MAYO CLINIC

Pharmacy Grand Rounds

200 First Street SW
Rochester, Minnesota 55905
https://ce.mayo.edu/pharmacy-grandrounds-2024/series/pharmacy-grand-rounds-2024

Aminoglycosides and *MT-RNR1*: a Drug-Gene Interaction You May Not Have Heard About

Session Date: 04/16/2024
Session Time: 11:00 – 11:45 AM (CST)

Target Audience

This continuing education (CE) session was planned to meet the needs of professional staff who deal with the selection and monitoring of medication(s) as part of their patient care duties, including pharmacists, RNs, APRNs, PAs, MDs.

Activity Overview

The 2023 Clinical Pharmacogenetics Implementation Consortium (CPIC) guideline for *MT-RNR1* and aminoglycosides recommends avoiding aminoglycosides in patients carrying specific alleles of the mitochondrial gene *MT-RNR1* due to increased risk of ototoxicity. Aminoglycosides are well known to have an ototoxic risk associated with their use. However, some patients can experience permanent hearing impairment after exposure to a single standard dose of an aminoglycoside. Unlike many other pharmacogenomic drug-gene interactions, this one does not involve a gene encoding a P450 drug metabolizing enzyme, but rather a gene found within the human mitochondrial genome. This presentation will focus on the evidence behind this recent CPIC guideline and its current recommendations, the mechanism behind aminoglycoside induced hearing loss, which patient populations may benefit most from genetic testing, and the current and future ways this genetic testing might be best implemented into clinical care.

Learning Objectives

At the conclusion of this knowledge-based CE session, participants should be able to:

1. Recognize the unique qualities of the pharmacogenomic drug-gene interaction of aminoglycosides and *MT-RNR1* and the mechanism causing ototoxicity.
2. Describe the Clinical Pharmacogenetic Implementation Consortium aminoglycoside prescribing recommendations for patients with high-risk *MT-RNR1* alleles.
3. Assess implementation strategies to better utilize guideline information in clinical practice.

Faculty Information

Alexander McCarthy, PharmD, MS
PGY2 Clinical Pharmacogenomics Resident
Mayo Clinic Hospital - Rochester, MN

Alex received a Doctor of Pharmacy degree from the University of Missouri – Kansas City School of Pharmacy. He completed his PGY1 in pharmacy practice at Children's Mercy in Kansas City, MO and is the current PGY2 Clinical Pharmacogenomics resident at Mayo Clinic Hospital – Rochester. His practice interests include pharmacogenomics and pediatrics.

Approved Provider Statement

JOINT ACCREDITATION™
INTERPROFESSIONAL CONTINUING EDUCATION

In support of improving patient care, this activity is planned and implemented by Mayo Clinic College of Medicine and Science. Mayo Clinic College of Medicine and Science is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC) to provide continuing education for the healthcare team.

Credit Statements

AMA

Mayo Clinic College of Medicine and Science designates this live activity for a maximum of 0.75 *AMA PRA Category 1 Credits*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

ACPE

ACPE Universal Activity Number (UAN): JA0000238-0000-24-004-L01-P
Mayo Clinic College of Medicine and Science designates this educational activity for a maximum of 0.75 ACPE Knowledge-based contact hours. Participants should claim only the credit commensurate with the extent of their participation in the activity

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Mayo Clinic College of Medicine and Science designates this activity for a maximum of 0.75 ANCC contact hours. Nurses should claim only the credit commensurate with the extent of their participation in the activity.

AAPA

PA AAPA CATEGORY 1 CME

Mayo Clinic College of Medicine and Science has been authorized by the American Academy of PAs (AAPA) to award AAPA Category 1 CME credit for activities planned in accordance with AAPA CME Criteria. This activity is designated for 0.75 AAPA Category 1 CME credits. PAs should only claim credit commensurate with the extent of their participation.

Educational Format and CE Requirements

This CE session is available as a live presentation, including live webcast.
Participants must complete the following to record attendance and obtain CE credit:

1. Attend the entire session.
2. Text the session code to 507-200-3010 within 48 hours of the live presentation to record attendance.
   a. This number is only used for receiving text messages related to tracking attendance
   b. Employees are encouraged to create a contact in their mobile phone, as the same number is used to record attendance for every session
3. Complete the online evaluation for the respective session within 2 weeks of live presentation.

Pharmacist CE credit is electronically transferred to the National Association of Boards of Pharmacy CPE Monitor. To track CE, please go to NABP CPE Monitor.

Non-pharmacist attendees can print out a record of attendance at ce.mayo.edu after completing the evaluation and claiming credit.

Live Webcast - access during presentation times

Disclosure Summary

As a provider accredited by Joint Accreditation for Interprofessional Continuing Education, Mayo Clinic College of Medicine and Science must ensure balance, independence, objectivity and scientific rigor in its educational activities. All who are in a position to control the content are required to disclose all financial relationships with any ineligible company. Faculty will also identify any off-label and/or investigational use of pharmaceuticals or instruments discussed in their content for FDA compliance.

Listed below are individuals with control of the content of this program:

The faculty report the following relationships:

- Alexander McCarthy, PharmD, MS
  - Declares no financial relationship(s) pertinent to this session
  - Declares off-label use of medications will not be discussed during this presentation

Course Director and Planning Committee Members declare no relevant financial relationship(s) pertinent to this session. Members include:

- Jennifer Elmer, DNP, APRN, CCNS
- Andrew Herber, PA-C
- Sarah Jane Kotval, BSW, RSS Coordinator
- Scott Nei, PharmD, BCPS, BCCCP, FCCM, FMSHP
- Wayne Nicholson, MD, PharmD, BCPS
- Sara Thompson, PharmD, MEd, BCACP

All relevant financial relationships have been mitigated.

For additional disclosure information regarding Mayo Clinic School of Continuous Professional Development accreditation review committee members visit ce.mayo.edu, About Us, Disclosures - or - https://ce.mayo.edu/content/disclosures

System and Technical Requirements

For participants viewing the webcast, sessions are delivered via Mayo Clinic intranet web browser and Adobe® PDF. For participants viewing outside the Mayo Clinic firewall, a VPN connection is required for remote access. Recommended web browser includes Google Chrome. This session is planned and coordinated by **the Department of Pharmacy, Mayo Clinic.**