



Crimson Connect

Leveraging **Mobile Communication** for Health System Transformation

Improving Physician Engagement and Building a Foundation
for Innovation through Mobile Communication

Crimson Connect

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Executive Summary

Health systems' priorities, such as reducing clinical variation and improving care coordination, coupled with an increasingly dispersed workforce (due to a proliferation of mergers and acquisitions) are demanding innovative communication solutions for clinicians. Despite many available communication channels—email, text, phone, pager etc.—health systems are finding it both more difficult and more important to effectively communicate with, and engage physicians. To achieve this, health systems must meet clinicians where they are, on the go.

1

“The Smartphone is the New Sun”

Mobile phones are at the center of technology innovation. Annual sales for personal computers hover at three hundred million, while annual mobile phone sales are at two billion and climbing. Of the four billion adults in the world who own a mobile phone, two billion own smart phones; this cohort is expected to grow to one hundred percent as the price of the smartphone continues to fall. Resultantly, healthcare is buying into a mobile centric future and clinicians are integrating smartphones into their daily workflows.

2

Meeting the Physician Communication Challenge

Communicating with physicians is a perennial challenge for health systems. Despite health systems' best efforts, only forty-two percent of physicians think their organization is “open and responsive to their input.” Mastering effective communication is critical not only for operational excellence, but for harnessing strong physician engagement, which leads to increased physician productivity, reduced medical errors, greater patient satisfaction, and higher health system revenues. Thankfully, mobile communication platforms are uniquely positioned to inflect engagement.

3

Mobile's Impact on Workflow Patterns, Social Behavior

Mobile communication solutions are positioned to overhaul existing physician workflows and create new work modalities. Physicians will be able to seamlessly communicate with one another in real-time across geographies, provide data-analytics on when and where communication is received and how content is processed, leading to greater engagement and accountability, and will experience greater autonomy and mobility in their work day, no longer needing to continuously retreat to a desktop work station. Furthermore, mobile communication may influence new norms for social behavior. More frequent communication will raise colleagues' awareness of one another's work patterns, subsequently improving teamwork and collaboration in ways previously unseen.

Introduction: The Call for a Mobile Communication Solution

An Opportunity for Superior Physician Communication and Engagement

As health systems continue to grow and their physician employment relationships become more diversified, health care leaders must ensure everyone in the enterprise is executing on shared goals. With a rise in mergers and acquisitions, health care leaders across the country are managing a geographically dispersed physician base with an unprecedented breadth and diversity of preferred care models. At the same time, increased quality oversight from the government and payers demands renewed focus on reducing clinical variation. Not surprisingly, organizations are finding it difficult to create, cultivate, and communicate a unified vision and mission among their physicians, making it more critical than ever for health systems to focus on a robust communication strategy.

Unfortunately, traditional communication channels—phone calls, faxing, overhead paging, emails, and texts—are failing to meet health systems' needs, with provider teams operating in a harried state of phone tag, out-of-office messages, and unread emails. Beyond the workflow implications, poor communication contributes to physicians feeling as though they have little input into an organization's executive decision making and little autonomy in their work, both key engagement drivers. Research shows that the benefits of physician engagement go beyond improved productivity, patient satisfaction, and reduced burnout; as physician engagement rises, medical errors fall.¹ Ultimately, this suggests that improved communication, and in turn, improved engagement, are strong contributors to enhanced clinical quality.

To date, health systems have struggled to find the technological solutions necessary to meet their communication challenges, and have been further stretched by desktop-centered IT solutions, like the EHR. To seamlessly integrate with the clinician workflow, communication solutions must be at workers' fingertips—accessible on platforms and devices that harmonize with where they are—such as a mobile phone. Given the current rapid rate of change experienced by health systems and physicians, a mobile communication platform is a logical investment to keep a health system's transformation at pace with broader technological advancements, and to bring their health care delivery efforts into the 21st century.

1) The Advisory Board Survey Solutions' National Physician Engagement Database, 2015

1. “The Smartphone is the New Sun”

Mobile Solutions at the Center of Technology Innovation

Mobile communication platforms and the tools physicians and administrators use to access them, such as a smartphone, are uniquely positioned to allay today’s health system’s most pressing challenges. It is not only the smartphone’s seamless integration into the physician workflow, due to its mobility, but also its position in the broader context

of technological innovation, that makes it powerful. According to technology blogger and researcher Benedict Evans, “the smartphone is the new sun.”²

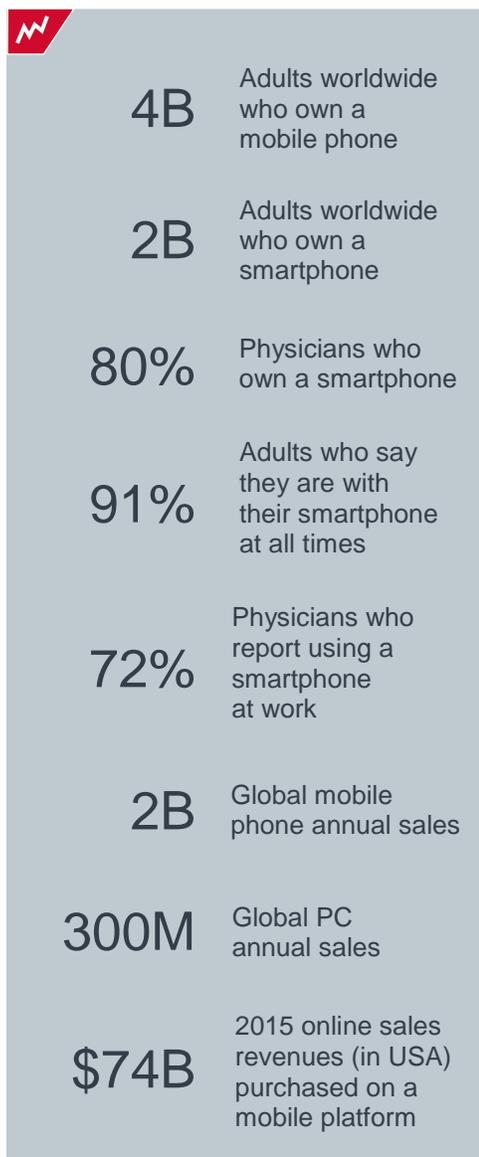
Evans explains that historically, smartphones have been reserved for discrete use cases and thought of as an appendage to typical daily use of the internet. Today, however, smartphones are the most utilized device for accessing the web and are used not only when people are mobile but also when they are at home and at work.³

Furthermore, of the five billion adults on earth, four billion have mobile phones—about half are smartphones.⁴ Experts, like Evans, predict that the remaining two billion adults will convert to smartphones as the price continues to fall. Notably, the entry price for an Android in Asia is now below \$30.

As important as the number of users is the volume of annual sales. Mobile phone sales, currently at two billion, dwarf PC sales, which hover at just over 300 million.⁵ Half of mobile phone sales are smartphones, and this number is expected to grow to 100% over the next few years, making the smartphone tech’s first universal product.⁶ The implications of this cannot be overstated. The smartphone, as a universal product, will influence every part of the technology supply chain, including software development, which will increasingly occur at the level of the smartphone, not the desktop. Innovation is now smartphone-centric.

Extending well beyond the hardware and software of the actual product, the world is innovating for mobile—m-commerce, m-marketing, m-health, to name a few—are fast growing industries. Three out of ten online purchases are now made on a mobile platform in the United States, accounting for \$74 billion dollars in revenue in 2015, up 32% from 2014.⁷

In addition to the smartphone’s ubiquity, its capabilities exceed that of a traditional PC because it is always with the end-user, presenting a plethora of use cases. Not only do adults report spending the majority of their time on their smartphones in applications,⁸ but ninety-one percent of



2) Evans, Benedict. “The Smartphone Is the New Sun.” Andreesen Horowitz., Aug. 2015. Web. 21 Dec. 2015. <http://ben-evans.com/benedictevans/2015/5/13/the-smartphone-and-the-sun>

3) Ofcom, “The Communications Market Report”, 6 Aug. 2015. Web. 21 Dec. 2015. http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr15/CMR_UK_2015.pdf

4) Evans, Benedict. “The Smartphone Is the New Sun.” Andreesen Horowitz., Aug. 2015. Web. 21 Dec. 2015. <http://ben-evans.com/benedictevans/2015/5/13/the-smartphone-and-the-sun>

5) IDC, “PC Leaders Continue Growth And Share Gains As Market Remains Slow.” Jan. 2015. Web. 21 Dec. 2015. <http://www.idc.com/getdoc.jsp?containerId=prUS25372415>

6) Evans, Benedict. “The Smartphone Is the New Sun.” Andreesen Horowitz., Aug. 2015. Web. 21 Dec. 2015. <http://ben-evans.com/benedictevans/2015/5/13/the-smartphone-and-the-sun>

7) FacebookIQ, “The Thumb Is in Charge: A Marketers Guide to Seizing the Mobile Opportunity.” 26 Oct. 2015. Web 21 Dec 2015: <http://insights.fb.com/2015/10/26/the-thumb-is-in-charge/>

8) Smith, A. “U.S. Smartphone Use in 2015.” Pew Research Center, 1 Apr. 2015. Web. 21 Dec. 2015. <http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/>

adult smartphone users report that the device is within an arm's reach at all times, even when they are sleeping.⁹ Smartphones may not have the processing power of a traditional computer, but the range of utility, by virtue of their mobility, is significantly greater. Sensors, a camera, ease of access, and ease of use redefine the possible outputs. The smartphone and the applications it provides access to are providing a new, richer way to engage with the internet and with one another.

Health Care Buying into a Mobile-Centric Future

“Now is the tipping point for the medical smartphone.”

The smartphone's dominance is trickling into health care, where more than 80% of physicians own a smartphone and 72% of physicians use their smartphone to access drug information—confirming on-the-job use.¹⁰ In the first quarter of 2015, a record \$429 million of venture capital funding was invested in health care information technology, 56% growth in this category from the previous year.¹¹ Mobile health technologies in particular are the fastest growing category of one of the fastest growing sectors in the world, valued at \$10.5 billion in 2014¹² and projected to be worth more than \$11.88 billion by 2018.¹³ M-health (mobile health) is expected to have a compound annual growth rate (CAGR) of 33.5% from 2015-2020.¹⁴ The demand and opportunity for mobile innovation in health care is clear, and the market is responding.

According to health care analyst and researcher Steven Wardell, “Now is the tipping point for the medical smartphone. The physician is the ultimate mobile knowledge worker, and their tool is coming into focus.”¹⁵ Physicians are substituting components of their daily work with a mobile solution and are doing so at an accelerating pace. This shift is accounted for by larger-screen smartphones, which ease content consumption, and a broader offering of mobile applications that can streamline and enhance workflow.¹⁶ After switching to larger-screen devices, like the iPhone 6+, physicians report shifting from consuming 25% to 40%-90% of their work-related content on the smartphone. They also report using applications that offer integrated medical information and medical tools, such as the Medscape application, “regularly, often more than once a day.”¹⁷

Outside of applications that target physicians' knowledge and expertise, most of the excitement in the physician application space has been generated by communication applications, specifically those that target messaging. There is a clear opportunity for communication solutions to play a role in care collaboration, patient engagement, and in turn, improved outcomes and empowered users. However, many remain skeptical about whether physicians will adopt these technologies, even if available.

9) Deloitte, “mhealth in an mworld: How mobile technology is transforming health care.” 2105. Web. 21 Dec. 2015. <http://www2.deloitte.com/sk/en/pages/life-sciences-and-healthcare/articles/mhealth-in-mworld.html>

10) Advisory Board Company, Physician Executive Council, “How to Reach 100% of the Medical Staff,” 2014

11) Gornley, Brian. “Health-Care Startups Raise Record \$3.9 Billion in Venture Capital in First Quarter” Wall Street Journal. 21 Apr. 2015. Web. 21 Dec. 2015. <http://www.wsj.com/articles/health-care-startups-raise-record-3-89-billion-in-venture-capital-in-first-quarter-1429633713>

12) Wood, L., “Research and Markets: Global mHealth Market to Grow at CAGR 33.5% over Five Years—Analysis, Trends, Forecast 2015-2020” Business Wire. 4 Dec. 2015. Web. 21 Dec. 2015. <http://www.businesswire.com/news/home/20151204005725/en/Research-Markets-Global-mHealth-Market-Grow-CAGR>

13) Global Data. “mhealth: Health Care Goes Mobile.” 3 Aug. 2012. Web. 21 Dec. 2015. <http://healthcare.globaldata.com/media-center/press-releases/medical-devices/mhealth-healthcare-goes-mobile>

14) Wood, L., “Research and Markets: Global mHealth Market to Grow at CAGR 33.5% over Five Years—Analysis, Trends, Forecast 2015-2020” Business Wire. 4 Dec. 2015. Web. 21 Dec. 2015.

15) Wardell, Steven. “WebMD Health Corp: Medscape Emerging as Killer App on Mobile, Raising Estimates, PT to \$55” 12 Nov. 2015. Web. 21 Dec. 2015. <http://www.leerink.com/services/equity-research/>

16) Ibid

17) Ibid

Physicians Adopt Mobile with Executive Support

“Thus, while m-health is positioned to influence every part of the healthcare delivery chain, improved communication among physicians on a mobile platform is emerging as a clear first step.”

A recent study by Putzer et al. shows promise for physician adoption. The research team investigated the innovation factors that affect a physician’s decision to adopt an emerging mobile technological device in the workplace, such as a smartphone.

Physician’s attitudes regarding adoption were evaluated on the basis of:

- 1) Workflow compatibility
- 2) Job relevance
- 3) Support from the internal environment
- 4) Observability (the frequency with which the adopter is able to observe the technology in use in the workplace)
- 5) Personal experience
- 6) Pressure from the external environment to use a competing device

Researchers found workflow compatibility, job relevance, and support from the internal environment to be the most impactful. In other words, physicians who adopted the smartphone solution felt it was suitably aligned with their own workflow and the technologies in the hospital, believed the smartphone contributed to improving overall patient care, and saw support from executive management. This suggests that executive backing, which is speculated by many to hinder technology adoption, is in fact paramount for physicians in a health care workplace.

Table 1: Top Innovation Factors Influencing Physician Mobile Adoption

Regression Analysis of Attitudes Toward Using a Smartphone and Innovation Factors
(n = 103 physicians)

Innovation Factors	Performance
Compatibility: Alignment of aspects of an individual’s work with the individual’s work style and habits	($\beta = .71, t = 9.28, p = .00$)
Job Relevance: The frequency of smartphone use and the effectiveness of using a smartphone regarding job performance	($\beta = .62, t = 7.30, p = .00$)
Internal Environment: Management support, organizational size, and user involvement	($\beta = .42, t = 4.21, p = .00$)

Based on Putzer et al.’s findings, it is not surprising that health care professionals are discarding their pagers and requesting that all hospital and health system related communications be accessible on their smart phones.¹⁸ These requests position smartphones as an essential part of clinical decision making and hospital operations.¹⁹

Institutions such as the University of Pittsburgh Medical Center (UPMC) are responding by equipping their physicians and nurses with smartphones, with the objective of improving communication.²⁰ Thus, while m-health is positioned to influence every part of the healthcare delivery chain, improved communication among physicians on a mobile platform is emerging as a clear first step.

18) Al-Ubaydli, M. “Smartphone Computing Moving into Docs’ Offices.” iHealthBeat, March 31, 2008. Web. 21 Dec. 2015. <http://www.epocrates.com/gomobile/articles/iHealthBeat.pdf>

19) Dolan, B. “Prediction: Smartphones to replace pagers in hospitals.” Mobile Health News, May 29, 2009. Web. 21 Dec. 15. <http://mobihealthnews.com/2448/prediction-smartphones-to-replace-pagers-in-hospitals/>

20) Putzer, G et al. “Are Physicians Likely to Adopt Emerging Mobile Technologies? Attitudes and Innovation Factors Affecting Smartphone Use in the South Eastern United States.” Perspectives in Health Information Management. 1 Apr. 2012. Web. 21 Dec. 2015. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3329206/>

2. Meeting the Physician Communication Challenge

Health System Still Struggling to Hear Physicians' Voice

Communication with physicians remains a challenge for health system leaders across the country. Chief Medical Officers rank “physician communication” as a top strategic priority and see it as a significant barrier to accomplishing organizational goals.²¹ Despite leaders’ efforts to deploy an array of communication tactics to reach physicians—from town hall meetings, to physician portals, to face to face communication—the majority of physicians still feel they are not being heard. Less than half (49%) of physicians agree that they are “kept informed of (their) organization’s strategic plans and direction” and only 42% believe that their organization is “open and responsive to their input.”²²

The disconnection is likely accounted for by a physician “silent majority” who feel that communication engagement is laborious and unrewarding. Health system leaders effectively foster bi-directional communication with physician leadership, highly engaged physicians, and—on the other end of the spectrum—outliers and vocally resistant physicians, but have few channels for reaching the physicians in the middle.

Fig. 1: Health System Leaders Failing to Reach the Silent Majority

Spectrum of Physician Communicators



“The communication channels in use, such as email or a physician portal, best managed and consumed at a desk, are incongruent with physicians’ ambulatory workflow.”

Leaders report dwindling meeting attendance and low response rates from physicians on all forms of communication. Physicians cite lack of time and an email inbox that fans the communication problem, cluttered by non-pertinent messaging from countless sources.²³ Furthermore, the communication channels in use, such as email or a physician portal, best managed and consumed at a desk, are incongruent with physicians’ ambulatory workflow. Lastly, beyond the logistical challenges, health system

21) The Advisory Board Company, Physician Executive Council, “How to Reach 100% of the Medical Staff,” 2014.

22) The Advisory Board Survey Solutions’ National Physician Engagement Database, 2015.

23) The Advisory Board, Physician Executive Council, “How to Reach 100% of the Medical Staff,” 2014.

leadership faces organizational challenges trying to understand to whom, when, and where they should be sending what communication, inadvertently contributing to the noise.

The benefits of improved physician communication are not limited to operational gains, although those are worth mentioning: opportunities for streamlined shift-exchange, rapid wide-spread emergency notifications, and easily accessible tracking of shared metrics (among many others). The true benefit of improved communication is improved physician engagement, for which the relationship to communication and subsequent advantages may be less apparent.

Improved Communication Yields Higher Physician Engagement

To reiterate, the Advisory Board Survey Solutions' National Physician Engagement Database shows less than half (49%) of physicians agreeing that they are "kept informed of (their) organization's strategic plans and direction" and only 42% believing that their organization is "open and responsive to their input."²⁴ Both statements are heavily dependent on effective bi-directional communication between a parent organization and physician. Not surprisingly, positive performance on these statements is highly correlated to greater physician engagement. In fact, both of these statements are among the top five most impactful drivers of physician engagement (Appendix 2). Interestingly, even though both communication-related drivers are highly correlated to engagement, physicians are less likely to "agree" or "strongly agree" with the communication-related statements (Appendix 3, Drivers 2 and 3) than any of the other top ten impact drivers, meaning organizations have substantial opportunity for improvement in communication-related areas.

While survey analysis presents a strong correlative case for the relationship between communication and physician engagement, the best-practice work of hospitals such as Good Samaritan in Lebanon, Pennsylvania further supports the connection.²⁵ After measuring low physician engagement scores in 2012, Good Samaritan worked to overhaul their communication strategy, adding an online portal, Chief Medical Officer blog, and a text messaging application for their physicians. A follow-up physician engagement survey in 2013 revealed a thirty-two percent increase in performance on the communication-related driver "this organization is open and responsive to my input."



Case in Brief: Good Samaritan Hospital, Lebanon, PA

- 170-bed community hospital in Lebanon, PA, part of six-hospital Wellspan Health system.
- Investments in communication strategy (online portal, CMO blog, and physician text messaging application) lead to increase in physician engagement scores
- 32% increase in communication-related driver, "this organization is open and responsive to my input."

24) The Advisory Board Survey Solutions' National Physician Engagement Database, 2015.

25) Good Samaritan Hospital, Lebanon, PA; The Advisory Board Company, Physician Executive Council interviews and analysis.

Further highlighting the relationship between physician communication and physician engagement, Bain and Company has found that physicians working in management-led (as opposed to physician-led) organizations are significantly less likely than their physician-led counterparts to recommend their health care organization to others, leading to a negative Net Promoter Score²⁶ from those physicians. Bain and Company posits that a possible explanation may be that physicians in management-led organizations report having less knowledge of their organization's mission and being less engaged in the organization's activities. Positively, Bain and Company has found that when management-led organizations take the time to communicate their mission and subsequently effectively engage physicians, their Net Promoter score rises dramatically, from -50 to 20.²⁷

Furthermore, engagement scores are correlated to other measures of organizational value. Health systems with highly engaged employees see higher revenues, increased physician productivity, reduced medical errors, and greater patient satisfaction, among other positive benefits.²⁸ Although there are few examples in the health care industry to date, out of industry organizations have found that a mobile communication platform in particular can act as a powerful tool for driving employee engagement.

Benefits of Physician Engagement



“Companies which invest in a mobile software initiative experience superior business performance, including 50%+ gains in employee satisfaction, workload completed on mobile, operational efficiency and employee productivity.”

Mobile Communication Platform Drives Employee Engagement, Content Penetration

A 2013 study found that companies which invest in a mobile software initiative experience superior business performance, including 50%+ gains in employee satisfaction, workload completed on mobile, operational efficiency and employee productivity.²⁹ Dutch technology company, ImgZine, which develops mobile content sharing and communication platforms, found that a mobile first communication strategy not only improves productivity, but increases employee engagement.³⁰ Being able to share company news and weigh in on company decision making and goal setting makes employees feel like valued members of the organization. Two factors in particular are crucial for achieving this: transparency and dialogue. Organizations achieve transparency when employees can see what their colleagues, and importantly, their managers, are thinking, saying, and doing.³¹ Mobile devices encourage dialogue by

- 26) The Net Promoter Score was developed by Bain & Company and in this case measures whether or not physicians would recommend their organization to someone else as a place to work or to receive care. A positive Net Promoter Score indicates physicians' loyalty and support for their organization, while a negative score shows the opposite. Bain and Company, "Front Line of Health Care Report 2015: The Shifting US Health Care Landscape by the Numbers," 2015, Web. 21 Dec. 2015. <http://www.bain.com/publications/articles/front-line-of-healthcare-report-2015.aspx>
- 27) Bain and Company, "Front Line of Health Care Report 2015: The Shifting US Health Care Landscape by the Numbers," 2015, Web. 21 Dec. 2015. <http://www.bain.com/publications/articles/front-line-of-healthcare-report-2015.aspx>
- 28) Burger, J. & Giger, A., "Want to Increase Hospital Revenues? Engage Your Physicians," accessed December, 2015. Web. 21 Dec. 2015. <http://www.gallup.com/businessjournal/170786/increase-hospital-revenues-engage-physicians.aspx>
- 29) Aberdeen Group, "Enterprise-Grade Mobile Apps: Powering Organizational Transformation," 2013. Web. 21 Dec. 2015. <http://www.aberdeen.com/research/8424/ra-enterprise-mobile-applications/content.aspx>
- 30) ImgZine, "How a mobile first strategy can increase employee engagement," February, 2014. Web. 21 Dec. 2015. <http://www.backbonemag.com/files/PDF/Speakers/2014-03-mobile-first-strategy-employee-engagement.pdf>
- 31) Holtz, S., "The 11 Vital Internet Communication Trends You'd Be Crazy to Ignore," 2013, Web. 21. Dec. 2015, <http://holtz.com/blog/visual-communication/the-11-vital-internal-communications-trends-you-d-be-crazy-to-ignore/4223/>

being omnipresent in the users' daily life and by offering structured platforms for discussion, feedback, and more.

To better understand employee interaction with mobile content platforms, and the significance of employer or colleague affiliation to those platforms, ImgZine measured its own employees' utilization of its internal and external enterprise applications, finding increased engagement with the internally (vs. externally) facing platform.



Study in Brief: ImgZine Internal Enterprise News Application

ImgZine analyzed employee utilization of two of its own enterprise news applications (used for internal communication) compared to employee utilization of ImgZine's external applications for large corporate enterprises and publishers, which use the applications to distribute content and market insights, and digital magazines and newspapers respectively.

Study Findings:

- Employees are more loyal to internal enterprise applications, showing a 4x adoption rate over the external enterprise applications
- 61% of internal application visits take place after working hours
- Employees visit internal applications with greater frequency (every 3.3 days compared to 14.9 days for external publishers)
- Articles posted to internal enterprise applications are read by 48.5% of users, compared to 41.4% for external enterprise applications, and 27% for publishers
- Articles that are "recommended" by a colleague are read by 75% of users

The critical insight from ImgZine's study, based on the affirmation that employees are paying attention to the thoughts and recommendations of their colleagues and are investing time in absorbing them, often after working hours, is that a mobile communication platform is encouraging employees to engage with content and one another in a way that would not happen otherwise.

In summary, the challenges of existing physician communication strategies, and the need for improved physician engagement, may be well served by mobile communication platforms similar to ImgZine, designed for the health care industry.

The tiny interface of a smartphone can be laborious to navigate, and skeptics wonder whether content absorbed by this method is as well retained or understood. Facebook recently commissioned the research group SalesBrain to answer this question. The group found that people are more focused and less distracted when consuming media on mobile devices, feel more positively towards the information they are consuming, particularly on a smartphone, and perceive a tiny screen held close to be larger than it actually is.³²

Taken in tandem with ImgZine's findings, this suggests that an increase in communication that is facilitated by a mobile platform not only improves content

32) FacebookIQ and SalesBrain, "Mobile Minded: How the Brain Processes Mobile and TV Ads." Jun 2015. Web 21 Dec 2015: https://fbinsights.files.wordpress.com/2015/06/facebookiq_neuro_whitepaper_june2015.pdf

penetration, but engagement among employees. In addition to increasing worker productivity and worker satisfaction, mobile communication platforms are positioned to also influence the way employees work and relate to one another.



Study in Brief: Mobile Minded, How the Brain Processes Mobile and TV

Commissioned by Facebook, SalesBrain assessed how much stimuli on a mobile screen and on a TV sustained attention, triggered emotions, produced distraction, required mental effort and elicited engagement.

Study Findings:



- When held close, a mobile screen is perceived to be larger than it actually is
- Overall, people are more attentive and tend to feel more positively toward information presented on a smartphone than on a TV



- People's brains are more distracted when processing information on a TV than when processing information on a smartphone
- People's cognitive load is higher with a TV than a smartphone, meaning that their brains have to work harder to process the same amount of information



- There is a statistically significant difference in message recall when stimuli are viewed on a TV vs. smartphone; subjects experience greater recall when stimuli are viewed on a phone

3. Mobile's Impact on Workflow Patterns, Social Behavior

Mobile Communication Set to Overhaul Physician Workflow

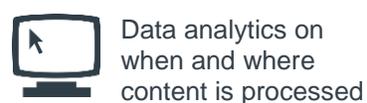
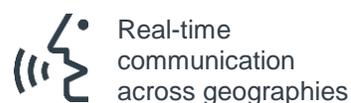
Mobile devices, especially smartphones, are positioned to not only influence the way physicians (and the average worker) access content and communicate with one another, but how and where physicians execute on their daily workflow. The size of the smartphone challenges the plausibility of this concept, but, when considered outside of the bounds of traditional computing, the smartphone's interface—demanding brevity and simplicity, attuned to motion, touch, and sound—affords the possibility of disruptive solutions.

The smartphone has the potential to become the connective tissue of any health system, serving as a platform to execute or triage tasks in real time, on the basis of need. This is likely to occur in sync with innovation in the mobile sector's productivity-messaging space more broadly, where technology platforms such as Slack and Quip, developed for the standard enterprise, are course charting mobile's future. As a byproduct of these disruptive platforms, other technologies like email, voicemail, and facsimile will be phased out of the work place and reserved for discrete use cases.³³

Thus, for the health system, mobile technology, particularly a communication platform, offers the possibility for new work modalities, including: the ability for targeted, real-time communication across geographies, such as stemming referrals to a facility with a broken MRI machine; data analytics providing insight on when content is absorbed, by whom, where, what is sent, and with what frequency, giving executive and physician leadership a pulse on often dispersed physician constituencies; and providing physicians with greater autonomy and mobility, thereby alleviating the physicians' need to be attached to a health system's mainframe through a desktop workstation.

In addition to creating new workflows, mobile devices and mobile communication platforms will influence the way all people, including workers, relate to one another.

New Work Modalities



Mobile Communication Establishing New Norms for Social Behavior

Technology user experience research shows that when people communicate in short form messages, in text messages and on twitter, the value of the communication is not limited to the content of the message itself. The frequency of the messaging and developed awareness of the sender is as important. User experience researchers have dubbed this phenomenon "social proprioception," borrowing from the medical term *proprioception*, meaning spatial awareness of one's body and limbs.³⁴

33) Evans, Benedict. "Messaging and Mobile Platforms." Andreesen Horowitz, 30 Mar. 2015. Web. 21 Dec. 2015. <http://ben-evans.com/benedictevans/2015/3/24/the-state-of-messaging>

34) Thompson, C., "How Twitter Creates a Social Sixth Sense." Wired Magazine. 26 Jun.2007. Web. 21 Dec. 2015. <http://www.wired.com/2007/06/st-thompson-4/>

According to research, over time, a group of communicators develops an awareness of its collective self and the behaviors of its component parts, allowing for otherwise unlikely feats of coordination.³⁵ After many months of messaging, a change in the cadence and timing of a particular team member's communication might alert the rest of the group that the person is experiencing distress. Preemptive attention to the individual may then thwart burnout or prevent a negative, disruptive event. Positively, the opportunity for increased communication, and an awareness of the patterns in which it occurs, may speed the efficiency of work, offer the opportunity for greater clarification, or connect previously unaffiliated parties, generating a previously unobtainable positive outcome. When considered in the context of a health care setting, this type of awareness could be highly influential for finessing care coordination, strengthening care delivery, and improving quality outcomes.

In addition to a social network's influence on social proprioception, preliminary research suggests that smartphone communication may allow an individual to adapt his or her Dunbar Circles (the number of people to whom he or she naturally maintains a social attachment and relationship) beyond his or her geographic footprint.³⁶ A person's Dunbar numbers are controlled by synchronicity of experience and experiences, like laughing together. Researchers suspect that this power of positive, collective, shared experience is what makes the "like" button on social media platforms so influential—it is providing users with a sense of shared attachment.

The average person can maintain many Dunbar circles, as seen in the graphic below. Until recently, Dunbar's theory was rooted in the finding that physical touch was a necessary prerequisite to someone being in the smaller circles, and that shared physical space was a necessity for the larger circles. Yet now, even Dunbar himself acknowledges that many of these social-physical responses are developed in childhood, and there is no telling how an entire generation raised on mobile communication devices will develop and respond. Preliminary research shows small children's brains respond to mobile communication devices differently, with hormonal spikes not experienced by adult counterparts, for example, when interacting with friends and family.

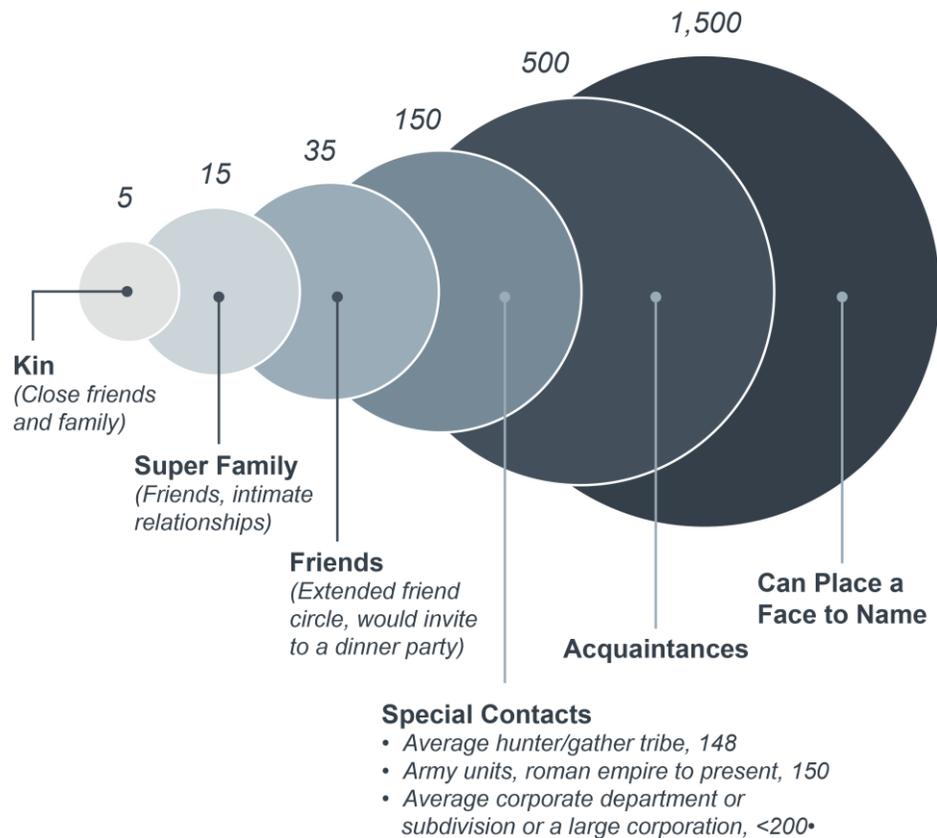
The implications of this are profound. Mobile communication devices may facilitate social interaction, and in turn teamwork, in a way not yet accomplished by other technology. There is no environment where this could be more impactful than in health care, where coordination is the lynchpin of the performance of the care team.

35) ³⁵ Ibid

36) Konnikova, M. "The Limits of Friendship." *The New Yorker*, 7 Oct. 2014. Web. 21 Dec. 2015.
<http://www.newyorker.com/science/maria-konnikova/social-media-affect-math-dunbar-number-friendships>

Table 2. Dunbar Circles³⁷

Dunbar Circles indicate the number of people to whom the average person naturally maintains a social relationship



“The Medium is the Message”

In conclusion, as Marshall McLuhan said in 1964, “The medium is the message... New tools start out being made to fit the existing workflows, but over time the workflows change to fit the tools.”³⁸ The mobile revolution is well underway, laying the groundwork for technological innovation with global impact. Health systems and their existing mobile workflows are uniquely positioned to take advantage of the current technological transition, from desktop to smartphone. They stand to see significant gains in physician communication and engagement from early adoption of a mobile communication platform, and stand to gain a mobile foundation for adoption of additional smartphone technologies targeting the component parts of the delivery system.

37) Dunbar, Robin IM. "5 The Social Brain Hypothesis." *Foundations in social neuroscience* 5.71 (2002): 69.

38) Marshall McLuhan, “The Medium is the Message.” In *Understanding Media: The Extensions of Man*. New York: Signet, 1964.

Crimson Connect

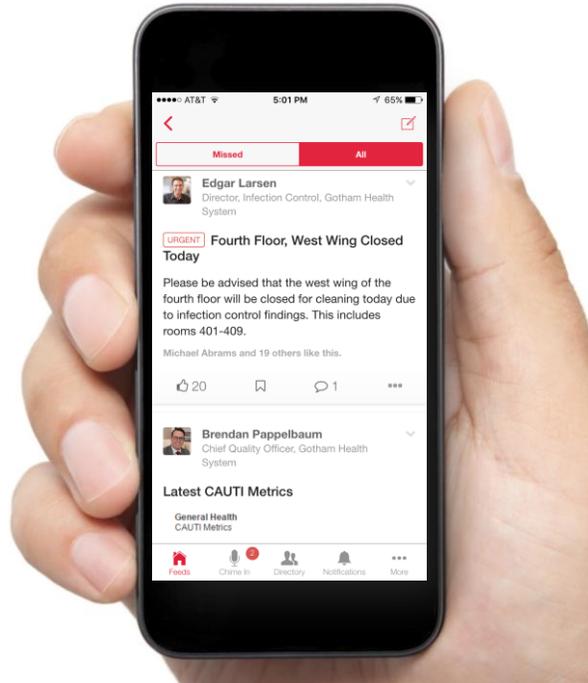
Product Overview

Streamlining and simplifying communications with physicians

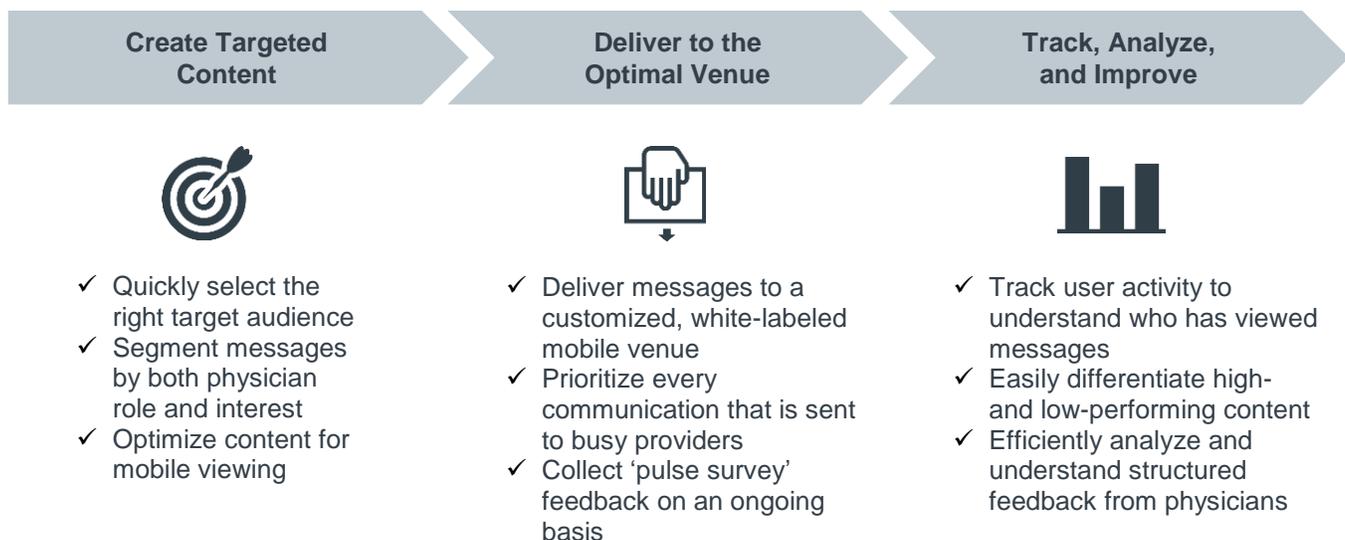
It's no secret—physicians have a lot on their plate. From providing excellent patient care to managing their administrative and organizational activities, today's physicians have more responsibilities than ever before. Couple that with the transformative change currently underway in the health care enterprise—and the need for sustainable physician engagement and ongoing communication is clear.

Unfortunately, legacy communication tools and strategies create more noise than signal, leaving physicians feeling disconnected in this time of increased complexity. Institutions need tailor-made communication mediums to bridge the gap between organizational needs and the realities of physician practice.

Crimson Connect offers administrators and clinical leaders the ability to reach the right clinical staff with the right information at the right time. Through a unique combination of targeted strategic support and innovative 'mobile-first' capabilities, Crimson Connect ensures that your physicians stay continually invested, informed, and engaged.



Key Features



More than Technology: Robust Support to Drive Ongoing Adoption and Impact

Leverage The Advisory Board Company's Expertise to Transform Communication Strategies



Strategic Support at the Outset

- Assessment of current communication tactics
- Recommendations from Advisory Board experts on best practices to overhaul communication strategy



Best-Practice Tools and Templates

- Access to the Advisory Board's library of communication-related research
- Custom templates designed to address specific communication types and needs



Implementation and Roll-Out Resources

- On-site resources dedicated to driving adoption and use of the platform
- Training resources for both physician and administrator users



Ongoing Monitoring

- Advisory Board advisors and experts track utilization and engagement
- Proactive next step recommendations keep communication active and invigorated

Benefits of Membership



Research

Offering best-practice research to help members understand physician communication patterns and improve engagement and performance



Technology

Access to a fully customizable platform designed with a single goal in mind—to simplify, streamline, and improve the physician communication experience



Services

A deep bench of physician engagement experts who are ready to help jump-start critical transformative initiatives



Interested in learning more about Crimson Connect?

Contact us to obtain more information or schedule a demo.

Matt Allen

Director, Performance Technologies

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Appendix

The Advisory Board's Survey Solutions' National Physician Engagement Database evaluates physician engagement using the below index and then measures the top drivers impacting engagement through a multivariate regression analysis.

Chart 1: Advisory Board Survey Solutions' Engagement Index

Differentiated Dependent Variables for Measuring Physician Commitment

Engagement Index

- This organization inspires me to perform my best
- I am willing to put in a great deal of effort in order to help this organization succeed
- I would recommend this organization to other clinicians as a great place to practice
- I am likely to be practicing with this organization three years from now

Chart 2: Top Impact Drivers for Economically Affiliated Physicians³⁹

Multivariate Regression Analysis of 2014 Benchmark Cohort

Top Drivers for Economic Affiliates

Rank-Ordered by Impact on Engagement Index

1. I would recommend this organization to a friend or relative to receive care
2. **The actions of this organization's executive team reflect the goals and priorities of participating clinicians**
3. **This organization is open and responsive to my input**
4. I am interested in physician leadership opportunities at this organization
5. This organization supports the economic growth and success of my individual practice

38) Regression model includes 13 of 28 engagement drivers; $r^2 = 0.639$

Chart 3: Performance Variation Across Cohort on Top 10 Engagement Drivers

Percentage of All Economically Affiliated Physicians Agreeing or Strongly Agreeing Per Organization

