Artificial intelligence has begun to impact healthcare in areas including electronic health records, medical images, and genomics. But one aspect of healthcare that has been largely left behind thus far is the physical environments in which healthcare delivery takes place: hospitals, clinics, and assisted living facilities, among others. In this talk I will discuss our work on endowing healthcare spaces with ambient intelligence, using computer vision-based human activity understanding in the healthcare environment to assist clinicians with complex care. I will first present pilot implementations of AI-assisted healthcare spaces where we have equipped the environment with visual sensors. I will then discuss our work on human activity understanding, a core problem in computer vision. I will present deep learning methods for dense and detailed recognition of activities, and efficient action detection, important requirements for ambient intelligence, and I will discuss these in the context of several clinical applications. Finally, I will present work and future directions for integrating this new source of healthcare data into the broader clinical data ecosystem.