

Turgay Ayer
George Family Foundation Assistant Professor
H. Milton Stewart School of Industrial and Systems Engineering

I. EARNED DEGREES

- Ph.D. Industrial and Systems Engineering, **University of Wisconsin-Madison**
Minor in Mathematics.
- M.Sc. Industrial and Systems Engineering, **University of Wisconsin-Madison**
- B.S. Manufacturing Systems Engineering, **Sabanci University, Turkey**
Minor in Mathematics.

II. ACADEMIC EMPLOYMENT

Georgia Institute of Technology, Atlanta, GA George Family Foundation Assistant Professor H. Milton Stewart School of Industrial and Systems Engineering	April 2016—
Research Director for Medical Decision Making Center for Health and Humanitarian Systems	August 2014—
Assistant Professor H. Milton Stewart School of Industrial and Systems Engineering	August 2011—
Emory University, Atlanta, GA Assistant Professor (by courtesy) Winship Cancer Institute	August 2016—

III. HONORS, AWARDS, AND RECOGNITION

(Awards given to mentored students for joint work marked with a *)

A. International or National Awards

i. Research Awards

- Inducted as the Franz Edelman Laureate, 2017 ¹
 - INFORMS Franz Edelman Laureates are “recognized for their significant contribution to work that is selected as representative of the best applications of analytical decision making in the world”

¹ For the work that impacted and changed blood collection operations at the American Red Cross; a video synopsis produced by the American Red Cross highlighting the realized impact can be found here: <https://vimeo.com/206581123/72c76ad3dd>

- NSF CAREER Award, 2015
- South Big Data Hub Program to Empower Partnerships with Industry (PEPI) Fellow, 2015
 - Financially supports early career faculty members and pairs each fellow with industry partners. Ayer is hosted by the UnitedHealthcare Group.
- INFORMS Seth Bonder Foundation Research Award, 2012, 2014
 - awarded to the most promising young researchers in healthcare area
- INFORMS Bonder Scholarship for Applied Operations Research in Health Services, 2010
 - Selected annually; provides financial support to one Ph.D. student with the greatest potential for making a significant contribution to the field of applied Operations Research in healthcare

ii. Paper Awards

- First Prize, M&SOM Practice-Based Research Competition, 2017
- Finalist, INFORMS Franz Edelman Award for Achievements in Operations Research and Management Science, 2017
 - “the world’s most prestigious award for achievement in the practice of analytics and operations research” (informs.org)
- First Prize, POMS College of Sustainable Operations Best Student Paper Competition, 2017*
- Finalist, INFORMS Pierskalla Award (Healthcare Applications Society Best Paper Competition), 2016
 - recognizes research excellence in the field of health care management science
- First Prize, INFORMS Decision Analysis Society Student Paper Competition, 2016*
- Honorable Mention, INFORMS Public Sector OR Paper Competition, 2016
- First Prize, INFORMS Doing Good with Good OR Paper Competition, 2015*
 - recognizes outstanding papers in the field of operations research and the management sciences that have a significant societal impact
- Finalist, INFORMS Nicholson Student Paper Competition, 2015*
- First Prize, 2011 INFORMS Doing Good with Good OR Competition
- Second Prize, 2011 INFORMS M&SOM Society Student Paper Competition
- Finalist, 2011 INFORMS Decision Analysis Society Student Paper Competition

- First Prize, Society for Medical Decision Making (SMDM) Lee B. Lusted Award, 2009
 - recognizes outstanding presentations of research at the Annual Meeting of the SMDM
- First Prize, INFORMS Interactive Session Award, 2009
- Outstanding Presentation Award in the Informatics Session of 2008 Annual Meeting of Radiological Society of North America (invited for publication in RadioGraphics)
- Paul Carbone Prize for Best Poster in Cancer Control during 2nd Annual UW Carbone Comprehensive Cancer Center (UWCCC) Research Retreat in 2008
- Selected for the 2010 INFORMS Doctoral Colloquium

B. Institute or School Awards

- George Family Foundation Assistant Professorship, 2016-present
- Thank a teacher Certificate, Georgia Tech, Spring 2012, Spring 2013

C. SOCIETAL AND POLICY IMPACTS

C.1. Impact in Practice

- Ayer and co-authors developed an alternative blood collection model which was implemented by the American Red Cross. The implementation of the proposed solution resulted in an approximately 40 percent reduction in the per unit collection cost for cryoprecipitate, a blood product with a tight collection-to-processing time constraint. A video synopsis produced by the American Red Cross to highlight the realized impact can be found here:
 - <https://vimeo.com/206581123/72c76ad3dd>
- Ayer and co-authors published a study on the value-based pricing of lung cancer drugs, which provided additional evidence for the final disapproval decision of this drug in the UK. For more details, please see:
 - <http://www.fiercepharma.com/pharma/eli-lilly-s-portrazza-turned-away-final-nice-guidance>

C2. Press/media coverage of research

- Value-based pricing of cancer treatment drugs
 - Washington Post: Cancer drugs aren't just really expensive; they're a bad value drugs aren't just really expensive; they're a bad value - See more at: <https://www.washingtonpost.com/news/wonk/wp/2015/08/27/cancer-drugs-arent-just-really-expensive-theyre-a-bad-value/>

- The Wall Street Journal Coverage I: Lilly's Lung-Cancer Drug Portrazza to Cost \$11,430 a Month - See more at: <http://www.wsj.com/articles/lillys-lung-cancer-drug-portrazza-to-cost-11-430-a-month-1449867424>
- The Wall Street Journal Coverage II: Experimental Lilly Lung-Cancer Drug Stirs Price Debate - See more at: <http://www.wsj.com/articles/unapproved-lilly-lung-cancer-drug-stirs-price-debate-1440687723>
- Cancer Network: Cost of CLL Management Expected to Skyrocket – See more at: <http://www.cancernetwork.com/hematologic-malignancies/cost-ctl-management-expected-skyrocket>
- The Economic Times: Targeted therapy drugs could radically increase the cost of leukemia treatment – See more at: <http://health.economictimes.indiatimes.com/news/industry/targeted-therapy-drugs-could-radically-increase-the-cost-of-leukemia-treatment/55505495>
- Hepatitis C treatment in US prisons and jails
 - NPR: Treating Prisoners With Hepatitis C May Be Worth The Hefty Price - See more at: <http://www.npr.org/sections/health-shots/2015/11/23/457145471/treating-prisoners-with-hepatitis-c-may-be-worth-the-hefty-price>
 - US News: Screening Inmates for Hepatitis C Benefits General Community - See more at: <http://health.usnews.com/health-news/articles/2015/11/23/screening-inmates-for-hepatitis-c-benefits-general-community-study>
- High Cost, Minimal Benefit for Bevacizumab in Metastatic Colorectal Cancer
 - Cancer Network: <http://www.cancernetwork.com/colorectal-cancer/high-cost-minimal-benefit-bevacizumab-metastatic-crc#sthash.P22BJbw5.dpuf>
- Maintenance And Consolidation Therapies: Cost-Effective Strategies To Prolong Remission In Patients With Follicular Lymphoma
 - ISPOR News and Press: <http://press.ispor.org/index.php/maintenance-and-consolidation-therapies-cost-effective-strategies-to-prolong-remission-in-patients->
- Reconsider the Mammogram
 - Slate Magazine http://www.slate.com/articles/double_x/doublex/2013/08/mammograms_the_right_way_to_use_them.html
 - Daily Herald <http://www.dailyherald.com/article/20130809/entlife/708099955/print/>
 - Chicago Tribune <http://www.chicagotribune.com/news/plus/chi-wp-slate-reconsider-mammogram,0,3708527.story>

IV. SCHOLARLY ACCOMPLISHMENTS

(* indicates work conducted at Georgia Tech)

(Bolded co-authors are advisees [i.e., post-docs, graduate or undergraduate students] under Dr. Ayer’s supervision)

(*M.D.* denotes a medical doctor collaborator)

A. PUBLISHED BOOKS AND PARTS OF BOOKS

Refereed Book Chapters

1. *T. Ayer, **Q. Chen** (2017), “*Personalized Medicine*”, forthcoming in *Handbook of Healthcare Analytics: Theoretical Minimum for Conducting 21st Century Research on Healthcare Operations*, edited by Sridhar Tayur and Tinglong Dai, John Wiley & Sons (invited and refereed).
2. *T. Ayer, P. Keskinocak, and J. Swann (2014), “*OR/MS Research in Public Health*,” in *Bridging Data and Decisions* (pp. 216-239), edited by A. Newman and C. Smith (invited and refereed).
3. O. Alagoz, T. Ayer, F.S. Erenay (2011), “*Operations Research Models in Cancer Screening*,” in *Encyclopedia of Operations Research and Management Science*, edited by James J. Cochran, John Wiley & Sons. Published online: 14 January 2011, DOI: 10.1002/9780470400531.eorms0597 (invited and refereed).

B. REFEREED PUBLICATIONS

(* indicates work conducted at Georgia Tech)

(Bolded co-authors are advisees [i.e., post-docs, graduate or undergraduate students] under Dr. Ayer’s supervision)

(*M.D.* denotes a medical doctor collaborator)

B1. Submitted Papers

1. ***Q. Chen**, T. Ayer, J. Chhatwal (2015), “Optimal M-switch Surveillance Policies for Liver Cancer in Hepatitis C-Infected Population,” in preparation for third round of review, *Operations Research*.
 - First Prize Winner, 2016 INFORMS Decision Analysis Society Student Paper Competition.
 - Honorable Mention, INFORMS Public Sector OR Paper Competition, 2016
2. ***C. Zhang**, T. Ayer, C. C. White (2015) “2-Approximation Policies for Fixed-Lifetime Perishable Inventory Control,” submitted <http://arxiv.org/abs/1605.01442>
 - Finalist, 2015 INFORMS Nicholson Student Paper Competition

3. *T. Ayer, **C. Zhang**, **A. Bonifonte**, A. Spaulding (*M.D.*), J. Chhatwal (2016), “Prioritizing Hepatitis C Treatment in U.S. Prisons”, submitted https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2869158
 - Finalist, INFORMS Healthcare Applications Society Best Paper Award (Pierskalla Award)
4. *T. Ayer, M. Ayvaci, Z. Karaca, **J. Vlacy** (2015) “The Impact of Health Information Exchanges on Emergency Department Length of Stay,” submitted <http://ssrn.com/abstract=2968618>
 - Finalist, INFORMS Conference on Information Systems and Technology (CIST) Best Paper Competition, 2015
 - Finalist, Workshop on Health IT & Economics (WHITE) Best Paper Competition, 2015
5. *M. Cevik. T. Ayer, O. Alagoz (2016), “Analysis of Mammography Screening Policies under Resource Constraints,” in preparation for second round of review, *Production and Operations Management (POM)*.
6. ***J. Vlacy**, T. Ayer, M. Ayvaci, S. Raghunathan (2017), “The Business of Healthcare: Physician Integration in Bundled Payments”, Submitted.

B2. Accepted/Published Papers

7. *T. Ayer, **C. Zhang**, **C. Zeng**, C. C. White III, V. Roshan Joseph (2017) “Analysis and Improvement of Blood Collection Operations”, to appear in *M&SOM*
 - First prize winner, 2017 M&SOM Practice-Based Research Competition
 - First prize winner, 2015 INFORMS Doing Good with Good OR Competition
 - Selected as one of the four showcase presentations by the College of Healthcare Operations (CHOM) of the Production & Operations Management Society (POMS) annual Synapse Mini-Conference, 2017
8. ***S. Samur**, B Kues, T Ayer , MS Roberts (*M.D.*), F Kanwal (*M.D.*), C Hur (*M.D.*), DMS Donnell (*M.D.*), R Chung (*M.D.*), J. Chhatwal (2017), “Cost-Effectiveness of Pre versus Post Liver Transplant Hepatitis C Treatment with Direct-Acting Antivirals”, to appear in *Clinical Gastroenterology and Hepatology*.²

² Impact Factor: 7.68

9. *T. Ayer, **C. Zhang, C. Zeng**, C.C. White, V. Roshan Joseph, K. Lee, Z. Ozkaynak, M. Deck (2017), “American Red Cross Uses Analytics-based Methods to Improve Blood Collection Operations”, to appear in *Interfaces*.
 - Finalist, 2017 INFORMS Franz Edelman Award, “the world’s most prestigious award for achievement in the practice of analytics and operations research” (informs.org)³
10. *DA Goldstein (M.D.), **Q. Chen**, T. Ayer, KW Chan (M.D.), K Virik (M.D.), A Hammerman (M.D.), B Brenner (M.D.), CR Flowers (M.D.), PS Hall (M.D.) (2017), “Bevacizumab for metastatic colorectal cancer: A global cost-effectiveness analysis,” *The Oncologist*⁴, DOI:10.1634/theoncologist.2016-0455 [Epub ahead of print].
11. *R. Aggarwal (M.D.), **Q. Chen**, A. Goel (M.D.), N. Seguy (M.D.), R. Pendse (M.D.), T. Ayer, J. Chhatwal (2017) “Cost-Effectiveness of Hepatitis C Treatment using Generic Direct-Acting Antivirals Available in India,” *PLoS One*⁵, <https://doi.org/10.1371/journal.pone.0176503> [Epub ahead of print].
12. *H. Terawaki (M.D.), **C. Caglayan, Q. Chen**, T. Ayer, C. Flowers (M.D.) (2017), “Microsimulation Modeling in Oncology”, to appear in *Journal of Clinical Oncology (JCO) Clinical Cancer Informatics*.
13. *AR Ruiz (M.D.), **J Vlachy**, JW Lee (M.D.), EJ Gilmore (M.D.), T Ayer, et al. (2017), “Association of Periodic and Rhythmic Electroencephalographic Patterns With Seizures in Critically Ill Patients”, *JAMA Neurology*⁶, 74(2), 181-188.
14. *M. Capan, A. Khojandi, B. Denton, KD Williams, T. Ayer, J. Chhatwal, M. Kurt, JM Lobo, MS Roberts (M.D.), G. Zaric, S. Zhang, JS Schwartz (M.D.) (2017), “From Data to Improved Decisions: Operations Research in Healthcare Delivery”, *Medical Decision Making*⁷, doi: 10.1177/0272989X17705636 [Epub ahead of print].
15. ***Q. Chen**, T. Ayer, J. Chhatwal (2016), “Sensitivity Analysis in Sequential Decision Models: A Probabilistic Approach”, *Medical Decision Making*⁸, doi: 0272989X16670605 [Epub ahead of print].

³ Finalist papers will appear in *Interfaces*. See www.informs.org/About-INFORMS/News-Room/Press-Releases/2017-INFORMS-Franz-Edelman-Award-finalists-selected-from-leading-analytics-teams-around-the-world for the finalist announcement.

⁴ Impact Factor: 4.7

⁵ Impact Factor: 3.05

⁶ Impact Factor: 8.2, #2 among 40+ clinical neurology journals.

⁷ Impact Factor: 2.9, #4 among 25+ medical informatics journals.

16. ***Q. Chen**, N. Jain (*M.D.*), T. Ayer, W.G. Wierda (*M.D.*), C. R. Flowers (*M.D.*), S. O'Brien (*M.D.*), M. Keating (*M.D.*), H. M. Kantarjian (*M.D.*), J.Chhatwal (2016), "Economic Burden of Chronic Lymphocytic Leukemia in the Era of Oral Targeted Therapies in the United States", *Journal of Clinical Oncology (JCO)*⁸, 35(2), 166-174.
 - This paper was covered by the *Economic Times* and *Cancer Network*⁹
17. *J. Chhatwal, **X. Wang**, T. Ayer, M. Kabiri, R.T. Chung (*M.D.*), C. Hur (*M.D.*), J. M. Donohue (*M.D.*), M. S. Roberts (*M.D.*), F. Kanwal (*M.D.*) (2016), "Hepatitis C Disease Burden in the United States in the Era of Oral Direct-Acting Antivirals", *Hepatology*¹⁰, 64(5), 1442-1450.
18. *J. Chhatwal, **S. Samur**, B Kues, T Ayer , MS Roberts (*M.D.*), F Kanwal (*M.D.*), C Hur (*M.D.*), DMS Donnell (*M.D.*), R Chung (*M.D.*) (2016), "Optimal Timing of Hepatitis C Treatment in Patients on The Liver Transplant Waiting List", *Hepatology*¹¹, doi: 10.1002/hep.28926 [Epub ahead of print].
19. *T. He (*M.D.*), K. Li, M.S. Roberts (*M.D.*), A. C. Spaulding (*M.D.*), T. Ayer, J. J. Grefenstette, J. Chhatwal (2016), "Prevention of Hepatitis C By Screening and Treatment in United States Prisons," *Annals of Internal Medicine*¹², 164(2), 84-92.
 - This paper was covered in NPR¹³
20. *G. Rust (*M.D.*), S. Zhang (*M.D.*), Z. Yu, L. Caplan (*M.D.*), S. Jain (*M.D.*), T. Ayer, L. McRoy, R.S. Levine (*M.D.*) (2016) "Counties Eliminating Racial Disparities in Colorectal Cancer Mortality," *Cancer*¹⁴, 122(11), 1735-1748.
21. *T. Ayer, O. Alagoz, N.K. Stout, E.S. Burnside (*M.D.*) (2015), "Heterogeneity in Women's Adherence and Its Role on Optimal Breast Cancer Screening Policies," *Management Science*, 62 (5), 1339-1362.
 - First Prize Winner of the 2011 INFORMS Doing Good with Good OR Competition

⁸ Impact Factor: 20.98, the most widely read oncology publication.

⁹ See <http://www.cancernetwork.com/hematologic-malignancies/cost-cll-management-expected-skyrocket> and <http://health.economictimes.indiatimes.com/news/industry/targeted-therapy-drugs-could-radically-increase-the-cost-of-leukemia-treatment/55505495>

¹⁰ Impact Factor: 11.05, highest ranking hepatology journal.

¹¹ Impact Factor: 11.05, highest ranking hepatology journal

¹² Impact Factor: 17.81, the highest of any specialty journal in the Thomson Reuters' General and Internal Medicine category.

¹³ See <http://www.npr.org/sections/health-shots/2015/11/23/457145471/treating-prisoners-with-hepatitis-c-may-be-worth-the-hefty-price>

¹⁴ Impact Factor: 5.64.

22. *T. Ayer (2015), “Inverse optimization for Assessing Emerging Technologies in Breast Cancer Screening,” *Annals of Operations Research*, 230(1), 57-85.
23. *DA Goldstein (M.D.), **Q. Chen**, T. Ayer, D. Howard, J. Lipscomb, SS Ramalingam (M.D.), FR Khuri (M.D.), CR Flowers (M.D.) (2015), “Necitumumab in Metastatic Squamous Lung Cancer – Establishing a Value-Based Cost,” *JAMA Oncology*, 1(9), 1293-1300.
 - This paper was covered in the Wall Street Journal and Washington Post¹⁵
24. ***Q. Chen**, T. Ayer, L. Nastoupil (M.D.), JL Koff (M.D.), L Jean (M.D.), AD Staton (M.D.), J. Chhatwal, CR Flowers (M.D.) (2015), “Population-specific prognostic models are needed to stratify outcomes for African-Americans with diffuse large B-cell lymphoma,” *Leukemia and Lymphoma*¹⁶, 57(4), 842-851.
25. *DA Goldstein (M.D.), BA Ahmad (M.D.), **Q. Chen**, T. Ayer, D. Howard, J. Lipscomb, RD Harvey (M.D.), B El-Rayes (M.D.), CR Flowers (M.D.) (2015), “Cost-effectiveness Analysis of Regorafenib for Metastatic Colorectal Cancer,” *Journal of Clinical Oncology*¹⁷, 33(32), 3727-3732.
26. ***J. Yan**, T. Ayer, P. Keskinocak, A. Caughey (M.D.) (2015), “Preference-Sensitive Risk Cutoff Values for Prenatal Integrated Screening Test for Down Syndrome,” *Prenatal Diagnosis*¹⁸, 35(7), 645-51.
27. ***A. Bonifonte**, T. Ayer, E. Veledar, **A. Clarke**, P. Wilson (M.D.) (2015), “Antecedent blood pressure as a predictor of Cardiovascular Diseases,” *Journal of the American Society of Hypertension*¹⁹, 9(9), 690-696.
28. *AD Staton (M.D.), JL Koff (M.D.), **Q. Chen**, T Ayer, CR Flowers (M.D.) (2015), “Next-generation prognostic assessment for diffuse large B cell lymphoma”, *Future Oncology*, 20, 1-15 (invited paper).
29. *DA Goldstein (M.D.), **Q. Chen**, T. Ayer, D. Howard, J. Lipscomb (M.D.), RD Harvey (M.D.), B El-Rayes (M.D.), CR Flowers (M.D.) (2015), “First and Second line

¹⁵ See <https://www.washingtonpost.com/news/wonk/wp/2015/08/27/cancer-drugs-arent-just-really-expensive-theyre-a-bad-value/> and <http://www.wsj.com/articles/lillys-lung-cancer-drug-portrazza-to-cost-11-430-a-month-1449867424>

¹⁶ Impact Factor: 3.09

¹⁷ Impact Factor: 20.98, the most widely read oncology publication.

¹⁸ Impact Factor: 3.27, ranking #1 in Prenatal Diagnosis area.

¹⁹ Impact Factor: 2.77.

bevacizumab in addition to chemotherapy for metastatic colorectal cancer: A US based cost-effectiveness analysis,” *Journal of Clinical Oncology (JCO)*²⁰, 33(10), 1112-8.

30. ***Q. Chen**, T. Ayer, AC Rose (*M.D.*), LJ Nastoupil (*M.D.*), CR Flowers (*M.D.*) (2015), “Comparing the Cost Effectiveness of Rituximab Maintenance and Radio-immunotherapy Consolidation Therapy Following First-line Chemo-Immunochemotherapies for Follicular Lymphoma,” *Value in Health*²¹, 18(2), 189-97.
 - This paper was covered by ISPOR News and Press²²
31. *DA Goldstein (*M.D.*), **Q. Chen**, T. Ayer, D. Howard, J. Lipscomb, RD Harvey (*M.D.*), B El-Rayes (*M.D.*), CR Flowers (*M.D.*) (2014), “Cost Effectiveness Analysis of Pharmacokinetically Guided 5-Fluorouracil therapy in FOLFOX chemotherapy for metastatic colorectal cancer,” *Clinical Colorectal Cancer*²³, 13(4), 219-25.
32. *T. Ayer, **Q. Chen**, E.S. Burnside (*M.D.*) (2013), “Artificial Neural Networks in Mammography Interpretation and Diagnostic Decision Making,” *Computational and Mathematical Methods in Medicine*, doi:10.1155/2013/832509 (invited paper).
33. ***Q. Chen**, T. Ayer, L. J. Nastoupil (*M.D.*), R. Sinha (*M.D.*), H. Zhang (*M.D.*), C. R. Flowers (*M.D.*) (2012), “Initial Management Strategies for Follicular Lymphoma,” *International Journal of Hematologic Oncology*, 1(1), 35-45 (invited paper).
34. *T. Ayer, O. Alagoz, N.K. Stout (2012), “A POMDP Approach to Personalize Mammography Screening Decisions,” *Operations Research*, 60, 1017-1018.
 - First Prize Winner of the 2009 INFORMS Best Poster Presentation Award
 - Second Prize Winner of the 2011 INFORMS M&SOM Student Paper Competition
 - Finalist in 2011 INFORMS Decision Analysis Society Student Paper Competition
 - This paper was covered in *Daily Herald*²⁴
35. T. Ayer, O. Alagoz, J. Chhatwal, J. W. Shavlik, C.E. Kahn, E.S. Burnside (2010), “Breast Cancer Risk Estimation with Artificial Neural Networks Revisited: Discrimination and Calibration,” *Cancer*²⁵, 116, 3310–21.
 - Winner of the 2009 Society for Medical Decision Making Lee B. Lusted award

²⁰ Impact Factor: 20.98, the most widely read oncology publication.

²¹ Impact Factor: 3.27, Ranking 6th out of 76 in Health Care Sciences & Services

²² See <http://press.ispor.org/index.php/maintenance-and-consolidation-therapies-cost-effective-strategies-to-prolong-remission-in-patients->

²³ Impact Factor: 2.90

²⁴ See <http://www.dailyherald.com/article/20130809/entlife/708099955/print/>

²⁵ Impact Factor: 5.64.

36. T. Ayer, J. Chhatwal, O. Alagoz, C.E. Kahn, R.W. Woods, E.S. Burnside (2010), “Comparison of Logistic Regression and Artificial Neural Network Models with an Example in Breast Cancer Risk Prediction,” *RadioGraphics*²⁶, 30, 13–22.
37. T. Ayer, M.U.S. Ayvaci, Z.X. Liu, O. Alagoz, E.S. Burnside (2010), “Computer Aided Diagnostic Models in Breast Cancer Screening,” *Imaging in Medicine*, 2(3), 313-23 (invited paper).

B2. Conference Presentation with Proceedings (Refereed)

1. ***D. Frezza, W. Chen**, P. Keskinocak, T. Ayer, R. Jin, S.E. Barlow, S. Xanthakos, J.E. Lavine, M.B Vos (2016), “*Standardized Time Average of ALT is a Better Marker of Histologic Improvement in NAFLD*,” in *Hepatology* (Vol. 63, No. 1 SUPP, pp. 559A-560A), Wiley-Blackwell. Abstract also published in Proceedings of the 2016 Liver Meeting.
2. *J.Chhatwal, K. Li, T. He, MS Roberts, T. Ayer, **S. Samur**, J. Grefenstette, AC Spaulding (2016), “Patients who Fail Treatment in the era of DAAs: Projections from HEP-SIM Model,” *Hepatology* (Vol. 63, No. 1 Supp, pp. 412A-412A), Wiley-Blackwell. Abstract also published in Proceedings of the 2016 Liver Meeting.
3. *J.Chhatwal, **Q. Chen**, T. Ayer, F. Kanwal, K.V. Kowdley, X. Wang et al. (2016), “Patients who Fail Treatment in the era of DAAs: Projections from HEP-SIM Model,” *Hepatology* (Vol. 63, No. 1 Supp, pp. 412A-412A), Wiley-Blackwell. Abstract also published in Proceedings of the 2016 Liver Meeting.
4. *DA Goldstein, **Q. Chen**, T. Ayer, KK Chan, K. Virik, A. Hammerman, B. Brenner, CR Flowers, P. Hall (2016), "Bevacizumab (bev) for metastatic colorectal cancer (mCRC): A global cost-effectiveness analysis, " Proceedings of the 2016 American Society of Clinical Oncology Meeting.
5. ***Q. Chen**, T. Ayer, J. Chhatwal (2015), “Probabilistic sensitivity analysis in sequential decision models,” Proceedings of the 37th Annual Meeting of the Society for Medical Decision Making, St. Louis, MO, USA, October 18-21, 2015.
6. ***J. Vlachy, M. Jo, Q. Li**, T. Ayer, P. Keskinocak, L. Olson, J. Swann, A. Vats (2015), “Continuous Electroencephalography for Seizure Detection in Children: Who should we monitor?” *Critical Care Medicine*, Vol.42, No.12, December 2014. Abstract also published in Proceedings of the 42nd *Society of Critical Care Medicine Congress*.
7. *M. Oster, **C. Caglayan**, R. Simeone, P. Keskinocak, T. Ayer (2015), “Optimizing the Screening Algorithm for Critical Congenital Heart Disease: A Data-Driven Approach”, *Circulation*²⁷ 132 (Suppl 3), A15653-A15653. Abstract also published in Proceedings

²⁶ Impact Factor: 3.095

²⁷ 2015 Impact Factor 17.047, second highest ranking journal in Cardiology and Cardiovascular diseases.

of the American Heart Association Scientific Meeting, Orlando, FL, November 7-11, 2015.

8. *AD Staton, **Q. Chen**, T. Ayer, DA Goldstein, J. Koff, CR Flowers (2015). "Cost-Effectiveness of Subtype-based Treatment Strategies In Diffuse Large B-Cell Lymphoma Patients (DLBCL)." Proceedings of the 2015 American Society of Hematology Meeting.
9. *DA Goldstein, BB Ahmad, **Q. Chen**, T. Ayer, DH Howard, J. Lipscomb, BF El-Rayes, CR Flowers (2015). "Cost-effectiveness Analysis of Regorafenib for Metastatic Colorectal Cancer." *Blood*²⁸, **126 (23): 4476**. Abstract also published in Proceedings of the 57th American Society of Hematology Meeting. Abstract also published in Proceedings of the 2015 American Society of Clinical Oncology Meeting.
10. *DA Goldstein, **Q. Chen**, T. Ayer, D. Howard, J. Lipscomb, SS Ramalingam, FR Khuri, CR Flowers (2015). "Necitumumab in Metastatic Squamous Non-Small Cell Lung Cancer (mSqNSCLC): Establishing a Value-based Cost." Proceedings of the 2015 American Society of Clinical Oncology Meeting.
11. ***Q. Chen**, T. Ayer, J. Chhatwal (2015), "Patient-Centered Surveillance Strategies for Hepatocellular Carcinoma: A Societal Perspective," Proceedings of the 36th Annual Meeting of the Society for Medical Decision Making.
12. ***Q. Chen**, N. Jain, T. Ayer, S. O'Brien, M. Keating, W.G. Wierda, H. M. Kantarjian, J.Chhatwal (2016), "Prevalence and Economic Burden of Chronic Lymphocytic Leukemia (CLL) in the Era of Oral Targeted Therapies", *Blood*, **126 (23): 871**. Abstract also published in Proceedings of the 2015 American Society of Hematology Meeting.
13. *DA Goldstein, BB Ahmad, **Q. Chen**, T. Ayer, D. Howard, J. Lipscomb, RD Harvey, B El-Rayes, CR Flowers (2015), "Cost-effectiveness Analysis of Regorafenib for Metastatic Colorectal Cancer," Proceedings of the 2015 Gastrointestinal Cancers Symposium.
14. **A. Bonifonte**, T. Ayer, E. Veledar, A. Clarke, P. Wilson, "Role And Importance Of Antecedent Blood Pressure In Predicting Outcomes In Cardiovascular Disease," Hypertension 64 (Suppl 1), A433-A433.
15. C. Hebson, D. Lin, T. Ayer, **J. Vlachy**, M. Badell, M. Platner, A. Katarbarwa, J. Shinnick, A. Sahu, W. Book (2014) "Neonatal Outcomes and Maternal Morbidity Associated With Pregnancy in Women with Congenital Heart Disease." *Circulation* 130.Suppl 2 (2014): A18062-A18062.
16. *DA Goldstein, **Q. Chen**, T. Ayer, D. Howard, J. Lipscomb, RD Harvey, B El-Rayes, CR Flowers (2014), "Cost effectiveness analysis of pharmacokinetic-guided (PK) 5-fluorouracil (5FU) when combined with leucovorin and oxaliplatin (FOLFOX) chemotherapy for metastatic colorectal cancer (mCRC)," Proceedings of the 2014 American Society of Clinical Oncology Meeting.
17. *DA Goldstein, **Q. Chen**, T. Ayer, D. Howard, J. Lipscomb, RD Harvey, B El-Rayes, CR Flowers (2014), "Cost-effectiveness analysis (CEA) of bevacizumab (Bev) in first-

²⁸ 2015 Impact Factor 11.84, most cited peer-reviewed publication in Hematology.

and second-line treatment of metastatic colorectal cancer (mCRC),” Proceedings of the 2014 American Society of Clinical Oncology Meeting.

18. ***Q. Chen**, T. Ayer, L.J. Nastoupil, C. R. Flowers (2013), “Racial Disparities in Prediction Of 5-Year Overall Survival For Diffuse Large B-Cell Lymphoma (DLBCL) Patients,” *Blood*, **122** (21). Abstract also published in Proceedings of the 55th American Society of Hematology Meeting.
19. ***Q. Chen**, T. Ayer, A.C. Rose, L.J. Nastoupil, C. R. Flowers (2013), “Comparing The Cost-Effectiveness of Rituximab Maintenance and Radioimmunotherapy Consolidation Therapy Following First-Line Chemo/Immunochemotherapies For Follicular Lymphoma,” *Blood*, **122** (21). Abstract also published in Proceedings of the 55th American Society of Hematology Meeting.
20. T. Ayer, O. Alagoz, N.K. Stout, E.S. Burnside (2011), “Two Missing Factors in Mammography Screening Guidelines: Risk and Adherence,” Proceedings of the 97th Annual Meeting of the Radiological Society of North America.
21. T. Ayer, O. Alagoz, E.S. Burnside (2010), “Why May Neural Network-based CADx Models Fail in Clinical Translation?” Proceedings of the 96th Annual Meeting of the Radiological Society of North America.
22. T. Ayer, O. Alagoz, N.K. Stout, and E.S. Burnside (2010), "Designing Risk-Tailored Breast Cancer Screening Policies Considering Imperfect Adherence," Proceedings of the 32nd Annual Meeting of the Society for Medical Decision Making.
23. T. Ayer, O. Alagoz, N.K. Stout (2009), “A Mathematical Model To Optimize Breast Cancer Screening Policy,” Proceedings of the 31st Annual Meeting of the Society for Medical Decision Making.
24. T. Ayer, O. Alagoz, J. Chhatwal, J. Shavlik, C. Kahn, and E.S. Burnside (2009). “Discrimination and Calibration of Artificial Neural Networks in Mammographic Diagnosis,” Proceedings of the 31st Annual Meeting of the Society for Medical Decision Making.
25. T. Ayer, O. Alagoz, J. Chhatwal, J. W. Shavlik, C. E. Kahn, and E. S. Burnside (2008), “Comparing Artificial Neural Network Training Strategies for Breast Cancer Risk Prediction,” Proceedings of the 30th Annual Meeting of the Society for Medical Decision Making.
26. T. Ayer, J. Chhatwal, O. Alagoz, E. S. Burnside (2008), “Comparison of Artificial Neural Network and Logistic Regression Model for Breast Cancer Risk Prediction,” Proceedings of the 94th Annual Meeting of the Radiological Society of North America.

D. PRESENTATIONS

D1. Invited Seminars at Peer Institutions

1. Centers for Disease Control & Prevention (CDC), Division of Cancer Prevention and Control, June 2017 (scheduled).
2. Mayo Clinic, Center for the Science of Health Care Delivery and Division of Health Care Policy & Research, February 2017.
3. Carnegie Mellon University, Tepper School of Business, January 2017.
4. The University of Texas at Austin, Operations Research and Industrial Engineering, February 2017.
5. University of Minnesota, Industrial and Systems Engineering, December 2016.
6. Harvard University, Institute for Technology Assessment, November 2016.
7. University of Michigan, Industrial Engineering and Operations, October 2016.
8. Northwestern University, Industrial Engineering and Management Sciences, October 2016.
9. Harvard University & Mass General Hospital, Institute for Technology Assessment, November 2016.
10. University of Chicago, Booth School of Business, October 2016.
11. University of Tennessee, Industrial and Systems Engineering, April 2016.
12. Rutgers University Business School, New Brunswick, NJ, October 2015.
13. Kelley School of Business, Indiana University, Bloomington, IN, October 2015.
14. The MD Anderson Cancer Center, Houston, TX, November 2014.
15. Bogazici University, Istanbul, Turkey, July 2014.
16. Koc University, Istanbul, Turkey, July 2014.
17. Ozyegin University, Istanbul, Turkey, July 2014.
18. MIT, Operations Research Center, Boston, MA, January 2013.
19. Emory University, Winship Cancer Institute, December 2013.
20. Emory University, Emory Clinical Cardiovascular Research Institute, September 2013.
21. The University at Buffalo, Department of Industrial and Systems Engineering, NY, March 2012.
22. Centers for Disease Control and Prevention, Division of Cancer Control and Prevention, Atlanta, GA, January 2012.
23. Penn State University, Department of Industrial and Manufacturing Engineering, Department of Industrial and Manufacturing Engineering, February 2011.
24. University of Minnesota, Department of Industrial and Systems Engineering, February 2011.
25. Rutgers University, Department of Industrial and Systems Engineering, February 2011.
26. MIT, Engineering Systems Division, Boston, MA, January 2011.

27. University of British Columbia, Sauder School of Business, Vancouver, Canada, January 2011.
28. Indiana University, Kelley School of Business, Bloomington, IN, January 2011.

D2. Tutorial/Keynote at conferences

1. T. Ayer, P. Keskinocak, J. Swann, "Global Healthcare Operations: Research in Public Health for Efficient, Effective, and Equitable Outcomes," INFORMS, San Francisco, CA, November 9-12, 2014.
2. T. Ayer, "Future of Chronic Disease Screening and Treatment," SAMSI Data Driven Healthcare Workshop, Raleigh, NC, USA, August 26-29, 2012.

D3. Invited Conference and Workshop Presentations

1. T. Ayer, C. Zhang, A. Bonifonte, A. Spaulding, J. Chhatwal, "Prioritizing Hepatitis C Treatment in United States Prisons", INFORMS Annual Meeting, Nov 13-16, 2016.
2. Q. Chen, T. Ayer, J. Chhatwal, "Optimal Liver Cancer Surveillance in Hepatitis C-Infected Population", INFORMS Annual Meeting, Nov 13-16, 2016.
3. Q. Chen, T. Ayer, J. Chhatwal, "Resource Allocation for Hepatitis C Elimination", INFORMS Annual Meeting, Nov 13-16, 2016.
4. J. Yan, T. Ayer, P. Keskinocak, A. Caughey, "Incorporating Fairness and Women's Preferences into Down Syndrome Diagnosis Decisions", INFORMS Annual Meeting, Nov 13-16, 2016.
5. A. Bonifonte, T. Ayer, B. Haaland, P. Wilson, "A Continuous Time Stochastic Model To Optimize Blood Pressure Treatment Decisions", INFORMS Annual Meeting, Nov 13-16, 2016.
6. T. Ayer, M. Ayvaci, Z. Karaca, J. Vlachy, "The Impact Of Health Information Exchanges On Emergency Department Length Of Stay", INFORMS Annual Meeting, Nov 13-16, 2016.
7. C. Caglayan, M. Sir, K. Pasupathy, T. Ayer, Y. Liu, "ED Physician Staffing via Multi-stage Multi-class Network", INFORMS Annual Meeting, Nov 13-16, 2016.
8. C. Zhang, A. Atasu, T. Ayer, B. Toktay, "Truth-Inducing Mechanisms for Medical Surplus Products Allocation", INFORMS Annual Meeting, Nov 13-16, 2016.
9. Z. She, T. Ayer, "Modeling Health Insurance Marketplaces", INFORMS Annual Meeting, Nov 13-16, 2016.
10. Y. Kim, M. Ayvaci, S. Raghunathan, T. Ayer, "Medical Guideline Making When Litigation Is A Concern: The Role Of Ubiquitous Health Information," INFORMS Annual Meeting, Nov 13-16, 2016.
11. C. Zhang, T. Ayer, C.C. White, "2-Approximation Algorithms for Perishable Inventory Control When FIFO Is an Optimal Issuing Policy", INFORMS Healthcare, Nashville, TN, July 29-31, 2015.
12. C. Zhang, T. Ayer, A. Bonifonte, J. Chhatwal, A. Spaulding, "Prioritizing Hepatitis C Treatment in United States Prisons", INFORMS Conference, Nov 1-4 2015.
13. C. Zhang, T. Ayer, C.C. White, "2-Approximation Algorithms for Perishable Inventory Control When FIFO Is an Optimal Issuing Policy", INFORMS, Philadelphia, PA, November 1-4, 2015.

14. T. Ayer, M. Ayvaci, Z. Karaca, J. Vlachy, "Does Health Information Exchange Move Patients Through Emergency Departments Faster?," INFORMS, Philadelphia, PA, November 1-4, 2015.
15. C. Caglayan, T. Ayer, "Optimal Screening Policies for Women at High Risk of Breast Cancer", INFORMS Conference, Nov 1-4 2015.
16. C. Caglayan, T. Ayer, D. Nestler, K. Pasupathy, M. Sir, "Physician Staffing in the Emergency Department: Opening the Blackbox", INFORMS Conference, Nov 1-4 2015.
17. T. Ayer, M. Ayvaci, S. Raghunathan, J. Vlachy, "Bundled Payments: The Roles of Organization and Diagnosis," INFORMS, Philadelphia, PA, November 1-4, 2015.
18. Q. Chen, T. Ayer, J. Chhatwal (2015). "Optimal Liver Cancer Surveillance in Hepatitis C-Infected Population. INFORMS Annual Meeting 2015, Philadelphia, PA, USA, November 1-4, 2015.
19. M. Cevik, T. Ayer, O. Alagoz, "Effects of Budgetary Restrictions on Mammography Screening Policies," INFORMS, San Francisco, CA, November 9-12, 2014.
20. Q. Chen, T. Ayer, J. Chhatwal, "Optimal Strategy for Hepatocellular Carcinoma Surveillance in Hepatitis C Patients," INFORMS, San Francisco, CA, November 9-12, 2014.
21. J. Yan, T. Ayer, P. Keskinocak, "Preference-Sensitive Risk Cutoff Values for Prenatal Integrated Screening Test for Down Syndrome," INFORMS, San Francisco, CA, November 9-12, 2014.
22. Q. Chen, T. Ayer, J. Chhatwal, "Optimal Policies for Hepatocellular Carcinoma Surveillance: A Dynamic Approach," INFORMS, Minneapolis, MN, USA, October 6-9, 2013.
23. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside, "Behavioral Heterogeneity in Women's Adherence and Its Role on Optimal Mammography Screening Policies," INFORMS, Phoenix, AZ, USA, October 14-17, 2012.
24. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside "Redesigning the Breast Cancer Screening Policies," INFORMS, Charlotte, NC, USA, November 13-16, 2011.
25. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside "Optimizing Mammography Screening Policies Considering Adherence: A Behavioral Perspective," INFORMS, Charlotte, NC, USA, November 13-16, 2011.
26. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside "Designing a New Breast Cancer Screening Program Considering Adherence," INFORMS, Austin, TX, USA, November 7-10, 2010.
27. T. Ayer, O. Alagoz, N.K. Stout, "A POMDP Approach To Personalize Mammography Screening Decisions," INFORMS, Austin, TX, USA, November 7-10, 2010.
28. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside, "Operations Research for Early Diagnosis of Breast Cancer," INFORMS, San Diego, CA, USA, October 11-14, 2009.
29. T. Ayer, O. Alagoz, N.K. Stout, "Using POMDPs to Determine the Optimal Mammography Screening Schedule From the Patient's Perspective," INFORMS, San Diego, CA, USA, October 11-14, 2009.
30. T. Ayer, O. Alagoz, J. Chhatwal, J. W. Shavlik, C. E. Kahn, "An Artificial Neural Network to Quantify Breast Cancer Risk Based on Mammography Findings," INFORMS, San Diego, CA, USA, October 11-14, 2009.

31. T. Ayer, O. Alagoz, N.K. Stout, "Optimizing Patient-Specific Mammography Schedule Using POMDPs," CORS-INFORMS International, Toronto, ON, Canada, June 14-17, 2009.
32. T. Ayer and O. Alagoz, "A POMDP Model for Optimizing Mammography Screening for Breast Cancer," INFORMS, Washington, DC, USA, October 12-15, 2008.
33. T. Ayer, O. Alagoz, E.S. Burnside, J. Chhatwal, C. E. Kahn, "Using Artificial Neural Networks to Predict the Risk of Breast Cancer," INFORMS, Seattle, WA, USA, November 4-7, 2007.
34. T. Ayer, O. Alagoz, E.S. Burnside, J. Chhatwal, C. E. Kahn, "Artificial Neural Networks in Prediction of the Risk of Breast Cancer," INFORMS Midwest Regional Conference, Northwestern University, IL, USA, August 24-25, 2007.

D4. Conference and Workshop Presentations

1. T. Ayer, C. Zhang, A. Bonifonte, A. Spaulding, J. Chhatwal, "*Prioritizing Hepatitis C Treatment in U.S. Prisons*", Academic & Health Policy Conference on Correctional Health, Atlanta, GA, March 16-17, 2017.
2. T. Ayer, J. Vlachy, M. Ayvaci, S. Raghunathan, "The Business of Healthcare: Physician Integration in Bundled Payments", POMS, Seattle, WA, May 5-8, 2017.
3. C. Zhang, A. Atasu, T. Ayer, B. Toktay, "Truth-Inducing Mechanisms for Medical Surplus Products Allocation", POMS, Seattle, WA, May 5-8, 2017.
4. T. Ayer, C. Zhang, A. Bonifonte, A. Spaulding, J. Chhatwal, "*A Decision Support Tool for Hepatitis C Treatment Prioritization in Prisons*", Academic & Health Policy Conference on Correctional Health, Baltimore, MD, March 17-18, 2016.
5. C. Zhang, A. Atasu, T. Ayer, B. Toktay, "Truth-Inducing Mechanisms for Medical Surplus Products Allocation", POMS, Orlando, FL, May 6-9, 2016.
6. C. Zhang, T. Ayer, C.C. White, "Risk Pooling In a Two-Location Perishable Inventory System," TSL Workshop, Atlanta, GA, June 20-22, 2016.
7. Q. Chen, T. Ayer, J. Chhatwal (2015). "Probabilistic Sensitivity Analyses in Sequential Decision." 37th Annual Meeting of the Society for Medical Decision Making, St. Louis, MO, USA, October 18-21, 2015.
8. N. Jain, Q. Chen, T. Ayer, S. O'Brien, M. Keating, W. Wierda, H. Kantarjian, C. Jagpreet (2015). "Economic Burden and Prevalence of Chronic Lymphocytic Leukemia (CLL) in the Era of Targeted Therapies." XVI International Workshop on Chronic Lymphocytic Leukemia, Sydney, Australia, September 7-9, 2015.
9. T. Ayer, O. Alagoz, N.K. Stout, E.B. Burnside, "Role of adherence in optimizing mammography screening", International Cancer Screening Network Meeting, Rotterdam, The Netherlands, June 2-4, 2015.
10. M. Oster, C. Caglayan, R. Simeone, P. Keskinocak, T. Ayer, "Optimizing the Screening Algorithm for Critical Congenital Heart Disease: A Data-Driven Approach", American Heart Association Scientific Meeting, Orlando, FL, November 7-11, 2015.
11. J. Chhatwal, X. Wang, M.S. Roberts, M. Kabiri, T. Ayer, J.M. Donohue, F. Kanwal, "The Cost of Making Hepatitis C a Rare Disease in the United States", American Association for the Study of Liver Diseases, The Liver Meeting 2015, San Francisco, CA, November 13-17, 2015.

12. J. Chhatwal, X. Wang, F. Kanwal, M. Kabiri, T. Ayer, J.M. Donohue, M.S. Roberts, "Hepatitis C Disease Burden in the United States in 2015 and Beyond", American Association for the Study of Liver Diseases, The Liver Meeting 2015, San Francisco, CA, November 13-17, 2015.
13. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside, "Role of Adherence in Optimizing Mammography Screening," International Cancer Screening Network (ICSN) Meeting, Rotterdam, The Netherlands, June 2-4, 2015.
14. M. Ozkaynak, T. Ayer, M. Sills, J. Vlachy, Dziadkowiec, "Combining Visualization and Markov Models to Characterize Workflow in Emergency Departments", ISERC 2015, Nashville, TN, May 30-June 2, 2015.
15. J. Chhatwal, T. He, K. Li, M.S. Roberts, T. Ayer, J. J. Grefenstette, A. C. Spaulding, "Predicting the Benefit from Opt-out Hepatitis C Screening in United States Prisons through Mathematical Modeling," Academic & Health Policy Conference on Correctional Health, Boston, MA, March 19-20, 2015.
16. M. Jo, Q. Li, J. Vlachy, T. Ayer, P. Keskinocak, J. Swann, A. Vats, L. Olson, "Continuous Electroencephalography for Seizure Detection in Children: Who should we monitor?" 44th Critical Care Congress, Phoenix, Arizona, January 17-21, 2015.
17. T. Ayer, M. Ayvaci, Z. Karaca, H.S. Won, J. Vlachy, "Does Health Information Exchange Move Patients Through Emergency Departments Faster?," Annual Workshop on Health Information and Economics (WHITE), Washington, DC, October 10-11, 2014.
18. Q. Chen, T. Ayer, J. Chhatwal, "Optimal Surveillance of Hepatocellular Carcinoma for Patients with Hepatitis C: A Societal Perspective," Health Systems Optimization Workshop, Chicago, IL, September 12-13, 2014.
19. A. Bonifonte, T. Ayer, E. Veledar, A. Clarke, P. Wilson, "Role And Importance Of Antecedent Blood Pressure In Predicting Outcomes In Cardiovascular Disease," High Blood Pressure Research Conference, San Francisco, CA, September 9-12, 2014.
20. Q. Chen, T. Ayer, J. Chhatwal, "Optimal Surveillance of Hepatocellular Carcinoma for Patients with Hepatitis C: A Societal Perspective," Production and Operations Management Society (POMS) Conference, Atlanta, GA, May 9-12, 2014.
21. M. Jo, Q. Li, J. Vlachy, T. Ayer, P. Keskinocak, J. Swann, A. Vats, L. Olson, "Improving Continuous Electroencephalography (cEEG) Monitoring in Pediatric Intensive Care Units (PICU): Whom Should We Monitor and How Long?," Pediatric Healthcare Innovation Conference, Atlanta, GA, April 21, 2014.
22. J. Yan, T. Ayer, P. Keskinocak, "Preference-Sensitive Risk Cutoff Values for Prenatal Integrated Screening Test for Down Syndrome," Pediatric Healthcare Innovation Conference, Atlanta, GA, April 21, 2014.
23. J. Yan, T. Ayer, P. Keskinocak, "Fetal Loss Rates, Maternal Age Dynamcis and Optimal Risk Cutoff Values for Prenatal Screening Strategies for Down Syndrome," Emory Pediatrics Innovation Conference, Atlanta, GA, 2013.
24. T. Ayer, O. Alagoz, N.K. Stout, "Tailored Breast Cancer Screening Policies," CDC National Cancer Conference, Washington, DC, USA, August 21-23, 2012.
25. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside, "Behavioral Heterogeneity in Women's Adherence and Its Role on Optimal Mammography Screening Policies," MOPTA Conference, Lehigh University, USA, July 30-31, 2012.

26. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside “Behavioral Heterogeneity in Women’s Adherence and Its Role on Optimal Mammography Screening Policies,” IIE Orlando, FL, USA, May 19-22, 2012.
27. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside “Behavioral Heterogeneity in Women’s Adherence and Its Role on Optimal Mammography Screening Policies,” Production and Operations Management Society (POMS) Conference, Chicago, IL, April 20-23, 2012.
28. T. Ayer, O. Alagoz, N.K. Stout, E. S. Burnside “Risk-Based Breast Cancer Screening and Diagnosis Policies,” Centers for Disease Control & Prevention, Atlanta, GA, USA, January 11, 2012.
29. T. Ayer, O. Alagoz, N.K. Stout, E.S. Burnside, “Two Missing Factors in Mammography Screening Guidelines: Risk and Adherence,” RSNA Annual Meeting, Chicago, IL, USA, November 27-December 2, 2011.
30. O. Alagoz, T. Ayer, N.K. Stout, “A Mathematical Modeling Framework to Personalize Mammography Screening,” Mayo Clinic Conference on Systems Engineering and Operations Research in Health Care, Rochester, MN, August 19-20, 2010.
31. T. Ayer, O. Alagoz, N.K. Stout, EB Burnside, "Designing a New Breast Cancer Screening Program Considering Imperfect Adherence," Invited Presentation, Workshop on OR for the Public Interest, Stanford, CA, June 17-18, 2010.
32. E. S. Burnside, J. Chhatwal, K. E. Witte, J. Liu, T. Ayer, O. Alagoz, C. D. Page, D. H. Gustafson, “Computational Techniques to Improve the Early Diagnosis of Breast Cancer,” 3rd Annual UWCCC Research Retreat, Madison, WI, January 24, 2009.
33. T. Ayer, J. Chhatwal, O. Alagoz, E. S. Burnside, “Comparison of Artificial Neural Network and Logistic Regression Model for Breast Cancer Risk Prediction,” RSNA Annual Meeting, Chicago, IL, USA, November 30-December 5, 2008.
34. E. S. Burnside, O. Alagoz, D. H. Gustafson, C. D. Page, J. Chhatwal, T. Ayer, J. Liu, K. E. Witte, “Computational Techniques to Improve the Early Diagnosis of Breast Cancer,” 2nd Annual UWCCC Research Retreat, Madison, WI, February 2, 2008.

E. GRANTS AND CONTRACTS (Total Ayer Portion ~ \$2.1 million)

E1. As Principal Investigator

1. NSF-NIH Smart and Connected Health (SCH) Grant (accepted for funding, award no pending, total \$1.2 million), “SCH: INT: Collaborative Research: Smart Intervention Strategies for Hepatitis C Elimination, “National Science Foundation - National Institutes of Health Interagency Initiative: Smart and Connected Health, August 2017-August 2021 (Role: GT PI, Ayer portion: \$430,000, collaborative proposal with Harvard Medical School and Emory University Rollins School of Public Health).
2. NSF-NIH Smart and Connected Health (SCH) Grant (NSF Award No. 1601084, \$289,569), “SCH: EXP: Smart Adaptive Adherence-Enhancing Intervention Strategies for Breast Cancer Prevention”, National Science Foundation - National Institutes of Health Interagency Initiative: Smart and Connected Health, January 2017-January 2020 (Role: PI).

3. NSF CAREER Award (Award No. 1452999, \$500,000), “CAREER: Optimal Management of Chronic Diseases Caused by Infections”, National Science Foundation, September 2015-September 2020 (Role: PI).
4. NSF Grant (Award No. 1335137, \$360,000), “GOALI: Improving Blood Collection, Production, and Inventory Operations,” National Science Foundation, May 2014-May 2017 (Role: PI, Ayer Portion: \$280,000, Co-PIs: J. DeShane, Z. Ozkaynak, C. White).
5. Georgia Tech - Geisinger Health System Grant Program (\$99,932). “Development of an Operational Decision Support Tool for Biologic Pharmaceutical Use in Chronic Disease Management”, 2016-2018 (Role: PI, GT Portion: \$46,808, Co-PI: Seth Hostetler of Geisinger, Collaborators: P. Griffin, J. Swann, N. Serban).
6. Emory University – CORPH, Children’s Healthcare of Atlanta, and Georgia Tech (\$50,000), “Optimization of the algorithms for screening for critical congenital heart disease,” 2014 – 2015 (Role: PI, Ayer Portion: \$43,000, Co-PI: M. Oster (*M.D.*) of the Children’s Healthcare of Atlanta and CDC, Collaborators: R. Simeone (CDC), P. Keskinocak).
7. Emory University – Department of Neurology (\$50,000), “Continuous ICU Electroencephalography Monitoring: Prediction Models for Improving Outcomes and Cost Effectiveness,” 2015 – 2017 (Role: PI).
8. NIH Health Innovation Program via ACTSI Grant (\$25, 000), “Next generation prognostic models for patients with lymphoma”, July 2015-2016 (Role: PI, Ayer Portion: \$21,000, Co-PI: C. Flowers (*M.D.*) of the Emory University Winship Cancer Institute)
9. George Family Foundation Seed Grant (\$10,000), “Optimizing Screening for Critical Congenital Heart Disease,” March 2015-2016, (Role: PI, Co-PI: P. Keskinocak).
10. George Family Foundation Seed Grant (\$5,000), “Optimal Policies for Hepatocellular Carcinoma Surveillance,” March 2014-2015, (Role: PI).
11. George Family Foundation Seed Grant (\$5,000), “Sequential Blood Pressure Change-point Detection,” March 2014-2015, (Role: PI, Collaborators: Y. Xie).
12. George Family Foundation Seed Grant (\$5,000), “Considering Women's Preferences in Down Syndrome Screening,” March 2014-2015, (Role: PI, Collaborators: P. Keskinocak).

E2. As Co-Principal Investigator

1. Merck (229,944 direct, total \$350K) “Strategies for Management of Hepatitis C Virus: A Global Optimization Tool” (Ayer portion: \$105, 814, Role: Co-PI , PI: J. Chhatwal of the Harvard Medical School).

E3. As Senior Personnel or Contributor

1. Burroughs Wellcome Fund, 2017-2020 (Role: Senior Personnel, Ayer Portion: \$192,000, PI: C. Flowers (*M.D.*) of the Emory University Winship Cancer Institute)

2. Gilead Sciences (Award No. IN-US-337-1856, \$231,103, Ayer Portion: \$40,697), “Hepatitis C Prevention in Society Because of Treatment in United States Prisons”, (Role: Co-PI, PI: J. Chhatwal of the Harvard Medical School).

G. OTHER PROFESSIONAL ACTIVITIES

- **Consulting**
 - MD Anderson Cancer Center, Houston, TX, 2014.
 - Gilead Sciences, 2016.

V. TEACHING

A. COURSES TAUGHT

Undergraduate Courses

Semester, Year	Course No.	Course Name
Spring, 2012	ISyE 2027	Probability with Applications
Spring, 2013	ISyE 2027	Probability with Applications
Fall, 2014	ISyE 4106	Senior Design
Spring, 2015	ISyE 4106	Senior Design
Spring, 2017	ISyE 4803	Healthcare Systems Engineering

Graduate Courses

Semester, Year	Course No.	Course Name
Spring, 2013	HS 6000	Intro to Healthcare Delivery
Spring, 2014	HS 6000	Intro to Healthcare Delivery
Fall, 2014	HS 6000	Intro to Healthcare Delivery
Spring, 2015	HS 6400 (x-listed with ISyE 6320)	Health Systems Practice
Fall, 2015	HS 6000	Intro to Healthcare Delivery
Fall, 2016	HS 6000	Intro to Healthcare Delivery

B. INDIVIDUAL STUDENT GUIDANCE

B1. Ph.D. Students

B1. a. Graduated

1. Qiushi Chen
 - a. Advisement began in Spring 2012, graduated in 2016.
 - b. Dissertation Title: Cost-Effective Management of Chronic Diseases: Surveillance, Treatment, and Elimination
 - c. Health Systems Institute George Fellowship for academic performance and leadership, 2012.
 - d. INFORMS Decision Analysis Society Best Student Paper Award recipient, 2016.
 - e. Currently employer: Harvard Medical School; will join Penn State University Industrial Engineering Department as a tenure track Assistant Professor in Spring 2018.

2. Chenxi Zeng (co-advised with Chip White)
 - a. Advisement began in 2012, graduated in 2016.
 - b. Dissertation Title: A minimum cost and risk mitigation approach for blood collection
 - c. 2013 Georgia Tech Research and Innovation Conference (GTRIC) fellowship recipient
 - d. 2015 INFORMS Doing Good with Good OR Award recipient
 - e. Current employer: Amazon Inc.

B1. b. In Process

3. Anthony Bonifonte
 - a. Advisement began in Fall 2012.
 - b. Passed Ph.D. Comprehensive exams in Operations Research Track in Fall 2012.
 - c. Dissertation Title: Models and Analysis for Optimal Real Time Blood Pressure Monitoring and Control
 - d. Health Systems Institute George Fellowship for academic performance and leadership, 2013.
 - e. Will join Denison University Data Analytics Department as a tenure track Assistant Professor in Fall 2017.

4. Jan Vlachy
 - a. Advisement began in Spring 2013.
 - b. Passed Ph.D. Comprehensive exams in Operations Research Track in Fall 2013.
 - c. Dissertation Title: Data-driven Healthcare in Emerging Directions: Health Information Exchanges, New Payment Models, and Patient Workflow Optimization
 - d. Health Systems Institute George Fellowship for academic performance and leadership, 2014.
 - e. Will join Google in Fall 2017.

5. Jia Yan (co-advised with Pinar Keskinocak)
 - a. Advisement began in Spring 2013.

- b. Passed Ph.D. Comprehensive exams in Operations Research Track in Spring 2014.
 - c. Dissertation Title: Personalized Down Syndrome Screening and Diagnosis Strategies
 - d. Will join Lyft in Fall 2017.
6. Can Zhang (co-advised with Chip White)
- a. Advisement began in Fall 2013.
 - b. Passed Ph.D. Comprehensive exams in EDA Track in Spring 2014.
 - c. Tentative Dissertation Title: Optimal Control Models for Single and Multi-Location Blood Inventories
 - d. Finalist in INFORMS Nicholson Student Paper Competition, 2015.
 - e. First Prize, POMS College of Sustainable Operations Best Student Paper Competition, 2017
 - f. Honorable mention for the ISyE Jarvis Award, 2017
7. Caglar Caglayan
- a. Advisement began in Fall 2013
 - b. Passed Ph.D. Comprehensive exams in OR Track in Fall 2014
 - c. Tentative Dissertation Title: Multi-Modality Disease Screening
8. Zhaowei She
- a. Advisement began in Fall 2015
 - b. Passed Ph.D. Comprehensive exams in OR Track in Fall 2016
 - c. Tentative Dissertation Title: TBD
 - d. Health Systems Institute George Fellowship for academic performance and leadership, 2014.

B2. M.S. Students

B2.a. Graduated M.S. Non-thesis

1. Wen Chen, Master's Student in Health Systems (Spring 2016-2017)
2. Damon Frezza, Master's Student in OR (Spring 2016)
3. Mahadevan Vaidyanathan, Master's Student in IE (Spring 2016-present)
4. Darshini Nanavati, Master's Student in Health Systems (Spring 2016)
5. Jane Wang, Master's Student in Health Systems (Spring 2014-2015)
6. Ruizhi Wang, Master's Student in IE (Spring 2012)
7. Luke Wang, Master's Student in IE (Summer 2013, Fall 2013)
8. Justin Huff, Master's Student in Health Systems (Summer 2013, Fall 2013)
9. Shwetha Devanagondi, Master's Student in Health Systems (Summer 2013, Fall 2013)

B2.b. In Process M.S. Non-thesis

1. Kirthana Hampapur, Master's Student in OR (Spring 2017-)

B3. Undergraduate Students

1. Ijeabalum Okafor, NSF Summer Undergraduate Research in Engineering/Sciences (S.U.R.E.), Summer 2016
2. Diem “Dineise” Tran, Fall 2015-present
3. Simon Chow, undergraduate student (Spring 2013-2015)
4. Allison Clark, visiting undergraduate student from Texas Lutheran University under NSF S.U.R.E. program (Summer 2012)
5. Wesley Marrero, visiting undergraduate student from Universidad del Turabo at Gurabo, Puerto Rico under NSF S.U.R.E. program (Summer 2013)

B4. Service on thesis or dissertation committees

Internal

1. Yanling Chan, graduated in 2015, Advisors: Alan Erera, Chip Chite, ISyE.
2. Isil Alev, graduated in 2015, Advisors: Atalay Atasu, Ozlem Ergun, Beril Toktay, ISyE.
3. Monica Villarel, graduated in 2014, Advisor: Pinar Keskinocak, ISyE.
4. Pengyi Shi, graduated in 2013, Advisors: Jim Dai & Pinar Keskinocak, ISyE.
5. Jacqueline Griffin, graduated in 2012, Advisor: Pinar Keskinocak, ISyE.
6. Hannah Smalley, graduated in 2012, Advisor: Pinar Keskinocak, ISyE.

B5. Mentorship of postdoctoral fellows

1. Sumeyye Samur, 2015-2016, currently Research Fellow at Harvard Medical School
2. Hoon Jang, 2016-2017, currently Associate Research Fellow, Science and Technology Policy Institute, Republic of Korea

C. OTHER TEACHING ACTIVITIES

C1. Course Development

- Co-developed a new undergraduate course, ISyE 4803 – Health Systems Engineering: this course is intended for preparing undergraduate students for a professional career in healthcare industry. Healthcare is the largest industry, yet; ISyE did not have a healthcare-focused course in its undergraduate program. In this new course, students learn about the healthcare systems, various stakeholders, incentive misalignments, grand challenges, and potential applications of Industrial Engineering and Operations Research/ Analytics in healthcare.

C2. Course Improvement

- Completely redesigned HS 6000 – Introduction to Healthcare Delivery (a core course for the MSHS program). In addition to regular classroom teaching activities, the students are actively participating in real healthcare projects in collaborations with the medical organizations in Atlanta area (past collaborators include Winship Cancer Institute, Emory University Hospital, Shepherd Center, and Perkins Will).

C3. Professional Development/Continuing Education

- Course Developer, organizer, and instructor for the short course on “Clinical Applications of Artificial Neural Networks,” Society for Medical Decision Making (SMDM) Annual Meeting (intended audience: medical professionals such as medical doctors and health policy researchers).

VI. SERVICE

A. PROFESSIONAL CONTRIBUTIONS

A1. Editorial Board Memberships

- Guest Associate Editor, *Operations Research*, 2015-

A2. Society Offices, Activities, and Membership

A2.1. Institute for Operations Research and Management Science (INFORMS)

- Health Applications Society (HAS), 800+ members society, the second largest society within INFORMS
 - *President*, 2016-2017
 - *Vice President (President-Elect)*, 2015-2016
 - *Treasurer*, Health Applications Society, 2013-2015.
 - *Judge*, HAS Student Paper Competition (2013, 2015, 2017)
- *Co-Chair*, INFORMS Doing Good with Good OR Paper Competition, 2017.

A2.2. Society for Medical Decision Making (SMDM)

- *Short Course Instructor*, 2011-2013.
 - taught short courses on analytics to mainly medical doctors
- Member, 2008-present

A3. Organization and Chairmanship of Technical Sessions, Workshops and Conferences

- INFORMS HAS Cluster Chair, 2013, 2015
 - Organized 60+ healthcare focused conference sessions in HAS cluster
- Organizing Committee Member and Stream Chair, Healthcare Analytics, INFORMS Computing Society (ICS) Conference, 2017
- Organizing Committee Member, INFORMS Healthcare Conference, 2013.
- Management Committee Member, 8th INFORMS Workshop on Data Mining and Health Informatics, 2014.
- Program Committee Member, Global Joint Conference on Industrial Engineering and Its Application Areas, 2016.
- Organizing Committee Member, Health Systems Optimization Workshop, Northwestern University, 2014.
- Program Committee Member, Global Conference On Healthcare Systems Engineering (Gchse) 2014.
- Program Committee Member, International Conference on Health Informatics, 2014.
- Program Committee Member, YAEM (Turkish INFORMS) Conference, 2014.
- Session Chair, IFORS Conference, 2014.
- Stream Chair, Health Applications, MOPTA Conference, Lehigh University, 2012.
- Session Chair, INFORMS Annual Meetings, 2010- present.
- Session Chair, Production and Operations Management Society Conference, 2012, 2014

A4. Technical Journal or Conference Referee Activities

- Judge roles at INFORMS Competitions
 - INFORMS Doing Good with Good OR Competition (2016)

- M&SOM Healthcare SIG (2016, 2017)
- Pierskalla Best Paper Competition (2013, 2014)
- Decision Analysis Society Student Paper Competition (2013)
- INFORMS Interactive Session Competition (2011- 2013)
- Canadian Operations Research Society (CORS)/INFORMS Student Paper
- *Judge*, College of Healthcare Operations Management Best Paper Competition, 2012, 2014, 2015.
- *Reviewer*, Society of Medical Decision Making Annual Meetings, 2011-
- *Reviewer*, ISERC Annual Meeting, 2012.
- Referee for *Operations Research, Management Science, M&SOM, Productions and Operations Management, Decision Analysis, IEE Transactions, IEE Transactions on Healthcare Systems Engineering, Medical Decision Making, Health Care Management Science, Wiley Series in Operations Research and Management Science, Radiology, Cancer, Value in Health, Socio-Economic Planning Science, British Journal of Cancers, The Pharmacogenomics*

A5. Proposal Panels and Reviews

- National Science Foundation, 2012-

A6. Other Involvement

- Editor-in-Chief Search Committee, INFORMS *TutORials* Journal, 2017
- Committee Member, INFORMS Finance Committee, 2016-

B. PUBLIC AND COMMUNITY SERVICE

No data

C. INSTITUTE CONTRIBUTIONS

- ISyE Graduate Committee, 2016-
- ISyE Ph.D. Admissions Committee, 2016-
- Organizer, NSF OE Program Director visit to ISyE, 2017
- ISyE Distinguished Scholarship Lecture Host Committee, 2015, 2016
- Organizer, NSF SES/MES Program Director visit to ISyE, 2016
- Search Committee Member for the George Chair, ISyE, GaTech, 2011-2014
- Host for several faculty candidates, 2011-