

**MODUL PROTEKSI DAN PERTUKARAN INFORMASI KESEHATAN**

**HIE Landscape  
PERTEMUAN 2 (ONLINE)**



## PENGANTAR

Perkembangan teknologi informasi pada saat ini sudah sangat pesat. Berbagai disiplin ilmu sudah tidak bisa dipisahkan dengan teknologi. Salah satu teknologi yang masih populer adalah komputer, karena berbagai pekerjaan banyak dipermudah dengan komputer. Seperti membuat surat, membuat formulir rekam medis, merekap sepuluh besar penyakit, membuat statistik pelayanan kesehatan, dll. Pada Bidang kesehatan banyak manfaat yang telah dirasakan oleh kita dengan adanya komputer, sekarang ini tidak hanya sekedar teknologi informasi yang berjalan di fasilitas kesehatan, perkembangan teknologi komputer dan informasi sudah ke ranah Personal Health Record (PHR). Contoh produk PHR yang telah banak digunakan di dunia kesehatan adalah berbentuk *telemedicine*, yaitu bentuk teknologi home care jarak jauh. Pasien tinggal dirumah dan petugas kesehatan hanya mengecek kesehatan, terutama pada pasien jantung yang tinggal di rumah sendiri maka alat yang berbentuk gelang tangan itu bisa mengirimkan sinyal kepada petugas kesehatan jika pasiennya terjadi perubahan kesehatan.

Sejalan dengan penetrasi teknologi informasi dan komunikasi (TIK) yang telah merambah menyatu ke semua segi kehidupan, pemanfaatan TIK untuk mendukung pembangunan kesehatan menjadi tak terhindarkan. Implementasi TIK dalam bidang kesehatan dapat: (1) meningkatkan kualitas, aksesibilitas, dan kesinambungan upaya kesehatan serta kecepatan proses kerja terutama di fasilitas pelayanan kesehatan; (2) mengoptimalkan aliran data sehingga meningkatkan ketersediaan data dan informasi kesehatan yang berkualitas.

Kemajuan TIK telah sampai pada tingkatan melakukan transformasi pelayanan kesehatan, tidak hanya sebatas penyelenggaraan Sistem Informasi Kesehatan (SIK). Keberadaan SIK sebagai salah satu subsistem dalam sistem kesehatan sangatlah penting. Melalui SIK yang handal, proses pemantauan dan evaluasi program kesehatan akan berjalan lebih efektif. Data yang dikumpulkan secara rutin oleh fasilitas pelayanan kesehatan dapat diolah secara otomatis dan menghasilkan laporan yang sesuai dengan kebutuhan manajemen untuk membuat berbagai keputusan operasional, manajerial sampai dengan strategik.

Penerapan TIK di bidang kesehatan telah menjadi tuntutan organisasi/institusi kesehatan tidak saja di sektor pemerintah tetapi juga di sektor swasta dalam menjalankan operasional pelayanannya agar lebih efisien. Beberapa inisiatif implementasi *e-kesehatan*, yaitu (1) untuk mendukung layanan kesehatan individu (sistem elektronik untuk pencatatan dan pelaporan rumah sakit, Puskesmas, dan fasilitas pelayanan kesehatan lainnya, serta telemedicine), (2) layanan kesehatan masyarakat (sistem elektronik untuk surveilans penyakit, penanggulangan krisis kesehatan), dan (3) layanan dukungan administrasi kesehatan (sistem elektronik untuk manajemen sumber daya manusia, logistik obat dan perbekalan kesehatan dan jaminan kesehatan). Di Indonesia pelaksanaan *e-kesehatan* masih terbatas pada cakupan dan wilayah dan sub sistem kesehatan tertentu.

Berbagai masalah masih dihadapi dalam penyelenggaraan sistem informasi kesehatan di Indonesia. Masalah-masalah dimaksud dapat dikelompok menjadi 3

kelompok masalah, yaitu: (1) lemahnya tatakelola SIK, (2) fragmentasi sistem informasi kesehatan, dan (3) lemahnya manajemen data dan sistem penunjang pengambilan keputusan. Hal ini semua mengakibatkan masih rendahnya ketersediaan dan kualitas data/informasi kesehatan pada level nasional. Padahal di satu sisi sejalan dengan perkembangan organisasi kesehatan, kebutuhan pemanfaatan data/informasi semakin meningkat dan cepat. Ketersediaan data/informasi yang baik untuk pengambilan keputusan yang lebih baik. Fragmentasi ini terlihat dari berbagai macam sistem informasi digunakan untuk mendukung berjalannya program kesehatan. Masing-masing program kesehatan memiliki mekanisme pengumpulan, analisis, presentasi, dan pengambilan keputusan secara mandiri, dan tidak terintegrasi satu sama lainnya.

Dari hasil penilaian SIK pada tahun 2007 dan 2012 menggunakan perangkat penilaian sistem informasi kesehatan dari *Health Metrics Network* (HMN), secara umum menunjukkan bahwa SIK adekuat dan masih banyak peluang untuk ditingkatkan, terutama dari aspek manajemen data kesehatan. Namun demikian, dalam kurun waktu lima tahun itu secara umum terlihat adanya perbaikan yang mana perbaikan yang cukup besar pada komponen sumber daya. Namun demikian, upaya penataan dan penguatan sistem informasi kesehatan harus terus dilakukan. Berbagai permasalahan sistem informasi kesehatan ini tentunya menuntut strategi yang tepat dalam mengimplementasikan *e-kesehatan*.

Perkembangan aplikasi pelayanan kesehatan yang ada saat ini sudah berjalan baik, namun disadari bahwa aplikasi *e-kesehatan* tersebut belum mampu menyediakan data/informasi yang sesuai dengan harapan dan belum mampu menjadi alat manajemen yang baik serta belum optimal mendukung proses kerja dalam pelayanan kesehatan. Kondisi ekosistem sistem kesehatan yang sangat kompleks menjadi salah satu hambatan, yang mana saat ini terdapat lebih dari 2.000 rumah sakit dan lebih dari 9.000 Puskesmas. Selain itu, berbagai macam fasilitas pelayanan kesehatan yang sudah memanfaatkan teknologi informasi dan komunikasi, di antaranya sistem informasi manajemen rumah sakit, sistem informasi Puskesmas, klinik, praktek dokter swasta, apotik, laboratorium, optik, asuransi kesehatan, dan industri farmasi, tidak saling terhubung satu dengan lainnya (tidak interoperabel).

Hasil *assessment e-kesehatan* tahun 2013 menunjukkan bahwa pemanfaatan standar masih perlu banyak penguatan. Standar dapat dilihat berbagai sudut pandang antara lain standar fungsional sistem informasi elektronik, standar data, dan terminologi kesehatan, standar keamanan dan privasi, maupun standar komunikasi data elektronik (protokol pertukaran data). Upaya standardisasi *e-kesehatan* sudah dilakukan dengan beberapa pendekatan. Sebagai contoh penggunaan standar data dan terminologi kesehatan dituangkan dalam Kamus Data Kesehatan Nasional (*Health Data Dictionary*) yang mulai dibangun sejak tahun 2013 melalui Kementerian Kesehatan. Standar pertukaran data elektronik dilakukan dengan mengadopsi standar internasional yang sudah ada dalam kerangka SNI (Standar Nasional Indonesia) yang diinisiasi oleh Kementerian Komunikasi dan Informasi.

Berbagai macam aplikasi *e-kesehatan* yang telah ada menuntut perlunya pengelolaan standar *e-kesehatan* secara nasional yang tidak hanya terkait pada standar data dan terminologi kesehatan. Diperlukan pengembangan standar teknis untuk

membangun privasi, keamanan sistem informasi, interoperabilitas, dan juga standar output informasi kesehatan dari sistem informasi yang ada (standar indikator) serta mekanisme penyebaran informasi kesehatan melalui media elektronik dan website. Standar nonteknis juga perlu dikembangkan seperti standar fungsionalitas rekam medis elektronik, standar sertifikasi sistem informasi, standar tenaga fungsional sistem informasi kesehatan dan masih banyak lagi yang perlu dikembangkan bersama.

Beberapa sistem informasi untuk pelayanan kesehatan individu telah dikembangkan baik oleh Kementerian Kesehatan (SIKDA Generik, SIMRS GOS, SIHA, SITT, SIM Surveilans, SI-PTM, SISMAL), BPJS (*P-Care*), maupun industri (SIMPUS, SIMRS, SIM-Klinik) yang berpotensi untuk mempercepat adopsi sistem informasi pada pelayanan kesehatan. b. Data warehouse tingkat pusat akan mengintegrasikan berbagai sistem data. Visualisasi informasi kesehatan di tingkat pusat sudah dapat diakses melalui berbagai aplikasi Komdat, Aplikasi SPM, *eLogistik*, SIRS Online, Sistem Kewaspadaan Dini dan Respons dan lainnya. c. Aplikasi SPGDT dan tele-radiologi serta tele-konsultasi telah berhasil diimplementasikan di beberapa lokasi dan siap untuk diimplementasikan ke seluruh Indonesia.

## Understanding the HIE Landscape

The health information exchange (HIE) landscape has changed dramatically since HIE and the Nationwide Health Information Network (NwHIN) was first conceptualized in 2001. The National Committee on Vital and Health Statistics (NCVHS) published recommendations in 2001 on nationwide electronic health information exchange in the report titled “Information for Health, A Strategy for Building the National Health Information Infrastructure.” Formally codified by the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009, the Office of the National Coordinator for Health IT (ONC) has supported the development of standards, services, and policies for HIEs. The number of HIEs and HIE stakeholders exchanging information has grown exponentially as a result of ONC's efforts. But both emerging and established HIEs continue to face challenges and barriers, such as:

- Financial sustainability
- HIE governance
- Winning stakeholder support
- Establishment of consistent privacy and security safeguards

In spite of the numerous challenges, the promise of improved patient care resulting from the availability of a longitudinal health record across the healthcare continuum provides the necessary incentive to continue working toward accurate, secure, and interoperable health information exchange.

The speed with which HIEs are developed and implemented across the US has impacted the health information management (HIM) profession. As key stakeholders in efforts such as privacy, security, and confidentiality, HIM professionals will be called upon to ensure the appropriate and accurate exchange of information. HIM professionals must be prepared to interact and provide guidance to HIEs in order to incorporate foundational information management and governance practices into this emerging arena.

This practice brief describes the current HIE landscape, provides best practices in information management, and identifies how HIM professionals can collaborate with and offer education to HIEs.

The introduction of payment and delivery reforms, which range from the establishment of accountable care organizations (ACOs) to bundled payments and patient-centered medical homes, is creating a compelling business case for electronic exchange. In response to HIE-infused initiatives like the federal government's “meaningful use” EHR Incentive Program, healthcare systems and small providers now desire to link to an HIE. Innovative approaches to electronic information exchange are emerging as a result, including private HIE networks advanced by hospital systems pursuing ACO status, exchange services offered by electronic health record (EHR) vendors, and regional- and state-level information exchange initiatives. According to a recent KLAS survey, the number of active private HIEs tripled from 52 in 2009 to 161 in 2010.

Instead of waiting for state HIEs to mature, some larger health networks have begun contracting with IT vendors to develop their own proprietary health information exchanges focused on exchanging information between its own facilities and select outside partners. Concerns have been raised that, because of their narrow focus on providing services based on margin and competitive advantage, such private HIEs will drain customers and resources away from state and community HIEs.

State and community HIEs have seen a steady-although less dramatic-rate of growth. The eHealth Initiative (eHI) identified 255 HIE initiatives in 2011, up from 234 in 2010. Many HIE proponents are concerned that the rapid growth of private HIE activities will ultimately undercut the state and community HIE business model, decreasing the likelihood of their success and making the NwHIN dependent on nascent technologies for community-level functions, such as record locator services.

For the time being, ONC has adopted a wait-and-see attitude, contending that different models work best for different states. ONC has urged its grantees to try to leverage the private HIE development in their states, looking for ways to provide services not being offered by the private HIEs, such as linking private HIEs together, providing access to rural providers, or offering unique services as a platform through which innovative software developers could offer valuable new services to healthcare providers and other HIE participants. Other possible services include patient locator services, immunization registries, birth registries, and cancer registries. Proponents of state and community HIEs believe they are uniquely positioned to bring competitors together to achieve unmet service needs.

The NwHIN, the former NwHIN Exchange (now called eHealth Exchange and operated by a public-private partnership), and The Direct Project are three initiatives launched to help expand secure HIE efforts using NwHIN standards. If NwHIN is considered as the "Internet"-an electronic environment in which the use of a common set of standards, services, and policies will allow a group of entities to exchange information, then eHealth Exchange could be compared to a consortium using a secure "intranet" in which only approved members can gain access after receiving the appropriate security credentials and agreeing to the terms of use.

The Direct Project is similar to secure e-mail or secure instant messaging. The NwHIN comprises multiple approaches one could use to electronically exchange health information among a variety of stakeholders. The variety of approaches to exchanging information may lower the cost of connections between providers. For example, Direct allows information to be pushed between providers and eliminates the cost of interfaces. The Direct Project specifies a simple, secure, scalable, standards-based way for participants to send authenticated and encrypted health information directly to known, trusted recipients over the Internet.

## HIE Governance Assures Continuity

Governance is the mechanism that assures necessary policies, standards, and services are in place so organizations can manage business operations, services, and relationships with its stakeholders. This ensures the organization is appropriately established, coordinated, and overseen, and that its policies are enforced. The first step in developing an HIE is to establish a governing structure. If the HIE will include facilities competing in the same local or regional market, a structure for building consensus on sharing patient information is imperative.

HIEs may establish a separate organization (either profit or nonprofit) with a board of directors. Board membership often includes equal representation from all facilities. However, maintaining the perfect balance of representation may be difficult. A board that is too large to work efficiently and effectively can become paralyzing. In addition, HIE membership may grow with the network's success, so establishing a limit to the size of the board can deter future issues.

Enacted in February 2009, HITECH requires the ONC to establish a governance mechanism for the Nationwide Health Information Network.<sup>7</sup> It also authorizes the Federal Health IT Policy Committee to recommend the areas in which standards, implementation specifications, and certification criteria are needed for the electronic exchange and use of health information.

The NwHIN should be:

- An environment of trust and interoperability for exchange based on NwHIN Conditions of Trust and Interoperability (CTEs)
- The preferred approach for exchange of health information nationwide
- Supported by the federal government with strong incentives to vigorously promote adoption

Creating a formal leadership structure within the HIE may facilitate further organizational activities such as establishing mission and goals, strategic planning, policies, procedures, and accountability. Important decisions to be made at the initial development of the HIE include opt-in/opt-out models, privacy and security practices, and vendor selection.

In May 2012 the ONC issued a request for information (RFI) public comment period seeking input on a broad range of governance mechanisms. In response to the public comments received, ONC decided against issuing a formal regulatory governance structure and instead proposed the following four-step non-regulatory approach.

- **Lead Through Action:** Use available levers to directly accomplish specific goals
- **Lead Through Guidance:** Disseminate a framework of principles and where available-good practices, models, and tools for specific exchange challenges
- **Engage, Listen, and Learn:** Proactively encourage and engage with communities and stakeholders offering solutions for exchange
- **Monitor:** Monitor marketplace for abuses, exchange successes, gaps, and failures as well as consumer and provider attitudes

## Meaningful Choice and HIE

The program information notice (PIN), introduced on March 22, 2012 by ONC, outlines privacy and security framework requirements and guidance for establishing robust privacy and security policies and practices for exchanging health information.<sup>10</sup> This provides the common set of privacy and security rules of the road and assures provider and public trust in enabling progress in health information exchange to support patient care.

The individual choice section within the PIN outlines that an individual should be able to designate a family member, caregiver, domestic partner, or legal guardian to make decisions on their behalf. If the HIE stores, assembles, or aggregates information beyond a directed exchange (i.e., provider-to-provider via encrypted e-mail), it should ensure individuals have “meaningful choice” regarding the exchange of information through the HIE. Patient choice is not required if the HIE uses directed exchange and does not access or use the information.

Meaningful choice signifies:

- Choice is made with advance knowledge/time
- Not used for discriminatory purposes or as a condition for receiving medical treatment
- Choice is made with full transparency and education
- Commensurate with circumstances for why individually identifiable health information (IIHI) is exchanged
- Consistent with patient expectations
- Revocable at any time

Healthcare providers will be challenged to provide patients in advance with meaningful choice, and they have several options as to the method of provision, such as paper brochures or flyers, consents, and online patient portals. Ensuring patients are provided meaningful choice will require education and awareness.



## **HIM's HIE Responsibilities Defined**

The HIM profession is changing each day. HIM roles and responsibilities are moving forward as advancements are made in healthcare delivery systems. Solid information management practices at the HIE level are vital to an HIE's success. HIM professionals can facilitate the design and maintenance of privacy and security practices, record retention activities, release of information activities, and other fundamental core competencies of the profession in both new and established HIEs.

HIM professionals are assuming leadership roles within HIE organizations providing testimony, volunteering on HIE committees, and securing key leadership roles at the workgroup, staff, and board level within an HIE. HIM professionals, healthcare organizations, and physicians must work with component state associations to support the establishment of the HIE, develop HIE policies and procedures, and incorporate fundamental information management principles into HIE functions.

Accurate patient identification and successful linking of electronic records is highly dependent on the accuracy of key demographic data. There are three different events that must occur in order to maintain patient identity data integrity:

- The data must be collected correctly
- The data must be entered correctly
- The data must be queried correctly

Errors during any of these three events create opportunities for inaccurate patient identity. As the organization becomes larger, the volume of these events grows and there is a proportionately increased opportunity for patient identity errors. These errors become compounded when an organization becomes part of a larger network or incorporates other entities' information into its own.

The underlying causes of identity errors are numerous. Some causes include people and process issues such as registration and scheduling staff selecting the wrong patient (causing an overlaid record) or the registrars entering the data to be searched incorrectly (causing either an overlay or a duplicate). Other identity errors are caused by technology challenges such as loose algorithmic record matching that causes incorrect electronic linking or auto-merging of records, or ineffective record search algorithms that prevent a registrar from finding the patient's previous record.

Another common cause is data stored in the enterprise master patient index that is not current for the patient (i.e., last name change) and the searched data is different from the data stored in the system-resulting in a duplicate record. Related to this data integrity challenge, records in the historical database often have inadequate identifying information about the patient, causing the registrar to have to create yet another record for the patient-and therefore a duplicate. Many other data integrity scenarios exist, and combinations of all of these scenarios create even more complexity. As databases get larger, the complexity of the data integrity grows exponentially.

The HIM challenge is managing multitudes of detailed data on thousands of records and millions of transactions each and every year. A strong data quality and control program must be maintained or the data will get out of control quickly in a health information exchange environment.

### ***The State of HIE in 2011***

A 2011 report from the eHealth Initiative found that 2011 brought significant change in the health information exchange environment.

- The number of HIE organizations continues to grow, with a total of 255 HIE initiatives in 2011, up from 234 in 2010.
- Out of the 196 HIE initiatives responding to the eHealth Initiative's survey, only 24 (12 percent) currently reported being self-sustaining.
- There are 10 initiatives that ceased operating between 2010 and 2011. Four closed down operations, four others consolidated with other HIE initiatives, and two for-profit organizations were purchased and had HIE operations shuttered.
- Defining value, addressing organization and governance issues, privacy and confidentiality issues, and technical aspects of HIE remain top challenges for sustainable HIEs.
- Of the 24 sustainable HIEs, 13 indicated that they will participate in an accountable care organization (ACO), and one indicated they would not participate. Ten initiatives are unsure of their plans regarding ACOs.
- HIEs generally fall into one of three architecture models. Sustainable initiatives utilize all three of these models, but the predominant model is a hybrid architecture.
  - Centralized-characterized by health information and data that resides in one central location
  - Federated-health information is stored at the local or regional level with the HIE services acting as a conduit for exchange between other entities
  - Hybrid-a combination of centralized and federated, often a central repository of information with "edge servers" utilized for data storage
- Sustainable initiatives tend to focus on care coordination services, rather than services that support administrative functions, such as claims and eligibility information.
- Opt-out was the predominant type of privacy model used by sustainable HIEs in 2011, but many initiatives are providing more granular consent at the encounter or data level.

## ***Privacy, Security, and Audits***

According to research from RTI International, the biggest challenges to establishing an HIE are varying interpretations and applications of HIPAA privacy and security rules, inconsistencies between state and federal privacy laws, and lack of trust. The lack of a clear and consistent HIE approach to privacy and security may hinder US ability to realize the benefits of electronic HIE. In an effort to bridge the gap on privacy and security within HIEs, ONC published “The Nationwide Privacy and Security Framework for Electronic Exchange of Individually Identifiable Health Information” in 2008. The framework was based on a review of numerous domestic and international privacy and security documents and practices.

The report outlines eight principles that public- and private-sector entities should use when engaging in electronic HIE. The framework also includes compliance and enforcement approaches. The principles are designed to complement current state, federal, and local laws and regulations. They provide detail on such issues as:

- Individual access
- Correction
- Openness and transparency
- Individual choice
- Collection
- Use and disclosure limitation
- Data quality and integrity
- Safeguards
- Accountability

ONC initiated the Strategic Health IT Advanced Research Projects (SHARP) in late 2009 as an American Recovery and Reinvestment Act initiative. This initiative provides funding for research that focuses on addressing problems that have impeded providers’ ability to adopt and meaningfully use health IT. The program itself is led by collaborative efforts at the University of Illinois at Urbana-Champaign, the University of Texas at Houston, Harvard University, the Mayo Clinic of Medicine, and Massachusetts General Hospital. Research is currently being conducted in several areas, including security of health information technology.

The University of Illinois at Urbana-Champaign is helping to develop technologies and policy recommendations that reduce privacy and security risks and increase public trust. This research encompasses three projects: EHRs within a single healthcare delivery organization, telemedicine, and HIE. The HIE project is concerned with security and privacy of health records as they are exchanged between care delivery organizations or individuals. The **Secure Health Information Exchange project** addresses the inadequacy of current exchange service models. The **Experienced-based Access Management project** limits insider threats through a continuously evolving model for access control rules. And the **Personal Health Records project** address third-party personal health record (PHR) privacy standards with PHR stakeholders.

HIM professionals have a responsibility to maintain a keen awareness of the developing HIE environment so they can develop, implement, and update systemwide policies and procedures that address the privacy and security of all individually identifiable health information-regardless of the medium used to capture, store, and transmit it.

## The Professionals Who Maintain and Use Health Information

**Healthcare systems administrators** are concerned with how all automated systems, including the electronic health record, affect individual departments. For example, will all the information needs of the board of directors and administration for adequate, easily obtainable decision support data be met by the current (or proposed) electronic health record system? Will the clinicians have fast, easily accessible, accurate clinical information? Is the system secure and does it meet all standards and regulations? The healthcare systems administrator may be known as the chief information officer and will typically have a great deal of knowledge and experience related to the technical aspects of automated systems.

A leadership position within a healthcare facility, including chief executive officer, chief operating officer, chief financial officer, chief information officer, or other higher-level management positions. May also be referred to as healthcare manager or health systems manager. Healthcare professionals such as medical assistants, nurses, medical coders and billers, and other administrative professionals will be using the software in a medical practice and will want it to be “user friendly,” since they will be required to enter and retrieve data quickly yet accurately.

The American Health Information Management Association (AHIMA), the American Association of Medical Assistants (AAMA), the American Medical Technologists (AMT), the Healthcare Information and Management and Systems Society (HIMSS), and the Physician Office Management Association of America (POMAA) are all professional associations offering certifying exams; providing members with up-to-date, relevant information about their respective fields; and offering continuing education opportunities, networking opportunities, publications, and career assistance. Each has an extensive website accessible by a search of the name.

Let's look at an example. Alison Holt is seen in the emergency room of Memorial Hospital on July 15, 2015. An EMR is compiled for that visit. She also has an EMR for an inpatient stay in Memorial Hospital from October 5 to October 10, 2014. There are additional EMRs for Alison Holt that pertain to various physician office visits and outpatient diagnostic testing. Then, in April 2016, Ms. Holt sees a pulmonary specialist, who needs to review her previous health records. Her providers and the hospitals she has been admitted to are able to share information through a **Regional Health Information Organization (RHIO)**, which includes healthcare organizations in her area that exchange patient information in order to improve care. This **health information exchange (HIE)** results in the quick and easy sharing of her medical history with the pulmonary specialist. Her individual records thus becomes part of an EHR. In effect, an EHR allows for the exchange of information among caregivers and others (insurance,

employers, etc.) who have a need to know, but in a secure environment and according to certain standards.

The role of six healthcare professionals who maintain or use practice management and electronic health record applications.

Healthcare professionals, their educational background, their certifications, and how they use health information:

- Chief information officer
- Health information professionals
- Chief financial officer
- Healthcare administrators/managers/office administrators
- Care providers
- Nurses, medical assistants

## DAFTAR PUSTAKA

<https://fixit.id/healthcare-it-adalah/>

<https://www.rchnfoundation.org/?p=1757>

<https://www.healthit.gov/topic/health-it-and-health-information-exchange-basics/what-hie>

<https://www.healthit.gov/topic/health-it-basics/hie-benefits>

<https://www.healthit.gov/topic/health-it-and-health-information-exchange-basics/what-hie>

Claudia Williams, Farzad Mostashari, Kory Mertz, Emily Hogin and Parmeeth Atwal. From The Office Of The National Coordinator: The Strategy For Advancing The Exchange Of Health Information. *Health Affairs*, 31, no.3 (2012):527-536.

Esmaeilzadeh, P., & Sambasivan, M. (2016). Health Information Exchange (HIE): A literature review, assimilation pattern and a proposed classification for a new policy approach. *Journal of biomedical informatics*, 64, 74-86.

Healthcare Information and Management Systems Society (HIMSS). "[Evaluating a Potential HIE OpportunityWeb Site DisclaimersWeb Site Disclaimers](#)", HIMSS Guide to Participating in HIE. 2009 November.

Shanholtzer, M. B., & Mbadu, D. M. (2012). *Integrated Electronic Health Records: A Worktext for Greenway Medical Technologies' PrimeSUITE*. McGraw-Hill.