

# Technology Adoption for Health Care Management Among Older Adults

Embracing app-based technology as a means  
for better managing post-operative care after arthroplasty

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## Abstract

At the turn of the millennium, older adults (defined as those over age 50) significantly lagged behind the younger generation in technology adoption. Just 20 years later, older adults have closed the gap in their use of smartphones, apps, online medical information and preference for mixed medical management. The statistics may be surprising, but the trend is clear: digital medical management is being and will continue to be embraced by older adults.

Health care providers and innovators must develop and utilize new patient care management tools in order to meet the demands and expectations of this modern-aging adult generation. Combined solutions such as wearable technology and strategically designed smartphone apps can equip patients to better manage their own health outcomes and provide convenience, while potentially reducing healthcare costs for this population.

## Problem Statement

There is a long-held belief that adults over the age of 65 are not digitally savvy and furthermore uninterested in becoming such. While this stereotype was formerly consistent with the attitudes of the elderly as reported in survey research, it no longer holds true today. One may conclude that older adults find it easier to embrace digital resources than the younger generation find it to appreciate the former's maturing relationship with technology. Consequent of this lagging perception, innovators and health care providers have neglected to introduce digital solutions to this demographic. Yet, mixed health care management (combining digital with traditional health care staff) seems to present an ideal solution in the quest to achieve maximum health outcomes, particularly in active, motivated older adult segments.

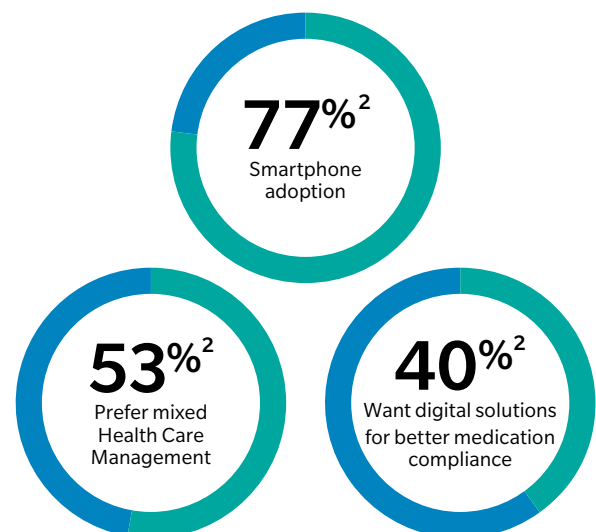
## Background

### The Evolution of Adoption

At the turn of the millennium, a mere 14% of those over 65 were Internet users and only a rare older adult owned a smartphone.<sup>1</sup> Even as recently as 2014, research reported that 50% of adults over the age of 50 owned a smartphone compared to 80% of their younger counterparts.<sup>2</sup>

However, in the last six years, smartphone adoption among older Americans has increased significantly from 50% in 2014 to 70% in 2018 to 77% at the time of the report's publication in 2020.<sup>2</sup> Another contemporary report stated that three of four adults age 55-65 own smartphones, download and use apps. The same report noted that this group accesses medical information online in the same proportion as those under 55.<sup>3</sup>

## Quick Facts: Older adults are adopting digital solutions faster than we may realize<sup>2</sup>



### **Digital Technology for Health Management**

Increasingly, those surveyed are interested in digital resources that improve their health care management including apps, phone calls, video consultations with and text messages to health care providers.

- 40% have used a health care app.<sup>3</sup>
- 60% have engaged in a virtual care phone call.<sup>3</sup>
- Around 30% have used video calls or text messages with health providers.<sup>3</sup>

In an attitude survey, 40% of baby boomers indicated that they would like to use a technology that would improve their medication compliance, and more than half reported a preference for mixed (digital and traditional) health care provision.<sup>2</sup>

While the numbers are perhaps not staggering, they are indicative of the ever-increasing popularity and importance of digital health resources. Moreover, the statistics demonstrate the eagerness of this demographic to embrace new methods of health care management. Not yet accounted for in reported research, is the effect of COVID-19 on the use of digital health technology. Of note, in a survey of nearly 5,000 practicing US physicians in July 2020, 80% had conducted a virtual patient consult in the last three months. Of the physicians who said they had conducted a virtual consult in the prior three months, half expected to continue this method of consult following the COVID-19 pandemic.<sup>4</sup> What is evident is that irrespective of the effects of COVID-19 on physician-patient consultation, the latter expects to spend less time waiting in a doctor's office and we can only anticipate that the recent global pandemic further incites that preference.

Digital platforms may also provide older adults with the opportunity to stay connected. Many elderly face social isolation, further compounded by the aforementioned pandemic. One study investigated isolation among seniors during the pandemic and, perhaps unsurprisingly, found that seniors quarantining alone who used technology to connect with others felt less isolated than those who did not. The importance of leveraging technology for connecting support systems is underscored when public health policy recommends social distancing. Nevertheless, it can be beneficial at all times given the needs of the older population. Often, the medical community serves both as a health and a social system of connecting for seniors. Leveraging technology to deepen these connections has the potential to enhance well-being in this population.<sup>5</sup>

### **From Trial to Adoption**

With a multitude of health information technologies available, it is important to elucidate which factors lead from trial to adoption in a senior user group. A meta-analysis of 41 studies concluded that performance expectations had a significant and positive impact on adoption. More simply stated, the more useful the user

found the technology, the more likely he was to adopt it. Effort expectancy and price/cost to value ratio also had a significant impact on adoption from the standpoint that too much effort or too much cost versus value proved a barrier to adoption. The conclusion: health information technologies win with older adults when they add value, are easy to use and costs remain controlled.<sup>6</sup>

Another study assessing the adoption of wearable devices delved further into this topic. Not only did the study corroborate what is presented above, concluding that complexity is a barrier to adoption, it went a step further to understand the reasons or definition of complexity to users. Not surprisingly, the seniors found wearable technologies complex because they didn't know how to interpret the results.<sup>7</sup> Thus, we can conclude that information from wearable devices must be self-evident and meaningful to the end user.

We would be remiss to conclude this section without also noting that one of the primary concerns of older adults with health technology solutions is privacy. "Only about 1 in 10 are very or extremely confident that their interactions with any smart home technology will be kept private."<sup>2</sup>

### **Solution**

This evolving dynamic presents an important opportunity for health care providers and medical technology innovators alike to transform patient management pathways. The future belongs to the innovators who integrate digital solutions with good old fashion medical expertise to maximize patient outcomes and comfort. Fortunately, there is research to guide innovators who want to strategically design technology in alignment with the demonstrated adoption characteristics of this demographic.

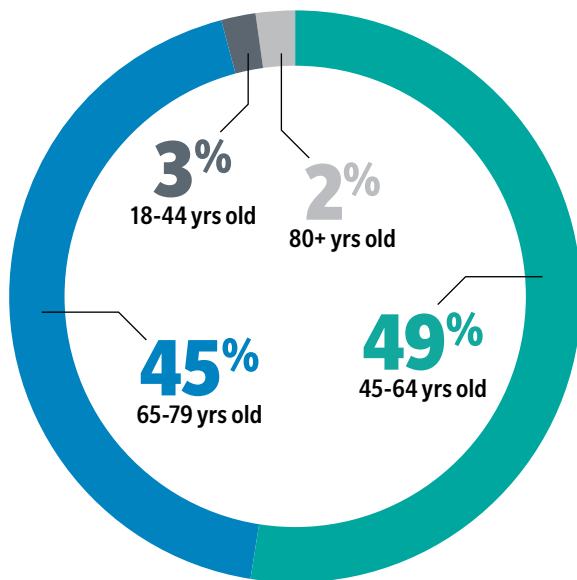
### **mymobility® from Zimmer Biomet**

The use of technology as a tool to manage and coordinate care before and after arthroplasty is a natural fit. Moreover, user-focused design, simplified instructions and clear, meaningful contextual information, make adoption of technology more likely.

mymobility® with Apple Watch is a care management platform that uses iPhone and Apple Watch to help deliver support and guidance to patients through a connected experience. mymobility delivers continuous data and patient-reported feedback to health care providers to facilitate care, outcomes and satisfaction about patients' surgical preparation and recovery. Meanwhile, patients receive engaging educational content and exercise direction appropriate for their unique recovery which enables them to better manage the post-operation phase. Additionally, physicians and patients can maintain communication and connection via telemedicine solutions built into the platform, like messaging and virtual video visits\*.

Historically, the average age of an arthroplasty patient was 71.<sup>8</sup> However, over the last three decades with the advances in procedural efficacy and prosthesis durability, arthroplasty is often recommended for much younger patients and now the average patient is 65-years-old.<sup>9</sup> This 6 year-shift in age means that even more patients are likely to have smartphones and prior app experience.

Based on the previously discussed trends, the majority of these patients do have access to a digital care management platform through a smartphone. The demographic results from the mymobility clinical trial are shown in Figure A and help to confirm the willingness of Preliminary demographic to adopt health information technology.<sup>10</sup>



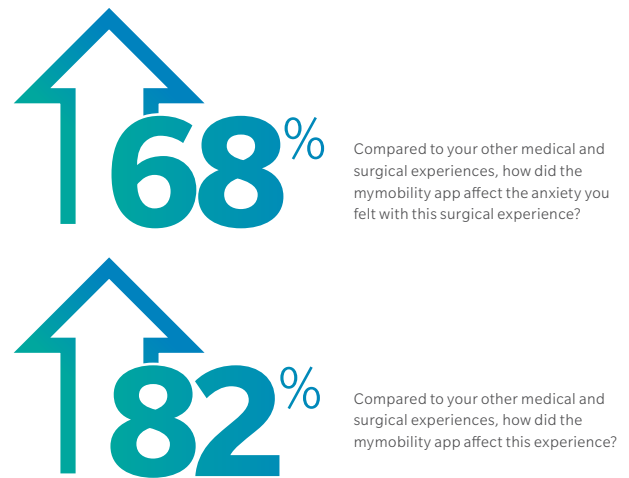
**Figure A**  
Source: mymobility Clinical study data-mymobility patients through November 21, 2022

Zimmer Biomet has strategically designed mymobility to optimize the user experience by reducing app complexity with a guided and connected experience, providing meaningful data to both health care and patient users.

The mymobility with Apple Watch platform has been designed to make enrollment and setup easy for both patient & provider. During a pre-operative consult, prospective orthopedic patients are enrolled in the program and advised to download mymobility on their smartphone. Many patients enrolled in mymobility also choose to utilize the Apple Watch through their episode of care. The Apple Watch is provided to patient via the program with a discounted purchase option at the conclusion of the episode of care. A customer service phone number is available to support patients in case of questions.

Pre-procedural anxiety has been shown to be a predictor of post-surgical satisfaction.<sup>11</sup> Preliminary data from the mymobility Clinical Study (study ongoing) shows an overwhelming 82% of subjects in the mymobility clinical study reported that their surgical experience was “better” or “much better” than other surgical experiences. 68% responded that the mymobility app had a positive impact on their surgery-related anxiety by answering better or much better when comparing this surgical experience to previous medical and surgical experiences.<sup>10</sup>

**mymobility from Zimmer Biomet improved procedural satisfaction percentage of patients who answered ‘better’ or ‘much better’**



Source: mymobility Clinical study Preliminary Data. Patients completing survey through November 21, 2022.. Questions answered between 14 and 44 days post-op. Study ongoing.

Post-operatively, the app continues to track patient’s progress through remote monitoring, Patient-Reported Outcome Measures (PROMs) collection, engagement and adherence. One year follow-up data from the mymobility clinical study evaluated 401 patients with one year follow-up data (data extract May 2, 2022) who underwent total or partial knee arthroplasty. The data found that in comparison to the control group, the Zimmer Biomet ongoing mymobility group required significantly fewer physical therapy visits ( $p < 0.0001$ ). Additionally, the mymobility group utilized fewer emergency department visits related to the index procedure, from 5.4% in the control group to 1.3% in the mymobility group. The finding is both clinically and statistically significant ( $p = 0.03$ ).<sup>12</sup>

Zimmer Biomet prioritizes patient privacy and data security and takes seriously its obligations to comply with applicable law, including its duties under the US Health Insurance Portability and Accountability Act (HIPAA) and European General Data Protection Regulation (GDPR). mymobility has implemented measures to safeguard patient personal health information.

\*Some features may not be available on the web-based version.

## Conclusion

Older adults are demonstrating a continued and significant adoption of technology. Moreover, baby boomers are increasingly eager to have their health care needs managed through a combination of technology and traditional health care.

Resources such as Zimmer Biomet's mymobility app can support patients in the preparation for and post-

operative management of several orthopedic procedures. Health care providers must continue to innovate with solutions that enable patients to enhance their treatment experience and ultimately contribute to their own outcomes. The new frontier of medicine and medical research will be exploration and research to determine whether improved clinical outcomes can be achieved through mixed medicine.

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Patients must have Internet access and a text-capable mobile device or a compatible smartphone to use mymobility. Not all features are available on all phones or the web-based version. Apple, Apple Watch, iPhone are trademarks of Apple, Inc., registered in the U.S. and other countries. The Zimmer Biomet Connected Health mymobility® Application.

