

Cardiac Rehabilitation Adherence Strategy
Use of Text Messaging and Mobile Applications

Subject	Content
Definition/Description	Text messaging and mobile applications using smartphones to expand strategies to support cardiac rehabilitation enrollment and adherence.
Key Terms/ Abbreviations	<ul style="list-style-type: none"> • CR = Cardiac Rehabilitation • EMR = Electronic Medical Record • HIPAA = Health Insurance Portability and Accountability Act • HITECH = Health Information Technology for Economic and Clinical Health • HL7 = Health Level 7 • ITD = Information Technology Department • ITP = Individual Treatment Plan • SMS = Short Message Service • Text messaging = texting, SMS text messages typically sent via smart/cell phones; phone application, mobile phones, smartphone applications digital health, mobile health, CR, smart pads/tablets, vendor-proprietary software.
Background and Purpose	<ul style="list-style-type: none"> • Increasing evidence suggests that structured text messaging programs or specific smartphone apps may increase enrollment, and patient engagement / satisfaction in phase II and possibly phase III CR programs. • The literature regarding the use of text/SMS messaging for health care enhancement suggests there are potential benefits to be gained beyond the current standard CR care paradigm; however the research is limited both in volume and quality (small, nonrandomized trials with short term assessment and limited outcome evaluation). Consideration should be taken that it is a challenge to identify key content and design elements for this evolving concept. • May play a role in readmission reduction strategies in healthcare reform payment initiatives such as Bundle Care Payment for 30-90 days with greater patient engagement with clinicians on a more frequent basis via text or mobile app which may increase patient's adherence to their plan of care.
Relevant Metrics	<ul style="list-style-type: none"> • Track enrollment and attendance of patients that use an app or receive text messages. • Increase patient engagement in between visits.

	<ul style="list-style-type: none"> ○ If patient did not show up reminder call may be triggered. ○ Reduce non-attendance at follow-up appointments %. ○ Patients who complete the program from ~XX to XX% ○ Program completion 36 sessions or # of insurance claims generated. ● Engagement (% messages sent to patient and read) ● Satisfaction ● Confidence in Self Care (1-10 score).
<p>Process Description/ Processes Impacted</p>	<p>Regulatory</p> <ul style="list-style-type: none"> ● Ensure management of patient data is HIPAA-compliant (review with ITD and Legal Counsel) ● Discuss does patient data reside within the hospital system/on vendor server ● Assess if data are stored securely (firewalls/HL7 refers to a set of international standards for transfer of clinical and administrative data between software applications used by various healthcare providers/encrypted) ● Examine if vendor has access to patient-identified data ● Explore who owns the data (shared with vendor, hospital secure access only) <p>Financial</p> <ul style="list-style-type: none"> ● Recommend development of an internal business plan for incorporation of text/mobile app that addresses return on the investment: direct revenue enhancement (what increase in program attendance/patient volume is required to offset cost of purchasing and operating the system?) as well as quality improvement outcome tracking plan (indirect cost savings of program from decreased readmissions). ● Discuss if this service a standard offering to all CR patients or an add-on service. If add-on service, factor in utilization rate/volume. ● Examine if there an additional patient-borne cost for the use of this system or will this be underwritten (partially or in whole) by the institution. ● Assess is the design/cost of service acceptable to your patient population. ● Consider additional costs to patient (e.g. cost of phone, cost of additional data use). ● Factor in initial cost as well as ongoing license/utilization fee for service. ● Consider additional personal time to operate system, data entry, compile data. ● Explore if training cost/time for CR staff and patient end user acceptable ● Assess if vendor system technology is compatible with your EMR. Will data be stored in patient EMR or on separate server. ● Review data access/storage issues with ITD and Legal department.

	<ul style="list-style-type: none"> • Discuss with hospital finance regarding telehealth reimbursement. <p>Programmatic Design</p> <ul style="list-style-type: none"> • Perform a review of literature to see the various applications of CR texting use. • Identify a champion advocate for CR texting and mobile apps. Starting with CR Medical Directors and service line administrator for recommendations on design and implementation of program. • Assess if the hospital has strategic plans via EMR for app development and/or implementation for patient care prior to vetting external vendors. • Discuss with hospital ITD capabilities of features via patient portal for pushing notifications of appointment reminders and educational teaching points. • Survey inpatients and outpatients regarding ownership and use of computers and mobile phones (types of mobile phones). • Identify your hospital vetting process (legal clearance, IT needs, compliance review) for external approval of mobile app vendors • Examine if text is program design flexible to meet unique facility/program needs or a standard canned package • Assess if program can run on all standard platforms (Apple, Android). Many newer apps do not work well with iPhone Operating System that is just a year or two old and patients may need to upgrade their phones. • Review if text messages are canned statements or patient tailored based on the CR ITP, if text messages be modified and who is responsible (vendor or CR staff) • Explore timeline/skill requirements to develop/modify text message • Inquire if text messages are generated based on patient progress/achievement of specific milestones or at fixed intervals • Are text messages one-way (from hospital to patient only) or bi-directional (patient can respond/interact with CR staff) • Discuss bi-directional data flow and determine how critical patient care issues will be dealt with (response time frame, disclaimers, hours of operation) • Determine the key quality items that will be tracked and how/who will analyze • Ensure that content of text message is consistent with other program educational information • Explore if text messaging content is appropriate for all CR patient populations? • Discuss with hospital ITD a grant and if being considered to support the text messaging program, is there a sub division of ITD for research clearance.
<p>Key People/ Departments to Engage</p>	<ul style="list-style-type: none"> • Medical Director and Cardiac Rehabilitation staff

	<ul style="list-style-type: none"> • Department of Cardiology practices, Chief Nursing Officer- Departments of Nursing, and Hospital Administration • ITD for either a homegrown app or vendor off the shelf option. • Legal department and/or Information Privacy and Security Officer/Department to vet and approve specific messaging per HIPAA and HITECH Act • Finance department to look at billing and telehealth • CR collaboration with other departments with similar longitudinal care coordination with texting capabilities to patients. • Patient Advisory Council for text or mobile app program responsible for development of how many SMS/week patients should receive.
<p>Data Sources</p>	<ul style="list-style-type: none"> • Vendor platform and ITD integration via a secured portal is needed and integration with hospital system EMR would be optimal. • Access to number of sessions via hospital records. • Current patient data utilizing smartphone technology supported by a web-based clinician dashboard to enhance their Cardiac Rehabilitation experience, and compliance with enrollment and adherence to attendance of the program. • Individual patient engagement, completion of and responses to daily messaging are readily available for review by clinician in real time mode. • Seamless transmission of different mobile devices transferring info to CR Vendor platform and hospital system EMR. • Patients need a cell phone with SMS or internet access. • Patients must be in agreement with the timing of the texting, or push notifications.
<p>Cost Concerns</p>	<ul style="list-style-type: none"> • Vendor fees/license fees for off the shelf apps and customization. These fees may be the responsibility of the institution or patient depending on specific design and structure. • Cost of HL7 and ITD consult time for programing interface • Additional patient fees may be incurred for wireless data transfer, and must be disclosed. • Data fees, pay as you go phones • Additional staff time to run program (read and answer patient texts and data). (efficiency with group texting) • Nurse Managers can engage with patients using the app when doing rounding among the CR groups. • Vendor partner can measure time spent by CR staff on dashboard to evaluate efficiency and productivity as well as messaging to patients. • For those patients who don't have smartphones or tablets, the vendor can set up phone rental arrangements whereby patients have access to a smartphone for the duration of their use of the mobile care program.

<p>Timeline</p>	<ul style="list-style-type: none"> • Variable to build and implement. 3 months to 1 year from vendor agreement to application. • Duration also variable but presumably 36 sessions (~3-4 months). Patient timeline- rolling admission to all CR patients who have access to the smartphone/pad/tablet technology. Best if patients start on app as soon as starting traditional CR program. May consider enrolling patients on the app during inpatient stay for qualifying cardiac event if looking to connect with patients sooner in the outpatient setting. This strategy can potentially enhance CR enrollment by engaging patients at an earlier point in their recovery process when they are at their highest levels of motivation to change health behaviors.
<p>Supporting Material</p>	<ul style="list-style-type: none"> • Examples of companies who could or have designed CR apps: <ul style="list-style-type: none"> ○ www.movinganalytics.com ○ http://www.stickk.com/ ○ http://santechhealth.com/ ○ https://www.wellframe.com/ ○ https://www.healthcrowd.com/ • Vendor Checklist: <ul style="list-style-type: none"> ✓ Define the goals of an app (increase referrals, increase attendance, modify/track un/healthy behaviors or risk factors, provide virtual education and/or connectivity with providers) ✓ Will the app meet your goals and integration needs? This largely depends on vendor presentation of the app and its capabilities/functions, and efficacy data. ✓ How customizable is the program? ✓ What do existing users say about it? ✓ Are there any published or other proof points about its efficacy? ✓ Is it easy to use by patients of all ages and socio-economic backgrounds? ✓ What's the ease of use for staff and patients? ✓ How many patients will adopt the app, and how many will decline? ✓ How long is implementation? ✓ Do you need or want to integrate with an EMR or any other existing system? If yes, for what purposes and to what extent? ✓ Can our current budget fund the app or will a budget need to be created/how will department fund it? Cost may be greater for higher levels of integration. ✓ What is anticipated payback period? This is likely based on anticipated increases in attendance (thus billable sessions) vs not using the app, after expenses are deducted. Carefully vet this. Best/Worst case scenarios should be considered here.

	<p>✓ HITECH act considerations for sharing of PHI-Business Associates Agreement likely will be needed or at least embedded in the Service Agreement. Contact your legal department first!</p>
<p>References</p>	<ol style="list-style-type: none"> 1. Forman D, LaFond K, Panch T, Allsup K, Manning K, Sattelmair J. Utility and efficacy of a smartphone application to enhance the learning and behavior goals of traditional cardiac rehabilitation: a feasibility study. <i>J Cardiopulm Rehabil Prev.</i> 2014 Sep-Oct;34(5):327--234. doi: 10.1097/HCR.0000000000000058. 2. Chow CK, Ariyaratna N, Islam SM, Thiagalingam A, Redfern J. mHealth in Cardiovascular Health Care. <i>Heart Lung Circ.</i> 2016 Aug;25(8):802-7. doi: 10.1016/j.hlc.2016.04.009. Epub 2016 May 11. 3. Lounsbury P, Elokda AS, Gylten D, Area R, Clarke W, Gordon EI. Text-messaging program improves outcomes in outpatient cardiovascular rehabilitation <i>IJC Heart Vasc.</i> 2015;7;170-175 4. Widmer RJ, Allison TG, Lerman LO, Lerman A. Digital Health Intervention as an Adjunct to Cardiac Rehabilitation Reduces Cardiovascular Risk Factors and Rehospitalizations. <i>J Cardiovasc Transl Res.</i> 2015 Jul;8(5):283-92. doi: 10.1007/s12265015-9629-1. Epub 2015 May 7. 5. U.S. Department of Health and Human Services. Health Resources and Services Administration. <i>Using Health Text Messages to Improve Consumer Health, Knowledge, Behaviors, and Outcomes: An Environmental Scan.</i> Rockville, Maryland: U.S. Department of Health and Human Services, 2014.

Questions should be directed to: aacvpr@aacvpr.org