Texting Boosts Compliance in Organ Transplant Patients

Texting while driving can be a deadly mix. But the electronic prompts may well be a lifesaver in the case of solid organ transplant patients, according to a company that offers a system for sending text messages to the phones of adolescent patients, reminding them to take their immune-suppressing medications.

The developer, CareSpeak Communications Inc., recently announced that the system will be in use for a one-year tryout at the pediatric heart transplant program at NewYork-Presbyterian/Morgan Stanley Children's Hospital. A better method for motivating teens to take their anti-rejection medications is sorely needed, according to Linda Addonizio, director of the hospital's heart transplant program.

"Despite extensive educational programs for families and pediatric heart transplant recipients, significant medication noncompliance still occurs with alarming frequency, particularly with adolescents, which can prove deadly," Ms. Addonizio noted in a press release from CareSpeak. "The outlook for long-term survival in noncompliant patients can be as low as 30%, compared to 90% in compliant pediatric heart transplant recipients."

Serge Loncar, chief executive officer of CareSpeak, told *Pharmacy Practice News* that texting is "the perfect tool" for reaching out to teenagers with drug compliance reminders "because they're notorious text messagers." Although CareSpeak does not have any data on the degree to which texts are opened by teens, Mr. Loncar cited data available from Neustar, a multiplatform communications provider: the data show that it takes recipients an average of four minutes to open SMS text messages, compared with 48 hours for e-mails.

Another benefit: Cell phones "are nearly ubiquitous, and they're a familiar technology—there's really no learning curve with this system," he said.

But the texting approach really shines in comparison with pharmacy compliance letters sent home via "snail mail," Mr. Loncar said. "Our clinical partners tell us that these letters are rarely opened, or if they are, there is no way to track their impact."

With the phone texting system, in contrast, impact *can* be tracked—and documented in clinical studies. In a *Pediatrics* study (2009;124:e844-e850) by researchers at Mount Sinai Medical Center, two episodes of organ rejection occurred in liver transplant patients enrolled in the CareSpeak texting program, versus 12 cases of rejection pre-rollout.

Edward Y. Zavala, administrator of the transplant center at Vanderbilt University Medical Center in Nashville, Tenn., agreed that the "open" rate for traditional compliance letters, which are often sent by retail pharmacies, "is probably rather low." Asked to review the basics of the CareSpeak system, he replied, 'Texting seems to be supported by good data, and it does take advantage of very easy-to-use technology. So this is something we would certainly consider."

The only downside, Mr. Zavala noted, "is something I've seen in my own kids—keeping their cell phones charged can be its own compliance challenge. Texts going to a dead phone aren't going to be much help to anyone."

In the *Pediatrics* study, similar problems did emerge: nearly a third of the patients had to drop out because they lost their phone privileges or could no longer affort a cellphone. And that's despite the researchers paying for the texting charges.

'When you explain to teens that their lives are at stake if they don't take these medications, that's a very powerful motivator to keep their cell phones charged and to respond honestly to the text prompts.'

—Serge Loncar

How the System Works

Assuming teens can manage to keep their cell phones, here's how the CareSpeak system works: Patients or caregivers are sent an SMS text whenever a dose of anti-rejection medication is scheduled to be taken. "The patient has 15, 30, 45 or 60 minutes, depending on the settings of the system, to respond that he's taken the medication by sending a coded reply," Mr. Loncar said. "If he doesn't reply, then a parent or other caregiver can get an "escalation alert" via text, warning them that there is a problem with compliance. That message has the young patient's cell phone number embedded in it. By clicking on that number, caregivers can call the child and remind them to take the meds."

Physicians can also get involved. For a snapshot of overall compliance, they can access an online dashboard and view patient self-reported compliance and the number of escalation alerts that were sent, Mr. Loncar added. Clinicians also can receive e-mail reports in case they forget to check the dashboard, he noted.

Mr. Loncar said this approach addresses a major challenge when managing organ transplant patients—keeping the continuity-of-care loop intact. "With adolescents, you have a transition of care from parents to child," he explained. "So you need a tool for reaching these younger patients. Text alerts, in our experience, are the easiest and most effective way to accomplish that."

Kwaku Marfo, PharmD, clinical pharmacy manager, solid organ transplantation at Montefiore Medical Center in New York City, pointed out that although texting may help teens comply with their organ transplant medications, it's not a fail-safe technology. "Texting that they've taken their medication is no guarantee that they've actually done so," he said.

Dr. Kwaku's strategy for ensuring compliance? "We bring teenage patients into the clinic two, three, maybe even four times a week immediately post-transplant. Then we use the direct observation method to make sure they've taken their meds." (For more compliance tips from Dr. Marfo, see sidebar.)

Mr. Loncar agreed that the CareSpeak program is not foolproof. But in the *Pediatrics* study, he noted, blood levels of anti-rejection drugs showed that for at least some patients, it *can* be effective. Before participation, the standard deviation of tacrolimus in the 41 patients studied was 3.46 g/L. After participation, that fell to 1.37 g/L (P=0.05),

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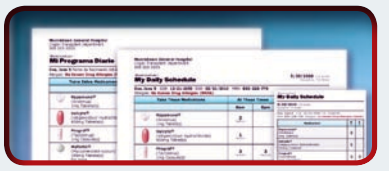
More Compliance Strategies

Kwaku Marfo, PharmD, clinical pharmacy manager, solid organ transplantation at Montefiore Medical Center in New York City, and Edward Y. Zavala, administrator of the transplant center at Vanderbilt University Medical Center in Nashville, Tenn., offered the following strategies for boosting drug compliance in solid organ transplant patients:



Start immediately. "We begin educating teens and their parents/caregivers right after the patients come out of surgery," Dr. Marfo said. "That sends the right message that compliance is critical."

Focus on side effects. Teens are particularly sensitive to side effects and will stop taking their meds if you don't prepare them for the adverse effects. "We let them know what to expect," Dr. Marfo said. "It reduces anxiety and they know how to respond." In the case of weight gain related to prednisone, for example, Dr. Marfo will tell patients they can be placed on a "Quick Taper" regimen, where they are started at a fairly high dose (20 mg)for the first month and then tapered down to 5 mg thereafter. "That approach will limit weight gain and growth inhibition," Dr. Marfo said.

Offer alternatives. Cyclosporine can be problematic because it causes gingival hyperplasia, which is cosmetically unsightly. For patients who are concerned about that side effect, Dr. Marfo noted, a viable option is tacrolimus.

Use reminder tools. Dr. Marfo gives all of his transplant patients calendars with a medication sheet that outlines the timing, dose and duration of all drug therapy. Telephone follow-up, e-mails and patient visits all can be used as needed. Mr. Zavala suggests using visual aids as well. At his hospital, they give patients medication guides that have images of every medication they're taking. "It helps them to distinguish all the different meds they're taking, and to ensure no errors in dispensing have been made," he said.

Use the Internet. Vanderbilt pharmacists teach patients how to use an Internet-based system called medactionplan.com, a Web site that records a patient's drug regimens and any subsequent changes made to those regimens. Patients can access the system and schedule e-mail reminders to take and also to refill their medications. Reminders can also be sent to health care providers. "It's not only a great tool for the patients," Mr. Zavala said. "It also helps us keep track of what's going on with their drug therapy."

Offer a compliance contract. Dr. Marfo: "We will go into contract with the patient or caregiver for them to be able to demonstrate being compliant with their medications for at least six months, before we consider them ready to be a bit more independent in managing their disease."

—David Bronstein

TYGACIL® (tigecycline) Brief Summary

See package insert for full Prescribing Information. For further product information and current package insert, please visit www.wyeth.com or call our medical communications department toll-free at 1-800-934-5556.

INDICATIONS AND USAGE

TYGACIL is indicated for the treatment of adults with complicated skin and skin structure infections caused by *Escherichia coli*, *Enterococcus faecalis* (vancomycin-susceptible isolates), *Staphylococcus aureus* (methicillin-susceptible and -resistant isolates), *Streptococcus agalactiae*, *Streptococcus anginosus* grp. (includes *S. anginosus*, *S. intermedius*, and *S. constellatus*), *Streptococcus pyogenes*, *Enterobacter cloacae*, *Klebsiella pneumoniae*, and *Bacteroides fragilis*.

TYGACIL is indicated for the treatment of adults with complicated intra-abdominal infections caused by *Citrobacter freundii*, *Enterobacter cloacae*, *Escherichia coli*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, *Enterococcus faecalis* (vancomycin-susceptible isolates), *Staphylococcus aureus* (methicillin-susceptible and -resistant isolates), *Streptococcus anginosus* grp. (includes *S. anginosus*, *S. intermedius*, and *S. constellatus*), *Streptococcus agalactiae*, *Streptococcus pneumoniae* (penicillin-susceptible isolates), *Streptococcus salivarius*, *Streptococcus mitis*, *Clostridium perfringens*, and *Peptostreptococcus micros*.

TYGACIL is indicated for the treatment of adults with community-acquired pneumonia infections caused by *Streptococcus pneumoniae* (penicillin-susceptible isolates), including cases with concurrent bacteremia, *Haemophilus influenzae* (beta-lactamase negative isolates), and *Legionella pneumophila*.

CONTRAINDICATIONS

TYGACIL is contraindicated for use in patients who have known hypersensitivity to tigecycline.

WARNINGS AND PRECAUTIONS

Anaphylactoid/Anaphylactoid Reactions

Anaphylactic/anaphylactoid reactions have been reported with nearly all antibacterial agents, including TYGACIL, and may be life-threatening. TYGACIL is structurally similar to tetracycline-class antibiotics and should be administered with caution in patients with known hypersensitivity to tetracycline-class antibiotics.

Hepatic Effects

Increases in total bilirubin concentration, prothrombin time and transaminases have been seen in patients treated with tigecycline. Isolated cases of significant hepatic dysfunction and hepatic failure have been reported in patients being treated with tigecycline. Some of these patients were receiving multiple concomitant medications. Patients who develop abnormal liver function tests during tigecycline therapy should be monitored for evidence of worsening hepatic function and evaluated for risk/benefit of continuing tigecycline therapy. Adverse events may occur after the drug has been discontinued.

Mortality Imbalance and Lower Cure Rates in Ventilator-Associated Pneumonia

A study of patients with hospital-acquired pneumonia failed to demonstrate the efficacy of TYGACIL. In this study, patients were randomized to receive TYGACIL (100 mg initially, then 50 mg every 12 hours) or a comparator. In addition, patients were allowed to receive specified adjunctive therapies. The sub-group of patients with ventilator-associated pneumonia who received TYGACIL had lower cure rates (47.9% versus 70.1% for the clinically evaluable population) and greater mortality (25/131 [19.1%] versus 14/122 [11.5%]) than the comparator.

Use During Pregnancy

TYGACIL may cause fetal harm when administered to a pregnant woman. If the patient becomes pregnant while taking tigecycline, the patient should be apprised of the potential hazard to the fetus. Results of skeletal studies in rats and rabbits that tigecycline crosses the placenta and is found in fetal tissues. Decreased fetal weights in rats and rabbits (with associated delays in ossification) and fetal loss in rabbits have been observed with tigecycline [see USE IN SPECIFIC POPULATIONS].

Tooth Development

The use of TYGACIL during tooth development (last half of pregnancy, infancy, and childhood to the age of 8 years) may cause permanent discoloration of the teeth (dark-gray-brown). Results of studies in rats with TYGACIL have shown bone discoloration. TYGACIL should not be used during tooth development unless other drugs are not likely to be effective or are contraindicated.

***Clostridium difficile*-Associated Diarrhea**

Clostridium difficile-associated diarrhea (CDAD) has been reported with use of nearly all antibacterial agents, including TYGACIL, and may range in severity from mild diarrhea to fatal colitis. Treatment with antibacterial agents alters the normal flora of the colon leading to overgrowth of *C. difficile*. *C. difficile* produces toxins A and B which contribute to the development of CDAD. Hypertoxin producing strains of *C. difficile* cause increased morbidity and mortality as these infections can be refractory to antimicrobial therapy and may require colectomy. CDAD must be considered in all patients who present with diarrhea following antibiotic use. Careful medical history is necessary since CDAD has been reported to occur over two months after the administration of antibacterial agents. If CDAD is suspected or confirmed, ongoing antibiotic use not directed against *C. difficile* may need to be discontinued. Appropriate fluid and electrolyte management, protein supplementation, antibiotic treatment of *C. difficile*, and surgical evaluation should be instituted as clinically indicated.

Patients With Intestinal Perforation

Caution should be exercised when considering TYGACIL monotherapy in patients with complicated intra-abdominal infections (cIAI) secondary to clinically apparent intestinal perforation. In cIAI studies (n=1642), 8 patients treated with TYGACIL and 2 patients treated with imipenem/cilastatin presented with intestinal perforations and developed sepsis/septic shock. The 8 patients treated with TYGACIL had higher APACHE II scores (median = 13) versus the 2 patients treated with imipenem/cilastatin (APACHE II scores = 4 and 6). Due to differences in baseline APACHE II scores between treatment groups and small overall numbers, the relationship of this outcome to treatment cannot be established.

Tetracycline-Class Effects

TYGACIL is structurally similar to tetracycline-class antibiotics and may have similar adverse effects. Such effects may include: photosensitivity, pseudotumor cerebri, and anti-anabolic action (which has led to increased BUN, azotemia, acidosis, and hyperphosphatemia). As with tetracyclines, pancreatitis has been reported with the use of TYGACIL.

Superinfection

As with other antibacterial drugs, use of TYGACIL may result in overgrowth of non-susceptible organisms, including fungi. Patients should be carefully monitored during therapy. If superinfection occurs, appropriate measures should be taken.

Development of Drug-Resistant Bacteria

Prescribing TYGACIL in the absence of a proven or strongly suspected bacterial infection is unlikely to provide benefit to the patient and increases the risk of the development of drug-resistant bacteria.

ADVERSE REACTIONS

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

In clinical trials, 2514 patients were treated with TYGACIL. TYGACIL was discontinued due to adverse reactions in 7% of patients compared to 6% for all comparators. Table 1 shows the incidence of treatment-emergent adverse reactions through test of cure reported in ≥2% of patients in these trials.

Table 1. Incidence (%) of Adverse Reactions Through Test of Cure Reported in ≥2% of Patients Treated in Clinical Studies

Body System Adverse Reactions	TYGACIL (N=2514)	Comparators[a] (N=2307)
Body as a Whole		
Abdominal pain	6	4
Abscess	3	3
Asthenia	3	2
Headache	6	7
Infection	8	5
Cardiovascular System		
Phlebitis	3	4
Digestive System		
Diarrhea	12	11
Dyspepsia	2	2
Nausea	26	13
Vomiting	18	9
Hemic and Lymphatic System		
Anemia	4	5
Metabolic and Nutritional		
Alkaline Phosphatase Increased	4	3
Amylase Increased	3	2
Bilirubinemia	2	1
BUN Increased	3	1
Healing Abnormal	4	3
Hyperglycemia	5	3
SGOT Increased[b]	4	5
SGPT Increased[b]	5	5
Nervous System		
Dizziness[c]	3	3
Skin and Appendages		
Rash	3	4

[a] Vancomycin/Aztreonam, Imipenem/Cilastatin, Levofloxacin, Linezolid.

[b] LFT abnormalities in TYGACIL-treated patients were reported more frequently in the post therapy period than those in comparator-treated patients, which occurred more often on therapy.

In all Phase 3 and 4 studies that included a comparator, death occurred in 3.9% (147/3788) of patients receiving TYGACIL and 2.9% (105/3648) of patients receiving comparator drugs. An increase in all-cause mortality has been observed across phase 3 and 4 clinical studies in TYGACIL treated patients versus comparator. The cause of this increase has not been established. This increase should be considered when selecting among treatment options. [See Table 2.]

Table 2. Patients with Adverse Events with Outcome of Death by Infection Type

Infection Type	TYGACIL n/N	TYGACIL %	Comparator n/N	Comparator %	Risk Difference[a] % (95% CI)
Approved Indications					
cSSSI	13/834	1.4	6/813	0.7	0.7 (-0.5, 1.9)
cIAI	40/1382	2.9	27/1368	1.9	1.0 (-0.3, 2.2)
CAP	12/434	2.8	11/422	2.6	0.2 (-2.3, 2.7)
Combined	64/2840	2.4	44/2628	1.7	0.7 (-0.0, 1.6)
Unapproved Indications					
HAP[b]	65/487	13.9	58/487	12.0	1.9 (-2.6, 6.4)
Non-VAP[b]	40/336	11.9	43/345	12.2	-0.3 (-5.4, 4.9)
VAP[b]	25/131	19.1	14/122	11.5	7.6 (-2.0, 16.9)
RP	11/139	8.6	3/43	4.7	3.9 (-9.1, 11.6)
DFI	7/553	1.3	3/508	0.6	0.7 (-0.8, 2.2)
Combined	84/1148	7.2	61/1018	6.0	1.2 (-1.0, 3.4)

CAP = Community-acquired pneumonia; cIAI = Complicated intra-abdominal infections; cSSSI = Complicated skin and skin structure infections; HAP = Hospital-acquired pneumonia; VAP = Ventilator-associated pneumonia; RP = Resistant pathogens; DFI = Diabetic foot infections.

[a] The difference between the percentage of patients who died in TYGACIL and comparator treatment groups.

[b] These are subgroups of the HAP population.

Note: The studies include 300, 305, (306 cSSSI), 301, 306, 315, 316, 400 (cIAI), 308 and 313 (CAP), 311 (HAP), 307 (Resistant gram-positive pathogen study in patients with MRSA or Vancomycin-Resistant Enterococcus (VRE)], and 319 (DFI with and without osteomyelitis).

In comparative clinical studies, infection-related serious adverse events were more frequently reported for subjects treated with TYGACIL (7%) versus comparators (6%). Serious adverse events of sepsis/septic shock were most frequently reported for subjects treated with TYGACIL (2%) versus comparators (1%). Due to baseline differences between treatment groups in this subset of patients, the relationship of this outcome to treatment cannot be established [see WARNINGS AND PRECAUTIONS].

The most common treatment-emergent adverse reactions were nausea and vomiting which generally occurred during the first 1 – 2 days of therapy. The majority of cases of nausea and vomiting associated with TYGACIL and comparators were either mild or moderate in severity. In patients treated with TYGACIL, nausea incidence was 26% (17% mild, 8% moderate, 1% severe) and vomiting incidence was 18% (11% mild, 6% moderate, 1% severe).

In patients treated for complicated skin and skin structure infections (cSSSI), nausea incidence was 35% for TYGACIL and 9% for vancomycin/aztreonam; vomiting incidence was 30% for TYGACIL and 4% for vancomycin/aztreonam. In patients treated for complicated intra-abdominal infections (cIAI), nausea incidence was 35% for TYGACIL and 21% for imipenem/cilastatin; vomiting incidence was 29% for TYGACIL and 15% for imipenem/cilastatin. In patients treated for community-acquired bacterial pneumonia (CABP), nausea incidence was 24% for TYGACIL and 8% for levofloxacin; vomiting incidence was 16% for TYGACIL and 6% for levofloxacin.

Discontinuation from tigecycline was most frequently associated with nausea (1%) and vomiting (1%).

For comparators, discontinuation was most frequently associated with nausea (<1%).

The following adverse reactions were reported infrequently (<2%) in patients receiving TYGACIL in clinical studies:

Body as a Whole: injection site inflammation, injection site pain, injection site reaction, septic shock, allergic reaction, colitis, injection site edema, injection site phlebitis

Cardiovascular System: thrombophlebitis

Digestive System: anorexia, jaundice, abnormal stools

Metabolic/Nutritional System: increased creatinine, hypocalcemia, hyperglycemia, hypokalemia

Special Senses: taste perversion

Hemic and Lymphatic System: partial thromboplastin time (aPTT), prolonged prothrombin time (PT), eosinophilia, increased international normalized ratio (INR), thrombocytopenia

Skin and Appendages: pruritus

Urogenital System: vaginal moniliasis, vaginitis, leukorrhea

Post-Marketing Experience

The following adverse reactions have been identified during postapproval use of TYGACIL. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure. Anaphylactic/anaphylactoid reactions, acute pancreatitis, hepatic cholestasis, and jaundice.

DRUG INTERACTIONS

Warfarin

Prothrombin time or other suitable anticoagulation test should be monitored if tigecycline is administered with warfarin [see CLINICAL PHARMACOLOGY (12.3) in full Prescribing Information].

Oral Contraceptives

Concurrent use of antibacterial drugs with oral contraceptives may render oral contraceptives less effective.

USE IN SPECIFIC POPULATIONS

Pregnancy

Teratogenic Effects—Pregnancy Category D [see WARNINGS AND PRECAUTIONS]

Tigecycline was not teratogenic in the rat or rabbit. In preclinical safety studies, ^{14}C-labeled tigecycline crossed the placenta and was found in fetal tissues, including fetal bony structures. The administration of tigecycline was associated with slight reductions in fetal weights and an increased incidence of minor skeletal anomalies (delays in bone ossification) at exposures of 5 times and 1 times the human daily dose based on AUC in rats and rabbits, respectively (28 mcg-hr/mL and 6 mcg-hr/mL at 12 and 4 mg/kg/day). An increased incidence of total loss was observed at maternotoxic doses in the rabbits with exposure (AUC) equivalent to human dose.

There are no adequate and well-controlled studies of tigecycline in pregnant women. TYGACIL should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers

Results from animal studies using ^{14}C-labeled tigecycline indicate that tigecycline is excreted readily via the milk of lactating rats. Consistent with the limited oral bioavailability of tigecycline, there is little or no systemic exposure to tigecycline in nursing pups as a result of exposure via maternal milk.

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when TYGACIL is administered to a nursing woman [see WARNINGS AND PRECAUTIONS].

Pediatric Use

Safety and effectiveness in pediatric patients below the age of 18 years have not been established. Because of effects on tooth development, use in patients under 8 years of age is not recommended [see WARNINGS AND PRECAUTIONS].

Geriatric Use

Of the total number of subjects who received TYGACIL in Phase 3 clinical studies (n= 2514), 664 were 65 and over, while 288 were 75 and over. No unexpected overall differences in safety or effectiveness were observed between these subjects and younger subjects, but greater sensitivity to adverse events of some older individuals cannot be ruled out.

No significant difference in tigecycline exposure was observed between healthy elderly subjects and younger subjects following a single 100 mg dose of tigecycline [see CLINICAL PHARMACOLOGY (12.3) in full Prescribing Information].

Hepatic Impairment

No dosage adjustment is warranted in patients with mild to moderate hepatic impairment (Child Pugh A and Child Pugh B). In patients with severe hepatic impairment (Child Pugh C), the initial dose of tigecycline should be 100 mg followed by a reduced maintenance dose of 25 mg every 12 hours. Patients with severe hepatic impairment (Child Pugh C) should be treated with caution and monitored for treatment response [see CLINICAL PHARMACOLOGY (12.3) and DOSAGE AND ADMINISTRATION (2.2) in full Prescribing Information].

OVERDOSAGE

No specific information is available on the treatment of overdosage with tigecycline. Intravenous administration of TYGACIL at a single dose of 300 mg over 60 minutes in healthy volunteers resulted in an increased incidence of nausea and vomiting. In single-dose intravenous toxicity studies conducted with tigecycline in mice, the estimated median lethal dose (LD_{50}) was 124 mg/kg in males and 98 mg/kg in females. In rats, the estimated LD_{50} was 106 mg/kg for both sexes. Tigecycline is not removed in significant quantities by hemodialysis.

This Brief Summary is based on TYGACIL direction circular MI05210013 ET01, revised 09/09.

TEXTING

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showing a more consistent presence of therapeutic drug levels as a result of the texting program.

As an additional aid, "we also can include an education and motivational component to the program and to the texts," Mr. Loncar said. "When you explain to teens that their lives are at stake if they don't take these medications, that's a very powerful motivator to keep their cell phones charged and to respond honestly to the text prompts."

What It Costs

Mr. Loncar said the cost of the texting program varies, depending on the number and complexity of features included. Educational and motivational messages, for example, come at additional cost.

"The basic systems start at about $1 per patient per month," he said. "That compares pretty favorably to the $2 to $4 it can cost to send a traditional compliance letter to a patient via snail mail." Plus, he added, multiple texts per day can be sent, versus only one letter per month. "A cell phone is the most personal accessory we carry everywhere. So it's a much more efficient target for investment in a drug compliance tool."

Currently, hospitals pay for the texting service. But given the cost savings from preventing just one case of organ rejection, "it's only logical that insurers take a look at this technology and consider paying for it themselves," he said.

As far as future clinical applications of the texting technology, several are in the works, Mr. Loncar noted. Collaborations are planned with "a major" diabetes hospital, for example, "and several other centers of excellence" are looking for help in boosting drug compliance in diabetes, asthma, HIV, congestive heart failure, kidney disease and others.

Hospital Pharmacists Can Help

Asked to comment on the role hospital pharmacists might play in promoting use of text-based reminder systems, Mr. Loncar acknowledged that retail pharmacies have been more of a focus for his company. But told of the close-knit relationship between many organ transplant recipients and hospital pharmacists who specialize in transplant medicine, he replied, "That is a very exciting opportunity to pursue."

"Our goal is to connect all of the people in a patient's circle of care into one seamless experience," Mr. Loncar said. "If we can give tools such as texting to even more clinicians in that circle of care, whether it's a hospital pharmacist or other provider, that's very empowering and an important, ongoing goal."

—David Bronstein