

Medical student shadowing on hospital medicine direct-care services

Daniel J. Aldrich MD^{1,2}   | Shannon K. Martin MD, MS^{1,2} 

¹Department of Medicine, University of Chicago, Chicago, Illinois, USA

²Pritzker School of Medicine, University of Chicago, Chicago, Illinois, USA

Correspondence

Daniel J. Aldrich, MD, Department of Medicine, University of Chicago, 5841 S. Maryland Ave, MC 5000, Chicago, IL 60637, USA.

Email: danielaldrich@uchicagomedicine.org; Twitter: @DanielAldrichMD

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INTRODUCTION

Physician shadowing, or observation of the day-to-day work of a physician, is a time-honored way to introduce students to medical careers and patient care but can be challenging to implement.^{1,2}

Hospital medicine (HM) requires broad expertise in clinical and health systems sciences and provides an opportune environment for valuable and diverse clinical shadowing experiences. Coinciding with HM's growth as a field, HM direct-care services (HM-DCS), or services in which a hospitalist is the sole primary provider, are increasingly utilized in medical education.³ The clinical practice of HM, however, is demanding, and some may fear incorporating early learners on HM-DCS may cause greater provider stress, distracting multitasking, and lower productivity.⁴⁻⁶

More than ever before, hospitalist educators must navigate tensions between clinical demands and the educational mission.^{7,8} A key strategy offered by HM leaders is developing innovative educational opportunities beyond traditional teaching services.⁹ A well-designed shadowing program can meet this need, and hospitalist educators can excel in creating such programs with a thoughtful approach to design, implementation, and evaluation. Applying Kern's approach to curriculum development and central strategies of implementation science,^{10,11} we present a model of preclerkship (i.e., first and second-year medical student) shadowing on HM-DCS at the Pritzker School of Medicine (PSOM) at the University of Chicago

Medicine (UCM) that demonstrates how HM-DCS can be successful learning environments for shadowing students while facilitating satisfying teaching opportunities for hospitalists.

THE HOSPITAL MEDICINE SHADOWING EXPERIENCE

Before 2021, PSOM students lacked formal opportunities to shadow in HM. To meet this need, the Section of HM at UCM partnered with PSOM to create an HM-DCS shadowing intervention, or Hospital Medicine Shadowing Experience (HMSE), available to first- and second-year PSOM students and UCM hospitalists.

UCM, a tertiary academic medical center, has 13 general medicine and subspecialty HM-DCS comprising medically and psychosocially complex patients. HM-DCS cap at 11–14 patients and are staffed by approximately 70 hospitalists with varying teaching responsibility levels. Seven-day HM-DCS rotations begin Monday, Wednesday, or Thursday. PSOM, whose campus is adjacent to UCM, has roughly two preclerkship years followed by clinical rotations. Classes are approximately 88 students.

We chose DCS for shadowing students because, unlike traditional teaching services with interns, residents, and other students, they enable a 1:1 apprentice-teacher model, which may allow a more direct interface with patient care and the health system and enhance

Preliminary results of this work were presented at the University of Chicago Medical Education Day, Chicago, Illinois, November 2021; the Society of Hospital Medicine Converge Annual Meeting, Nashville, Tennessee, April 2022; and the Midwest Society of General Internal Medicine Meeting, St. Louis, Missouri, October 2022.

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physician role-modeling and mentorship while not overcrowding traditional teaching services with additional learners.

We first identified stakeholders and considered facilitators and barriers to implementation in our context. Based on these, we decided participation would be voluntary, students and hospitalists would be paired 1:1, and shadowing would last a minimum of 2 h and occur on Sundays. We considered that restricting shadowing to Sundays could decrease exposure to the scope of HM practice but accepted this tradeoff in favor of reasons such as accommodating student class schedules. To establish program objectives, we conducted a prepilot needs assessment from February to March 2021. General advertisements were disseminated via email. Students and hospitalists were paired based on availability. The only prepilot guideline was shadowing should last at least 2 h. Within 2 weeks of participation, students and hospitalists were asked to provide narrative feedback.

We reassessed facilitators and barriers following feedback review and established the following formal HMSE objectives: (1) educate students about HM careers; (2) provide students clinical education; (3) enhance students' professional identity formation (PIF)—that is, the process through which students come to think, act, and feel like physicians—through preceptor role modeling and experiential learning¹²; (4) provide hospitalists satisfying teaching opportunities; and (5) minimize clinical disruption. Table 1 outlines key implementation strategies. The full pilot was subsequently formulated.

HMSE was piloted from April 2021 to June 2023. Several HMSE components were modified or introduced based on the needs assessment. For example, we implemented a hospitalist tip sheet highlighting strategies to streamline workflow, teach and engage students, discuss HM careers, and be a physician role model (Table 2). Tailored advertisements were disseminated each fall and spring. HMSE components were iteratively refined following the annual survey analysis.

MEASURING HMSE SUCCESS

One week following participation, student and first-time hospitalist participants received survey invitations (Appendix A). Participants were surveyed over three academic years (AYs) from 2020 to 2023. Fifty-two students shadowed 19 unique hospitalists over 55 instances. Student participation increased after the first AY and was stable thereafter; hospitalist participation was similar across AYs (Appendix B). Student and hospitalist survey response rates were 95% (52/55) and 84% (16/19), respectively.

Students shadowed for a mean 3.3 h (SD 1.0) on a mean 10.1 patients (SD 3.1). Most (79%) reported direct-clinical engagement (e.g., taking histories). Twenty-one percent of students observed consultation with a specialist, and 75% discussed nonclinical HM career opportunities (e.g., quality improvement). Students and hospitalists were highly satisfied with HMSE. Among students, 98% were satisfied overall with HMSE; 98% were satisfied with hospitalist role modeling; 98% with clinical teaching; and 85% with direct-clinical engagement. Among hospitalists, 88% were satisfied overall with HMSE with 94%

satisfied with the opportunity to teach (Appendix C). Satisfaction was stable across AYs (Appendix D). All students reported an increased understanding of HM clinical practice, 95% reported an increased understanding of nonclinical HM opportunities, and over half (56%) reported increased interest in pursuing an HM career.

We were additionally interested in measuring the impact of HMSE on HM-DCS clinical workflow. Nearly all hospitalists (94%) perceived workflow disruption. It was not feasible to assess certain disruption endpoints, like delays and omissions in placing orders and consults. Thus, to assess whether shadowing resulted in delays in hospitalist work completion, we examined the following electronic health record (EHR) data: (1) mean time of progress note and discharge summary entry; (2) mean percentage of notes copied from prior notes; (3) mean number of discharge orders placed; and (4) mean time of discharge order entry. Data were collected for patients on the hospitalist preceptors' census on shadowing Sundays and the immediately preceding non-shadowing Saturdays, which had similar mean total notes and mean new admissions. The mean time of note entry was 44 min later on shadowing versus nonshadowing days ($p < .001$). Mean time of discharge order entry was 51 min later on shadowing days, but this difference was not significant ($p = .15$); differences for other measures of workflow disruption also were not significant (Appendix E).

RECOMMENDATIONS AND NEXT STEPS

We describe a successful model for preclerkship medical student shadowing on HM-DCS. HMSE educated students about HM careers. Further, HMSE was a feasible and sustainable teaching opportunity for hospitalist educators. Here, we highlight several important findings for HM groups implementing shadowing experiences for early learners on HM-DCS.

In medical education, PIF derives from a complex network of social interactions, experiential learning, and explicit and tacit knowledge acquisition.¹² Consequently, role modeling exerts an important influence on medical student career choices and shapes students' PIF through clinical teaching.^{13,14} Our survey data, including high student-reported interest in HM following HMSE, supports success in achieving our objectives of educating students about HM, providing clinical education and engagement, and promoting physician role modeling, which was consistently rated very highly. While favorable for students in the short term, we believe the impact of HMSE could also influence student PIF, whether students decide to become hospitalists or not. For example, the extremely positive experience students reported having with hospitalist role models in HMSE could improve perceptions about HM and even strengthen interprofessional collaboration between future physicians in HM and non-HM specialties. HMSE does not aim to turn every student into a hospitalist, but rather to highlight the unique role and expertise hospitalists bring as leaders of inpatient teams, a feature supported by the high number of students reporting better understanding of both clinical and nonclinical elements of HM.

TABLE 1 Key implementation strategies in the Pilot of the University of Chicago Hospital Medicine Shadowing Experience, April 2021–June 2023.

Stakeholders	Potential facilitators	Implementation strategies
Students	Education about HM as a career	Emphasize to hospitalists objective of educating students about HM Outline nonclinical HM career opportunities and encourage hospitalists to discuss them Encourage students to ask hospitalists about nonclinical HM career opportunities and rewards and challenges of clinical practice HMSE is a minimum of 2 h
	Clinical education and engagement	Emphasize to hospitalists objectives of clinical teaching and engagement for students Provide hospitalists tips for clinical teaching and engagement for students.
Hospitalists	Clinical teaching	Emphasize opportunity to teach students Partner with HM Medical Education Committee to recruit hospitalists interested in clinical teaching
	Academic setting	Highlight opportunity to fulfill institutional service to PSOM and UCM
PSOM	Clinical education for students	(See strategies for students and hospitalists)
	Enhanced PIF for students	Students and hospitalists are paired 1:1 Promote clinical teaching and engagement for students Highlight to hospitalists characteristics of positive role models in medical education
Patients	More time spent with hospitalist	Promote teaching and engagement for students
HMSE coordinator	Career fulfillment leading a shadowing experience for students and hospitalists	Apply Kern's curriculum development approach and implementation science strategies
Stakeholders	Potential barriers	Implementation strategies
Students	Time away from studying and leisure	Participation is voluntary
	Inadequate exposure to HM	HMSE is a minimum of 2 h Students can shadow more than once
	Competition among learners	HMSE takes place on HM-DCS Students and hospitalists are paired 1:1
	Busy class schedules on weekdays	HMSE takes place on Sundays
Hospitalists	Lack of desire teaching students	Participation is voluntary
	Greater clinical workload on weekdays	HMSE takes place on Sundays
	Clinical disruption from shadowing	Provide tips for minimizing workflow disruption HMSE takes place on Sundays
PSOM	Competition among learners	HMSE takes place on HM-DCS Students and hospitalists are paired 1:1
	Clinical disruption from shadowing	(See strategies for hospitalists)
Patients	Reluctance having students present during rounds	Explain importance of teaching to UCM's mission Give option to decline participation
	Scheduling students and hospitalists	Design and implement a formal sign-up process
HMSE coordinator	Low feasibility and sustainability of HMSE	Apply implementation science strategies to evaluate and improve HMSE

Abbreviations: DCS, direct-care services; HM, hospital medicine; HMSE, Hospital Medicine Shadowing Experience; PIF, professional identity formation; PSOM, Pritzker School of Medicine; UCM, University of Chicago Medicine.

TABLE 2 Tip sheet provided to hospitalists in the pilot of the University of Chicago Hospital Medicine Shadowing Experience, April 2021–June 2023.

Tip sheet
<p>Streamlining workflow</p> <ul style="list-style-type: none"> Meet your student around 8–9 a.m. after independently chart-reviewing patients, addressing “fires,” and seeing patients for whom early discharge is planned. Complete notes and sign-out after shadowing is over.
<p>Teaching and engaging your student</p> <ul style="list-style-type: none"> Ask your students what they want to get out of the shadowing experience. Give a 2–3 sentence patient summary before entering each patient room. Invite your student to start patient interviews and participate in physical exams. Connect basic science and pathophysiology to clinical medicine at the bedside. Briefly discuss your assessment and plan while seeing or after seeing each patient. Highlight psychosocial barriers and other health systems domains of patient care (e.g., interprofessional collaboration, hospitalization and discharge structures and processes, high-value care, health policy and economics, health technology, and ethics). Invite your student to enter orders and pages in Epic. Have your student listen in on calls with consultants.
<p>Discussing hospital medicine as a career</p> <ul style="list-style-type: none"> Discuss the pathway to become a hospitalist. Discuss quality improvement, clinical operations, medical education, and other nonclinical career opportunities. Discuss why you went into hospital medicine. Discuss what you find most rewarding about the practice of hospital medicine. Discuss what you find most challenging about the practice of hospital medicine.
<p>Being a physician role model</p> <ul style="list-style-type: none"> Demonstrate clinical expertise. Demonstrate respect, empathy, compassion, and a patient-centered approach. Demonstrate a collaborative spirit with other care team members. Create a positive, supportive educational environment and show interest in the growth of your students. Have a positive outlook!

We predicted clinical disruption would be our greatest implementation barrier. Unsurprisingly, nearly all hospitalist respondents perceived workflow disruption. While all objective measures of workflow disruption trended in the direction

supporting this perception, only the difference in mean note entry time reached statistical significance. It is plausible, however, that the nonsignificant differences for our other workflow measures reflect type II error given our sample size. Despite the challenge of workflow disruption, we maintained stable hospitalist participation and high satisfaction throughout the pilot which supports success in achieving our last objective of mitigating disruption. This is especially important given the current climate of diminished teaching opportunities throughout the HM landscape and the need to develop additional venues for clinical teaching.^{7,8} Future work describing measures of hospitalist workflow should incorporate contributions hospitalists perceive from educational responsibilities, such as those in HMSE.¹⁵

We also recognize student survey feedback has the potential to aid faculty promotion. Although our results were not linked to official learner evaluations, we recommend that other groups employing shadowing models consider the value of program evaluation for this purpose, particularly for faculty with high clinical responsibilities and fewer opportunities to receive learner evaluations.

DCS are valuable clinical learning environments, even for early learners. We believe HMSE has the potential for future dissemination not only for HM groups at other institutions but also on DCS in non-HM specialties.¹⁶ For groups considering the HMSE model in their own context, we advise special attention to implementation science principles—especially in settings with higher patient loads which could adversely impact implementation—and recommend a methodical approach that includes conducting a thorough stakeholder analysis to identify facilitators and barriers, developing theory-based strategies to leverage facilitators and mitigate barriers, systematically measuring outcomes aligned with objectives, and iteratively modifying HMSE in response to evolving results.

A structured shadowing intervention on HM-DCS can educate students about HM and may contribute to career exploration and PIF. Utilizing DCS for shadowing experiences may also enhance career satisfaction for hospitalist educators.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

ETHICS STATEMENT

This program was granted exemption by the University of Chicago Institutional Review Board (IRB21-0629).

ORCID

Daniel J. Aldrich  <http://orcid.org/0009-0006-3782-0178>

Shannon K. Martin  <http://orcid.org/0000-0002-7431-4956>

TWITTER

Daniel J. Aldrich  @DanielAldrichMD

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APPENDIX A: SURVEYS FOR STUDENTS AND HOSPITALISTS FOLLOWING PARTICIPATION IN THE PILOT OF THE UNIVERSITY OF CHICAGO HOSPITAL MEDICINE SHADOWING EXPERIENCE, APRIL 2021-JUNE 2023.

STUDENT SURVEY

Please complete the survey below.

Thank you!

Please enter the last letter of your last name followed by the last four digits of your phone number. For example, Jane Smith 123-456-7899 would be entered as "h7899" _____

What is your year of training?

- 1st year medical student
- 2nd year medical student

What is your gender?

- Female
- Male
- Nonbinary
- Prefer not to say

What are your prior medical school shadowing experiences? Check any that apply.

- Hospital medicine (inpatient)
- General internal medicine (outpatient)
- Internal medicine subspecialty (e.g., cardiology)
- Other

If other, please specify. _____

Have you previously participated in the Hospital Medicine Shadowing Experience?

- Yes
- No

What is your primary reason for participating in the Hospital Medicine Shadowing Experience?

- Gain clinical experience
- Learn more about a career in hospital medicine
- Learn more about clinical medicine in general
- Meet attending physicians
- Other

If other, please specify. _____

Before participating in this shadowing experience, how much did you know about hospital medicine compared to other medical specialties with respect to the following:

The clinical practice of hospital medicine (e.g., which patients are seen and for what conditions)

- Much less
- Somewhat less
- About the same
- Somewhat more
- Much more

The pathway to attain a career in hospital medicine

- Much less
- Somewhat less
- About the same
- Somewhat more
- Much more

The Nonclinical aspects of hospital medicine (e.g., quality improvement, clinical operations, medical education)

- Much less
- Somewhat less
- About the same
- Somewhat more
- Much more

What was your level of interest in pursuing a career in hospital medicine before participating in this shadowing experience?

- Not at all interested
- A little bit interested
- Interested
- Extremely interested
- Unsure

What was the approximate number of hours (rounded to nearest whole number) that you spent shadowing? _____

What was the approximate number of patients you saw? _____

Which of the following categories of acute medical issues did you encounter? Check all that apply.

- Cardiology (e.g., heart failure, poor blood pressure control)
- Pulmonology (e.g., chronic obstructive pulmonary disease, asthma, pulmonary embolism)
- Nephrology (e.g., acute kidney injury, electrolyte abnormality)
- Infectious Disease (e.g., pneumonia, osteomyelitis, abscess)
- Gastroenterology (e.g., diarrhea, liver disease)
- Endocrinology (e.g., poor diabetes control)
- Rheumatology (e.g., lupus, gout flare)
- Hematology (e.g., anemia, sickle cell pain crisis)
- Oncology (e.g., complications of cancer)

- Neurology/Psychiatry (e.g., altered mental status, seizure, depression)
- Other

If other, please specify. _____

Which of the following categories of patient psychosocial issues did you encounter? Check all that apply.

- Issues relating to substance use
- Underinsurance or uninsured status
- Barrier to hospital discharge (e.g., delays in post-acute care placement, inadequate home support)
- Challenge in communication or disagreement with a patient or family member
- Difficulty adhering to treatment
- Other

If other, please specify. _____

Did you observe consultation with a specialist?

- Yes
- No

Did you discuss Nonclinical aspects of hospital medicine (e.g., quality improvement, clinical operations, medical education)?

- Yes
- No

Which of the following direct clinical experience (if any) did you participate in? Check any that apply.

- History taking—did you perform any part of the history taking of a patient?
- Physical examination—did you perform any part of the physical exam of a patient?
- Assessment and plan—did you discuss the clinical assessment and plan of care of a patient?

After participating in this shadowing experience, please rate your satisfaction with the following elements:

Number of patient encounters

- Extremely unsatisfied
- Unsatisfied
- Neutral
- Satisfied
- Extremely satisfied

Amount of your direct clinical participation (e.g., history taking, performing physical exams, discussing clinical assessment and plans)

- Extremely unsatisfied
- Unsatisfied
- Neutral
- Satisfied
- Extremely satisfied

Clinical teaching received

- Extremely unsatisfied
- Unsatisfied
- Neutral
- Satisfied
- Extremely satisfied

Role modeling provided by your attending physician

- Extremely unsatisfied
- Unsatisfied
- Neutral
- Satisfied
- Extremely satisfied

Overall experience

- Extremely unsatisfied
- Unsatisfied
- Neutral
- Satisfied
- Extremely satisfied

Any comments about your attending physician's teaching that you would like to share? _____

After participating in this shadowing experience, have you had any change in your:

Understanding of hospital medicine clinical practice

- Significantly decreased
- Decreased
- Stayed the same
- Increased
- Significantly increased

Understanding of the pathway to attain a career in hospital medicine

- Significantly decreased
- Decreased
- Stayed the same
- Increased
- Significantly increased

Understanding of Nonclinical aspects of hospital medicine (e.g., quality improvement, clinical operations, medical education)

- Significantly decreased
- Decreased
- Stayed the same
- Increased
- Significantly increased

Interest in pursuing a career in hospital medicine

- Significantly decreased
- Decreased
- Stayed the same
- Increased
- Significantly increased

Would you recommend the Hospital Medicine Shadowing Experience to other medical students?

- Yes
- No

Any comments about the Hospital Medicine Shadowing Experience that you would like to share?

HOSPITALIST SURVEY

Please complete the survey below.

Thank you!

How many years have you been an attending physician? Please round to nearest whole number. _____

How many years have you been an attending physician with the Section of Hospital Medicine at UChicago Medicine? Please round to nearest whole number. _____

What is your gender?

- Female
- Male
- Nonbinary
- Prefer not to say

What is your primary reason for participating in this shadowing experience?

- To gain more experience teaching
- To fulfill a professional requirement (e.g., Passport requirement, service/citizenship needs for promotion)
- To help students gain exposure to hospital medicine
- To recruit students to the field of hospital medicine
- To assist the medical school community in filling a need for shadowing/early clinical exposure
- To meet more medical students
- Other

If other, please specify. _____

How much did shadowing disrupt the following:

Your workflow

- Not at all
- Little
- Some
- Much
- Very much

Patient care

- Not at all
- Little
- Some
- Much
- Very much

What is your level of comfort with teaching?

- Very uncomfortable
- Somewhat uncomfortable
- Neutral
- Comfortable
- Very comfortable

After participating in this shadowing experience, please rate your satisfaction with the following:

Opportunity to teach

- Extremely unsatisfied

- Unsatisfied
- Neutral
- Satisfied
- Extremely satisfied

Student's exposure, whether through direct observation or discussion, to the core elements of hospital medicine

- Extremely unsatisfied
- Unsatisfied
- Neutral
- Satisfied
- Extremely satisfied

Your overall experience participating in the shadowing experience

- Extremely unsatisfied
- Unsatisfied
- Neutral
- Satisfied
- Extremely satisfied

Would you like to continue to be a preceptor in the Hospital Medicine Shadowing Experience?

- Yes
- No

Any comments about the shadowing experience that you would like to share? _____

APPENDIX B

Table B1

TABLE B1 Student and hospitalist participation and characteristics of student and hospitalist survey respondents in the pilot of the University of Chicago Hospital Medicine Shadowing Experience (HMSE), April 2021–June 2023.

Academic year	Students	Hospitalists (first-time participants)		
2020–2021	10	8 (8)		
2021–2022	25	12 (7)		
2022–2023	20	9 (4)		
Students	Aggregate (n = 52)	AY 2020–2021 (n = 10)	AY 2021–2022 (n = 23)	AY 2022–2023 (n = 19)
Gender				
Female (%)	58	60	57	58
Male (%)	40	40	43	37
Nonbinary (%)	2	0	0	5
Level of training				
First-year medical student (%)	73	80	78	63
Second-year medical student (%)	27	20	22	37
Prior experience shadowing				
Yes (%)	77	90	65	84
No (%)	23	10	35	16
Prior participation in HMSE				
Yes (%)	4	0	0	11
No (%)	96	100	100	89
Primary reason for participating in HMSE				
Learn more about HM (%)	71	80	65	74
Gain clinical experience (%)	19	0	22	26
Learn more about clinical medicine (%)	10	20	13	0
Understanding of HM versus other specialties before HMSE				
Clinical practice				
Much less (%)	13	20	9	16
Somewhat less (%)	40	40	43	37
About the same (%)	23	40	13	26
Somewhat more (%)	13	0	17	16
Much more (%)	10	0	17	5
Nonclinical work				
Much less (%)	18	20	22	11
Somewhat less (%)	41	30	39	47
About the same (%)	25	50	17	21
Somewhat more (%)	14	0	17	16

(Continued)

TABLE B1 (Continued)

Students	Aggregate (n = 52)	AY 2020–2021 (n = 10)	AY 2021–2022 (n = 23)	AY 2022–2023 (n = 19)
Much more (%)	4	0	4	5
Career pathway				
Much less (%)	2	10	0	0
Somewhat less (%)	35	40	35	32
About the same (%)	37	30	30	47
Somewhat more (%)	24	20	30	16
Much more (%)	4	0	4	5
Level of interest in HM before HMSE				
Not at all interested (%)	8	10	9	5
A little bit interested (%)	52	40	52	58
Interested (%)	33	40	35	26
Unsure (%)	8	10	4	11
Hospitalists	Aggregate (n = 16)	AY 2020–2021 (n = 6)	AY 2021–2022 (n = 7)	AY 2022–2023 (n = 3)
Gender				
Female (%)	44	50	43	33
Male (%)	56	50	57	67
Years as attending (years as UCM attending)				
Less than 1 (%)	6 (12.5)	0 (0)	14 (29)	0 (0)
1–2 (%)	38 (50.0)	17 (33)	43 (43)	67 (100)
3–5 (%)	31 (25)	50 (33)	29 (29)	0 (0)
6 or more (%)	25 (12.5)	33 (33)	14 (0)	33 (0)
Primary reason for participating in HMSE				
Gain more experience teaching (%)	38	0	57	67
Help students gain exposure to HM (%)	38	50	43	33
Assist the medical school community (%)	19	33	0	0
Other (%)	6	17	0	0
Comfort teaching				
Very uncomfortable	6	17	0	0
Somewhat uncomfortable	13	0	14	33
Neutral	0	0	0	0
Comfortable	38	50	29	33
Very comfortable	44	33	57	33

Abbreviations: AY, academic year; HM, hospital medicine; UCM, University of Chicago Medicine.

APPENDIX C

Figure C1

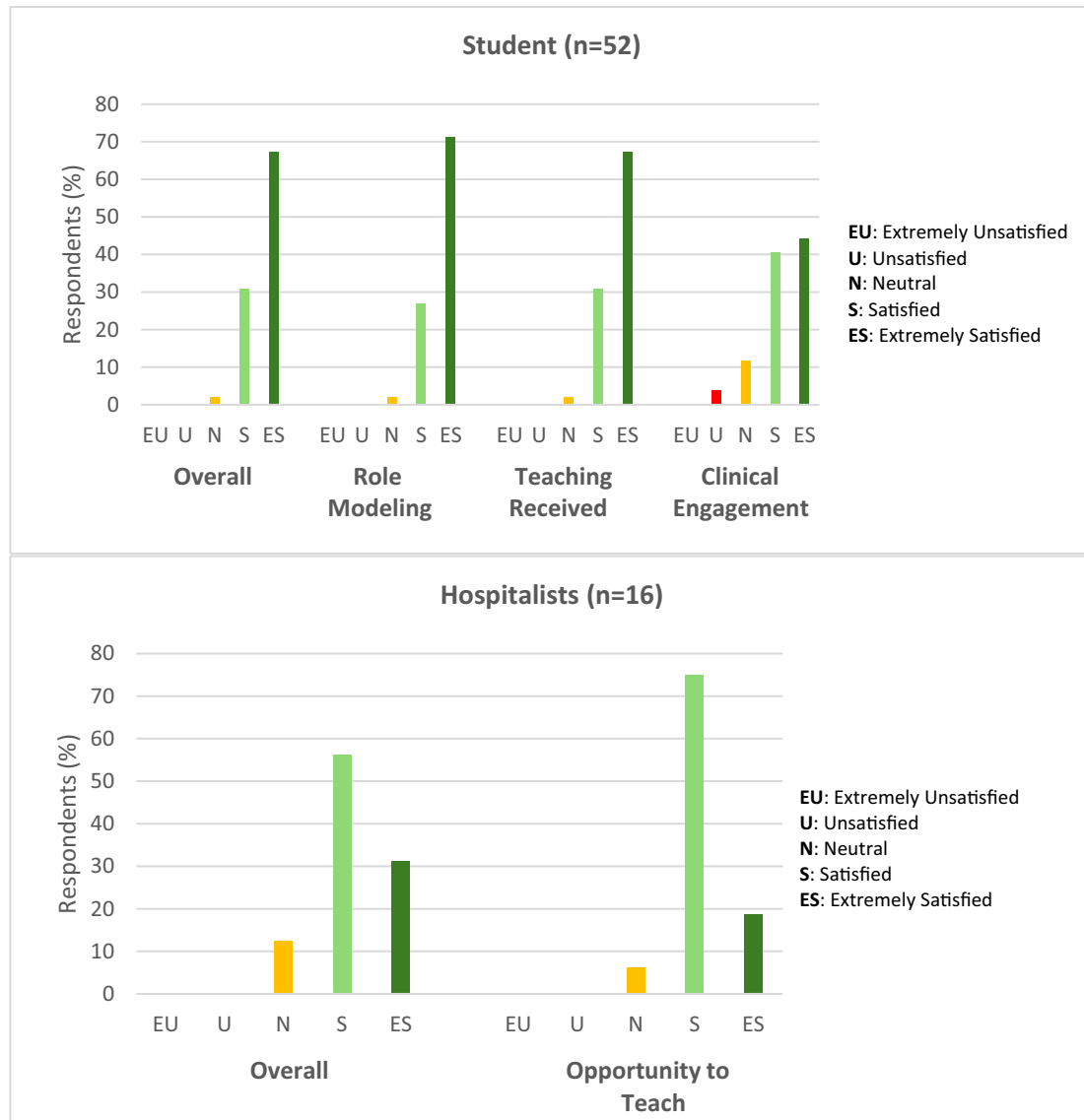


FIGURE C1 Student and hospitalist satisfaction in the pilot of the University of Chicago Hospital Medicine Shadowing Experience, April 2021–June 2023.

APPENDIX D

Figure D1

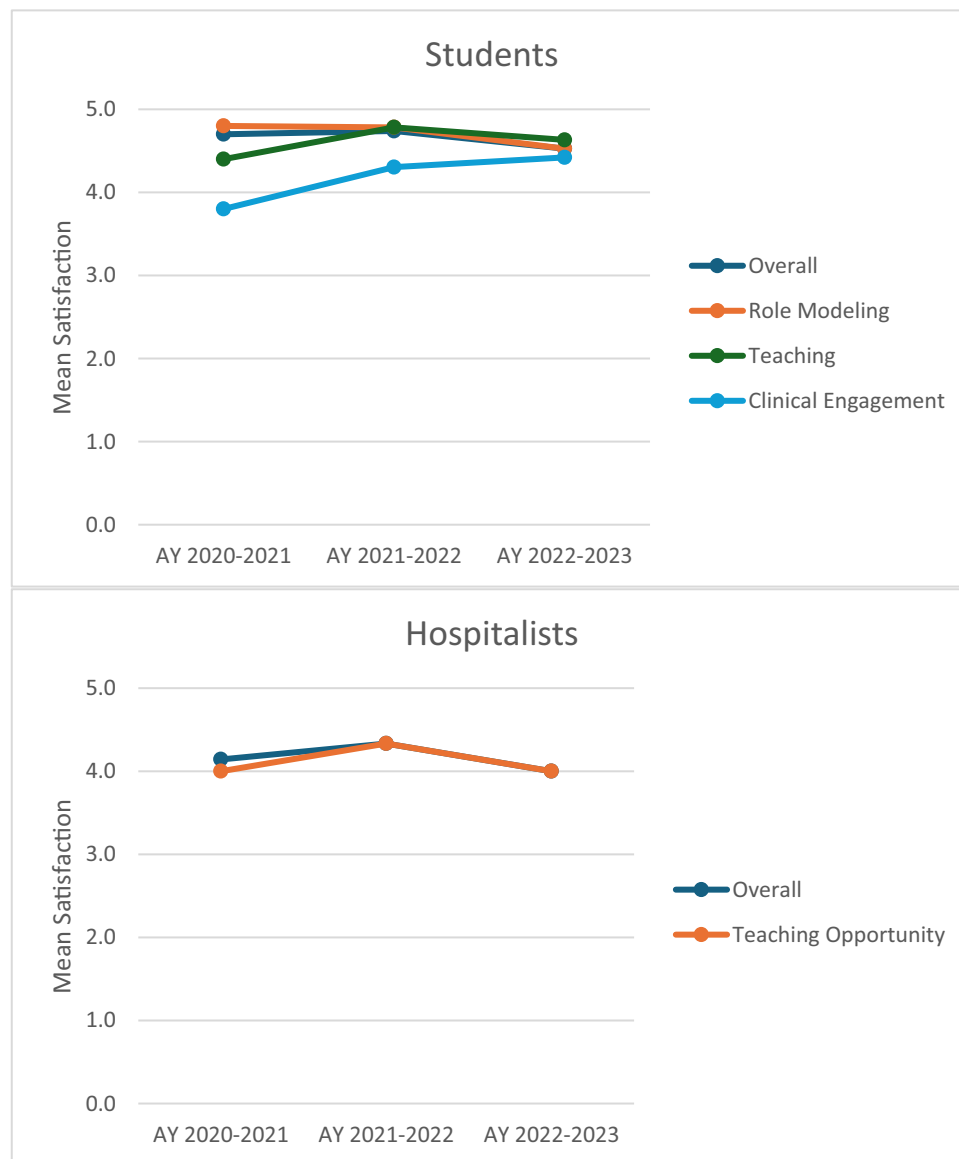


FIGURE D1 Student and hospitalist satisfaction over time in the pilot of the University of Chicago Hospital Medicine Shadowing Experience, April 2021–June 2023. Students and hospitalists rated their satisfaction on a 5-point Likert-type scale. Mean satisfaction was calculated from the weighted average of ratings, with *extremely unsatisfied*–1, *unsatisfied*–2, *neutral*–3, *satisfied*–4, and *extremely satisfied*–5. AY 2020–2021: students, $n = 10$; hospitalists, $n = 6$. AY 2021–2022: students, $n = 23$; hospitalists, $n = 7$. AY 2022–2203: students, $n = 19$; hospitalists, $n = 3$. AY, academic year.

APPENDIX E

Table E1

TABLE E1 Measures of clinical workflow disruption for hospitalist preceptors in the pilot of the University of Chicago Hospital Medicine Shadowing Experience, April 2021–June 2023.

	Shadowing days (n = 23)	Nonshadowing Days (n = 23)	Difference	p-Value
Mean time of note entry	12:37	11:52	0:44	<.001
Mean percentage of notes copied	66.1	63.8	2.3	.07
Mean number of discharge orders placed	0.87	1.26	-0.39	.16
Mean time of discharge order entry	11:17	10:26	0:51	.15
Mean number of total notes	11.2	10.9	0.3	.42
Mean number of notes for new admissions	1.48	1.78	-0.30	.36

Note: Mean time of progress note and discharge summary entry, mean percentage of notes copied from prior notes, mean number of discharge orders placed, and mean time of discharge order entry on shadowing Sundays were compared to data on the immediately preceding nonshadowing Saturdays using one-sided Wilcoxon rank-sum tests. Mean service census and new admissions on shadowing versus nonshadowing days were compared using two-tailed t-tests. $p < .05$ was used for statistical significance.