<u>**Project Title:**</u>	Minimizing Stress, Maximizing Success of Physician's Use of Health Information and Communications Technologies **Final Report**
<u>**Team Members:**</u>	Philip Kroth, Principal Investigator Mark Linzer, Co-Investigator Nancy Morioka-Douglas, Co-Investigator Sharry Veres, Co-Investigator
<u>**Organization:**</u>	The University of New Mexico Health Sciences Center
<u>**Inclusive Dates of Project:**</u>	June 1, 2014 – May 31, 2017 June 1, 2017 – May 31, 2018 (No-cost Extension)
<u>**Grants Management Specialist:**</u>	Anna Caponiti
<u>**Program Official**</u>	Derrick Wyatt
<u>**Acknowledgement of Agency Support:**</u>	Agency for Healthcare Research and Quality
<u>**Grant Award Number:**</u>	1 R18 HS22065-03

ABSTRACT

Purpose: Identify the features of health information and communications technologies (HICT) such as electronic health records (EHR), web-based clinical systems, and smartphone technologies that are most associated with clinician stress and burnout. Identify effective coping strategies of these clinicians in dealing with the stress caused by HICT.

Scope: This research focuses on clinicians who work in the outpatient, ambulatory setting and who work in internal medicine and its subspecialties, pediatrics and its subspecialties, and family and community medicine.

Methods: Phase 1: conduct focus groups at three institutions that use three different EHRs vendors to identify the aspects of HICT they feel are most associated with stress and burnout (41 clinicians in six groups, 2 groups at each institution). Phase 2: Conduct a survey of 450 clinicians to drill down on the results from Phase 1. This includes quantifying self-reported time outside of duty hours required to complete required clinical documentation tasks. Determine the association between job stress and HICT use and the use of effective coping strategies.

Results: Clinicians overwhelmingly agree that HICT is a significant source of their work stress and increases burnout. Coping strategies such as good self-care, exercise, and resiliency training help somewhat but HICT stress is having an overall negative impact on clinician job satisfaction, burnout, and worklife balance. A significant amount of time is usually required outside of duty hours to complete routine clinical documentation.

Key Words: Electronic Health Record, Burnout, Job Stress, Worklife

PURPOSE

Our long-term goal is to inform the design of HICT to help mitigate the stress and burnout associated with its use. We also seek to define and promote coping strategies that users indicate help mitigate HICT related stress. This will in turn support the benefits of HICT on patient quality and cost, all while assuring the general wellness of its users. The first step is to learn more about stresses brought on by HICT in the practice of medicine. We will also identify clinician strategies for successfully coping with the stresses of HICT. Managing user stress, fatigue, and other unintended consequences are going to be essential as HICT becomes integral to the practice of medicine. Our specific aims are:

1) Identify and characterize points of stress on practitioners associated with the use of advancing health information and communications technologies. This aim will be accomplished by elucidating specific HICT features or functions that are associated with stress to providers of health care a) during the routine office visit and b) outside the clinic disrupting work-life balance.

2) Identify the coping strategies practitioners use to effectively manage the stress associated with the use of advancing health information and communications technologies. This aim will be accomplished by identifying coping mechanisms health care providers have found helpful in mitigating the stress caused by the use of HICT while maintaining workflow in the office and work-life balance at home. Identifying and disseminating successful coping strategies may benefit other HICT users experiencing HICT stress.

3) Determine the association between stress on practitioners and a) the use of information and communications technologies; and, b) the use of coping strategies to effectively manage stress associated with the use of health information and communications technologies. This aim will be accomplished using the validated stress scale developed by Motowidlo along with the scales developed as part of specific aims 1 and 2. Variables indicating that HICT is an important cause of stress and variables representing coping strategies will be included as explanatory variables in regression analyses to determine the magnitude of an association between the measures while adjusting for other sources of stress.

SCOPE

Physician stress and burnout levels are alarmingly high. A study of primary care clinicians in 2009 showed that "More than one half of the physicians (53.1%) reported time pressure during office visits, 48.1% said their work pace was chaotic, 78.4% noted low control over their work, and 26.5% reported burnout. Adverse workflow (time pressure and chaotic environments), low work control, and unfavorable organizational culture were strongly associated with low physician satisfaction, high stress, burnout, and intent to leave." (1) High physician stress impacts their health, professional performance, and the quality of care they can provide.(2-11)   More recently in 2015, Shanafelt et al showed that 54% of US physicians reported at least 1 symptom of burnout and that this level had increased significantly from 46% in 2011.(12)

Previous research has demonstrated how information and communication technologies can cause user stress and negatively impact user health and productivity in the business domain (13-21). As physician work becomes more centered on health information and communications technologies (HICT), and physicians spend more time using HICT, it becomes important to determine what elements of HICT are associated with user stress and what strategies can mitigate this stress.

A time-motion study of medical interns demonstrates how patient care is becoming more HICT-centered: interns spend only 12% of their time on direct patient care but 64% on indirect care.   "Computer use" occupied 40% of their time.(22)

Another study demonstrates how information chaos affects quality of care and physician performance: "Information chaos … is not just inconvenient, annoying, and frustrating; it has implications for physician performance and patient safety."(23) A meta-analysis of surveys conducted by the American College of Physicians showed rising physician dissatisfaction with workload and electronic health records (EHRs) in particular.(24) While the amount of data used per medical decision is increasing exponentially, the amount of time allocated per patient is not expanding to accommodate this increased information processing required, thus leading to clinician time pressure.(25) This trend is likely to continue with the increasing complexity EHRs and documentation requirements. (26)

Our primary goal was to identify and characterize the features of HICT used by primary care clinicians in the ambulatory setting that are most associated with user stress and burnout. We also sought to identify clinician strategies for coping with the HICT-related stresses identified.

METHODS

Focus Groups (Phase 1):

We performed 2 clinician focus groups at 3 separate institutions each with a different EHR vendor:

1) *Centura Health Physician Group* is a large multispecialty group in Colorado and Western Kansas, with multiple geographically dispersed practices and an extensively deployed Meditech EHR.
2) *University of New Mexico* is a federally designated Hispanic-serving institution that uses a Cerner EHR system.
3) *Stanford University Medical Center* is a large academic site with an Epic EHR.

Subject Recruitment

We recruited focus group subjects through distributions of paper flyers to clinical areas, email lists, announcements at institutional gatherings, and word of mouth. The target group was those physicians in family medicine, internal medicine, pediatrics, and the subspecialties of the latter two groups, who practice in the ambulatory setting. We also invited Nurse practitioners and physician assistants working in the same settings to participate. We invited no residents or other trainees. We provided participants snacks and received a $50 gift card for participating in the 90-minute sessions.

Focus Group Design and Operation

We developed draft focus group questions and follow up probes by the investigator team that included experts in physician worklife, clinical informatics, health services research, qualitative research, and biostatistics. We tested questions and probes using a calibration focus group at the University of New Mexico. We recruited participants for this group in the same manner as participants for the other focus groups. Participants in the calibration group did not participate in any other subsequent group. The investigators and the group facilitator had a face-to-face meeting to review the de-identified transcript of the calibration group to refine the draft questions and probes before deploying the groups at all three institutions. We used the refined questions in the subsequent six groups.

We asked focus group participants to complete a short, anonymous survey based on the previously validated Mini-z instrument that measures clinician stress, burnout, basic demographic and practice information as well as several burnout predictors (e.g., level of control, time pressure, and office chaos).(27, 28) Trained focus group facilitators who were not members of the investigator team led all focus groups. The team produced a detailed focus group manual that specified exactly how the focus groups were to be conducted based on current best practices.(29) The investigator team did not have access to the audio files that were deleted after de-identified transcripts were produced.

Analysis Process

We analyzed the focus group de-identified transcripts using a formal content analysis to identify common themes. The authors held numerous conference calls to discuss identified themes that they then sorted into five categories:

1) HICT successes
2) Stressors related to HICT use
3) Personal consequences (outcomes) of HICT use (especially ergonomic consequences)
4) Recommended organizational changes
5) Personal coping strategies

Survey (Phase 2):

The output of Phase 1 of the study (the focus groups) informed the design of the survey instrument. The instrument's design also incorporated a previously validated instrument, the Mini-z, an instrument developed by Co-I Linzer and others to assess physician stress and propensity for burnout. Attached is a copy of the survey instrument we developed for the MS-Squared Study as Appendix 1 of this report.

Each institution (UNM, Centura Health, and Stanford) assembled a list of all clinicians from five areas (family medicine, general internal medicine, general pediatrics, internal medicine subspecialties and pediatric subspecialties) who met the inclusion and exclusion criteria described earlier. The lists of survey targets were generated from departmental listings and publically available institutional websites.   Clinician lists were randomly permuted by institution and area to achieve balance amongst institutions and areas. The first 30 names by institution and area (150 total for each institution) were contacted as described below. This constituted the first wave of the survey where the number of clinicians invited was evenly weighted amongst the five groups listed above. Unfortunately, there were not a sufficient number of internal medicine and pediatric subspecialists at the Centura site to reach 150 so this site filled in this deficit with family and community medicine physicians. (450, 3-site total)

The survey was sent out first electronically using the REDCap survey system with three, 2-week reminders. Non-responders to the electronic survey received a paper survey in the postal mail with paper non-responders receiving a repeat paper survey after 6 weeks.

After wave 1 of the survey was complete, there were sufficient resources remaining to survey the clinicians on the three institutional lists who were not randomized to the first wave of the survey. This comprised wave 2 of the survey (n = 223). Although these clinicians were not equally weighted between the 5 defined specialty groups, we believed that adding more respondents outweighed the value of equally balancing the survey group by medical specialty. We tested responses from Wave 1 and Wave 2of the survey to test for statistically significant differences between responses from the originally planned group and the additional 223.

RESULTS

Focus Groups (Phase 1):

Of the clinicians, 72% were women, 95% were physicians, and 73% worked in primary care for an average of 11 years. Only 22% indicated sufficient time for documentation. Fifty-six percent noted "a great deal of stress" because of their job. Forty-two percent reported "poor" or "marginal" control over workload. Even though 90% reported EHR proficiency, 56% indicated EHR time at home was "excessive" or "moderately high." Focus group themes included HICT "successes" where all patients' information is in one place and accessible from multiple locations. HICT "stressors" included inefficient user interfaces, slow system response times, lack of interoperability between systems, broken hardware, and large amounts of required data entry. "Outcomes" included ergonomic problems (e.g., eyestrain and hand, wrist, and back pain), dispirited primary care clinicians, and decreased attractiveness of primary care. Suggested "organizational changes" included EHR training, improved HICT usability, and scribes. The "Personal/Resilience" theme included self-care (e.g., exercise, maintaining work-life boundaries, and positive thinking).

Attached, as Appendix 2 is a table that summarizes the themes we identified from the formal content analysis we preformed. We authored a paper that was published in the inaugural issue (July 2018) of the new open access Journal of the American Medical Informatics Association "JAMIA Open". We also previously presented preliminary findings as a scientific abstract at the AMIA iHealth Meetings in Minneapolis MN May 5, 2016. These results were also the focus of two workshops, one at an international conference on EHR stress hosted by Brown University in March 2017 and subsequently at the SGIM annual meetings in Washington, DC, April, 2017. These workshops were well received, with substantial amounts of audience participation and a large turnout for both.

Survey (Phase 2):

Wave 2 of the survey closed July 31, 2017. Statistical testing of responses from Wave 1 and Wave 2 showed no significant difference between these two waves of the survey so we will report Wave 1 and Wave 2responses pooled together. The biostatistical analysis of the survey data is completed. We presented a peer-reviewed abstract and podium presentation with preliminary findings at the annual meeting of the Society of General Internal Medicine (SGIM) on April 12, 2018 in Denver, CO. We also included some preliminary results in the workshop we were invited to give at the Institute for Healthcare Improvement (IHI) Summit on April 27, 2018 in San Diego, CA.

The following are the current response rates for Waves 1 and 2 of the survey. Note that we removed survey targets from the denominator if the target was not valid, (e.g., deceased, left institution, discovered to not be within survey inclusion criteria).

Wave:	Responders:	Valid Survey Targets:	Response Rate:	Close Date:
I	206	420	49.05%	3/21/2017
II	69	223	30.94%	7/31/2017
Total	**275**	**643**	**42.77%**	**--**

We are currently preparing a manuscript to present the findings from our survey we plan to submit to the Archives of Internal Medicine. The following is a summary of our survey findings:

We surveyed 643 clinicians with a 43% completion rate. Of the respondents, 74% were physicians, 12% mid-level providers, and 13% unspecified; 58% were female and 60% worked in primary care (GIM, general pediatrics and family medicine). The most prevalent HICT challenges were excessive data entry (88%), inaccessible information from multiple institutions (85%), notes geared toward billing (78%), note bloat (77%), worklife balance (64%), posture (53%) and pain due to HICT use (48.7%). Exercise (70%), talking with others (70%) and setting work boundaries (60%) were the most prevalent coping strategies. Six HICT factors were associated with clinician stress: information overload ($p = 0.001$), slow system response time ($p<0.001$), excessive data entry ($p<0.001$) inability to navigate the system quickly ($p<0.001$), fear of missing something ($p<0.001$), and notes geared toward billing instead of patient care ($p<0.001$). Velicer's MAP test indicated one factor was appropriate for these six items (Omega=0.75, [95% CI 0.70, 0.79]). A HICT stress scale (HSS) using the mean of the six factors was associated with a significant increase in stress (0.54 clinician stress unit/one HSS unit, [95% CI 0.38, 0.70], $p<0.001$, $R^2=0.14$). The odds of burnout were 2.0 times greater per unit increase in HSS ([95% CI 1.3, 3.1], $p=0.001$, Nagelkerke $R^2=0.05$). No coping strategy identified systematically reduced clinician stress after adjusting for multiple comparisons.

EHR stress contributes to overall stress and burnout. Specific factors such as information overload, fear of missing important data, note bloat and notes geared toward billing are associated with increased stress, and could be effective targets for efforts to reduce stress and burnout. A six question "HICT stress" scale may be a useful tool to measure and monitor HICT related stress.

LIST OF ALL PUBLICATIONS AND PRODUCTS

Focus Groups (Phase 1):

1. Kroth P, Morioka-Douglas N, Veres S, Pollock K, Babbott, S, Poplau S, Corrigan K, Linzer, M. The electronic elephant in the room: Physicians and the electronic health record. JAMIA Open.
2. Linzer M. Webinar for AHRQ. 15 years of research in working conditions, clinician reactions and quality of care. Presented to the Research Unit of AHRQ, May 31, 2017.
3. Babbott S, Kroth PJ, Linzer, M, Poplau S. What we know and what we can do about electronic health records, clinician stress and burnout. SGIM Annual Meeting 2017: Resilience & Grit - Pursuing organizational change & preventing burnout in GIM, Washington, DC. April 21, 2017. (Peer Reviewed Abstract and Presentation)
4. Babbott S, Corrigan K, Kroth, PJ, Morioka-Douglas N, Veres S. Symposium on factors associated with the use of health information and communications technologies & clinician stress & burnout: What we know & what we can do. The patient, the practitioner, and the computer: Holding on to the core of our healing professions in a time of technological change conference, Providence, RI. March 17, 2017. (Peer Reviewed Abstract and Presentation)
5. Kroth PJ. Factors associated with clinician stress and burnout: Results from the MS-Squared Study (Minimizing Stress, Maximizing Success from Health Information and Communications Technologies). Park Nicollet Health System, Minneapolis, MN, July 12, 2016. (Invited Presentation)
6. Kroth PJ, Morioka-Douglas N, Veres S, Pollock K, Linzer M, Poplau, S. Factors associated with clinician stress and burnout: Results from the MS-Squared Study (Minimizing Stress, Maximizing Success from Health Information and Communications Technologies). American Medical Informatics Association iHealth 2016 Clinical Informatics Conference, Minneapolis, MN, May 5, 2016. (Peer Reviewed Abstract and Presentation)
7. Kroth PJ. Factors associated with clinician stress and burnout: Results from the MS-Squared Study (Minimizing Stress, Maximizing Success from Health Information and Communications Technologies). Hennepin County Medical Center Wellness Initiative Speaker Series, Minneapolis, MN, May 4, 2016. (Invited Presentation)
8. Kroth PJ. User design issues with health information and communication technologies. Translational Informatics Workshop: Drug, Target, Disease, Population: How Informatics Can Impact Healthcare, Albuquerque, NM, February 18, 2015. (Invited Presentation)

We developed a section of UNM's **Digital Repository** to publically archive scholarly content not destined for peer-reviewed journals. We have uploaded the brief physician stress survey instrument we used in the focus groups and the focus group questions along with their probes to this study's digital repository hosted at the University of New Mexico. This makes the survey instrument(28) and the focus group questions(30) freely available in perpetuity:

http://digitalrepository.unm.edu/ms2/

Survey (Phase 2)

1. Kroth PJ, Morioka-Douglas N, Veres S, Pollock K, Babbott S, Poplau S, Corrigan K, Linzer M. The electronic elephant in the room: Physicians and the electronic health record. JAMIA Open. 2018 Jul; 1(1):49-56. PMC Journal - In Process
2. Kroth PJ. How to improve EHR-related physician stress, burnout, and turnover. Learning Lab 3. IHI Summit. San Diego, CA. April 27, 2018. (Invited workshop)

After we publish the survey results, we intend to upload the phase 2 survey instrument to the UNM digital repository, making it freely available in perpetuity at that time.

REFERENCES

1.   Linzer M, Manwell LB, Williams ES, Bobula JA, Brown RL, et al. Working conditions in primary care: physician reactions and care quality. Ann Intern Med. 2009 Jul 7;151(1):28-36, W6-9.

2.   Wallace JE, Lemaire JB, Ghali WA. Physician wellness: a missing quality indicator. Lancet. 2009 Nov 14;374(9702):1714-21.

3.   Lemaire JB, Wallace JE, Dinsmore K, Roberts D. Food for thought: an exploratory study of how physicians experience poor workplace nutrition. Nutr J. 2011;10(1):18. PMCID 3068081.

4.   Wallace JE, Lemaire J. Physician well being and quality of patient care: an exploratory study of the missing link. Psychol Health Med. 2009 Oct;14(5):545-52.

5.   Firth-Cozens J, Greenhalgh J. Doctors' perceptions of the links between stress and lowered clinical care. Soc Sci Med. 1997 Apr;44(7):1017-22.

6.   Firth-Cozens J. Interventions to improve physicians' well-being and patient care. Soc Sci Med. 2001 Jan;52(2):215-22.

7.   Gundersen L. Physician burnout. Ann Intern Med. 2001 Jul 17;135(2):145-8.

8.   Levin S, Aronsky D, Hemphill R, Han J, Slagle J, et al. Shifting toward balance: measuring the distribution of workload among emergency physician teams. Ann Emerg Med. 2007 Oct;50(4):419-23.

9.   Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. Ann Intern Med. 2002 Mar 5;136(5):358-67.

10.   Wetterneck TB, Linzer M, McMurray JE, Douglas J, Schwartz MD, et al. Worklife and satisfaction of general internists. Arch Intern Med. 2002 Mar 25;162(6):649-56.

11.   Williams ES, Manwell LB, Konrad TR, Linzer M. The relationship of organizational culture, stress, satisfaction, and burnout with physician-reported error and suboptimal patient care: results from the MEMO study. Health Care Manage Rev. 2007 Jul-Sep;32(3):203-12.

12.   Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. Mayo Clin Proc. 2015 Dec;90(12):1600-13.

13.   Thomee S, Harenstam A, Hagberg M. Mobile phone use and stress, sleep disturbances,and symptoms of depression among young adults -- a prospective cohort study. BMC Public Health. 2011;11:66. PMCID 3042390.

14.   Thomee S, Eklof M, Gustafsson E, Nilsson R, Hagber G. Prevalence of perceived stress, symptoms of depression and sleep disturbances in relation to information and communication technology use amoung young adults - An explorative prospective study. Computers in Human Behavior. 2007;23(3):1200-321.

15.   Ragu-Nathan TS, Tarafdar M, Ragu-Nathan BS, Tu Q. The consequences of technostress for end users in organizations: conceptual development and empirical validation. Information Systems Research. 2013;19(4):417-33.

16.   Yun H, Kettinger WJ, Lee CC. A new open door: The smartphone's impact on work-to-life conflict, stress, and resistance. Int J Electronic Commerce. 2012;16(4):121-51.

17.   Arnetz B, Berg M, Arnetz J. Mental strain and physical symptoms among employees in modern offices. Arch Environ Health. 1997;52:63-7.

18.   Ganster DC. Work stress and employee health. Journal of Management. 1991;17(2):235-71.

19.   Tarafdar M, Tu Q, Ragu-Nathan B, Ragu-Nathan T. The impact of technostress on role stress and productivity. J Manage Inf Syst. 2007;24(1):301-28.

20.   Cooper C, Dewe P, O'Driscoll M. Organizational stress: A Review and Critique of Theory, Research, and Applications. Thousand Oaks, CA: Sage; 2001.

21.   McGrath J. Handbook of Organizational and Industrial Psychology. Chicago, IL: Rand McNally; 1976.

22.   Block L, Habicht R, Wu AW, Desai SV, Wang K, et al. In the Wake of the 2003 and 2011 duty hours regulations, how do internal medicine interns spend their time? J Gen Intern Med. 2013 Apr 18

23.   Beasley JW, Wetterneck TB, Temte J, Lapin JA, Smith P, et al. Information chaos in primary care: implications for physician performance and patient safety. J Am Board Fam Med. 2011 Nov-Dec;24(6):745-51. PMCID 3286113.

24.   American College of Physicians. Survey of Clinicians: User satisfaction with electronic health records has decreased since 2010. 2003 [6 may 2013]; Available from: http://www.acponline.org/pressroom/ehrs_survey.htm.

25.   Stead W, editor. Beyond expert-based practice. IOM Annual meeting summary: Evidence-based medicine and the changing nature of healthcare; 2007; Washington, DC: The National Acadamies Press 2008: Institute of Medicine.

26.   Hsiao C-J, Hing E. Use and characteristics of electronic health record systems among office-based physician practices: United States, 2001–2013, NCHS Data Brief No. 143. 2015 [updated 6 Nov 2015; cited 2016 March 9]; Available from: http://www.cdc.gov/nchs/data/databriefs/db143.htm.

27.   Linzer M, Poplau S, Babbott S, Collins T, Guzman-Corrales L, et al. Worklife and wellness in academic general internal medicine: Results from a national survey. J Gen Intern Med. 2016 Sep;31(9):1004-10. PMCID 4978678.

28.   Kroth PJ, Morioka-Douglas N, Vares S, Pollock K, Babbott SF, et al. MS-Squared Focus Group Survey Instrument. 2014 [cited 2017 7 Feb]; Available from: http://digitalrepository.unm.edu/ms2/1/.

29.   Kruger RA, Cassy MA. Designing and conducting focus group interviews. Social Analysis, selected tools and techniques. 2002;4(23):4-24.

30.   Kroth PJ, Morioka-Douglas N, Vares S, Pollock K, Babbott SF, et al. MS-Squared Focus Group Questions and Probes. 2014 [cited 2017 22 Feb]; Available from: http://digitalrepository.unm.edu/ms2/2/.

APPENDIX 1 – FOCUS GROUP THEMES IDENTIFIED

HICT successes	Stressors related to HICT use	Personal consequences (outcomes) of HICT use (especially ergonomic consequences)	Recommended organizational changes	Personal coping strategies
• Patient trends, medical images & pictures • Messaging (colleagues, patient status, patient connections) • References, research • Access for all info • Allergy alerts; drug interactions • Filters • Legibility • Training/mentoring • Quality of care (ambivalent)	• Click boxes, too many clicks • Short visits, no time to reflect • Doctor-patient interactions • EMR built for billing rather than patient care (thought process lost) • Note bloat (cut and paste) • EMR at home, home not restful, hard to disconnect • IT staff not knowledgeable of clinical issues • Lose lunch, staying late • Too many screening questions • Interoperability (between hospitals) • Hard to find things in chart, fear of missing something • No clear spot for required activities (e.g. foot exams) • Computer slowdowns • Scanned info lost • No printers in rooms • Stress – "when can I do my notes"? • Population management compromises care of individual patient • Productivity down due to EHR • Need for workarounds/speed • Problem list maintenance • Lack of standardized data curation • Redundancy	• Pain: wrist, neck, back, eye, shoulders, headaches • Posture • Sleep troubles • Anxiety (regulations, missing things, when to write notes) • Providers dropping out of primary care • Primary care less attractive to students	• Go talk with someone, less pinging • Highlighting key findings • Artificial intelligence • Auto-billing • Badge or fingerprint login (tap and go) • Touchscreen functionality • Care team work to top of license, staff support with In-basket, MAs write orders (watch out for consequences for support staff) • Recurring IT training, including "elbow to elbow" • Desk top slots to catch up on EMR • Decrease # of clicks • Chat room with specialists • Scribes/documentation support (help with data input) • Customizable EMRs • Increase connect time with patients (e.g. printers in rooms)	• Swimming, spinning, exercise – Self care • Set limits, be intentional about work, protect home time, sharpen work/life boundaries • Have routines, walk at lunch • More concise notes/empowerment around note writing • When I'm there I'm there, when I'm not, I'm out. • Don't respond quickly • Think positively • Remember what you cannot control • Take the training and retraining • Customizing your EHR • Talk with residents and colleagues to learn the "tricks" of technology • Reduce clinical hours or work part-time

Minimizing Stress, Maximizing Success of the Electronic Health Record (EHR) Clinician Survey

CONFIDENTIAL

The identification number at the left allows us to keep track of the questionnaires as they are returned. **Any information that would permit identification of an individual or a practice organization will be held strictly confidential, will be used only for the purposes of this study, and will not be disclosed or released to other persons or used for any other purposes.**

INTRODUCTION:
The purpose of this survey is to learn how physicians find the use of health information and communication technologies, e.g., electronic health records (EHRs), cell phones, email, texting, etc., is impacting job satisfaction and stress. Your answers are confidential and only summary data will be reported. While mainly for outpatient practices, if most of your work is in the hospital, please answer as best you can. Thank you for participating!

Section A. *About your patients and workload...*

1. In the grid below, please <u>estimate</u> the average time ALLOCATED versus the average time you feel would be NEEDED to provide high quality care during your typical outpatient visit:

Visit Type	Time _ALLOCATED_	Time _NEEDED_	N/A
a. Annual physical or full consultation	_____ min.	_____ min.	
b. Routine follow-up	_____ min.	_____ min.	

2. Taking into account all your compensated roles, do you consider yourself to work…?
☐ Full time   ☐ Part-time

3. During your most typical week how many hours do you AVERAGE: Hours per week

   a. In the office seeing patients?   _____

   b. In the hospital seeing patients?   _____

   c. On other patient-related activities (e.g., email, phone calls, paperwork, consultation)?   _____

   d. On teaching and/or research?   _____

   e. On other work NOT related to patient care (e.g., administration)?   _____

                                                         TOTAL: _____

4. Sufficiency of time for documentation at work is:

   1 – Poor   2 – Marginal   3 – Satisfactory   4 – Good   5 – Optimal

5a. The amount of time you spend on the electronic health record at HOME is:

   1 – Excessive   2 – Moderately high   3 – Satisfactory   4 – Modest   5 – Minimal/none

5b. Your estimated AVERAGE hours of EHR use at HOME each week: _____

6. Estimate the percentage of your patients that:

   a. Have 3 or more complex medical problems: _____%

   b. Have complex or numerous psycho-social problems: _____%

   c. Are non-English speaking: _____%

7. Regarding your personal time:	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. My work schedule leaves me enough time for my personal/family life.	1	2	3	4	5

Section B.   *About the content of your work...*

1. In your practice setting, how much access do you have to…?

	Slight or none	Some	Moderate	Great
a. IT support staff	1	2	3	4
b. "Super user" colleagues	1	2	3	4
c. IT support by phone or electronic communication (IM)	1	2	3	4
d. Access to inbox coverage when you are out of the office	1	2	3	4

2. How much does your practice setting *emphasize the importance of*…?

	Slight or none	Some	Moderate	Great
a. Care for underserved populations	1	2	3	4
b. Teamwork	1	2	3	4
c. IT training	1	2	3	4
d. Balancing professional and personal life	1	2	3	4
e. Productivity	1	2	3	4

3. My control over my workload is:

1 – Poor   2 – Marginal   3 – Satisfactory   4 – Good   5 – Optimal

4. My professional values are well aligned with those of my department /clinical leaders:

1 – Agree strongly   2 – Agree   3 – Neither agree nor disagree   4 – Disagree   5 – Strongly disagree

5. Which number best describes the atmosphere in your office?

Calm		Busy, but reasonable		Hectic, chaotic
1	2	3	4	5

Section C.   *About your health and wellbeing...*

	Not at all	Some	A moderate amount	A great deal
1. Have you recently been feeling unhappy and depressed?	1	2	3	4

2. Using your own definition of "burnout", please circle *one of the answers below:*

a. I enjoy my work. I have no symptoms of burnout.

b. Occasionally I am under stress, and I don't always have as much energy as I once did, but I don't feel burned out.

c. I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion.

d. The symptoms of burnout that I'm experiencing won't go away. I think about frustrations at work a lot.

e. I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some help.

If you select "d" or "e" please consider seeking assistance through the Employee Assistance Program or health insurer.

	None	Slight	Moderate	Likely	Definitely
3. What is the likelihood that you will leave your current practice within TWO YEARS?	1	2	3	4	5

Section D.   *About your attitudes toward your work...*

1. Circle the number which best describes how you feel:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. Overall, I am satisfied in my current practice.	1	2	3	4	5
b. Many stressful things happen to me at work.	1	2	3	4	5
c. My job is extremely stressful.	1	2	3	4	5
d. I almost always feel stressed at work	1	2	3	4	5
e. I feel a great deal of stress because of my job.	1	2	3	4	5

Section E.   *About your EHR use…*

First tell us which EHR you use in the **ambulatory setting** (please circle):

Allscripts   Cerner McKesson   CPRS (VA System)   CPSI   Epic   Healthland Healthcare

Management Systems   Meditech   NextGen   Siemens   Other _____

1. How much do the following aspects of the EHR <u>work for you</u>?

	Not at all			To a great extent
a. Sharing results and trends with patients	1	2	3	4
b. Messaging colleagues	1	2	3	4
c. Accessing EHR from home	1	2	3	4
d. Alerts (drug interactions, allergies)	1	2	3	4

2. How <u>challenging</u> are the following aspects of your EHR?

	Not at all			To a great extent
a. Information overload	1	2	3	4
b. Lack of access to patient information from multiple institutions	1	2	3	4
c. Slow system response times	1	2	3	4
d. Excessive data entry	1	2	3	4
e. Inability to navigate the system quickly	1	2	3	4
f. "Note bloat" (progress notes too complex to read)	1	2	3	4
g. Fear of missing something	1	2	3	4
h. Interference with the provider-patient relationship	1	2	3	4
i. Notes geared toward billing, not patient care	1	2	3	4

3. How much of the following consequences have you <u>experienced</u> from your EHR?

	Not at all			To a great extent
a. Pain (in: wrist, neck, back, shoulders)	1	2	3	4
b. Headache/eye strain	1	2	3	4
c. Posture problems	1	2	3	4
d. Sleep difficulties	1	2	3	4
e. Anxiety or depression	1	2	3	4
f. Interference with work-life balance	1	2	3	4

4. How much would having the following improve your EHR experience?

(If you already have some of the following, please tell us how much they help):

	Not at all			To a great extent
a. Staff support for acting on your EHR messages	1	2	3	4
b. Order writing by support staff	1	2	3	4
c. Better helplines	1	2	3	4
d. One-on-one training	1	2	3	4
e. More training sessions/workshops	1	2	3	4
f. Blocked slots for documentation catch up	1	2	3	4
g. Improved voice recognition software	1	2	3	4
h. Scribes (personnel who document for you)	1	2	3	4
i. Printers in exam rooms	1	2	3	4
j. Coding and billing assigned to others	1	2	3	4
k. Someone to cover your inbox messages/electronic work while on vacation	1	2	3	4

5. How much would the following improve your workflow?

	Not at all			To a great extent
a. Fewer clicks for each task	1	2	3	4
b. Fingerprint login	1	2	3	4
c. Touchscreen functionality	1	2	3	4
d. Highlighting of key findings	1	2	3	4
e. Redundant data entry tasks assigned to others	1	2	3	4
f. Smart phrases	1	2	3	4

6. How much do you use the following to cope with EHR/job stress?

	Not at all			To a great extent
a. Exercise	1	2	3	4
b. Setting boundaries about when and where work is done	1	2	3	4
c. Taking breaks (e.g., walking at lunch)	1	2	3	4
d. Writing shorter notes	1	2	3	4
e. Staying off the EHR when out of the office	1	2	3	4
f. Talking with colleagues, friends or family	1	2	3	4
g. Discussing EHR messages with staff rather than "pinging" messages back and forth	1	2	3	4
h. Resilience or mindfulness training	1	2	3	4

7. What do you think is the <u>effect</u> of increased EHR use on the following?

	Positive	None	Negative	Don't know
a. Quality of care you are able to deliver to your patients	1	2	3	4
b. Cost of care	1	2	3	4
c. Efficiency of care	1	2	3	4

What else would you like to tell us about how you experience or minimize stress from the EHR?

The following are used for classification purposes only. Surveys are de-identified and data are reported as aggregate numbers only.

Section F.   *About you…*

1. What is your age? _____ Years

2. Gender?   ☐ Male   ☐ Female

3. What is your ethnicity? (Please check one)   ☐ Hispanic/Latino   ☐ Not Hispanic/Latino

4. What is your race? (Check all that apply)

☐ White (European, Middle Eastern, other)   ☐ Native Hawaiian or Pacific Islander

☐ Black or African American   ☐ Asian

☐ American Indian or Alaska Native   ☐ Other: _____

5. What type of clinician are you? ☐ **MD** ☐ **DO** ☐ **PA** ☐ **NP** ☐ **Other:** _____

6. What is your practice type?

☐ Primary care

☐ Non-procedural specialist (Specify :_____)

☐ Procedural specialist (Specify :_____)

7. Number of years since completing training? _____ Years

Thank you for assisting us with our research! We have one final question…

8. How long did it take you to complete this survey? _____ Minutes