OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

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NAME: Sunni A. Barnes

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Director of STEEEP Analytics & the BSWH Survey Center, Baylor Scott & White Health

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE  (if applicable) | Completion Date  MM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| Baylor University, Waco TX | BSE | 1999 | Mathematics |
| Baylor University, Waco TX | MA | 2000 | Statistics |
| Baylor University, Waco TX | PhD | 2003 | Statistics |

# A. Personal Statement*.*

I am currently serving as the Director of STEEEP Analytics and the Baylor Scott & White Health (BSWH) Survey Center and Biostatistician for the Disability and Rehabilitation Research Projects (DRRPs) Centers Program: Traumatic Brain Injury Model Systems Centers. Daily, I oversee development, deployment, sampling, and analysis of results for system-wide surveys regarding employee and patient satisfaction, patient safety, quality of life and other various research projects. I have considerable scientific experience, with research interests including the use of statistical techniques to handle missing data, multiple imputation, and survey methodology. Specifically, I recently served as the Biostatistician and Survey Development Lead on the NIH grant “Improving Physician and Nurse Communication with Serious Gaming” (1R18HS020416) ) where I worked with web developers to integrate data collection tools within a gaming environment to improve communication training among nurses and physicians. Prior to joining BHCS, I served as the Associate Director of the Mayo Clinic Survey Research Center. Additionally, I have served in the capacities of co-investigator and consultant for additional NIH-funded grants including “Skin Blood Flow in Diabetes: Local and Reflex Control” (R01 - HL73884-01) and “Mayo Nicotine Dependence Education Program” (CA86421-04). My research interests include using statistical techniques to handle missing data, multiple imputation, and survey methodology and my experience working within the healthcare environment to develop web-based tools for data collection and communication has equipped me with a unique background to bring to this current study. As biostatistician on the TBI Model System Center grant I am skilled with analyzing rehabilitation data and completing complex modeling involving large datasets.

1. Dahdah MN, Barisa MT, Schmidt K, Barnes SA, Dubiel R, Dunklin C, Harper C, Callender L, Wilson A, Diaz-Arrastia R, Shafi S. Comparative Effectiveness of Traumatic Brain Injury Rehabilitation: Differential Outcomes Across TBI Model Systems Centers. J Head Trauma Rehabil. 2013 Sep 18. [Epub ahead of print]
2. Houston S, Casanova MA, Leveille M, Schmidt KL, Barnes SA, Trungale KR, Fine RL. The intensity and frequency of moral distress among different healthcare disciplines. J Clin Ethics. 2013 Summer;24(2):98-112.

# B. Positions and Honors

## Positions and Employment

1997-2003 Private Tutor, Statistics/Math, Waco TX

* 1. Teaching Assistant, Department of Psychology, Baylor University, Waco TX
  2. Research Assistant (Eisenhower Grant), Dept of Mathematics, Baylor University, Waco TX
  3. Statistical Consultant, Baylor University, Waco TX
  4. Lecturer, Department of Information Systems, Baylor University, Waco TX
  5. Research Associate/ Assistant Professor, Division of Biostatistics, Department of Health Sciences Research, Mayo Clinic, Rochester MN

2005-2006 Associate Director, Survey Research Center, Mayo Clinic, Rochester MN

2006-2007 Senior Statistician, Health Outcomes Research, KCI USA, San Antonio TX

2008-2010 Biostatistician/ Survey Resource Manager, Institute of Health Care Research and Improvement,

Baylor Health Care System, Dallas TX

2010-2013 Director of Survey Research and Clinical Trials/ Biostatistician, Institute of Health Care

Research and Improvement, Baylor Health Care System, Dallas TX

2013-Present Director of STEEEP Analytics and BSWH Survey Center, Baylor Scott & White

Health

**Other Professional Experience and Memberships**

2003-Present Member, American Statistical Association

2003-Present Member, Caucus of Women in Statistics (2005 Executive Committee)

2004 Presentation, Joint Statistical Meetings, Toronto, Canada

2004-2005 Thesis Advisor, Fellow in Cardiovascular Surgery, Mayo Clinic

2004-2005 Thesis Advisor, Fellow in Orthopaedic Surgery, Mayo Clinic

2004-2006 Member, Dissertation Committee, Department of Statistics, Baylor University, Waco TX

2005-2006 Thesis Advisor, Fellow in Cardiovascular Disease, Mayo Clinic

2005 Poster Presentation, Academy Health Annual Research Meeting, Boston MA

2005 Presentation, NIH/RWJF Critical Issues in eHealth Research Conference, Bethesda, MD

2005 Presentation, 60th Annual Conference of the American Association for Public Opinion Research, Miami FL

2006 Organizer and Chair, Invited Session, Joint Statistical Meetings, Seattle WA

2006 Presentation, SRCOS Summer Research Conference in Statistics, Kerrville TX, Jun 4-7

2006 Presentation, 7th Annual New Cardiovascular Horizons, New Orleans LA (Nov)

**Honors**

1999 Dean’s List, Baylor University, Waco TX

1999 President of Pi Mu Epsilon, Math Honor Society

1999 Vice-President of Kappa Delta Pi, Education National Honor Society

1999 Member, Golden Key National Honor Society

1999 Member, Alpha Chi, Top 10% Baylor University Juniors & Seniors

# C. Contribution to Science

1.   My early methodological work focused on missing data methods in statistical analysis. Multiple imputation is known to be statistically valid when “n” is large. However, questions remained about the validity of multiple imputation for small samples in clinical trials. Therefore, I investigated the small-sample performance of several multiple imputation methods, as well as the last observation carried forward method. Based on this experience, I then conducted a simulation study that compared the rate of false positive results or regulatory risk error (RRE) from last or baseline observations forward( LOCF, BOCF), multiple imputation (MI), and likelihood-based repeated measures in 32 scenarios that were generated from a 2(5) full factorial arrangement with data missing due to a missing not at random (MNAR) mechanism since a common choice for the primary analysis in drug development is to assess mean changes via analysis of (co)variance with missing data imputed by LOCF, BOCF. In 2010, I translated this work into missing data assumptions and methods in a smoking cessation study and determined that none of the missing data imputation methods currently available can compensate for bias when there are substantial amounts of missing data. By providing evidence and statistical approaches to solving these analytical problems, continue to be a resource to healthcare research. I served as the primary biostatistician for all of these studies.

1. **Barnes SA**, Lindborg SR, Seamen JW.  Multiple Imputation Techniques in Small Sample Clinical Trials.  *Statistics in Medicine*, Jan 2006; 25(2):233-45.
2. **Barnes SA**, Mallinckrodt CH, Lindborg SR, Carter MK.  The Impact of Missing Data and How It Is Handled on the Rate of False Positive Results in Drug Development.  *Pharmaceutical Statistics*, 2008 Jul-Sep;7(3):215-25.
3. **Barnes SA**, Larsen MD, Schroeder D, Hanson A, Decker PA.Missing data assumptions and methods in a smoking cessation study.  *Addiction* 2010 Mar;105(3):431-7.

2.    In addition to the scientific contributions above, I have also been active in survey research, from the evaluation of methods of data collection and the impact of response rates to survey instrument development. Specifically, survey tools are needed for ongoing improvement of healthcare and have not been developed for aspects of EHR implementation. For example, I have successfully developed a valid survey tool that can be useful when prioritizing improvement efforts in relation to electronic health record implementation. Further, I have experience in both patient and clinician survey research, assessing the effects of mixed-mode (mail and web survey) combinations on response rates, response times, and nonresponse bias among primary care and specialty internal medicine physicians in addition to burden of fatigue.

1. Xiao Y, Montgomery DC, Philpot LM, **Barnes SA**, Compton J, Kennerly D.  Development of a tool to measure user experience following electronic health record implementation*.  J Nurs Adm*. 2014 Jul-Aug;44(7/8):423-8.
2. Beebe, TJ, Locke, GR, **Barnes, SA**, Davern ME, Anderson, KJ.  Mixing web and mail methods in a survey of physicians.  *Health Services Research* 2007 June 42:3, Part 1: 1219-1234.
3. Mesa RA, Wadleigh M, Niblack, J, Gilliland DG, Verstovsek S, Camoriano J, Solberg L, **Barnes SA**, Sloan J, Atherton P, Tan A, Tefferi A.  The burden of fatigue and quality of life in myeloproliferative disorders (MPDs): an international internet-based survey of 1179 MPD patients.  Cancer, 2007 Jan 1;109(1):68-76.
4. Beebe, TJ, McRae, JA, **Barnes, SA.**  A comparison of self-reported use of behavioral health services with Medicaid agency records in Minnesota.  *Psychiatric Services*, 2006 Nov;57(11):1652-4.

3.    Most recently, I have actively supported clinical discovery in the area of trauma and TBI. Specific to TBI research, I have analyzed data from 21 TBI Model Systems across the US (including nearly 7000 participants) and examined differences in functional outcomes between centers. This was the first comparative effectiveness study completed specific to TBI outcomes and results indicated that there were large differences in patient characteristics between centers as well as in functional outcomes (even when differences in patient characteristics were controlled). I served as the biostatistician on this project and the other TBI MS projects. As a result, I am skilled and competent in analyzing complex and large rehabilitation datasets.

1. Shafi S, **Barnes SA**, Rayan N, Kudyakov R, Foreman M, Cryer HG, Alam HB, Hoff W, Holcomb J.  Compliance with recommended care at trauma centers: association with patient outcomes.  *J Am Coll Surg*. 2014 Aug;219(2):189-98.
2. Shafi S, **Barnes SA**, Millar D, Sobrino J, Kudyakov R, Berryman C, Rayan N, Dubiel R, Coimbra R, Magnotti LJ, Vercruysse G, Scherer LA, Jurkovich GJ, Nirula R.  Suboptimal compliance with evidence-based guidelines in patients with traumatic brain injuries.  *J Neurosurg*. 2014 Mar;120(3):773-7.
3. Shafi S, Ogola G, Fleming N, Rayan N, Kudyakov R, **Barnes SA**, Ballard DJ.  I[nsuring the uninsured: Potential impact of Health Care Reform Act of 2010 on trauma centers.](http://www.ncbi.nlm.nih.gov/pubmed/23032805)  J Trauma Acute Care Surg. 2012 Oct 1.
4. Shafi S, Renfro LA, **Barnes S**, Rayan N, Gentilello LM, Fleming N, Ballard D.  [Chronic consequences of acute injuries: Worse survival after discharge.](http://www.ncbi.nlm.nih.gov/pubmed/22710768)  J Trauma Acute Care Surg. 2012 Jun 14.

# Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/1jyzsz7wmMO5t/bibliography/47767785/public/?sort=date&direction=ascending>

* 1. Xiao Y, Montgomery DC, Philpot LM, **Barnes SA**, Compton J, Kennerly D. Development of a tool to measure user experience following electronic health record implementation*. J Nurs Adm*. 2014 Jul-Aug;44(7/8):423-8.
  2. Shafi S, **Barnes SA**, Rayan N, Kudyakov R, Foreman M, Cryer HG, Alam HB, Hoff W, Holcomb J. Compliance with recommended care at trauma centers: association with patient outcomes. *J Am Coll Surg*. 2014 Aug;219(2):189-98.
  3. Millard M, Hart M, **Barnes S**. Validation of Rules of Two™ as a paradigm for assessing asthma control. *Proc (Bayl Univ Med Cent)*. 2014 Apr;27(2):79-82.
  4. Shafi S, **Barnes SA**, Millar D, Sobrino J, Kudyakov R, Berryman C, Rayan N, Dubiel R, Coimbra R, Magnotti LJ, Vercruysse G, Scherer LA, Jurkovich GJ, Nirula R. Suboptimal compliance with evidence-based guidelines in patients with traumatic brain injuries. *J Neurosurg*. 2014 Mar;120(3):773-7.
  5. Carter JL, Trungale KR, **Barnes SA**. From bedside to graveside: increased stress among healthcare chaplains. *J Pastoral Care Counsel*. 2013 Sep-Dec;67(3-4):4.
  6. Barakat A, **Barnes SA**, Casanova MA, Stone MJ, Shuey KM, Miller AM. [Advance care planning knowledge and documentation in a hospitalized cancer population.](http://www.ncbi.nlm.nih.gov/pubmed/24082411) Proc (Bayl Univ Med Cent). 2013 Oct;26(4):368-72.
  7. Dahdah MN, Barisa MT, Schmidt K, **Barnes SA**, Dubiel R, Dunklin C, Harper C, Callender L, Wilson A, Diaz-Arrastia R, Shafi S. Comparative Effectiveness of Traumatic Brain Injury Rehabilitation: Differential Outcomes Across TBI Model Systems Centers. J Head Trauma Rehabil. 2013 Sep 18.
  8. Houston S, Casanova MA, Leveille M, Schmidt KL, **Barnes SA**, Trungale KR, Fine RL. [The intensity and frequency of moral distress among different healthcare disciplines.](http://www.ncbi.nlm.nih.gov/pubmed/23923809) *J Clin Ethics*. 2013 Summer;24(2):98-112.
  9. Sobrino J, **Barnes SA**, Dahr N, Kudyakov R, Berryman C, Nathens AB, Hemmila MR, Neal M, Shafi S. [Frequency of adoption of practice management guidelines at trauma centers.](http://www.ncbi.nlm.nih.gov/pubmed/23814383) *Proceedings (Bayl Univ Med Cent)*. 2013 Jul;26(3):256-61.
  10. Shafi S, Ogola G, Fleming N, Rayan N, Kudyakov R, **Barnes SA**, Ballard DJ. I[nsuring the uninsured: Potential impact of Health Care Reform Act of 2010 on trauma centers.](http://www.ncbi.nlm.nih.gov/pubmed/23032805) *J Trauma Acute Care Surg*. 2012 Oct 1. [Epub ahead of print]
  11. Shafi S, Renfro LA, **Barnes S**, Rayan N, Gentilello LM, Fleming N, Ballard D. [Chronic consequences of acute injuries: Worse survival after discharge.](http://www.ncbi.nlm.nih.gov/pubmed/22710768) *J Trauma Acute Care Surg*. 2012 Jun 14. [Epub ahead of print]
  12. Shafi S, Rayan N, **Barnes S**, Fleming N, Gentilello LM, Ballard D. [Moving from "optimal resources" to "optimal care" at trauma centers.](http://www.ncbi.nlm.nih.gov/pubmed/22491598) *J Trauma Acute Care Surg*. 2012 Apr;72(4):870-7.
  13. Rayan N, **Barnes S**, Fleming N, Kudyakov R, Ballard D, Gentilello LM, Shafi S. [Barriers to compliance with evidence-based care in trauma.](http://www.ncbi.nlm.nih.gov/pubmed/22491540) *J Trauma Acute Care Surg*. 2012 Mar;72(3):585-93.
  14. Sayeed SA, Sayeed YA, **Barnes SA**, Pagnano MW, Trousdale RT. [The Risk of Subsequent Joint Arthroplasty after Primary Unilateral Total Knee Arthroplasty, a 10-Year Study.](http://www.ncbi.nlm.nih.gov/pubmed/20884167) *J Arthroplasty*. 2011 Sep;26(6):842-6.
  15. Shafi S, **Barnes S**, Nicewander D, Ballard D, Nathens AB, Ingraham AM, Hemmila M, Goble S, Neal M, Pasquale M, Fildes JJ, Gentilello LM. [Health care reform at trauma centers--mortality, complications, and length of stay.](http://www.ncbi.nlm.nih.gov/pubmed/21150517) *J Trauma*. 2010 Dec;69(6):1367-71.
  16. Shafi S, **Barnes S**, Nicewander D, Ballard D, Nathens AB, Ingraham AM, Hemmila M, Goble S, Neal M, Pasquale M, Fildes JJ, Gentilello LM. [Health care reform at trauma centers--mortality, complications, and length of stay.](http://www.ncbi.nlm.nih.gov/pubmed/21150517) *J Trauma*. 2010 Dec; 69(6):1367-71.
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  18. El-Nashar SA, Hopkins MR, **Barnes SA**, Pruthi RK, Gebhart JB, Cliby WA, Famuyide AO. [Health-related quality of life and patient satisfaction after global endometrial ablation for menorrhagia in women with bleeding disorders: a follow-up survey and systematic review.](http://www.ncbi.nlm.nih.gov/pubmed/20060089) *Am J Obstet Gynecol*. 2010 Apr;202(4):348.e1-7.
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  22. Mardones R, Lara J, Donndorff A, **Barnes SA**, Stuart MJ, Glick J, Trousdale R. Surgical Correction of “Cam-Type” Femoroacetabular Impingement: A Cadaveric Comparison of Open Versus Arthroscopic Debridement. [*Arthroscopy: The Journal of Arthroscopic & Related Surgery*](http://www.sciencedirect.com/science/journal/07498063)*.* [Vol 25, Issue 2](http://www.sciencedirect.com/science?_ob=PublicationURL&_tockey=%23TOC%236704%232009%23999749997%23863068%23FLA%23&_cdi=6704&_pubType=J&view=c&_auth=y&_acct=C000049188&_version=1&_urlVersion=0&_userid=952824&md5=fb2749ce6d1b09a39d6eeca9c3e06a4f), 2009 Feb: 175-182.
  23. Baharestani MM, Houliston-Otto DB, **Barnes S.** Early Versus Late Initiation of Negative Pressure Wound Therapy: Examining the Impact on Length of Stay in Home Care. *Ostomy Wound Management.* 2008 Nov;54(11):48-53.
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# D. Research Support

**Ongoing Research Support**

Glasko-Smith Kline Barnes SA (PI) 01/01/2014-08/31/2016

Project Title: Barriers to collecting and analyzing Patient Reported Outcome Data

The goal of this project is to understand the barriers and perceived benefits of collecting and using Patient Reported Outcomes (PROMS) in healthcare from the perspectives of patients, administrators and providers.

H133 A120098 Shafi (PI) 09/01/12-08/31/17

Project Title: Disability and Rehabilitation Research Projects (DRRPs) Centers Program: Traumatic Brain Injury Model Systems Centers (TBIMS) CFDA Number 84.133A-5

The goal of this project is to collect data on adults with traumatic brain injury, complete two independent/local studies (1. Comparative Effectiveness Research; 2. Dopamine and brain function), and complete modular/collaborative research project (1. Sleep and activity patterns; 2. Internet use; 3. Aging with a TBI).

Role: Biostatistician

**Completed Research Support**

1R18HS020416 (PI: Mancini) 04/10/11-03/31/13

Project Title: Improving Physician and Nurse Communication with Serious Gaming

The goal of this project is to develop, test and evaluate the application of existing gaming knowledge and technology in a healthcare setting to improve nurse and physician communication.

Role: Biostatistician/ Survey Expert

Merck Company Foundation (PI: Walton) 01/01/09-12/31/13

Project Title: Community Based Partnerships: Addressing Diabetes Disparities in Dallas County

The goal of this project was to support a community diabetes education initiative for the underinsured and uninsured throughout Dallas County.

Role: Biostatistician/ Survey Expert

SHARP (PI: Zhang) 06/01/10-05/31/12

Office of National Coordinator for Health IT

National Center for Cognitive Informatics and Decision Making in Healthcare

Project Title: Strategic Health IT Advanced Research Projects (SHARP) Program.

This project will address the challenge of harnessing the power of health IT to enhance and support clinicians’ reasoning and decision-making, rather than forcing them into a mode of thinking that is natural to machines but not to people.

Role: Biostatistician

National Trauma Institute (PI: Shafi) 11/01/10-10/31/11

ProjectTitle: Comparative Effectiveness of Clinical Care Processes in Resuscitation and Management of Moderate to Severe Traumatic Injuries – a multicenter study

The goal of this study was to identify the processes of care that predict patient outcomes after injury including mortality, complications, costs, and length of hospital stay.

Role: Biostatistician

AHRQ 1R01HS017718-01A1 (PI: Shafi) 09/30/09 - 07/31/12

Project Title: From NSQIP to TQIP - Trauma Quality Improvement Project

The goal of this study was to identify trauma center structures and processes of care that are associated with their risk-adjusted patient outcomes measured using observed-to-expected patient mortality ratios

Role: Biostatistician

AHRQ 1R18 HS017908 (PI: Kennerly) 09/30/08-09/29/12

Project Title: Improving the Safety of Primary Care by Measuring Adverse Events and Improvement

The goal of this project was to provide a means of broadly disseminating a measurement tool to track and characterize primary care-derived adverse events (AE)s, demonstrate the utility of this tool in evaluating effectiveness of patient safety initiatives in the primary care setting, and contribute valuable information regarding costs associated with primary care-derived AEs to inform provider and policy decisions regarding prioritization of safety initiatives and potential realignment of reimbursement strategies to better apportion costs and resultant savings related to investments in safety initiatives

Role: Biostatistician