Spotlight:
Health Information Technology in Nursing Homes

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Background

The Maryland Health Care Commission ("MHCC") administers a Health Information Technology[1] ("health IT") Questionnaire as part of the Annual Long-Term Care Survey.[2] Health IT plays an important role in managing patient care.[3,4] Key components include health information exchange (HIE), electronic health records (EHRs), and telehealth. Health IT diffusion creates opportunities for improving care delivery.[5] Studies have shown that health IT investments have the potential to simultaneously improve health outcomes and reduce costs.[6,7,8] Use of health IT is particularly important in supporting older patients[9] with complex chronic care needs[10] that often have more frequent transitions between their homes, acute care, and nursing home settings.[11]

Viewpoints

The MHCC conducted interviews[12] with representatives[13] from eight nursing homes[14] in Maryland to learn more about the impact of EHRs and telehealth adoption. Nursing home representatives ("representatives") that participated in the interviews consisted of three chains and five non-chains, which accounts for about 60 nursing home sites (26 percent) statewide.[15] During the COVID-19 Public Health Emergency (PHE), EHRs and telehealth enabled providers to quickly adapt to shifting needs for patient care; HIE enabled timely, accurate, and reliable data sharing.[16,17]

EHRs

Representatives conveyed that EHR adoption enables workflow efficiencies as it relates to documentation and sharing clinical information. Many noted that EHR automation (data standardization, templates, notifications, and alerts) helps improve patient safety. Several representatives referenced the regional partnership pilot program that connected hospital and nursing home EHR systems[18] as an example where EHRs favorably impacted care coordination and unplanned hospital admissions.

TELEHEALTH

Most representatives reported that telehealth adoption has been challenging. Smaller nursing homes and those located in rural areas discussed need for better Wi-Fi to support telehealth. Some nursing homes shared success stories from using telehealth while still noting how onerous it can be integrating telehealth into clinical workflows. Representatives cited difficulty maneuvering mobile telehealth carts in modestly sized patient rooms and staff reluctance to use telehealth.

EHR Adoption

EHR use is the first step toward transforming care delivery. Maryland nursing homes have achieved a milestone in advancing EHR adoption (Maryland: 98 percent, Nation: 84 percent[19]); EHRs improve quality in part through better documentation and increasing the accuracy and completeness of patient data. Structured data allows for rule-based decision support and promotes established care pathways, among other things.[20] Several EHR vendors are used by hospitals and ambulatory practices in Maryland; among the several EHR vendors used by nursing homes, one vendor, PointClickCare, has a more sizable presence (Table 1). Between 2018 and 2019, the number of nursing homes using PointClickCare increased by 22. Since 2019, the EHR vendor landscape has remained stable. The Chesapeake Regional Information System for our Patients (CRISP) is working with the two largest EHR vendors operating in Maryland, PointClickCare and MatrixCare, to integrate with their EHRs.

Table 1

EHR Vendor Diffusion

	2018	2019	2020	Percent Change
	Count	Count	Count	
American Data	7	1	1	-86
American Healthtech	4	3	2	-50
BlueStep	1	1	2	100
Cantata Health	1	1	1	0
Cerner	0	1	1	100
CueSHIFT	0	1	0	-
ECS	1	0	0	-100
Epic	1	2	2	100
MatrixCare	37	29	29	-22
MEDITECH	1	1	1	0
Netsmart	8	9	9	13
NTT DATA	1	1	0	-100
Optimus EMR	3	3	4	33
PointClickCare	148	170	170	15
Vision	1	0	0	-100
WellSky	2	0	0	-100
Missing	11	4	5	-55
Total	*227*	*227*	*227*	

Social Determinants of Health

Social Determinants of Health (SDOH) are nonmedical factors in environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.[21] SDOH guide discharge planning, access to outpatient rehabilitation services, and other therapeutic interventions.[22] Patients discharged from a nursing home with limited social support is a significant predictor for hospital readmission.[23] Addressing SDOH is essential to improving health and reducing health disparities and cost.[24, 25] SDOH information collected by nursing homes enables coordination with community-based support for the patient and family when returning to the community.[26] Less than one-half of nursing homes collect SODH information (Table 2).

Table 2
SDOH – Data Collection

	2019 Count	2020 Count	Percent Change
Yes	107	106	-1
No	116	116	0
Missing	4	5	25
Total	*227*	*227*	

Advance Directives

Advance directives, whether oral or written, enable consumers to express their values, goals for care, and treatment preferences to guide future decisions about health care.[27] Advance directives also allow consumers to identify a health care agent that can make decisions on their behalf. About 50 percent of nursing homes store advance directives in their EHR (Table 3). Nearly 81 percent of nursing homes indicate that collecting advance directives ensures care is consistent with a patient's wishes (Table 4). The General Assembly passed House Bill 1385, *Public Health – Advance Directives - Procedures, Information Sheet, and Use of Electronic Advance Directives* in 2016.[28] The law required MHCC to recognize electronic advance directives services that meet criteria related to privacy and security.[29] To date, ADVault, Inc. (MyDirectives.com) is the only web-based repository recognized by MHCC. A growing trend is to upload advance directives to EHRs using patient portals. While not all EHRs support this feature, most support a scanned document saved as an attachment in the EHR.

Table 3

Advance Directives in EHRs

	Facility Count 2020	Collects Advance Directives, 2020
American Data	1	7
American Healthtech	2	2
BlueStep	2	1
Cantata Health	1	1
CERNER	1	0
CueSHIFT	0	0
ECS	0	1
Epic	2	1
MatrixCare	29	23
MEDITECH	1	0
Netsmart	9	4
NTT DATA	0	1
Optimus EMR	4	1
PointClickCare	170	72
Vision	0	0
WellSky	0	0
Total	*227*	*114*

Table 4

Collecting Advance Directives –
Ensures Care Delivery is Aligned with Patient Preference

	2019 Count	2020 Count	Percent Change
Strongly Agree	81	87	7
Agree	95	98	3
Neither Agree or Disagree	26	23	-12
Disagree	4	3	-25
Strongly Disagree	8	1	-88
Unknown	9	2	-78
NA	0	8	-
Missing	4	5	25
Total	*227*	*227*	*--*

HIE

HIEs enable the exchange of electronic health information by connecting information contained in EHRs across the continuum of care. Initial funding to advance HIE was included in the *American Recovery and Reinvestment Act of 2009* under the *Health Information Technology for Economic and Clinical Health Act*.[30, 31] Today, HIEs are usually funded through private and public partnerships. CRISP continues to expand provider access to HIE information through EHR integration. Enabling providers to have access to HIE information in the workflow creates efficiencies in care delivery and provides timely and seamless portability of information. In 2020, about 41 percent of nursing homes believed that CRISP provides timely notification of information available on their patients (Table 5); 42 percent feel that information obtained through CRISP enhances care quality (Table 6); and 41 percent think that the use of CRISP to assist in care management can help reduce hospital admission (Table 7).

Table 5

CRISP Provides Timely Notifications – Information Available on Patients

	2019		2020		Percent Change
	#	%	#	%	
Strongly Agree	24	11	29	13	21
Agree	64	28	63	28	-2
Neither	40	18	44	19	10
Disagree	1	0	4	2	300
Strongly Disagree	17	7	19	8	12
Unknown	29	13	34	15	17
N/A	52	23	34	15	-35

Table 6

CRISP Information Enhances Care Quality

	2019		2020		Percent Change
	#	%	#	%	
Strongly Agree	19	8	29	13	53
Agree	60	26	66	29	10
Neither	46	20	39	17	-15
Disagree	20	9	20	9	0
Strongly Disagree	0	0	3	1	-
Unknown	30	13	36	16	20
N/A	52	23	34	15	-35

Table 7

CRISP Use Assists in Care Management – Reduces Hospital Admission

	2019		2020		Percent Change
	#	%	#	%	
Strongly Agree	19	8	27	12	42
Agree	63	28	66	29	5
Neither	43	19	38	17	-12
Disagree	20	9	23	10	15
Strongly Disagree	1	0	2	1	100
Unknown	29	13	37	16	28
N/A	52	23	34	15	-35

Telehealth

Nursing homes generally use telehealth to support geriatrician, psychiatric, and palliative care consults. Nursing homes' adoption of telehealth has increased over the last two years with most adopting the technology during the PHE.[32] In 2019, about eight percent of nursing homes had implemented telehealth; adoption grew to nearly 75 percent during the PHE (Table 8). Change in payer policy coupled with the Office of Civil Rights exercising its enforcement discretion around penalties for noncompliance with HIPAA rules during the PHE were key drivers to spurring adoption.[33, 34]

Table 8

Telehealth Adoption

	Non-Adopters	Adopters	Total
Pre-COVID	207	20	227
After declaration of a public health emergency	37	190	227

Information Technology Security

The frequency of health care data breaches, magnitude of records potentially exposed, and financial losses due to breached records are rapidly increasing. Nursing homes are especially vulnerable, as most lack the financial resources to invest in cybersecurity. Staff training on appropriate uses of information technology is a critical step to reducing risk of cyber-attacks.[35] In 2020, about 36 percent of nursing homes conducted security training on a monthly or quarterly basis, and roughly 45 percent yearly (Table 9). During the same time, roughly 69 percent of nursing homes relied on a third-party detection vendor to identify cyber risks, a six percent increase from the prior year (Table 10). Outsourced cybersecurity management is increasingly common in health

care.[36] Managed Security Service Providers take on the responsibility for monitoring and initiating an appropriate response that could result in intrusion or potential exposure.

Table 9

Security Training – Frequency

	2019	2020	Percent Change
Monthly	47	49	4
Quarterly	29	33	14
Yearly	104	103	-1
Never	6	2	-67
Other	6	14	133
Missing	35	26	-26
Total	*227*	*227*	

Table 10

Third-Party Cyber Security Detection Vendor Use

	2019	2020	Percent Change
Yes	144	156	8
No	83	71	-14
Total	*227*	*227*	

Takeaways

The health IT adoption gap between nursing homes, hospitals, and ambulatory practices continues to narrow. However, hospitals and ambulatory practices are often considered more advanced users of health IT. The progression from health IT adoption to advanced use depends on various factors, such as staff training, perceived value, and workflow integration.[37] Nursing homes that are advanced users of health IT generally have relied on implementation techniques that include change management strategies to lead change, rather than being responsive to the effects of change. By and large, nursing home progress in diffusing health IT is laudable.

[1] U.S. Department of Health & Human Services, *Health Information Technology*. Available at: www.hhs.gov/hipaa/for-professionals/special-topics/health-information-technology/index.html.

[2] Nursing homes operating in Maryland are required by COMAR 10.24.03*, Maryland Long-Term Care Survey* to complete the annual survey.

[3] Agency for Healthcare Research and Quality, *Health Information Technology Integration*. Available at: www.ahrq.gov/ncepcr/tools/health-it/index.html.

[4] The Office of the National Coordinator for Health Information Technology, *Long-Term and Post-Acute Care*. Available at: www.healthit.gov/topic/health-it-health-care-settings/long-term-and-post-acute-care.

[5] National Library of Medicine, National Center for Biotechnology Information, *The Impact of Health Information Technology on Patient Safety*, December 2017. Available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC5787626/.

[6] Erol, Atiye Cansu, Hitt, Lorin M., and Tambe, Prasanna, *Does EMR Adoption by Nursing Homes Decrease Hospitalization Costs?* June 2020. Available at: papers.ssrn.com/sol3/papers.cfm?abstract_id=3725715 or dx.doi.org/10.2139/ssrn.3725715.

[7] Health Affairs, *Use of Telemedicine Can Reduce Hospitalizations of Nursing Home Residents and Generate Savings for Medicare*, February 2014. Available at: www.healthaffairs.org/doi/full/10.1377/hlthaff.2013.0922.

[8] EHR Intelligence, *How Effective HIE Use Saves Money, Improves Health Outcomes*, September 2017. Available at: www.ehrintelligence.com/news/how-effective-hie-use-saves-money-improves-health-outcomes#:~:text=Promoting%20nationwide%20cost%20savings,industry%20on%20a%20national%20scale.&text=A%20study%20released%20earlier%20this,than%20%243%20billion%20a%20year.

[9] By 2030, individuals aged 65 and older are projected to account for 20 percent of the population nationally. More information is available at: healthforce.ucsf.edu/sites/healthforce.ucsf.edu/files/publication-pdf/ImpactEmergingTechnologiesLongTermCareWorkforce_0.pdf.

[10] The Office of the National Coordinator for Health Information Technology. *Electronic Health Record Adoption and Interoperability among U.S. Skilled Nursing Facilities in 2016*. Available at: www.healthit.gov/sites/default/files/electronic-health-record-adoption-and-interoperability-among-u.s.-skilled-nursing-facilities-in-2016.pdf

[11] *Ibid.*

[12] Interviews were convened via video chat in October and November 2021.

[13] A total of 18 representatives in operational and clinical roles (e.g., chief executive officer, chief information officer, IT manager, chief nursing officer, administrator, and a nurse).

[14] Interviewees include: Egle Nursing Home, Inc., FutureCare Health, Homewood at Williamsport, Genesis Healthcare, Goodwill Retirement Community, Lorien Health Services, Laurelwood Care Center, and Marquis Health Consulting Services (provides services that support operations for Collingswood Rehabilitation and Healthcare Centers, Meadow Park Rehabilitation & Healthcare Center, Orchard Hill Rehabilitation and Healthcare Center, and Westgate Hills Rehabilitation & Healthcare Center).

[15] Counties include: Allegany, Anne Arundel, Baltimore City, Baltimore, Carroll, Charles, Cecil, Dorchester, Frederick, Garrett, Harford, Howard, Montgomery, Prince George's, Talbot, Queen Anne's, Washington, and Wicomico.

[16] Computerworld, *COVID-19 Puts New Demands on E-Health Records Systems*, March 2020. Available at: www.computerworld.com/article/3535083/covid-19-puts-new-demands-on-e-health-record-systems.html.

[17] JAMA, *COVID-19 and the Need for a National Health Information Technology Infrastructure*, May 2020. Available at: jamanetwork.com/journals/jama/fullarticle/2766368.

[18] Regional Partnership Transformation Funding Program was a four-year competitive grant-based program designed to create and fund hospital-led multidisciplinary teams to develop interventions for high-risk and high-utilizing Medicare beneficiaries. The grant was awarded by the Health Services Cost Review Commission in 2015. Available at: www. hscrc.maryland.gov/Pages/Regional-Partnership-Transformation-Funding-Program-.aspx.

[19] Vest JR, Jung HY, Wiley K Jr, Kooreman H, Pettit L, Unruh MA. Adoption of Health Information Technology among U.S. Nursing Facilities. J Am Med Dir Assoc. 2019;20(8):995-1000.e4. doi:10.1016/j.jamda.2018.11.002. Available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC6591108/.

[19] Atasoy H, Greenwood BN, McCullough JR. The Digitization of Patient Care: A Review of the Effects of Electronic Health Records on Health Care Quality and Utilization. Annual Review of Public Health; 2019 40(1): 487–500. Available at: www.annualreviews.org/doi/10.1146/annurev-publhealth-040218-044206

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[21] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, Healthy People 2030. *Social Determinants of Health*. Available at: www.health.gov/healthypeople/objectives-and-data/social-determinants-health.

[22] Frontiers in Public Health, *Social Determinants of Health in Physiatry: Challenges and Opportunities for Clinical Decision Making and Improving Treatment Precision*, November 2021. Available at: www.doi.org/10.3389/fpubh.2021.738253.

[23] The University of San Francisco, *Social Determinants of Health Assessment for Skilled Nursing Patients*, August 2021. Available at: www. repository.usfca.edu/cgi/viewcontent.cgi?article=2507&context=capstone.

[24] See n. 21, *Supra*.

[25] The Commonwealth Fund, *Review of Evidence for Health-Related Social Needs Interventions*. Available at: www.commonwealthfund.org/sites/default/files/2019-07/COMBINED-ROI-EVIDENCE-REVIEW-7-1-19.pdf.

[26] McKnights Long-Term Care News, *Coverage of Social Determinants of Health Have Implications for SNFs*, November 2018. Available at: www.mcknights.com/marketplace/marketplace-experts/coverage-of-social-determinants-of-health-have-implications-for-snfs/.

[27] American Medical Association, *Advance Directives, Code of Medical Ethics Opinion 5.2*. Available at: www.ama-assn.org/delivering-care/ethics/advance-directives.

[28] Chapter 510 of the Laws of Maryland.

[29] Electronic advance directives services are third-party vendors that allows consumers to create, maintain, and share electronic advance directives online. Vendors are required by statute to adopt privacy and security guidelines in the National Institute of Standards and Technology Special Publication 800-63A, *Digital Identity Guidelines: Enrollment and Identity Proofing*. Available at: csrc.nist.gov/publications/detail/sp/800-63a/final.

[30] Enacted by the 111th U.S. Congress and signed into law by President Barack Obama in February 2009.

[31] Title XIII of the American Recovery and Reinvestment Act of 2009.

[32] National Library of Medicine, National Center for Biotechnology Information, *Telemedicine and Telehealth in Nursing Homes: An Integrative Review,* April 2021. Available at: www.pubmed.ncbi.nlm.nih.gov/33819450/.

[33] Journal of American Medical Informatics Association, *An Evaluation of Telehealth Expansion in U.S. Nursing Homes,* February 2021. Available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC7883984/.

[34] U.S. Department of Health and Human Services, *Notification of Enforcement Discretion for Telehealth Remote Communications During the COVID-19 Nationwide Public Health Emergency*. Available at: www.hhs.gov/hipaa/for-professionals/special-topics/emergency-preparedness/notification-enforcement-discretion-telehealth/index.html.

[35] Caitlin-Morgan Insurance Services, *Addressing Cybersecurity Threats in Long Term Care Facilities*, August 2020. Available at: www.caitlin-morgan.com/addressing-cybersecurity-threats-in-long-term-care-facilities/.

[36] Healthcare Information and Management Systems Society, *Outsourced Cybersecurity Staff, One Way Healthcare is Getting Around the Talent Shortage*, June 2017. Available at: www.healthcareitnews.com/news/outsourced-cybersecurity-staff-one-way-healthcare-getting-around-talent-shortage.

[37] National Library of Medicine, National Center for Biotechnology Information, *Nursing Home Implementation of Health Information Technology: Review of the Literature Finds Inadequate Investment in Preparation, Infrastructure, and Training*, June 2018. Available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC6050994/.