

## Renin-Angiotensin System: Should We Give It More Attention in Shock?

**Session Date:** 01/04/2022

**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

Vasodilatory shock is the most common form of circulatory failure and is associated with considerable morbidity and mortality. The renin-angiotensin system plays a key role in blood pressure homeostasis and may be an important target in the identification and treatment of shock. This presentation will review the current literature describing the renin-angiotensin system and the use of angiotensin II in the management of shock.

### Learning Objectives

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

1. Describe the mechanisms of the renin-angiotensin system and its interplay in vasodilatory shock
2. Review emerging data surrounding the use of angiotensin II in vasodilatory shock
3. Identify clinical shock scenarios where angiotensin II may be of most benefit

### Faculty Information

Patrick M. Wieruszewski, PharmD, BCCCP  
Assistant Professor of Anesthesiology and Pharmacy  
Mayo Clinic Hospital - Rochester, MN

Patrick received a Bachelor of Science degree in Chemistry and Materials Engineering from the University of Florida and Doctor of Pharmacy degree from the University of Florida. He completed postgraduate year one and two residencies specializing in critical care at Mayo Clinic. Patrick currently practices as a clinical pharmacist in the cardiothoracic surgery intensive care unit and ECMO program at Mayo Clinic in Rochester and is the current Vice Chair of the Mayo Midwest Pharmacy Research Committee. Patrick has published over 40 peer-reviewed papers and has dual academic rank as Assistant Professor of Pharmacy and Anesthesiology in the Mayo Clinic College of Medicine. His research focuses on understanding the mechanisms of hypotension and optimizing the identification, management, outcomes of refractory vasodilatory shock.



## 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):** JA0000238-0000-22-139-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

#### ANCC

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



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](http://ce.mayo.edu) after completing the evaluation and claiming credit.

[Live Webcast](#) - access during presentation times

[Video Recording](#) - access two weeks after session date

## Disclosure Summary

As a provider accredited by Joint Accreditation Interprofessional Continuing Education, Mayo Clinic College of Medicine and Science (Mayo Clinic School of CPD) must ensure balance, independence, objectivity and scientific rigor in its educational activities. Course Director(s), Planning Committee Members, Faculty, and all others who are in a position to control the content of this educational activity are required to disclose all relevant financial relationships with any commercial interest related to the subject matter of the educational activity. Safeguards against commercial bias have been put in place. Faculty also will disclose any off label and/or investigational use of pharmaceuticals or instruments discussed in their presentation. Disclosure of these relevant financial relationships will be published in activity materials so those participants in the activity may formulate their own judgments regarding the presentation.

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

The faculty report the following relationships:

- Patrick M. Wieruszewski, PharmD, BCCCP
  - Declares financial relationship(s) pertinent to this session, including:
    - Consultant, La Jolla Pharmaceutical Company
  - 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
- Michael Huckabee, MPAS, PA-C, PhD
- Sarah Jane Kotval, BSW
- Wayne Nicholson, MD, PharmD, BCPS
- Garrett Schramm, PharmD, FCCP

For additional disclosure information regarding Mayo Clinic School of Continuous Professional Development accreditation review committee members visit [ce.mayo.edu](http://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.**