The Chronology of Present Illness as a Tool to Teach Patient-Physician Communication and Reduce Diagnostic Errors

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a. Project Description

One of the first clinical skills taught in medical school is patient history taking. The importance of the medical interview for correct diagnosis and patient compliance is well known and accepted.[1] Yet teaching and evaluating history taking is far from standardized, and the methodology is rarely if ever rigorously tested. We propose a project evaluating the impact of a novel method for taking and writing the patient history: the Chronology of Present Illness (CPI).[2, 3] An alternative to the traditional 'history of present illness,' or HPI, the CPI is a timeline-based format that has potential benefits in improving efficiency of the interview, clarity of the patient note and oral presentation, and quality of the resulting differential diagnosis. The CPI utilizes the illness chronology as a conceptual framework to facilitate history taking, note writing, and physician-physician communication.[2]

This project will evaluate the impact of the CPI on consultant evaluations of written notes, as well as their ability to generate a differential diagnosis. We have previously piloted the CPI in the Internal Medicine residency with an in-person educational intervention. With this grant, we will expand on the materials to create a video-based curriculum to asynchronously teach the CPI to medical students and residents.

b. Rationale

Medical history taking is often taught with a combination of seemingly clichéd advice, from "be sympathetic," to "don't rush."[4] Recommendations focus on establishing rapport, without considering the ultimate *goal* of the interview. Assessing history taking is also difficult. The Maastricht History-Taking Checklist, for example, contains 129 separate domains.[5] Consistently, the focus in teaching or evaluating history taking is ensuring that the patient understands the doctor, and that the patient "feels heard."[4, 6] In the Kalamazoo Consensus Statement on teaching medical communication, participants defined "build a relationship" as "the fundamental communication task."[7]

This traditional outlook on the patient interview may lead to several problems. First, it ignores the importance of the *doctor* understanding the *patient,* of actually obtaining information that can facilitate a diagnosis. We hypothesize that focusing only on establishing rapport, without also stressing the value of the patient's self-reported information, may be one cause of diagnostic errors. Additionally, the traditional HPI is recorded as a prose narrative, with students encouraged to write a 'story' that culminates in a diagnosis. Attempting to make patient information 'fit' into a coherent narrative can lead clinicians to ignore potentially crucial facts they don't understand. This is especially important in light of the Institute of Medicine's 2015 report warning that diagnostic errors are an increasing source of morbidity, mortality, and rising costs, and calling for a renewed focus on improving diagnoses.[9]

Most relevant to this proposal, traditional methods for teaching patient history taking ignore the importance of communicating the resultant history to other physicians. This is particularly dangerous for a complex patient who is cared for by multiple consulting services, all reading the same initial admission note. By structuring the history around the timeline, the CPI allows physicians and trainees to more easily focus on symptom evolution, highlighting changes and decreasing the cognitive load faced in considering the patient's diagnosis.[8] We hypothesize that this will improve consultant satisfaction as well as allowing experts to develop more accurate patient assessments on the basis of a more complete initial note.

c. Pilot Data

We are currently completing a single group crossover design pilot study evaluating the feasibility and acceptability of the CPI for internal medicine residents on a 2-week night float rotation. In the first week, residents admit patients and write notes as usual. Mid-way, they participate in an in-person educational session describing the CPI method, and use the CPI for the second week. Night float residents (n=20) and the resident and attending day team members completed evaluations on the clarity of the verbal sign out, written note, and assessment and plan during each week of the study. Residents saw statistically significant improvements in clarity of the verbal and written sign out after using the CPI ($p < 0.001$), as well as improvements in efficiency ($p < 0.001$), quality of patient interactions ($p = 0.006$), and quality of the assessment and plan ($p = 0.05$). The day team residents who received the sign out also reported a significant increase in the clarity of the verbal sign-out, the clarity of the written note, the efficiency of sign out, and their own preparedness to present new patients ($p < 0.01$ for all).

d. How the project supports/promotes diversity

Many studies have demonstrated that patient-physician communication changes depending on the gender, race/ethnicity, and socioeconomic group of both participants.[10-12] There has been a general call to improve patient-centeredness of interviews, and overall communication skills, in order to overcome these barriers and provide the same high quality of care to all patients. The CPI is fundamentally patient centered: it assumes at the outset that all of the patient's background and communicated information is valuable. We hypothesize that teaching this patient-centered and chronology-oriented method for taking a history will help physicians and medical students overcome

the current gender, racial, and socioeconomic barriers to patient-physician communication by overtly respecting and documenting the patient's background and chronological story.

e. Methods

Specific aim 1: Evaluate the impact of CPI versus HPI on consultant satisfaction and differential diagnosis.

1. Chart review: all new patient notes written during the pilot study will be classified as 'HPI' or 'CPI,' and consult services during the index hospitalization will be documented.
2. Development of a note quality tool utilizing existing literature and a modified Delphi method
3. For each common consulting service (e.g, surgery, cardiology, etc), 2 expert consultants not involved in the Delphi process will rate the initial note and develop a differential diagnosis for the patient

Specific aim 2: Develop a video-based curriculum to teach the Chronology of Present Illness.

1. Develop educational videos based on the successful in-person instruction, with input from residents
2. Address communication educational needs and preferences for different specialties and levels
3. Pilot videos with mixed specialty residents and students, to evaluate video versus in-person instruction

f. Timeline and implementation plan

Activity Name	Mar	Apr	May	Jun	Jul	Aug
AIM 1: Consultant Study						
Develop note quality tool						
Chart review for patient notes						
Consultant note review and interviews						
AIM 2: Video creation and evaluation						
Resident interviews for video content						
Video scripting, filming, editing						
Pilot testing of videos with specialty services						
Dissemination Activities						
Prepare manuscripts						
Video submission to MedEdPortal						

g. Anticipated work product

This project has two major anticipated work products. First, the expert-derived and consultant-validated note quality tool has potential benefit to a wide variety of fields. Educational researchers, quality improvement projects, medical school instructors, and even insurance companies and hospital billers all need to make objective assessments of written note quality. The quality assessment tool with the validity evidence we will obtain has potential for major impact in a variety of fields. Next, we are creating a short, accessible, video-based curriculum on the CPI. These videos will be appropriate for all levels of medical learners, from students to attending physicians, and can be disseminated throughout Stanford and beyond.

h. Plan for evaluation

The video-based curriculum will be evaluated using questionnaires that have been pilot tested with the Internal Medicine residents, and with interviews with the involved residents. A new group of residents will receive the video-based instruction, rather than the in-person version. They will be asked to assess the impact of utilization of the CPI, and their responses will be compared with those residents who received in-person instruction.

i. Plan for dissemination of results

The results of these studies will be submitted to peer-reviewed clinical journals. They will also be shared with the Stanford community, specifically in grand rounds or educational conferences, to ensure that the participants of the study have the opportunity to share in the results. The videos that are created will be submitted to MedEdPortal, a peer-reviewed repository for medical education curricula, so that the content is accessible by all potential learners.

j. Anticipated impact on education/mentoring at School of Medicine

Patient history taking is formally taught to every Stanford medical student, and on an informal basis, on daily patient rounds and during consults on every clinical service within the hospital. The CPI is a standardized, systematic, patient-centered method for teaching students and residents to take, write, and communicate a patient's history. In every specialty, for every patient, the medical encounter begins with an initial conversation, recorded in the medical record as a patient note. The quality of that interaction and that note will impact education, mentoring, and clinical care for every student, resident, faculty member, and patient at Stanford.

k. Specific educational aims

Specific aim 1: Evaluate the impact of the CPI versus HPI on consultant satisfaction and differential diagnosis.
Specific aim 2: Develop an evergreen video-based curriculum to teach the Chronology of Present Illness.

References:

1. PR L. Chapter 3: The medical interview. In: Walker HK HW, Hurst JW, ed. *Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition.* Boston: Butterworths; 1990.
2. Skeff KM. Reassessing the HPI: the Chronology of Present Illness (CPI). *Journal of general internal medicine.* 2014;29:13-15.
3. Skeff KM. Restructuring the Patient's History: Enhancing the Consultant's Role as a Teacher. *Gastroenterology.* 2014;147:1208-1211.
4. Rahman A, Tasnim S. Twelve tips for better communication with patients during history-taking. *TheScientificWorldJournal.* 2007;7:519-524.
5. van Thiel J, Kraan HF, Van Der Vleuten CP. Reliability and feasibility of measuring medical interviewing skills: the revised Maastricht History-Taking and Advice Checklist. *Medical education.* 1991;25:224-229.
6. Redelmeier DA, Schull MJ, Hux JE, Tu JV, Ferris LE. Problems for clinical judgement: 1. Eliciting an insightful history of present illness. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne.* 2001;164:647-651.
7. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. *Academic medicine : journal of the Association of American Medical Colleges.* 2001;76:390-393.
8. Young JQ, Ten Cate O, O'Sullivan PS, Irby DM. Unpacking the Complexity of Patient Handoffs Through the Lens of Cognitive Load Theory. *Teaching and learning in medicine.* 2016;28:88-96.
9. Improving Diagnosis in Health Care. *Institute of Medicine.* 2015.
10. Roter DL, Hall JA. Physician gender and patient-centered communication: a critical review of empirical research. *Annual review of public health.* 2004;25:497-519.
11. Johnson RL, Roter D, Powe NR, Cooper LA. Patient race/ethnicity and quality of patient-physician communication during medical visits. *American journal of public health.* 2004;94:2084-2090.
12. van Ryn M, Burke J. The effect of patient race and socio-economic status on physicians' perceptions of patients. *Social science & medicine.* 2000;50:813-828.