ABSTRACTS TO INFORM HOME HEALTH BEST PRACTICES

These abstracts are current articles examining hot topics in home health care, with a focus on topics reported on Home Health Compare. The abstracts are intended to assist home health agencies to identify strategies supported by evidence that may improve outcomes for patients receiving home health services. This is not a comprehensive review of literature on every topic area addressed in the VNAA Blueprint for Excellence – 5-Star Best Practices.

The abstracts are loosely organized by topic area, but the reader may benefit from browsing the abstracts for topics of interest.

Compiled December, 2015

Abstract

RATIONALE, AIMS AND OBJECTIVES:
To determine whether US home health agencies that intensively engaged with the 2010 Home HealthQuality Improvement National Campaign were more likely to reduce acute care hospitalization (ACH) rates than less engaged agencies.

METHOD:
We included all Medicare-certified agencies that accessed Campaign resources in the first month of the Campaign and also responded to an online survey of resource utilization at month two. We used the survey data and item response theory to estimate a latent construct we called engagement with the campaign. ACH rates were calculated from the Centers for Medicare & Medicaid Services Outcome and Assessment Information Set for pre- and post-intervention periods (March-November 2009 and 2010, respectively).

RESULTS:
Staff from 1077 agencies accessed resources in the first month of the Campaign. Of these, 382 provided information about resource use and had 10 or more monthly discharges throughout the measurement periods. Dividing these agencies into quartiles based on engagement score, we found an association between engagement and reduction in ACH rates, P=0.049 (χ(2) for trend). Exploratory path analysis revealed the effect of engagement score on reduction in ACH rate to be partially mediated through reduction in average length of service rates.

CONCLUSION:
We found evidence that early intensity of engagement with the Campaign, as measured through use of activities and resources, was positively associated with improvement. To continue the investigation of this relationship, future work in this and other campaigns should focus on further development of engagement measures.
Abstract

BACKGROUND:
An important goal of home health care is to assist patients to remain in community living arrangements. Yet home care often fails to prevent hospitalizations and to facilitate discharges to community living, thus putting patients at risk of additional health challenges and increasing care costs.

OBJECTIVES:
To determine the relationship between home health agency work environments and agency-level rates of acute hospitalization and discharges to community living.

METHODS AND DESIGN:
Analysis of linked Center for Medicare and Medicaid Services Home Health Compare data and nurse survey data from 118 home health agencies. Robust regression models were used to estimate the effect of work environment ratings on between-agency variation in rates of acute hospitalization and community discharge.

RESULTS:
Home health agencies with good work environments had lower rates of acute hospitalizations and higher rates of patient discharges to community living arrangements compared with home health agencies with poor work environments.

CONCLUSION:
Improved work environments in home health agencies hold promise for optimizing patient outcomes and reducing use of expensive hospital and institutional care.

Author information

Abstract
Frontloading of skilled nursing visits is one way home health providers have attempted to reduce hospital readmissions among skilled home health patients. Upon review of the frontloading evidence, visit intensity emerged as being closely related. This state of the science presents a critique and synthesis of the published empirical evidence related to frontloading and visit intensity. OVID/Medline, PubMed, and Scopus were searched. Seven studies were eligible for inclusion. Further research is required to define frontloading and visit intensity, identify patients most likely to benefit, and to provide a better understanding of how home health agencies can best implement these strategies.
BACKGROUND:
We sought to determine if discharge home with home health care (HHC) is an independent predictor of increased readmission after pancreatectomy.

STUDY DESIGN:
We examined 30-day readmissions in patients undergoing pancreatectomy using the Healthcare Cost and Utilization Project State Inpatient Database for California from 2009 to 2011. Readmissions were categorized as severe or nonsevere using the Modified Accordion Severity Grading System. Multivariable logistic regression models were used to examine the association of discharge home with HHC and 30-day readmission using discharge home without HHC as the reference group. Propensity score matching was used as an additional analysis to compare the rate of 30-day readmission between patients discharged home with HHC with patients discharged home without HHC.

RESULTS:
Of 3,573 patients who underwent pancreatectomy, 752 (21.0%) were readmitted within 30 days of discharge. In a multivariable logistic regression model, discharge home with HHC was an independent predictor of increased 30-day readmission (odds ratio = 1.37; 95% CI, 1.11-1.69; p = 0.004). Using propensity score matching, patients who received HHC had a significantly increased rate of 30-day readmission compared with patients discharged home without HHC (24.3% vs 19.8%; p < 0.001). Patients discharged home with HHC had a significantly increased rate of non-severe readmission compared with those discharged home without HHC, by univariate comparison (19.2% vs 13.9%; p < 0.001), but not severe readmission (6.4% vs 4.7%; p = 0.08). In multivariable logistic regression models, excluding patients discharged to facilities, discharge home with HHC was an independent predictor of increased non-severe readmissions (odds ratio = 1.41; 95% CI, 1.11-1.79; p = 0.005), but not severe readmissions (odds ratio = 1.31; 95% CI, 0.88-1.93; p = 0.18).

CONCLUSIONS:
Discharge home with HHC after pancreatectomy is an independent predictor of increased 30-day readmission; specifically, these services are associated with increased non-severe readmissions, but not severe readmissions.

Acute care hospitalization during or immediately following a Medicare home health care (HHC) episode is a major adverse outcome, but little has been published about HHC patient-level risk factors for hospitalization. The authors determined risk factors at HHC admission associated with subsequent acute care hospitalization in a nationally representative Medicare patient sample (N = 374,123). Hospitalization was measured using Medicare claims data; risk factors were measured using Outcome Assessment and Information Set data. Seventeen percent of sample members were hospitalized. Multivariate logistic regression analysis found that the most influential risk factors (all p < .001) were skin wound as primary HHC diagnosis, clinician-judged guarded rehabilitation prognosis, congestive heart failure as primary HHC diagnosis, presence of depressive symptoms, dyspnea severity, and Black, compared to White. HHC initiatives that minimize chronic condition exacerbations and actively treat depressive symptoms might help reduce Medicare patient hospitalizations. Unmeasured reasons for higher hospitalization rates among Black HHC patients deserve further investigation.

RATIONALE, AIMS AND OBJECTIVES:
Unplanned hospital readmissions of elderly people represent an increasing burden on health care systems. This burden could theoretically be reduced by adequate preventive interventions, although there is uncertainty about the effectiveness of different types of interventions. The objective of this systematic review was to identify interventions that effectively reduce the risk of hospital readmissions in patients of 75 years and older, and to assess the role of home follow-up.

METHODS:
We searched studies in MEDLINE, CINAHL, CENTRAL and seven other electronic databases up to October 2007, and we updated the MEDLINE search in October 2009. Clinical trials (randomized or controlled) evaluating the effectiveness of an intervention aimed at reducing readmissions in elderly patients were selected. Quality was assessed using the SIGN tool and the information extracted is presented in text and tables.

RESULTS:
Thirty-two clinical trials were included and they were divided into two groups: in-hospital interventions (17 studies) and interventions with home follow-up (15 studies). A positive effect of the intervention evaluated on the readmission outcome was found in three studies from the first group and in seven from the second group.

CONCLUSIONS:
Most of the interventions evaluated did not have any effect on the readmission of elderly patients. However, those interventions that included home care components seem to be more likely to reduce readmissions in the elderly.
Naylor MD, Brooten D, Campbell R, Jacobsen BS, Mezey MD, Pauly MV, Schwartz JS.


CONTEXT:
Comprehensive discharge planning by advanced practice nurses has demonstrated short-term reductions in readmissions of elderly patients, but the benefits of more intensive follow-up of hospitalized elders at risk for poor outcomes after discharge has not been studied.

OBJECTIVE: To examine the effectiveness of an advanced practice nurse-centered discharge planning and home follow-up intervention for elders at risk for hospital readmissions.

DESIGN: Randomized clinical trial with follow-up at 2, 6, 12, and 24 weeks after index hospital discharge.


PARTICIPANTS: Eligible patients were 65 years or older, hospitalized between August 1992 and March 1996, and had 1 of several medical and surgical reasons for admission.

INTERVENTION: Intervention group patients received a comprehensive discharge planning and home follow-up protocol designed specifically for elders at risk for poor outcomes after discharge and implemented by advanced practice nurses.

MAIN OUTCOME MEASURES:
Readmissions, time to first readmission, acute care visits after discharge, costs, functional status, depression, and patient satisfaction.

RESULTS:
A total of 363 patients (186 in the control group and 177 in the intervention group) were enrolled in the study; 70% of intervention and 74% of control subjects completed the trial. Mean age of sample was 75 years; 50% were men and 45% were black. By week 24 after the index hospital discharge, control group patients were more likely than intervention group patients to be readmitted at least once (37.1% vs 20.3%; P<.001). Fewer intervention group patients had multiple readmissions (6.2% vs 14.5%; P = .01) and the intervention group had fewer hospital days per patient (1.53 vs 4.09 days; P<.001). Time to first readmission was increased in the intervention group (P<.001). At 24 weeks after discharge, total Medicare reimbursements for health services were about $1.2 million in the control group vs about $0.6 million in the intervention group (P<.001). There were no significant group differences in post-discharge acute care visits, functional status, depression, or patient satisfaction.

CONCLUSIONS:
An advanced practice nurse-centered discharge planning and home care intervention for at-risk hospitalized elders reduced readmissions, lengthened the time between discharge and readmission, and decreased the costs of providing health care. Thus, the intervention demonstrated great potential in promoting positive outcomes for hospitalized elders at high risk for rehospitalization while reducing costs.
REVIEWS OF READMISSION PREVENTION STRATEGIES (INCLUDING HH)

Kansagara D¹,²,³, Chiovaro JC¹,², Kagen D¹,², Jencks S⁴, Rhyne K¹,², O'Neil M³, Kondo K³, Relevo R³, Motu'apuaka M³, Freeman M¹,³, Englander H². So many options, where do we start? An overview of the care transitions literature. J Hosp Med. 2015 Nov 9.

BACKGROUND:
Health systems are faced with a large array of transitional care interventions and patient populations to whom such activities might apply.

PURPOSE:
To summarize the health and utilization effects of transitional care interventions, and to identify common themes about intervention types, patient populations, or settings that modify these effects.

DATA SOURCES:

STUDY SELECTION:
Systematic reviews of transitional care interventions that reported hospital readmission as an outcome.

DATA EXTRACTION:
We extracted transitional care procedures, patient populations, settings, readmissions, and health outcomes. We identified commonalities and compiled a narrative synthesis of emerging themes.

DATA SYNTHESIS:
Among 10 reviews of mixed patient populations, there was consistent evidence that enhanced discharge planning and hospital-at-home interventions reduced readmissions. Among 7 reviews in specific patient populations, transitional care interventions reduced readmission in patients with congestive heart failure and general medical populations. In general, interventions that reduced readmission addressed multiple aspects of the care transition, extended beyond hospital stay, and had the flexibility to accommodate individual patient needs. There was insufficient evidence on how caregiver involvement, transition to sites other than home, staffing, patient selection practices, or care settings modified intervention effects.

CONCLUSIONS:
Successful interventions are comprehensive, extend beyond hospital stay, and have the flexibility to respond to individual patient needs. The strength of evidence should be considered low because of heterogeneity in the interventions studied, patient populations, clinical settings, and implementation strategies. Journal of Hospital Medicine 2015. © 2015 Society of Hospital Medicine.
Transitions of Care from Hospital to Home: An Overview of Systematic Reviews and Recommendations for Improving Transitional Care in the Veterans Health Administration


Summary of findings: We examined 17 systematic reviews across different patient populations and representing a variety of intervention types in order to provide a broad overview of the care transitions literature. While there have been numerous examples of interventions that reduced readmission rates, there were no patient population or intervention type categories within which transitional care interventions were uniformly successful.

It is not surprising that there are many sources of heterogeneity in a field as broadly defined as transitional care. Variation in populations studied, intervention characteristics, personnel, outcomes measured, and settings make it difficult to identify definitive recommendations for a specific intervention that should be broadly applied. Nevertheless, we were able to draw several generalizations from the literature.

1. Interventions that address more components of the care transition are probably better than those that address fewer.

2. Successful interventions tended to include the means to assess and respond to individual peri-discharge needs.

3. There is very little data supporting the effectiveness of interventions isolated to either the pre- or post-discharge settings. Successful interventions which were largely implemented in one setting often included components (such as home visits, a single point of contact, and/or telephone calls) that bridged settings. On the other hand, in select populations such as patients with CHF, there is some evidence supporting post-discharge interventions such as structured telephone support and multidisciplinary CHF clinics.

4. It is not clear to what extent and for whom post-discharge home visits are a necessary component of care transitions.

5. The vast majority of the care transitions literature has been hospital-focused, with very little literature examining the role of primary care teams during the transitions of care. There is a growing literature examining the effects of medical home interventions, most of which include cross-site care coordination activities; however, the characteristics of successful care transitions within the medical home context have not been well explored.

6. Many interventions that have demonstrated a reduction in readmission rates have included patients at high risk for readmission because of underlying comorbidities such as CHF and/or because of additional factors such as prior utilization.
7. Interventions designed to address the needs of patients with complex, chronic medical illness have been the best studied. It is unclear whether the success of some interventions studied in these patient populations reflects the content expertise that intervention personnel might develop in working with specific patient populations, higher baseline risk of poor outcomes among these patients, or sensitivity of chronic medical illness to transitional care improvements. However, there are many notable exceptions even among patients with chronic medical illness – for example, we found little evidence of benefit in COPD populations, though many transitional care components were absent in these studies. There is little good-quality transitional care literature in mental health or surgical populations.

8. Reviews that examined effects by year of publication suggest that many of the interventions demonstrating benefit were conducted more than a decade ago.

9. In order to allow for better collation of results from trials, development of a standard taxonomy is needed. This taxonomy should include both population descriptors as well as intervention descriptors.

Policy implications: In the main report, we present several policy implications along with a brief discussion and rationale for each. There are likely many steps of the care transition that, if missed, could hinder the quality of the care transition. We recommend each institution use a standardized approach to diagnose transitional care gaps. We have included a transitional care “map” that could be used for such assessments. We do not suggest that each step is necessary for every patient. We also suggest that the VHA could harness existing infrastructures such as PACT and home-based primary care to accomplish pieces of the care transition that had previously been accomplished in the intervention literature by additional transitional care nurses. Because some transitional care intervention activities can be resource intensive, we provide some discussion about the potential merits and pitfalls of risk assessment to identify high-risk patients for intervention. Finally, we suggest the VHA critically examine the current broad-based implementation of post-discharge telephone calls.
Abstract
This article reviews the past history of home health agency care from its beginnings to the present day, evidence regarding the effect of recent changes in financing on these services, the state of skilled home health care in 2008, and a discussion of future directions. Home health care serves several million patients per year, many of whom are recuperating from acute illness episodes. Due to illness burden and Medicare funding, a large proportion of care that home health agencies deliver is geriatric care. However, home health care plays an important role for patients of all ages with significant acute and chronic illnesses. Medicare home health care suffered a significant downturn following the 1997 Balanced Budget Act and is recovering under Prospective Payment. Like most sectors of care, home health care has often operated in a "silo" but there is increasing recognition of the need to bridge care settings and provide care continuity for sick, chronically ill individuals. This is an important challenge for the future. Agencies that have strong information technology infrastructure and chronic care management systems along with a seasoned clinical workforce will be well positioned for key roles in home health care in decades to come. Home health care serves several million patients each year, many of whom are recuperating from acute illness episodes. Due to the burden of illness and Medicare funding, a large proportion of care that home health agencies deliver is geriatric care. However, home health care plays an important role for patients of all ages with significant acute and chronic illnesses. Medicare home health care suffered a significant downturn following the 1997 Balanced Budget Act (BBA) and is recovering under prospective payment. Like most sectors of care, home health care has often operated in a "silo," but there is increasing recognition of the need to bridge care settings and provide care continuity for sick, chronically ill individuals. This is an important challenge for the future. Agencies that have strong information technology infrastructure and chronic care management systems along with a seasoned clinical workforce will be well positioned for key roles in home health care in the decades to come.

BACKGROUND:
Although hospitals are increasingly held accountable for patients' post-discharge outcomes, giving them incentive to help patients choose high-performing home health agencies, little is known about how quality reports inform decision making.

OBJECTIVE:
We aimed to learn how quality reports are used when choosing home care in one northeast state (Rhode Island).

DESIGN:
The study consisted of focus groups with home health consumers and structured interviews with hospital case managers.

PARTICIPANTS:
Thirteen consumers and 28 case managers from five hospitals participated in the study.

APPROACH:
We identified key themes and illustrative quotes by audiotaping each session, and then three independent reviewers conducted repeated examination and content analysis.

KEY RESULTS:
No participants were aware of existing state or Medicare home health agency public reports. Case managers provided agency lists to consumers, who routinely asked case managers to tell them which agencies to choose or which were best; but case managers felt unable to directly respond to consumers' requests for help in making the choice, because they did not have additional information to provide and because they feared violating federal laws requiring freedom of patient choice. Case managers also felt that there was little difference in agency quality, although they acknowledged they might not be aware of problems related to post-hospital care.

CONCLUSIONS:
Home health consumers and hospital case managers were unaware of public reports about home health quality, which limited consumers' ability to make informed decisions and case managers' ability to assist them in that decision-making process. Case managers were otherwise prohibited from recommending specific providers to patients and viewed the 'patient choice' laws as restricting their ability to respond to patients' requests for help in choosing home health agencies. Public reports can be marketed as tools that case managers can use to help patients differentiate among providers, while supporting patient autonomy.
Market-based solutions are often proposed to improve health care quality; yet evidence on the role of competition in quality in non-hospital settings is sparse. We examine the relationship between competition and quality in home health care. This market is different from other markets in that service delivery takes place in patients' homes, which implies low costs of market entry and exit for agencies. We use 6 years of panel data for Medicare beneficiaries during the early 2000s. We identify the competition effect from within-market variation in competition over time. We analyze three quality measures: functional improvements, the number of home health visits, and discharges without hospitalization. We find that the relationship between competition and home health quality is nonlinear and its pattern differs by quality measure. Competition has positive effects on functional improvements and the number of visits in most ranges, but in the most competitive markets, functional outcomes and the number of visits slightly drop. Competition has a negative effect on discharges without hospitalization that is strongest in the most competitive markets. This finding is different from prior research on hospital markets and suggests that market-specific environments should be considered in developing polices to promote competition.

Abstract

OBJECTIVES:
To use natural language processing (NLP) of text from electronic medical records (EMRs) to identify failed communication attempts between home health nurses and physicians, to identify predictors of communication failure, and to assess the association between communication failure and hospital readmission.

DESIGN:
Retrospective cohort study.

SETTING:
Visiting Nurse Service of New York (VNSNY), the nation’s largest freestanding home health agency.

PARTICIPANTS:
Medicare beneficiaries with congestive heart failure who received home health care from VNSNY after hospital discharge in 2008-09 (N = 5,698).

MEASUREMENTS:
Patient-level measures of communication failure and risk-adjusted 30-day all-cause readmission.

RESULTS:
Identification of failed communication attempts using NLP had high external validity (kappa = 0.850, P < .001). A mean of 8% of communication attempts failed per episode of home care; failure rates were higher for black patients and lower for patients from higher median income ZIP codes. The association between communication failure and readmission was not significant with adjustment for patient, nurse, physician, and hospital factors.

CONCLUSION:
NLP of EMRs can be used to identify failed communication attempts between home health nurses and physicians, but other variables mostly explained the association between communication failure and readmission. Communication failures may contribute to readmissions in more-serious clinical situations, an association that this study may have been underpowered to detect.

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[Purpose] This study aimed to clarify differences between home-visit rehabilitation users and providers in their understanding of the content and subjective effects of this practice. [Subjects] The subjects of this study were home-visit rehabilitation users and providers. [Methods] Home-visit rehabilitation users and providers were given self-administered questionnaires regarding home-visit rehabilitation, such as the content and subjective effects. The McNemar's test was used for statistical analysis. [Results] Responses of 34 pairs meeting the inclusion criteria were analyzed. Mean user age was 75.2 ± 9.2 years, and 58.8% (20/34) of respondents were female. In terms of home-visit rehabilitation content, users believed that the following 3 items had been "implemented" to a greater extent than that estimated by providers: paralysis improvement exercise, floor sitting and standing, and self-care activities. No significant differences in awareness were identified between users and providers regarding the maintenance/improvement effects of home-visit rehabilitation. [Conclusion] Users tend to consider that programs aimed at relieving symptoms and pain and improving mobility are being implemented to a greater extent than that considered by providers. Providers need to explain the aims of home-visit rehabilitation programs in a way that can be understood by users.

**KEYWORDS:**

Home-visit rehabilitation; Rehabilitation program; Subjective effects

Abstract

BACKGROUND:
The literature on the impact of home-based rehabilitation on functional outcomes for patients after stroke is limited. The purpose of this study was to describe the outcomes of home-based rehabilitation (HBR) on functional and gait performance for patients after stroke and associated factors that contribute to better outcomes after an episode of care.

METHODS:
The nature of the study design was retrospective and the settings used were home care services. The total number of subjects receiving home care services after stroke was 213 (mean age 76.5 ± 9 years, 51% female). Treatment records for patients receiving HBR in 2010 were reviewed at the start of care and discharge. The primary outcome measure was a change in a gait speed and activities of daily living (ADL) performance between admission and discharge from home health care services. The composite score to calculate overall functional status (Outcome Information and Assessment Set-version C [OASIS-C]) was used. Mean change in ADL and gait scores and factors predictive of improvement were identified using an analysis of covariance and multivariate linear models. The main outcome measures were change in the OASIS-C composite scores and gait speed.

RESULTS:
After adjustment for age and ADL score at the start of care, discharge from skilled nursing or long-term facilities, presence of confusion most of the times, cognitive impairment, and memory deficits were negatively associated with an improvement in functional scores (ADL). Living in congregate facilities was also negatively associated with an improvement in gait speed. The best multivariate model included age, baseline ADL composite scores, confusion status, and gait speed at the start of care, which predicted 41% of the variance in ADL score changes over the course of intervention.

CONCLUSIONS:
Gait speed and ADL scores at the start of care had largest influence on functional and gait improvement. Type of discharge facility, confusion status, and living arrangement had effects on HBR outcomes for stroke survivors.

Author information

Abstract

OBJECTIVE:
To investigate the impact of physiotherapy (PT) and occupational therapy (OT) services on long-stay home care patients with musculoskeletal disorders.

DESIGN:
Observational study.

SETTING:
Home care programs.

PARTICIPANTS:
All long-stay home care patients between 2003 and 2008 (N=99,764) with musculoskeletal disorders who received a baseline Resident Assessment Instrument for Home Care assessment, 1 follow-up assessment, and had discharge or death records.

INTERVENTIONS:
PT and OT.

MAIN OUTCOME MEASURES:
The effects of PT and OT services on transitions in functional state, discharge from home care with service plans complete, institutionalization, and death were assessed via multistate Markov models.

RESULTS:
Home care patients with deficiencies in instrumental activities of daily living and/or activities of daily living at baseline and who received home-based rehabilitation had significantly increased odds of showing functional improvements by their next assessment (for a state 3 to state 2 transition: odds ratio [OR]=1.17; 95% confidence interval [CI], 1.10-1.26; P<.0001; for a state 2 to state 1 transition: OR=1.36; 95% CI, 1.14-1.61; P=.0005). Receipt of PT/OT also significantly reduced the odds of mortality and institutionalization in this group.

CONCLUSIONS:
With increasing numbers of older adults with chronic conditions and limited funding for health care services, it is essential to provide the right services at the right time in a cost-effective manner. Long-stay home care patients who receive rehabilitation at home have improved outcomes and lower utilization of costly health services. Our findings suggest that investment in PT and OT services for relatively short periods may provide savings to the health care system over the longer term.

PURPOSE:
Functional capacity is widely recognized as a key factor in maintaining the ability of older people to live independently and safely at home. Promoting functional capacity is an important priority particularly in HHC. The purpose of the study was to examine predictors of functional capacity change among HHC patients with HF.

MATERIALS AND METHODS:
Clinical and administrative data from 2005 from the Medicare Chronic Conditions Warehouse were linked at the population level for HHC patients with a primary diagnosis of HF. The primary outcome was change in functional capacity score from HHC admission to HHC discharge.

RESULTS:
Over the course of the episode (M=44 days), most (70%) patients improved, 15.6% stayed the same, and 14.4% declined in activities of daily living (ADL) scores. The mean change score was modest (mean=-0.74, SD=1.11) with a median change of -0.58. Multivariate analyses (R(2)=0.23) showed that the largest influence was the admission ADL score followed by receiving any physical therapy (PT), admission ability to manage oral medications, cognitive functioning, rehabilitation prognosis, and urinary incontinence.

DISCUSSION:
There is a modest rate of improvement from admission to discharge that likely represents the progressive nature of HF and/or the short time frames over which HHC is provided. Providers may want to use the predictive factors to identify patients most at risk for functional decline.
PURPOSE:
To examine the use of the Outcomes Assessment and Information Set (OASIS) data to analyze patient-level outcomes of home health care.

DESIGN:
OASIS data were obtained on 1,015 patients who received home health care services for 60 days or fewer from a large, independent home health agency between August 1998 and December 1999.

METHODS:
An index was constructed consisting of 16 OASIS measures, primarily activities of daily living (ADL) and instrumental activities of daily living (IADL). Scores were computed for functional status on admission and at discharge. Predictors of functional status at discharge were identified by regression analysis.

FINDINGS:
78.1% of patients improved, 18.5% declined, and 2.8% showed no change. The model explained 57.2% of variance in functional status at discharge. Age, visual impairment, having Medicaid as a payer, urinary incontinence, cognitive impairment, and use of unplanned or emergency care were negatively associated with functional outcomes of care. Being treated for open wounds or lesions, cardiovascular and orthopedic conditions were positively associated with functional outcomes.

CONCLUSIONS:
OASIS data can be used to analyze patient-level functional outcomes of short-term home health services. Further research is needed to continue refining methods of analyzing patient outcomes and their predictors.
OBJECTIVES:
To compare home-based rehabilitation with the standard hospital rehabilitation in terms of improving knee joint mobility and recovery of muscle strength and function in patients after a total knee replacement.

MATERIALS AND METHODS:
A non-randomised controlled trial was conducted. Seventy-eight patients with a prosthetic knee were included in the study and allocated to either a home-based or hospital-based rehabilitation programme. Treatment included various exercises to restore strength and joint mobility and to improve patients' functional capacity. The primary outcome of the trial was the treatment effectiveness measured by the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).

RESULTS:
The groups did not significantly differ in the leg side (right/left) or clinical characteristics ($P > 0.05$). After the intervention, both groups showed significant improvements ($P < 0.001$) from the baseline values in the level of pain (visual analogue scale), the range of flexion-extension motion and muscle strength, disability (Barthel and WOMAC indices), balance, and walking.

CONCLUSIONS:
This study reveals that the rehabilitation treatments offered either at home or in hospital settings are equally effective.

**Author information**

**Abstract**

Research examining care process variables and their relationship to clinical outcomes after total knee arthroplasty has focused primarily on inpatient variables. Care process factors related to outpatient rehabilitation have not been adequately examined. We conducted a retrospective review of 321 patients evaluating outpatient care process variables including use of continuous passive motion, home health physical therapy, number of days from inpatient discharge to beginning outpatient physical therapy, and aspects of outpatient physical therapy (number of visits, length of stay) as possible predictors of pain and disability outcomes of outpatient physical therapy. Only the number of days between inpatient discharge and outpatient physical therapy predicted better outcomes, suggesting that this may be a target for improving outcomes after total knee arthroplasty for patients discharged directly home.

Author information

Abstract

BACKGROUND:
Patients are discharged to home or inpatient settings after primary unilateral total knee arthroplasty (TKA). Few studies have compared patient outcomes following these 2 rehabilitation models for TKA patients. We identified predictors of inpatient discharge, 3-month postoperative range of motion (ROM), and 3-month postoperative patient-reported physical function improvement (Veterans RAND 12-Item Physical Component Score [PCS]) between these discharge settings.

METHODS:
We studied prospectively collected cohort data for 738 TKAs between April 2011 and April 2013 at a high-volume tertiary academic medical center in a rural setting. All patients followed a standardized care pathway that involved prospective data collection as part of routine clinical care. Adjusting variables included age, sex, preoperative PCS, surgeon, modified Charlson Comorbidity Index, preoperative body mass index, laterality, and preoperative ROM; the 3-month models also included length of stay and discharge disposition as adjusters.

RESULTS:
Significant adjusted predictors of inpatient discharge included older age, female sex, surgeon, comorbidity, lower PCS, and body mass index greater than 40. Only lower preoperative ROM predicted postoperative ROM. Inpatient discharge and higher preoperative PCS predicted lower PCS improvement. Home-based rehabilitation was associated with greater 3-month PCS improvement and showed no difference with 3-month ROM.

CONCLUSION:
Discharge to home-based rehabilitation after TKA, rather than inpatient facility, is associated with higher physical function at 3 months postsurgery and shows no difference with 3-month ROM. Total knee arthroplasty inpatient discharge should be based on patient care requirements rather than perceived benefit of improved ROM and physical function.

BACKGROUND:
Arthritis of the knee is a common problem causing pain and disability. If severe, knee arthritis can be surgically managed with a total knee arthroplasty. Rehabilitation following knee arthroplasty often includes continuous passive motion (CPM). CPM is applied by a machine that passively and repeatedly moves the knee through a specified range of motion (ROM). It is believed that CPM increases recovery of knee ROM and has other therapeutic benefits. However, it is not clear whether CPM is effective.

OBJECTIVES:
To assess the benefits and harms of CPM and standard postoperative care versus similar postoperative care, with or without additional knee exercises, in people with knee arthroplasty. This review is an update of a 2003 and 2010 version of the same review.

SEARCH METHODS:
We searched the following databases: the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2012, Issue 12), MEDLINE (January 1966 to 24 January 2013), EMBASE (January 1980 to 24 January 2013), CINAHL (January 1982 to 24 January 2013), AMED (January 1985 to 24 January 2013) and PEDro (to 24 January 2013).

SELECTION CRITERIA:
Randomised controlled trials in which the experimental group received CPM, and both the experimental and control groups received similar postoperative care and therapy following total knee arthroplasty in people with arthritis.

DATA COLLECTION AND ANALYSIS:
Two review authors independently selected trials for inclusion, extracted data and assessed risk of bias. The primary outcomes of interest were active knee flexion ROM, pain, quality of life, function, participants' global assessment of treatment effectiveness, incidence of manipulation under anaesthesia and adverse events. The secondary outcomes were passive knee flexion ROM, active knee extension ROM, passive knee extension ROM, length of hospital stay, swelling and quadriceps strength. We estimated effects for continuous data as mean differences or standardised mean differences (SMD), and effects for dichotomous data as risk ratios; all with 95% confidence intervals (CI). If appropriate, we performed meta-analyses using random-effects models.

MAIN RESULTS:
We identified 684 papers from the electronic searches after removal of duplicates and retrieved the full reports of 62 potentially eligible trials. Twenty-four randomised controlled trials of 1445 participants met the inclusion criteria; four of these trials were new to this update. There was moderate-quality evidence to indicate that CPM does not have clinically important short-term effects on active knee flexion ROM: mean knee flexion was 78 degrees in the control group, CPM increased active knee flexion ROM by 2 degrees (95% CI 0 to 5) or absolute improvement of 2% (95% CI 0% to 4%). The medium- and long-term effects are similar although the quality of evidence is lower. There was low-quality evidence to indicate that CPM
does not have clinically important short-term effects on pain: mean pain was 3 points in the control group, CPM reduced pain by 0.4 points on a 10-point scale (95% CI -0.8 to 0.1) or absolute reduction of -4% (95% CI -8% to 1%). There was moderate-quality evidence to indicate that CPM does not have clinically important medium-term effects on function: mean function in the control group was 56 points, CPM decreased function by 1.6 points (95% CI -6.1 to 2.0) on a 100-point scale or absolute reduction of -2% (95% CI -5% to 2%). The SMD was -0.1 standard deviations (SD) (95% CI -0.3 to 0.1). There was moderate-quality evidence to indicate that CPM does not have clinically important medium-term effects on quality of life: mean quality of life was 40 points in the control group, CPM improved quality of life by 1 point on a 100-point scale (95% CI -3 to 4) or absolute improvement of 1% (95% CI -3% to 4%). There was very low-quality evidence to indicate that CPM reduces the risk of manipulation under anaesthesia; risk of manipulation in the control group was 7.2%, risk of manipulation in the experimental group was 1.6%, CPM decreased the risk of manipulation by 25 fewer manipulations per 1000 (95% CI 9 to 64) or absolute risk reduction of -4% (95% CI -8% to 0%). The risk ratio was 0.3 (95% CI 0.1 to 0.9). There was low-quality evidence to indicate that CPM reduces the risk of adverse events; risk of adverse events in the control group was 16.3%, risk of adverse events in the experimental group was 17.9%, CPM decreased the risk of adverse event by 150 fewer adverse events per 1000 (95% CI 103 to 216) or absolute risk reduction of -1% (95% CI -5% to 3%). The risk ratio was 0.9 (95% CI 0.6 to 1.3). The estimates for risk of manipulation and adverse events are very imprecise and the estimate for the risk of adverse events does not distinguish between a clinically important increase and decrease in risk. There was insufficient evidence to determine the effect of CPM on participants' global assessment of treatment effectiveness.

AUTHORS' CONCLUSIONS:
CPM does not have clinically important effects on active knee flexion ROM, pain, function or quality of life to justify its routine use. It may reduce the risk of manipulation under anaesthesia and risk of developing adverse events although the quality of evidence supporting these findings are very low and low, respectively. The effects of CPM on other outcomes are unclear.
BACKGROUND:
The availability of less resource-intensive alternatives to home visits for rehabilitation following orthopaedic surgeries is important, given the increasing need for home care services and the shortage of health resources. The goal of this trial was to determine whether an in-home telerehabilitation program is not clinically inferior to a face-to-face home visit approach (standard care) after hospital discharge of patients following a total knee arthroplasty.

METHODS:
Two hundred and five patients who had a total knee arthroplasty were randomized before hospital discharge to the telerehabilitation group or the face-to-face home visit group. Both groups received the same rehabilitation intervention for two months after hospital discharge. Patients were evaluated at baseline (before total knee arthroplasty), immediately after the rehabilitation intervention (two months after discharge), and two months later (four months after discharge). The primary outcome measure was the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) questionnaire at the last follow-up evaluation. Secondary outcome measures included the Knee Injury and Osteoarthritis Outcome Score (KOOS) questionnaire, functional and strength tests, and knee range of motion. The noninferiority margin was set at 9% for the WOMAC.

RESULTS:
The demographic and clinical characteristics of the two groups of patients were similar at baseline. At the last follow-up evaluation, the mean differences between the groups with regard to the WOMAC gains, adjusted for baseline values, were near zero (for 182 patients in the per-protocol analysis): -1.6% (95% confidence interval [CI]: -5.6%, 2.3%) for the total score, -1.6% (95% CI: -5.9%, 2.8%) for pain, -0.7% (95% CI: -6.8%, 5.4%) for stiffness, and -1.8% (95% CI: -5.9%, 2.3%) for function. The confidence intervals were all within the predetermined zone of noninferiority. The secondary outcomes had similar results, as did the intention-to-treat analysis, which was conducted afterward for 198 patients.

CONCLUSIONS:
Our results demonstrated the noninferiority of in-home telerehabilitation and support its use as an effective alternative to face-to-face service delivery after hospital discharge of patients following a total knee arthroplasty.

LEVEL OF EVIDENCE:
Therapeutic Level I. See Instructions for Authors for a complete description of levels of evidence.
BACKGROUND: The emerging attention on in-home care in Canada assumes that chronic disease management will be optimized if it takes place in the community as opposed to the health care setting. Both the patient and the health care system will benefit, the latter in terms of cost savings.

OBJECTIVES: To compare the effectiveness of care delivered in the home (i.e., in-home care) with no home care or with usual care/care received outside of the home (e.g., health care setting).

DATA SOURCES: A literature search was performed on January 25, 2012, using OVID MEDLINE, OVID MEDLINE In-Process and Other Non-Indexed Citations, OVID EMBASE, EBSCO Cumulative Index to Nursing & Allied Health Literature (CINAHL), the Wiley Cochrane Library, and the Centre for Reviews and Dissemination database, for studies published from January 1, 2006, until January 25, 2012.

REVIEW METHODS: An evidence-based analysis examined whether there is a difference in mortality, hospital utilization, health-related quality of life (HRQOL), functional status, and disease-specific clinical measures for in-home care compared with no home care for heart failure, atrial fibrillation, coronary artery disease, stroke, chronic obstructive pulmonary disease, diabetes, chronic wounds, and chronic disease/multimorbidity. Data was abstracted and analyzed in a pooled analysis using Review Manager. When needed, subgroup analysis was performed to address heterogeneity. The quality of evidence was assessed by GRADE.

RESULTS: The systematic literature search identified 1,277 citations from which 12 randomized controlled trials met the study criteria. Based on these, a 12% reduced risk for in-home care was shown for the outcome measure of combined events including all-cause mortality and hospitalizations (relative risk [RR]: 0.88; 95% CI: 0.80-0.97). Patients receiving in-home care had an average of 1 less unplanned hospitalization (mean difference [MD]: -1.03; 95% CI: -1.53 to -0.53) and an average of 1 less emergency department (ED) visit (MD: -1.32; 95% CI: -1.87 to -0.77). A beneficial effect of in-home care was also shown on activities of daily living (MD: -0.14; 95% CI: -0.27 to -0.01), including less difficulty dressing above the waist or below the waist, grooming, bathing/showering, toileting, and feeding. These results were based on moderate quality of evidence. Additional beneficial effects of in-home care were shown for HRQOL although this was based on low quality of evidence.

LIMITATIONS: Different characterization of outcome measures across studies prevented the inclusion of all eligible studies for analysis.

CONCLUSIONS: In summary, education-based in-home care is effective at improving outcomes of patients with a range of heart disease severity when delivered by nurses during a single home visit or on an ongoing basis. In-home visits by occupational therapists and physical therapists targeting modification of tasks and the home environment improved functional activities for community-living adults with chronic disease.

**Abstract**

Most older adults are admitted to home health care with some functional impairment related to chronic illness and/or hospitalization. This article describes: (1) the impact of a quality improvement initiative (QI) on functional outcomes of older, chronically ill patients served by a large homecare organization; and (2) key implementation challenges affecting intervention outcomes. Over 6,000 patients were included in two dissemination phases. Phase 1 randomly assigned service delivery teams to intervention (QI) or usual care (UC). Phase 2 spread the intervention to UC teams. Phase 1 yielded statistically significant, albeit modest, functional improvements among intervention team patients relative to UC. Phase 2 improvements in the original intervention group were smaller, suggesting some regression to the mean. UC teams did not "catch up" when exposed to the intervention in Phase 2. Analysis of the implementation process suggested that modification of improvement strategies and "dilution" of peer-to-peer communication hindered additional Phase 2 improvements. The findings highlight the challenges of relying on peer-to-peer spread, and of distinguishing the core elements of an effective improvement strategy that must be spread consistently from those that can be adapted to variations within and across organizations.

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Grant LA¹, Rockwood T², Stennes L².


Author information

Abstract

We assessed client satisfaction with the home telemonitoring service provided by 14 home health care agencies in five US states. Clients were randomised to two groups. Telehealth services (health monitoring and patient safety) were provided to 450 experimental subjects. Control subjects (n = 409) received usual care. Clients were asked to rate their satisfaction with their service providers on 25 items, at baseline, 6 months post-discharge (to home) and 12 months post-discharge. The mean age of the clients was 78 years. Out of the initial 859 subjects, 490 had dropped out of the study by the 12-month follow-up, an overall attrition rate of 57%. There were similar proportions of clients reporting high satisfaction with external systems at baseline and at 6 months; at 12 months, there were significantly more clients in the experimental group who reported high satisfaction (P = 0.049). There were similar proportions of clients reporting high satisfaction with internal systems at baseline and at 12 months; at 6 months, there were significantly more clients in the experimental group who reported high satisfaction (P = 0.031). Clients with home monitoring were more satisfied with health-related and medical services post-discharge than those receiving usual care over a 6-12 month period.
**Medication Reconciliation**


**Author information**

**Abstract**

**BACKGROUND:**
With substantial morbidity and functional impairment, older patients receiving home health care are especially susceptible to the adverse effects of unsafe or ineffective medications. Home health agencies’ medication review and reconciliation services, however, provide an added mechanism of medication safety that could offset this risk.

**OBJECTIVE:**
To estimate the prevalence of potentially inappropriate medications (PIMs) among current elderly home health patients in the US.

**DESIGN:**
Cross-sectional analysis using data from the 2007 National Home and Hospice Care Survey.

**SUBJECTS:**
3,124 home health patients 65 years of age or older on at least one medication.

**MAIN MEASURES:**
Prevalence and classification of PIM use and the association between PIM use and patient and home health agency characteristics. Key Results In 2007, 38% (95% CI: 36-41) of elderly home health patients were taking at least one PIM. Polypharmacy was associated with an increased risk of PIM use; admission to home health care from a nursing home or other sub-acute facility (compared to admission from the community) and a payment source other than Medicare or Medicaid were associated with a decreased risk of PIM use.

**CONCLUSIONS:**
The prevalence of PIM use in older home health patients is high despite potential mechanisms for improved safety. Policies to improve the review and reconciliation processes within home health agencies and to improve physician-home health clinician collaboration are likely needed to lower the prevalence of PIM use in older home health patients.

Abstract

OBJECTIVE: To establish a community pharmacist-provided home health service to improve medication adherence and reduce 30-day heart failure-related hospital readmissions.

SETTING: Visiting Nurse Services of Newport and Bristol Counties located in Portsmouth, RI, from December 2013 to April 2014.

PRACTICE DESCRIPTION: Each patient received one in-home visit provided by a Postgraduate Year 1 community pharmacy resident within 1 week of admission to visiting nurse services followed by two follow-up telephone calls, 1 week and 4 weeks after the visit. The in-home visit consisted of a baseline assessment of medication adherence using the Morisky 8-Item Medication Adherence Questionnaire as well as pharmacist-provided education regarding chronic heart failure management. The follow-up telephone calls were used to reassess patient adherence and to monitor for hospital readmission within 30 days of the initial in-home visit.

PRACTICE INNOVATION: Community pharmacist-provided in-home medication reconciliation and medication teaching has not been described in the literature previously. In addition, pharmacists are often not included on home health care teams placing patients undergoing transitions in care at risk for potential medication-related errors.

MAIN OUTCOME MEASURES: Improvement in medication adherence and reduction in 30-day heart failure-related hospital readmission rates.

RESULTS: Ten patients were enrolled from December 2013 through April 2014. Following intervention, all patients saw improvements in adherence questionnaire scores during follow-up. Hospital readmission rates for patients seen by the pharmacist were lower compared with agencywide figures over a similar time period.

CONCLUSION: A community pharmacist-provided in-home medication teaching service for patients following recent hospital discharge helps facilitate successful transitions of care from an inpatient to outpatient setting, improves medication adherence and has produced lower observed 30-day heart failure-related hospital readmission rates. Expansion of this or a similar service within the community pharmacy to reach as many patients as possible, including those not using visiting nurse services, could serve to only augment these benefits.

**OBJECTIVE:** To assess the impact of ambulatory clinical pharmacist medication therapy assessment and reconciliation for patients postdischarge in terms of hospital readmission rates, financial savings, and medication discrepancies.

**SETTING:** Group Health Cooperative (Group Health) in Washington State, from September 2009 through February 2010.

**PRACTICE DESCRIPTION:** Group Health is a nonprofit integrated group practice and health plan, operating 25 primary care medical centers and 5 specialty centers. Group Health's practice design is a patient-centered medical home model.

**PRACTICE INNOVATION:** All patients identified as high risk for readmission were followed by Group Health care management. Patients in care management who received a phone call from a pharmacist 3 to 7 days postdischarge for medication therapy assessment and reconciliation were identified as the medication review group (n = 243). Patients who did not receive clinical pharmacist intervention were included in the comparison group (n = 251).

**MAIN OUTCOME MEASURES:** Readmission rates, financial savings, and medication discrepancies.

**RESULTS:** Patients who received medication therapy assessment and reconciliation had decreased readmission rates at 7, 14, and 30 days postdischarge, with statistical significance at 7 and 14 days. Medication review versus comparison readmission rates were as follows: 7 days: 0.8% vs. 4% (P = 0.01); 14 days: 5% vs. 9% (P = 0.04); and 30 days: 12% vs. 14% (P = 0.29). Financial savings for Group Health per 100 patients who received medication reconciliation was an estimated $35,000, translating to more than $1,500,000 in savings annually. Of patients, 80% had at least one medication discrepancy upon discharge.

**CONCLUSION:** Most literature on medication reconciliation evaluates inpatient processes, whereas data on medication reconciliation postdischarge are limited. Our data support the hypothesis that medication assessment and reconciliation by pharmacists 3 to 7 days postdischarge can decrease readmissions and provide cost savings.

**OBJECTIVES:**

To determine whether medication regimen complexity (MRC) could predict likelihood for occurrence of potential adverse drug events (ADEs), unplanned 30-day hospital readmission, or 30-day emergency department use in patients transitioning from hospital to home care.

**METHODS:**

Hospital discharge medication lists and medication lists constructed during visits to patients' homes were analyzed for 213 participants. MRC was quantified with the Medication Regimen Complexity Index (MRCI). The potential for ADEs was based on medication discrepancies detected between the discharge and patient reported home medication lists. Unplanned acute care utilization in the 30 days after index hospitalization was tracked. Logistic regression analyses were used to approximate the odds for an ADE and postdischarge acute care utilization from MRCI scores.

**RESULTS:**

Home medication lists were less complex than hospital discharge medication lists. High home medication list MRCI scores increased the odds more than 4-fold for a potential ADE (P < 0.001). High discharge medication list MRCI scores increased the odds more than 5-fold for an unplanned 30-day hospital readmission (P = 0.026). High regimen complexity did not significantly elevate odds for emergency department use.

**CONCLUSIONS:**

MRC was predictive of patients' potential for ADEs and unplanned hospital readmission. MRC may be useful in identifying patients that would benefit from additional transitional care interventions. Results indicate that simplifying medication regimens may favorably impact postdischarge outcomes.
Westberg SM¹, Swanoski MT, Renier CM, Gessert CE. Evaluation of the impact of comprehensive medication management services delivered posthospitalization on readmissions and emergency department visits. J Manag Care Spec Pharm. 2014 Sep;20(9):886-93.

Abstract

BACKGROUND: The impact of providing cognitive pharmacy services following hospital discharge has been studied with various results. This study is specifically focused on comprehensive medication management services delivered postdischarge in an interprofessional team environment to patients aged >65 years.

OBJECTIVE: To determine if delivery of comprehensive medication management services postdischarge will prevent hospital readmissions or emergency department visits within 6 months following discharge in patients aged >65 years. Secondary endpoints included 30-day and 60-day postdischarge events.

METHODS: This was a prospective group matched-controlled study of patients aged >65 years with selected diagnoses identified as high risk for readmission. The intervention group received comprehensive medication management that was provided face-to-face in the patient's primary care clinic within 2 weeks of discharge.

RESULTS:

No statistically significant difference was found between intervention and control groups in hospital readmissions or emergency department visits at 30 days, 60 days, or 6 months after discharge. No statistically significant difference was seen in mortality between groups.

CONCLUSIONS:

Provision of comprehensive medication management services did not reduce emergency department visits or readmissions in this study. This study was limited by multiple other changes occurring in the health system during the time of this study that potentially confounded results. In addition, the study may have been too small to detect a difference.

PURPOSE: The impact of an innovative medication reconciliation and discharge education program on 30-day readmissions and emergency department (ED) visits was evaluated.

METHODS: An observational pre-post analysis was conducted at an academic medical center to compare rates of hospital readmissions and return to ED visits during three-month periods before and after implementation of a restructured pharmacy practice model including (1) medication reconciliation at transitions of care for every patient and discharge education for a high-risk subgroup, (2) new or expanded services in the preanesthesia testing clinic and ED, (3) a medication reconciliation technician team, and (4) pharmacist-to-patient ratios of 1:30 on acute care floors and 1:18 on critical care units. The primary outcome was the composite of rates of readmissions and return to ED visits within 30 days of discharge.

RESULTS: A total of 3,316 patients were included in the study. Pharmacy teams completed medication reconciliation in 95.8% of cases at admission and 69.7% of cases at discharge. Discharge education was provided to 73.5% of high-risk patients (defined as those receiving anticoagulation therapy or treatment for acute myocardial infarction, chronic obstructive pulmonary disease, congestive heart failure, or pneumonia). No significant difference was observed between the preimplementation and postimplementation groups with regard to the primary outcome. In the high-risk subgroup, there was a significant reduction in the 30-day rate of hospital readmissions, which declined from 17.8% to 12.3% (p=0.042); cost projections indicated that this reduction in readmissions could yield annual direct cost savings of more than $780,000.

CONCLUSION: Implementation of a team-based pharmacy practice model resulted in a significant decrease in the rate of 30-day readmissions for high-risk patients.

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Abstract

PURPOSE:

Medication errors related to hospital discharge result in rehospitalization and emergency department (ED) visits, yet no systematic approach has been implemented nationally to decrease these medication errors. Pharmacist involvement during postdischarge transitions of care may be an important strategy to prevent and correct medication discrepancies and reduce costly rehospitalization and ED visits.

METHODS:

This prospective, randomized, open-label, pilot study evaluated the effect of a pharmacy clinic visit focused on medication reconciliation and patient education after hospital discharge on the incidence of rehospitalization and ED visits and the resolution of medication discrepancies.

RESULTS:

Of the 61 subjects included in the study, 33 (54%) had medication discrepancies identified at discharge. Fifty percent of medication discrepancies were resolved in subjects randomized to the pharmacist intervention arm compared with 9.5% in the usual care arm (P = .015). Patients randomized to the intervention arm had significantly lower rates of the primary composite outcome of 30-day rehospitalization and ED visits compared with the usual care arm (0% vs 40.5%, P < .001).

CONCLUSION:

A pharmacist-driven intervention focused on patient education and medication reconciliation after discharge improved medication use and reduced health care resource utilization in this pilot study.

KEYWORDS:

continuity; medication reconciliation; patient education; pharmacist; transitions
Abstract

OBJECTIVE:

Create an automated algorithm for predicting elderly patients' medication-related risks for readmission and validate it by comparing results with a manual analysis of the same patient population.

MATERIALS AND METHODS:

Outcome and Assessment Information Set (OASIS) and medication data were reused from a previous, manual study of 911 patients from 15 Medicare-certified home health care agencies. The medication data was converted into standardized drug codes using APIs managed by the National Library of Medicine (NLM), and then integrated in an automated algorithm that calculates patients' high risk medication regime scores (HRMRs). A comparison of the results between algorithm and manual process was conducted to determine how frequently the HRMR scores were derived which are predictive of readmission.

RESULTS: HRMR scores are composed of polypharmacy (number of drugs), Potentially Inappropriate Medications (PIM) (drugs risky to the elderly), and Medication Regimen Complexity Index (MRCI) (complex dose forms, instructions or administration). The algorithm produced polypharmacy, PIM, and MRCI scores that matched with 99%, 87% and 99% of the scores, respectively, from the manual analysis.

DISCUSSION: Imperfect match rates resulted from discrepancies in how drugs were classified and coded by the manual analysis vs. the automated algorithm. HRMR rules lack clarity, resulting in clinical judgments for manual coding that were difficult to replicate in the automated analysis.

CONCLUSION: The high comparison rates for the three measures suggest that an automated clinical tool could use patients' medication records to predict their risks of avoidable readmissions.

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Pharmacist Identification of Medication-Related Problems in the Home Care Setting

OBJECTIVE: To identify medication-related problems (MRPs) in home care patients.

DESIGN: A prospective case series involving pharmacist medication review of patient charts.

SETTING: A nonprofit agency serving the disabled and elderly of Rockingham County, North Carolina.

PATIENTS, PARTICIPANTS: Patients living in their homes, who qualify for home health care and who take eight or more medications.

INTERVENTIONS: Patients identified received at least one medication review performed by a pharmacist. Six types of MRPs were identified. Recommendations to resolve such MRPs were sent to the prescriber for analysis.

MAIN OUTCOME MEASURES: Outcome measures include MRPs identified, recommendations, and prescriber acceptance.

RESULTS: 380 charts received medication reviews from July 2007 through June 2009, and 148 (39%) required pharmacist intervention. A total of 232 MRPs were identified during the review process. Of the problems identified, suboptimal therapy (28%) and use of unnecessary drugs (24%) were most common. Discontinuing a drug (38.6%) and consulting the prescriber (23.2%) comprised the majority of the recommendations.

CONCLUSIONS: Pharmacists successfully identified a large number of MRPs not previously identified by other health care providers. Unnecessary drug use in home care patients was among the highest MRP noted. Discontinuation of an unnecessary drug was the most recommended resolution to the MRP. Prescribers respond positively to suggestions made by pharmacists regarding MRPs.

WHAT IS KNOWN AND OBJECTIVE: Potentially inappropriate prescribing (PIP) has significant clinical, humanistic and economic impacts. Identifying PIP in older adults may reduce their burden of adverse drug events. Tools with explicit criteria are being developed to screen for PIP in this population. These tools vary in their ability to identify PIP in specific care settings and jurisdictions due to such factors as local prescribing practices and formularies. One promising set of screening tools are the STOPP (Screening Tool of Older Person's potentially inappropriate Prescriptions) and START (Screening Tool of Alert doctors to the Right Treatment) criteria. We conducted a systematic review of research studies that describe the application of the STOPP/START criteria and examined the evidence of the impact of STOPP/START on clinical, humanistic and economic outcomes in older adults.

METHODS: We performed a systematic review of studies from relevant biomedical databases and grey literature sources published from January 2007 to January 2012. We searched citation and reference lists and contacted content experts to identify additional studies. Two authors independently selected studies using a predefined protocol. We did not restrict selection to particular study designs; however, non-English studies were excluded during the selection process. Independent extraction of articles by two authors used predefined data fields. For randomized controlled trials and observational studies comparing STOPP/START to other explicit criteria, we assessed risk of bias using an adapted tool.

RESULTS AND DISCUSSION: We included 13 studies: a single randomized controlled trial and 12 observational studies. We performed a descriptive analysis as heterogeneity of study populations, interventions and study design precluded meta-analysis. All observational studies reported the prevalence of PIP; however, the application of the criteria was not consistent across all studies. Seven of the observational studies compared STOPP/START with other explicit criteria. The STOPP/START criteria were reported to be more sensitive than the more-frequently-cited Beers criteria in six studies, but less sensitive than a set of criteria developed in Australia. The STOPP criteria identified more medications associated with adverse drug events than the 2002 version of the Beers criteria. Patients with PIP, as identified by STOPP, had an 85% increased risk of adverse drug events in one study (OR = 1.85, 95% CI: 1.51-2.26; P < 0.001). There was limited evidence that the application of STOPP/START criteria optimized prescribing. Research involving the application of STOPP/START on the impact on the quality of life was not found. The direct costs of PIP were documented in three studies from Ireland, but more extensive analyses on the economic impact or studies from other jurisdictions were not found.

WHAT IS NEW AND CONCLUSION: The STOPP/START criteria have been used to review the medication profiles of community-dwelling, acute care and long-term care older patients in Europe, Asia and North America. Observational studies have reported the prevalence and
predictors of PIP. The STOPP/START criteria appear to be more sensitive than the 2002 version of the Beers criteria. Limited evidence was found related to the clinical and economic impact of the STOPP/START criteria.

Abstract

OBJECTIVE:
To determine the prevalence of hospital admissions associated with ADRs and examine differences in prevalence rates between population groups and methods of ADR detection.

DATA SOURCES:
Studies were identified through electronic searches of Cumulative Index to Nursing and Allied Health Literature, EMBASE, and MEDLINE to August 2007. There were no language restrictions.

STUDY SELECTION AND DATA EXTRACTION:
A systematic review was conducted of prospective observational studies that used the World Health Organization ADR definition. Subgroup analysis examined the influence of patient age groups and methods of ADR detection on reported ADR admission rates. All statistical analyses were performed using STATA v 9.0.

DATA SYNTHESIS:
Twenty-five studies were identified including 106,586 patients who were hospitalized; 2143 of these patients had experienced ADRs. The prevalence rates of ADRs ranged from 0.16% to 15.7%, with an overall median of 5.3% (interquartile range [IQR] 2.7-9.0%). Median ADR prevalence rates varied between age groups; for children, the ADR admission rate was 4.1% (IQR 0.16-5.3%), while the corresponding rates for adults and elderly patients were 6.3% (IQR 3.9-9.0%) and 10.7% (IQR 9.6-13.3%), respectively. ADR rates also varied depending on the methods of ADR detection employed in the different studies. Studies that employed multiple ADR detection methods, such as medical record review and patient interview, reported higher ADR admission rates compared with studies that used medical record review alone. Anti-infective drugs were most often associated with ADR admissions in children; cardiovascular drugs were most often associated with ADR admissions in adults and elderly patients.

CONCLUSIONS:
Approximately 5.3% of hospital admissions were associated with ADRs. Higher rates were found in elderly patients who are likely to be receiving multiple medications for long-term illnesses. The methods used to detect ADRs are also likely to explain much of the variation in the reported ADR prevalence rates between different studies.

Abstract

OBJECTIVES:
To characterize adverse drug events (ADEs) occurring within the high-risk 45-day period after hospitalization in older adults.

DESIGN:
Clinical pharmacists reviewed the ambulatory records of 1,000 consecutive discharges.

SETTING:
A large multispecialty group practice closely aligned with a Massachusetts-based health plan.

PARTICIPANTS:
Hospitalized individuals aged 65 and older discharged home.

MEASUREMENTS:
Possible drug-related incidents occurring during the 45-day period after hospitalization were identified and presented to a pair of physician-reviewers who classified incidents as to whether an ADE was present, whether the event was preventable, and the severity of the event. Medications implicated in ADEs were further characterized according to their inclusion in the 2012 Beers Criteria for Potentially Inappropriate Medication Use in Older Adults.

RESULTS:
At least one ADE was identified during the 45-day period in 18.7% (n = 187) of the 1,000 discharges. Of the 242 ADEs identified, 35% (n = 84) were deemed preventable, of which 32% (n = 27) were characterized as serious, and 5% (n = 4) as life threatening. More than half of all ADEs occurred within the first 14 days after hospitalization. The percentage of ADEs in which Beers Criteria medications were implicated was 16.5% (n = 40). Beers criteria medications with both a high quality of evidence and strong strength of recommendation were implicated in 6.6% (n = 16) of the ADEs.

CONCLUSION:
ADEs are common and often preventable in older adults after hospital discharge, underscoring the need to address medication safety during this high-risk period in this vulnerable population. Beers criteria medications played a small role in these events, suggesting that efforts to improve the quality and safety of medication use during this critical transition period must extend beyond a singular focus on Beers criteria medications.

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Abstract

BACKGROUND:
Older adults with a range of comorbidities are often prescribed multiple medications, which may impact on their function and cognition and increase the potential for drug interactions and adverse events.

AIMS:
This study investigated the extent of polypharmacy and potentially inappropriate medications in patients receiving post-discharge transitional home care and explored the associations of polypharmacy with patient characteristics, functional outcomes, and frailty.

METHODS:
A prospective observational study was conducted of 351 patients discharged home from hospital with support from six Transition Care Program (TCP) sites in two states of Australia. A comprehensive geriatric assessment was conducted at TCP admission and discharge using the interRAI Home Care assessment tool, with frailty measured using an index of 57 accumulated deficits. Medications from hospital discharge summaries were coded using the World Health Organization Anatomical Therapeutic Chemical Classification System.

RESULTS:
Polypharmacy (5-9 drugs) was observed in 46.7% and hyperpolypharmacy (≥ 10 drugs) in 39.2% of patients. Increasing numbers of medications were associated with greater number of comorbid conditions, a higher prevalence of diabetes mellitus, coronary heart disease, chronic obstructive pulmonary disease, dizziness, and dyspnea and increased frailty. At discharge from the program, the non-polypharmacy group (<5 drugs) had improved outcomes in Activities of Daily Living, Instrumental Activities of Daily Living and fewer falls, which was mediated because of lower levels of frailty. The commonest drugs were analgesics (56.8%) and antiulcer drugs (52.7%). The commonest potentially inappropriate medications were tertiary tricyclic antidepressants.

CONCLUSION:
Polypharmacy is common in older patients discharged from hospital. It is associated with frailty, falls, and poor functional outcomes. Efforts should be made to encourage regular medication reviews and rationalization of medications as part of discharge planning. Whether careful deprescribing improves outcomes in frail patients should be the focus of randomized trials.

Abstract

BACKGROUND:
Overuse of unnecessary medications in frail older adults with limited life expectancy remains an understudied challenge.

OBJECTIVE:
To identify intervention studies that reduced use of unnecessary medications in frail older adults. A secondary goal was to identify and review studies focusing on patients approaching end of life. We examined criteria for identifying unnecessary medications, intervention processes for medication reduction, and intervention effectiveness.

METHODS:
A systematic review of English articles using MEDLINE, EMBASE, and International Pharmaceutical Abstracts from January 1966 to September 2012. Additional studies were identified by searching bibliographies. Search terms included prescription drugs, drug utilization, hospice or palliative care, and appropriate or inappropriate. A manual review of 971 identified abstracts for the inclusion criteria (study included an intervention to reduce chronic medication use; at least 5 participants; population included patients aged at least 65 years, hospice enrollment, or indication of frailty or risk of functional decline-including assisted living or nursing home residence, inpatient hospitalization) yielded 60 articles for full review by 3 investigators. After exclusion of review articles, interventions targeting acute medications, or studies exclusively in the intensive care unit, 36 articles were retained (including 13 identified by bibliography review). Articles were extracted for study design, study setting, intervention description, criteria for identifying unnecessary medication use, and intervention outcomes.

RESULTS:
The studies included 15 randomized controlled trials, 4 non-randomized trials, 6 pre-post studies, and 11 case series. Control groups were used in over half of the studies (n = 20). Study populations varied and included residents of nursing homes and assisted living facilities (n = 16), hospitalized patients (n = 14), hospice/palliative care patients (n = 3), home care patients (n = 2), and frail or disabled community-dwelling patients (n = 1). The majority of studies (n = 21) used implicit criteria to identify unnecessary medications (including drugs without indication, unnecessary duplication, and lack of effectiveness); only one study incorporated patient preference into prescribing criteria. Most (25) interventions were led by or involved pharmacists, 4 used academic detailing, 2 used audit and feedback reports targeting prescribers, and 5 involved physician-led medication reviews. Overall intervention effect sizes could not be determined due to heterogeneity of study designs, samples, and measures.

CONCLUSIONS:
Very little rigorous research has been conducted on reducing unnecessary medications in frail older adults or patients approaching end of life.
AIM:
The proportion of re-admissions to hospital caused by ADRs is poorly documented in the UK. The aim of this study was to evaluate the impact of ADRs on re-admission to hospital after a period as an inpatient.

METHODS:
One thousand patients consecutively admitted to 12 wards were included. All subsequent admissions for this cohort within 1 year of discharge from the index admission were retrospectively reviewed.

RESULTS:
Of the 1000 patients included, 403 (40.3%, 95% CI 39.1, 45.4%) were re-admitted within 1 year. Complete data were available for 290 (70.2%) re-admitted patients, with an ADR contributing to admission in 60 (20.8%, 95% CI 16.4, 25.6%) patients. Presence of an ADR in the index admission did not predict for an ADR-related re-admission (10.5% vs. 7.2%, P=0.25), or re-admission overall (47.2% vs. 41.2%, P=0.15). The implicated drug was commenced in the index admission in 33/148 (22.3%) instances, with 37/148 (25%) commenced elsewhere since the index admission. Increasing age and an index admission in a medical ward were associated with a higher incidence of re-admission ADR. The most frequent causative drugs were anti-platelets and loop diuretics, with bleeding and renal impairment the most frequent ADRs. Over half (52/91, 57.1%) of the ADRs were judged to be definitely or possibly avoidable.

CONCLUSIONS:
One fifth of patients re-admitted to hospital within 1 year of discharge from their index admission are re-admitted due to an ADR. Our data highlight drug and patient groups where interventions are needed to reduce the incidence of ADRs leading to re-admission.

CONTEXT: Despite concerns about drug safety, current information on older adults' use of prescription and over-the-counter medications and dietary supplements is limited.

OBJECTIVE: To estimate the prevalence and patterns of medication use among older adults (including concurrent use), and potential major drug-drug interactions.

DESIGN, SETTING, AND PARTICIPANTS: Three thousand five community-residing individuals, aged 57 through 85 years, were drawn from a cross-sectional, nationally representative probability sample of the United States. In-home interviews, including medication logs, were administered between June 2005 and March 2006. Medication use was defined as prescription, over-the-counter, and dietary supplements used "on a regular schedule, like every day or every week." Concurrent use was defined as the regular use of at least 2 medications.

MAIN OUTCOME MEASURE: Population estimates of the prevalence of medication use, concurrent use, and potential major drug-drug interactions, stratified by age group and gender.

RESULTS: The unweighted survey response rate was 74.8% (weighted response rate, 75.5%). Eighty-one percent (95% confidence interval [CI], 79.4%-83.5%) used at least 1 prescription medication, 42% (95% CI, 39.7%-44.8%) used at least 1 over-the-counter medication, and 49% (95% CI, 46.2%-52.7%) used a dietary supplement. Twenty-nine percent (95% CI, 26.6%-30.6%) used at least 5 prescription medications concurrently; this was highest among men (37.1%; 95% CI, 31.7%-42.4%) and women (36.0%; 95% CI, 30.2%-41.9%) aged 75 to 85 years. Among prescription medication users, concurrent use of over-the-counter medications was 46% (95% CI, 43.4%-49.1%) and concurrent use of dietary supplements was 52% (95% CI, 48.8%-55.5%). Overall, 4% of individuals were potentially at risk of having a major drug-drug interaction; half of these involved the use of nonprescription medications. These regimens were most prevalent among men in the oldest age group (10%; 95% CI, 6.4%-13.7%) and nearly half involved anticoagulants. No contraindicated concurrent drug use was identified.

CONCLUSIONS: In this sample of community-dwelling older adults, prescription and nonprescription medications were commonly used together, with nearly 1 in 25 individuals potentially at risk for a major drug-drug interaction.

**PURPOSE:**
The development and implementation of a postdischarge home-based, pharmacist-provided medication management service are described.

**SUMMARY:**
A work group composed of pharmacy administrators, clinical specialists, physicians, and nursing leadership developed the structure and training requirements to implement the service. Eligible patients were identified during their hospital admission by acute care pharmacists and consented for study participation. Pharmacists and pharmacy residents visited the patient at home after discharge and conducted medication reconciliation, provided patient education, and completed a comprehensive medication review. Recommendations for medication optimization were communicated to the patient's primary care provider, and a reconciled medication list was faxed to the patient's community pharmacy. Demographic and medication-related data were collected to characterize patients receiving the home-based service. A total of 50 patients were seen by pharmacists in the home. Patient education provided by the home-based pharmacists included monitoring instructions, adherence reinforcement, therapeutic lifestyle changes, administration instructions, and medication disposal instructions. Pharmacists provided the following recommendations to providers to optimize medication regimens: adjust dosage, suggest laboratory tests, add medication, discontinue medication, need prescription for refills, and change product formulation. Pharmacists identified a median of two medication discrepancies per patient and made a median of two recommendations for medication optimization to patients' primary care providers.

**CONCLUSION:**
The implementation of a post-discharge, pharmacist-provided home-based medication management service enhanced the continuity of patient care during the transition from hospital to home. Pharmacists identified and resolved medication discrepancies, educated patients about their medications, and provided primary care providers and community pharmacies with a complete and reconciled medication list.

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**Pressure Ulcer**


**Outcome and assessment information set data that predict pressure ulcer development in older adult home health patients.**

**Bergquist-Beringer S¹, Gajewski BJ.**

**Abstract**

**OBJECTIVES:**
To identify risk factors for pressure ulcer (PrU) development in older adult home health patients from admission Outcome and Assessment Information Set (OASIS) data.

**DESIGN:**
Retrospective cohort study.

**SETTING:**
A convenience sample of 5 home healthcare agencies from across the United States.

**PARTICIPANTS:**
The cohort sample included 5395 nonhospice patients 60 years or older who were admitted for intermittent skilled home healthcare between September 30, 2007, and January 30, 2009.

**MAIN MEASURES:**
OASIS data on age, sex, race/ethnicity, diagnoses, caregiving, mental health status, clinical status, and functional status relevant to PrU risk were extracted from the electronic medical record of eligible patients in participating agencies. Patient OASIS data were followed forward chronologically from admission to new PrU development or discharge.

**MAIN RESULTS:**
The 3323 females (61.6%) and 2072 males (38.4%) ranged from age 60 to 103 years (mean, 78.2 [SD, 8.6] years). The cumulative incidence of PrUs was 1.3% (n = 71 patients). Multiple logistic regression analyses revealed that bowel incontinence, needing assistance with grooming, dependence in ability to dress the upper body, dependence in ability to dress the lower body, dependence in toileting, inability to transfer, being chairfast or bedfast, and the presence of a PrU on admission were positively associated with new PrU development. Among patients who were PrU-free on admission, bowel incontinence and inability to transfer best predicted PrU development.

**CONCLUSION:**
Results suggest that OASIS data can be used to identify patients who are at risk for PrUs with potential for use nationwide.
Egnatios D. Improving pain outcomes in home health patients through implementation of an evidence-based guideline bundle. Home Healthc Now. 2015 Feb;33(2):70-6;

Abstract
Pain is often undertreated and underreported in the elderly. Many of these individuals receive home healthcare services for management of their conditions. Home healthcare agencies (HHAs) have outcome measures that are publicly reported. The purpose of this project was to implement an evidence-based (EB) guideline bundle to improve the outcome measure "Improvement in Pain Interfering With Activity." This quality improvement (QI) project used a pre-/posttest design. The setting was a hospital-based HHA in Arizona. The target sample included Medicare patients with chronic pain and pain that interfered with activity. The approach included a review of published clinical practice guidelines addressing pain management, and identification of relevant interventions for the home healthcare setting. A bundle of three interventions was created for implementation. Clinical staff was educated on use of the bundle. Chart audits were conducted on patients meeting the inclusion criteria to determine if the bundle was used, and if the patient had an improvement in pain. There was a statistically significant improvement in the outcome "pain interfering with activity" in the patients who had the bundle (78% vs. 48%) used in their care (p = 0.007). Clinical staff readily incorporated use of the bundle into their practice, showing that implementation of an EB guideline bundle is an effective way to incorporate EB practices into the home healthcare setting.

AIMS AND OBJECTIVES:
To describe quantitative and qualitative best evidence as sources for practical interventions usable in daily care delivery in order to integrate best evidence into clinical decision-making at local practice settings. To illustrate the development, implementation and evaluation of a pain management nursing care bundle based on a clinical practice guideline via a real-world clinical exemplar.

BACKGROUND:
Successful implementation of evidence-based practice requires consistent integration of best evidence into daily clinical decision-making. Best evidence comprises high-quality knowledge summarised in systematic reviews and translated into guidelines. However, consistent integration of guidelines into care delivery remains challenging, partly due to guidelines not being in a usable form for daily practice or relevant for the local context.

DESIGN:
A position paper with a clinical exemplar of a nurse-led, evidence-based quality improvement project to design, implement and evaluate a pain management care bundle translated from a national nursing guideline.

METHODS:
A pragmatic approach to integrating guidelines into daily practice is presented. Best evidence from a national nursing guideline was translated into a pain management care bundle and integrated into daily practice in 15 medical-surgical (med-surg) units of nine hospitals of a large university hospital system in Finland.

CONCLUSIONS:
Translation of best evidence from guidelines into usable form as care bundles adapted to the local setting may increase implementation and uptake of guidelines and improve quality and consistency of care delivery.

RELEVANCE TO CLINICAL PRACTICE:
A pragmatic approach to translating a nursing guideline into a pain management care bundle to incorporate best evidence into daily practice may help achieve more consistent and equitable integration of guidelines into care delivery, and better quality of pain management and patient outcomes.

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