Chalk Talks in Internal Medicine

Scripts for Clinical Teaching

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SM dedicates this book to his parents: anything I have accomplished as a physician and a scholar I owe to them.

LAB dedicates this book to all who spend their lives in the service of learning, teaching, and healing and to the families who support us on that journey.

JWK dedicates this book to his family for their boundless support.

JW dedicates this book to Patrick: for your love and support.

Preface

Chalk talks immerse high yield, and relevant teaching in the clinical setting – immediately linking clinical experiences with the skills of physicianship. Chalk talks not only enhance the learning of students and trainees but also enable fun, satisfying, and meaningful teaching. We hope this book positively contributes to the experience of teaching and learning medicine for all readers

This book is the result of a unique endeavor by the Division of General Internal Medicine, University of Washington. We recruited ninety-six faculty members from our Division to create teaching scripts for commonly encountered inpatient and outpatient clinical scenarios. In addition to creating the teaching scripts, we encouraged co-authors to engage in peer mentorship around career development and satisfaction. Thus, faculty not only used their expertise and experience to create these teaching scripts, many developed partnerships supporting their career development.

This is a guide for teaching clinical medicine and not a manual for clinical practice. Readers should be vigilant for advances in medical science and changes in clinical practice that supersede the details of this book. While we did our utmost to avoid errors and omissions, the responsibility for verifying the accuracy of the content lies with the reader.

We hope that you will find Chalk Talks in Internal Medicine to be useful and engaging. We wish you the best in your teaching career.

Seattle, WA, USA
July 8, 2019

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Chapter 1
Introduction

Somnath Mookherjee, Lauren A. Beste, Jared W. Klein, and Jennifer Wright

Why We Created This Book

Every year, thousands of teaching physicians are asked to train the next generation of learners in a growing body of knowledge. Formal teaching time has become increasingly limited because of rising clinical workload, medical documentation requirements, duty hour restrictions, and other time pressures. In addition, today's learners expect teaching sessions that deliver focused content integrated into their clinical workflow. One classic teaching method that is ideally suited to meet these needs is the "chalk talk," a focused teaching session typically delivered with just a white board for drawing visual aids and extensive audience participation.

We have all observed master teachers deliver riveting chalk talks off the cuff. However, most of us would benefit from structured content and guidance on how to deliver this content-also known as a teaching script. A good teaching script anticipates learners' misconceptions, highlights a select number of teaching points, uses strategies to engage the learners, and provides a cognitive scaffold for teaching the topic that the teacher can refine over time.

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Intended Audience

The primary target audience for this book are trainees in internal medicine and attending physicians who teach in inpatient or outpatient clinical settings. In addition, physician's assistants, nurse practitioners, and others who teach general medicine will be interested in this book. Finally, we anticipate that learners throughout the continuum of medical education, from first-year medical students to experienced attending physicians, will deepen their comfort with these important concepts by practicing to teach them.

Guiding Principles

All teaching scripts share the same overall goal: to help teachers plan and execute effective teaching sessions. The structure and content of a script depend on the teaching setting, audience, experience of the teacher, and many other factors. For our teaching scripts, we determined the following guiding principles to facilitate the structure and content:

- While teaching based on clinical trials and prominent studies is important, this collection focuses on important principles of diagnosis and care without relying on extensive references to the literature.
- Well-designed learning objectives are critical for each teaching script: limited in scope and number, realistic for the teaching session, and behaviorally anchored.
- The content should be explicitly engaging to the learner.
- Visual representations (drawings, tables, and diagrams) are essential, both for maximizing ease of use for the teacher and for aiding in knowledge retention by the learners.
- The visual elements of the teaching scripts should be easily reproducible by hand.
- Salient parts of the teaching script should be able to be taught in about 10 min with content provided to give lengthier or more in-depth chalk talks.

Finally, we wish to emphasize key internal medicine concepts that an early clinician (students and residents) should know, and acknowledge that this is not meant to be a comprehensive textbook of internal medicine.

Structure

After reading the chapter and practicing the teaching script, the reader should be able to give a chalk talk on the topic. Each teaching script is anchored by a brief clinical scenario and structured around questions the teacher may ask of the learners. Each step in the teaching scripts is explicitly linked with a portion of the diagram for the teacher to use as they teach the content. Figure 1.1 outlines the structure of the teaching scripts provided in this book.

Description of teaching script component	Examples from Chapter 38: Approach to microscopic hematuria
Objectives: these were designed to complete the sentence: "After this talk, the learner will be able to…"	1. Use a systematic approach to evaluation of microscopic hematuria 2. Describe common causes of microscopic hematuria 3. Distinguish between "glomerular" and "non-glomerular" sources of microscopic hematuria 4. Identify risk factors for genitourinary (GU) malignancy
Clinical vignette: a brief description of a clinical scenario that anchors the teaching script. As with all aspects of the teaching scripts offered, the teacher can modify this based on their own experiences or points which they wish to emphasize.	A 62-year-old man comes to see you because he received notification that his insurance examination urine dipstick had shown "blood". He is confused by these results as he has never seen blood in his urine
Questions for the learner: these questions link to the visually represented content. In this example, the letter "A" refers to the point in diagram that the teacher should be writing on the white board.	**A. How do we define hematuria - do we know that he really has it?**
Brief directions to the teacher: these questions are included to clarify the steps of the teaching script for the teacher.	Write the definition as shown in the Figure.

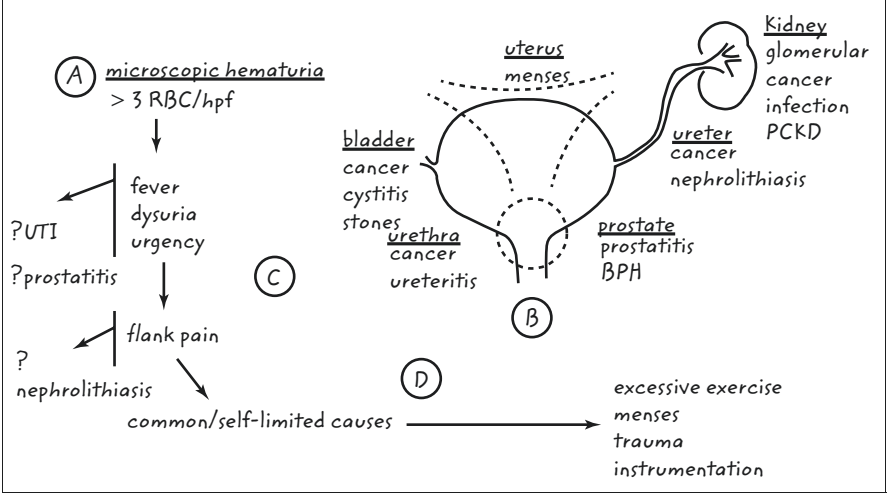

Fig. 1.1 Structure of the teaching scripts in this book

Teaching points: these are the key points to answer the questions to the learner and comprise the bulk of the content. We endeavored to minimize the overlap between the teaching points listed in the script and in the visual representations.	• The term "gross hematuria" is used to describe visible blood in the urine. The term "microscopic hematuria" is used when blood is not visible to the naked eye, only noted upon microscopic examination. • Positive blood on urine dipstick is not sufficient to diagnose microscopic hematuria, as this is a very sensitive test with frequent false positives. … continued in Chapter 38.
Return to objectives and emphasize key points: this section was included at the end of each teaching script to reinforce the importance of repeating the key points. The content provided intentionally overlaps with the teaching points and objectives previously provided.	1. Recognize common causes of microscopic hematuria – circle these in the figure • Cancer • Infection (e.g., bladder, kidney, prostate) • Stones • IgA nephropathy • Post streptococcal • Benign (e.g., menses, exercise) … continued in Chapter 38.
Resources: for each teaching script, we included for a list of key resources that support the content and provide further reading. This not meant to be a comprehensive list of references supporting the content of the teaching script.	1. Nielsen M, Quaseem A. Hematuria as a Marker of Occult Urinary Tract Cancer: Advice for High-Value Care from the American College of Physicians. Ann Intern Med 2016;164(7):488-497. … continued in Chapter 38.

Fig. 1.1 (continued)

Based on our own clinical teaching experiences and in consultation with our colleagues, we selected topics that often arise in the inpatient and outpatient contexts. The scope of each topic is deliberately narrow enough that a key portion can be taught in 10 min, but each chapter contains enough content such that the length of the teaching script can be adjusted, as needed (see Chap. 2).

Using Teaching Scripts

Our goal is to encourage clinical teachers to deliver these and other chalk talks. Teaching "on the fly" can be challenging, but we hope that these scripts provide valuable support and content to meet this challenge. In addition, we provide guidance on creating your own teaching scripts (Chap. 2) and detailed advice on delivering a chalk talk using a teaching script (Chap. 3). Figure 1.1 outlines how to use the teaching scripts in this book.

Chapter 2
How to Create a Teaching Script for a Chalk Talk

Diana Zhong and Somnath Mookherjee

Introduction

This book provides teaching scripts for 48 chalk talks on a variety of inpatient and outpatient internal medicine topics. We hope that the teaching scripts will be exceedingly useful, but ultimately, we aspire to encourage readers to create their own teaching scripts to use and share. Creating a teaching script can seem like an intimidating proposition. In this chapter, we provide guidance to clinical teachers on how to create their own teaching scripts.

Choosing the Topic

Uncertainty over your own level of content mastery is a common barrier to clinical teaching. Lack of confidence in recalling the names of salient clinical trials, the mechanism of action of drugs, or the pathophysiology once learned in medical school (but long forgotten) can discourage clinicians from taking on important teaching topics. In reality, you know much more than you think you do, and in the realm of practical knowledge, you will have much more to share with the learners than you anticipate. It takes less work than you might expect to fill in any knowledge gaps in order to create an effective teaching script, and taking the additional step of creating a teaching script will push you to better understand the topic.

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When creating a teaching script (or selecting one to use from this book), consider the following questions:

- What are some common scenarios that you encounter in your clinical work?
- What are recurring clinical decision points that you consider on a regular basis?
- Are there high-risk scenarios that are important to emphasize in your teaching?
- Are there situations that are commonly confusing to learners or may have been previously confusing to you?
- What are common misconceptions that you have encountered in your interactions with learners?

In addition, consider what clinical experiences your learners may have been exposed to and may be interested in learning more about. If on an inpatient or outpatient teaching service, teaching about medical conditions for patients recently seen together is often a great source of teaching topics.

Get Started by Creating a "Hook" and Defining Learning Objectives

Once you have a general idea for a chalk talk, start the script with an interesting opener—our recommendation is a brief clinical vignette. Think about classic presentations for your clinical topic. Rare variations may seem more interesting, but they may be less helpful to early learners who are starting to build their own "illness scripts" based on your teaching. Once you have established the patient presentation, formulate the two or three most important learning objectives that you want learners to take away from the talk. The SMART framework [1, 2] can help you create effective learning objectives:

- Specific: describes what the learner will be able to do as a result of your talk.
- Measurable: the objectives are tangible—they can be observed or counted.
- Action-oriented: behavior change or acquisition of knowledge, skills, or attitudes (in contrast to passive words such as "learn," "know," or "understand").
- Reasonable: realistic expectations for the learner in terms of the scope of the talk and the stage of the learner.
- Time-bound: achievable within the time allotted to teach.

Well-crafted learning objectives can help frame your learners' thinking before your talk and provide context for your learners to apply their knowledge. Table 2.1 provides some examples of good and suboptimal learning objectives.

Table 2.1 Good and suboptimal learning objectives

Examples of good learning objectives	Examples of suboptimal learning objectives
By the end of this talk, learners should be able to: 1. Define sepsis by SIRS and qSOFA criteria 2. Risk stratify patients with sepsis 3. Describe the initial treatment strategies for sepsis	1. Learn about sepsis (*too passive*) 2. Take care of patients with sepsis (*too broad, unreasonable, and unlikely to be achieved in the scope of a chalk talk*)

Table 2.2 Strategies for delivering content in a chalk-talk [3]

Discuss clinical reasoning	Explain complex physiologic principles	Prepare to discuss calculations or methods	Compare and contrast
Do you have a specific patient case that you'd like to discuss? You can go through the case like a morning report. Even with a simple structural organizer like a list, you can number the list (e.g., diagnostic criteria), or rank the list (e.g., sorting from most common to least common, or ranking a differential diagnosis from most likely to least likely). If you want to focus on clinical reasoning, consider emphasizing methods and approaches over facts.	Physiologic principles often work well with frameworks, drawings, and visual organizers. You can use chalk talks to discuss feedback loops and interactions. It can be helpful to evolve your concepts, such as explaining normal physiology and then transitioning to explaining abnormal pathophysiology.	Chalk talks are a great way to demonstrate specific calculations or methods, such as analyzing an arterial blood gas. Even if you're an expert at the calculations, create sample problems and prepare all the math and analyses in advance. This will ensure that your talk is accurate and fluent, and will allow you to focus on teaching the concepts and answering learner questions during the talk.	You can use charts or lists to compare and contrast clinical syndromes (e.g., Crohn disease vs ulcerative colitis) or management strategies (e.g., different antibiotic regimens). You can also compare and contrast old guidelines and new guidelines.

Determine the Most Salient Content and Start Organizing the Flow of the Talk

Once you have established your learning objectives, you are ready to create the content of your chalk talk. There are many ways to present your content, including the suggestions below. Use whichever strategies are most appropriate for your topic and your audience. While creating content, try to keep your information concise and high-yield, always considering how it relates to the learning objectives. Resist the urge to stray too far from your learning objectives or to provide excessive detail. For interested learners, you can always provide supplemental information with a handout, or send them journal articles with the evidence basis. Table 2.2 provides four

important strategies to help guide and effectively deliver your content. Other key points to remember are as follows:

Consider your audience If teaching learners of different levels, earmark certain concepts depending on the level of training (e.g., ask one type of question to the medical student and another to the senior resident).

Use frameworks and visual organizers Create frameworks to help improve your learners' recall. Does your topic lend itself to any visual organizers like diagrams, tables, graphs, or flowcharts? Whenever possible, find ways to order, sort, and enumerate information. The more visually clear and appealing your information, the more you will take advantage of the chalk talk format.

Create take-home points These are not the same as your learning objectives, but rather one or two "must knows" or "don't forgets." Ask yourself, "What are the crucial things that I want them to remember from this talk?"

Map Out the Chalk Talk

Now that you have considered the key content needed to accomplish the learning objectives, start to draw out the talk, using your clinical vignette as the starting point. At this stage it is normal to go through several iterations. The rest of this book provides many examples of potential ways to organize a chalk talk. Again, always link the content to your learning objectives.

Create your beginning template Create a rough outline, including placeholders for what you can draw before the talk starts and what you will populate during the talk [3]. What content should already be on the board before you begin speaking? It can be very helpful to write your learning objectives on the board in a corner to help structure your learners' thinking throughout the talk. You can even create placeholders and pre-draw parts of your talk before you begin. Do you have any graphs or tables? You can draw blank x and y graph axes, or you can label an empty table. You should aim to structure your board, not clutter it. What will you explain verbally? What will you write down? Try your best to have your highest yield points written out.

Decide when to ask questions As you've laid out your content, you can pinpoint specific places where you'll want to elicit learner participation (e.g., a learner-generated differential). Are there specific questions you want to ask? Should you designate certain questions for specific learner levels? Again, consider that you can discuss some ideas verbally, while others you will also write down. Don't rely exclusively on asking questions to populate the chalk talk—some of the content can be directly provided by you.

Get creative Consider using color to emphasize points (e.g., underline) or create contrast (e.g., draw different plots on a graph, or comparing and contrasting normal and abnormal feedback loops). This can improve the visual interest and clarity of your talk.

Evaluate your talk visually Step back and imagine what your talk would look like on an actual whiteboard (or chalkboard, or projected screen). Is it legible? Is it cluttered? Do you need to reassess?

Narrow the Scope of Your Talk as Appropriate for the Time Frame and the Audience

Teaching scripts will inevitably start out lengthier than intended. Fortunately, the script can easily be tailored for the amount of time available. One practical way to do this is by providing more information (such as in the opening clinical vignette) and narrowing the learning objectives.

For example, the learning objectives for a chalk talk on microscopic hematuria with a vignette describing a 62-year-old man presenting with a urine dipstick positive for blood may be:

1. Demonstrate an approach to microscopic hematuria.
2. Distinguish between glomerular and nonglomerular hematuria.
3. List risk factors for bladder cancer.

The teaching script for these objectives would be rather lengthy, as shown in Fig. 2.1. You can narrow the scope of the talk by deciding to emphasize a limited aspect of the case and by listing just two learning objectives:

1. Demonstrate an approach to microscopic hematuria.
2. List risk factors for bladder cancer.

Figure 2.2 shows this abbreviated teaching script, which could practically be accomplished in less than 10 min. To further narrow the teaching script, you can give more information in the clinical vignette and create a more discrete teaching point that you want to emphasize. For example:

Learning Objective

1. Suspect cancer if a man has blood in his urine.

Vignette: A 62-year-old man is presenting with a urine dipstick positive for blood. He has no other symptoms. He has smoked 1 pack of cigarettes per day for 40 years.

The teaching script for this highly condensed chalk talk is shown in Fig. 2.3.

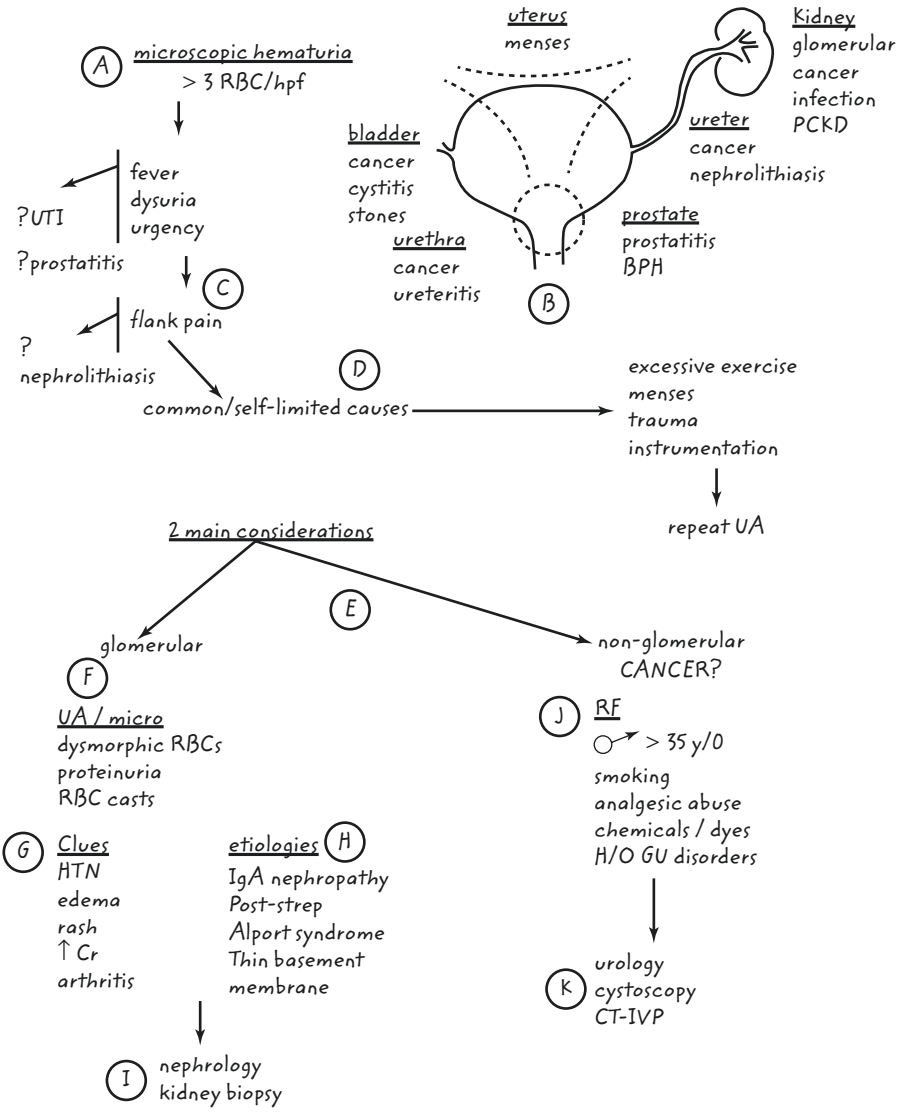

Fig. 2.1 Full-length chalk talk example for microscopic hematuria

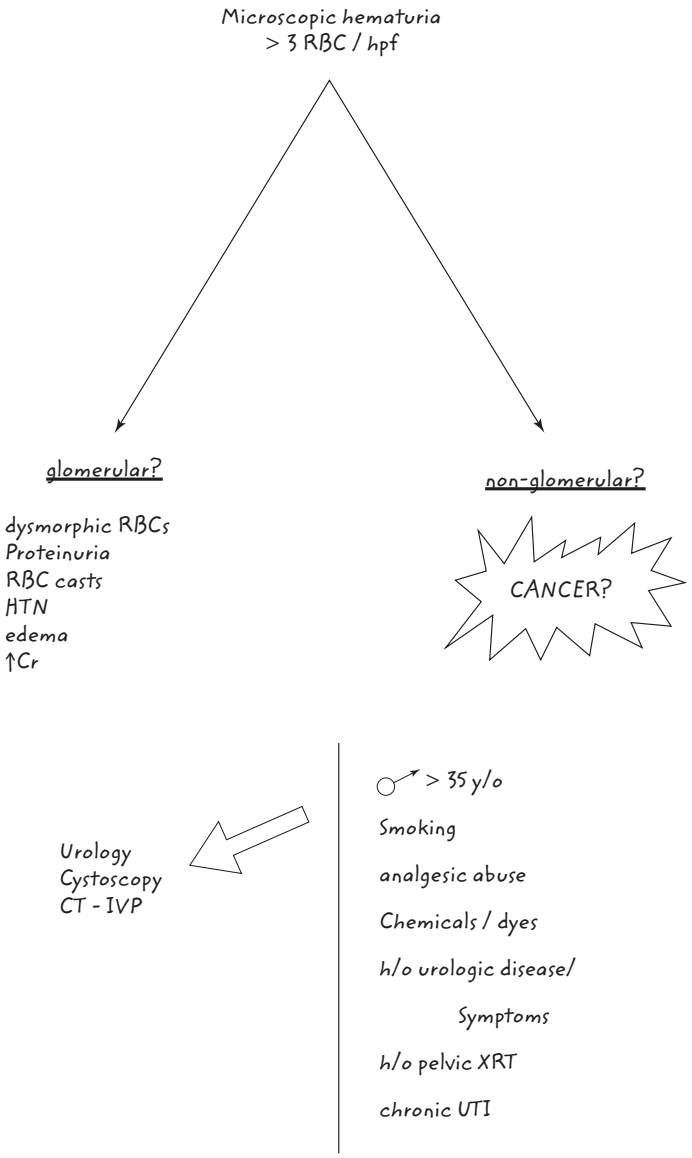

Fig. 2.2 Chalk talk trimmed to emphasize two objectives

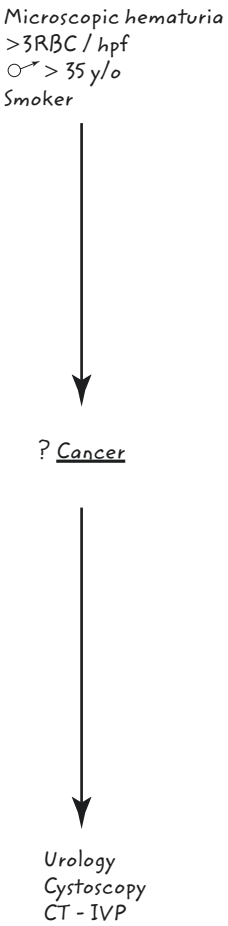

Fig. 2.3 Minimal chalk talk for one key point about microscopic hematuria