Care guides: using trained laypersons to improve chronic disease care. A randomized controlled trial.

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Background: Can we improve care for chronic disease patients while keeping costs down? We tested whether trained laypersons located in clinic waiting rooms, where they could interact face-to-face with patients and providers and build ongoing relationships, could improve care.

Methods: We conducted a randomized controlled trial in 5 primary care clinics diverse in location, patients, and providers. We hired 12 “care guides” (title chosen by patients). Eligibility for this position was two years of college plus strong social skills and a desire to help others; average salary was $16/h. Most were recent college graduates working in non-medical fields; none had clinical training. The care guides received two weeks' training that included medical ethics and confidentiality, motivational interviewing, the electronic health record (EHR), and basic information about diabetes, hypertension, and heart failure. They were located in small office cubicles in clinic waiting rooms. Their sole task was to help patients who had these diseases and their primary care physicians (PCPs) work together to reach each patient’s evidence-based care goals, as defined by national experts. PCPs were asked to refer patients who “needed help” to care guides for enrollment. Patients who agreed to participate (87%) were given written information about their disease-specific care goals, then randomized in a 2:1 ratio to work with a care guide and their PCP to meet these goals (CG patients), or to work with their PCP in the usual way (UC patients). The end point was percent of care goals unmet at baseline and one year later. Care guides and patients could determine the manner (in person, by telephone) and frequency of their interactions; care guides sent PCPs quarterly EHR progress reports and met informally with them as needed.

Results: A total of 2125 patients were enrolled, 1423 randomized to CG and 702 randomized to UC. Care guides served an average panel of 120 patients/full time position. Most patients had more than one diagnosis (1365 diabetes, 1723 hypertension, 122 heart failure). The groups were well matched for diagnoses, age, sex, insurance status, race, educational attainment, and goals met at baseline (75%).

We report interim (6-month) results. In the 1365 patients with diabetes, unmet goals declined 18% in CG patients (p<.001) and 1% in UC patients, with a significant difference between the two groups (p<.001). In the 705 patients with hypertension without diabetes, unmet blood pressure goals declined 45% in CG patients (p<.001) but 51% in UC patients (p<.001), with no significant difference between groups. For all randomized patients, unmet goals declined 24% in CG patients (p<.001) and 17% in UC patients (p<.001), with p=.065 for a difference between groups.

Data collection for the randomized patients will be carried out for 1 year. CG and UC patients will be compared with 13,647 propensity-score matched patients in similar clinics without care guides, for a subset of goals.

Conclusions: Trained laypersons integrated into the primary care delivery process can improve care for chronic disease patients, especially those with diabetes, at a relatively low cost.
What’s cost got to do with it? Characteristics of ‘high cost’ users of health care and the overlap between costs, hospital admissions, and emergency department visits

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Background: Care management programs targeted at ‘high cost’ individuals, or those deemed at risk for becoming high cost – those with frequent hospital admissions or readmissions, emergency department (ED) visits or outpatient visits – are increasingly common among health systems seeking to reduce costs. Among ‘high cost’ individuals, it is unclear what proportion of costs are potentially responsive to care management and to what extent ‘high cost’ individuals are also frequent users of the hospital and ED. We examined a population of ‘high cost’ patients within a university-based primary care population to explore the extent of overlap between cost, admissions, readmissions and ED visits.

Methods: We analyzed hospital cost and use metrics from July 1 2010 to June 30 2011 for all adults ≥ 18 years old with a primary care provider (PCP) at the University of California San Francisco (UCSF) with at least one hospital admission at UCSF (n=2,727). We defined cutoffs for the top 10% of individuals by hospital costs (>63,239, n=273) and hospital admissions (≥3, n=251). Demographic characteristics between groups were compared using McNemar’s chi-square and two-way analysis of variance. Hospital costs (excluding physician fees), admissions, emergency department visits and medical diagnosis groups as coded by Centers for Medicare & Medicaid Services Diagnosis Related Groups (CMS-DRGs) were obtained from administrative billing data. To identify admissions for the top 3 CMS core conditions, we used CMS-DRGs 089, 090, 121, 122, 123 and 127 to identify admissions for pneumonia, myocardial infarction and heart failure.

Results: ‘High cost’ individuals represented 10% of the study population but accounted for 46% of hospital costs and 22% of hospital admissions. Compared to those who were not ‘high cost’, they were more likely to be male (49% vs. 36%, p<0.001), African-American (24% vs. 14%, p<0.001) and have Medicare or Medicaid as a primary payor (77% vs. 57%, p<0.001).

Fewer than half (48%) of high cost individuals were also within the top 10% by admissions. Those who met cost criteria alone had an increased length of hospital stay (15.6±17.3 vs. 8.35±6.0 days, p<0.001); greater average costs per admission ($72,666±64,942 vs. $30,183±36,432); and a smaller proportion of readmissions (16% vs. 47%, p<0.001) compared to those who met both cost and admissions criteria. Additionally, those who met cost criteria alone had a greater proportion of admissions for surgical procedures (56% vs. 28%, p<0.001) and had a lower proportion of admissions for a CMS core condition (3% vs. 6%, p=0.07) compared to those who met both cost and admissions criteria.

Fewer than half (43%) of high cost individuals had 1 or more ED visits within the study period. A significantly smaller proportion of those meeting only cost criteria had ≥1 ED visit (35%) compared to those who met both cost and admissions criteria (52%, p=0.005).

Conclusions: Defining ‘high use’ by costs alone may not adequately identify the population with expenditures potentially amenable to intervention, while defining ‘high use’ by volume of service (admissions and ED visits) alone may inadequately capture costly patients. A multi-faceted definition of high users incorporating both cost and service volume data may more effectively identify high users with preventable costs and use and help to inform more effective strategies to improve the quality of care for these patients.
CPOE-Related Medication Errors: Analysis of 10,000 Error Report Narratives and Vulnerability Testing of Current Systems

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Background: Although CPOE has been shown to reduce medication errors, like any new technology it also has potential for introducing new errors. A recent IOM report on HIT safety urges studying problems to analyze their causes and implement prevention strategies. Since 1998 the USP MEDMARX medication error reporting system has collected nearly 2 million reports; in 2003 a coded field was added for CPOE as a contributing cause of the error. As these reports had not been studied previously, we obtained and analyzed the structured and narrative details of these CPOE-related error reports.

Methods: A team of general internists and pharmacists analyzed MEDMARX CPOE-related error reports using 2 approaches: a) in-depth quantitative and qualitative review of report content, particularly narrative descriptions, and b) by testing vulnerability of leading current CPOE systems to actual error cases by attempting to enter these erroneous orders. We used qualitative analytic software to create a new taxonomy of CPOE errors categorized by type, cause, and prevention strategies. Representative cases were selected to construct “use case” scenarios based on frequency, severity, generalizability, testability, and correctability.

Results: Of 1.6 million reported errors, 63,040 were reported as CPOE-related. We reviewed and coded 10,000 (15.8%) reports and derived a taxonomy of 73 codes describing error causes, 112 codes describing error effects, and 76 codes describing potential prevention strategies. Leading error causes included multiple electronic systems (1166 cases), problematic use of abbreviations (489), failure to follow procedures/protocol (468), profiling failure/issues (420), lack of computer training/system knowledge (301), hybrid (electronic & paper) systems (202), entry/typing errors (199), medication reconciliation issues (177), and alerts ignored/overridden (143). Leading error effects included missing/incorrect sig (2078), missing/wrong quantity ordered (872), wrong dose or strength (849), wrong schedule (548), duplicate orders (474), wrong formulation/dosage form (360), overdose/potential overdose (355), wrong drug (295), and comments field with conflicting information (254). Testing vulnerability of selected CPOE systems to 21 selected prototypical cases found that of 307 attempted erroneous orders, 174 (57%) could be relatively easily replicated (entered easily or w/ minor workarounds) with no warning or blocking of potentially dangerous orders. Observations of typical users (mostly medical residents) documented multiple instances of error-prone ordering and ignoring of warnings.

Conclusions: Medication error narrative reports are a rich source of descriptions and insights into medication errors, especially those related to CPOE. Review of 10,000 CPOE-related errors provided the foundation for a new taxonomy of errors, and subsequent vulnerability testing revealed that the majority of errors tested could be replicated in current CPOE systems. Selected insights from this analysis include potential for CPOE propagating errors that are perpetuated in recurring orders, potential for facilitation of adjacency/pull down errors, poor integration of CPOE across multiple systems, widespread evidence of alert fatigue/ignoring with repeated examples of prescribers overriding true positive alerts, and evidence that prescribers often have difficulty entering desired orders leading to potentially dangerous workarounds, in particular description of their intent in free text comments.