

TORONTO NOTES

2022

**COMPREHENSIVE MEDICAL REFERENCE
AND A REVIEW FOR MCCQE**

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TORONTO NOTES

2022

Comprehensive Medical Reference
and a Review for the Medical Council of Canada Qualifying Exam
(MCCQE)

38th Edition

Editors-in-Chief:
Yuliya Lytvyn & Maleeha A. Qazi



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Thirty-eighth Edition

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NOTE:

Many of you have wondered about the *Toronto Notes* logo, which is based on the rod of Asclepius, the Greek god of medicine. The rod of Asclepius consists of a single serpent entwined around a staff. This icon symbolizes both rebirth, by way of a snake shedding its skin, and also authority, by way of the staff.

In ancient Greek mythology, Asclepius was the son of Apollo and a skilled practitioner of medicine who learned the medical arts from the centaur Chiron. Asclepius' healing abilities were so great that he was said to be able to bring back people from the dead. These powers displeased the gods, who punished Asclepius by placing him in the sky as the constellation Orphiuchus.

The rod of Asclepius is at times confused with the caduceus, or wand, of Hermes, a staff entwined with two serpents and often depicted with wings. The caduceus is often used as a symbol of medicine or medical professionals, but there is little historical basis for this symbolism.

As you may have guessed, our logo uses the rod of Asclepius that is modified to also resemble the CN Tower – our way of recognizing the university and community in which we have been privileged to learn the art and science of medicine.

Thomas O'Brien, MD
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Preface – From the Editors

Dear reader,

We are grateful to present Toronto Notes 2022 to you. This edition is the product of an exceptional effort from the hundreds of editors and contributors who worked tirelessly with us as we navigated through the challenges posed by the on-going COVID-19 pandemic. Together, we have created the thirty-eighth edition of Toronto Notes, thus continuing our organization's rich tradition of providing an up-to-date, comprehensive, and concisely written medical resource to our readers.

Thirty-eight years ago, Toronto Notes began as a humble initiative, with medical students from the University of Toronto collecting and circulating their notes. Nearly four decades later – with annual editions and an ever-expanding vision – Toronto Notes has become one of the most trusted medical review texts; it is a resource that is cherished by trainees and physicians throughout Canada and around the world.

The Toronto Notes for Medical Students Inc. is a nonprofit corporation whose mission is to provide a trusted medical resource in order to give back to our community. This year, while our global community continued their fight for racial justice and battled the COVID-19 pandemic, locally we were also devastated by the loss of our colleague, Mohammad Asadi-Lari, an MD-PhD student at the Temerty Faculty of Medicine, who was a passenger on the Ukrainian Airlines Flight 752 that crashed on January 8th, 2021. As a country, we also reeled from the discovery of unmarked graves across Residential Schools in Canada, reminding us once again of the discrimination, injustice, and racism Indigenous Peoples have faced and continue to face. Keeping in line with our values and community needs, all proceeds from Toronto Notes sales are directly donated to support both global and local initiatives. This year we have contributed to a new program by the Community of Support at the University of Toronto, the Indigenous Student Mentorship Fund, to support Indigenous students in gaining mentorship for careers in medicine. Toronto Notes also supported the Black Health Alliance with their African, Caribbean, Black (ACB) COVID-19 Public Awareness Initiative – a collaboration with the Black Medical Students Association of Canada, and the Black Youth Helpline. Among other initiatives, we have also supported U of T Medicine class activities, student scholarships and bursaries (such as the Mohammad and Zeynab Asadi-Lari award), our Daffy annual musical fundraiser for the Canadian Cancer Society, and the entirety of our (over twenty-five) student-led outreach programs that seek to enrich lives in the community.

This is why we, and all the members of our U of T team, gladly dedicated so many hours toward this immensely involved project. As our valued reader, we thank you for your honest and vital financial contribution through your purchase of our textbook. Each book sold makes an important difference.

The 2022 edition features substantial content revisions to the text, figures, and graphics of all 32 chapters, following a comprehensive review by our student and faculty editorial team. Up-to-date, evidence-based medicine studies are also summarized in highlighted boxes throughout the text. This year, one of our priorities was to include a table of often discussed Landmark Clinical Trials in every chapter. Alongside our textbook-wide revisions, the Cardiology and Cardiac Surgery, the Geriatric Medicine, and the Infectious Diseases chapters have received substantial expansions to increase their utility in practice. In addition to content updates, the Toronto Notes 2022 Clinical Handbook chapters now include a section on Do Not Miss Diagnoses to guide your learning during clerkship rotations. Toronto Notes prioritizes cultural sensitivity, health equity, and strives for accurate representation of our vibrant and diverse communities. To enhance our team's editorial lens on these concepts while editing the chapters, training was provided by the Anti-Racism and Cultural Diversity Office and Office of Inclusion & Diversity at the University of Toronto.

We sincerely thank each of our 207 student editors and 101 faculty editors, whose meticulous revisions and shared dedication to the bettering of this text has helped make Toronto Notes 2022 possible. We have learned so much from leading this team, and are especially grateful to everyone for contributions to Toronto Notes with challenging time commitments and demands. We thank our incredible Associate Editors – Ming Li, Jacqui van Warmerdam, Thomas Chang, Andreea Damian, Winston Li and Ashmita Singh – for their tireless leadership, exceptional organization, and wonderful teamwork. We, and the success of this edition, lean on their shoulders. We also thank our Clinical Handbook Editors – Benjamin Baker, Cathy Huilin Lu, and Chunyi Christie Tan—for their exceptional editorial leadership and spearheading the work on this resource. We are grateful to our Production Managers – Jennifer Parker and Anders Erickson – who make Toronto Notes' operations a reality with their daily work. We owe a great deal of gratitude to the Editors-in-Chief of the 2021 edition – Megan Drupals and Matthaues Ware – for their continued guidance over the past two years. Lastly, we thank our longtime partners at Type & Graphics Inc – especially our backbone, Enrica Aguilera and Maria Garcia – for their years of support and excellent work producing Toronto Notes 2022. Finally, we thank you for supporting our initiative by purchasing and reading our product. We hope that you will find Toronto Notes 2022 to be a useful companion on your medical journey, both now and for years to come.

Sincerely,

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How To Use This Book

This book has been designed to remain as one book or to be taken apart into smaller booklets. Identify the beginning and end of a particular section, then carefully bend the pages along the perforated line next to the spine of the book. Then tear the pages out along the perforation.

The layout of *Toronto Notes* allows easy identification of important information. These items are indicated by icons interspersed throughout the text:

Icon	Icon Name	Significance
	Key Objectives	This icon is found next to headings in the text. It identifies key objectives and conditions as determined by the Medical Council of Canada or the National Board of Medical Examiners in the USA. If it appears beside a dark title bar, all subsequent subheadings should be considered key topics.
	Clinical Pearl	This icon is found in sidebars of the text. It identifies concise, important information which will aid in the diagnosis or management of conditions discussed in the accompanying text.
	Memory Aid	This icon is found in sidebars of the text. It identifies helpful mnemonic devices and other memory aids.
	Clinical Flag	This icon is found in sidebars of the text. It indicates information or findings that require urgent management or specialist referral.
	Evidence Based Medicine	This icon is found in sidebars of the text. It identifies key research studies for evidence-based clinical decision making related to topics discussed in the accompanying text.
	Colour Photo Atlas	This icon is found next to headings in the text. It indicates topics that correspond with images found in the Colour Photo Atlas available online (www.torontonotes.ca).
	Radiology Atlas	This icon is found next to headings in the text. It indicates topics that correspond to images found in the Radiology Atlas available online (www.torontonotes.ca).
	Online Resources	This icon is found next to headings in the text. It indicates topics that correspond with electronic resources such as Functional Neuroanatomy or ECGs Made Simple, available online (www.torontonotes.ca).

Chapter Divisions

To aid in studying and finding relevant material quickly, many chapters incorporate the following general framework:

Basic Anatomy/Physiology Review

- features the high-yield, salient background information students are often assumed to have remembered from their early medical school education

Common Differential Diagnoses

- aims to outline a clinically useful framework to tackle the common presentations and problems faced in the area of expertise

Diagnoses

- the bulk of the book
- etiology, epidemiology, pathophysiology, clinical features, investigations, management, complications, and prognosis

Common Medications

- a quick reference section for review of medications commonly prescribed

Common Acronyms and Abbreviations Used in Medicine

The following are common medical acronyms/abbreviations that may be used without definition throughout the Toronto Notes text. These are typically not included in the acronym list at the beginning of each chapter. Please refer back to this list for definitions.

[]	concentration	ECG	electrocardiogram
β-hCG	beta human chorionic gonadotropin	ED	emergency department
		EEG	electroencephalography
ABx	antibiotics	EMG	electromyography
ACE	angiotensin-converting enzyme	ENT	ears, nose, and throat
ACTH	Adrenocorticotrophic hormone	ESR	erythrocyte sedimentation rate
AIDS	acquired immune deficiency syndrome	EtOH	ethanol/alcohol
ALP	alkaline phosphatase		
ALT	alanine aminotransferase	FMHx	family medical history
AR	absolute risk	FSH	follicle stimulating hormone
ASA	acetylsalicylic acid		
AST	aspartate transaminase	G6PD	glucose-6-phosphate dehydrogenase
aSx	asymptomatic	GGT	gamma-glutamyl transferase
AXR	abdominal x-ray	GH	growth hormone
		GHB	gamma hydroxybutyrate
BID	twice a day (bis in die)	GI	gastrointestinal
BMI	body mass index	GU	genitourinary
BP	blood pressure		
BPM/bpm	beats per minute	Hb	hemoglobin
		HIV	human immunodeficiency disease
C/I	contraindication	HR	heart rate
C&S	culture and sensitivity	HTN	hypertension
CAD	coronary artery disease	Hx	history
CBC	complete blood count		
CC	chief complaint	I&D	incision and drainage
CHF	congestive heart failure	ICP	intracranial pressure
COPD	chronic obstructive pulmonary disease	ICU	intensive care unit
CPR	cardiopulmonary resuscitation	IM	intramuscular
Cr	creatinine	IV	intravenous
CRH	corticotropin-releasing hormone		
CSF	cerebrospinal fluid	JVP	jugular venous pressure
CT	computed tomography		
CXR	chest x-ray	LDH	lactate dehydrogenase
		LFT	liver function test
D&C	dilatation and curettage	LH	luteinizing hormone
dBp	diastolic blood pressure	LR	likelihood ratio
DDx	differential diagnosis		
DM	diabetes mellitus		
DNR	do not resuscitate		
Dx	diagnosis		