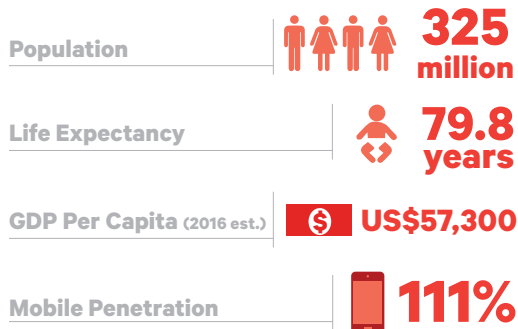# Care Beyond Walls and Wires™
Using Remote Monitoring to Enhance Patient Care

About half of all adults in the US—117 million people—have one or more chronic health conditions, and the number is on the rise.[1] In order to address this growing challenge, the Care Beyond Walls and Wires (CBWW) program was created to increase access to care and improve outcomes for patients suffering from chronic disease. A collaboration between Qualcomm® Wireless Reach™, Northern Arizona Healthcare (NAH), Qualcomm Life, Inc., and Entra Health Systems, a CRF Health company, CBWW began as a congestive heart failure remote monitoring program. Started in 2011, CBWW utilizes 3G/4G mobile broadband with connected home-use medical devices to enable nursing care coordinators to remotely monitor patients. As of 2017 the program is expanding to cover more patients with other chronic or high-risk conditions such as sepsis (blood poisoning from infection). The program aims to extend the delivery of care beyond the walls of hospitals by giving patients the tools to stay connected to providers – anytime, anywhere.

UNITED STATES
2017 Statistics*

Population		**325 million**
Life Expectancy		**79.8 years**
GDP Per Capita (2016 est.)	$	**US$57,300**
Mobile Penetration		**111%**

Challenge

- 90% of all health care spending in 2014 was for people with one or more chronic medical conditions.[2]

- Surgeries with implantable devices, such as open-heart surgery, put patients at a higher risk for contracting sepsis after undergoing an operation. In fact, 750,000 patients a year are hospitalized for sepsis.[3,4] Mortality rates for patients in severe sepsis are around 20% or higher.[5,6]

- New hospital readmission payment reductions took effect October 2016 for re-hospitalization of patients with six common conditions, including heart attacks/heart failure, pneumonia, chronic lung disease, hip and knee replacements and coronary artery bypass graft surgery.[7]

- The Centers for Medicare and Medicaid Services (CMS) payment reductions for hospitals with excess readmissions will reach a new high in 2017 as Medicare is expected to withhold more than half a billion dollars in payments, up $108 million from $430 million in 2016.[8]

Solution

- With the program's expansion, NAH is now enrolling new types of patients into CBWW: those with multiple chronic conditions, those at risk for developing sepsis, such as open-heart surgery patients, and pre-hypertension wellness patients.

- Many of NAH's patients live in underserved, ultra-rural communities, including some on remote Native American reservations, where regular support provided by their care managers is crucial.

- Patients are given a remote monitoring kit that includes wireless home-use medical-grade devices, such as a blood pressure cuff monitor, weight scale, pulse oximeter, thermometer and a Qualcomm Life 2net™ Hub, a plug-and-play communications device.

- Participants use the medical devices to take daily measurements that are communicated via the 2net Hub over a 3G/4G wireless network to a digital health software platform by Entra Health Systems called "MyHealthPoint."

- Care managers log in to the platform on a regular basis to monitor patients' data uploads and call them as needed. Patient data, and any notes the care manager may have, are also uploaded into the patients' electronic health record for other medical providers to review.

- If care managers see a warning sign, they may call the patient, alert the provider, order testing or change medications as necessary.

*Sources: CIA World Factbook (https://www.cia.gov/library/publications/the-world-factbook); US Census Bureau (https://www.census.gov/popclock/); Mobile penetration data provided by Ovum World Cellular Information Service and based on market intelligence.

Impact

(The following statistics are from a program evaluation at Flagstaff Medical Center that took place from 2011 to 2012.[9])

Results Published in Peer-reviewed Journal

Program evaluation results were published in 2015 in *Telemedicine and e-Health*, the official journal of the American Telemedicine Association and the leading peer-reviewed journal on cutting-edge telemedicine applications for patient care.[10]

44%
Preventing Readmission by 44%

Patients were readmitted to the emergency department 44% less on average in the six months following enrollment compared to the six months prior to enrollment in the program evaluation.[11]

64%
Decreasing Days Hospitalized by 64%

Patients experienced 64% fewer days hospitalized on average in the six months following enrollment compared to the six months prior to enrollment in the program evaluation.[12]

$92,000
Lowering per Patient Hospital Charges by $92,000

Hospital charges per patient were $92,000 less on average in the six months following enrollment compared to the six months prior to enrollment in the program evaluation.[13]

Improved Patient Satisfaction

"Since I started using this I haven't been back into the hospital for heart failure at all. Now that I've gotten used to it, I enjoy doing it now. It's good for me, 'cause I know [the NAH care managers] are keeping track of me." – Manuel Ono

Program Stakeholders

Northern Arizona Healthcare
Flagstaff Medical Center

QUALCOMM LIFE
a Qualcomm company

C-R-F HEALTH

Qualcomm
wireless reach

[1]Ward BW, Schiller JS, Goodman RA. Multiple chronic conditions among US adults: a 2012 update. *Prev Chronic Dis*. 2014; 11:130389. http://dx.doi.org/10.5888/pcd11.130389

[2]Buttorff, Christine, et al. Multiple Chronic Conditions in the United States. Santa Monica, CA: RAND Corporation, 2017. https://www.rand.org/pubs/tools/TL221.html

[3]Kochanek KD, Murphy SL, Xu J. Deaths: Final data for 2011. *Natl Vital Stat Rep*. 2015; 63(3):1–120.

[4]Angus DC, Linde-Zwirble WT, Lidicker J, et al. Epidemiology of severe sepsis in the United States: Analysis of incidence, outcome, and associated costs of care. *Crit Care Med*. 2001; 29(7):1303–1310.

[5]Seymour CW, Rea TD, Kahn JM, et al. Severe sepsis in pre-hospital emergency care: Analysis of incidence, care, and outcome. *Am J Respir Crit Care Med*. 2012; 186(12):1264–1271.

[6]ProCESS Investigators, Yealy DM, Kellum JA, et al. A randomized trial of protocol-based care for early septic shock. *N Engl J Med*. 2014; 370(18):1683–1693.

[7]Medicare's Readmission Penalties Hit New High. Kaiser Health News. August 2, 2016. http://khn.org/news/more-than-half-of-hospitals-to-be-penalized-for-excess-readmissions/

[8]Kaiser Family Foundation. Aiming for Fewer Hospital U-turns: The Medicare Hospital Readmission Reduction Program. March 10, 2017. http://kff.org/medicare/issue-brief/aiming-for-fewer-hospital-u-turns-the-medicare-hospital-readmission-reduction-program/

[9]Qualcomm Life medical devices and the Entra Health Systems software platform were not used in the program evaluation.

[10]Riley et al. "Program evaluation of remote heart failure monitoring: healthcare utilization analysis in a rural regional medical center." *Telemed J E Health*. 2015 Mar;21(3):157-62. https://www.ncbi.nlm.nih.gov/pubmed/25025239

[11, 12, 13]Ibid.

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