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## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Program Directors' Survey

**You received the survey link because the ACGME website has identified you as the Nephrology Program Director at your institution. If you are not the program director, please do not complete the survey--and if possible, forward the link to the program director. Thank you!**

* 1. I am the Nephrology Program Director at my institution

◯ Yes

◯ No

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Program Directors' Survey

### Forwarding the Survey to Your Fellows and Clinical Faculty

**This survey is designed to assess the impact of the EMR on Nephrology fellowship training. Not only do we want input from program directors, we want to know what fellows and clinical faculty think as well. To do this anonymously, we are asking that you forward/email the survey links below to your fellows and clinical faculty. This will allow us to establish how many received the link, and calculate response rate. Thank you!**

* 2. We use one or more EMR at our primary training site:

◯ Yes

◯ No

3. I forwarded the link to my fellows. The link is: https://www.surveymonkey.com/r/MY8KF58

◯ Yes

◯ No

4. The number of fellows to whom I forwarded the link is:

[                    ]

5. I forwarded the link to my clinical faculty. The link is:https://www.surveymonkey.com/r/M257PJD

◯ Yes

◯ No

6. The number of clinical faculty to whom I forwarded the link is:

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Program Directors' Survey

### About You and Your Program

7. The number of years I have practiced nephrology (including fellowship training) is

- ◯ < 5 years
- ◯ 5-10 years
- ◯ >10-20 years
- ◯ >20 years

8. How many total clinical fellows (both first and second year together) do you have in this training year (2018-2019?

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Program Directors' Survey

### About the EMR at Your Primary Training Site

9. Problems with EMR functionality at our primary training site include (check all that apply):

- [ ] Screen latency/delay
- [ ] Frequent unscheduled downtime
- [ ] Inpatient and outpatient EMR do not communicate
- [ ] Generalized slowness
- [ ] Too many click-boxes
- [ ] Too many required fields not relevant to the encounter.
- [ ] Too much focus on billing rather than clinical features of encounter
- [ ] Difficulty in navigation
- [ ] Too many alerts
- [ ] Templates import information that is not useful and/or is incorrect
- [ ] Clinical decision support package is not useful and/or is incorrect
- [ ] There are no significant problems with our EMR

Other (please specify)

10. At my institution, EMR functionality is slowed, disrupted, or completely lost:

- ( ) Daily
- ( ) Weekly
- ( ) Monthly
- ( ) A few times a year
- ( ) Almost never
- ( ) Never

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Program Directors' Survey

### The EMR and Nephrology Fellow Education

11. Our EMR contributes POSITIVELY to Nephrology Fellow education.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

12. Positive effects of your institution's EMR on Nephrology Fellow education include (check all that apply).

- [ ] Allows fellows to efficiently determine patient medications
- [ ] Allows tracking of outpatient diagnosis mix to enhance fellow education
- [ ] Provides a way (e.g. dashboard) to ensure that fellows are meeting quality indicators for CKD patients
- [ ] Allows fellows and faculty to track quality indicators in chronic dialysis patients
- [ ] Facilitates delivery of protocolized post-transplant care
- [ ] Facilitates adjustment of medication dosing for eGFR
- [ ] Ensures that fellows write correct acute dialysis and CRRT prescriptions by use of drop-down boxes or warnings
- [ ] Simplifies coding
- [ ] Simplifies billing
- [ ] Is an important source for retrospective data-base studies for fellow research projects
- [ ] Allows for efficient lab result trending
- [ ] Improves patient health information data security
- [ ] We are able to access the EMR from home and/or from a mobile device
- [ ] Improves communication with the multidisciplinary team
- [ ] Our EMR has no positive effect on fellow education

Other (please specify)

Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Program Directors' Survey

## The EMR and Nephrology Fellow Education

13. Negative effects of your institution's EMR on Nephrology Fellow education include (check all that apply):

- [ ] Excessive and/or irrelevant EMR documentation by providers makes chart review of past medical history difficult
- [ ] The structure of the EMR makes longitudinal assessment of the patient difficult
- [ ] "Copy forward" features lead to inaccurate and/or incorrect documentation
- [ ] For a given encounter, fellows spend less time with patients and more on documentation
- [ ] Irrelevant documentation requirements (sometimes for billing) prevent fellows from learning the minimal essential evaluation of a given disease process.
- [ ] The inpatient EMR at our institution is set up so that it is confusing for fellows to write clear orders for acute dialysis/CRRT.
- [ ] Drop-down boxes and "forced" choices prevent fellows from learning how to write for dialysis or CRRT therapy without prompts.
- [ ] The inpatient and outpatient EMR at my institution do not "talk to each other".
- [ ] Fellows are reluctant to engage in educational experiences (including performing procedures) because of the time otherwise needed for EMR documentation.
- [ ] Our EMR often functions slowly or not at all, adding excessive time to documentation for fellows and faculty.
- [ ] Worsens timeliness of note completion
- [ ] Ability to access EMR from home and/or mobile device interferes with protected time for education and/or self-directed learning.
- [ ] Ability to access EMR from home and/or mobile device interferes with protected time for personal needs, including time for sleep/rest
- [ ] Our EMR has no negative effects on fellow education

Other (please specify)

Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Program Directors' Survey

## The EMR and Nephrology Fellow Education

14. In my program, fellows are at risk to exceed work hours because of time spent completing EMR documentation.

- Often
- Sometimes
- Rarely
- Never

15. Because of the competing time demands of EMR completion, fellows at my program are reluctant to:

| | Strongly agree | Agree | Neither agree or disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| Do procedures | | | | | |
| Participate in conferences | | | | | |
| Prolong patient interactions | | | | | |
| Do independent case-directed literature review | | | | | |

# Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Program Directors' Survey

## The EMR and Nephrology Fellow Education--Your Comments

16. Please attach any other comments or suggestions you may have

# Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Program Directors' Survey

Thank you for taking the survey. Please click done if you are finished.

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Fellow Survey

### Invitation to Complete the EMR Survey

**You are being asked to participate in an anonymous research survey that will explore the impact of the Electronic Medical Record on Nephrology fellowship training. You have been sent the link to the survey by your program director. Not only do we want input from program directors, we want to know what fellows and faculty think as well. To do this anonymously, we asked your program director to send the survey links below to both program fellows and faculty.**

**If you are not a nephrology fellow, please do not complete the survey. The 17-question, anonymous on-line survey (IP addresses are blocked) should take approximately 5-10 minutes to complete. Regardless of whether you complete the survey, we and your program director will not know that you individually did so. You may receive reminders to complete it from your program director, but these will be sent to all fellows, because we won't know whether you completed it or not.**

**We will share the nationwide results of this survey with your program director, and encourage him/her to send it to all the fellows in the program.**

**This research survey was reviewed and approved by a Walter Reed National Military Medical Center Exempt Determinations Official. Taking the survey implies that you consent to participating.**

**Thank you in advance your participation, and feel free to contact me or your program director if you have any questions.**

**Christina M. Yuan, MD**
**Principal Investigator**
**Associate Program Director, Nephrology**
**Walter Reed National Military Medical Center**
**301-295-4331**
**christina.m.yuan.civ@mail.mil**

* 1. I am a:

- ( ) First Year Nephrology Fellow
- ( ) Second Year Nephrology Fellow
- ( ) Third Year or More
- ( ) I am not a Nephrology Fellow

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Fellow Survey

### About Your Program's EMR

* 2. We use one or more EMR at our primary training site:

- ◯ Yes
- ◯ No

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Fellow Survey

### About the EMR at Your Primary Training Site

3. Problems with EMR functionality at our primary training site include (check all that apply):

- ☐ Screen latency/delay
- ☐ Frequent unscheduled downtime
- ☐ Inpatient and outpatient EMR do not communicate
- ☐ Generalized slowness
- ☐ Too many click-boxes
- ☐ Too many required fields not relevant to the encounter.
- ☐ Too much focus on billing rather than clinical features of encounter
- ☐ Difficulty in navigation
- ☐ Too many alerts
- ☐ Templates import information that is not useful and/or is incorrect
- ☐ Clinical decision support package is not useful and/or is incorrect
- ☐ There are no significant problems with our EMR

Other (please specify)

4. At my institution, EMR functionality is slowed, disrupted, or completely lost:

- Daily
- Weekly
- Monthly
- A few times a year
- Almost never
- Never

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Fellow Survey

### The EMR and Nephrology Fellow Education

5. Our EMR contributes POSITIVELY to my Nephrology Fellowship education.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

6. Positive effects of my institution's EMR on my Nephrology Fellowship education include (check all that apply).

- [ ] Allows me to efficiently determine patient medications
- [ ] Allows tracking of my outpatient diagnosis mix to enhance my education
- [ ] Provides a way (e.g. dashboard) for me to ensure that I am meeting quality indicators for my CKD patients
- [ ] Allows me to track quality indicators in my chronic dialysis patients
- [ ] Facilitates my delivery of protocolized post-transplant care
- [ ] Facilitates medication dosage adjustment for eGFR
- [ ] Ensures correct acute dialysis and CRRT prescriptions by use of drop-down boxes or warnings
- [ ] Simplifies coding
- [ ] Simplifies billing
- [ ] Is an important source for retrospective data-base studies for fellow research projects
- [ ] Allows for efficient lab result trending
- [ ] Improves patient health information data security
- [ ] We are able to access the EMR from home and/or from a mobile device
- [ ] Improves communication with the multidisciplinary team
- [ ] Our EMR has no positive effect on my education

Other (please specify)

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Fellow Survey

### The EMR and Nephrology Fellow Education

7. Negative effects of my institution's EMR on my Nephrology Fellowship education include (check all that apply):

- [ ] Excessive and/or irrelevant EMR documentation by providers makes chart review of past medical history difficult
- [ ] The structure of the EMR makes longitudinal assessment of the patient difficult
- [ ] "Copy forward" features lead to inaccurate and/or incorrect documentation
- [ ] For a given encounter, I spend more time on EMR documentation than interacting with the patient
- [ ] Irrelevant documentation requirements (sometimes for billing) prevent me from learning the minimal essential evaluation of a given disease process.
- [ ] The inpatient EMR at our institution is set up so that it is confusing for fellows to write clear orders for acute dialysis/CRRT.
- [ ] Drop-down boxes and "forced" choices prevent me from learning how to write for dialysis or CRRT therapy without prompts.
- [ ] The inpatient and outpatient EMR at my institution do not "talk to each other".
- [ ] I am reluctant to engage in educational experiences (including performing procedures) because of the time needed for EMR documentation.
- [ ] Our EMR often functions slowly or not at all, adding excessive time to documentation.
- [ ] Ability to access EMR from home and/or mobile device interferes with protected time for education and/or self-directed learning.
- [ ] Ability to access EMR from home and/or mobile device interferes with protected time for personal needs, including time for sleep/rest
- [ ] I spend too much time entering information that should be entered by ancillary or administrative staff.
- [ ] Our EMR has no negative effects on my education

Other (please specify)



## Impact of the EMR on Fellow-Patient Encounters

8. Our EMR increases my stress when seeing outpatients.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

9. How long are new patient visits in your outpatient continuity clinic?

10. Approximately how many minutes do you spend entering data into the EMR before, during and after a new patient encounter?

11. How long are follow-up patient visits in your outpatient continuity clinic?

12. Approximately how many minutes do you spend entering data into the EMR before, during and after a follow-up encounter?

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Fellow Survey

### The EMR and Nephrology Fellow Education

13. Because of the competing time demands of EMR completion, I am often reluctant to:

| | Strongly agree | Agree | Neither agree or disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| Do procedures | ○ | ○ | ○ | ○ | ○ |
| Participate in conferences | ○ | ○ | ○ | ○ | ○ |
| Prolong patient interactions | ○ | ○ | ○ | ○ | ○ |
| Do independent case-directed literature review | ○ | ○ | ○ | ○ | ○ |

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Fellow Survey

### Impact of the EMR on Nephrology Fellow Education

14. I am at risk to exceed work hours limits because of time spent completing EMR documentation.

- Often
- Sometimes
- Rarely
- Never

15. I have exceeded work hours limits because of time spent completing EMR documentation.

- Often
- Sometimes
- Rarely
- Never

16. I have made mistakes in documentation in EMR notes due to the use of "copy forward"

- Often
- Sometimes
- Rarely
- Never
- We do not have the ability to "copy forward" in our EMR

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Fellow Survey

### The EMR and Nephrology Fellow Education--Your Comments

17. Please attach any other comments or suggestions you may have

## Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Fellow Survey

Thank you for taking the survey.  Please click done if you are finished.

## Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

### Invitation to Complete the EMR Survey

**You are being asked to participate in an anonymous research survey that will explore the impact of the Electronic Medical Record on Nephrology fellowship training. You have been sent the link to the survey by your program director. Not only do we want input from program directors, we want to know what fellows and faculty think as well. To do this anonymously, we asked your program director to send the survey links below to both program fellows and faculty.**

**If you are not a nephrology clinical physician faculty, please do not complete the survey. The 17-question, anonymous on-line survey (IP addresses are blocked) should take approximately 5-10 minutes to complete. Regardless of whether you complete the survey, we and your program director will not know that you individually did so. You may receive reminders to complete it from your program director, but these will be sent to all faculty, because we won't know whether you completed it or not.**

**We will share the nationwide results of this survey with your program director, and encourage him/her to send it to all the faculty in the program.**

**This research survey was reviewed and approved by a Walter Reed National Military Medical Center Exempt Determinations Official. Taking the survey implies that you consent to participating.**

**Thank you in advance your participation, and feel free to contact me or your program director if you have any questions.**

**Christina M. Yuan, MD**
**Principal Investigator**
**Associate Program Director, Nephrology**
**Walter Reed National Military Medical Center**
**301-295-4331**
**christina.m.yuan.civ@mail.mil**

* 1. I am a Nephrology Clinical Faculty member and a practicing nephrologist.

- ◯ Yes
- ◯ No

## Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

### About You and Your Program

2. The number of years I have practiced nephrology (including fellowship training) is

- < 5 years
- 5-10 years
- >10-20 years
- >20 years

* 3. We use one or more EMR at our primary training site:

- Yes
- No

## Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

### About the EMR at Your Primary Training Site

4. Problems with EMR functionality at our primary training site include (check all that apply):

- [ ] Screen latency/delay
- [ ] Frequent unscheduled downtime
- [ ] Inpatient and outpatient EMR do not communicate
- [ ] Generalized slowness
- [ ] Too many click-boxes
- [ ] Too many required fields not relevant to the encounter.
- [ ] Too much focus on billing rather than clinical features of encounter
- [ ] Difficulty in navigation
- [ ] Too many alerts
- [ ] Templates import information that is not useful and/or is incorrect
- [ ] Clinical decision support package is not useful and/or is incorrect
- [ ] There are no significant problems with our EMR

Other (please specify)

5. At my institution, EMR functionality is slowed, disrupted, or completely lost:

- ○ Daily
- ○ Weekly
- ○ Monthly
- ○ A few times a year
- ○ Almost never
- ○ Never

Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

The EMR and Nephrology Fellow Education

6. Our EMR contributes POSITIVELY to Nephrology Fellow education.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

7. Positive effects of your institution's EMR on Nephrology Fellow education include (check all that apply).

- [ ] Allows fellows to efficiently determine patient medications
- [ ] Allows tracking of outpatient diagnosis mix to enhance fellow education
- [ ] Provides a way (e.g. dashboard) to ensure that fellows are meeting quality indicators for CKD patients
- [ ] Allows fellows and faculty to track quality indicators in chronic dialysis patients
- [ ] Facilitates delivery of protocolized post-transplant care
- [ ] Facilitates adjustment of medication dosing for eGFR
- [ ] Ensures that fellows write correct acute dialysis and CRRT prescriptions by use of drop-down boxes or warnings
- [ ] Simplifies coding
- [ ] Simplifies billing
- [ ] Is an important source for retrospective data-base studies for fellow research projects
- [ ] Allows for efficient lab result trending
- [ ] Improves patient health information data security
- [ ] We are able to access the EMR from home and/or from a mobile device
- [ ] Improves communication with the multidisciplinary team
- [ ] Our EMR has no positive effect on fellow education

Other (please specify)

## Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

### The EMR and Nephrology Fellow Education

8. Negative effects of your institution's EMR on Nephrology Fellow education include (check all that apply):

- [ ] Excessive and/or irrelevant EMR documentation by providers makes chart review of past medical history difficult
- [ ] The structure of the EMR makes longitudinal assessment of the patient difficult
- [ ] "Copy forward" features lead to inaccurate and/or incorrect documentation
- [ ] For a given encounter, fellows spend less time with patients and more on documentation
- [ ] Irrelevant documentation requirements (sometimes for billing) prevent fellows from learning the minimal essential evaluation of a given disease process.
- [ ] The inpatient EMR at our institution is set up so that it is confusing for fellows to write clear orders for acute dialysis/CRRT.
- [ ] Drop-down boxes and "forced" choices prevent fellows from learning how to write for dialysis or CRRT therapy without prompts.
- [ ] The inpatient and outpatient EMR at my institution do not "talk to each other".
- [ ] Fellows are reluctant to engage in educational experiences (including performing procedures) because of the time otherwise needed for EMR documentation.
- [ ] Our EMR often functions slowly or not at all, adding excessive time to documentation for fellows and faculty.
- [ ] Worsens timeliness of note completion
- [ ] Ability to access EMR from home and/or mobile device interferes with protected time for education and/or self-directed learning.
- [ ] Ability to access EMR from home and/or mobile device interferes with protected time for personal needs, including time for sleep/rest
- [ ] Our EMR has no negative effects on fellow education

Other (please specify)

## Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

### Impact of the EMR on Fellow-Patient Encounters

9. Our EMR increases the time needed to staff patients with fellows.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Other (please specify)

10. How long are new patient visits in the fellow outpatient continuity clinic?

11. When you staff a fellow for a new patient appointment, how many minutes do you spend (approximately) entering data into the EMR before, during and after the encounter?

12. How long are follow-up patient visits in the fellow outpatient continuity clinic?

13. When you staff a fellow for a follow-up appointment, how many minutes do you spend (approximately) entering data into the EMR before, during and after the encounter?

Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

The EMR and Nephrology Fellow Education

14. Because of the competing time demands of EMR completion, fellows at my program are reluctant to:

| | Strongly agree | Agree | Neither agree or disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| Do procedures | ○ | ○ | ○ | ○ | ○ |
| Participate in conferences | ○ | ○ | ○ | ○ | ○ |
| Prolong patient interactions | ○ | ○ | ○ | ○ | ○ |
| Do independent case-directed literature review | ○ | ○ | ○ | ○ | ○ |

15. Because of the competing time demands of EMR completion, I am reluctant to:

| | Strongly agree | Agree | Neither agree or disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| Assist fellows with procedures | ○ | ○ | ○ | ○ | ○ |
| Participate in conferences | ○ | ○ | ○ | ○ | ○ |
| Staff fellow outpatient clinic | ○ | ○ | ○ | ○ | ○ |
| Discuss cases in detail with fellows | ○ | ○ | ○ | ○ | ○ |

## Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

### Impact of the EMR on Nephrology Fellow Education

16. In our program, fellows are at risk to exceed work hours because of time spent completing EMR documentation.

- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

17. I have observed fellow mistakes in documentation in EMR notes due to the use of "copy forward"

- Often
- Sometimes
- Rarely
- Never
- We do not have the ability to "copy forward" in our EMR

## Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

### The EMR and Nephrology Fellow Education--Your Comments

18. Please attach any other comments or suggestions you may have


## Copy of Impact of Electronic Medical Record (EMR) on Nephrology Fellowship Training: Faculty Survey

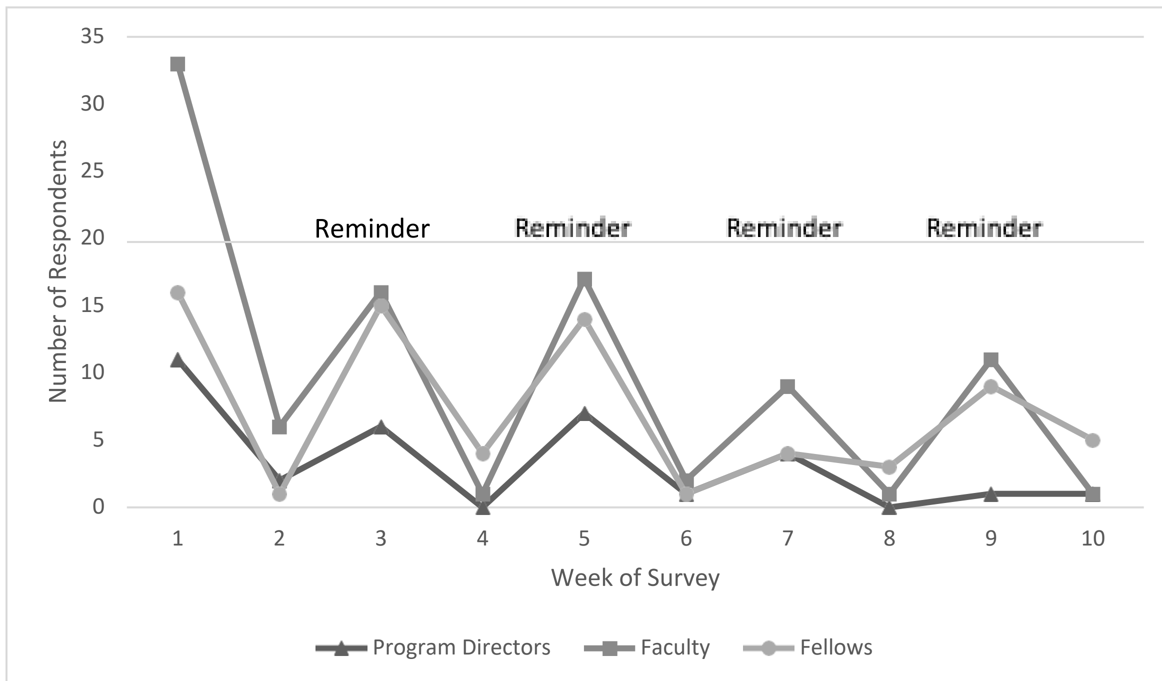

Thank you for taking the survey. Please click done if you are finished.

Supplement 4
Completion Rates for Faculty, Program Director, and Fellow Surveys by Question
(Refer to individual surveys for content of questions)

| | Faculty Response (N, %) | PD Survey | PD Response (N, %) | Fellow Survey | Fellow Response (N, %) |
|---|---|---|---|---|---|
| Q1 | 97 | Q1 | 51 | Q1 | 72 |
| Q2 | 97 (100%) | Q2 | 39 (76%) | Q2 | 71 (99%) |
| Q3 | 97 (100%) | Q3 Fwd to Fellows | 33 Yes (65%) | Q3 | 67 (93%) |
| Q4 | 94 (97%) | Q4 # Fellows | 33 (65%) | Q4 | 66 (92%) |
| Q5 | 94 (97%) | Q5 Fwd to Faculty | 32 (63%) | Q5 | 63 (88%) |
| Q6 | 90 (93%) | Q6 # Faculty | 32 (63%) | Q6 | 64 (89%) |
| Q7 | 90 (93%) | Q7 | 38 (75%) | Q7 | 64 (89%) |
| Q8 | 89 (92%) | Q8 | 38 (75%) | Q8 | 62 (86%) |
| Q9 | 88 (91%) | Q9 | 37 (73%) | Q9 NP | 59 (82%) |
| Q10 | 80 (82%) | Q10 | 37 (73%) | Q10 | 60 (83%) |
| Q11 | 80 (82%) | Q11 | 37 (73%) | Q11 FU | 59 (82%) |
| Q12 | 78 (80%) | Q12 | 37 (73%) | Q12 | 59 (82%) |
| Q13 | 78 (80%) | Q13 | 36 (71%) | Q13a | 60 (83%) |
| Q14a | 84 (87%) | Q14 | 37 (73%) | Q13b | 61 (85%) |
| Q14b | 83 (86%) | Q15a | 37 (73%) | Q13c | 62 (86%) |
| Q14c | 85 (88%) | Q15b | 37 (73%) | Q13d | 62 (86%) |
| Q14d | 84 (87%) | Q15c | 36 (71%) | Q14 | 63 (88%) |
| Q15a | 83 (86%) | Q15d | 37 (73%) | Q15 | 62 (86%) |
| Q15b | 85 (88%) | | | Q16 | 63 (88%) |
| Q15c | 84 (87%) | | | | |
| Q15d | 84 (87%) | | | | |
| Q16 | 85 (88%) | | | | |
| Q17 | 85 (88%) | | | | |
| Response Rate | 25% | | 34% | 33% | |
| Completion Rate | 84% | | 77% | 84% | |

Supplement 5.
Wave Analysis of EMR Survey: Assessment of Non-response Bias

Figure: Response Numbers vs. Week of Survey




We chose respondents who replied to the survey in the last 3 weeks (Weeks 8-10) of the survey, and compared them to those who responded in the first 7 weeks of the survey. 24% of fellows, and 13% of faculty responded during these last 3 week and are “late responders”. Although the number is small, they may be more likely to represent non-responders in the “continuum of resistance”, and provide a limited assessment of the degree of non-response bias (Halbesleben JRB & Whitman MV. Evaluating survey quality in health services research: A decision framework for assessing non-response bias. Health Services Research. 2013. 48;3(June): 913-39.)

Table: Selected Question Responses of Fellows and Faculty Responding to the Survey in Weeks 1-7 vs. Weeks 8-10. “Late responders” appear demographically similar, and similar in answer patterns to earlier responders.

| **Fellow Survey** | | | |
|---|---|---|---|
| Responses | Weeks 1-7 (N=55) | Weeks 8-10 (N=17) | P Value |
| First Year Fellows | 29 (53%) | 10 (59%) | 0.78 |
| Second Year Fellows | 26 (47%) | 7 (41%) | |
| Strongly Agree/Agree that EMR contributes positively to Nephrology Fellowship education | 23/47 (49%) | 9/16 (53%) | 0.77 |
| Because of the competing time demands of EMR completion, I am often reluctant to: (Strongly agreed/Agreed) | | | |
| Do Procedures | 26/45 (58%) | 5/15 (33%) | 0.14 |
| Participate in Conferences | 26/47 (55%) | 7/14 (50%) | 0.77 |
| Prolong Patient Interactions | 35/47 (74%) | 11/15 (73%) | 1.00 |
| Do Independent Case-Directed Study | 28/46 (61%) | 6/16 (38%) | 0.15 |
| Exceeded Work Hours Limits (Often/Sometimes) | 30/46 (65%) | 10/16 (63%) | 1.00 |
| **Faculty Survey** | | | |
| Responses | Weeks 1-7 (N=84) | Weeks 8-10 (N=13) | P Value |
| >20 years | 26/84 (31%) | 6/13 (46%) | 0.34 |
| ≤20 years | 58/84 (69%) | 7/13 (54%) | |
| Strongly Agree/Agree that EMR contributes positively to Nephrology Fellowship education | 30/79 (38%) | 6/11 (55%) | 0.34 |
| Because of the competing time demands of EMR completion, fellows at my program are reluctant to: (Strongly agreed/Agreed) | | | |
| Do Procedures | 21/74 (28%) | 3/10 (30%) | 1.00 |
| Participate in Conferences | 25/73 (34%) | 2/10 (20%) | 0.49 |
| Prolong Patient Interactions | 43/75 (57%) | 6/10 (60%) | 1.00 |
| Do Independent Case-Directed Study | 31/74 (42%) | 3/10 (30%) | 0.73 |
| Observed EMR Errors due to Copy-Forward (Often/Sometimes) | 69/75 (92%) | 9/10 (90%) | 1.00 |

Supplement 6: Survey Comments (All proprietary EMR names have been removed). Comments are recorded as they were given by respondents, and may not reflect the subject of the survey question.

Part 1. Fellow Comments (page 27)
Part 2. Faculty Comments (page 30)
Part 3. Program Director Comments (page 33)

## Part 1. Fellow Comments

| **Nephrology Fellow General Comments** |
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| Prevention decline of fellow education has less to do with EMR and more to do with overall time efficiency with relation to requirements of fellows. |
| Minimize the documentation or templates where we have to fill in the info as we are talking to the patient will help to optimize the time spent on documentation |
| Interconnectivity of all EMR's AT LEAST within a given health care institution should be mandated by Law. And this in a way that is functional. for example; an EMR may allow for "viewing as PDF" of a consult from the OPD clinic while in the hospital but would not allow for a "search" functionality as it is an image (view) of the document; therefore the user would have to read whole document searching for an item of interest, i.e. "acute kidney injury" or "cardiac catheterization". We leave months and will have left years of our lives in charting on EMR's. |
| Our EMR functions well but unfortunately have to spend way too much time documenting. Improved mobile functionality may help efficiency and our institution is currently bringing in a new mobile app which is significantly better than the old one which may help but ultimately in a given day spending 2-3 hours documenting is just notsustainable and does force you to miss out on opportunities for learning because you have too many notes to do still. |
| The amount of needed documentation limits the interaction time with the patient. |
| I really think the EMR is a wealth of information, however, with too much information, you are forced to spend time to try to "find" the information you are looking for. Additionally, patients expect you to have read ALL of their chart (which is not possible at all), and I think this is worsened because of the electronic medical record. Additionally, ancillary staff documentation (esp. notes) are not always very helpful and can detract from the time you spend looking up patients. |
| Need a New EMR Stat! |
| I wish the EMR in our clinic, the EMR in the transplant clinic and the hospital EMR were the same to allow for better and accurate patient care, not only among nephrologists but other specialties as well |
| It's painful documenting all the clinical encounter as more time is being spent in documentation than patient interaction |
| Overall I find the benefits of electronic-based medical records exceed my perception of what a paper-based system would be like (having never practiced in the pre-EMR era). This isn't to say that improvements to the EMR to streamline the work required when interacting withthe EMR cannot be made, of course. |
| The risk of over-extending hours because of documentation is likely underestimated because I'm hesitant to document those hours under "work hours." Often, the work hours documented are just the ones spent in the hospital, not the ones I spend at home writing notes. |

| I came from a country where EMRs are not widely used. I don’t know if it is good or bad to have EMR, but what I am certainly sure is that I used to spend most of my time in the hospital talking with patients and other medical teams rather than in front of a computer. I know EMRs are a great way to store information, but I think we need to find better ways to use that information to help our patients and at the same time learn more during our fellowships. |
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| The joy of education is lost due to EMR |
| Billing requirements for a note is also stressful and sometimes irrelevant to the clinical need. However I need to keep a shirt on my back. Not sure whether practicing medicine in general is worth it, let alone nephrology. |
| The Nephrology fellowship is a training process, it's not just to do a service at hospitals and get the job done. We are spending more time with EMR than a real clinical practice with patients , attending educational lectures and then fellow rounds as well . Thank you. |
| Standardization of documentation would speed up workflow and copy forward would be easier to ensure "need to be updated" sections are updated |
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| **Fellow EMR Functionality Comments** |
| build in template for our specialty (nephrology) is not available like in some of the other specialties. |
| -Inpatient EMR crashes frequently - |
| Depending on specialty, some outpatient clinic notes are posted in inpatient EMR, some are posted in outpatient EMR. Also within specialty (for ex. nephrology), fellow clinic notes are posted in inpatient EMR, whereas transplant clinic notes or attending clinic notes are posted in outpatient EMR ---- overall this can be very confusing -Communication between the inpatient and outpatient EMR is new within last few months (for ex. can view outpatient EMR notes in inpatient EMR), but sometimes this is not possible seemingly for random reasons |
| Multiple passwords, multiple log-ins. Inpatient over multiple institutions is not integrated. |
| There is often lag using EMR at our university hospital. Note templates are poorly organized and take up vast amounts of screen space. We nephrologist take up a lot of Clinical data and writing data on paper and then retyping the same data on EMR is complete redundancy and waste of time. I spend 50% of my time editing and formatting note. Poor centralized information. There are no way to customize views and information so that all relevant information is on 1 screen. outpatient encounters and emails are too many. Most important ones are Hospitalizations, ED & Office visits and surgeries/procedures. |
| Outpatient dialysis center EMR does not communicate with hospital EMR. Outpatient HD center EMR is outdated and slow with unnecessary repetitions. Outpatient clinic and hospital EMR communicate and are great. |
| Outpatient dialysis and inpatient/clinic EMR do not communicate. Is there dialysis “EMR X”? |
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| **Fellow Positive Impacts on Education Comments** |
| medications are incorrectly or not updated in EMR |
| 70% documenting and 30% patient care .... Not conducive to learning. Too many required documentation and most should auto-populate into note but doesn't. Makes me much LESS efficient with many aspects of my day |
| Med dosing we use here is based on CrCl. and it is not readily listed and I have to calculate in separately |

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| **Fellow Negative Impacts on Education Comments** |
| Only HD CRRT orders are well organized |
| EMR lengthens the documentation size (problem lists, PMH, PSH). All meticulously documented lists auto-populate into notes and make it difficult to recognize relevant history when reviewing notes (esp. from other services). |
| “EMR X”is fine. Dialysis “EMR Y” is awful |
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## Part 2. Faculty Comments

| Faculty General Comments |
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| “X EMR” is a great EMR. |
| It is very clear that trainees & other providers get most information from the EMR, rather than the patient. Mistakes are carried or copied throughout the chart, histories and exams are clearly copied. Loads of irrelevant information are templated into notes. Relevant information is not reviewed as it is automatically brought into the note. |
| Needless to say, you’ve identified a serious problem but solutions are few and there’s no going back. |
| The Notes should only contain relevant information and things that are not clinically relevant should not be in the note. |
| Use of physical exam templates encourages "documentation" of aspects of the physical exam not actually performed: very bad habit. It also discourages actually looking carefully at the patient and describing accurately the precise findings which may not be included in the drop-down template menu |
| EMR is better for billing than for pt care |
| EMR is a tool of the future and by no means it is perfect yet. Physician need to take charge and ensure that EMR are modified to suit their needs and work through the bureaucracy and IT department. In most EMRs there are unlimited customization option and ways to remove/reduce redundancies. There is no reason to write a bad note just because it is being written on EMR and not on paper. In addition, the easy of retrieval of lab/pathology/radiology via EMR is amazing. We need to embrace EMR and make it work for us, this is the only way forward. I personally never want to go back to paper charts. |
| EMR's are a fact of life in our place and I suspect most other places. There is no way we can function without them anymore |
| EMR is overall a vital tool in nephrology. it gives access to laboratory and imaging results, in a way that improves outcomes |
| EMR use has increased required physician time, as many tasks can no longer be performed by nurse, particularly order and consult entry. |
| The EMR is great and necessary, but where it was thought to be a tool to reduce documentation, it has actually exacerbated it. Information is documented multiple times over as there is so much to look for and a provider relies on "their" notes, rather than the system. Also a problem that everyone thinks that everyone else is updating the system. I see much less history taking and much more reliance on the EMR as the source of information and this can lead to errors. |
| The main daily activity of fellows and clinical faculty is to populate the EMR. Patients are incidental to this. And kidney physiology, which was once the cornerstone of our specialty, is seldom discussed. The EMR is partly to blame by displacing time that was formerly available for serious discourse worthy of a learned profession, which we are ceasing to be. |
| EMR is likely a necessary technology advance and does allow us to look up outside records with relative ease to check creatinine, old biopsy records. challenge is the very long notes which usually provides very little true added value or worse, copied forward with outdated or erroneous information. Also taking a lot longer than in the past to weave through all the records because of sheer volume. Efforts to streamline/simplify documentation such that we do not need to over document, allow attendings to edit the notes in “Y EMR” (“Institution” does not allow attendings to edit notes once trainees wrote them), will be helpful. Needs to balance/limit documentation time |

| Our EMR system is quite good. Most of the issues stem either from log-in security or from billing requirements. Also it is not always easy to pull in meaningful data into the note. |
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| The main issue with the EMR, in my opinion, is it promotes less time in actual patient/patient family contact. Extracting data from patients/family is critical to taking care of the family. Often, the EMR bypasses the need for fellows, residents, and students from learning this critical skill. I also believe trainees should have limited functionality to the use of the EMR-no templates, no drop down screens, no cut and paste option. There is a sense that critical thinking and the formation of independent thought is bypassed by all the EMR is capable of providing. |
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| **Faculty EMR Functionality Comments** |
| Too many patients have more than one medical record number making it very cumbersome to review charts |
| iPatient - The culture we have created in which the training doctors think that the patient is INSIDE the computer. |
| 1. Will not allow me to program a user specific patient profile. 2. Poor integration with “Dictation Software X” to allow for voice input because there is so much typing that joints of my hands deteriorating 3. Encourages plagiarism 4. Important information often lost in the excess verbiage contained in notes for purposes of billing |
| My main problem is the SLOWNESS and idle time. Other than that I actually like it. |
| takes more time than patient care. quality of notes from busy practitioners low because it is all templated |
| time consuming... spend too much time on EMR that can be used differently |
| We use “EMR X”, so the problems are fairly generic: 1) focus is on billing, not accuracy of clinical information 2) redundant fields that don't contribute to clinical care and that no one updates 3) medication lists that are difficult to update and maintain 4) difficulty with placing certain orders, such as outpatient infusion orders |
| the EMR appears sometimes booby-trapped, i.e. there are loopholes in it where relevant information can evade attention, or orders be transmitted incorrectly. Moreover, tests results can be lost in the cyberspace if not routed to the ordering physician in the right way |
| Too many different EMRs. All different in 3 different practice settings, 2 hospitals and 1 outpatient clinic. None communicate with the other. |
| The focus of trainees has shifted from knowledge and human aspect to screens. There is an unprecedented decline of the quality that trainees obtain. Their ability to extract relevant information form medical record is at all-time low. This is, in part, caused by the amount of junk data inserted in every note. |
| Different EMR for dialysis which is different than in/outpatient. The dialysis one has problems, the other is good. |
| Log in procedure to a new workstation is very long. If I am rounding on a patient and would like to look something up quickly or put in an order, it can take several minutes to log in! |
| Other providers that have access to the EMR can alter/undo work that has been set up for a given patient by me in the common areas of the chart. |
| Our EMR (we have two) does not permit nuanced physical exams or history. Clicking boxes does not convey the more pertinent facts. |
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| **Faculty Positive Impacts on Education Comments** |

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| Without an EMR it would be extremely difficult to allow adequate transitions of care and visibility of pt data among an interdisciplinary team. |
| I definitely would not want to go back to paper charts (I remember spending time during pre-rounding as a fellow trying to track down patient binders) but the current EHR could be improved. |
| Trending labs and especially in a graphical form is really helpful. |
| The medications are NOT reconciled in the EMR. We spend more time doing this in Nephrology Clinic with the fellows (or our own clinics) from other encounters than should be necessary. Too many discontinued meds still on active list, etc. Others missing. EMRs do not seem to improve communication. If anything, it delays communication since the notes are cumbersome and written later AFTER rounds so the primary teams do not see the changes. We end up calling each PCP or primary team to let them know our recommendations so it doubles the work. Sometimes it seems no one reads the communications except for the coders and billers. |
| Easy access to years of lab, ex-ray, and other clinical data. |
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| **Faculty Negative Impacts on Education Comments** |
| As faculty at our Hospital X affiliate, I see Fellows struggling with lack of familiarity. |
| contributes directly and substantially to burnout |
| If EMR has the capability of entering the information in the note real-time as you are reviewing the information in morning about interval events, vitals, labs and medication administration as we used to do in the paper chart - EMR can be very useful; however, it doesn't have that degree of capability and providers end up spending duplicated time on the charting. |
| Different EMRs at our different hospitals and in our OP HD units do not share information thus making the fellows access multiple EMRs to obtain pertinent clinical data at times |
| Dialysis EMR does not communicate with the rest. |
| The copy forward feature distracts from the CURRENT issue at hand and only serves to provide info for billing. Important data are lost in the forest for the trees. The timeliness is very bad and ability to access at home is a double edged sword. Our fellows do home call so access to the record is very helpful but doing notes at home blurs the work-study-rest times especially for individuals who are not disciplined. |
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## Part 3. Program Director Comments

| Program Director General Comments |
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| The current state of the EMR is in no way a tool to augment learning in a specialty as complex as ours. Very little interoperability. |
| The EMR has tremendous value in delivery of patient care and education in training programs. However, there are components that should not be accessible to trainees, specifically the "cut and paste" properties most EMR's permit. Having been around when paper charts were all that were available, I raise concern that we are minimalizing the importance of critical thinking, formative thought, and comprehensive care delivery to patients since the EMR template and cut and paste properties permit pre-formed "thought" in the Assessment, Plan, and Recommendations portions of the Consult or Physician note. I personally believe "cut and paste" should not be made available to physician trainees and Critical and Formative thought and Plan (usually labeled ASSESSMENT AND PLAN/RECOMMENDATIONS, respectively in Templates) should be left blank and require direct input by the physician based on knowledge, critical thought, applicability of that thought to patient care, and a work-up/meds/interventions relevant and specific to the patient |
| It is the need for documenting lengthy notes for billing that is the problem, not the EMR. No one would be against having a data base of all patient info that is easily accessible and secure. We need to change the requirements for note writing. |
| I did recently clean out my office and found progress note paper and old paper orders. The EMR is definitely better than the old system but needs to be streamlined and focus brought back to patient care. |
| Slows down the day considerably. Half of their day is spent in note writing - the attending attestation happens much later and prolongs the day for us too. Lot of irrelevant material is added on for billing which make them difficult to read and notes do not look appealing and concise. |
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| **Program Director EMR Functionality Comments** |
| We use 2 EMRs; for outpatient we use “EMR X” and for inpatient we use “EMR Y”. Both systems are fraught with problems, the biggest one is that it just takes too long to write a note. The second major problem (not included above) is that in both cases it is very difficult to view data while writing your note (in “X” this is impossible; in “Y” you have to move the note aside and try to look 'behind' it). In nephrology, this is a major, major problem as we are a data driven subspecialty The EMRs are both overly complex, slow, and have antiquated interfaces, a confluence of awfulness that makes it a struggle to get the note out. You feel as though you are fighting with the EMR just to get your note written. This doubles or triples the time to write the notes and subsumes your out of clinic and out of hospital time with note writing. I spend hours outside of work just inputting my notes and I am tech savvy and my typing speed is around 80 wpm. (I often wonder why none of these companies have hired ex-Google or ex-Apple designers just to improve interface.) “Y” crashes 3-4 or so times during a day. On a busy service, with the attending covering 30 to 35 patients, this is infuriating. Why the crash occurs near the end of inputting a note is unclear, but this is time that I will never get back. “X”, in our system, has days where it just keeps crashing--on the bright side, the “X” engineers couldn't fix this but at least it saves 98% of what you put into the system so when the thing recovers almost no inputted information is lost. The crashing problem seems to happen 3 or 4 days every couple of months and seems to correlate with updates. Eventually, they must release a patch and for the most part it stays open. For whatever reason, “X” main |

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| day-to-day problem has to do with connectivity--printing does not always work to the local printer for lab slips and after visit summaries (required at our institution), Fax capabilities intermittently don't work or only send part of the fax, and recently we have been having intermittent problems with electronically prescribed meds getting to the pharmacy. Home connectivity to both systems is a bear. Both have to be 'Citrixed' into and the connections from home are more iffy than the ones at work. Crashing, due to Citrix disconnections, seems to be the rule and this happens two or three times in the space of the added 3-4 hours in my day |
| copy forwarding of notes results in incorrect information propagated in EMR |
| Problem is not EMR, it's the requirement of documenting irrelevant information. If we needed to write one paragraph on our assessment and recs, there wouldn't be any issues with EMR. |
| We transitioned from "EMR X" to "EMR Y" and it has been disastrous. We have no ability to electronically fax our consult notes, order tests (they must be printed by the MA and then manually faxed), and the number of clicks is insane. We have clearly devolved |
| Awful text editor. Preformatted notes are awful and cannot be edited. Generally terrible ergonomics and layout. |
| prescription ordering system is quite tedious with may alerts that require clicking and duplication of orders required and complex medical reconciliation required |
| Not very user friendly and does not follow the usual flow of a soap note. Does not import prior medications or history accurately. Designed for coding NOT note writing. |
| Notes of different types are difficult to locate (not indexed well). Outside records are poorly indexed/categorized. Multiple user interface problems (i.e. it's obvious that the interface was not designed with effective clinician input) |
| Copy and paste errors that are actually propagated by the system. Remote access glitch |
| The EMR detracts from synthesis of the data and answering of the clinical question. There is just a lot of junk in there |
| Dialysis EMR and EMR X do not communicate with each other. |
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| **Program Director Positive Impacts on Education Comments** |
| Given that we are using "X" (has that new Windows 2000 appeal) and "Y" (that 1995/Netscape 2.0 feeling) the EMRs are not very customization, slow us down big time, and the time we have to put into that nonsense at some point takes away from medical education. The EMR sort of becomes a thing in and of itself. Remote access to data is the major advantage in our institution. That and trending data. |
| Comments: -nephrology fellows should NEVER use the EMR to determine medications as the medication lists usually do not reflect how patients take medicines -Problem lists are full of billing diagnoses -We have no way of tracking individual outcomes at patient level for quality indicators. EMR support staff are overwhelmed? -no one reads notes b/c they are full of garbage and because people write notes so late. We have (de)evolved to oral-based communication. |
| With conversion to "EMR X", we no longer have the ability to track patient diagnoses/ensure quality indicators are met for CKD patients, or use for retrospective data-base reviews. It is quite possibly the worst EMR in existence |
| trains them on use of EMR which will be required of them in the future as well. Allows legible information from all services. Tracks our hemodialysis monthly history events |

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| Home access only works if VPN is functional. The EMR does allow for better review of the medical record in that we can access notes, radiology results, and lab written by and ordered by other specialties easily. |
| Allows transfer of information including from outpatient to inpatient but also other institutions (care everywhere). Problem is so much information that is repetitive that takes time and may be incorrect if just carried forward without checking |
| don't get me started! -the medication lists are always wrong. Providers assume someone else has verified the meds, the patient is confused about what they are actually taking...the list goes on and on. The med rec needs to be personally done by the nephrologist -The problem lists are useless bc they cannot be adjusted to a specific area, so there is a lot of old or not-relevant problems. You have to hunt thru a long list of randomly ordered problems. I just want to have the "neph problem list" that can only be adjusted by neph. -we have no way of downloading quality indicators from "EMR X" for the nephrology fellowship. Despite the fact that "EMR X" is a national tool, and that teaching institutions all need to give patient based PBLI data to their fellows, each site must re-invent the wheel to do so. Wasted time and effort for both local EMR X programmers and on program directors. This is a HUGE failing in my eyes for the corporation. -I would not trust using eGFR in the hospital to dose meds- what if they have anuric AKI and Cr is 2 from 1 the day before? -BC of all of the above plus the fact that many people don't get notes done until later in the day, no one ever, ever reads the chart anymore. The chart is now a repository for cut and pasted junk without any synthesis of what is actually going on. It would be comical if it weren't so sad. |
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| **Program Director Negative Impacts on Education Comments** |
| I was instrumental in developing the CRRT orders for EMR X in our institution. In spite of working on this extensively, inputting the orders is horrific. The distinct advantage, though, is that the orders can be adjusted from home (no need for a fellow to go in) and that now everyone can see the prescription. I'm not interested in going back to paper. But the system is just terrible and not easily customizable. Again, the interface really needs to be fixed. Copying and pasting is the BANE of my existence; as is getting my other attendings to truly supervise and actually READ the fellows' notes and correct them or have the fellows correct them. This is an ongoing battle with the fellows and we have CT results listed in the same note that says the CT scan is pending and problem lists that don't seem to change in spite of changes in the course. These days, generally, there is one history that is taken at some point in the ER and everyone seems to copy and paste it ad infinitum. This has apparently replaced talking to the patient and actually eliciting a history. It leads to horrible patient care and it is totally unbillable--I have had many conversations with just about every fellow in our program about doing their own work. Again, few other attendings in our program actually read the fellows' notes. The fellows are still mystified as to how I knew they copied and pasted. (They probably had the same look that was on my face in 3rd grade when my teacher somehow, psychically knew that I copied the report word for word from the encyclopedia. The difference is, however, I stopped copying since the single incident. The fellows keep on plugging, as they forget that I'm checking because most of our attendings just don't) |
| I value continuity of care but also feel fellows (and faculty:) need downtime. I find that fellows will not sign out when they are not on call as they plan to just follow and "take care of it themselves". While noble this leads them to not having any true time off. The logging of time worked at home becomes very murky as someone may be able to write all their notes |

undistracted or they may be trying to cook dinner, take care of kids, watch TV. Writing notes at home always takes longer.