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Title: Implementation of a priority structured paging system at an academic institution

Abstract:

Problem Statement: Paging is a commonly used, yet limited means of communication. Despite text capability, one-way numeric paging remains the dominant method of communication at the University of Colorado Hospital (UCH). On a modified Hospital Survey on Patient Safety Culture performed on a medical floor, inefficiencies in provider to nursing communication were highlighted as an area of staff concern. Further examination of this issue found that providers were unable to triage pages effectively as every numeric page communication appeared the same regardless of urgency.

Innovation Objectives: First, to develop, deploy, and adopt a paging structure that numerically implied page priority across a medical specialties unit that was easy to understand, remember, and use. Second, use this paging structure to improved alignment between level of nurse concern and provider response time.

Program Description: An interdisciplinary Communication Improvement Taskforce (In-CITe) consisting of nurses and providers was formed to develop a Priority Structured Paging (PSP) system whereby nurses could convey their level of urgency by tagging their page, numeric or text, with a numeric priority indicator. In the pre-intervention phase, nurses blinded to the intervention collected data, recording response time was appropriateness based on their level of concern. After 3 weeks, a pre-intervention survey was disseminated to nurses and providers by email. After a 2 week response period, the intervention phase began by informing and reminding nurses at every shift change huddle to tag sent pages with a numeric urgency indicator, and record multiple aspects of their pages as done during the pre-intervention phase. Receiving providers were educated about the different priority tiers by flyers and emails, and were asked to record their received, tagged pages on provider intervention data recording forms. The intervention phase was concluded after 2 weeks, and was followed by a nurse and provider survey.

Findings to date: Nurses and providers agreed that adoption of a priority structured paging system aligned nursing concern and timely provider response on both pre- and post-intervention surveys (p=0.13, p=0.9 respectively). There was disagreement between nurses and providers regarding the optimal number of priority tiers (p=.0001), however 52.5% (21 of 40) of nurses preferred a 4-tiered structure (low, medium, high, and emergent). Nurse recorded intervention data demonstrated a significant decrease (low urgency p=0.45, medium urgency p=.46, high urgency p=.15, emergency = no pages recorded). Nurses agreed when asked if providers responded in an "appropriate timeframe" in the pre and post-intervention surveys that priority structured paging improved appropriate response times (p<.0000005), however, providers did not perceive a statically significant improvement (=0.175). Additional post-intervention survey data demonstrated that out of 34 nursing respondents, 100% used the system and found that the priority structured paging system was useful (97.1%), sustainable (97.1%), easy to use (100%), easy to understand (97.1%), improved numeric paging’s effectiveness (94.1%), improved patient safety and quality of care (97.1%), and should be implemented hospital wide (97.1%). 76.47% of providers agreed with PSP's general usefulness, applicability in extreme volume/and or
disaster scenarios (83.33%), ability to allow providers to triage call more appropriately (70.59%), and the need to be implemented hospital wide (70.83%).

Key lessons learned: Numeric paging, while limited as a communication device, can be made more effective by adopting a Priority Structured Paging system. Nursing adoption is critical, and is the primary reason for this pilot's subjective success. When reviewing the survey results, user bias must be considered. Additionally, the pilot was performed on a general medical floor, limiting use of higher urgency priority tiers. Future plans include implementation on nursing units with higher acuity and increased service line diversity, and if successful, hospital-wide adoption.