STRATEGIC INNOVATIONS FOR AFFORDABLE, SUSTAINABLE HEALTH CARE:

A Model for Health System Reform

Environmental Scan

Pharmaceutical Innovations
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PHARMACEUTICAL INNOVATIONS

Overview: Employers and purchasing groups use pharmaceutical innovations to manage costs and increase the value of prescription drug benefits. These include: incentive-based formularies (multi-tier formularies), generic substitution, coinsurance and copayments, pharmacy benefit management (PBM), and computerized real-time alerts.

Definitions: Incentive-based formularies are an innovation designed to curb the increasing costs of prescription drugs. An incentive-based or tiered formulary provides financial incentives (i.e., lower copayments) for enrollees to choose drugs that are preferred by the payer. Generic substitution is the practice of providing the generic equivalent of brand name medications, when available, to patients. Copayments require consumers to pay a fixed percentage of a prescription’s costs, with the remaining cost paid through the health or prescription drug benefit.

A Pharmacy Benefit Manager (PBM) is a third party administrator of prescription drug programs. They are primarily responsible for processing and paying prescription drug claims. They also are responsible for developing and maintaining the formulary, contracting with pharmacies, and negotiating discounts and rebates with drug manufacturers. Today, more than 210 million Americans nationwide receive drug benefits administered by PBMs. Fortune 500 employers and public purchasers (Medicare Part D, the Federal Employees Health Benefits Program) provide prescription drug benefits to the vast majority of American workers and retirees.

Computerized real time alerts include: electronic alerts to patients, reminding them to take medications; computerized order entry (and real-time decision support such as reminders and prompts) for physicians that provide prescribing alerts regarding medicines with potential contraindications and therapeutic alternatives; and faxed letters to prescribers regarding patients who have had gaps in refilling prescriptions.

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<td>INCENTIVE-BASED FORMULARIES (MULTI TIER FORMULARIES)</td>
<td>Incentive-based formularies are intended to reduce health benefit costs. Criteria for placing drugs in different tiers should be based on clinical outcomes and not on the cost of ingredients and manufacturer rebates. If not, then the costs of pharmaceuticals may decrease, but overall medical costs may increase.</td>
<td>• Different changes in formulary administration may have dramatically different effects on utilization and spending and may in some instances lead enrollees to discontinue therapy. The associated changes in copayments can substantially alter 1) out-of-pocket spending by enrollees, 2) the continuation of the use of medications, and possibly 3) the quality of care.</td>
<td>Incentive-based formularies are applicable to all markets.</td>
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In several studies have found that the adoption of an incentive-based formulary and the accompanying changes in copayments resulted in lower aggregate utilization of and spending on drugs.1,2
## PHARMACEUTICAL INNOVATIONS

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<td></td>
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<td>6, 7, 8, 9, 10 However, most of the savings go to health insurance plans, not to consumers. 11 There is greater spending by patients, 12, 13, 14, 15, 16, 17</td>
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<td>• Adding tiers generally results with increased switching within drug classes (switching toward “preferred” drugs on formulary occurring among 5% to 49.4% of patients). 18, 19, 20, 21, 22, 23, 24, 25</td>
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<td>• Adding tiers to copayment structures has been associated with either no change 26 or an increase in the rate of discontinuation of prescribed drug treatments. 27, 28, 29, 30, 31</td>
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<td></td>
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<td>• Also, whether these effects are beneficial overall depends on potential health effects and spillover effects on medical spending. 32 These results are mixed.</td>
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<td>• One study of chronically ill patients found that doubling copayments in a two-tier plan for antidiabetic, anti-asthmatic, and antiulcerant agents resulted in a 17% increase in predicted annual emergency department visits and a 10% increase in predicted annual hospital days for persons with the respective conditions. 33</td>
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<td>• Other studies contradict these findings. One study found that a three-tier structure reduced the payer’s prescription drug costs and increased consumers’ out-of-pocket drug expenditures without affecting physician office visits, inpatient hospital stays, or emergency department visits. 34 This study only observed effects up to 12 months after implementation. Another study confirmed these findings for 30 months after implementation. However, there were other limitations of this work, particularly that the study only examined one health plan. 35</td>
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<td>• One study found a decrease in total drug spending of about 5% to 15% from changing from a single tier to a two- or three-tier formulary. 36</td>
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<td>Other Comments</td>
<td>An example of an incentive based formulary is a three-tiered formulary. In this model, the first tier is comprised of generic drugs with the lowest copayment. The second tier is comprised of brand name drugs that are preferred by the payer and have a higher copayment. The third tier generates the highest copayment, as it is comprised of brand-name drugs that are not preferred by the payer.</td>
<td>As of 2005, almost 75% of commercially insured individuals had prescription drug coverage with an incentive formulary with three or more tiers, whereas a decade ago such coverage was rare. Many studies of tiered formularies are limited in conclusions for particular populations, including the elderly, those with low-incomes, and the chronically ill. Also, among the various plans studied, there were differences in drug benefit design features. Some plans had co-payments, others had coinsurance. Some had retail and other mail-order pharmacies. Some plans had generic substitution rules, and others a list of drugs or drug classes excluded from coverage.</td>
<td>A key distinction is between price-based formularies, in which copayments are tied to the price of the drug, and value-based formularies, in which copayments are tied to the cost-effectiveness or therapeutic value of the drug.</td>
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<td><strong>Case Example:</strong></td>
<td>This intervention lowers the cost of required projects. This single change in pharmaceutical benefit design immediately made critical brand-name drugs available to most Pitney Bowes employees and their covered dependents for 10% co-insurance, the same coinsurance level as for generic drugs, versus the previous cost share of 25% to 50%.</td>
<td>- After two to three years, preliminary results in plan participants with diabetes indicate that medication possession rates have increased significantly, use of fixed-combination drugs has increased (possibly related to easier adherence), average total pharmacy costs have decreased by 7%, and emergency department visits have decreased by 26%. - Hospital admission rates, although increasing slightly, remain below the demographically adjusted Medstat benchmark. Overall direct healthcare costs per plan participant with diabetes decreased by 6%. In addition, the rate of increase in overall per-plan participant health costs at Pitney Bowes has slowed markedly, with net per-plan-participant costs in 2003 at about $4,000 per year versus $6,500 for the industry benchmark. - The percentage of members with suboptimal adherence with insulin decreased by two thirds. The percentage of members using fixed-combination oral hypoglycemic increased from 9% to 22%. Among insulin-dependent diabetic plan participants, the shift to newer brands of test strips in tier one was associated with a doubling in the usage rate of these test strips on glucometers (from 28% usage to 55% usage).</td>
<td>In all of Pitney Bowes’ self-funded plans and a few of the others, the drug benefits are provided by a carve-out pharmacy benefit manager. This coverage of approximately 90% of all employees under one common pharmaceutical plan provides a potentially powerful single point of entry for studying – and leveraging – long-term disease outcomes in the Pitney Bowes population.</td>
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| **Pitney Bowes, Inc.**           | shifted all diabetes drugs and devices from tier two or three formulary status to tier 1. |                                                                                       |                                                                                           |

**Other Comments**

The average annual increase in employee health cost from 2000 to 2003 was 8.1% versus composite annual increases of 12% to 15% for benchmark companies.

**Generic Substitution**

Generic substitution is intended to keep costs down by providing lower cost generics in place of more expensive, branded products.

- In surveys of more than 400 employers in the US: 39% always require a generic to be used when available and appropriate, 31% charge a higher copayment for brands unless indicated as medically necessary by a physician.
- One study found that if a generic had been substituted for all corresponding brand-name outpatient drugs in 2000, the median annual

Generic substitution is applicable to all markets.
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<td><strong>COINSURANCE AND COPAYMENTS</strong></td>
<td>Both coinsurance and copayments are cost sharing mechanisms to ensure that consumers’ decision making reflects that they assume at least some of the cost of the product. Absent these mechanisms, consumers have no incentive to select cost-effective treatments. Coinsurance is attractive to employers because, unlike fixed co-payments per prescription, coinsurance rates keep pace with rising drug costs.</td>
<td>- Higher levels of cost sharing result in reductions in prescription drug use.(^49, 50, 51, 52) However, demand for prescription drugs is insensitive to price changes. Most estimates of price elasticity suggest that a 10% increase in price, for example, would decrease use by less than that, ranging from 1% to 4%.(^53) However, the price elasticity of different medication classes can vary widely.(^54, 55) - RAND found that increased cost sharing resulted in overall use reductions of 25% to 45% for common drugs, and reductions of 8% to 23% for drugs used by chronically ill patients. Individuals who use specialty drugs responded to increased cost sharing much less, ranging from about 1% to 21%.(^56) - Several studies have found that increased cost sharing has detrimental effects on patient’s health.(^57, 58, 59, 60, 61, 62) Modest increases in prescription copayments have been shown to have a negative impact on consumers’ medication purchasing decisions. These increases may lead to pill splitting or other reduced-dosing methods, increased time between refills, and increased medication discontinuation, particularly for symptomatic medications, but also for classes of prescription medications used for long-term disease prevention.(^63)</td>
<td>Coinsurance and copayments are applicable to all markets. However, even small increases in coinsurance and copayments can severely limit access for low-income populations.</td>
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savings in drug expenditures per person would have been $45.89 (interquartile range, $10.35 to $158.06) for adults younger than 65 years of age and $78.05 (interquartile range, $19.94 to $241.72) for adults at least 65 years of age. In these age groups, the national savings would have been $5.9 billion (95% confidence interval, $5.5 billion to $6.2 billion) and $2.9 billion (CI, $2.6 billion to $3.1 billion), respectively, representing approximately 11% of drug expenditures.\(^47\)
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<td>• In one study that considered 75 different plans, increasing a single copayment from $5 to $10 cut annual per-person spending from $725 to $563, or more than 20%. Similarly, doubling co-payments in multi-tier plans reduced average drug spending by about one-third.</td>
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<td>Other Comment</td>
<td>Patients respond differently to an increase in their out-of-pocket costs for prescription medications depending on the condition being treated, the absolute price increase, and the availability of treatment alternatives.</td>
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### PHARMACY BENEFIT MANAGEMENT

General activities of a PBM that generate cost savings to plan sponsors include:  
- efficient processing of prescription claims;  
- providing a network of retail and mail-order pharmacy services to lower ingredient and dispensing fees (e.g., formulary management, generic-use programs, drug utilization review, disease management, manufacturer rebates);  
- academic detailing (e.g., letters to prescribers, educational interventions, newsletters); and  
- offering prescription drug insurance benefits with patient cost sharing and other incentives.

### DISEASE MANAGEMENT

Disease Management attempts to decrease health care costs and utilization and improve health outcomes over the life of a patient. Also aims to improve medication compliance.  
- In a study of an HMO’s diabetes management program decreased hospitalizations by 18% among enrolled diabetic patients, and total gross costs were decreased by $44/patient/month (10.9%).  
- In another study of self-insured diabetic beneficiaries, implementation of a disease management program led to a 9.4% decrease in medical spending compared to baseline, and a 17% compared to expected.  
- Disease management requires a long-term focus.  
- Programs are most common in large organizations (>50,000 employees).

Other Comments  
- Disease management tends to target specific conditions (e.g., diabetes, heart disease, asthma).  
- Longitudinal information on benefits is not well documented.
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| Quantity Limitations                | This intervention seeks to control drug costs and access by setting quantity limits. It may also set maximum allowable quantity limits. | • One study found that limiting the number of prescriptions covered by Medicaid to three/month/recipient resulted in a reduction in medication use and thus a savings in prescription costs.  
• Longer-term studies have shown that this can have deleterious health effects. | Utilization Management applies to all markets. |
| Other Comments                      | Limiting prescription access may lead to unintended consequences and should be carefully considered. |
| Prior Authorization                 | Prior authorization is used to control utilization and expenditures and helps prevent potentially harmful or unnecessary utilization. It requires advanced physician and insurance approval before dispensing a prescription. | • Implementing a prior authorization policy for higher-cost NSAIDs led to a drug cost savings of 53% in one study.  
• There is a potential for high administrative costs, as well as patient dissatisfaction. | Prior authorization applies to all market settings. |
<p>| Other Comments                      | Prescriptions most commonly restricted by prior authorization policies include fertility drugs, growth hormones, and medications with a potential cosmetic or &quot;lifestyle&quot; use. |
| Drug Utilization Review (DUR)       | (Typically automated) reviews conducted either before dispensing a prescription medication or retrospectively, after the prescription has been dispensed to the patient. Warnings are prompted by pharmacy computer systems at the time a prescription claim is processed. These include drug-drug interactions, drug duplication warnings, drug-disease interactions, allergy overlaps, early or late refill alerts, pregnancy alerts, incorrect dosage alerts, drug-age warnings, and drug-gender warnings. | There is little evidence that Drug Utilization Review programs actually lead to any health or financial benefits. | Computer-based systems are required. |</p>
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<td><strong>DELIVERY SYSTEMS</strong></td>
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| The intervention achieves cost savings through offering restricted access to retail pharmacies. | • Adding a mail-order pharmacy benefit has been shown to: provide an opportunity for deeper discounts compared with retail networks; be convenient for beneficiaries needing maintenance medications; and provide greater opportunity for effectively managing cost, utilization, and compliance.  
• These types of arrangements are often inconvenient to beneficiaries and, therefore, may decrease consumer satisfaction. In some cases, mail order systems may be more expensive than point of purchase options. | This intervention applies to all markets. | |
| A narrower network concentrates purchasing power by limiting the pharmacies at which members are covered, thereby leveraging greater discounts.  Mail-order pharmacies are often utilized to reduce costs. The Federal Trade Commission has found that prescription drug plan sponsors generally pay lower prices for drugs purchased through PBM-owned mail-order pharmacies. Although, mail-order pharmacies are not always more cost-effective. |                                               |                                                               |                                           |

**Other Comments**
- Over 87% of employers offered the option of mail-order service, with the ability to increase the supply of medication (90 days) for a decreased copayment.
- 31 states have “any willing provider” laws requiring PBMs to contract with any pharmacy willing to accept their reimbursement rate.

**BENEFIT DESIGN AND CONSUMER COST SHARING**

**Generic Incentives**
- Blue Cross Blue Shield of Michigan determined that increasing the use of generic medications by just 1% would result in $17M in savings.
- In surveys of more than 400 employers in the US: 39% always require a generic to be used when available and appropriate, 31% charge a higher copayment for brands unless indicated as medically necessary by a physician.

Generic incentives can be used in all markets.
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<td><em>Multi-tiered Copayments</em></td>
<td>Above and beyond the brand/generic distinction, plans categorize medications according to their effectiveness, availability of therapeutic alternatives, and the differential pricing and/or rebates obtained from manufacturers or wholesale distributors. Typically, copayment tiers are based on formulary status.</td>
<td>71% of HMO panelists and 75% of PBM panelists who use the three-tier system stated that the design did save their organization money. More than 25% of HMO executives estimated that ~10% of pharmacy costs were saved as a result of implementing a three-tier benefit.</td>
<td>Multi-tiered copayments can be used in all markets.</td>
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<td>Other Comments</td>
<td>Multi-tiered copayments require sufficient cost gap to incentivize purchasing behavior.</td>
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<td><em>Coinsurance</em></td>
<td>Coinsurance raises consumer cost sharing to proportionally reflect actual medication costs.</td>
<td>This intervention is designed to sensitize consumers to the cost of medications, provide a stronger financial incentive for use of lower-cost medications, and help protect payers from drug-price inflation.</td>
<td>Cost sharing applies to all market settings.</td>
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<td><strong>Case Examples 1:</strong></td>
<td>The intervention manages pharmaceutical quality and costs.</td>
<td>It is estimated that the tri-state initiative will save 10-15% a year on prescription drug costs.</td>
<td>PBMs can be used in all market settings.</td>
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*New England Tri-State Prescription Drug Purchasing Coalition*[^2]

The coalition determined that the most comprehensive approach to managing quality and health care costs for their populations was through a PBM. Each state will contract separately with First Health Services for populations that it determines are most appropriate.

Other Comments
This case example involved regional-level, large scale purchasers.
# Pharmaceutical Innovations

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| **Case Example 2:** Federal Employees Health Benefits Program⁸³ | The intervention helps manage the FEHBP prescription drug benefits. | • The average price PBMs negotiated for drugs from retail pharmacies was 18% below the average cash price customers would pay at retail pharmacies for 14 selected brand-name drugs and 47% below the average cash price for 4 selected generic drugs.  
• The average mail-order price was about 27% - 53% below the average cash price customers would pay at a retail pharmacy for the selected brand name and generic drugs, respectively.  
• Across the plans, rebates reduced total annual drug spending by 3% - 9% from 1998 to 2001.  
• PBMs achieved savings through intervention techniques such as prior authorization and drug utilization reviews that identify excess use, duplicative therapies, or the availability of effective, low-cost drug alternatives.  
• Enrollees benefited from cost savings from PBM services through lower costs for mail-order prescriptions, lower cost sharing linked to PBMs’ discounts obtained from retail pharmacies, and a lower increase in premiums overall.  
• PBM reductions in plan claims costs for prescription drugs translate into lower premiums for enrollees in later years. | PBMs can be used in all market settings. |

### Other Comments
- Example Intervention Techniques include:  
  o Drug utilization review,  
  o Prior authorization,  
  o Therapeutic interchange, and  
  o Generic substitution.  
- Nearly all FEHBP enrollees had a retail pharmacy participating in their plan within a few miles of their residence.  
- The plans reviewed were: Blue Cross and Blue Shield (BCBS), Government Employees Hospital Association (GEHA), and PacifiCare of California.  
- Together, these plans accounted for about 55% of the 8.3M people covered through FEHBP plans as of July 2002 and represented various plan types and PBM contractors.  
- These plans covered more than half of all FEHBP enrollees and paid $3.3B for about 65M prescriptions dispensed to these enrollees in 2001.

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⁸³ The FEHBP is the largest employer-sponsored health insurance program in the United States. The three PBMs examined achieved savings for FEHBP-participating health plans by using three key approaches: obtaining drug price discounts from retail pharmacies and dispensing drugs at lower costs through their mail-order pharmacies; passing on certain manufacturer rebates to the plans; and using intervention techniques that reduce utilization of certain drugs or substitute other, less costly, drugs.
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<td><strong>COMPUTERIZED REAL TIME ALERTS</strong></td>
<td>Patient-directed electronic reminders to take medication combat lack of adherence to drug regimens that may result in increased health care and emergency room utilization. Physician-directed computerized order entry is intended to alert prescribing physicians of potential contraindications and therapeutic alternatives at the time of prescribing. Other real-time decision support, such as reminders and prompts that are often connected to an electronic medical record, help to remind physicians of particular prescriptions or tests that may help in a particular case. Physician-directed faxed letters notify prescribers of patients who have gaps in refilling prescriptions.</td>
<td>• There is very little scientific evidence regarding the efficacy of using e-mail or text message reminders to patients in order to increase prescription drug regimen adherence. • Several studies indicate improvements in care due to use of computerized order entry and real-time decision support such as reminders and prompts, including: reduced dispensing rates of potentially contraindicated medicines and higher quality of care.⁸⁵, ⁸⁶, ⁸⁷, ⁸⁸, ⁸⁹ • One study evaluated the impact of alerting prescribers via faxed letters about patients who had gaps of more than 10 days in refilling antidepressant prescriptions during the first six months of therapy. The faxed alerts to prescribers had no discernable effect on the proportion of non-adherent patients or the number of days without antidepressant treatment during the 12-month follow-up period.⁹⁰</td>
<td>There is very little evidence regarding the types of markets in which computerized real time alerts are either successful or unsuccessful. However, real-time decision supports as reminders and prompts to physicians often rely on electronic medical records (EMRs), requiring a market that is utilizing EMRs. Computerized order entry requires the corresponding system.</td>
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**Case Examples**:
- **Electronic alerts to patients**, reminding them to take medications.
- **Computerized order entry (and real-time decision support such as reminders and prompts)** for physicians provides prescribing alerts regarding medicines with potential contraindications and therapeutic alternatives.
- **Fax**ed letters to prescribers regarding patients who have had gaps in refilling prescriptions.

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⁸⁴ Includes:
- Electronic alerts to patients, reminding them to take medications.
- Computerized order entry (and real-time decision support such as reminders and prompts) for physicians provides prescribing alerts regarding medicines with potential contraindications and therapeutic alternatives.
- Fax letters to prescribers regarding patients who have had gaps in refilling prescriptions.
**Pharmaceutical Innovations**

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| **Case Example:** CareSpeak Communication and Mount Sinai Hospital | The intervention is intended to increase adherence to prescribed pharmaceutical regimens in pediatric liver transplant patients. In turn, this was intended to reduce the risk of organ rejection, end stage liver disease, and/or death. | - The program increased adherence to medication regimens and significantly reduced the risk of organ rejection.  
- The standard deviation of mean serum tacrolimus levels (a measure of the amount of tacrolimus—a common immunosuppressant taken by all study participants—in the blood) fell significantly, from 3.46 micrograms per liter in the year before the study to 1.37 micrograms per liter during the year-long study. Lower standard deviations are associated with higher levels of adherence, as they suggest more consistent amounts of medication in the blood. Results were consistent regardless of the number of medications being taken or who (the caregiver or patient) took responsibility for medication intake.  
- Among the 41 study participants, the number with a standard deviation above the threshold level of 2.5 micrograms per liter (which puts the patient at increased risk of a rejection episode) fell from 24 before program implementation to 6 afterwards.  
- Among participants, the number of episodes of acute cellular rejection fell from 12 in the year before implementation to 2 during the study. | - The program appears applicable to all markets. Program developers are currently applying for funding to cover the costs of a national multicenter study of the program.  
- Only patients or caregivers who had a cell phone and active cell phone service were allowed to participate in the program.  
- Over 40% of participants in the initial study dropped out before the end of the year, with the inability to pay for cell phone service being the single biggest reason for ending participation. To address this issue, those considering implementing a similar initiative may wish to provide prepaid cell phones with text-messaging capabilities to patients and/or caregivers. |

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**Section 8 • Endnotes**

2. RAND Health Research Highlights of Joyce, et al. (2002).


END SECTION 8
**Mission**

Altarum serves the public good by solving complex systems problems to improve human health, integrating research, technology, analysis, and consulting skills.

**Vision**

Altarum Institute demonstrates and is sought for leadership in identifying, understanding, and solving critical systems issues that impact the health of diverse and changing populations. Altarum is acknowledged as a valued, collaborative, and collegial institute of the utmost competence and integrity.

For more information: www.altarum.org or contact Gloria N. Eldridge, PhD, MSc at gloria.eldridge@altarum.org.