Introduction:
New medical devices and health IT products are reaching the market at an increasingly rapid pace. Prioritizing innovation options among a wide array of relevant and attractive products is a challenge encountered by most medical facilities. Leaders are faced with three key risks when implementing new products: 1) the lack of objective clinical information; 2) the lack of sufficient financial data; and 3) unfavorable clinician interactions with the technology can lead to suboptimal performance and inability to obtain full value from the investment. Clinical performance and cost estimates of emerging products are challenging to assess prior to implementation. Clinical trials and meta-analyses that support the efficacy of a given innovation take time to complete and will likely be available after the period when adoption would lead to the greatest competitive advantage. Likewise, data on actual operating costs may not be available. However, leveraging current knowledge of individual adoption theory prior to implementation can minimize clinician rejection. Systematically collecting clinician opinions about radical technologies provides an opportunity to gain insight into end user preferences as well as variations in underlying values between clinicians. A recent study used Q-methodology (Figure 1), a mixed-methods technique, to analyze the opinions of physicians and nurses in a large, urban emergency department and Level I trauma facility.

Figure 1: A) Qualitative methods generated data on potential areas for radical innovation. Interviews identified favorable technology characteristics and focus groups identified specific clinical challenges. B) Market analysis identified products that met ergonomic and clinical needs identified qualitatively. C) Generic descriptions of current products were developed. D) Participants were asked to rank the 43 products in terms of what they felt were “most likely” and “most unlikely” to improve care in their department. These Qsorts were then subjected to factor analysis and interpreted.
Results:
40 participants completed Q sorts (12 physicians, 25 nurses, and 3 of undisclosed licensure; Q sorts are described in Figure 1). Factor analysis revealed 4 statistically significant (p<.01) clusters of shared opinions held among 33 participants that explained 53% of the study variance. Members of each factor represented diverse clinical roles, seniority, and self-described innovation style (Figure 2).

Prioritization: Of 43 possible products, nine were identified as “positive consensus products” (ranked “most likely to improve care” by three of the opinion groups and ranked neutrally by the fourth). The prioritization exercise provided hospital administrators with a streamlined list of potential innovations for further analysis (e.g., cost benefit analysis) that directly reflected providers’ current clinical needs.

Clinician Engagement: Analysis of the individual factors revealed trends in technology preferences that could provide useful insights during change management and implementation planning. Factor 1 (33% of participants) selected technologies that would improve speed and patient turnover, heavily favoring technologies such as point of care diagnostics that would provide results in minutes. Factor 2 (12% of participants) identified technologies that would improve patient experience, favoring non-invasive diagnostics and products that were designed to decrease pain during procedures. Factor 3 (24%) favored products that were designed to improve outcomes for high acuity patients but would be less applicable to treating non-emergent cases. Factor 4 (30%) favored technologies that improved communication among all clinicians, such as applications that allow file sharing with primary care physicians and videoconferencing with emergency medical services. Taken together, these “subcultures” could inform communication efforts and ensure the organization’s message resonates with clinical end-users.

Implications:
This study illustrates a methodology that hospital administrators could use to incorporate clinician opinions into strategic planning efforts more effectively. In addition, understanding the “subcultures” represented by each factor can provide valuable insights for clinician engagement during implementation planning.

Further Investigation:
There are two near-term directions for future inquiry. First, the same instrument could be deployed in a different emergency department to determine whether similar preference patterns emerge. Second, the methodology could be repeated in other clinical settings to identify new innovation opportunities, consensus technologies, and departmental subcultures.

Citations: