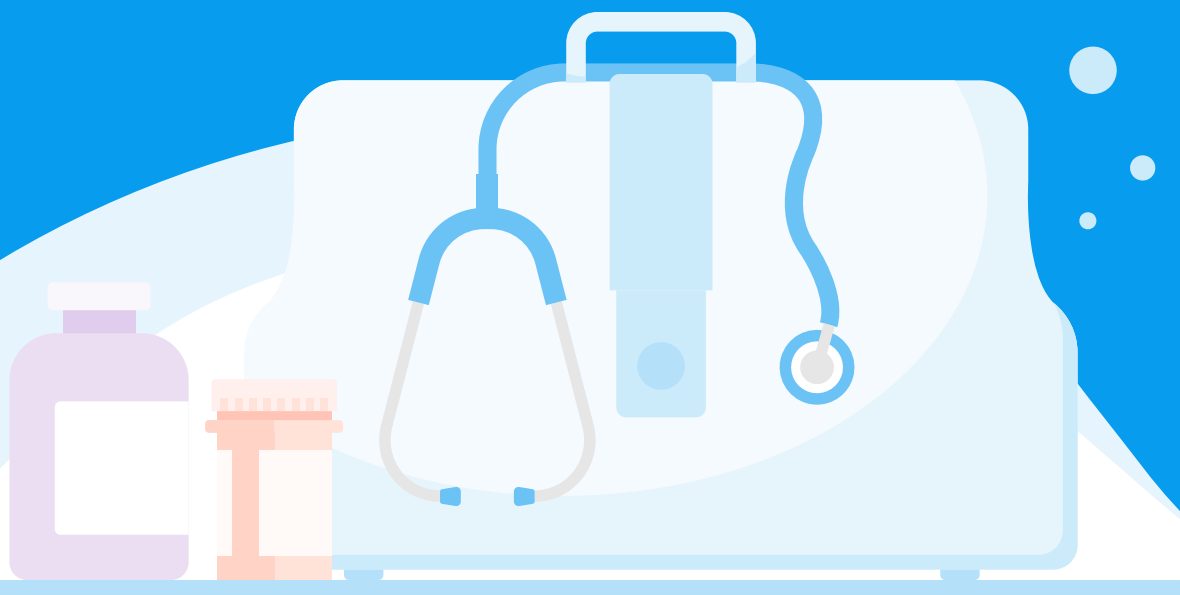


SMS: A growing tool in healthcare

How the healthcare industry can leverage texting and omni-channel communication





Historically, the healthcare industry has been slow to change when it comes to embracing new technology. The industry falls behind retail and banking for the adoption of new tools, with regulation of healthcare and the need to protect patient data as two of the main reasons contributing to that lag. While SMS and other digital channels were quickly adopted by other industries, healthcare has only recently embraced them, mostly out of necessity.

In 2020, the healthcare industry's digital transformation jumped ahead drastically due to the COVID-19 pandemic. Many clinics had to move their practices online over the course of a week to preserve PPE (personal protective equipment) and slow the spread of the virus. During that time, telehealth visits increased over 4,000% for non-urgent care.¹ As hospitals and clinics closed their waiting rooms, billing and registration went digital, and virtual waiting rooms became commonplace.

During the worst medical crisis in 100 years, when healthcare providers were short on time and resources, texting with patients became more commonplace. Healthcare systems and clinics leaned into SMS as a way to automate scheduling and easily notify patients of upcoming appointments or test results. Pharmacies embraced text notifications for prescription pickup and refills. Two-way texting allowed providers to quickly and easily answer patient questions via a four-second text as opposed to a longer five-minute phone call.

Healthcare's digital transformation may have been thrown into high gear by the pandemic, but the convenience of digital health tools and solutions will transform the industry forever. In a report from Frost & Sullivan, more than 50% of hospitals are boosting their technology investments.² Embracing cloud-based IT, AI and machine learning, and communication technologies will not only decrease costs in healthcare, but have the capacity to increase access to healthcare and health information, and improve patient outcomes.



TABLE OF CONTENTS

- 4 Using SMS to reduce costs for hospitals & clinics
- 5 Clinical Reviews: SMS campaigns improve patient outcomes for chronic conditions
- 7 Reminders for preventative care & checkups
- 8 Medication compliance in the US and Impacts of SMS reminders
- 9 Increase access to care and expand health literacy
- 10 Patient communication preferences & omni-channel communication
- 11 Caring for patients beyond the clinic walls

Using SMS to reduce costs for hospitals & clinics

The healthcare industry loses \$150B each year due to missed patient appointments.³ In a world where elective surgeries account for up to 60% of revenue for hospitals, cancelled procedures cost hospitals hundreds of thousands of dollars each year. Same day surgery cancellations vary by specialty but on average cancelled neurosurgery costs \$5,962 while orthopedic procedures cost \$2,779 per episode.⁴ Text messaging is an inexpensive and every day tool that is being leveraged more for appointment reminders as well as pre-procedure instructions to reduce cancellations and help providers realize the revenue they need to continue operating.

The Houston Fertility Institute in Texas utilized text messaging for appointment reminders and saw a 20% improvement in scheduling, and an 80% reduction in emails and phone tag. By reducing the administrative drain, providers were able to spend 15% more time with their patients, resulting in a higher standard of care.

Texting is the most used communication channel for many Americans, and it has the ability to help decrease costs for clinics and hospitals. Text messages cost just pennies to send and can be sent on a large scale. One study out of England suggested the use of SMS reminders could save healthcare providers between £55M and £83M each year.⁵ By some estimates hospitals can reduce their discharge time by 50% with text messaging, saving an average of \$557,253 per year.⁶

Global healthcare spending typically increases each year. Spending reached \$8.3 trillion in 2020 and is expected to grow slightly to \$8.8 trillion by the end of 2021.⁷ In the United States, the Centers for Medicare and Medicaid Services (CMS) projects healthcare spending would reach \$6.19 trillion by 2028, or 19.7% of the GDP. Text messaging is a simple and inexpensive way to help decrease some of those costs for healthcare systems, but healthy living texting campaigns can contribute to patients' overall health outcomes.



Clinical Reviews:

SMS campaigns improve patient outcomes for chronic conditions

Chronic illnesses cost the United States \$2.2 trillion each year. When accounting for losses in economic productivity, that cost reaches \$3.7 trillion. Chronic conditions such as asthma, cancer, COPD, heart disease, and diabetes affect a large portion of the population. Approximately 133 million Americans, or about 40% of the population, are living with chronic conditions, and millions more are undiagnosed. According to the Centers for Medicare & Medicaid Services (CMS), the cost of chronic conditions are expected to rise to nearly \$6 trillion by 2050.⁸

The American Diabetes Association projects diabetes spending alone costs the US healthcare system \$237 billion in direct medical costs and \$90 billion in reduced productivity annually.⁹ Texting campaigns for diabetes management have been shown to have success in several studies, and could potentially reduce costs of care while increasing outcomes for patients with diabetes. In one clinical study, patients who received motivational text messaging reminders had a mean A1c (HbA1c) level of 8.5% while the control group had a mean of 9.4%. For context, normal glucose of someone without diabetes is below 5.7%.

Researchers at Scripps Whittier Diabetes Institute followed Type 2 diabetes patients for six months. During the course of the study, patients received text messages with reminders about their diabetes care. Participants experienced lower blood sugar levels that were similar to results found with some glucose-lowering medications.

In the Dulce Digital study, researchers discovered that patients who frequently texted their blood glucose levels to their provider had the most success in lowering their A1c (HbA1c) levels.¹⁰

A 2019 diabetes and texting study out of China followed 502 patients from 32 hospitals. Patients in the study had both diabetes mellitus and coronary heart disease. Over the course of one year, study participants received

health intervention text messages. Patients received six text messages each week with lifestyle guidance for diet suggestions, glucose monitoring, and exercise recommendations. Greater reduction in A1c (HbA1c) was seen in the intervention group compared to the control group.¹¹ In addition to lower A1c (HbA1c) scores, patients in the study group exhibited lower low-density lipoprotein (LDL), lower body mass index (BMI), and had increases in physical activity. At the study conclusion, 97% of study participants reported the text messages were easy to understand, while 94% said the messaging reminders were useful.



"Taken together, these findings suggest that, on a wider scale, a simple, low-cost text message-based approach like the one offered through Dulce Digital has the potential to significantly benefit many people who struggle every day to manage their diabetes and maintain their health."

- Athena Philis-Tsimikas, M.D.
Corporate Vice President
Scripps Whittier

A similar study out of New Zealand sent tailored text messages to patients over the course of nine months in addition to standard diabetes care. The text messages to the study group received health information, motivation, and tips on diabetes self management via text. A reduction in A1c (HbA1c) was significantly greater with the study group than the control group (-8.85 mmol/mol in the study group than -3.96 mmol/mol in the study group).¹²



In the UK, teenagers with Type 1 diabetes were followed over an 18 month period to study text responsiveness and glycaemic benefit. Study participants who responded to text reminders on at least 50% of the days experienced lower glycemic control.¹³

Similar to diabetes, hypertension is one of the most prevalent health conditions in the United States. Almost half of all adults in the United States have high blood pressure, and nearly 20% are unaware they suffer from the condition. High blood pressure puts adults at risk for heart disease and stroke, and was a primary or contributing cause of death for over 500,000 people in 2019. According to the Centers for Disease Control (CDC) hypertension costs the United States over \$130 billion each year.¹⁴

A 2015 study published in JAMA took a closer look at lifestyle and health literacy text messages in patients

with heart disease. In the study, 700 participants were split into two groups. Over the course of six months, the test group received four text messages per week in addition to usual care, while the control group received usual care. Text messages were personalized based on background information including dietary habits, preferred name, and smoking status.

At the study's conclusion, LDL levels for the study group were significantly lower compared to the controlled group. The study group also saw reductions in systolic blood pressure, increases in physical activity, and a significant reduction in smoking. Study participants reported that the text messaging program was useful (91%), and easy to understand (97%).¹⁵

Clara Chow, MBBS, PhD, lead study author, said her group was surprised by the results of the study.¹⁶

"These are the things that medications usually do, not text messages. I like to look for things that are able to be used in multiple corners of our world, from low-income settings to high-income settings," Chow said. "Everybody owns a mobile phone these days. You don't have to have a smartphone to text."

The potential for hospitals and physician offices to leverage SMS to care for patients with chronic conditions is endless. These could include:



Personalized messages sent at different frequencies based on how newly diagnosed or well controlled a condition is



Reminders with embedded video links to remind patients of best practices for devices like blood glucose meters or insulin pumps



Two-way texting for quick answers to questions patients have as they learn to manage their conditions

The number of messages received can also be personalized based on how well controlled a patient's condition is. While well controlled patients might receive only 1-2 messages a week with more advanced health tips, while uncontrolled patients might get more reminders based on their specific challenges.

Reminders for preventative care & checkups

In addition to managing chronic conditions, texting has shown to be useful in preventative healthcare. Text messaging campaigns have been shown to be successful tools for improving cancer screenings, adherence to post-surgery instructions, and routine check-ups.

In 2021, researchers compared the effectiveness of text message outreach in addition to home screening kits for colorectal cancer. Participants (440) from Federally Qualified Health Center (FQHC) in Philadelphia were chosen if they were overdue for colorectal screening and had a cell phone on EHR record.¹⁷ The trial showed text messaging combined with at home kits could substantially improve colorectal cancer screening rates. Patients receiving the text messages returned their screening kits 10-fold compared to those who had kits shipped to them.

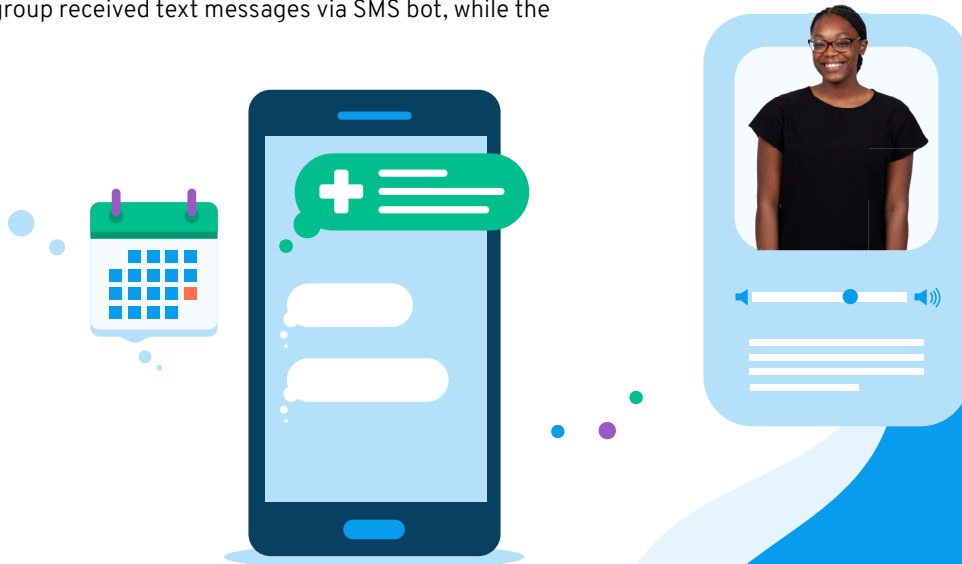
Similar texting campaigns could be used to increase screenings for breast cancer, blood pressure, cholesterol, and cervical cancers. By having patients opt-in within a health system, reminders and text appointments could help hospital systems reach their patient base for these important milestones. Additional reminders for other appointments like annual eye exams and bi-annual dental exams via text could help patients stay on top of routine healthcare and find any problems early on.

In a study following 159 patients with knee or hip joint replacement, text messaging bots helped patients increase engagement and exercise. The intervention group received text messages via SMS bot, while the

control group received a traditional education process. Patients in the text intervention group exercised nearly 9 more minutes a day compared to the control group. The study group stopped narcotic medications 10 days sooner, and placed fewer telephone calls to the surgeon's office.¹⁸

Hospitals can utilize texting to send patients before and after surgery instructions to decrease same day cancellations or preventable readmissions. A study from the Medical College of Wisconsin, Milwaukee, showed that nearly 80% of patients preferred to receive notifications via text messaging. When text messages were used to remind patients to take antiseptic showers 24 to 48 hours before a scheduled surgery, they were more compliant with pre-admission orders.¹⁹ When same day surgery cancellations can cost thousands of dollars in losses per procedure, texting reminders are a small drop in the bucket.

It is likely similar text messaging reminders could be used for post surgery instructions and physical therapy. Preventable readmissions costs the US \$17 billion each year. Post-operative instructions via texting could give routine reminders to patients and potentially decrease some avoidable readmissions. Only 30% of patients who receive outpatient physical therapy attend all their visits. Text reminders with videos of exercises and stretches could supplement PT, help prevent reinjury, and encourage the cessation of pain medication sooner.



Medication compliance in the US and impacts of SMS reminders

Medication compliance is a major issue across the globe. For optimum care, patients need to take medication correctly 80% of the time. However, it is estimated medication adherence for chronic conditions hovers around 50%. Medication non-adherence can lead to worsening conditions, injury, or death. In the United States alone, medication non-adherence accounts for up to 50% of treatment failures, 25% of hospitalizations, and around 125,000 deaths each year. According to the American College of Preventive Medicine, healthcare costs could be decreased by \$100 to \$300 billion per year by addressing medication adherence.²⁰

Patient education, counseling, and ongoing communication can help address some medication adherence issues. Text messaging can reinforce information patients receive in the outpatient setting. Several studies have shown improved medication adherence with text messaging.

A 2020 meta-analysis of 10 studies showed text messaging was effective in lowering HbA1c levels and increasing medication adherence for patients with Type 2 diabetes.²¹ A 2019 assessment of text messaging interventions for medication adherence in adults with ADHD found text messages resulted in more timely prescription refills. Around 68% of patients receiving

text reminders picked up their prescriptions in a timely manner.²²

Medication adherence for chronic diseases hovers around 50% - 60% and approximately 66% of the US adult population take prescription drugs. For many of these people, medication adherence wanes over time. Within six months to one year, nearly half of all patients discontinue medication and most do not take medication as prescribe.²³ This can lead to worsening of conditions, hospitalization, or death. Patients often stop taking medication without consulting their physicians for several reasons including costs, transportation, side effects (29%), belief they no longer need the medication (16%), or think the medication is ineffective (15%).

Text messaging has been found to nearly double the odds of medication adherence for patients with chronic diseases.²⁴ It can be a quick and easy way for physicians or pharmacists to continue engagement outside the clinic setting to check in on patients, monitor medication adherence, and quickly make adjustments as needed. Two-way texting can be an effective tool to remove some of the barriers to correct dosing and keep patients more empowered with their healthcare journey.



Increase access to care and expand health literacy

Access to the internet is considered a social determinant of health. With the increased use of home computers and cell phones, internet access (and more specifically 5G) has been a key factor for patients seeking medical information as well as gaining additional access to telehealth during the COVID pandemic.

As ¼ of the United States still does not have access to high quality internet access, text messaging has the potential to increase health literacy for patients between medical visits.²⁵ Health information via text messaging can bridge the information gap in a number of ways, including providing mental health tips, vaccine education, and routine health screenings.

There are several barriers to healthcare including transportation, mobility, and low income. Geography is a barrier to care that impacts one in five Americans. Physician shortages and traveling long distances to see specialists like for cardiology, endocrinology, and mental health providers mean many patients either go without care, or have longer periods of time between care. As a matter of fact, approximately 60 million adults and children with mental health conditions in the United States go without treatment, and 33% of patients had difficulty finding mental health prescribers who would accept their insurance.²⁶ Texting is expanding that access to care, and more clinicians are leveraging it to provide quick consults, supportive group chats, and to provide mental health resources.

During a time when more people are reporting higher levels of stress, telehealth and text messaging are breaking down barriers to receiving mental health care. The Text4Support program was launched in Canada in late 2018. During a recent study of the program, subscribers received supportive texts on a daily basis. Text messages were written by therapists and mental health providers and encouraged suggestions for a healthy mind and body, how to handle anxiousness, and general wellbeing. During the 12-week study, 84% of participants noted they read the messages and took action.²⁷

A 2020 Dartmouth College investigated the impact of text messaging interventions as an additional treatment to mental health care. Over a three-month

period, licensed mental health providers engaged with patients via text messaging, fielding over 12,000 interactions with patients. In a time when there is a shortage of mental health providers, the study showed text messaging interventions were cost-effective and scalable.²⁸ The study participants found the text messages helpful: 94% indicated the messages made them feel better, and 87% said they would recommend it to friends.

In 2020, Hartford Healthcare in Connecticut leveraged text messaging to help patients register for COVID-19 vaccinations. By simplifying patient engagement via texting and not requiring patients to download mobile apps, the state had one of the highest vaccination rates in the country. Hartford Healthcare sent out 1.5 million texts, and over 600,000 patients were able to register for vaccines via a simple click in the text message. Hartford Healthcare has plans to expand text message campaigns in the future including reminding patients to schedule their annual exams.²⁹ Similar text messaging campaigns have been used across the country to reach vaccine-hesitant, undecided, or unaware patients.

The National Cancer Institute conducted a smoking cessation text-messaging intervention campaign called SmokefreeTXT (SFTXT). Patients with high text engagement were less likely to be daily smokers and most likely to become smoking abstinence by the end of the 6-8 week program. The study showed the importance of maintaining high engagement via text with patients as a way to encourage better health choices.³⁰

When patients can bypass barriers to care and have access to more health literacy information, they can work with their providers to take action. Easy access to information, reminders for routine checkups and screenings, and healthy living reminders are all ways texting campaigns can expand conversations between patients and their providers while increasing patient outcomes and satisfaction. Texting is not only an inexpensive way to convey this information, but it is preferred by many patients.

Patient communication preferences & omni-channel communication

The COVID-19 pandemic drastically changed healthcare. Over the course of a weekend, healthcare providers moved their practices online and set up virtual visits to continue caring for patients while maintaining social distancing requirements and preserving PPE. The implementation of telehealth and text messaging exploded as a way to continue patient care. During the initial months of the pandemic, phone calls for providers dropped and overall preference for text communications rose 14% during the pandemic. Patients noted that digital methods like texting were more accessible and easy for them.

SR Health by Solutionreach conducted a 2021 HIMSS survey on patient communication, and the results on digital preferences were startling. The survey found that patients expect to receive healthcare text messages for appointment reminders, pre-visit instructions, and notifications from their patient portal. Patients aged 50 years and older wanted to receive more healthcare text messages from their providers, while 37% of patients under 50 were more likely to switch to healthcare providers that were willing to use more modern forms of communication like text messaging. A whopping 65% of survey respondents wanted to receive healthcare text messages.³¹

87% of patients prefer text messaging from their providers because it was easier, faster, and more convenient.

The pandemic likely revealed patient preferences that were already existing. Texting has been outpacing phone calls and emails as a preferred communication channel for years.³²

- 76% of consumers do not like taking business calls
- Texts have a 98% open rate and 45% response rate - higher than any other form of communication including email which has a 20% open rate and only 6% average response rate
- Texts are 7x more likely to get a response
- The average person sends 25% more texts than emails
- 90% of SMS messages are opened within 3 minutes

Over 80% of Americans own a smartphone and almost 100% of them send a text weekly. Texting is a preferred communication channel because it is quick and convenient and easier for recipients to respond in their own time frame compared to playing voicemail phone tag. In the healthcare setting, texting saves clinical staff considerable time when responding to patient inquiries. On average, a text message can take four seconds to send whereas a phone call to relay the same information can take 2-4 minutes.³³ In many cases, APIs and AI can help automate texts, saving healthcare staff even more time.

Learn more about Bandwidth's APIs and how they support the healthcare industry

The pandemic caused a large enough disruption that it uncovered a preference for texting that had already existed, but omni-channel communication will be necessary for healthcare systems and providers to truly increase access to care for all patients. Although a larger portion of patients may prefer texting, there are still barriers to the technology. Having an option for voice, messaging, and email communication to reach patients on multiple channels will ensure they get the health information and reminders they need. Healthcare organizations will need to keep a pulse on emerging communication channels and preferences to adapt to patients' changing needs.

Caring for patients beyond the clinic walls

Historically, the healthcare industry is slow to adapt to new technology. Regulation is one of the contributing factors to that slow adoption, but it is likely that technology will always outpace regulatory bodies. The COVID-19 pandemic blasted the industry into a digital transformation on par with the industrial revolution. By embracing new technology including omni-channel communication and text messaging they can take health information far beyond the clinic walls. But the industry is just scratching the surface for potential ways to leverage SMS.

Ways that Bandwidth has seen healthcare providers utilize SMS:

- ✓ Appointment reminders & scheduling
- ✓ Billing & patient intake forms
- ✓ Before & after procedure instructions
- ✓ Prescription refill & pickup reminders
- ✓ Correct dosing instructions & APIs connecting to EHRs to show medication adherence
- ✓ Virtual waiting rooms
- ✓ Remote patient monitoring reminders & emergency calling
- ✓ 2FA and links to patient portals
- ✓ Patient satisfaction and HCAHPS surveys
- ✓ Health literacy campaigns for chronic conditions, annual check-ups, and routine health screenings
- ✓ Videos via text for medical device instructions
- ✓ Connecting mental health patients to support groups and care providers
- ✓ Notifications of lab and screening results via links to patient portals



Texting can be a quick and easy way to relay important health information to patients. It is an inexpensive tool to create an individualized patient journey outside of the clinic. Texting is the preferred communication channel for patients in the United States and across the globe, and has the power to give patients control over their health right in the palm of their hands!

To learn more, visit us at bandwidth.com/industries/healthcare or talk to a member of our team to see how Bandwidth is helping to drive the healthcare industry's digital transformation.



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