

The Navigation Guide: Selected Milestones
Program on Reproductive Health and the Environment

2016

July 2016

Whaley, P., Halsall, C., Agerstrand, M., Aiassa, E., Benford, D., Bilotta, G., ... Taylor, D. (2016). Implementing systematic review techniques in chemical risk assessment: Challenges, opportunities and recommendations. *Environment International*, 92-93, 556-564.

Vandenberg LN, Ågerstrand M, Beronius A, ., Beausoleild C, Bergman A, Bero LA, Bornehag C, Boyer CS, Cooper GS, Cotgreave I et al: A proposed framework for the systematic review and integrated assessment (SYRINA) of endocrine disrupting chemicals. *Environment Health* 2016, In press.

Stephens ML, Betts K, Beck NB, Cogliano V, Dickersin K, Fitzpatrick S, Freeman J, Gray G, Hartung T, McPartland J et al: The Emergence of Systematic Review in Toxicology. *Toxicol Sci* 2016, 152(1):10-16.

Johnson PI, Koustas E, Vesterinen HM, Sutton P, Atchley DS, Kim AN, Campbell M, McDonald JM, Bero L, Sen S et al: Reproductive and developmental effects of exposure to triclosan. A systematic review of the evidence. 2016 In press *Environment International*.

Sheehan MC, Lam J, Navas-Acien A, Chang HH: Ambient air pollution epidemiology systematic review and meta-analysis: A review of reporting and methods practice. *Environ Int* 2016, 92-93:647-656.

Rooney AA, Cooper GS, Jahnke GD, Lam J, Morgan RL, Boyles AL, Ratcliffe JM, Kraft AD, Schunemann HJ, Schwingl P et al: How credible are the study results? Evaluating and applying internal validity tools to literature-based assessments of environmental health hazards. *Environ Int* 2016, 92-93:617-629.

Morgan RL, Thayer KA, Bero L, Bruce N, Falck-Ytter Y, Gherzi D, Guyatt G, Hooijmans C, Langendam M, Mandrioli D et al: GRADE: Assessing the quality of evidence in environmental and occupational health. *Environ Int* 2016, 92-93:611-616.

2015

April 2015

Woodruff TJ: Making it real--the environmental burden of disease. What does it take to make people pay attention to the environment and health? *J Clin Endocrinol Metab* 2015, 100(4):1241-1244.

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2015 February

Diabetes and Pregnancy Conference. Environmental Health in Pregnancy. (Las Vegas, NV, February 7).

Diabetes and Pregnancy Conference. Environmental Health in Pregnancy. (Newport Beach, CA, February 21).

2015 January

Society of Toxicology Risk Assessment Specialty Section. Systematic Reviews, Risk of Bias and Evidence Evaluation for Characterization of Environmental Chemicals. (Webinar, January 14).

Future directions for application of transparent, consistent and systematic framework for risk assessment of endocrine disrupting chemicals. Participant. (London, England, January 20-21).

2014

2014 December

Vesterinen H, Johnson P, Atchley D, Sutton P, Lam J, Zlatnik M, Sen S, Woodruff T: The relationship between fetal growth and maternal glomerular filtration rate: a systematic review. *J Maternal Fetal Neonatal Med* 2014:1-6.

2014 November

George Washington University. Science-based decision-making in environmental health policy: What's systematic review got to do with it? (Washington, DC, November 12).
3rd International Symposium on Systematic Review and Meta-Analysis of Laboratory Animal Studies. Systematic review and meta-analysis in regulatory toxicology. (Washington, DC, November 13).

American Public Health Association. Science-based decision-making in environmental health policy: What's systematic review got to do with it? (New Orleans, LA, November 19).
UK Royal Society of Chemistry. The Navigation Guide Systematic Review Methodology. (London, England, November 20).

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2014 October

Seminar for the International Agency for Research on Cancer. Navigation Guide Systematic Review Methodology for Reaching Strength of Evidence Conclusions in Environmental Health. (Lyon, France, October 14).

USEPA IRIS Bi-Monthly Meeting. Adapting Systematic Review Methodologies for IRIS. (Webinar, October 15).

PPTOX IV: Environmental Stressors in Disease and Implications for Human Health. Poster: Fetal Growth and Maternal Glomerular Filtration Rate: A Systematic Review. (Boston, MA, October 27).

PPTOX IV: Environmental Stressors in Disease and Implications for Human Health. Identifying Cumulative Exposures to Chemicals in Pregnant Women – A Non-Targeted Exposome Approach. (Boston, MA, October 28).

UCSF Fall Interprofessional Nutrition Elective. Reproductive Health Impacts of the Industrialized Food System. (San Francisco, CA, October 30).

University of San Francisco. Radiation and Human Health: Three Years After the Fukushima Disaster. (San Francisco, CA, October 30).

Woodruff TJ, Sutton P: The Navigation Guide systematic review methodology: a rigorous and transparent method for translating environmental health science into better health outcomes. *Environ Health Perspect* 2014, 122(10):1007-1014.

Lam J, Sutton P, Koustas E, Johnson P, Atchley DS, Sen S, Robinson K, Axelrad DA, Woodruff TJ: The Navigation Guide — evidence-based medicine meets environmental health: integration of animal and human evidence for PFOA effects on fetal growth. *Environ Health Perspect* 2014, 122(10):1041-1051.

Koustas E, Lam J, Sutton P, Johnson PI, Atchley DS, Sen S, Robinson KA, Axelrad DA, Woodruff TJ: The Navigation Guide—evidence-based medicine meets environmental health: systematic review of nonhuman evidence for PFOA effects on fetal growth. *Environ Health Perspect* 2014, 122(10):1015-1027.

Johnson PI, Sutton P, Atchley DS, Koustas E, Lam J, Sen S, Robinson KA, Axelrad D, TJ W: The Navigation Guide—evidence-based medicine meets environmental health: systematic review of human evidence for PFOA effects on fetal growth. *Environ Health Perspect* 2014, 122(10):1028-1039.

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2014 September

Grand Rounds Oakland Kaiser. Environmental Contaminants & Reproductive Health: What should we tell our patients? (Oakland, CA, September 4).

European Societies of Toxicology (Eurotox). Navigation Guide - Strength of evidence from theory to practice: identifying the health impacts of environmental chemicals. (Edinburgh, Scotland, September 9).

Green Chemistry Conference Plenary Session. The Future of Toxic Substances Control Act (TSCA) Reform. (San Francisco, CA, September 16).

National Capital Area Chapter of the Society of Toxicology: A Walk Through the National Academies Review of EPA's IRIS Process: Implications for Hazard Assessment. Pathways to Implementation of the NRC Recommendations. (Webinar, September 19).

2014 August

Presentation to the California Environmental Protection Agency. Triclosan Case Study Results. (Oakland, CA, August 1).

International Society for Environmental Epidemiology (ISEE). Poster: Application of the Navigation Guide Method of Systematic Review to Assessing the Potential Developmental and Reproductive Hazards of Triclosan. (Seattle, WA, August 26).

2014 July

How Fracking Impacts Public Health, Forum, SF Public Library. Mobilizing the Health Professional Voice Against Fracking. (San Francisco, CA, July 23).

2014 June

Future directions for application of transparent, consistent and systematic framework for risk assessment of endocrine. Putting the Pieces Together: Navigation Guide and Proof of Concept: A Systematic Review of Human and Non-Human Evidence for PFOA and Fetal Growth. (London, England, June 2).

Future directions for application of transparent, consistent and systematic framework for risk assessment of endocrine disrupting chemicals. Approaches to Evaluating Overall Quality of Evidence. (London, England, June 2).

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Seminar at World Health Organization. EXPANDING GRADE: Addressing effects on the next generation: Innovative Approaches to Guideline Development in Environmental and Reproductive Health. (Geneva, Switzerland, June 4).

USEPA IRIS Bi-Monthly Meeting. UCSF's Comments on USEPA's Draft IRIS Assessment of Inorganic Arsenic. (Webinar, June 25).

2014 Teratology Society Annual Meeting. The Navigation Guide Systematic Review Methodology Proof of Concept: PFOA and Fetal Growth. (Bellevue, WA, June 30).

2014 Teratology Society Annual Meeting. Poster: Application of the Navigation Guide Method of Systematic Review to Assessing the Potential Developmental and Reproductive Hazards of Triclosan. (Bellevue, WA, June 30).

2014 May

UCSF Health and Sustainability Summit. Navigating the Science: Systematic Reviews & Evaluating Scientific Evidence for Environmental Exposures. (San Francisco, CA, May 29).

2014 February

American Association for the Advancement of Science. Lifecourse Approaches for Ensuring Children's Environmental Health Protection. (Chicago, IL, February 14).
Green Science Policy Institute. Navigating the Science on Flame Retardants (Johnson). (February 14, Berkeley, CA).

Navigation Guide Work Group Meeting (February 12).

Making the Connection. Wisconsin Environmental Health Network. Translating Environmental Health Science Into Healthy Future Generations. (Madison, WI February 28).

2014 January

Submitted written recommendations to Cal-EPA for summarizing data from epidemiological and toxicological studies specifically commenting on the example tables that were presented to the Developmental and Reproductive Toxicant Identification (DART) Committee for discussion on December 4, 2013 and posted on the Office for Environmental Health Hazard Assessment website for public comment period.

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2013

2013 November

Vesterinen HM, Johnson PI, Koustas E, Lam J, Sutton P, Woodruff TJ. In Support of EHP's Proposal to Adopt the ARRIVE Guidelines. *Environ Health Perspect.* 2013 Nov-Dec;121(11-12):A325. doi: 10.1289/ehp.1307775. PubMed PMID: 24284027; PubMed Central PMCID: PMC3855525.

10th Women's Health Congress. New Paradigms in Evaluating Scientific Evidence for Environment and Reproduction. World Health Organization. (Geneva, Switzerland, January 10).

2013 October

Presentation to Institute of Medicine at Annual Meeting (October 21, Washington DC.)

2013 September

Navigation Guide Work Group Meeting (September 3rd).

Mid-Atlantic Center for Children's Health and the Environment Children's National Medical Center Conference on Environmental Health for Obstetricians and Gynecologists. (Arlington, VA, September 20).

Featured publication article in *Environmental Health Perspectives* Krauth D, Woodruff TJ, Bero L. Instruments for Assessing Risk of Bias and Other Methodological Criteria of Published Animal Studies: A Systematic Review. *Environ Health Perspect.* 2013 Jun 14. [Epub ahead of print]

2013 August

EPA Workshop: Applying Systematic Review to Assessments of Health Effects of Chemical Exposures (August 26, Washington, DC)

2013 July

Canadian Partnership for Children's Health and Environment (CPCHE). *The Navigation Guide: A Systematic and Transparent Method to Evaluate Environmental Health Science.* (July 22, Webinar).

International Society of Environmental Epidemiology. *The Navigation Guide - Evidence-Based Medicine Meets Environmental Health: PFOA and Fetal Growth.* (Basel, Switzerland, August 20).

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2013 June

Submitted written comments to National Toxicology Program on its draft OHAT approach for systematic review and evidence integration for literature-based health assessments.

Sutton P, Woodruff TJ. Risk communication and decision tools for children's health protection. *Birth Defects Res C Embryo Today*. 2013 Mar;99(1):45-9. doi: 10.1002/bdrc.21029. Review. Erratum in: *Birth Defects Res C Embryo Today*. 2013 Jun;99(2):147. PubMed PMID: 23723171.

2013 May

Navigation Guide Work Group Meeting (Webinar) (May 14)

2013 March

2nd International Symposium on the Systematic Reviews of Animal Data, The Navigation Guide: integrating meta-analysis to weight of evidence assessments in reproductive toxicology (Tracey Woodruff) (March 7-8 Edinburgh, Scotland)

Society for Toxicology - Risk communication and decision tools for children's health protection. (Tracey Woodruff); The Navigation Guide as an Evidence-Based Medicine Methodology to Evaluate Human Health Effects of Environmental Chemicals: Perfluorooctanoic Acid (PFOA) and Fetal Growth (Erica Koustas) (March 10-14 San Antonio TX)

National Academy of Sciences, Weight of Evidence National Research Council Committee to Review the IRIS Process Putting the Pieces Together: A Case Study (Tracey Woodruff) (March 28, WA DC)

February 2013

U.S. Environmental Protection Agency. The Navigation Guide. Meeting and presentation to Kenneth Oden, Director, National Center for Environmental Assessment and John Vandenberg, National Program Director Human Health Risk Assessment Research Program and other EPA leadership. (Tracey Woodruff, Patrice Sutton, Erica Koustas, Juleen Lam) (February 20 WA DC). California Environmental Protection Agency. Presentation on the Navigation Guide Systematic Review Methodology, Oakland, CA.

Federal Summit on Evaluating and Synthesizing Evidence: Applying Systematic Review to Questions of the Health Effects of Chemical Exposures. The Navigation Guide Evidence-

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Based Medicine Meets Environmental Health: PFOA and Fetal Growth (Erica Koustas and Juleen Lam) (February 27-28 Research Triangle Park, NC)

January 2013

Navigation Guide Work Group Meeting (Webinar) (January 15)

2012

2012 September

Improving the Use of Science in Administrative Process. A Workshop Under the Auspices of The National Academy of Sciences' Committee on Science, Technology and Law in Collaboration with The Administrative Conference of the United States (Tracey Woodruff) Navigation Guide Work Group Meeting (Webinar) (September 20)

2012 August

NTP Board of Scientific Counselors Working Group on Reaching Evidence Assessment Conclusions (August 28, Research Triangle Park, North Carolina).

International Society for Environmental Epidemiology - Navigation Guide: A Systematic Methodology to Sort the Scientific Evidence Linking Environmental Exposures to Adverse Health Outcomes (Tracey Woodruff, Erica Koustas and Juleen Lam) (August 29 Columbia, SC)

2012 July

Triservice Environmental Risk Assessment Workgroup (TSERAWG). This workgroup is made up of US Department of Defense risk assessors, biologists and toxicologists who meet a few times a year to discuss concerns (emerging contaminants, legacy compounds, new risk approaches). Test-Driving the Navigation Guide: PFOA and Reduced Fetal Growth (Erica Koustas and Juleen Lam) (July 10 Aberdeen Proving Grounds, MD)

2012 June

Approaches to Weight Of Evidence in Chemical Toxicity Assessment, meeting organized by Ake Bergman, Stockholm University. The Navigation Guide: A Systematic and Transparent Method to Evaluate Environmental Health Science (Tracey Woodruff) Navigation Guide Work Group Webinar (June 28)

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2012 May

US Environmental Protection Agency Test-Driving the Navigation Guide: PFOA and Reduced Fetal Growth (Erica Koustas and Juleen Lam) (May 30, WA DC)

2012 March

Publication of article in the American Journal of Obstetrics and Gynecology about role of obstetricians in preventing environmental exposures including reference to development of clinical guidelines using the Navigation Guide. Sutton P, Woodruff TJ, Perron J, Stotland N, Conry JA, Miller MD, Giudice LC. Toxic environmental chemicals: the role of reproductive health professionals in preventing harmful exposures. Am J Obstet Gynecol. 2012 Sep;207(3):164-73. doi: 10.1016/j.ajog.2012.01.034. Epub 2012 Mar 8. PubMed PMID: 22405527.

Presentation to the USEPA Children's Health Protection Advisory Committee about the Navigation Guide (3/28/12). Meeting with scientists at the California Environmental Protection Agency about the Navigation Guide (3/27/12). Two-day meeting of the Navigation Guide Working Group at UCSF's Parnassus Campus (March 9-10, SF CA)

2012 January

Presentation on the Navigation Guide at the meeting of the western National Institute of Environmental Health Services and USEPA Children's Centers

2011

2011 December

Sutton P, Woodruff TJ, Vogel S, Bero LA. Conrad and Becker's "10 Criteria" fall short of addressing conflicts of interest in chemical safety studies. Environ Health Perspect. 2011 Dec;119(12):A506-7. Presentation on the Navigation Guide to scientists at the Agency for Toxic Substances and Disease Registry

2011 September

Presentation about the Navigation Guide at the Association of Reproductive Health Professionals annual meeting, Las Vegas, NV.

2011 August

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U.S. Environmental Protection Agency/National Toxicology Program
Initiated work with USEPA and National Toxicology Program scientists to apply the Navigation Guide and related weight of evidence methods to one or more case studies.

Navigation Guide Working Group Inaugural Meeting

U.S. Environmental Protection Agency - Webinar for USEPA scientists on Navigation Guide

2011 July

U.S. Environmental Protection Agency Leadership of the American Congress of Obstetricians & Gynecologists (ACOG) (Jerry Joseph, MD, ACOG's Executive Vice President for Practice) and ACOG District IX (Jeanne Conry, MD, PhD) met with Peter Grevatt, Director of the Office of Children's Health Protection and Environmental Education.

2011 June

Collaborative on Health and the Environment (CHE) Partnership Call: Navigating the Science: Ensuring Research Quality.

2011 May

Publication of the method and presentation at the symposia that launched the first issue of Health Affairs to address environmental health, WA DC. Woodruff TJ, Sutton P; Navigation Guide Work Group. An evidence-based medicine methodology to bridge the gap between clinical and environmental health sciences. Health Aff (Millwood). 2011 May;30(5):931-7.

2011 April

Clean Med Presentation on Navigation Guide to participants at the Research Exchange on Advancing Patient, Worker and Environmental Safety & Sustainability in the Health Care Sector.

2010

2010 November

Current Opinion in Obstetrics and Gynecology Published article about advances in reproductive environmental health including discussion of the Navigation Guide. Sutton P, Giudice LC, Woodruff TJ. Reproductive environmental health. Curr Opin Obstet Gynecol. 2010 Dec;22(6):517-24. Review.

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2010 September

Santa Clara County Medical Society Published The Navigation Guide: An Evidence-Based Tool to Bridge the Gap Between Clinical Practice and Environmental Health Science in the journal of the Santa Clara County Medical Society.

2010 September

California Preconception Care Council The mission of the Preconception Health Council of California is to engage individuals, communities, health care organizations and policymakers to optimize the health and well-being of women and their partners, leading to healthier infants and families. The Council includes public and private providers from various health and social service agencies. Presentation to the Council leaders on the Navigation Guide and other aspects of the science related to reproductive health and the environment.

2010 August/September

Agency for Healthcare Research Quality (AHRQ) Met with Jean R. Slutsky, P.A., M.S.P.H., Director, Center for Outcomes and Evidence at AHRQ by phone to discuss the Navigation Guide followed by attendance at AHRQ's annual conference in Bethesda.

2010 August

Environmental Health Perspectives Woodruff TJ, Sutton P. Pulling back the curtain: improving reviews in environmental health. Environ Health Perspect. 2010 Aug;118(8):a326-7.

2010 May

American Congress of Obstetricians and Gynecologists (ACOG) Met with ACOG's national leadership (Hal Lawrence, MD) including discussion of the applicability of the Navigation Guide to clinical practice.

2010 April

National Institute of Environmental Health Sciences Conversation and collaboration initiated with Kristina A. Thayer, PhD, Director of the National Toxicology Program Office of Health Assessment and Translation on the development of weight of evidence methodologies.

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2010 March

San Francisco Medical Society Published The Navigation Guide: An Evidence-Based Tool to Bridge the Gap Between Clinical Practice and Environmental Health Science in the journal of the San Francisco Medical Society.

2010 February

Green Choices Presentation about the Navigation Guide to participants at Green Choices retreat. Green Choices is a national coalition led by Planned Parenthood Federation of America (PPFA) that brings together reproductive and environmental health scientists, clinicians and advocates towards common goals.

2010 January

Navigation Guide meeting convened by collaborator David Gee of the European Environmental Agency in Copenhagen with colleagues from the European Centers for Disease Control and the Institute of Community Medicine, University of Tromsø, Norway who are also engaged in developing weight of the evidence methodologies for infectious disease and complementary medicine specialties.

2009

2009 November

Collaborative on Health and the Environment (CHE) Partnership Call: Navigating the Scientific Evidence to Ensure Prevention.

2009 August

Navigating the Scientific Evidence to Improve Prevention Workshop
Two-day meeting of collaborators held to develop a methodology for the efficient evaluation of reproductive environmental health science to catalyze preventative action in medical, public health and policy arenas.

Diabetes and Pregnancy Conference. Environmental Health in Pregnancy. (Las Vegas, NV, February 7).

Diabetes and Pregnancy Conference. Environmental Health in Pregnancy. (Newport Beach, CA, February 21).