related to neonates, including harmful excipients



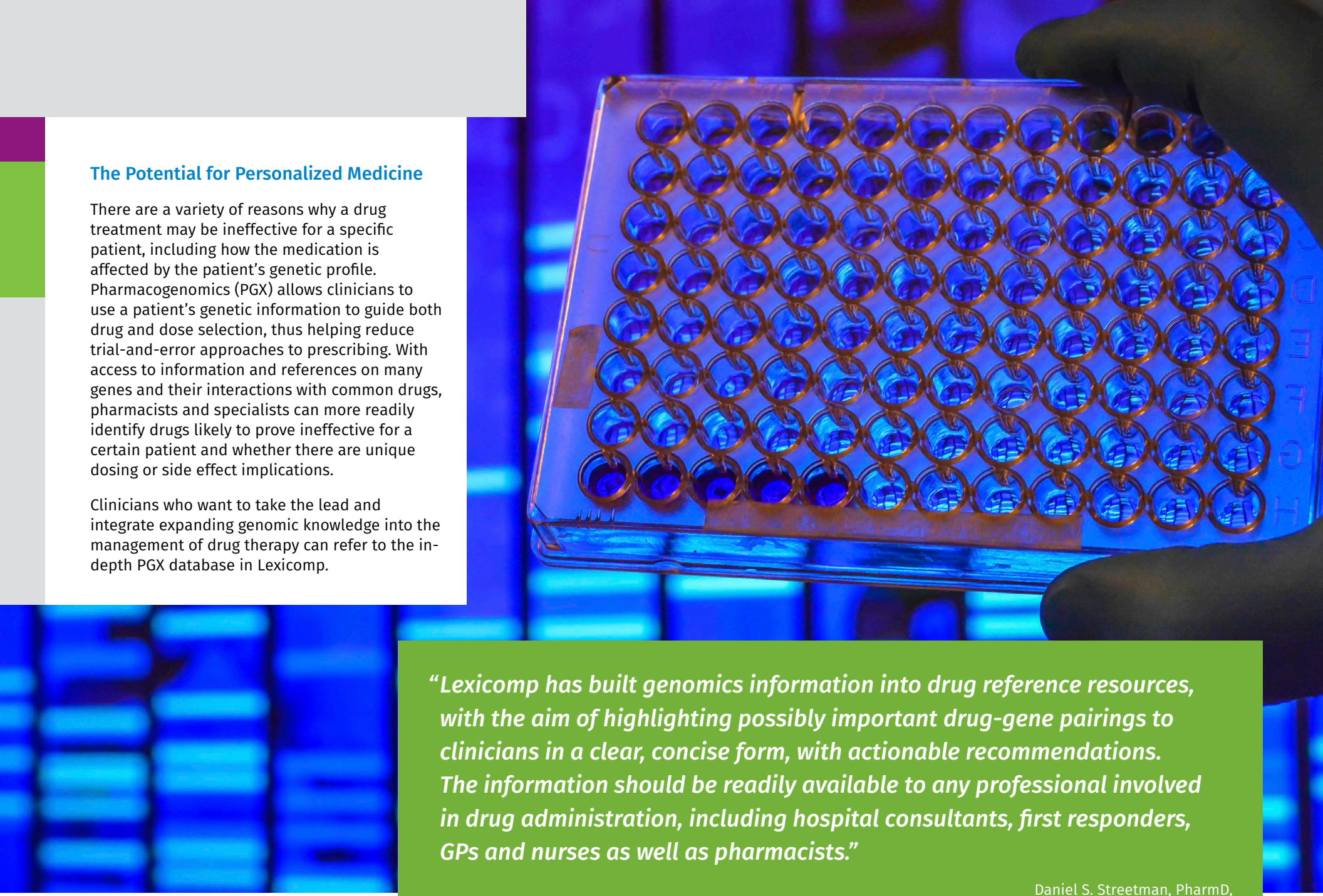


Access neonatal dosing information, such as GA dosing and dosing for special patient situations, including ECMO, CNS infection, renal dosing, and more.

The Potential for Personalized Medicine

There are a variety of reasons why a drug treatment may be ineffective for a specific patient, including how the medication is affected by the patient's genetic profile. Pharmacogenomics (PGX) allows clinicians to use a patient's genetic information to guide both drug and dose selection, thus helping reduce trial-and-error approaches to prescribing. With access to information and references on many genes and their interactions with common drugs, pharmacists and specialists can more readily identify drugs likely to prove ineffective for a certain patient and whether there are unique dosing or side effect implications.

Clinicians who want to take the lead and integrate expanding genomic knowledge into the management of drug therapy can refer to the in-depth PGX database in Lexicomp.



"Lexicomp has built genomics information into drug reference resources, with the aim of highlighting possibly important drug-gene pairings to clinicians in a clear, concise form, with actionable recommendations. The information should be readily available to any professional involved in drug administration, including hospital consultants, first responders, GPs and nurses as well as pharmacists."

Daniel S. Streetman, PharmD,
Manager for Lexicomp's Metabolism, Interactions, & Genomics group with Clinical Effectiveness, Wolters Kluwer Health

Source: Can connected healthcare lead to better patient outcomes? Accessed August 25, 2020

Each patient is unique. On the journey to safe and effective care, every decision counts.

Every day, pharmacists and other clinicians need to make decisions based on advanced clinical and drug information. This is especially critical in a rapidly changing pandemic – when trusted drug information and answers are needed fast.

While most clinical drug information resources restate and summarize new evidence, drug labels, and guidelines, very few are dedicated to advancing clinical pharmacy practice with original patient-centered **knowledge** available in the workflow, at the point of care.

This dedication to safer and better treatment for every patient is what sets Lexicomp apart. Our editorial team and network of experts continuously evaluate and synthesize the best evidence and clinical guidance available, thus supporting even the most complex decisions.

The following experts from our editorial team contributed to this report:
Elizabeth A. Tomsik, PharmD, BCPS, Senior Director; Reference Drug Content; **Joseph W. Snoke**, RPh, BCPS, Clinical Director, Reference Drug Content; **Catherine Mieves**, Manager, Content Management, Reference Drug Content; **Melanie Cucchi**, Manager, Content Management, Reference Drug Content; **Daniel M. Streetman**, PharmD, Manager for Lexicomp's Metabolism, Interactions, & Genomics group.

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