



The Future of Home Care Technology

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Sponsored by LivHOME, Microsoft, and Philips

“Technology is not the panacea, but it serves as a vital tool to assist both informal and formal caregivers to better care for those who require some assistance. Integrating high technology with high touch will result in better communication and coordination of care at an affordable price. Technology does not replace professionals but rather enhances the quality and availability of services within the continuum of care.”

Mike Nicholson, CEO, LivHOME

The technology used by caregivers will become increasingly important to older adults and their families. As technology is integrated into the daily activities of seniors, it has the power to transform lives by helping individuals stay more connected, independent and active.

Bonnie Kearney, Director of Trustworthy Computing Communications for Accessibility and Aging at Microsoft

“The demands for supportive home care will soon outstrip the supply of available “hands on” care. A range of new technology based solutions will help extend the supply of “hands on” care -- enabling tasks that require high touch to occur and be complemented by remote care tools. New solutions will bolster care in new and exciting ways, enabling caregivers to be more efficient and older adults to be more engaged and enabled to stay connected and independent.”

Deb Citrin, Sr. Director, Strategy & Business Development, Home Monitoring, Philips Home Healthcare Solutions

EXECUTIVE SUMMARY

Experts agree that the home care industries (non-medical home care, home health care, and geriatric care management) are at the early stages of maximizing benefits of technology. Information about the individual client is not yet passed effectively or electronically between the various locations a care recipient may visit. In a survey of home care managers responsible for a total of 34,509 workers, telephone and email dominate the communication toolkit. Little in-home use is made of telehealth and chronic disease monitoring tech, even less use of video communication with either the care recipient or the family. As non-institutional home care plays a growing role along the care continuum, a Home Care Information Network (HCIN) will form, enabling important information to follow the care recipient across building boundaries, boosting quality and informing and reassuring families. To maximize its benefit, organizations that deliver care must:

- 1) Boost partnerships that span non-medical, home health, and geriatric care
- 2) Craft a technology strategy that enables integration of processes and data
- 3) Identify strategic and local technology partnerships to turn strategy into reality
- 4) Inspire and engage family members, partners and staff about technology use

WHO SHOULD READ THIS REPORT?

This report, sponsored by LivHOME, Microsoft, and Philips, looks at current technology use and processes, suggesting changes required to better serve recipients of care in the home. It is relevant to:

- Policy makers and government agencies
- Health care organizations focused on improving care transitions
- Vendors within or considering entry into the market for care-related technologies
- Technology platform providers
- Telecommunication carriers
- Professional home care service providers
- News media
- Social services and non-profits focused on home-delivered care
- Professional geriatric care managers
- Caregivers, seniors, and family members

REPORT METHODOLOGY

This report represents a snapshot of the use of home care technology through an online survey of 315 supervisors responsible for 34,509 workers in home care, home health care, and geriatric care management employed by organizations and/or franchises.¹ The survey focused on what technology their workers have and use (cell phone, smartphone, laptop, tablet, sensors – and apps), what technology they recommend, and what data is captured and reported. In addition, 21 qualitative interviews were held with leading experts from each of the segments represented in the report: non-medical care, home health care, geriatric care as well as technology vendors.

HOME CARE – FILLING THE CARE GAP THAT SENIOR HOUSING DOES NOT

Over the past 10 years, the number of nursing homes has declined, with 1000 closings as of 2009.² Meanwhile, the growth of non-profit and for profit senior housing businesses like CCRCs and 55+ housing communities as well as Assisted Living communities stalled during the recession. Many were saddled with capacity and debt, the result of over-leverage during the housing bubble. Seniors wanting to move in could not sell their homes to make the move financially feasible. By 2011, the average move-in age to Independent Living pushed into the mid 80’s, while average age for Assisted Living move-in climbed to 89 – influencing services offered, the growing requirement for dementia care and other on-site therapies.³ Meanwhile:

The home care market has become a booming business. Home care of various types now augments and even enhances services that may have been provided by senior housing (see **Figure 1**). By 2010, the Bureau of Labor Statistics reported that home health and personal care aides represented the fastest growing job categories in the US – they are also among the lowest paying and least trained. This is no surprise – frail patients discharged from hospitals and rehab nursing homes might still require assistance with activities of dressing, bathing, medication management, food preparation and household tasks. And many already at home and in assisted living need the same care. Forecasts indicate a 70% jump in numbers of these jobs by 2020.⁴

Categories of home care	Services offered	Example organizations
Non-medical home care (sometimes called Companion Care)	Personal care, daily activity support, laundry, light housekeeping, meals, transportation	ComfortKeepers, HomeInstead, RightatHome
Home Health Care	Can include above, but also adds skilled, medically related services, can be Medicare-certified, can offer hospice care	Gentiva, Interim HealthCare, Visiting Nurse Services New York
Geriatric Care Management	Coordinates services, can include financial, guardian and legal help, can provide various types of aides	LivHOME, SeniorBridge

Figure 1 What is home care?

Aging population and healthcare changes make growth of home care inevitable. With the 85+ now representing the fastest growing age segment, and with aging in place preferred to senior housing, the home health and non-medical home care industries are poised to grow: home health aide services as part of skilled home health care will be further fueled by hospital penalties for excessive readmissions of patients with heart failure, heart attack or pneumonia in 2012.⁵ Furthermore, shrinking reimbursement rates for rehabilitation/nursing home stays and reduction in Medicaid coverage will boost risks to those frail elderly who are most likely to be readmitted to the hospital post-discharge and who may be least equipped to take care of themselves.

Trends are obvious to industry insiders – but technology strategies lag behind

Stakeholders in the home care industries acknowledge pressure for greater technology adoption, driven by:

- 1) Lower reimbursements for hospitalizations and doctor-prescribed home health care;
- 2) Expectations of seniors that they will be able to age at home;
- 3) Increased focus on accountability and documented outcomes across all stages of care;
- 4) Increasing pressure for processes that are well-defined and able to be replicated.

However, today there is no nationwide regulation or documented expectation about what care should be offered, its standard of care, or who will monitor its quality and delivery.⁶

Home care quality and oversight are variable. Unlike nursing homes, no standards-setting organizations specify minimum care requirements in the home. At the lowest skill level, home care jobs pay between \$9-10/hour according to the Bureau of Labor Statistics.⁷ Most firms hire part-time workers and overall job turnover is high – 40-60% (up to 100%) in some cases. In addition to low pay and benefits, non-medical and home health jobs can be lonely, with no onsite supervision or peer relationships. Care may be constrained to a few hours per day, just three times per week, whether by insurance reimbursement rates or cost to families – and private pay full-time care is not viable. According to Genworth Financial, with a median wage of \$18-\$19/hour, full-time care would cost double or triple the \$41K average cost of residential assisted living.⁸

“Our data show that the average utilization of home companion care is only 60 hours per month for less than a year – leaving families and/or care recipients largely on their own outside of that period.” -- Scott Dingfield, Chief Innovation Officer, Home Instead

Processes are evolving – but not yet sophisticated. Even with documented standards of care, few today have processes in place that could verify worker compliance. Within the private home setting, oversight of staff tasks relies on phone and email, with very limited use of smart phones and tablets.⁹ The primary use of systems has been to verify that the company provided -- and client received -- intended services. Agencies also use Interactive Voice Response (IVR) systems to verify staff arrival-departure times, as well as periodic reports about activities or status of care recipients. But the growth of caller ID blocking or cell phone-only use in homes and by workers has complicated the ability to verify start-end times, driving interest in and use of GPS location tracking.

Technology use is emerging – but not yet pervasive. Efforts are underway for data exchange in home health care, but these are at very early stages. Yet early adopter organizations are piloting tech improvements – among these: secure portals for sharing information with families, enabling use of video for interviews of workers, consultation among care professionals, and engagement with long-distance family. At the same time, sensor-based monitoring, telehealth data transmission, less expensive devices and growth in mobile/cellular technology make technology-supported care in the home more viable, although likely due to limited adoption, technology solutions may not be as beneficial, easy to use and as cost-effective as they can be. But new pilots continue to launch regularly, both in the US (the Veterans Administration is a well-documented and successful example) and elsewhere.¹⁰

“As a profession, often we are slow to adopt technology, afraid to be taken advantage of, claiming it is not our mission and will take too long to deploy. But technology can help engage the heart, mind and spirit of seniors, helping them to maintain independence.” – Wayne Olson, SVP Operations, Volunteers of America

“If you book a car or hotel or airplane, you can do all three on one site. The challenge in introducing home health is that it is like looking at a farm divided into little strips, all are working hard, but with no view to the overall farm; the success that the VA has had in this area is from using technology to coordinate care and not in continuing aspects of business as usual.” – Adam Darkins, MD, Chief Consultant for Telehealth Services, Department of Veterans Affairs

The clipboard is firmly entrenched – even when electronic records exist

Those who need assistance after hospitalization, ongoing care help with daily activities or who suffer from a disability or injury may not remain in one place. They often go from their home to the hospital emergency room, from ER unit to floor unit, out to a rehab facility (nursing home), or home to their residence (see **Figure 2**). Too often this cycle repeats: each time these frail individuals appear as new people, with faxes, paper records or EMR data following them as though from a great distance and long time lag. And experts admit that no standardization effort is yet underway to rationalize the difference in terminology and meaning between non-medical home care, home health care, and geriatric care management.

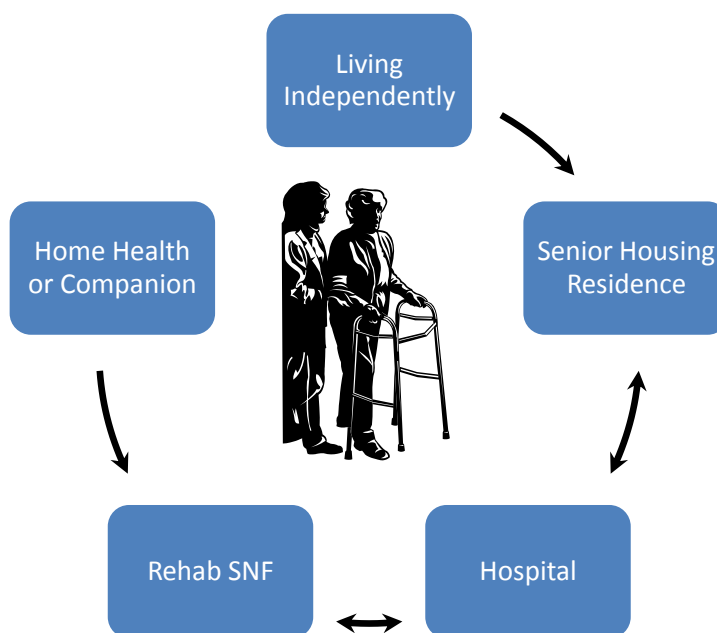


Figure 2 Care recipient’s information does not follow them through transitions of care

“Health care institutions’ biggest tech barrier is fear of anything beside the EMR project. The secondary barrier is HIPAA. Organizations assert they can only share with the ‘right people’ which means not sharing with anyone else.” – Ken Accardi, Chief Technology Officer, Ankota

“If I drive my car to a mechanic, he plugs into a module and finds a full history of work on my car. When I walk into a doctor’s office, I am handed a clipboard, even if they already have an online record about me.” – Mark VanderWerf, Director eHealth, Nonin Medical

Stakeholders cite lack of collaboration across organizational boundaries...Expert interviewees offered various reasons for the lack of technology beyond the survey’s verification that technology is primarily ‘for internal use only.’ Several cited fiefdoms of responsibilities rooted in a history of poor communication, competing payers, and lack of process ownership – these issues hamper progress.

“In many cases, home health care is at the bottom of the pecking order, not yet fully integrated into our overall care delivery system. But the opportunities are vast. Home care is well positioned to take a central role in keep patients healthy at home, helping to bring care from the doctor’s office or hospital into the day-to-day lives of patients and, in essence, becoming the quarterback of health care.” – Joseph Kvedar, MD, Founder and Director, Center for Connected Health

“In the home health continuum, there is a lack of conversation and care deliverers don’t speak the same language or have the same goal. There is not a good hand-off of information from one health care provider to the next.” – Anne Marie Gavel, VP, United Health Care Medicare and Retirement Group

...But these executives can imagine a better connected future. Within the electronic medical records (EMR) implementation transition, efforts are now underway to automate specific paper documents (for example, the home health 485 form) and make them electronic. For example, a longitudinal plan of care was developed by the Visiting Nurse Services of New York to accommodate transitions in care beyond the hospital.¹¹

“To improve transitions of care, it is essential to provide clinical information that is relevant and actionable. Standards for technology-enabled longitudinal care transitions are in development that could improve patient exchanges from acute care to long-term post-acute care (LTPAC) providers to make exchanges safer, patient-centered and more efficient.” – Richard Brennan, VP Technology Policy, National Association for Home Care & Hospice”

“The greatest opportunity to keep people at home is to deliver a type of service to keep you in contact with the patient within the first two weeks. Technology to do this should be consumer-friendly and enabling.” – Ilaina Edison, SVP Operations, VNSNY

THE SURVEY OF USAGE OF TECHNOLOGY IN HOME CARE TODAY

The survey offers a baseline quantification of the use of technology in home care today, revealing some of the techniques and challenges of the people on the front lines – supervisors of home health aides, non-medical home care aides and geriatric care managers – managing a total of 34,509 workers. There were a total of 315 responders to the survey. The survey responses are included in **Appendix I** and reveal that:

The cellphone and PC are the dominant devices in use today. Seventy-six percent of survey responders use cell phones and more than half are using either or both of a laptop (61%) or desktop (53%). Interestingly, 48% reported having smartphones, but adoption of tablets lags behind (24%) and Skype or

cameras are only used by 10%. As for text messaging, it's internal use only: more than half of managers are texting with their staff (59%) and 50% are texting with other managers.

Time and activity software was cited by fewer than half. Forty-two percent of the survey responders report using supporting application software to record time and activity data (enabling billing, payroll, performance oversight and compliance with regulations). In the survey, organizations with 25 or more employees are likely to use this type of software. Software packages mentioned by responders within free-form responses included: AppointMate, CareWatch, HomeTrak, McKesson, Santrax, and Soneto.

Recording care recipient status correlates with use of performance software. Sixty percent of responders indicated that care recipients' daily activity status was recorded. Those who manage Certified Nursing Assistants (CNAs) or companion aides are likely to record and use care recipients' daily activity status. But only 27% of all responding supervisors reported use of supporting software to measure performance of their staffs. Recording care recipient status appears to be the first step – those that do are more likely to have staff performance metrics and also use software to manage staff performance.

Facing outward – families, health and safety

The survey inquired about use of technologies that faced outside of the professional home care organization itself and revealed that:

Phone and email are the dominant outward-facing technologies. The telephone is the external communication technology of choice, whether it is with family member (81%) or care recipient (80%), followed by email to families (54%). The primary means of communication with families are and telephone (91%) and email (54%). Family portals are barely on the radar (6%), with similar low adoption of Skype (5%) and instant messaging (3%). Those who manage RNs are least likely to communicate directly by email with families. Most topics shared with family members -- such as health status, activities of daily living (ADLs) like eating or dressing, therapy status, or recreational activities -- are communicated at most weekly, more typically on request.

Telehealth technology utilization is minimal. While more than half of responders were familiar with telehealth technologies in which health data is transmitted from the home, the most frequently used device was the blood pressure monitor (14%).¹² The most frequently suggested device to families was the medication dispenser (52%), but only 9% indicated that data from a medication dispenser was transmitted. However, 25% said that although they were not recording data from chronic disease devices, they wished that they did.

Safety and health technologies are suggestions only – not resold or reimbursed. The only technology suggested to families by more than half of the respondents was the Personal Emergency Response System (PERS) pendant or watch (53%). Forty percent of responders are aware of PERS devices with fall detection, and 23% are familiar with them and recommend them to families. The most frequently suggested health technologies were medication dispensers – but likely not remotely monitored – followed by blood pressure monitors, weight scales, and thermometers. Fewer than 10% of organizations resell or are reimbursed for health technologies.

HOME CARE INFORMATION MUST FOLLOW THE CARE RECIPIENT

Instead of the operational focus of systems that is typical today, home care solutions of the future will have to examine transactions, searching for trends and patterns, communicating exceptions. Software will record status changes and outcomes, and enable management to be alerted to exceptions rather than poring over transactional reports. Because they must change as a result of external factors, the fundamentals of care delivered across boundaries will be transformed (see **Figure 3**):

From	To
Recipient is treated	Recipient is engaged in their own care
Care recipient (or proxy) integrates own care process	Virtual care is coordinated, integrated on the care recipient’s behalf
Repeated assessments at each new care location	Data about recipient is transferred and utilized in next stage of care
Care in the hospital or SNF	Care in the home or setting of choice
Terminology about care status is in the language of provider	Care status is translated into terms that recipient, AL/IL, family understand
Care status is disease-centric	Care status is person-centric, includes self-care, physical activity and ADLs
Incentives favor clinician as primary (and most expensive) care deliverer	With appropriate training and tech support, clinician shares responsibility with home care organizations/staffs
Transactional, episodic	Decision-supported, outcome-based
Family initiates inquiries about care	Updated care portals are part of the standard of care
Home monitoring pilots	Home monitoring as standard of care
Discharge to rehab or home	Discharge to home care

Figure 3 In the future, fundamental attributes of care must change

Introducing the Home Care Information Network

In the world of supply chain logistics, systems track valuable goods (and their carriers) across state boundaries. Similarly, instead of permitting care recipients to disappear from the ‘system’ across boundaries, basic information about the recipient and their status should move where they move, and/or track where they have gone and how they are doing. By tracking care recipient status as they move from place to place, assessment times should shrink and discharge process can be streamlined, leveraging the information and work that has gone before. This Home Care Information Network (HCIN) is defined for the purpose of this report as:

An interconnected set of information about care plan and status, independent of destination, that is about, for, and inclusive of the care recipient, care providers and designated family members

The HCIN does **not** exist today, and as noted, a variety of barriers inhibit its creation, but multiple principles will underpin its evolution over time:

Life, health and business activities will be integrated. Today’s home care support systems – across health, non-medical home care, and geriatric care management -- if implemented at all, are internally focused on productivity and effectiveness of business. In the future, redesigned processes will enable non-medical information like a care recipient’s ADL status to be linked to EMR/condition-centric processes and remote monitoring systems. Information about that status will be regularly communicated (email, chat, portal update) with invited family members. Home care managers will be able to switch easily from viewing their own resource utilization to discussing care status with a family member, to reporting health status exceptions to a clinician.

“Technology combined with in-home care services will turn an average caregiver into a super caregiver, from going into the home unaware of status, to knowing all kinds of data before opening the door.” – Laura Mitchell, VP Business Development, GrandCare Systems

“Technology must be empowering, enabling all of the stakeholders to be communicating, collaborating. Systems must provide social engagement and visibility, and they must be easy to use within the circle of care.” – Kian Saneii, CEO of Independa

Care coordination will be required. In the future, the assessment of condition and status will be initiated at each location from information in existing HCIN online records. A common lexicon of terms that combine health record and ADL status will enable information to be accessed as easily as plugging in a memory stick in a USB port. Based on type of insurance, home care coordinators will be easily identified at point of admission and passed to any location along transitions of care, where they will be notified and engaged (see **Figure 4**). Their attributes will be similar to the training and skills of a transitional nurse.¹³ If no care coordinator exists, just as a hospitalist is assigned for care coordination within the hospital, a home care coordinator – the transitional nurse or the transitional coach -- will be named on admission so that a person can be discharged to coordinated care.¹⁴ To ensure the highest level of care and the lowest requirement of institutional care, information about condition, medications, and care status will be transferred through the HCIN secure portal and shared between family, insurer, physician/provider, and pharmacy.

“Observations of everyday life must be translated into data with someone to receive it – eating, hydration, mobility, toileting, social interactions -- all are observable, countable, measurable, and potentially actionable.” – Bert Cave, President, Support for Home

“From a national policy perspective, if someone is in a complex chronic care program, they will get a lot of help from a care coordinator – which could come from the insurance industry.” – Gail Miller, Chief of Product Development, Humana Cares

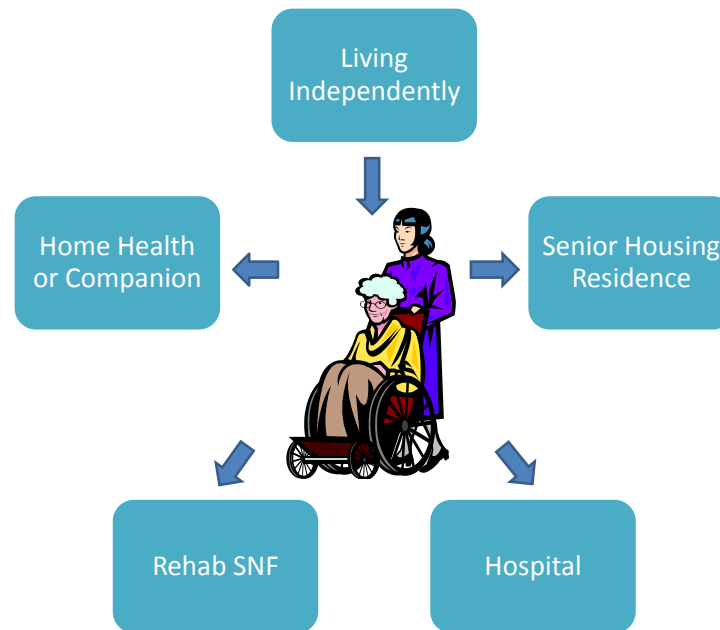


Figure 4 Care coordinators will follow the person across transitions of care

Portals will link the informal caregivers to the formal care system. Traditional and operational home care systems will be supplemented with tech-enabled and fee-based services that engage the care recipient with the formal as well as the informal care network (see **Figure 5**). Using the HCIN, family members will be able to share pictures, music, and chat conversations with care recipients through a portal (literally, a porthole-sized view of the care recipient’s status) that normalizes variations in terminology and enables recipient-centric care information to be shared just in time to offer just the right care (see **Figure 6**).

“The private informal support network has not been maximized. Imagine a 360-degree view of the care circle -- competent and caring individuals who can pick roles and timeslots for supplemental care.” – Andrea Cohen, CEO and Founder, House-Works

“The caregiver portal will have a Facebook page, where family members can share photos from school, where daughters can share recipes – Mom used to cook this. Imagine how comforting that would be.” – Merrily Orsini, CEO and Founder, corecubed

Technology	Purpose	Example/Description
Care search tools	Locate agency or worker	Caring.com, CareZone, CareLinx
Family portal	Communicate care status to families	Ankota, CaringBridge
Environmental and health sensing	Monitor safety in the home	Philips Lifeline with Auto Alert, Healthsense
Social engagement	Monitor, communicate with care recipient	GrandCare, Independa
Telehealth/mHealth, PERS	Remote chronic disease monitoring, medical alarm	IdealLife, Care Innovations, LifeStation
Video	Nurse-telehealth patient	Caring Connections (Intel/Pfizer)
Work management	Time, attendance, billing	Sandata, Stratis

Figure 5 Today’s technology for managing work and care recipient information

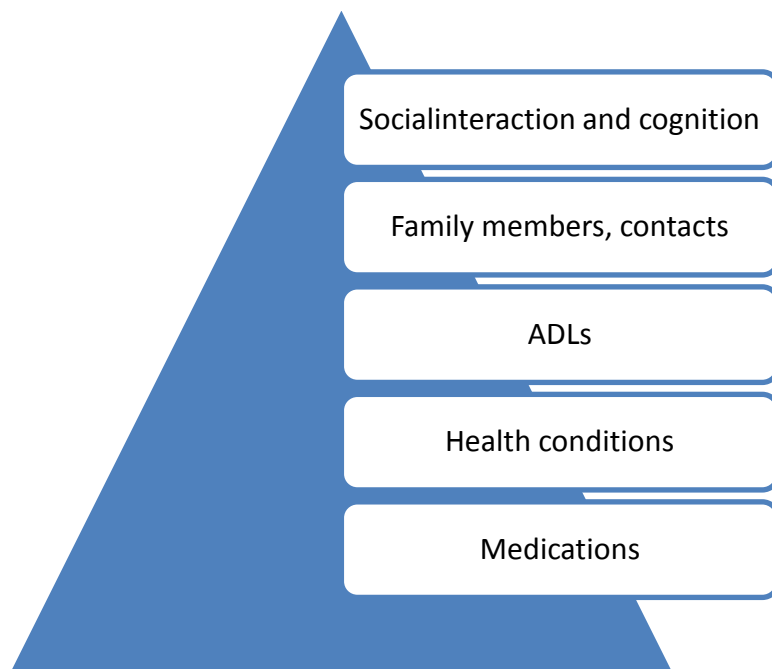


Figure 6 The HCIN will provide a hierarchy of secure information that follows care recipient

Rules, role position and incentives will be overcome to share responsibilities. Today’s payment of health care professionals centers on face-to-face interactions with clinicians and episode-of-care reimbursement of home care. Moving forward, resource constraints and reductions in reimbursements will require and motivate doctors to incorporate remote data into clinical care processes, force home health agencies to partner with companion care to reduce likelihood of readmissions, and elevate geriatric care

management to a partnership care coordination role.¹⁵ As standards for care emerge, reforms will be introduced to enable routine care to be performed by properly trained home care workers.¹⁶ At the same time, regulations will emerge to span state boundaries, linking Medicaid reimbursement to licensing requirements, modeled after the health and activity model of home care in the Federal PACE program.¹⁷

“We are an industry that must set standards which will enable consistent service -- and the first mover company that develops those will drive the quality standard for the market.” – Jeffrey Silverman, Chief Sales and Marketing Officer, Sandata Technologies

Preparing for the Home Care Information Network

Organizations of each type of care delivered into the home will need to prepare now for the inevitability of a Home Care Information Network that will be sponsored, delivered and adopted over the next five years. To maximize its benefit, organizations that deliver care must:

Boost partnerships that span non-medical, home health, geriatric care -- and insurers. Non-medical home care services increasingly transcend the ‘companion designation’ and are cross-contracting with each other (and other groups) to meet the requirements of care recipients – such as those with dementia and/or Alzheimer’s disease. Organizations will need to market and form alliances in their individual geographies that span their own boundaries (and barriers). And as last year’s Humana acquisition of SeniorBridge illustrates, insurance companies are also taking action to meet the needs of their customers.¹⁸

Craft a technology strategy that enables integration of processes and data. As home care organizations grow and evolve, they will need to establish a base platform of software that makes their processes repeatable and their data easily integrated. The history of enterprise software is instructive – at 100 employees it is difficult to change processes (and systems); at 1000 employees, it is disruptive to staff, customers, and partners – as well as costly in preparation and training. Beware of proprietary systems that lack integration points – that is, documented software interfaces where external data can be imported or extracted. In their absence, firms will spend heavily to develop their own difficult-to-upgrade software.

Identify strategic and local technology partnerships to turn strategy into reality. Nationwide firms may find technology partners that span multiple geographies. Regardless of company size, managers must cultivate local hardware, software, and services partnerships. Knowing who to call will keep staff and management functioning; keep communication channels with families open; and ensure that data can be transmitted, acted upon and analyzed to detect patterns and trends. For in-home tech support, the recent partnership between AARP and Best Buy’s Geek Squad (or its equivalent) may be appropriate.¹⁹

Inspire and engage family members, partners and staff about technology use. The most important aspect of successful in-home care is establishing strong personal relationships, both inside and with clients. But relationships alone are difficult to scale and sustain, especially with high staff turnover rates. As repeatable processes are defined, gaining supervisors interest in new technologies and demonstrating them to families will be just as important. A care recipient may move around – but she or he is still the same person, with the same family, history, and both medical and non-medical needs. High quality information is already essential to meeting those needs – getting everyone on board with the uses and benefits will provide differentiation for organizations and enable them to grow as society’s demands on them change.

Scenario: A future of coordinated care – enhanced by the HCIN

In the hospital. Mrs. Smith, age 85, suffers from congestive heart failure and has had several hospital stays. A new episode sends her to the hospital in an ambulance, and an HCIN card in her purse (similar to an ATM card) identifies her Geriatric Care Manager at **What's Next Home Care** (WNHC, fictional name). The card is scanned in at admission and her most recent admission diagnoses and latest discharge instructions are displayed. By scanning the card, the admissions nurse confirms that she still lives alone, continues to need support from her Geriatric Care Manager, and will need visits from a home health agency upon discharge as well as ongoing support from a non-medical home care aide. When the new admission information is saved, WNHC is notified automatically – and Ann Jones, WNHC's in-hospital Care Coordinator of post-hospitalization home care is assigned to Mrs. Smith. Ann owns Mrs. Smith's future home care plan throughout her hospital stay.

Ann visits Mrs. Smith during her stay and sets a post-hospital order in motion through the HCIN for meal delivery, supplies, and post-hospitalization visit schedule and transportation. Ann sees that Mrs. Smith has several named family members in the HCIN – she invites them into the HCIN private status update notification portal. Ann uses her tablet computer to conduct several video family meetings throughout Mrs. Smith's stay in order to include Mrs. Smith's long-distance relatives. At discharge, Ann uses the HCIN to alert Mrs. Smith's GCM and thus transfer care responsibility to the WNHC Home Care Coordinator.

At home with home health care. A home health care worker, Emily, greets her at her door when the ambulance brings her home from the hospital. What's Next Home Care has been working with a partner company that delivers and maintains home telehealth devices, and a WNHC-contracted technician sets her up with her telehealth monitoring to establish a baseline of readings. As part of her home health care assignment, Emily makes sure that Mrs. Smith's vital signs are taken and transmitted to her doctor and updated to the home care managers through the HCIN. Emily also provides regular status updates on Mrs. Smith's compliance with her post discharge health regimen.

At home with ongoing non-medical care. After Mrs. Smith is deemed stable in her vital signs, the telehealth equipment is removed. Mrs. Smith's family asks WNHC to assign Mrs. Smith a non-medical home care aide, Suzanne, who continues to provide updates to long-distance family about Mrs. Smith's status through use of the HCIN portal, accessed through Mrs. Smith's own computer – with local support by WNHC and as needed, additionally provided by a nearby member of Best Buy's Geek Squad. Because of the coordinated care provided by WNHC, Mrs. Smith's ability to remain at home is preserved and maintained.

Figure 7 An example scenario using the Home Care Information Network

Appendix I

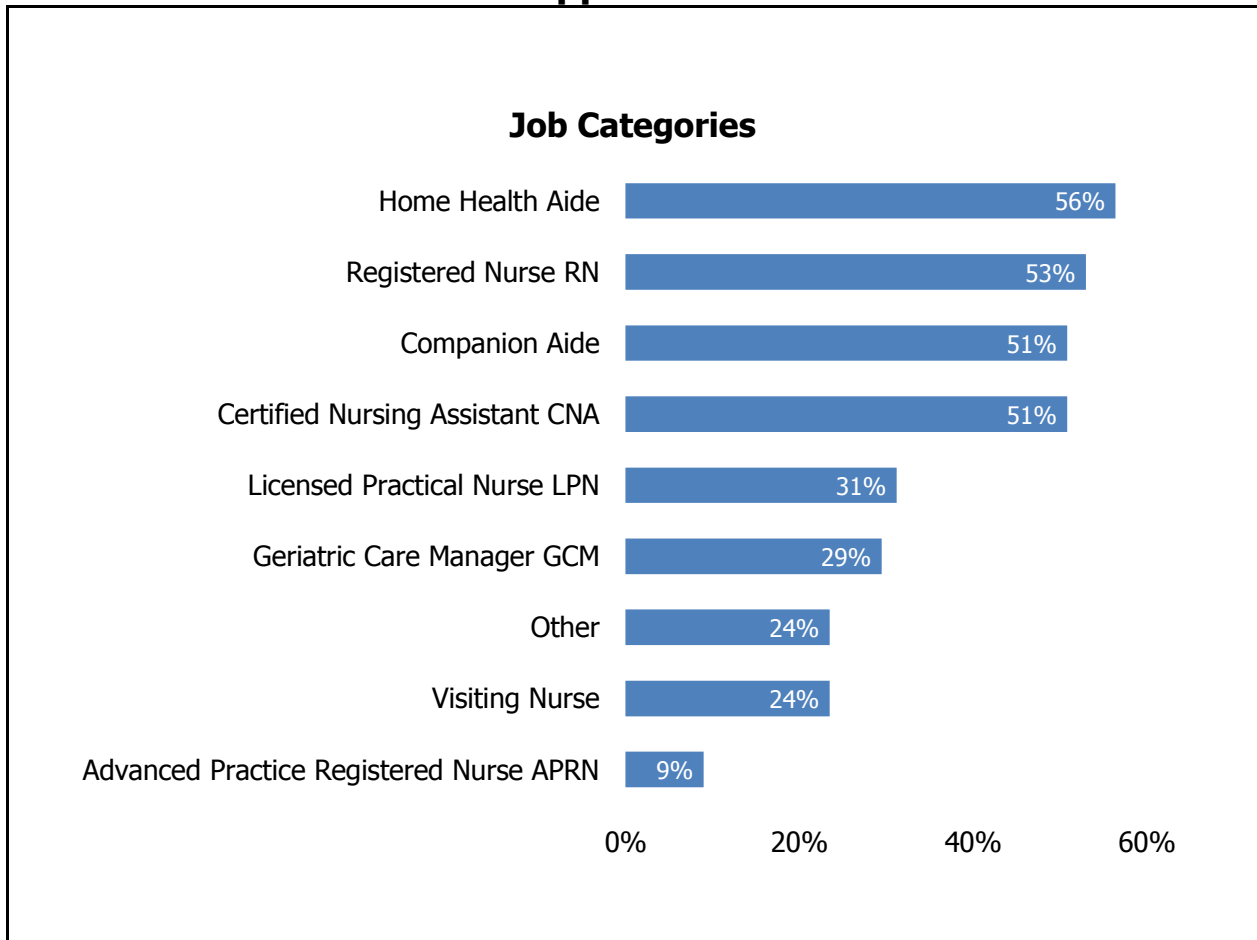


Figure I-a Supervisors manage a variety of workers with various skill levels [n=234]

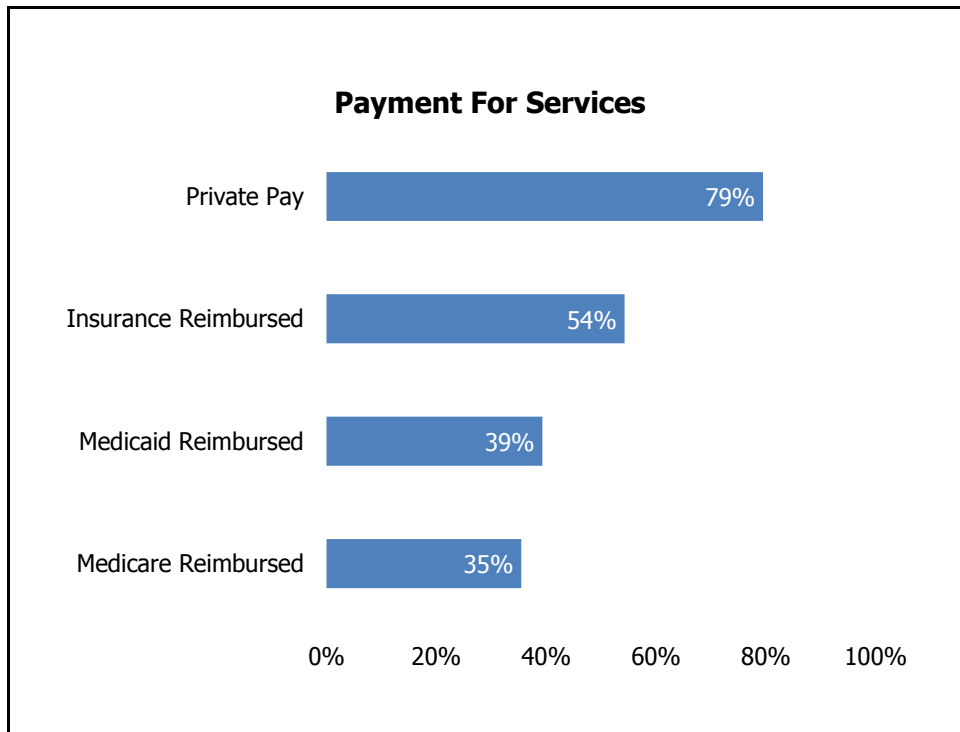


Figure I-b Private pay services are commonly available [n=234]

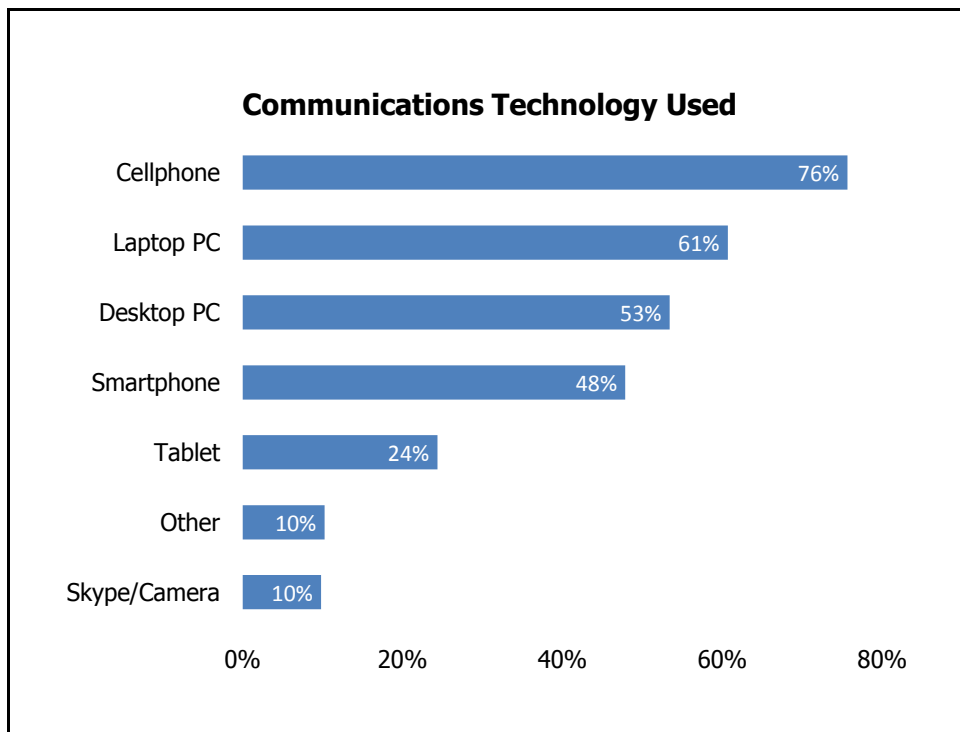


Figure I-c Tablet use is emerging, but nearly 50% use smartphones [n=234]

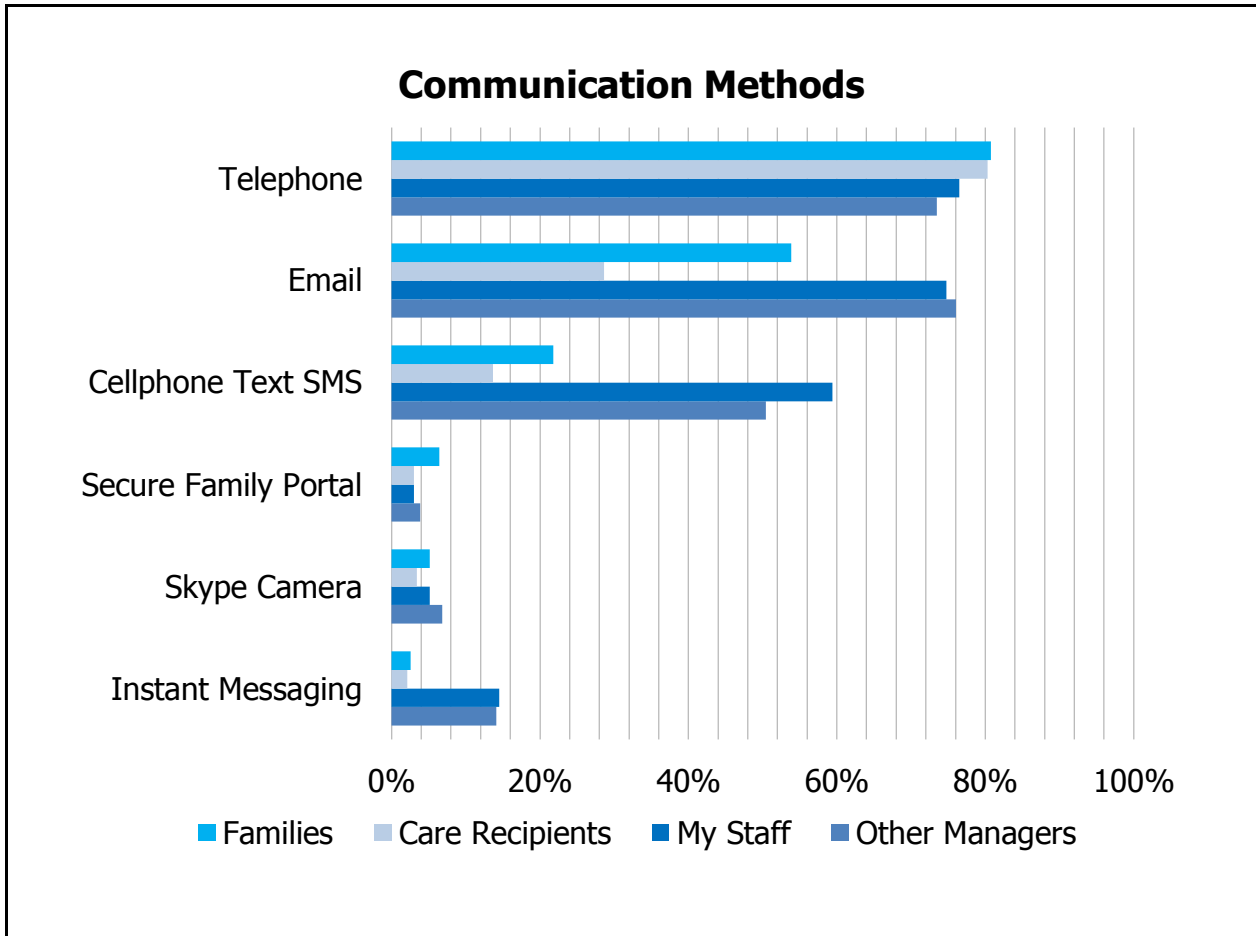


Figure I-d Instant messaging, Skype and family portals are opportunities [n=234]

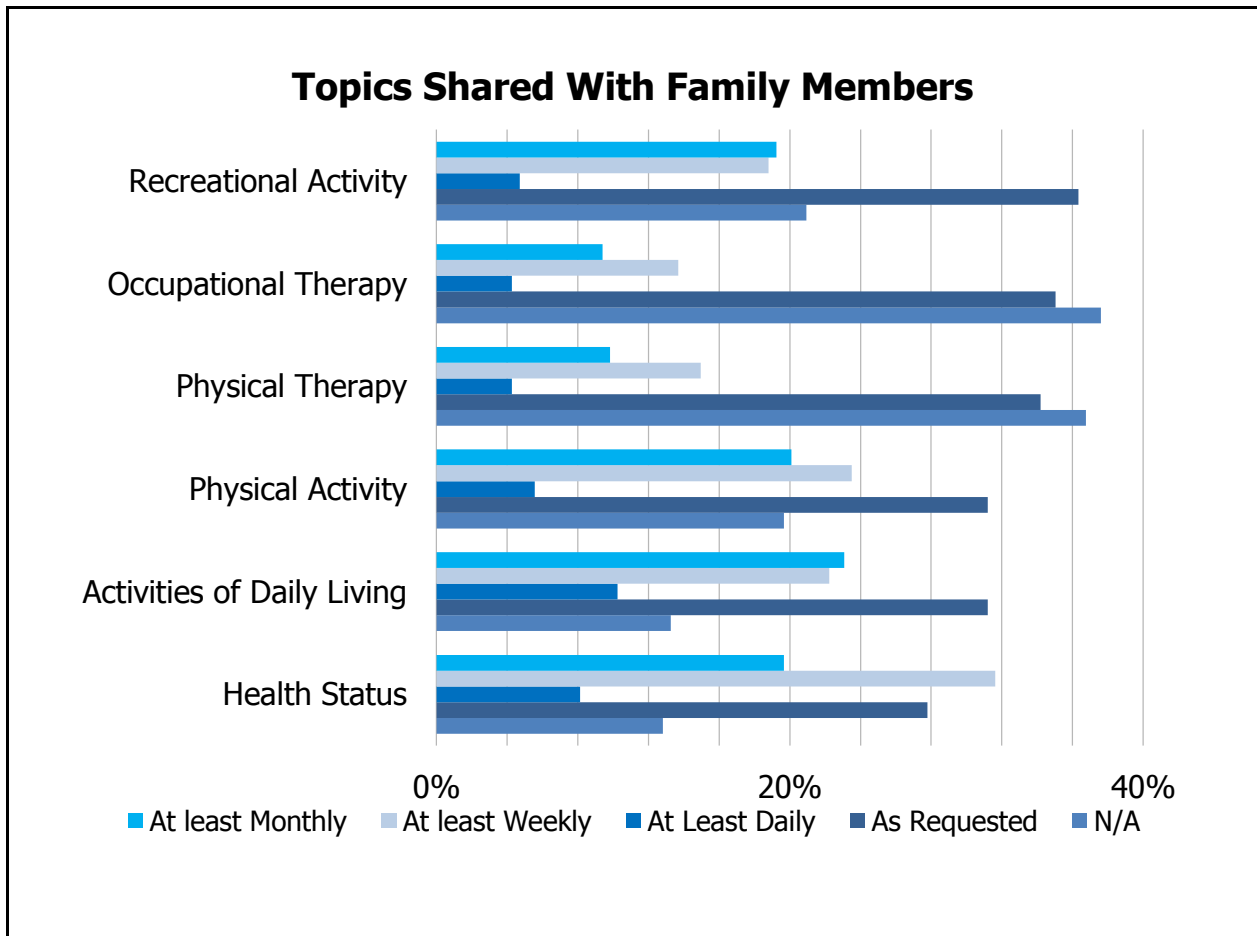


Figure I-e Health status is the topic most frequently shared with families [n=234]

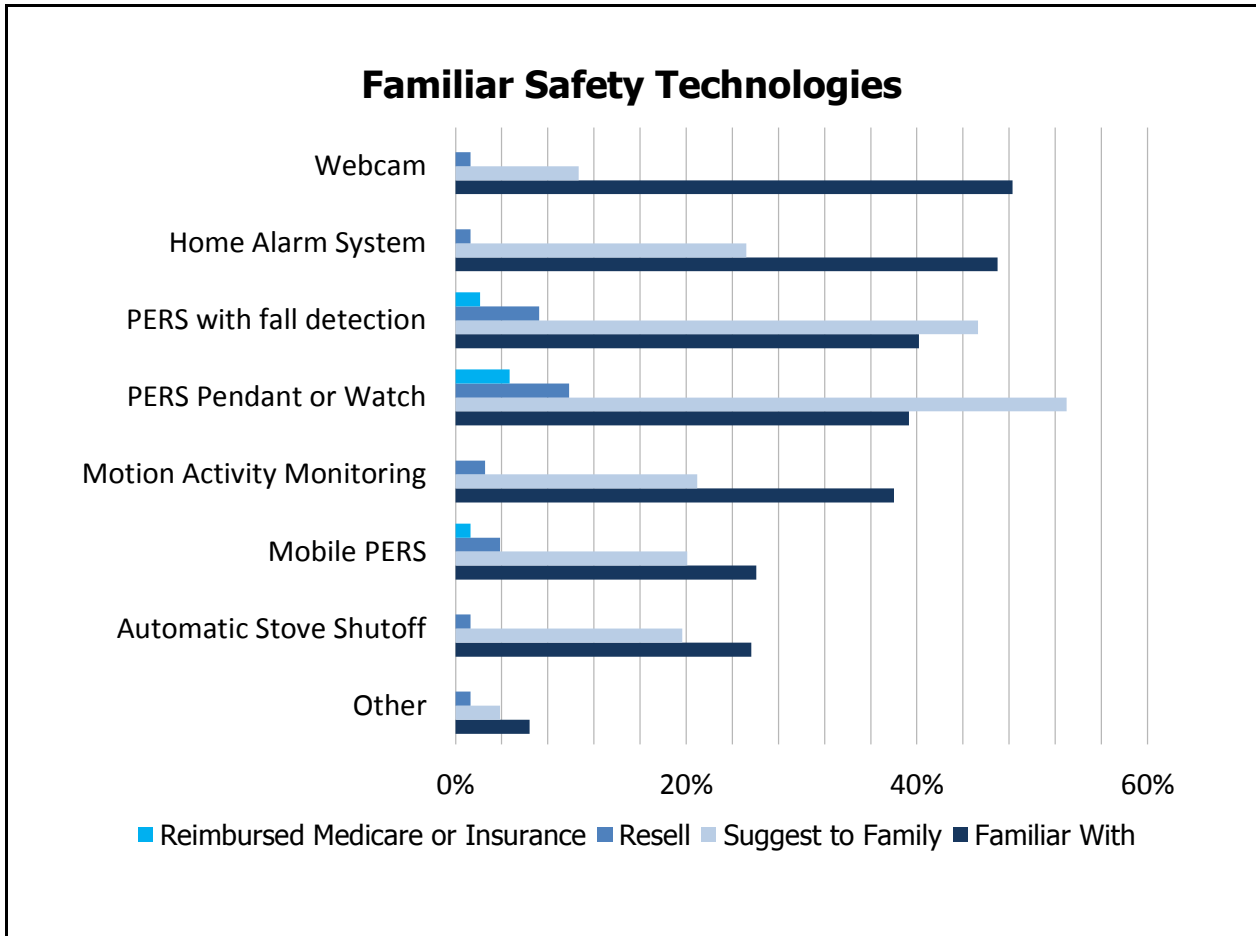


Figure I-f Personal Emergency Response Systems are frequently suggested [n=234]

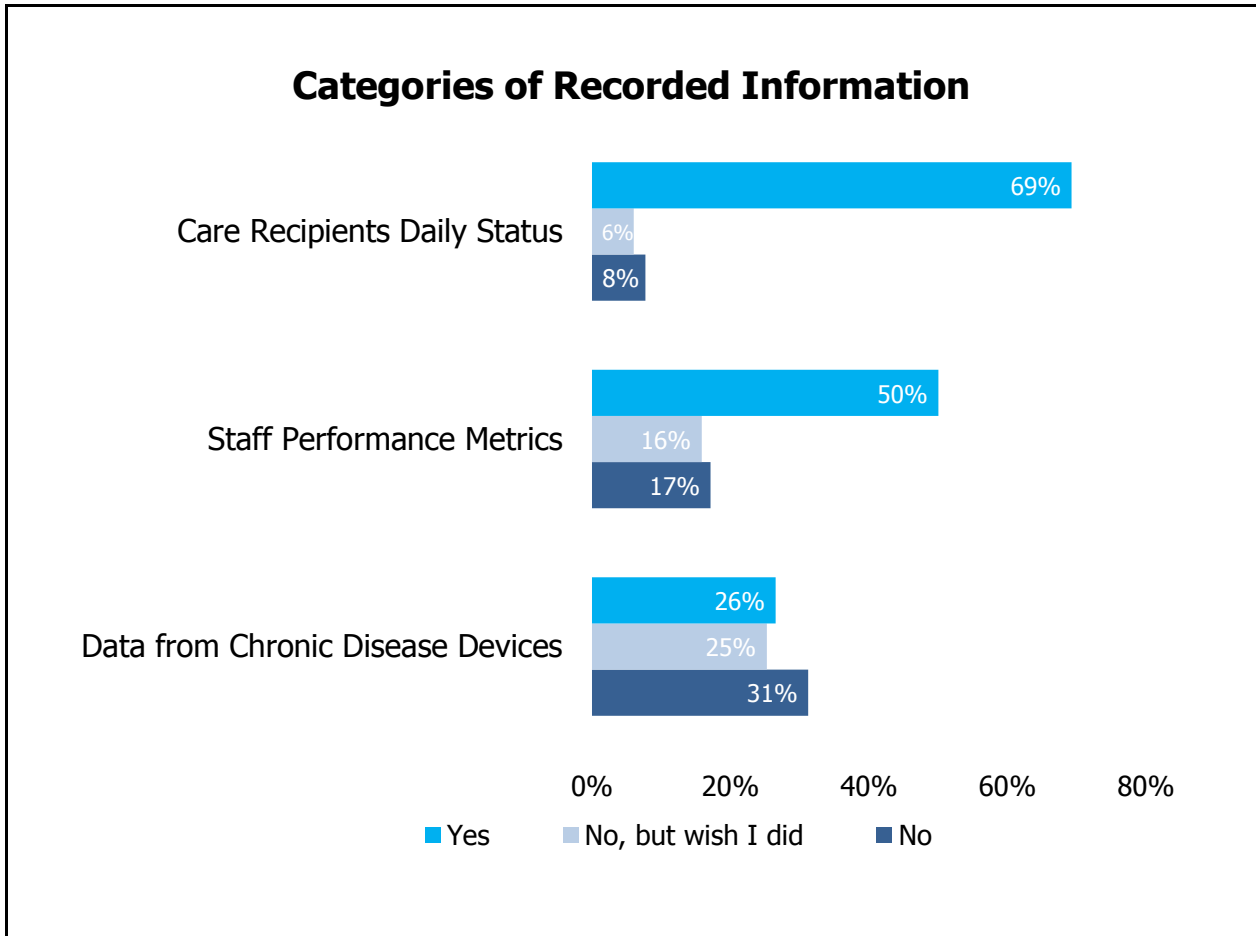


Figure I-g Organizations focus on care recipient status and staff performance [n=234]

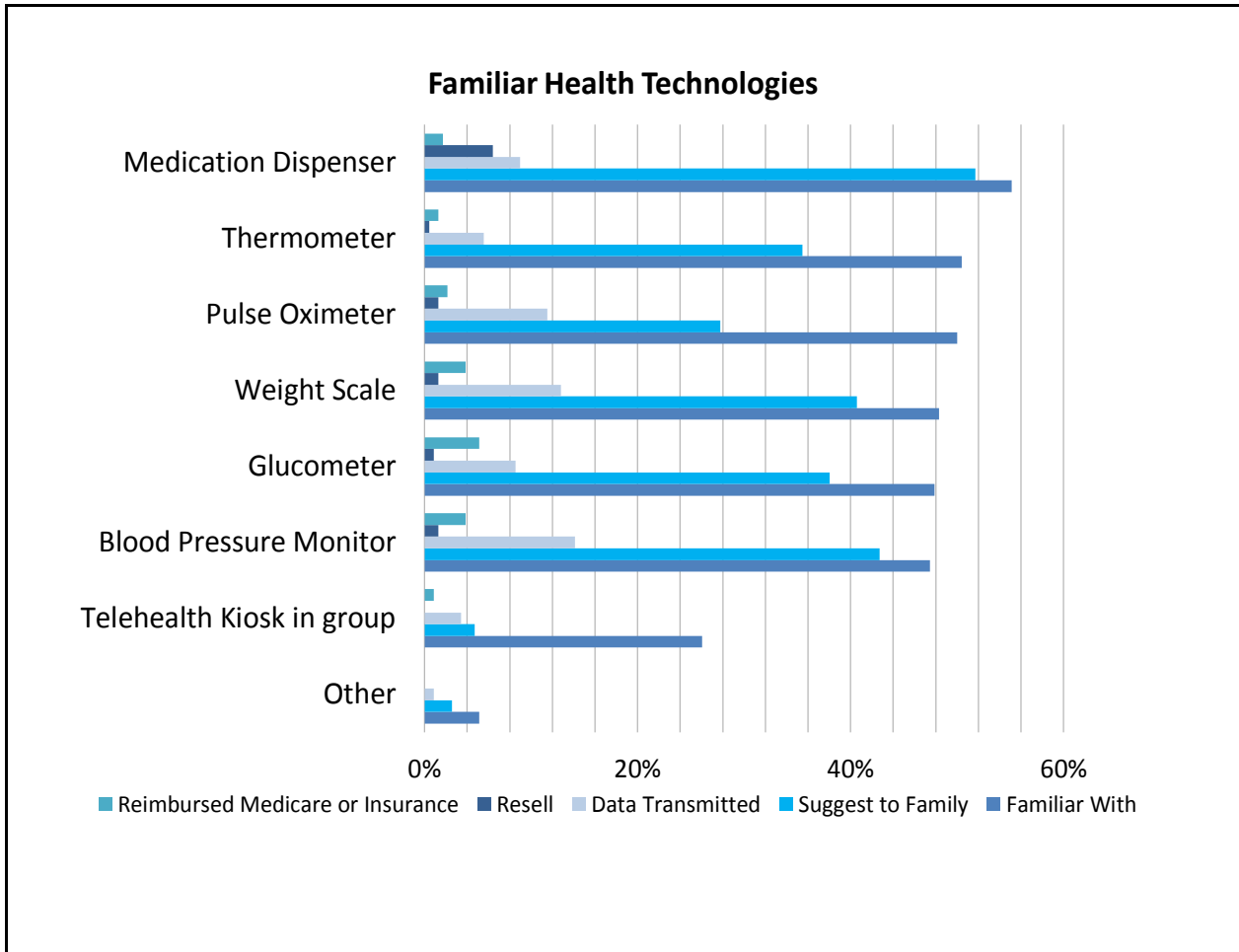


Figure I-h Responders are not actively engaged with most health technology [n=234]

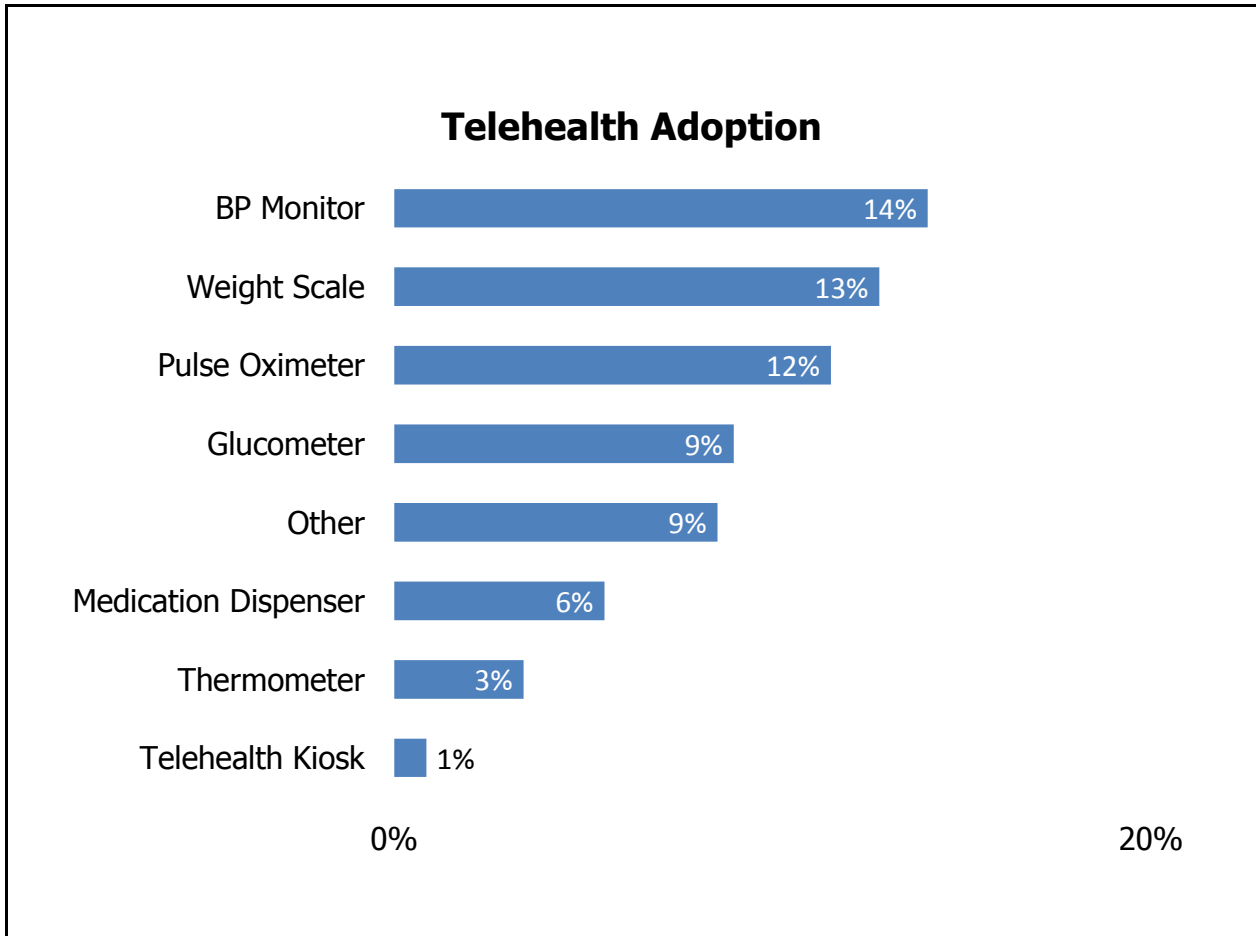


Figure I-i Telehealth technology deployment is not yet widespread [n=234]

Appendix II

II-a Communication technology

Devices used in organizations with:	Cell phone	Laptop	Desktop	Smartphone	Tablet	Skype/ Camera
Home Health Aides	80%	63%	55%	50%	25%	10%
Registered Nurses	77%	66%	60%	44%	24%	8%
CNAs	85%	70%	61%	57%	23%	13%
Companion Aides	81%	61%	60%	54%	23%	13%
LPNs	75%	70%	51%	45%	27%	11%
GCMs	70%	62%	54%	64%	33%	13%
Visiting Nurses	80%	67%	49%	36%	35%	9%
Adv. Practical RNs	71%	57%	52%	43%	43%	10%

II-b Health technology

Suggested to family by organizations with:	Med Dispenser	BP Monitor	Weight Scale	Pulse Oximeter	Thermometer	Telehealth Kiosk
Home Health Aides	57%	55%	54%	40%	48%	7%
Registered Nurses	56%	54%	55%	41%	48%	8%
CNAs	61%	54%	52%	38%	43%	6%
Companion Aides	56%	45%	43%	28%	34%	7%
LPNs	55%	58%	58%	44%	52%	7%
GCMs	64%	54%	55%	35%	36%	12%
Visiting Nurses	65%	60%	60%	51%	55%	13%
Adv. Practical RNs	48%	57%	52%	48%	52%	10%

II-c Safety technology

Suggested to family by organizations with:	Web Camera	PERS	Fall detection	Mobile PERS	Motion/ Activity Sensor	Auto Stove Shutoff	Home Alarm System
Home Health Aides	8%	55%	45%	20%	20%	23%	4%
Registered Nurses	7%	49%	40%	19%	24%	25%	3%
CNAs	11%	63%	53%	25%	26%	30%	5%
Companion Aides	13%	58%	51%	25%	24%	25%	4%
LPNs	5%	45%	34%	16%	22%	30%	3%
GCMs	22%	58%	57%	30%	33%	35%	7%
Visiting Nurses	9%	45%	42%	20%	20%	31%	5%
Adv. Practical RNs	10%	52%	48%	19%	43%	38%	10%

Interviewees

Ken Accardi, VP Marketing, Ankota
Constance Row, Executive Director, American Academy Home Care Physicians (AAHCP)
Joseph Kvedar, MD, CEO, Center for Connected Health
David Lindeman, CEO, Center for Technology and Aging
Liz Boehm, Director, Patient Experience, Experia Health; previously at Forrester Research
Laura Mitchell, VP Business Development, GrandCare Systems
Scott Dingfield, Chief Innovation Officer, Home Instead
Andrea Cohen, CEO, House-Works
Kate Marcus, Process Manager; Gail Miller Chief of Product Development, Humana Cares
Kian Saneii, CEO, Independa
Mickey Goldkorn, Steve Barlam; Mike Nicholson, CEO, LivHOME
Richard Brennan, President, National Association of Home Care (NAHC)
Bert Cave, President, National Private Duty Association (NPDA)
Mark VanderWerf, VP, of eHealth, Nonin Medical
Deb Citrin, Senior Director, Strategy & Business Development, Philips Healthcare
Merrily Orsini, Former President, Private Duty Home Care Association (PDHCA)
Jeffrey Silverman, Chief Marketing Officer, Sandata
Anne Marie Gavel, VP, Medicare and Retirement, United Health Care
Adam Darkins, MD, Chief Consultant for Telehealth Services, Department of Veterans Affairs
Ilaina Edison, SVP Operations, Visiting Nurse Services of New York (VNSNY)
Wayne Olson, SVP, Operations, Volunteers of America

Other Sources

Center for Technology and Aging, Oakland, CA “Lessons from a Leader in Telehealth Diffusion” A Conversation with Adam Darkins of the Veterans Health Administration

Office of the National Coordinator – Health IT Standards

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About the Author

Laurie M. Orlov, a tech industry veteran, writer, speaker and elder care advocate, is the founder of **Aging in Place Technology Watch**, a market research firm that provides thought leadership, analysis and guidance about technologies and related services that enable boomers and seniors to remain longer in their home of choice. In addition to her technology background and years as a technology industry analyst, Laurie has been a certified long-term care ombudsman, is currently certified in geriatric care management by the University of Florida, and the author of **When Your Parents Need Elder Care (Authorhouse, 2006)**. Updated versions of her research reports are available online at www.ageinplacetech.com.

In her previous career, Laurie spent more than 30 years in the technology industry, including 24 years in IT and 9 years as a leading industry analyst at Forrester Research. While there, she was often the first in the industry to identify technology trends and management strategies that have survived the test of time. She has spoken regularly and delivered keynote speeches at forums, industry consortia, conferences, and symposia, most recently on the business of technology for boomers and seniors. Her writing has been featured on Caring.com, Mature Markets, Aging Today, SilverPlanet, Mobile Health News, AARP, and her blog entries are widely syndicated. She advises large organizations as well as non-profits and entrepreneurs about trends and opportunities in the age-related technology market. Her segmentation of this emerging technology market and trends commentary has been presented in the Journal of Geriatric Care Management and ASA's Aging Today Online. Her perspectives have been quoted in Business Week, Forbes, Kiplinger, the New York Times, and the Wall Street Journal. She has been profiled in the New York Times and Huffington Post. She has a graduate certificate in Geriatric Care Management from the University of Florida and a BA in Music from the University of Rochester. In her current role, Laurie has consulted to organizations as diverse as AARP, J&J, and Microsoft. She is a participating expert on the Think Tank for The Philips Center for Health and Well-Being.

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