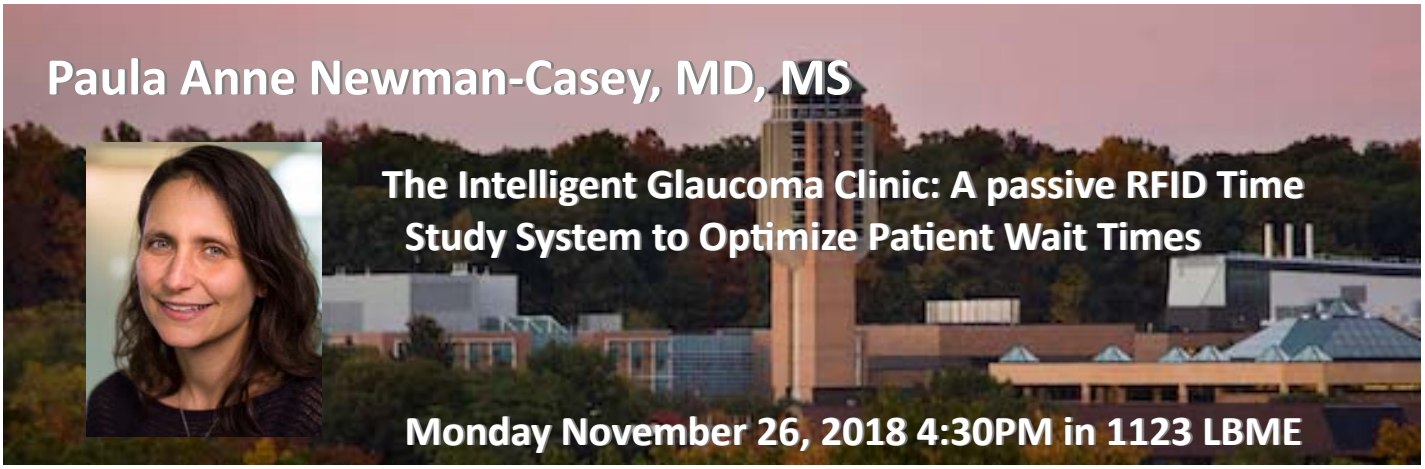

Dr. Newman-Casey is a clinical ophthalmologist who specializes in the medical and surgical management of glaucoma. She is an Assistant Professor of Ophthalmology & Visual Sciences at the University of Michigan Kellogg Eye Center. She completed medical school (2007), residency (2011) and fellowship (2013) at the University of Michigan. She holds a master's degree in Health Services Research (University of Michigan, 2012). Her current research on developing and testing technology based behavioral interventions to improve glaucoma self-management support. She is also interested in how operations engineering techniques can be used to improve patient's experience in clinic and identify ways to integrate more education into patients' clinical encounters. Her research is funded by a K23 Career Development Award from the National Eye Institute and a Research to Prevent Blindness Career Development Award.

During the talk, "The Intelligent Glaucoma Clinic: A Passive RFID Time Study System to Optimize Patient Wait Times," Dr. Newman-Casey will describe design choices that enabled the development of a low-cost, continuous automated, passive time-motion study in the glaucoma clinic.

ABSTRACT: Objective: Outpatient clinics lack infrastructure to easily track and improve patient wait times. Our objective was to design a low-cost, portable passive RFID system for real time localization within an outpatient clinic setting to measure patients wait times.

Materials and Methods: Direct observation was used to determine workflow in an outpatient glaucoma clinic at the University of Michigan. We used off-the shelf integrated ultra-high frequency (UHF) RFID readers (ThingMagic, Astra-Ex, Woburn, MA), UHF re-useable passive RFID tags (Zebra Impinj Monza 4QT, Seattle, WA) and a custom java RFID management application that was equipped with 'live' device administration to collect time and location data from patients and providers; these choices enabled low cost system installation. Hidden Markov modeling was used to smooth patient and provider location data. The model was validated with: 1) direct patient observations 2) direct provider observations and 3) comparison of provider location by electronic health record audit log trail.

Results: The smoothed RFID system data accurately predicted patient and provider presence >80% of the time.

Discussion: Passive RFID time study systems can enable real time localization of people in clinic, facilitating continuous capture of patient wait times. The system must be customized to the clinic to improve accuracy.

Conclusions: Capturing wait time data continuously and passively can facilitate continuous clinical quality improvement initiatives to enhance the patient experience.

The seminar series "Providing Better Healthcare through Systems Engineering" is presented by the U-M Center for Healthcare Engineering and Patient Safety (CHEPS): Our mission is to improve the safety and quality of healthcare delivery through a multi-disciplinary, systems-engineering approach.

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