Chapter 42. Information Transfer

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Introduction

Patient safety can be compromised by discontinuities in care. Studies suggest that discontinuity results from poor information transfer[1] and faulty communication,[2] which in turn may cause avoidable adverse events.[3]

Improving information transfer and communications among health care providers is an important patient safety practice and has been strongly recommended as a means to improve patient care.[1,3-7] This chapter evaluates safety practices involving improvements of provider-to-provider information transfer. Practices for evaluation include transfer of information between inpatient and outpatient pharmacies (Subchapter 42.1), sign-out systems for medical housestaff (Subchapter 42.2), automatically generated electronic discharge summaries (Subchapter 42.3), and systems to improve patient notification of abnormal results (Subchapter 42.4).

Subchapter 42.1. Information Transfer Between Inpatient and Outpatient Pharmacies

Background

Accurate and timely information transfer between community and acute care pharmacies is an important safety practice. Patients admitted to the hospital could benefit from the hospital's pharmacy obtaining better information concerning their medication allergies as well as prior therapeutic failures.[8] Furthermore, when patients transition from acute care to outpatient care, changes in medications that occurred during hospitalization may cause confusion for both patients and providers. In one study surveying patients one week after hospital discharge, patients' knowledge of their drug indications were worse for medications introduced during their hospitalization than for those taken prior to hospitalization (OR 0.69, 95% CI: 0.53-0.89).[9]

Confusion and incomplete information may increase the risk of under- or overmedication, harmful drug interactions, and other problems. Existing literature suggests that pharmacist interventions may reduce potential adverse drug events and have a modest impact on patient morbidity and mortality.[10,11] However, these studies have used independent reviewers to judge the impact of the intervention and have not specifically measured adverse drug events or patient outcomes. Clinical pharmacists' consultations prior to discharge might also improve patient medication compliance (see Chapter 7).[12]

Uncontrolled studies report that information-exchange programs between hospital and community pharmacies are perceived as beneficial and may have a positive impact on patient outcomes.[13] Although not the primary outcome measured in their small (n=127) observational study, Dvorak et al did note that using a pharmacy-to-pharmacy referral form was effective in preventing 2 medication errors. Thus, practices that improve information transfer between hospital and community pharmacies may improve patient safety.

Of the many potential methods for improving information transfer between hospitals and outpatient pharmacies, controlled trials have been reported in the literature for only 2: pharmaceutical care plans cards[14] and patient information facsimiles between pharmacies.[8] Although direct electronic communication of pharmacy data may be superior to these methods,

no controlled studies are currently available regarding this practice and therefore it is not reviewed within this chapter.

Practice Description

In a study by Smith and colleagues, patients received a card prior to discharge listing their pharmaceutical care plan, which included medication doses, indications, schedules, side effects, information as to the importance of drug compliance, and how to obtain medication refills.[14] Patients were instructed to give the card to their community pharmacist. In another study, the intervention consisted of pharmacy-to-pharmacy facsimile transmission at the time of admission and discharge from the hospital.[8] In this study, when a patient was admitted to the hospital their community pharmacy transmitted patient demographic information, historical information concerning allergies and adverse drug reactions, current medications, refill history, pharmacist's monitoring notes, communications with patient and physician, and a detailed medication history to the admitting hospital. After discharge the hospital pharmacy transmitted to the community pharmacy a list of any potential medication problems identified by the hospital pharmacist on admission, the patient's daily monitoring log, the pharmacist's discharge summary, and a discharge medication table. The medical records department of the hospital also transmitted the patient's discharge summary and laboratory test results to the community pharmacy.

Prevalence and Severity of the Target Safety Problem

Medication problems can arise because patients are frequently discharged from the acute care hospital on medications different from their ambulatory regimen.[15] Elderly patients in particular are at risk after discharge.[16] In one study, hospital providers changed 53% of the drugs prescribed by the primary care providers.[15]

The extent to which these medication changes and lack of communication result in recently discharged patients failing to receive medications or appropriate monitoring for their drug therapy is unclear. In one study of elderly patients, 32% of medications prescribed at discharge were not being taken 2 days after discharge.[17] Another study found that 51% of patients recently discharged from acute care hospitals had deviated from their prescribed regimen.[18] Of those that had deviated from the prescribed drug regimen, 70% did not understand the medication regimen. In a Scottish study, recently discharged, elderly patients were issued a 5-day supply of their medication on discharge and visited in their homes after these 5 days had elapsed.[16] Twenty-seven percent of the patients had not received a new prescription ordered on discharge. Of the patients with new prescriptions issued, 19% received inaccurately labeled medications. Medications were considered mis-labeled when non-specific container labels, such as "take as directed" replaced the more specific labels given on discharge. Some authors have suggested that improving communication about medications prior to and just after hospital discharge might reduce these medication errors.[18,19]

Poor communication is not the only problem.[16] Patient factors influence whether a medication is ultimately picked up and taken as directed. Deviations from prescribed drug regimens are multifactorial and improving pharmacy-to-pharmacy communication is only one aspect of the overall problem.

Opportunities for Impact

Data from primary care providers reveal that 96% of the respondents would like information concerning hospital drug changes.[20] Ninety-four percent of community pharmacists

surveyed also wished to be provided with information concerning hospital drug changes.[20] We were unable to identify data regarding what percentage of hospital pharmacies routinely transfer information on patients' medication regimens when they are admitted to and discharged from acute care.

Study Design and Outcomes

Two controlled studies were identified in the literature (Table 42.1.1). Both were randomized trials but neither was blinded. In Smith et al, patients received a written pharmacy care plan at discharge. Home visits were made 7 to 10 days later to assess compliance and discrepancies in the medication that patients were taking versus those ordered at discharge (Level 2).[14] In the study by Kuehl et al,[8] patients were randomly assigned to either usual care or to a bi-directional exchange of pharmacy information by facsimile between the ambulatory pharmacy and the admitting hospital, upon admission and discharge (Level 1). The outcomes were pharmacist interventions, such as changing medication doses or making allergy recommendations (Level 2).[8]

Evidence for Effectiveness of the Practice

Smith et al's small study (n=53) of a pharmacy care plan card found that in both groups patients were taking different medications than those ordered at discharge. The authors found that compliance with post-discharge medications was significantly better in the group that had received the information card ($p<0.01$). Unintentional changes to the medication were found in 14/28 (50%) of the study patients and 17/25 (68%) of the control patients during the follow-up visits (Pearson's chi-square $p=0.18$)

In the study by Kuehl et al, significantly more experimental group patients than control group patients had at least one in-hospital pharmacist intervention documented (47% vs. 14%, $p<0.001$). The mean number of in-hospital pharmacist interventions per patient was also significantly higher in the experimental group (1.0 vs. 0.2, $p<0.0001$). The types of interventions made by hospital pharmacists included addition of a medication the patient was taking as an outpatient that was not originally ordered on admission, dosage changes, and changes related to drug allergy. Interventions by ambulatory care pharmacists were also more frequent in experimental group patients compared with control group patients. Community pharmacists who received hospital pharmacy records performed interventions on one or more patients 42% of the time, while no interventions were performed in the control group ($p=0.001$). Specific community pharmacist interventions included monitoring of therapy (13/57), taking actions related to drug allergy problems (13/57), requesting documentation of an indication for a particular medication (9/57), and making a dosage change (8/57).

Although the data abstractor was blinded with regard to study group, the nature of the intervention did not permit blinding of participating pharmacists (ie, they received faxed information for some patients but not others). Also, the pharmacists were not explicitly blinded to the study's objectives. It is unclear how this knowledge might have affected the results. It could have resulted in more careful scrutiny of any potential drug problem (bias away from the null) or less scrutiny of these orders (bias towards the null). Kuehl et al note that although the results suggest discriminatory documentation did not play a major role, the possibility cannot be ruled out.

Another potential limitation of this study was the completeness of follow-up. Of the eligible patients from ambulatory care pharmacies, only 50% returned to their pharmacy during the study period. There were no comparisons presented between the ambulatory pharmacy visit

group and the loss to follow-up group. This large loss to follow-up could have significantly altered their findings.

Potential for Harm

None of the studies evaluating different hospital-community pharmacy communication processes detailed any adverse events. However, the degree of added workload and effects on current workflow must be taken into account.

Costs and Implementation

The 2 reviewed interventions for improving hospital to community pharmacy information transfer seemed simple and relatively inexpensive.[8,8,13,14,14] Although no formal cost analysis was performed, Dvorak et al described their method (use of a pharmacy-to-pharmacy referral form) as being "labor-intensive." No records were kept of the time necessary to provide the referrals but the authors estimated the time commitment per patient to be 30 minutes.[13] It is also important to note that complete information transfers occurred for 75% of the subjects in Kuehl's study, indicating that there is still room for improving the process. With improvements in information transfer technology, automated transfer of information from hospital to community pharmacy could have important patient safety benefits without excessively increasing providers' workloads.

Comment

Providing patients with data forms to convey transfer of information between hospital and ambulatory pharmacies has potential for reducing discontinuities resulting from inadequate medication information. Few studies have evaluated the effect of these interventions on patient outcomes, although any improvement in the transfer of this information would likely be well received by ambulatory providers. Future studies are necessary to determine if and how improved pharmacy-to-pharmacy communications reduce preventable adverse drug events and improve patient outcomes. Identifying the most effective and least disruptive forms of inter-pharmacy communication remains an area for further investigation.

Table 42.1.1. Practices to improve transfer of medication information

Study	Study Setting	Intervention	Study Design, Outcomes	Results
Smith, 1997[14]	53 patients (>65 yrs old) discharged to home who were likely to experience difficulties with their medications	Copies of medication doses, indications, side effects, importance of compliance and refill information given to patients at discharge	Level 1, Level 2	Patients taking medication not prescribed at discharge: information card 75%, control 96% ($p<0.01$)
Kuehl, 1998[8]	156 patients admitted to small mid-western community hospital	Pharmacy-to-pharmacy facsimile transmission o medication regimen at time of admission and discharge from hospital	Level 1, Level 2	Patients with • 1 pharmacist interventions in hospital: faxed-summary 47%, control 14% ($p<0.001$) Patients with • 1 pharmacist interventions in community: faxed summary 42%, control 0% ($p<0.05$)

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Subchapter 42.2. Sign-Out Systems for Cross-Coverage

Background

As physicians go off duty, they provide information to a "cross-covering" physician who will care for patients in the interim. The process of information transfer, known as "sign-out," is often informal and unstructured. Various methods are used, including handwritten lists, PC-based word processing or spreadsheet programs, and personal digital assistants (PDAs), but little literature has assessed their effectiveness in assuring continuity of care for patients and preventing medical errors. Although notes in the medical record often contain all the information needed to care for patients, cross-covering physicians make many decisions without the benefit of the patients' charts.[1] Jelley found lack of consistency in the content of weekend sign-out lists in a community-based internal medicine inpatient program.[1] Lee and colleagues found that medical interns recorded information elements such as patient age, DNR status, and medications more often when a standardized sign-out card was used.[2] In this section, we review evidence of a computerized sign-out system to reduce medical errors during cross-coverage.

Practice Description

The proposed safety practice is a structured sign-out process in which patient information is provided for various standardized data fields. The computerized sign-out program described by Peterson and colleagues consisted of a summary of the patient's medical status, a problem list, recent laboratory data, resuscitation status, allergies, and a "to do" list.[3] This information was accessible from any computer within the hospital and was accessed and maintained on a daily basis by housestaff physicians.

Prevalence and Severity of the Target Safety Problem

Discontinuities in provider care during hospitalization have been associated with an increased risk of adverse events. The Petersen et al study found the odds ratio for a preventable

adverse medical event occurring during cross-coverage as opposed to regular provider coverage to be 6.1 (95% CI: 1.4-26.7).[4] In the surgical domain, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) publication on wrong-site surgeries noted a number of cases involving last minute personnel changes.[5] It is possible that these rapid substitutions in the operating room with inadequate communication may have contributed to these adverse events.

Opportunities for Impact

The number of hospitals using either a computerized or paper-based sign-out process is unknown, but computerized sign-outs are probably unusual. One study found that 26% of adverse events in a single institution occurred during cross-coverage.[4] These data suggest that a standardized sign-out procedure could have a significant impact on improving patient safety.

Study Design and Outcomes

We identified one study evaluating the effect of a standardized sign-out system on the occurrence of adverse events (Table 42.2.1). In this study, adverse medical events detected by self-report were compared before and after implementation of a computerized sign-out system (Level 3).[3] This study involved internal medicine housestaff and any management of a patient performed by an intern from a different team or a night-float resident was considered cross-coverage. During chart review, the investigators recorded whether the physician at the time of the event was the patient's regular physician or a cross-covering physician. Adverse medical events, defined as "an injury due to medical therapy that prolonged hospital stay or disability at discharge"[3] were the primary outcomes (Level 2).

Evidence for Effectiveness of the Practice

There were significantly fewer adverse events during the intervention period compared with the baseline period (2.38% vs. 3.94%, $p<0.0002$). There was also a trend toward fewer preventable adverse events with the intervention (1.23% vs. 1.72%, $p<0.1$) but no significant difference in the rate of preventable events during cross-coverage (0.38% vs. 0.24%, $p>0.10$). Using a logistic regression model including factors for Acute Physiology and Chronic Health Evaluations (APACHE) II scores and alcohol use (the 2 variables significantly associated with adverse events during the intervention period), the authors calculated the odds ratio for a patient to experience an adverse medical event during cross-coverage in the baseline period to be 5.2 (95% CI: 1.5-18.2).

After implementation, the odds ratio for a cross-coverage adverse event was no longer statistically significant (OR 1.5, 95% CI: 0.2-9.0).[3] The authors noted that housestaff used the sign-out information not only for cross-coverage but for their primary patients as well, which may have contributed to the overall decrease in adverse events. Secular trends may also have played a role in this reduction.

Another limitation of this study was that it relied on self-report to capture adverse medical events. The investigators performed a review of a random sample of 250 charts and detected only 8 unreported, preventable adverse medical events. If extrapolated to the entire sample (3747), this represents 120 missed adverse events. These adverse events could have influenced the results either toward or away form the null hypothesis, depending on their distribution among regular and cross-covering physicians.

Potential for Harm

The study reported no adverse events as a result of the sign-out system. As with other sign-out systems, particularly those that are computerized or Web-enabled, the issues of data security and protection of confidentiality must be addressed.[6]

Costs and Implementation

Implementation of a computerized sign-out system like that described by Peterson et al would require information systems that allow extraction and aggregation of patient specific data (eg, laboratory and pharmacy) and financial support for programming. These resources may not be present at some institutions. Although housestaff responded favorably to the computerized system, physicians at other institutions or in other specialties may not be as willing to use this system.

Comment

One study has shown that an inpatient's risk of preventable adverse events was less after implementation of a computerized sign-out process. The method appears appropriately suited for hospitals with cross-coverage arrangements similar to those described by Peterson et al, specifically in-house coverage by resident trainees. It will be important to know if similar systems are as effective and well received at other institutions, including those without trainees. Such systems would be difficult to implement in hospitals with limited information systems or where physicians outside the hospital provide coverage through paging systems. Although a computerized system has the advantage of being accessible from any location in the hospital and may be able to automatically import important information, events attributable to faulty communication during cross-coverage could also be amenable to other strategies for standardizing the process (eg, sign-out cards, Web-based programs, PDAs). No evidence is available concerning the relative effectiveness of other standardized sign-out methods. Future research should address what data fields are most helpful to physicians providing cross-coverage in preventing adverse events and how different methods of standardized sign-out compare in effectiveness (eg, handwritten cards vs. PDAs).

Table 42.2.1. Computerized sign-out program

Study Setting	Study Design, Outcome	Results (95% Confidence Intervals)
8767 patients admitted to the medical service of a tertiary care teaching hospital in Boston[3]	Level 3, Level 2	Odds ratio (OR) of preventable adverse events occurring during cross-coverage compared with care under regular physician: baseline, OR 5.2 (1.5-18.2) with intervention, OR 1.5 (0.2-9.0)

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Subchapter 42.3. Discharge Summaries and Follow-up

Background

Discharge summaries are important tools for communicating pertinent patient information regarding hospitalizations to outpatient care providers. Yet their relatively unstructured, narrative format often invites inaccuracies.[1] In addition, there can be significant delays transmitting discharge summaries to patients' health care providers.[2,3]

Prior studies have investigated processes to improve discharge summaries, such as standardizing their format[4-6] and instituting physician education programs.[7] This chapter focuses on the use of structured, database-generated discharge summaries to improve the quality of the information content communicated after patient discharge, as well as to reduce the time required for this information transfer.[8]

Practice description

During the hospital course, physicians provide information corresponding to specific sections of the computerized discharge summary either on data collection forms which are manually entered into a database[8] or directly into a computer system. When the patient is discharged the database generates a structured discharge summary that can be sent to the patient's outpatient providers.

Prevalence and Severity of the Target Safety Problem

In one study examining the effectiveness of inpatient follow-up care, 9.7% of discharged patients experienced worsening of symptoms or functional capacity as a result of an inadequately managed discharge process.[2] Hospital discharge summaries are an important means of communication between hospital and community physicians, but have several problems. First, community physicians do not always receive summaries for recently discharged patients. In one study only 34% of patients had a discharge summary sent to their outpatient care provider.[2] Although no analysis was undertaken to determine if receiving a discharge summary had an effect on patients' follow-up, another study demonstrated that patients may be less likely to be readmitted to the hospital if their primary care provider receives a discharge summary.[9]

As mentioned above (Subchapter 42.1), patients frequently have their medication regimen changed while admitted.[10] The majority of ambulatory providers would like to have information regarding these medication changes.[11] Improvement in information transfer from acute care to ambulatory care might reduce medication discrepancies; however, patient compliance will also heavily influence these factors.

Opportunities for Impact

We found no data describing how many hospitals currently use database-driven discharge summaries.

Study Design and Outcomes

Several studies were identified that evaluated electronically generated discharge summaries, but these were limited by a lack of randomization or limited outcomes reporting.[12-14] One randomized controlled trial was identified that compared traditional dictated discharge summaries to summaries generated from a database (Table 42.3.1).[8] The primary outcome was the proportion of admissions with a discharge summary completed by 4 weeks after discharge (Level 3).[8] Overall quality of the discharge summaries was also assessed (Level 3) but patient level outcomes were not.

Evidence for Effectiveness of the Practice

Patients randomized to the database group were significantly more likely to have a discharge summary generated within 4 weeks of discharge than were patients randomized to the dictation group (113/142 vs. 86/151, $p<0.001$). Even with the database method, 20% of patients did not have a completed discharge summary by 4 weeks. Of the patients with a discharge summary generated within 4 weeks of discharge, 94.7% of the database-generated summaries were produced within one week, while only 80.2% of the dictated discharge summaries were completed in this timeframe ($p<0.001$). Physician ratings of the quality and timeliness of the discharge summaries were available for 210 of 302 (69.5%) summaries. The quality and timeliness of the 2 summaries were judged to be similar overall, but differed when stratified by provider specialty. Database-generated summaries were thought to be more timely by family physicians ($p=0.04$) and of lower quality by consultant physicians ($p=0.02$).

Potential for Harm

No adverse events were mentioned as a result of the database-generated discharge summary study.

Costs and Implementation

The direct and indirect costs of implementing and maintaining a system for database-generated discharge summaries have not been formally evaluated in the literature. Results of a mail survey of housestaff in the van Walraven study[8] suggest their intervention did not adversely affect the workflow of housestaff physicians. Housestaff significantly preferred ($p<0.001$) the database system and found it less burdensome ($p=0.002$). With the advent of electronic medical record systems, data can be automatically abstracted from various fields and collated into a discharge summary, eliminating the costs associated with abstraction form distribution, collection, and data entry. This is already a practice at some institutions.[12,15]

Comment

With the documented inefficiencies, inaccuracies and incompleteness of discharge summary information, interventions that improve the hospital discharge communication process without increasing provider workload could have a significant impact. A database method can significantly decrease the time for completion of discharge summaries. The amount of work required to generate the database discharge summaries could potentially be reduced in the future through electronic record-keeping. Further studies are required to determine how to best transfer discharge summary information to outpatient providers. A feasibility study has assessed the utility of faxing discharge summaries to community providers.[3] This remains an active area for study, recognizing that the optimal strategy to reduce discontinuities in care after hospital discharge will depend on the methods for generating discharge summaries, the accuracy and usefulness of their content, and the timeliness and method of their delivery to patients' providers.

Table 42.3.1. Improvements in discharge summary communications

Study	Study Setting	Study Design, Outcome	Results
van Walraven, 1999[33]	293 patients admitted to the General Medicine Service of a tertiary care teaching hospital in Ottawa	Level 1 Level 3	Discharge summary completed within 4 weeks: database group, 79.6% dictation group, 57% ($p<0.001$)

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Subchapter 42.4. Notifying Patients of Abnormal Results

Background

One of the most distressing safety issues of the clinical encounter is the failure to follow-up on diagnostic tests, particularly when a patient is not notified of an abnormal result. The complexities of this problem are legion. Contact methods—whether by phone, mail, fax or e-mail, and whether sent by the lab, clinic or individual clinician—vary widely in their reliability (with most being imperfect). In some instances patients are told that if they do not hear back regarding their test results it signifies normal results. Of course, not hearing may mean that the test was lost or that the contact method was faulty. Other issues arise when the content of the notification is not clear, either as to result or the recommended follow-up for re-testing or treatment options.

This chapter evaluates safety practices aimed at improving patient notification of abnormal results. Adequate medical and/or surgical care during follow-up is essential to reducing patient morbidity and mortality, but practices to address this are beyond the scope of patient safety as defined in this Report. We have chosen the example of Pap smear results, although many of the issues should be transferable to other laboratory (eg, PSA level) and radiologic (eg, mammogram) results.

Practice Description

Our search revealed only one study evaluating patient notification practices.[1] In this study, the patient's mailing address was included on the Pap smear request form. Two weeks after the patient's primary care provider received the results, the laboratory directly notified the patient by mail. The notification was by form letter advising the patient of her results and providing advice on the recommended follow-up step: discuss results with the doctor, return in two years time, or make an appointment to see the doctor without delay.

Prevalence and Severity of the Target Safety Problem

Few data exist concerning physician follow-up and patient notification of abnormal results. In a survey of attending physicians and residents practicing at a large urban teaching hospital and 21 suburban primary care practices, virtually all respondents believed it was moderately or extremely important to notify patients of abnormal results, yet 36% of physicians did not always do so.[2] Among the most common reasons reported by physicians were forgetfulness and inability to reach patients. One large cross-sectional study examined physician documentation of notification to patients of abnormal mammograms, Pap smears, and cholesterol tests. The results demonstrated that certain patient characteristics such as race, language, and education may be associated with a failure to transmit abnormal results to patients.[3]

An estimated 4600 American women died of cervical cancer in 2000.[4] There are no data regarding to what extent delays in notification result in worse patient outcomes, including mortality. One study evaluating processes to reduce non-adherence rates with the follow-up of abnormal Pap smears noted that many women (the exact number was not presented) reported that they were never notified of their abnormal Pap smear result initially.[5]

Tracking systems for abnormal Pap smear results have been briefly mentioned in the context of studies evaluating interventions to improve overall follow-up, not patient notification.[5,6] However, the effectiveness of these tracking systems was not specifically evaluated so they are not reviewed here.

Opportunities for Impact

Compliance rates with follow-up medical care after abnormal Pap smears typically ranges from 50% to 70%.[5,7-9] It is unclear how often losses to follow-up resulted from failure to notify. There are no data indicating how many practice groups directly mail abnormal Pap smear results to patients. Even with successful patient notification practices, a corresponding reduction in morbidity and mortality may not occur because of the other barriers to adequate follow-up described in the literature.[5,10]

Study Design and Outcomes

The study reviewed for this chapter was a randomized control design (Level 1).[1] (Table 42.4.1). Providers were randomized into 2 groups. In the intervention group, the pre-cervical smear questionnaire form had been redesigned to allow the patient to request that results be mailed directly to her. The physicians in the intervention group determined which patients would be offered direct notification. Patients of physicians in the control group were notified of results using whatever protocol the provider typically used. The authors did not elaborate on the methods used to notify patients in the control group.

The primary outcome was adherence with follow-up visits (Level 2), which was defined by searching the laboratory records for evidence of a follow-up Pap smear one year after notification. If a cervical smear result was not located through the laboratory database search then the patient's provider was contacted.[1]

Evidence for Effectiveness of the Practice

Significantly fewer women with cervical intraepithelial neoplasia (CIN) on Pap smear who were randomized to the intervention group were lost to follow-up (0/52 vs. 9/39 in the control group, $p<0.001$). In the group of women with atypia, 13% (15/116) were lost to follow-up in the intervention group and 10% (10/104) were lost to follow-up in the control (p=NS).

A limitation of this study was that providers decided who in the intervention group actually received the intervention after randomization. Only 41% of patients in the intervention group were actually mailed their results. However, analysis was performed with an intention-to-treat design.

Potential for Harm

Although the patients in this study were not interviewed, other reports reveal that psychological distress is common after notification of an abnormal Pap smear.[11] Thus a potential harm of this practice, or any practice to directly notify a patient of an abnormal result, could be anxiety and distress that might be mitigated if a health practitioner were to deliver the information.

Costs and Implementation

Buy-in of health care providers is an important aspect of practice implementation and may be affected by the concern for potential harm and the specifics of the notification process. In the Del Mar study, 23% of providers were unhappy with the wording of the letter.[1] Direct patient notification systems require accuracy and reliability of the administrative database. One study trying to improve adherence to follow-up after an abnormal Pap smear result was only able to make telephone contact with 42% of the eligible patients.[5] They found that 16%-20% of their telephone and address data were inaccurate.

Although patient tracking systems are not evaluated in this chapter because of the lack of published literature, in one study clinical personnel stated that they were reluctant to perform the tracking function of the intervention, and even discontinued the Pap smear log once the study was completed.[12]

Comment

Failure to notify patients of abnormal results is a little-studied but major problem involving both patient safety and health care quality. One study evaluated direct mailings of abnormal results to patients and found improved follow-up in one subset of patients. More data are required before recommending implementation of this practice.

We were unable to find any studies evaluating specific interventions aimed at providers that resulted in increased notification to patients of abnormal results. Interventions that target providers through computerized reminders linked with patient tracking systems might have an impact on improving patient notification of abnormal results. This area is an important source of future investigation.

Table 42.4.1. Randomized controlled trial of direct notification of abnormal Pap smear results*

Study	Study Setting	Outcomes	Results (95% Confidence Interval)†
Del Mar, 1995[1]	311 women with abnormal Pap smears from 42 general practices in Australia	Level 2	Patients with CIN lost to follow-up: Direct mail notification: 0 (0-0.07) Control: 0.23 (0.11-0.39) Patients with atypia lost to follow-up Direct mail notification: 0.10 Control: 0.13 (p=NS)

* CIN indicates cervical intraepithelial neoplasia; NS, not statistically significant.
† Proportion of patients lost to follow-up reported in intervention group vs. control group.

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Final Comment to Chapter 42

Faulty information transfer causes discontinuities of care that may result in adverse events. However, interventions to improve information transfer have received relatively little attention in the medical literature. Unfortunately, numerous barriers impede the appropriate transfer of information between institutions and between patient and provider. Future technologies that allow for more seamless transfer of information may mitigate these gaps in patient care. Further evaluation is critical.