

University of Tennessee Health Science Center UTHSC Digital Commons

Applied Research Projects

Department of Health Informatics and Information Management

2015

The Challenges of Establishing Partners in Health Information Exchange (HIE)

Torian Tate
University of Tennessee Health Science Center

Follow this and additional works at: http://dc.uthsc.edu/hiimappliedresearch

Part of the <u>Health and Medical Administration Commons</u>, <u>Health Information Technology</u> Commons, Health Services Administration Commons, and the Health Services Research Commons

Recommended Citation

Tate, Torian, "The Challenges of Establishing Partners in Health Information Exchange (HIE)" (2015). Applied Research Projects. 25. . $https://doi.org/10.21007/chp.hiim.0023 \\ http://dc.uthsc.edu/hiimappliedresearch/25$

This Research Project is brought to you for free and open access by the Department of Health Informatics and Information Management at UTHSC Digital Commons. It has been accepted for inclusion in Applied Research Projects by an authorized administrator of UTHSC Digital Commons. For more information, please contact jwelch30@uthsc.edu.

The Challenges of establishing partners in Health Information Exchange (HIE)

Applied Research Project

Torian Tate

University of Tennessee Health Science Center

Abstract

Health information exchange (HIE) has become a focus of the health care industry. The ability to share information electronically between multiple health care providers is thought to be a key ingredient in the creation of a more efficient global health care system. VA Hospital Memphis has significant challenges in regard to HIE. The Virtual Lifetime Electronic Record (VLER) coordinator at the facility has been charged with establishing an HIE system. This requires the coordinator to identify partners to share health information with electronically, obtain buy-in from patients and providers through education, and to promote/market the VLER program facility-wide. The VA recognizes that sharing health care information electronically is a much needed process. However, the powers that be must understand that establishing HIE is not an easy task and that there are many challenges. This paper details the challenges faced by VA Hospital Memphis as the facility attempts to establish partners in health HIE.

Table of Contents

Introduction
Virtual Lifetime Electronic Record (VLER).
Health Information Exchange (HIE)
My HealtheVet (MHV)
TriWest/PC3
Obtaining veteran consent.
Educating veterans/providers about VLER.
Literature Review
Study Design
Conclusions and Recommendations.

Introduction

Health information exchange (HIE) is believed to be essential in achieving better health care in the United States. The federal government has made it known to all that the wave of the future in health care is health information technology (HIT) and HIE. These two terms actually go hand in hand. In regard to HIE the question for many is what is it? Is HIE simply a doctor sharing information with a patient during a routine check-up? Is HIE a friend telling another friend about a new physician that they have been seeing that is providing excellent health care and recommending that the friend make an appointment with this doctor? These are good questions. One could not say that HIE is neither situation previously mentioned. The truth is HIE can be seen in many forms. This research focuses on HIE as defined as providers from one health care facility sharing health information electronically with providers from another health care facility. The Veterans Administration Medical Center (VAMC) Memphis is currently facing some challenges in the arena of HIE. This study will identify the challenges that VA Memphis may face in establishing HIE and offer recommendations that can lead to success.

VAMC Memphis is one of the only VAMCs that does not share health information with providers in the community or any other Non-VA facilities. This is a disadvantage to the veterans who receive care at VAMC Memphis. The reality is that veterans have multiple providers and do not use the Memphis VA for all of their health care needs. Also, there are occasions in which VA providers have to refer veterans outside of the VA for care that cannot be provided in-house. Not to mention situations in which a veteran goes out of town and has to seek emergency medical care. In each of these instances, VAMC Memphis has no relationship with any outside medical facilities or providers allowing the exchange of vital medical information.

This means that veterans have to hand deliver their records or authorize medical facilities to fax medical documents.

Not having a form of HIE is a disadvantage and an inconvenience for veterans. Having to hand carry or have records faxed can lead to vital documents being lost or faxed to the wrong individuals. This can also cause extensive damages to a veteran because if medical records get into the hands of those willing to use the information for harm, identity theft becomes a major concern.

Historically, providers rely on faxing or mailing each other pertinent information, which makes it difficult to access in "real time" when and where it is needed. HIE facilitates the exchange of this information via electronic health records (EHRs), which can result in much more cost-effective and higher-quality care. (Menachemi & Collum, 2011a)

Without efficient HIEs; veterans are burdened with unnecessarily repeated tests, inefficient health care delivery, and even misdiagnosis. These disadvantages can lead to increased costs for medical service, long wait times, and in the worst case scenario; death. The Department of Veterans Affairs (DVA) has recognized the need to establish HIE within VAMCs. In recognition of this need the virtual lifetime electronic record (VLER) health exchange program was developed. VLER coordinators were hired to work in VA hospitals across the country. The coordinators are responsible for establishing partnerships with local providers and facilities in respective communities in effort to create HIE and share medical information electronically.

Establishing the VLER program is not an easy task for VLER coordinators, especially for the coordinator at VAMC Memphis. While other VA hospitals across the nation are using the

VLER program, VAMC Memphis and other Tennessee VAMCs lag behind. The challenges faced by the VLER coordinator at Memphis include but are not limited to: obtaining veteran consent, obtaining VA provider buy-in, educating both the veteran and provider on the VLER program, and getting other key individuals/stakeholders within the facility to do their parts in regard to the program. Currently, there are providers willing to share information electronically with VA Memphis. However, the hospital has yet to determine interoperability requirements or EHR compatibility because the VLER coordinator is not being supported enough to actively promote the benefits of the program within and around the local area. Lack of this critical component is an obstacle that must be overcome in order for the program to continue to build the required infrastructure that must be cultivated for the exchange of medical information. While the challenges of getting the VLER initiative up and running at VAMC Memphis are many, they are not insurmountable. With the use of the three Cs; communication, cooperation, and coordination the benefits of the VLER can be experienced by veterans.

Health Information Exchange (HIE)

In order to understand the HIE issues facing VA Memphis one must understand exactly what HIE is. "HIE is the process of sharing patient-level electronic health information between different organizations and can create many efficiencies in the delivery of health care" (Menachemi & Collum, 2011b). Essentially, HIE would allow providers to have instant access to possible life-saving medical information through the use of sophisticated EHR systems. Why it is a priority in today's society?

In the 1980s and 1990s, such leading healthcare organizations as Intermountain

HealthCare, Partners HealthCare, and Wishard Memorial Hospital began to demonstrate

the quality and efficiency potential of EHRs. However, even in the midst of those successes, it became clear that there are key healthcare problems that 'siloed' EHRs do not solve. Examples of problems that could only be addressed by interoperability included support for the patient across transitions of care, the ability to perform longitudinal analyses of care and public-health needs. (Byers, 2011)

Consequently, as early as 1980 health care organizations have been trying to harness the power of EHRs and demonstrate their effectiveness. Lack of interoperability and HIE were identified as among the most salient problems inhibiting effective use of health information technology (HIT). The passing of the American Recovery and Reinvestment Act of 2009 was the federal government's first large-scale attempt to address the lack of HIE. Nguyen, Chan, Makam, Stieglitz, & Amarasingham (2014) highlight this:

The potential of health information technology (IT) to effectively bridge this gap across the delivery of healthcare and social services remains unrealized. The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 allocated \$548 million for the development of health information exchanges (HIEs), with the aim of building an IT infrastructure to support coordinated, interdisciplinary team-based care. (pg. 61)

HIE has the potential to make life easier for patients and providers alike. However, risks/challenges are associated with the implementation of HIE. The potential benefits of HIE are notable. The push of the federal government in favor of HIE is justified. "According to our analysis, accessing additional clinical data through the HIE in the ED settings can reduces the number of orders for laboratory tests and radiology examinations by, respectively, 52% and

36%" (Yaraghi, 2015). Reports as such give credence to the notion that HIE is beneficial and has the potential to lower health care costs and increase the quality of health care. However, providers must be aware of the challenges involved with HIE. "In 2013, the barriers listed were cost, efficiency/workflow, impedes competition, value of HIE is difficult to measure, clinical data missing when needed, usability, heavily dependent on leadership of the organization, lack of standards, and misaligned incentives" (Kruse, Regier, & Rheinboldt, 2014). Consequently, the option of HIE should be explored by all health care facilities, making sure not to exclude risk vs reward.

Virtual Lifetime Electronic Record (VLER)

The information sharing process between VA providers and Non-VA providers is part of the virtual lifetime electronic record (VLER) program.

This program gives VA and non-VA health care providers secure access to certain parts of your electronic health record. This access reduces the need for Veterans and their families to request and carry paper medical records from one health care provider to another. It also provides other potential benefits to Veterans and their providers. (U.S. Department of Veteran Affairs, 2015)

VLER is the VA's version of HIE. For the sake of simplicity, one should just consider VLER and HIE synonymously because the benefits and challenges are almost identical. However, getting VLER off the ground at VA Memphis reveals a different set of challenges that are sometimes overlooked. The VA began a pilot program to assess the viability of VLER Health Exchange in 2009. One particular study of the pilot program evaluated and detailed results from 12 of the pilot sites. This study also yielded other significant information.

VA implementation of VLER Health Exchange is overseen by a central leadership group and local implementation teams. Members of the local VA teams include, but are not limited to, VA medical center leadership and representatives from the Privacy, Health Information Management, and Release of Information departments, and clinician champions from throughout the VA health care system. During the pilot phase, VA community coordinators managed local troubleshooting, helped establish Veteran education and consent processes, supported provider training, and acted as the local liaison between VA and the partner organizations. (Byrne et al., 2014a).

VA Memphis has a VLER coordinator who is very optimistic and dedicated to getting the program up and running. However, there seems to be no local implementation team in place. The VLER coordinator is alone in the implementation process. VA Memphis leadership and other key individuals within the facility whose contributions would be extremely beneficial to the program are not present. Unfortunately, these individuals have avoided offering their assistance in the VLER initiative, fully aware of the positive impact their affiliation would have. Consequently, this is one of the challenges facing the VLER coordinator. Effective communication is not taking place at VA Memphis about the VLER program and the exchange of health information. Not having a strong team within the facility advocating for the program makes it that much harder to get to a point of establishing communication and exchange of information with Non-VA community providers. If VA Memphis cannot obtain buy-in within the hospital it will not be able to facilitate successful HIE with outside providers. Another challenge preventing VA Memphis from moving forward with reaching out to local providers and addressing interoperability concerns is obtaining patient consent. This process would seem to be one of minimal challenge as it simply requires getting the veteran to sign a piece of paper

or consent electronically online. However, this may be the most difficult/biggest challenge. The other challenge for VA Memphis is being able to provide sufficient education to the patient and provider population. If each respective group understands the benefits of VLER and the role they play in making the program a success then the program will be just that; a success.

My HealtheVet (MHV)

Patient portals have become a normalcy in health care. Many hospitals, doctors' offices, and even single provider practices are offering patient portals. These patient portals are essentially personal health records (PHRs) that are accessible online allowing the patient to view his/her medical record via any internet capable medium. Most patient portals allow patients to do things such as: refill prescriptions, schedule appointments, and communicate with providers through secure-messaging. Health care organizations implemented patient portals with the goal of empowering patients to take charge of their personal health care and to promote a team concept between patient and provider. "A recent survey found that people pay more attention and become more engaged in their health and medical care when they have easy access to their health information online" (Emont, 2011a). Patient portals have the ability to transform health care by increasing communication between patient and provider, giving patients more options in regard to their healthcare, and increasing the availability of appointments as the need for appointments will decrease with patient portal availability.

The VA launched an online personal health record system called My HealtheVet (MHV) in 2003. MHV is free, available to all veterans, and completely accessible through the internet (https://www.myhealth.va.gov/index.html). MHV allows VA patients access not only to their health records, but also to evidence-based health information, patient-

directed reminders for preventive health services, secure messaging with healthcare providers, and opportunities to record and track medications and self-entered health data. (Tsai & Rosenheck, 2012)

MHV is a fan favorite amongst the veteran population at VA Memphis. The ability to communicate with providers, access lab results, and do it all online is considered a tremendous asset to the veterans. "As of March 2010, it was reported that MHV received over 38 million visits with over 976,000 registered users, 75 percent of whom are VA patients" (Emont, 2011b).

The numbers achieved by MHV in 2010 were astounding. "According to the My HealtheVet program office, as of June 30, 2012 nearly 1.8 million Veterans, Servicemembers and their caregivers have registered to use the website" (U.S. Department of Veteran Affairs, 2014). Based on this fact, from 2010-2012 824,000 new users registered for MHV. Once again these numbers are favorable. These numbers are favorable mainly in regard to the implementation of the VLER program. It stands to reason that if 1.8 million individuals have registered for MHV, then those same individuals may consent to information sharing via the VLER program. Obviously, the DVA believes that veterans would be inclined to consent to VLER as well. The MHV site promotes VLER and encourages veterans to complete a consent form in order to connect their VA and community docs. The following is an excerpt from MHV in which VLER is highlighted:

Connecting the Docs: Sharing Electronic Medical Records



Would you like to connect your VA Doc and your community Doc ? Help them share your health information securely and electronically?

The Virtual Lifetime Electronic Record (VLER) Health program lets your VA health care providers ('Docs') see some of your non-VA health information. At the same time, your non-VA health care providers can see certain parts of your VA health information. All you have to do is sign a release (VA form 10-0485). The VA needs your permission before your health information is shared with your non-VA health care providers, using this secure program.

Many Veterans receive care from non-VA health care providers. Sharing your health information will help reduce the need for you to carry your records between your health care providers. It also gives your health care providers a better picture of your overall health when they are treating you.



This program is spreading across the country to make sure your non-VA health care provider is among the trusted partners with whom VA will share your health information. Remember that your VA Medical Center will only share your health information through this program with your signed permission. You can sign up online, using postal mail or at your local VA Medical Center.

Deciding not to participate will not affect your health benefits or your relationship with your doctor.

For more information about this program and the VA form you will need to sign, visit the VLER Health website at http://www.va.gov/VLER/. (My HealtheVet, 2015)

<u>TriWest/Patient-Centered Community Care (PC3)</u>

The problem that the VA has had in regard to appointment availability and veteran access to care has been well documented. As part of the DVA, the Veterans Health Administration (VHA) takes pride in caring for the nation's veterans and providing quality care when needed by those veterans. However, access to care has not been available in a timely matter where and when veterans have needed it.

On Wednesday, May 21, 2014 VA launched the Accelerating Access to Care Initiative, a nation-wide program to ensure timely access to care. As directed by President Obama, VHA identified Veterans across the system experiencing waits that do not meet Veterans expectations for timeliness. VA began contacting and scheduling all Veterans who are

waiting for care in VA clinics or arranging for care in the community, while simultaneously addressing the underlying issues that impede Veterans' access. (U.S. Department of Veteran Affairs, 2015)

This initiative was very important in winning back the trust of the veterans as the population did lose trust in knowing that the VA would always be willing and able to take care of their health care needs. One important aspect of the initiative is the VA arranging for veterans to be seen in the community. This part of the initiative revealed a third party administrator (TPA) coming into play. That TPA is TriWest/PC3. The TPA was established to help combat the access issues and improve veteran satisfaction with VHA services.

Through VAPC3, TriWest will provide access to high quality health care services through their network of providers as well as referral management, patient appointing, medical documentation tracking, coordination of admissions and discharges in community facilities, clinical quality management and claims payment. According to VA, the total value of the VAPC3 contract over a five year period is estimated at \$4.3 Billion. (TriWest Healthcare Alliance, 2013)

The important element of the affiliation with TriWest is the medical documentation tracking element. This particular feature is important because it allows the transfer of medical documentation and financial/billing information electronically. How is this possible? If TriWest is communicating with the VA electronically, why is it so difficult to get the VLER program operating in the same fashion?

Obtaining veteran consent

Obtaining veteran consent is the most integral part in the process of the VLER initiative. Veterans must agree to have their medical information shared electronically between VA providers and non-VA providers. Currently, there are correlations that indicate instances in which veterans who receive their primary care at VA Memphis are receiving care at non-VA providers. Correlations highlight the facilities visited and the number of VA Memphis veterans seen at each facility. The numbers within the correlations also signify the number of veterans that have not consented to sharing their medical information electronically. This is why obtaining consent is paramount. The interoperability requirements and EHR compatibility have already been established with certain non-VA providers; veteran consent is the missing element.

Consequently, without veteran consent, countless amounts of medical information remain untapped and unbeneficial to patients and providers. Veterans can consent to information sharing by completing and signing the VA Form 10-0485 Request For And Authorization To Release Protected Health Information To Health Information Exchanges.

VAP is the subsystem responsible for authorizing health information exchange to trusted PSPs and managing Veteran electronic consent directives. VAP creates an enterprise-wide electronic solution capable of supporting Veteran authorization preferences and consent directives. Also, it enforces organizational policies on privacy and security relative to Release of Information (ROI), and the disclosure of individually-identifiable health information to carry out treatment. The VAP system is comprised of both user and machine interfaces to set patient preferences for how patient data can be shared. Signed authorizations from Veterans can be obtained either on paper (mailed in or hand delivered) and then entered into the VAP system by ROI staff or electronically by using the VA/DoD eBenefits patient portal, where Veterans can sign pre-approved

authorizations. These authorizations are then processed automatically by VAP without human intervention. The VAP application generates three main reports: 1) the Accounting of Disclosures, 2) the Received NwHIN Documents Report, and 3) the Opt In/Opt Out Report. These reports provide a required audit and accountability of the transactions conducted over the NwHIN, including access to copies of the information exchanged. (Bouhaddou et al., 2012).

OMB Number: 2900-0260 Estimated Burden: 3 minutes Expiration Dute: 03/31/2016 Department of Veterans Affairs REQUEST FOR AND AUTHORIZATION TO RELEASE PROTECTED HEALTH INFORMATION TO HEALTH INFORMATION EXCHANGES Privacy Act Information: The execution of this form does not authorize the release of information other than that specifically described below. The information requested on this form is solicited under Title 38, U.S.C. The form authorizes release of information in accordance with The Health Insurance Portability and Accountability Act, (HIPAA) 45 CFR Parts 160 and 164, 5 U.S.C. 552a, and 38 U.S.C. 5701 and 7332 that you specify. Your disclosure of the information requested on this form is voluntary. However if the information containing the Social Security Number (SSN) (the SSN will be used to locate records for release) is not furnished completely and accurately, eHealth Exchange will be unable to comply with the request. The Veterans Health Administration may not condition treatment, payment, enrollment or eligibility on signing the authorization. VA may disclose the information that you put on the form as permitted by law. VA may make a "routine use" disclosure of the information as outlined in the Privacy Act systems of records notices identified as 24VA10P2 "Patient Medical Record -VA", and 168VA10P2 "Virtual Lifetime Electronic Record (VLER), and in accordance with the VHA Notice of Privacy Practices. You do not have to provide the information to VA, but if you do not, the eHealth Exchange will be unable to process your request and serve your medical needs. Failure to furnish the information will not have any affect on any other benefits to which you may be entitled. VA may also use this information on this form to identify Veterans and persons claiming or receiving VA benefits and their records, and for other purposes authorized or required by law.

Paperwork Reduction Act Information: The Paperwork Reduction Act of 1995 requires us to notify you that this information collection is in accordance with the clearance requirements of section 3507 of the Act. We may not conduct or sponsor, and you are not required to respond to, a collection of information unless it displays a valid OMB number. We anticipate that the time expended by all individuals who must complete this form will average 3 minutes. This includes the time it will take to read the instructions, gather the necessary facts and fill out the form. The purpose of this form is to provide an individual the means to make a written request for a copy of their information maintained by the Department of Veterans Affairs (VA)in accordance with 38 CFR 1.577. Patient Full Name Middle: First: Last: (print) Birth Date SSN: Gender: Male Female (mm/dd/yyyy): Requestor Name: VA Approved eHealth Exchange Participants and other Health Information Exchanges with whom VA has an agreement. Information Requested: Pertinent health information from electronic health record. I request and authorize my VA health care facility to release my protected health information (PHI) for treatment purposes only to the communities that are participating in the eHealth Exchange and other Health Information Exchanges with whom VA has an agreement. This information may consist of the diagnosis of Sickle Cell Anemia, the treatment of or referral for Drug Abuse, treatment of or referral for Alcohol Abuse or the treatment of or testing for infection with Human Immunodeficiency Virus. This authorization covers the diagnoses that I may have upon signing of the authorization and the diagnoses that I may acquire in the future including those protected by 38 U.S.C. 7332. This authorization will remain in effect for the period of five years. I may revoke this authorization, in writing, at any time except to the extent that action has already been taken to comply with it. Written revocation is effective upon receipt by the Release of Information Unit at my VA health care facility. Redisclosure of my electronic health records by those receiving the above authorized information may be accomplished without my further written authorization and may no longer be protected. AUTHORIZATION: I certify that this request has been made freely, voluntarily and without coercion and that the information given above is accurate and complete to the best of my knowledge. Signature of Patient Date VA FORM 10-0485

Challenges in establishing HIE

The issues of establishing HIE have been well documented. Many health care organizations have attempted to implement forms of HIE. Some of these organizations have failed and others have succeeded. The documented challenges with the implementation of HIE systems generally focus on interoperability and EHR systems.

"While the development of health information technology, particularly electronic health records (EHR), is a triumph for the advancement of healthcare, non-interoperable clinical data systems lead to fragmented communication and incomplete records. If interoperable HIT systems could be achieved integrated HIT could be leveraged to lessen medical errors, improve patient care and optimize epidemiological research. To understand the barriers to interoperability or health information exchange (HIE), we reviewed the literature on HIT and barriers to HIE. Our search yielded 492 articles, 25 meeting our inclusion criteria. In general, we found that the predominant barriers to HIE are need for standards, security concerns, economic loss to competitors, and federated systems. Research on interoperability is limited because most HIE programs are still in formative

stages. More research is needed to fully understand interoperability of HIT, how to overcome the barriers to interoperability, and how to design HIT to better facilitate HIE." (Edwards, Hollin, Barry & Kachnowski, 2010)

Security concerns, varying EHR systems, and standardization are significant barriers to the establishment of HIE. However, these are not the only barriers/challenges associated with implementing a system such as VLER.

Recommendations for Success

The VLER coordinator alone will not be enough to ensure HIE occurs between VA and non-VA providers. VA Memphis has seen the health care executives and leaders within the facility abandon the VLER program. These individuals are busy and have important jobs within the facility. It is understandable that other commitments can prohibit the level of focus required to render the program a success. Research has indicated that successful HIE requires a level of participation from upper management.

"The potential of HIE to address many cost and quality issues will ensure HIE remains on many national agendas. In many instances, health care executives and leaders have opportunities to work within national programs to help shape local exchange governance and decide technology partners. Furthermore, HIE raises policy questions concerning the role of centralized planning, national identifiers, standards, and types of information exchanged, each of which are vital issues to individual health organizations and worthy of their attention" (Vest JR, 2012)

THE CHALLENGES OF ESTABLISHING PARTNERS IN HEALTH

19

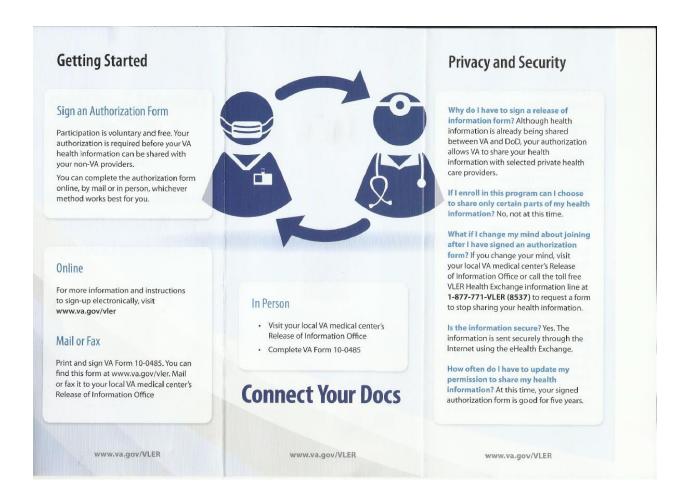
Participation on the part of the veteran is of the utmost importance to the VLER initiative. Without the veteran there is no VLER initiative. Education of the veteran population is needed in order to get the consent required from the veteran. If the veteran has no knowledge or has invalid assumptions about HIE and how it is conducted within the facility that he/she receives primary care, the chances of successful implementation of any HIE system will be minimal. Also, education must be provided to all veterans, even those who do not seek care from community

Many of the pilot sites initially targeted education efforts to Veterans who receive care from both VA and from an exchange provider ("shared" patients); however, any Veteran patient could participate even if not currently a shared patient [27]. Participation by non-shared patients can impact the ability to match patients, since these patients may not be known to existing HIE partners, as discussed below. Over time as more health care providers participate in HIE, there is a greater likelihood that the Veterans will be shared patients, and that their information will be available via VLER Health Exchange. (Byrne et al., 2014b)

Educating veterans/providers about VLER

providers.







References

- Bouhaddou, O., Bennett, J., Teal, J., Pugh, M., Sands, M., Fontaine, F., ... Cromwell, T. (2012).

 Toward a Virtual Lifetime Electronic Record: The Department of Veterans Affairs

 Experience with the Nationwide Health Information Network. AMIA Annual Symposium

 Proceedings, 2012, 51–60
- Byers, J. (2011). JAMIA: A brief history of HIE. *Clinical Innovation+Technology*. Retrieved from http://www.clinical-innovation.com/topics/health-information-exchange/jamia-brief-history-hie
- Byrne, C., Mercincavage, L., Bouhaddou, O., Bennett, J., Pan, E., Botts, N., Cromwell, T. (2014a). The Department of Veterans Affairs' (VA)implementation of the Virtual Lifetime ElectronicRecord (VLER): Findings and lessons learned fromHealth Information Exchange at 12 sites. *International Journal of Medical Informatics*, Volume 83, Issue 8, Pages 537–547. doi:10.1016/j.ijmedinf.2014.04.005
- Byrne, C., Mercincavage, L., Bouhaddou, O., Bennett, J., Pan, E., Botts, N., Cromwell, T. (2014b). The Department of Veterans Affairs' (VA)implementation of the Virtual Lifetime ElectronicRecord (VLER): Findings and lessons learned fromHealth Information Exchange at 12 sites. International Journal of Medical Informatics, Volume 83, Issue 8, Pages 537–547. doi:10.1016/j.ijmedinf.2014.04.005
- Edwards, A., Hollin, I., Barry, J., & Kachnowski S. (2010). Barriers to cross--institutional health information exchange: a literature review. *J Healthc Inf Manag*, 24(3):22-34. Retrieved from http://www-ncbi-nlm-nih-gov.ezproxy.uthsc.edu/pubmed/20677469

- Emont, S. (2011a). Measuring the Impact of Patient Portals: What the Literature Tells Us.

 California HealthCare Foundation. Retrieved from

 http://www.chcf.org/~/media/MEDIA%20LIBRARY%20Files/PDF/M/PDF%20Measuri

 ngImpactPatientPortals.pdf
- Emont, S. (2011b). Measuring the Impact of Patient Portals: What the Literature Tells Us.

 California HealthCare Foundation. Retrieved from

 http://www.chcf.org/~/media/MEDIA%20LIBRARY%20Files/PDF/M/PDF%20Measuri

 ngImpactPatientPortals.pdf
- Kruse, C. S., Regier, V., & Rheinboldt, K. T. (2014). Barriers Over Time to Full Implementation of Health Information Exchange in the United States. *JMIR Medical Informatics*, 2(2), e26. doi:10.2196/medinform.3625
- Menachemi, N., & Collum, T. H. (2011a). Benefits and drawbacks of electronic health record systems. *Risk Management and Healthcare Policy*, 4, 47–55. doi:10.2147/RMHP.S12985
- Menachemi, N., & Collum, T. H. (2011b). Benefits and drawbacks of electronic health record systems. *Risk Management and Healthcare Policy*, 4, 47–55. doi:10.2147/RMHP.S12985
- My HealtheVet. (2015). Connecting the Docs: Sharing Electronic Medical Records. *United States Department of Veteran Affairs*. Retrieved from https://www.myhealth.va.gov/mhv-portal-
 - web/mhv.portal? nfpb=true& nfto=false&_pageLabel=spotlightArchive&contentPage=spotlight/March2015/ConnectingDocsSharingElectronicMedicalRecords.html

- Nguyen, O.K., Chan, C.V., Makam, A., Stieglitz, H., & Amarasingham, R. (2014). Envisioning a social-health information exchange as a platform to support a patient-centered medical neighborhood: a feasibility study. *Journal of General Internal Medicine*, Jan;30(1):60-7. doi: 10.1007/s11606-014-2969-8
- TriWest Healthcare Alliance. (2013). TriWest Awarded Contract to Administer VA Patient-Centered Community Care Program. Retrieved from https://www.triwest.com/en/about-triwest/triwest-news/corp-news-archive/2013/09/vapccc-contract/
- Tsai, J. Rosenheck, R. (2012). Use of the internet and an online personal health record system by US veterans: comparison of Veterans Affairs mental health service users and other veterans nationally. *Journal of the American Medical Informatics Association*, 19 (6) 1089-1094; DOI: 10.1136/amiajnl-2012-000971
- United States Department of Veterans Affairs. (2015). Patient Access Data. http://www.va.gov/health/access-audit.asp
- United States Department of Veteran Affairs. (2014). Researchers aim to promote Veterans' use of MyHealtheVet. Retrieved from http://www.research.va.gov/news/features/MyHealthevet.cfm
- United States Department of Veterans Affairs. (2015). VLER Health. Retrieved from http://www.va.gov/VLER/
- Vest JR. (2012). Health information exchange: national and international approaches. *Adv Health Care Manag*. 2012;12:3-24. http://www-ncbi-nlm-nih-ov.ezproxy.uthsc.edu/pubmed/22894043

Yaraghi, N. (2015). An Empirical analysis of the financial benefits of health information exchange in emergency departments. *Journal of the American Medical Informatics*Association, DOI: 10.1093/jamia/ocv068