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Hypertension and Chronic Kidney Disease in Primary Care

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Abstract

Introduction: TBL enables a group of learners to engage in independent preparation through prereadings, check their knowledge with readiness assessments, and both share and build on their personal experience with each topic through robust small-group discussions. This TBL exercise uses case-based questions to enable learners to make a treatment plan for challenging cases of hypertension and to manage chronic kidney disease (CKD) in the primary care setting. **Methods:** This module serves as part of a series of team-based learning (TBL) modules in an internal medicine residency ambulatory medicine curriculum. The modules are delivered during the didactic half-days of the ambulatory week of our 3 + 1 block schedule. This particular module takes approximately 90 minutes to deliver and is intended to be moderated by an experienced primary care clinician. **Results:** Learners who participated in this TBL felt that it increased their knowledge about hypertension and CKD; they gave it an average rating of 4.67/5 (n = 30). **Discussion:** TBL has been heavily utilized in undergraduate medical education, and we have adapted the method to use it with small groups of resident physicians. It may also be suitable for other learners who will be responsible for the treatment of hypertension and CKD in the primary care setting (e.g., family medicine residents, advanced practice nurses, and physician assistants).

Keywords

Team-Based Learning, Hypertension, Internal Medicine, Chronic Kidney Disease, Renal Insufficiency, Chronic

Appendices

- A. Hypertension and CKD TBL RAT Student.docx
- B. Hypertension and CKD TBL RAT Preceptor.docx
- C. Hypertension and CKD TBL Application Student.docx
- D. Hypertension and CKD TBL Application Preceptor.docx

All appendices are peer reviewed as integral parts of the Original Publication.

Educational Objectives

By the end of this team-based learning module, learners will be able to:

1. Appropriately counsel patients about the impact of lifestyle measures on hypertension.
2. Identify appropriate medications to treat individuals with hypertension and specific medical comorbidities.
3. Plan an appropriate workup for causes of secondary hypertension.
4. Identify opportunities to improve high-value care for hypertension and chronic kidney disease by both prescribing generic and “\$4 list” medications and providing appropriate preventative services to patients with end-stage renal disease.

Introduction

This module serves as part of a series of team-based learning (TBL) modules in an internal medicine residency ambulatory medicine curriculum. The modules are delivered during the didactic half-days of the ambulatory week of our 3 + 1 block schedule. This particular module takes approximately 90 minutes to deliver and is intended to be moderated by an experienced primary care clinician. It may also be suitable for other learners who will be responsible for the treatment of hypertension and chronic kidney disease (CKD) in the primary care setting (e.g., family medicine residents, advanced practice nurses, and physician assistants).

TBL has been increasingly used in undergraduate medical education, but few data about its use in graduate medical education exist. Balwan and colleagues studied the implementation of TBL in their internal medicine residency program and found positive results in resident engagement, resident satisfaction, and faculty satisfaction.¹ TBL in a psychiatry residency curriculum effectively engaged both faculty and residents,² and a TBL series dedicated to a specific topic (alcohol screening and brief intervention) increased primary care residents' self-reported performance of the intervention in their practices.³

A search of MedEdPORTAL for resources referencing hypertension and CKD revealed several curricular resources for teaching students^{4,5} and residents.⁶ However, there were no TBL exercises for internal medicine residents on these topics currently available.

This module was created to help internal medicine residents become more comfortable with cases of difficult-to-control or resistant hypertension. The module is suitable for learners who are already comfortable with the diagnosis of hypertension and who are familiar with the pharmacology of the drugs used to treat hypertension. Learners are expected to be comfortable using first-line drugs for hypertension. The module has been designed to help learners become proficient in designing multiple drug regimens for hypertension and appropriately identify, diagnose, and manage cases of secondary hypertension. Because hypertension and CKD are closely linked (both physiologically and clinically), the module also addresses the appropriate workup of progressive renal dysfunction and the treatment of hypertension in individuals with CKD.

TBL has been heavily utilized in undergraduate medical education, and we have adapted the method for use with small groups of resident physicians. TBL enables a group of learners to engage in independent preparation through prereadings, check their knowledge with readiness assessments, and both share and build on their personal experience with each topic through robust small-group discussions. The method is adapted from Michaelsen.⁷

Methods

Team Formation

Resident teams are formed at the beginning of the academic year and remain unchanged throughout the year. Each team's group readiness assurance test (GRAT) score is tabulated, and the team with the highest cumulative GRAT score at the end of the year wins a prize.

Description of Advance Preparation Resources

The relevant articles from the In the Clinic series in *Annals of Internal Medicine*^{8,9} are emailed to learners 1 week prior to the TBL session. Learners are expected to spend about 1 hour reviewing the assigned prereading articles. It is also recommended that the objectives be distributed to learners prior to the TBL session.

Resources for further reading: While the In the Clinic articles are recommended based on their utility as accessible overviews of the topic, learners may want to explore the relevant guidelines. The 2014 Eighth Joint National Committee guideline addresses the latest evidence available at the time for blood pressure goals and initial medication management.¹⁰ This module was produced before the publication of the Systolic Blood Pressure Intervention Trial (SPRINT) and subgroup analyses, and avid learners may also want to further explore this potentially practice-changing study.^{11,12} Facilitators may want to include an application item focused on SPRINT in future iterations of this module. The 2013 American College of Physicians guideline on screening, monitoring, and treatment of stage 1 to 3 CKD provides a review of the evidence and recommendations for high-value care of CKD.¹³

Description of Readiness Assurance Process

This TBL contains 10 readiness assessment test (RAT) questions (Appendix A). The questions are intended to be first administered as an individual RAT (IRAT), followed by a group administration of the GRAT. The IRAT is administered as soon as the group of learners arrives for the session and should take about 15 minutes. It is immediately followed by the GRAT. Group assignments should already have been made prior

to the session. Administration of the GRAT takes about 20 minutes. Both RATs are closed book. The GRAT should be followed by feedback from the preceptor about the correct answers to the test; explanations and citations from the prereading are given in the preceptor copy of the IRAT/GRAT (Appendix B). The GRAT relies heavily on the prereading for content, along with some material with which an upper-level internal medicine resident would be expected to be familiar (i.e., the Center for Disease Control vaccination schedule and the concept of number needed to treat).

Immediate Feedback

Immediate feedback is provided during the GRAT with scratch-off immediate feedback assessment technique cards available from Epstein Education (www.epsteineducation.com).

Description of Team Application Activities

The application phase of this module consists of three cases with associated questions (Appendix C). The cases should be given out one at a time, with time allowed for the group to discuss each case and commit to the best answer. The answers to the clinical cases are meant to mimic clinical decision-making. Given this, the one best answer may vary depending on the team's clinical experiences and interpretation of the case. The cases are designed for simultaneous answer reporting and to encourage discussion about the best approach to the scenario. After each group has committed to an answer, the groups hold up their answers simultaneously; groups are then asked to explain why they picked that answer. References and explanations for the preceptors are included in Appendix D. The author's preferred answers are noted in this appendix, but since these cases are meant to reflect challenging real-world problems, other answers may be defensible. The preceptor should use the learners' explanations as a springboard for further discussion of the case and similar cases, and the instructor should identify any gaps in knowledge and pose further questions to the group. Learners are encouraged to recount their personal experiences with similar cases and to review any available resource in real time. The application phase is open book.

Facilitation Schema

- 15 minutes for IRAT.
- 20 minutes for GRAT.
- 10 minutes for feedback/answer explanation.
- 30-45 minutes for discussion of cases.

Results

This module has been delivered four times, each time to a group of 10-12 second- and third-year internal medicine residents divided into three teams. The average GRAT score was 35 out of a possible 40. IRAT scores are not tracked at our program because the purpose of the IRAT in our residency is to incentivize the group, rather than find areas of concern about individual learners. Application question scores are not formally tracked because these questions intentionally represent clinical gray areas where there may not strictly be one right answer. It has been the author's experience that there is usually one dissenting group among the three groups for the majority of the application questions.

Our learners' experience with this TBL has been positive. Learners participated in an anonymous year-end survey asking them to rate how this TBL improved their knowledge of hypertension and CKD. The TBL was rated on a 5-point Likert scale with 5 being *most helpful*. This TBL had an average score of 4.67/5 ($n = 30$).

Discussion

This resource was designed to teach management of hypertension and CKD to more advanced learners who are ready to go beyond the basics. Since many institutions do not have a dedicated hypertension clinic or service, general internists often serve as hypertension experts. General internists often manage CKD in collaboration with nephrologists up until patients require dialysis. This module was designed to help internal medicine residents become more comfortable with management of these problems in the outpatient setting. Some of the questions do challenge the resident to think like a subspecialist because a

general internist should be familiar with the next steps in the workup of these conditions even if he or she does not always perform the workups alone. Informal feedback regarding the module has been positive, with several residents citing information from the module when presenting patients to the author in clinic.

The original version of this module contained a problem about a reproductive-age woman with hypertension as part of the IRAT section; this item engendered so much discussion that subsequent versions of the module expanded the question as part of the application section. Many of our residents provide primary care in the Veterans Affairs hospital system and have less clinical experience with reproductive-age female outpatients, so they appreciated the opportunity to discuss this problem in depth with interteam debate and sharing of experiences.

The module could be further expanded by focusing more on issues of medication adherence and counseling for hypertension. Patient adherence to hypertension medications is often difficult because patients are asymptomatic. The high-value care aspect of the module can also be expanded; residents can examine their own patient data and prescribing practices to look for potential challenges in medication adherence for patients due to the cost of medications.

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Disclosures

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Ethical Approval

Reported as not applicable.

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