

Title:

SPECIAL SESSION: Lymphedema Symptom Science: Precision Phenotyping, Genotyping, and Intervention

Type:

Oral

Keywords:

lymphedema, phenotyping and symptom

Summary:

This presentation focuses on the methods for precision phenotyping and investigating biological mechanisms of symptoms to develop an innovative and pragmatic assessment and precision interventions for lymphedema. Methods of deep phenotyping, genomic approach to understand biological underpinnings of disease conditions, and ways to develop mHealth intervention will be discussed.

Final Number:

K 05

Slot:

K 05: Saturday, 29 July 2017: 3:30 PM-4:00 PM

References:**LIST OF SAMPLE PUBLICATIONS**

[1] **Fu, M.R.**, Rhodes, V.A., & Xu, B. (2002) The Chinese translation: The index of nausea, vomiting, and retching (INVR). *Cancer Nursing*, 25(2), 134-140. PMID: 11984101 [Based on this article, Dr. Mei R. Fu was awarded *Eminent Scientist of the Year 2003* by International Research Promotion Council (IRPC), an international organization committed to promote academic and research programs in science and medicine in the world.] Over 50 researchers from China, Taiwan, Australia, and United States requested permission for the use of this instrument.

[2] **Fu, M.**, LeMone, P., McDaniel, R., & Bausler, C. (2001). A multivariate validation of the defining characteristics of fatigue. *Nursing Diagnosis: International Journal of Nursing Language and Classification*, 12(1), 15-27. [This article was awarded *Outstanding Journal Article Award 2000-2002* by the North American Nursing Diagnosis Association, April 2002.]

[3] **Fu M.R.**, McDaniel R.W., & Rhodes V.A. (2007) Measuring symptom occurrence and symptom distress: development of the symptom experience index. *Journal of Advanced Nursing* 59(6), 623-634. PMID: 17672849 [62 researchers from the United States, China, Australia, Brazil, and Korea requested permission for the use of this instrument. The Korean and Portuguese version of the instrument has been translated and tested for reliability and validity.]

- [4] **Fu, M.R.** & Rosedale, M. (2009). Breast cancer survivors' experience of lymphedema related symptoms. *Journal of Pain and Symptom Management*, 38(6), 849-859. PMID: 19819668 [Based on this study and other two studies, Dr. Mei R. Fu was awarded Young Investigator Award: Tactile Systems Technology Young Investigator Award. The 22nd International Society of Lymphology Congress, Sydney, Australia, Sep. 21-25, 2009.]
- [5] **Fu, M.R.**, Chen, C., Haber, J., Guth, A., & Axelrod, D. (2010). The effect of providing information about lymphedema on the cognitive and symptom outcomes of breast cancer survivors. *Annals of Surgical Oncology*, 17(7), 1847-1853. Epub 2010 Feb 6. PMID: 20140528. DOI 10.1245/s10434-010-0941-3 [Based on this study, Dr. Mei R. Fu was awarded the Oncology Nursing Society 2009 Excellence in Cancer Nursing Research Award].
- [6] **Fu, M.R.**, Axelrod, D., Guth, A., Cartwright- Alcaresse, F., Qiu, Z., Goldberg, J., Kim, J., Scagliola, J., Kleinman, R., Haber, J., & (2014). Proactive approach to lymphedema risk reduction: a prospective study. *Annals of Surgical Oncology*, 21(11), 3481-3498. Online First. DOI: 10.1245/s10434-014-3761-z
- [7] **Fu, M.R.**, Axelrod, D., Guth, A., Fletcher, J., Qiu, J.M., Scagliola, J., Kleinman, R., E. Ryan, C. E., Nicholas, C., Haber, J. (2015). Patterns of obesity and lymph fluid level during the first year of breast cancer treatment: A prospective study. *Journal of Personalized Medicine*, 5(3):326-40. [PMID: 26404383 DOI: 10.3390/jpm5030326]
- [8] **Fu, M.R.**, Axelrod, D., Cleland, C.M., Guth, A.A., Qiu, Z., Kleinman, R., Scagliola, J., & Haber, J., (2015). Symptom reporting in detecting breast cancer-related lymphedema. *Breast Cancer: Targets and Therapy*, 7; 345-352 (#1825502). DOI: <http://dx.doi.org/10.2147/BCTT.S87854> PMID: 26527899
- [9] **Fu, M.R.**, Conley, Y.P., Axelrod, D., Amber, G.A., Yu, G., Fletcher, J., Zagzag, D. (2016). Precision assessment of heterogeneity of lymphedema phenotype, genotypes and risk prediction. *The Breast*. DOI: <http://dx.doi.org/10.1016/j.breast.2016.06.023>. Epub ahead print. PMID: 27460425
- [10] **Fu, M.R.**, Axelrod, D., Guth, A.A., Rampertaap, K., El-Shammaa, N., Hiotis, K., Scagliola, J., Yu, G., Wang, Y. (2016) mHealth self-care interventions: managing symptoms following breast cancer treatment. *mHealth* 2016; 2:28. DOI: 10.21037/mhealth.2016.07.03. PMID: 27493951

Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
The learner will be able to gain knowledge about different methods to conduct precision phenotyping.	We will discuss the definition and process of precision phenotyping for lymphedema,

	including limb volume measurement, level of fluid level and symptoms.
The learner will be able to gain knowledge about physiological and genetic/genomic approach to investigate the biological mechanism of lymphedema symptoms.	We will discuss research methods to explore to the relationships between lymphedema symptoms and limb volume and fluid level as well as genomic research to discover the biological underpinning of symptoms related lymphedema.
The learner will be able to gain knowledge about developing precision intervention based on phenotyping characteristics and biological mechanism.	We will discuss the process of developing pragmatic patient-center risk assessment and intervention based on phenotyping characteristics and biological mechanism of symptoms for risk reduction and symptoms symptom management.

Presenter:

Mei R. Fu, PhD, RN, FAAN
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Rory Meyers College of Nursing
Tenured Associate Professor
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USA

Professional Experience: Dr. Mei R. Fu's scientific focus has been on symptoms and management of chronic illnesses. Her research incorporates qualitative and quantitative methods, genomic and biomarker approaches and cutting edge measurement technology as well as mHealth and innovative behavioral interventions. Her research has been supported by National Institute of Health (NIH), the Oncology Nursing Society (ONS), the Hartford Institute of Geriatric Nursing, the Avon Foundation, the Vital Fund, Judges and Lawyers for Breast Cancer Alert, Pfizer Independent Learning and Change grant and Association of Chinese American Physicians cutting edge measurement technology as well as innovative behavioral interventions. Her research has been supported by National Institute of Health (NIH), the Oncology Nursing Society (ONS), the Hartford Institute of Geriatric Nursing, the Avon Foundation, the Vital Fund, Judges and Lawyers for Breast Cancer Alert, Pfizer Independent Learning and Change grant.

Author Summary: Dr. Mei R. Fu is an internationally and nationally well-known nurse scientist and outstanding researcher and educator. She is a Tenured Associate Professor of Nursing at New York University. She has over 100 high quality publications in peer-reviewed journals, book chapters, and professional publications and her work has been cited more than 1,250 times. She has over 200 invited or peer reviewed keynote and podium presentations at international, national, regional, and local conferences.

Abstract:

The purpose of the presentation is to share the experience of establishing a program of research on lymphedema symptom science.

Each year, 1.38 million women worldwide are diagnosed with breast cancer and more than 40% of the women suffer lymphedema, a chronic condition of more than 20 distressful symptoms and currently no surgical or medical approach can provide a cure. Starting with qualitative inquiry to understand patients' daily symptom experience and self-care of lymphedema and symptoms, the researcher has developed and tested instruments to effectively assess symptoms, pushing the boundaries of using cutting-edge technology for quantifying lymphedema, accomplished much-needed prospective investigation to discover the biological pathway of lymphedema symptomology using genomic and biomarker approach, and let prospective randomized intervention trails to test interactive and personalized interventions which are technology-driven and cost-effective. From her early career of scientific inquiry, the researcher has purposefully built her program of research in two synergetic lines of inquiry: (1) lymphedema symptom science to discover the biological pathways and significant relationships between symptoms and objective measures of lymphedema; and (2) technology-driven intervention to develop pragmatic symptom assessment and self-care mHealth (mobile health) intervention to reduce the risk of lymphedema and optimize lymphedema management through symptom assessment and management.

This presentation focuses on the methods for precision phenotyping and investigation of biological mechanisms of symptoms to develop an innovative and pragmatic assessment and precision interventions for lymphedema. Discussions will be focused on definition and process of precision phenotyping for lymphedema, including limb volume measurement, level of fluid level and symptoms. Descriptions of research methods will be discussed to explore the relationships between lymphedema symptoms and limb volume and fluid level as well as genomic research to discover the biological underpinning of symptoms related lymphedema. Finally, discussions will be on the process of developing pragmatic patient-center risk assessment and intervention based on phenotyping characteristics and biological mechanism of symptoms for risk reduction and symptoms symptom management.