

DISSERTATION ANNOUNCEMENT

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Title: Introduction of Innovative Medical Practices in Mayo Clinic: Effect of the Interventions on Patient Outcomes

Abstract

Purpose: Assessment of health technologies in medical practice is an ongoing process that clinicians, administrators and policymakers undertake to get information on the value of those applications. This dissertation aims to add to the existing body of literature and fill the gaps in prior studies by assessing two health technologies in Mayo Clinic Florida's medical practice. The first paper provides an assessment of patient portal adoption and activity during hospitalization among cancer patients, and determines whether a portal application is associated with selected indices of patient safety, utilization and satisfaction. The second paper provides an assessment of a new approach in pain management after total knee arthroplasty (TKA), a periarticular anesthetic injection (PAI), and compares patient outcomes postoperatively among those who had this new pain management approach versus the traditionally used approach using peripheral nerve blocks in a consecutive earlier period.

Methods: All cancer inpatients admitted between 2012-2014 (N=4,594) were reviewed retrospectively to compare portal adopters (i.e., who registered for a portal account) versus non-adopters, and to compare inpatient portal activity among active versus inactive users. Another pre-post retrospective review compared patients who had a primary unilateral TKA and received femoral nerve block (FNB) with single-shot sciatic nerve block (SNB) between Jan 2013-Oct 2015 (N=511) versus those who received PAI between Oct 2015-Dec 2016 (N=479). In addition to descriptive statistics, we incorporated Pearson χ^2 for categorical variables, Wilcoxon for non-parametric continuous variables, and Fisher's exact for variables with <40 observations. SAS Version 9.4 (SAS Institute Inc., Cary, NC, USA) was used for analysis.

Results: We found that 2352 (51.1%) were portal adopters, and of them, 632 (26.8%) were active inpatient users. Adoption was influenced by predisposing and enabling factors, such as age, sex, race, marital status, employment status, income, and type of health insurance. Active inpatient use was similarly influenced by predisposing and enabling factors, such as age, race, marital status, and geographic area of residence, in addition to factors related to need, such as being sicker and admitted for medical rather than surgical treatment ($P<0.05$). We also found that PAI had better analgesic effect during the first 24 hours after surgery compared to FNB, but no differences in the next post-operative day at 48 hours. Patients who received PAI had earlier ambulation, longer walking distance, shorter hospital stay, more discharges to home, better patient satisfaction with pain control, and lower hospitalization cost. On average, each patient who had their pain managed using PAI saved \$3,539.0 of their TKA hospitalization cost.

Conclusion: Based on early evidence, cancer patients reached modest levels of portal adoption, with increased adoption associated with predisposing and enabling determinants, and increased inpatient use associated with need. For pain management after TKA, we confirmed evidence on the superiority of PAI compared to FNB with single-shot SNB on various patient outcomes. Findings may provide insight for clinicians and policymakers who are interested in health technology assessment and directing future research efforts on the value of care.