Nate C. Apathy, PhD

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Academic Appointments

Postdoctoral Fellow, Health Services Research   July 2020 – Present
Perelman School of Medicine, University of Pennsylvania
Advisor: Rachel M. Werner, MD PhD (AHRQ T32 Training Grant)

Associate Fellow, Leonard Davis Institute of Health Economics   Aug. 2020 – Present

Affiliated Research Scientist, Regenstrief Institute   Aug. 2020 – Present

Adjunct Faculty, Health Policy & Management   Aug. 2020 – Present
Richard M. Fairbanks School of Public Health, Indiana University

Education

PhD, Health Policy & Management   Indiana University, 2020
Richard M. Fairbanks School of Public Health   Indianapolis, IN
Dissertation: *Health information exchange use in primary care*
Committee: Christopher A. Harle, PhD (co-chair); Joshua R. Vest, PhD (co-chair)
Justin Blackburn, PhD; Julia Adler-Milstein, PhD; Brian E. Dixon, PhD

BS, Business Administration (summa cum laude)   Creighton University, 2011
Major: Economics   Omaha, NE
Minor: Behavioral and Cognitive Neuropsychology

Previous Employment

Department of Health Policy & Management   August 2016 – June 2020
Fairbanks School of Public Health (IUPUI)
    Predoctoral Fellow, Population & Public Health Informatics (NLM T15)   Aug. 2017 – June 2020
    Graduate Research Assistant *to Christopher A. Harle, PhD*   Aug. 2016 – June 2020

Cerner Corporation, Kansas City, MO   July 2011 – April 2016

Grants

Post-Doctoral Fellow, R33DA046085. (R21/R33). Nudging Primary Care Providers toward Guideline-Recommended Opioid Prescribing through Easier and More Convenient EHR Information Design. National Institute on Drug Abuse (NIDA). $2,223,377. 2017-2022. PI: Christopher A. Harle, PhD

Peer-Reviewed Publications

1. **Apathy, NC**; Hare, AJ; Fendrich, S; Cross DA. Early Changes in Billing and Notes after the Evaluation and Management Guideline Change. *Annals of Internal Medicine.* 2022;175(4).

2. **Apathy, NC**; Holmgren, AJ; Werner, RM. Growth in health information exchange with ACO market penetration. *American Journal of Managed Care.* 2022;28(1).

3. Nguyen, OT; Turner, K; **Apathy, NC**; Magoc, T; Hanna, K; Merlo, LJ; Harle, CA; Thompson, LA; Berner, ES; Feldman, SS. Primary care physicians' electronic health record proficiency and efficiency behaviors and time interacting with electronic health records. *Journal of the American Medical Informatics Association.* 2022;23(2).

4. Werner, RM; Templeton, Z; **Apathy, NC**; Skira, MM; Konetzka, RT. Trends in post-acute care in US nursing homes: 2001 to 2017. *Journal of the American Medical Directors Association*. 2021;22(12).

5. **Apathy, NC**; Holmgren, AJ; Adler-Milstein, J. A Decade Post-HITECH: Critical Access Hospitals have EHRs but Struggle to Keep Up with Other Advanced Functions. *Journal of the American Medical Informatics Association.* 2021;28(9).

6. **Apathy, NC**; Vest, JR; Adler-Milstein, J; Blackburn, J; Harle, CA. Practice and market factors associated with provider volume of health information exchange. *Journal of the American Medical Informatics Association.* 2021;28(7).

7. Baxter, SL; **Apathy, NC**; Cross, DA; Sinsky, C; Hribar, ME. Measures of electronic health record use in outpatient settings across vendors. *Journal of the American Medical Informatics Association.* 2021; 28(5).

8. Taylor, HL; **Apathy, NC**; Vest, JR. Health information exchange use during dental visits. *AMIA Annual Symposium Proceedings.* 2020 Nov. *Student Paper Competition Finalist*

9. **Apathy, NC**; Everson, J. High rates of partial participation in the first year of the Merit-Based Incentive Program. *Health Affairs*. 2020;39(9).

10. **Apathy, NC**; Harle, CA; Vest, JR; Morea, JG; Menachemi, N. Use of electronic health records on days off: Comparing physicians to other EHR users. *Journal of General Internal Medicine*. 2020;36(4).

11. Holmgren, AJ; **Apathy, NC**. Evaluation of Prescription Drug Monitoring Program Integration With Hospital Electronic Health Records by US County-Level Opioid Prescribing Rates. *JAMA Network Open.* 2020;3(6).

12. Holmgren, AJ; **Apathy, NC**; Adler-Milstein, J. Barriers to Hospital Public Health Reporting and Implications for the COVID-19 Pandemic. *Journal of the American Medical Informatics Association.* 2020;27(8).

13. **Apathy, NC**; Holmgren, AJ. Opt-in consent policies: potential barriers to hospital health information exchange. *American Journal of Managed Care*. 2020;26(1).

14. Comer, AR; **Apathy, NC**; Waite C; Bestmann Z; Bradshaw J; Burchfield E; Harmon B; Legg R; Meyer S; O'Brien P, Sabec M; Sayeed J; Weaver A; D'Cruz L; Bartlett S; Marchand M; Zepeda I; Finnell, JT; Grannis, S; Silverman, RD; Embi, PJ. E-scooters: Assessing the Threat to Public Health and Safety in Setting Policies. *Chronicles of Health Impact Assessment.* 2020;5(1).

15. Holmgren, AJ; **Apathy, NC**. Hospital adoption of API-enabled patient data access. *Healthcare: The Journal of Delivery Science and Innovation.* 2019;8.

16. Balio, CP; **Apathy, NC**; Danek, R. Health information technology and accountable care organizations: synthesis of the literature and future directions. *eGEMs (Generating Evidence & Methods to improve patient outcomes).* 2019;7(1):24.

17. **Apathy NC**; Yeager VA. Examining Training Motivations Among Public Health Workers. *Journal of Public Health Management and Practice*. 2019;25(2), Public Health Workforce Interests and Needs Survey 2017: S157 –65.

18. Harle, CA; **Apathy, NC**; Cook, RL; Danielson, EC; DiIulio, J; Downs, SM; Hurley, RW; Mamlin, BW; Militello, LG; Anders, S. Information Needs and Requirements for Decision Support in Primary Care: An Analysis of Chronic Pain Care. *AMIA Annual Symposium Proceedings.* 2018 Nov.

19. **Apathy, NC**; Menser, T; Keeran, L; Ford, EW; Harle, CA; Huerta, TR. Trends and gaps in awareness of direct-to-consumer genetic tests from 2007-2014. *American Journal of Preventive Medicine.* 2018 Jun 1;54(6).

20. Mosa, AS; Yoo, I; **Apathy, NC**; Ko, KJ; Parker, JC. Secondary Use of Clinical Data to Enable Data-Driven Translational Science with Trustworthy Access Management. *Missouri Medicine*. 2015;112(6)

Research in Progress

Apathy, NC; Hare, AJ; Fendrich, S; Cross DA. What gives? Changes in clinical documentation composition as physicians shorten notes. (Under Review)

Apathy, NC; Rotenstein, LR; Bates, DW; Holmgren, AJ. Documentation dynamics: Note composition, burden, and physician efficiency. (In Preparation)

Apathy, NC; Holmgren, AJ; Melnick, T; Melton-Meaux, G; Cross, DA. Physician documentation support and electronic health record burden. (In Preparation)

Apathy, NC; Holmgren, AJ; Greenstein, S. Innovation spillovers from government investment in information technology: evidence from the HITECH Act. (In Preparation)

Apathy, NC; Vest, JR; Adler-Milstein, J; Dixon, BE; Blackburn, J; Harle, CA. Team-based use of health information exchange in primary care. (In Preparation)

Apathy, NC; Vest, JR; Adler-Milstein, J; Dixon, BE; Blackburn, J; Harle, CA. User-level patterns of health information exchange use. (In Preparation)

Apathy, NC; Dixon, BE. Interoperability in the wild: Comparing two exchange networks for data accessibility and consistency. (In Preparation)

Mazurenko, O; Sanner, LM; **Apathy, NC**; Mamlin, BW; Menachemi, N; Adams, MCB; Hurley, RW; Erazo, SF; Harle, CA. Recruiting primary care providers electronically as research subjects during the COVID-19 pandemic. (Under Review)

Rotenstein, LR; **Apathy, NC**; Landon, B; Bates, DW. Relationship Between Practice Ownership and Electronic Health Record Experience: A National, Cross-Sectional Study. (Under Review)

Rotenstein, LR; **Apathy, NC**; Bates, DW; Landon, B. Specialty and Gender Variation in Staff Support for Documentation: A Nationwide, Cross-Sectional Analysis. (Under Review)

Holmgren, AJ; **Apathy, NC**. Assessing the Impact of Patient Access to Electronic Health Information on Clinician Electronic Health Record Documentation. (Under Review)

Rotenstein, LR; **Apathy, NC**; Holmgren, AJ; Bates, DW. Physician documentation phenotypes and EHR time. (Under Review)

Cross, DA; **Apathy, NC**; Schulman, K; Holmgren, AJ. Variation in EHR Use Within and Across Organizations. (In Preparation)

Book Chapters

Dixon, BE; Rahurkar, S; & **Apathy, NC**. Health Information Exchange. In: Magnuson, JA; Dixon, BE, editors. *Public Health Informatics and Information Systems,* 3rd edition. Springer London. August 2020.

Patents

Harle, CA; Mamlin, B; Hurley, RW; **Apathy, NC**; Downs, SM; Dilulio, J. *Methods and Systems for Risk Assessment and Risk Prediction in Opioid Prescriptions and Pain Management Treatment*. US Patent Appln. No. 2021/0050113A1. Pub. Date Feb 18, 2021.

Research Interests

Health Information Technology	Health IT Policy	Population Health Informatics
Health Information Exchange	Health IT Use & Quality Measurement	Health Economics

Honors & Awards

Delta Omega (Public Health Honors Society)	April 2020
Med About Data Hackathon (Haifa, Israel) – Second Place	March 2019
IUPUI University Fellowship	Aug. 2016 – Jul. 2017
Population Health Leadership Development Program	Jan. 2015 – Dec. 2015
Cerner Masters Award	Aug. 2014

Invited Speaking

National Academy of Medicine Clinician Wellbeing Convening on Reducing Documentation Burden, Jan. 2022
The Practice of Medicine: MIPS and the Social Determinants of Health, Oct. 2020 *Health Affairs* Event

Conference Presentations

1. **Apathy, NC**; Holmgren, AJ; Greenstein, S. Spillover Effects from the HITECH Act on Innovation in Medical Informatics. *American Medical Informatics Association Annual Symposium.* Nov 2021.

2. **Apathy, NC**; Holmgren, AJ; Adler-Milstein, J. Meaningful Use and the Digital Divide After a Decade. *AcademyHealth Annual Research Meeting*. June 2021.

3. **Apathy, NC**; Holmgren, AJ; Werner, RM. Growth in Health Information Exchange with ACO Market Penetration. *AcademyHealth Annual Research Meeting.* June 2021.

4. **Apathy, NC**; Holmgren, AJ; Werner, RM. Growth in Health Information Exchange with ACO Market Penetration. *AHRQ NRSA Trainees Research Conference.* June 2021.

5. **Apathy, NC**; Holmgren, AJ; Greenstein, S. Innovation spillovers from government investment in information technology: evidence from the HITECH Act. *Conference on Health Information Technology & Analytics.* Oct 2020.

6. **Apathy, NC**. Team-based measures of health information exchange. *Kentucky Bluegrass and Indiana Chapters of HIMSS Annual Conference.* July 2020.

7. **Apathy, NC**; Vest, JR; Adler-Milstein, J; Dixon, BE; Blackburn, J; Harle, CA. Health information exchange in primary care: use among teams. *National Library of Medicine Informatics Training Conference.* June 2020.

8. **Apathy, NC**; Vest, JR; Adler-Milstein, J; Dixon, BE; Blackburn, J; Harle, CA. Factors related to primary care use of health information exchange. *AcademyHealth Annual Research Meeting*. June 2020.

9. **Apathy, NC;** Roberts, A; Hayden, R; Harle, CA; Vest, JR. Visualizing patient-level risk factors from clinical risk prediction algorithms. *American Medical Informatics Association Clinical Informatics Conference*. May 2020.

10. **Apathy, NC**; Vest, JR; Menachemi, N; Morea, JG; Harle, CA. Differing patterns in frequency of electronic health records documentation among clinicians following the replacement of a legacy EHR system. *American Medical Informatics Association Annual Symposium*. Nov. 2019

11. **Apathy, NC**; Yeager, VA. Training Motivations Among Public Health Workers. *American Public Health Association Annual Meeting.* Nov. 2019.

12. **Apathy, NC**. Association between physician usage of health information exchange and quality measures. *National Library of Medicine Informatics Training Conference.* June 2019

13. **Apathy, NC**; Vest, JR; Menachemi, N; Morea, JG; Harle, CA. Impact of Transitioning from a Homegrown to a Commercial EHR on User Satisfaction. *AcademyHealth Annual Research Meeting*. June 2019

14. **Apathy, NC**; Everson, J. Variations in Primary Care Provider Competition Indices across Commonly Used Data Sources. *AcademyHealth Annual Research Meeting*. June 2019

15. **Apathy, NC**; Harle, CA. Patient consent policies for state health information exchange and level of provider exchange. *American Medical Informatics Association Annual Symposium*. Nov. 2018

16. **Apathy, NC**. Measurement of Health Information Exchange & Interoperability. *National Library of Medicine Informatics Training Conference.* June 2018

17. Balio, CP; **Apathy, NC**; Wiley, K; Holmes, A. The association between usual source of care at a patient-centered medical home and high-expense service utilization. *AcademyHealth Annual Research Meeting*. June 2018

18. Harle, CA; Anders, S; **Apathy, NC**; Cook, RL; Danielson, EC; DiIulio, J; Downs, SM; Hurley, RW; Mamlin, BW; Militello, LG. Designing a user-centered electronic health record decision support system for guideline-concordant opioid prescribing. *AcademyHealth Annual Research Meeting*. June 2018

19. **Apathy, NC**; Vest, JR; Menachemi, N; Putz, JW; Morea, JG; Harle, CA. Differing patterns of satisfaction and perception among clinical and non-clinical users following replacement of a legacy EHR system. *American Medical Informatics Association Annual Symposium*. Nov. 2017

20. **Apathy, NC**; Vest, JR; Menachemi, N; Harle, CA. Changes in user perceptions of their electronic health record following the replacement of a legacy system: a longitudinal analysis. *AcademyHealth Annual Research Meeting*. June 2017

21. Bako, AT; **Apathy, NC**; Vest, JR; Harle, CA. User concerns following replacement of a legacy electronic health record: A longitudinal qualitative study. *AcademyHealth Annual Research Meeting*. June 2017

22. **Apathy, NC**; Balio, CP; Danek, RL. Underrepresentation of health information technology studies in the context of accountable care organizations: Using the HSRProj database. *AcademyHealth Annual Research Meeting*. June 2017

23. **Apathy, NC**; Mosa, AS; & Ko, KJ. Protecting Patient Data and Maintaining Site Autonomy: Managing Project Access in a Multi-Site i2b2 Database. *American Medical Informatics Association Annual Symposium*. Nov. 2014

Web Applications

Economics Seminar Diversity	RShiny Dashboard w/ ggplot2	v2.0.0 deployed August 2019

Interactive visualizations of invited seminar speakers to examine representation of female and under-represented minority economists at university economics departments

CHF Risk Prediction Tool (Demo)	RShiny, randomForest, & ggplot2	v1.2.1 deployed March 2019

Interactive visualization of risk scores for CHF at the population level, with option to view individual level risk factors underlying low, rising, or high-risk prediction

Opioid Prescribing Rate Visualization Tool	RShiny, ggplot2, & leaflet	v2.0.0 deployed August 2018

Interactive mapping visualization of CDC prescribing rates and changes over time by county and state

EHR Survey Response Visualizer	RShiny & ggplot2	v2.0.0 released Dec 2018

Interactive tool to analyze responses to a user satisfaction survey administered during an electronic health record transition at a large public safety net hospital

Professional Memberships

American Medical Informatics Association (AMIA)	2013 – Present
AcademyHealth	2016 – Present
American Public Health Association	2019 – Present
Health Information & Management Systems Society (HIMSS)	2016 – 2021

Teaching

H320: Health Systems Administration	Guest Lecturer	Fall 2019
H325: Health Information Technology Management & Policy	Instructor (*rating: 4.7/5*)	Fall 2018, Fall 2019
E335: Chronic Disease Epidemiology	Guest Lecturer	Spring 2018
H628: Healthcare Information Systems	Teaching Assistant	Spring 2017, Spring 2019

Editorial Experience

Peer Review: *Health Affairs, Milbank Quarterly, Health Services Research, American Journal of Managed Care, Journal of General Internal Medicine, Journal of the American Medical Informatics Association, Applied Clinical Informatics, Digital Health, Risk Management & Healthcare Policy, Health Policy & Technology, PLoS One, International Journal of Health Economics & Management, Medical Care*

International Conference on Information Systems, 2019 & 2021	Conference Submission Review
AcademyHealth Annual Research Meeting, 2019-2021	Theme Reviewer & Session Chair
Digital Technologies, Data, and Data Science Theme	
AMIA Annual Symposium	Conference Submission Review
AMIA Informatics Summits	Conference Submission Review

Leadership & Service

AMIA Advancing Health Equity & Antiracism in Healthcare Subcommittee, Member	Fall 2021 – Current
Leonard Davis Institute Associate Fellows Bootcamp: Intro to R, Instructor	November 2021
Summer Undergraduate Minority Research Scholars Program, R Tutor	Summer 2021
NLM and Support for Health Services Research, Invited Panelist	August 2020
National Research Network Audit Log Measures Workgroup, Co-Chair	Spring 2020 – Current
AMIA Annual Symposium, Session Moderator	Fall 2019
Collaborating Across Borders VII Conference, Session Moderator	Fall 2019
Indiana State Department of Health R Training Workshop, Instructor	July 2019
AMIA Policy Response Team, ONC Notices of Proposed Rulemaking	
Draft Federal Health IT Strategic Plan	Spring 2020
21st Century Cures, Information Blocking	Spring 2019
NLM Informatics Training Conference, 2018 & 2019	
Student Planning Committee Co-Chair	Nov. 2018 – June 2019
Student Planning Committee Member	Jan. 2018 – June 2018
AcademyHealth Student Competition: Identifying Gaps in HSR, Judge	April 2018
hsR: Using R for Health Services Research, Workshop Instructor	Spring 2018
AcademyHealth Student Chapter at IUPUI, President & Co-Founder	Feb. 2017 – March 2019

Press Coverage

To alleviate EHR burdens, teamwork makes the dream work, HealthcareIT News, Dec. 2021
Care Team EHR Documentation Support May Alleviate Clinician Burden, EHRIntelligence.com, Dec. 2021
Critical access hospitals lag behind in advanced EHR use functions, Healthcare IT News, Jul. 2021
Half of Providers Don't Utilize Health Information Exchange, EHRIntelligence.com, Mar. 2021
Barriers to Hospital Public Health Reporting and Implications for the COVID-19 Pandemic, *JAMIA*

> Healthcare IT News, Oct. 2020 | Becker's Hospital Review, May 2020
> Healthcare IT News, May 2020 | Healthcare Dive, May 2020

What the Fax? *Tradeoffs* podcast episode, May 12, 2020
Opt-In Health Information Exchange Drive Administrative Burden, EHRIntelligence.com, Jan. 2020
API growing pains. POLITICO Morning eHealth, Sept. 2019
IUPUI PhD student unpacks the impact scooters are having on Indianapolis, FOX59 Indianapolis, April 2019
Researcher's data shows how Indianapolis is using scooters. IndyStar, Mar. 2019
Lyft warns it may never make any money. Oversharing, Mar. 2019