Health care informatics technology

رؤى محمد علي خالد المدموج١٢١٤٣٩٢٥
اية محمد موسى ابو تمام ١٢١١٢٦٧٨
رؤى حسام محمد سمارو ١٢١١٢٥٤٦

د.سماح شتية

Health Care Informatics

Health care informatics refers to rapidly growing areas that apply computer information systems in health settings, designed for improving patient care as well as organizing structured workflow and supporting infrastructure of the whole healthcare system. It is a very important tool in the management of medical information, in making administrative processes more agile and enabling communication between healthcare professionals.

Health information technology(HIT):

Is information technology applied to health and health care.

It supports health information management across computerized systems and the secure exchange of the health information between consumers, providers, payers and quality monitors.

Importance of Information and Clinical Technology

1 — Enhanced Patient Care

Improves diagnosis and treatment through tools like EHRs and telehealth, ensuring timely access to care.

2 — Data Management

Consolidates patient information for better communication and care coordination, enhancing continuity and reducing duplicate testing.

3 — Informed Decision-Making

I Clinical Decision Support Systems provide evidence-based recommendations, improving care quality and reducing errors.

4 — Operational Efficiency

Automates administrative tasks, optimizes resource allocation, and enhances workflow, allowing staff to focus on patient care.

Importance of Information and Clinical Technology

5 — **Patient Engagement**

Patient portals promote active involvement in health management, improving satisfaction and communication.

6 — **Regulatory Compliance**

Ensures adherence to data protection regulations, safeguarding patient information and enhancing safety.

7 — **Training and Education**

I Offers innovative training solutions and access to the latest research, supporting ongoing professional development.

Technology's Role in Healthcare Management

Streamlined Operations

Electronic Health Records (EHRs): Store patient information making them available to healthcare workers all in one place.Automated Scheduler: Automates appointment scheduling to decrease the number of no-shows and help you use your resources more effectively..

Data Management and Analytics

Data Analytics: Provide healthcare stakeholders to analysis patient outcomes, operational efficiency and financial performance in order helping making strategic decisions.Predictive Analytics – helps identify trends and predict future potential health risk before it occurs with a proactive intervention.

Improved Patient Care

Telehealth Services: Provides flexibility adapting access to care, enabling patients remotely visit healthcare providers which is especially useful in rural areas.Clinical Decision Support Systems (CDSS): Providing recommendations based on the evidence, assisting during decision-making and decreasing errors.

Technology's Role in Healthcare Management

Patient Engagement

Patient Portals: Enable patients to view health information, conduct provider communication, and scheduling services in a way that drives more patient involvement with their care.Health Monitoring: Utilize mobile health applications to monitor patients' own health and wellness, allowing for self-management and compliance with care plans.

Collaboration across discipline

Health Information Exchanges facilitate secure data sharing, improving care coordination.

Security and Regulatory Compliance

Data security technologies ensure compliance with regulations, protecting patient information

Training and Development

E-learning platforms and simulation technologies support ongoing education for healthcare professionals.

Impact of Technology on Healthcare Leadership

1 **Strategic Planning**

Healthcare leaders need to understand the potential of technology to develop strategies that integrate new technologies, optimize workflows, and improve patient care delivery.

2 **Investment and Resource Allocation**

Leaders are responsible for allocating resources to invest in new technologies, infrastructure, and training programs that support the adoption and effective use of technology within the organization.

3 **Change Management**

Introducing new technology requires careful planning and execution to ensure that staff are adequately trained and that workflows are adjusted to optimize the use of new systems.

4 **Data Security and Privacy**

Healthcare leaders must prioritize data security and privacy by implementing robust measures to protect patient information and comply with regulations like HIPAA.

Technological Advancements in Patient Care

1 Telehealth and Telemedicine

Facilitates remote consultations and helps in health remote monitoring ensuring access to healthcare

2 Electronic Medical Records (EMRs).

Improves patient care by providing a better organized and more reliable coat of quality metrics. · Centralizes all the patients information for greater coordination and faster, higher-quality facility-in-crossing delivery (ie treatment)..

3 Mobile Health Applications

Allows patients to monitor their health, take medications on time and become more involved in their care.

4 Wearable Technology

Keep track of all vitals and activity so you can manage your health proactively.

Technological Advancements in Patient Care

5 Artificial Intelligence (AI)

Offers predictions and clinical decision support for more accurate verification

6 Robotics and Automation

Surgical robots enhance precision and minimize invasiveness during procedures, leading to faster recovery times and reduced complications. Robotics also play a role in tasks like medication dispensing and sterilization, improving efficiency and safety.

7 Patient Portals

Enables patients to securely have access their health information and communicate with providers.

8 3D Printing

Customized Solutions: 3D printing technology enables the creation of personalized implants, prosthetics, and even bioprinting of tissues. Surgical Planning: Surgeons can use 3D models for better preoperative planning.

Specialty in nursing informatics

❖There is a nursing specialty that focuses on IT Nursing informatics (NI)
That is a specialty that inter-grates nursing science, computer science,
and information science to manage and communicate data, information,
knowledge, and wisdom in nursing practice.

NI ➢ NI partners with consumers, patient advocates; nurses and other providers in their respective settings,decision making
in every role and setting.

❖Objective -to improve population health, communication with members of community by providing , making people
literate and aware about safety practice pademic,,,of families and individuals addressing around information management ,
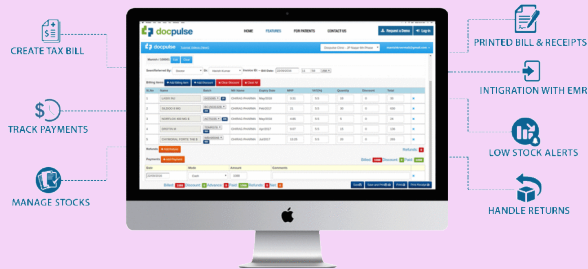communication.

✦An essential connection for all nurses to see the value of data collection and data analysis.

Clinical applications of new technology.

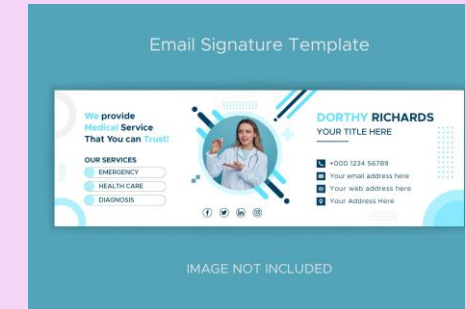|		
Automated Medication Administration	**Point-of-service barcoding helps ensure the "five rights" of medication safety: right patient, medication, time, dose, and route.**	
Unit Dose Systems	**systems provide individually packaged doses, allowing nurses to safely identify medications without confusion, enhancing patient care.**	
Point-of-Care Clinical Documentation	**This system facilitates documentation at the patient's location, reducing errors and improving timeliness, directly linking to patient-centered care.**	
Professional Order Entry System (POES)	**Healthcare professionals enter orders electronically, streamlining the process and reducing reliance on paper records.**	

Clinical applications of new technology.

Electronic Medical Record (EMR)	**A paperless documentation system that decreases time and costs related to transcription, storage, and copying**	
Smart Administration Pump	**This technology administers fluids and medications while monitoring patients for errors at the bedside.**	
Pharmacy System	**Computerized systems for managing pharmacy orders, checks, dispensing, and online documentation enhance efficiency and accuracy.**	
Remote Telemetry Monitoring	**Nurses receive alerts regarding patient identification, heart rate, and rhythm, enabling timely responses to changes in condition.**	

Clinical applications of new technology.

Medical Email	**Increasingly used by physicians to communicate with patients, offering a convenient channel for discussions.**	
Handheld Communication Systems	**Software for personal digital assistants enables staff to quickly access information when needed.**	
Internet Prescriptions	**Computerized systems for managing pharmacy orders, checks, dispensing, and online documentation enhance efficiency and accuracy.**	
Home Health IT	**Web-based programs for monitoring patients and interactive video services are expanding, particularly for managing conditions like congestive heart failure, diabetes, and coronary disease.**	

Technology: implications on health care delivery

❖Technology is more than just IT. It also includes technology that can be applied in clinical care, education and research.

Telehealth

❖Is the use of telecommunications equipment and communications networks for transferring health care information between participants at different locations.

❖This technology offers opportunities to provide care when face to face interaction is impossible
.
❖Telehealth applies telecommunication and computer technologies to the broad spectrum of public health and medicine.

❖It provides many opportunities for consumer health informatics.

Critical criteria for telehealth nursing practice include:

❖Systematically to ensure that specific criteria for quality adherence are being met via the use of protocols, algorithms or guideline sad dress patient needs.

❖Urgency of patient needs Creating a shared care plan with the patient and their support systems.

❖Developing a collaborative plan of care with the patient and his/her support systems. The plan of care may include: wellness promotion. Prevention education, advice for care counseling, disease state management, and care coordination.

❖Evaluating outcomes of practice and care.

Implications for nursing education

❖IT and telehealth, for sure have implications on your nursing education. Students will expect more IT as they use it for longer in their personal lives..

❖IPod, PDAs, Internet tools such as Facebook and Myspace, and mobile telephones can provide instant information and can also be very interactive.

❖These can be helpful in improving student-faculty inter action with the possibility of creating alternative methods for student-faculty direction in clinical Conclusion

Implications for patient education

❖E-health is now commonplace in many health care organization.

❖Consumers use the internet to find health information, store personal
health information, communicate with
health care provides, and in
many others ways.

❖The patient –oriented materials that could help nurses in the
management of care include:
▪ Preoperative instruction.
▪ Patient education guides for common problem (for example, diabetes,
cardiac, and so on).

▪ Description of postoperative experience.
▪ Description of admission process.
▪ Description of discharge process.

▪ Description of charge planning and role of patient.
▪ Family visiting guidelines.
▪ Patient right.
▪ Intensive care guideline for family member.
▪ helping your child with hospitalization.
▪ Hospital diets.

▪ Helping your child cope with a parent/grandparent in the hospital.
▪ Appropriate flowers and plants to send to ensure safety.
▪ Reimbursement issue and procedures.
▪ Talking with you doctors.
▪ Talking with your nurse.
▪ Who is who ?finding your way around our staff.
▪ Patient satisfaction and patient advocacy.

Benefits of Health Care Informatics

1

Improved Patient Care

Technology enhances patient care by facilitating accurate diagnoses, personalized treatment plans, and better communication between providers and patients.

2

Enhanced Efficiency and Productivity

Streamlined workflows, automated tasks, and real-time access to data lead to increased efficiency and productivity within healthcare organizations.

3

Reduced Costs

Technology can help healthcare organizations reduce costs through improved resource allocation, reduced administrative burdens, and improved patient outcomes.

4

Increased Patient Satisfaction

Improved communication, access to information, and personalized care contribute to higher patient satisfaction and a better overall healthcare experience.
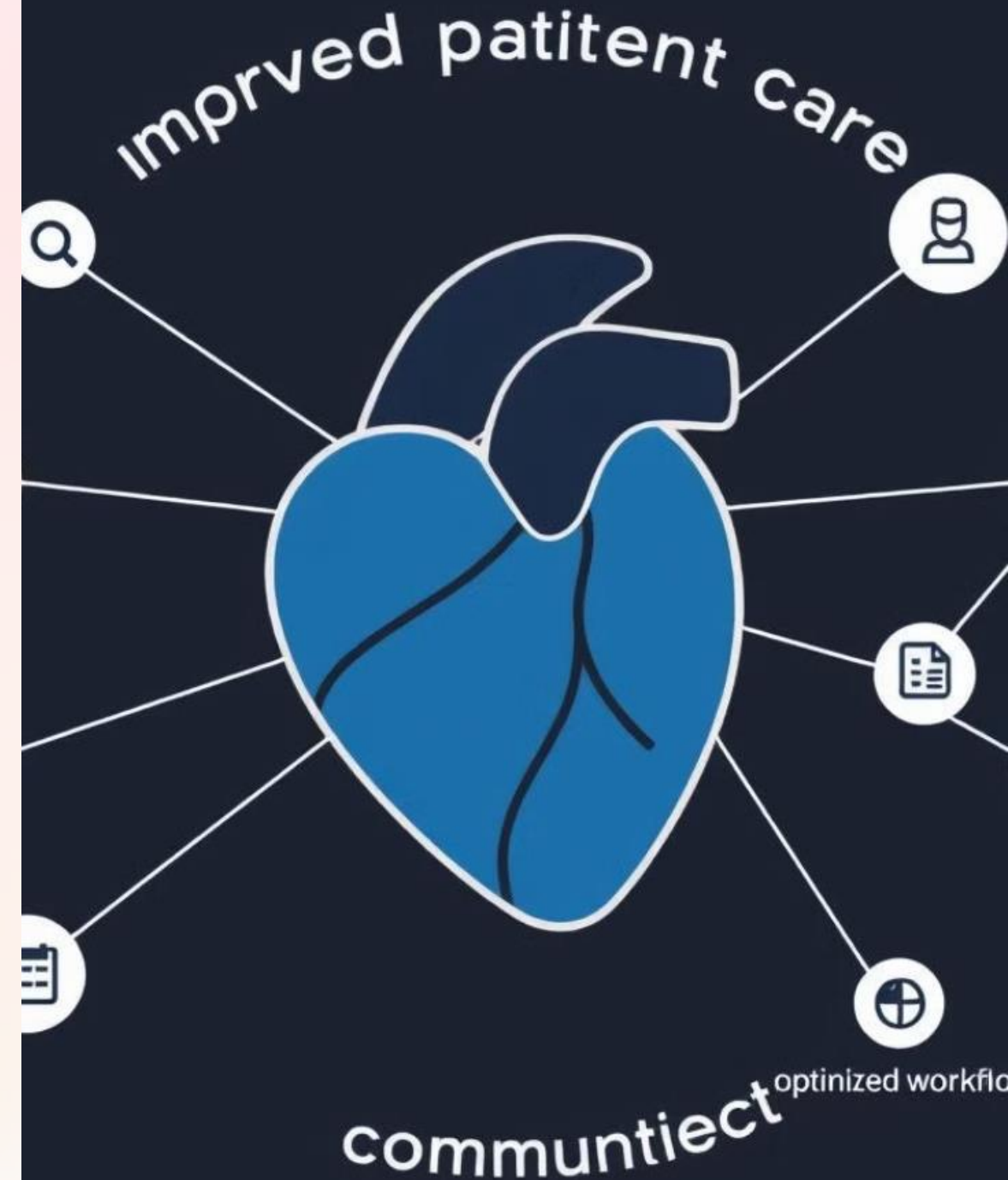
Challenges in Health Care Informatics

|	
Data Security and Privacy	Protecting patient data from unauthorized access and ensuring compliance with regulations like HIPAA is a major challenge.
Interoperability	Different healthcare systems often use incompatible technologies, making it difficult to share data and create a seamless flow of information.
Cost of Implementation	Implementing new technologies can be expensive, requiring significant investments in infrastructure, training, and ongoing maintenance.
Resistance to Change	Some healthcare professionals may resist the adoption of new technologies due to concerns about usability, privacy, or potential job displacement.
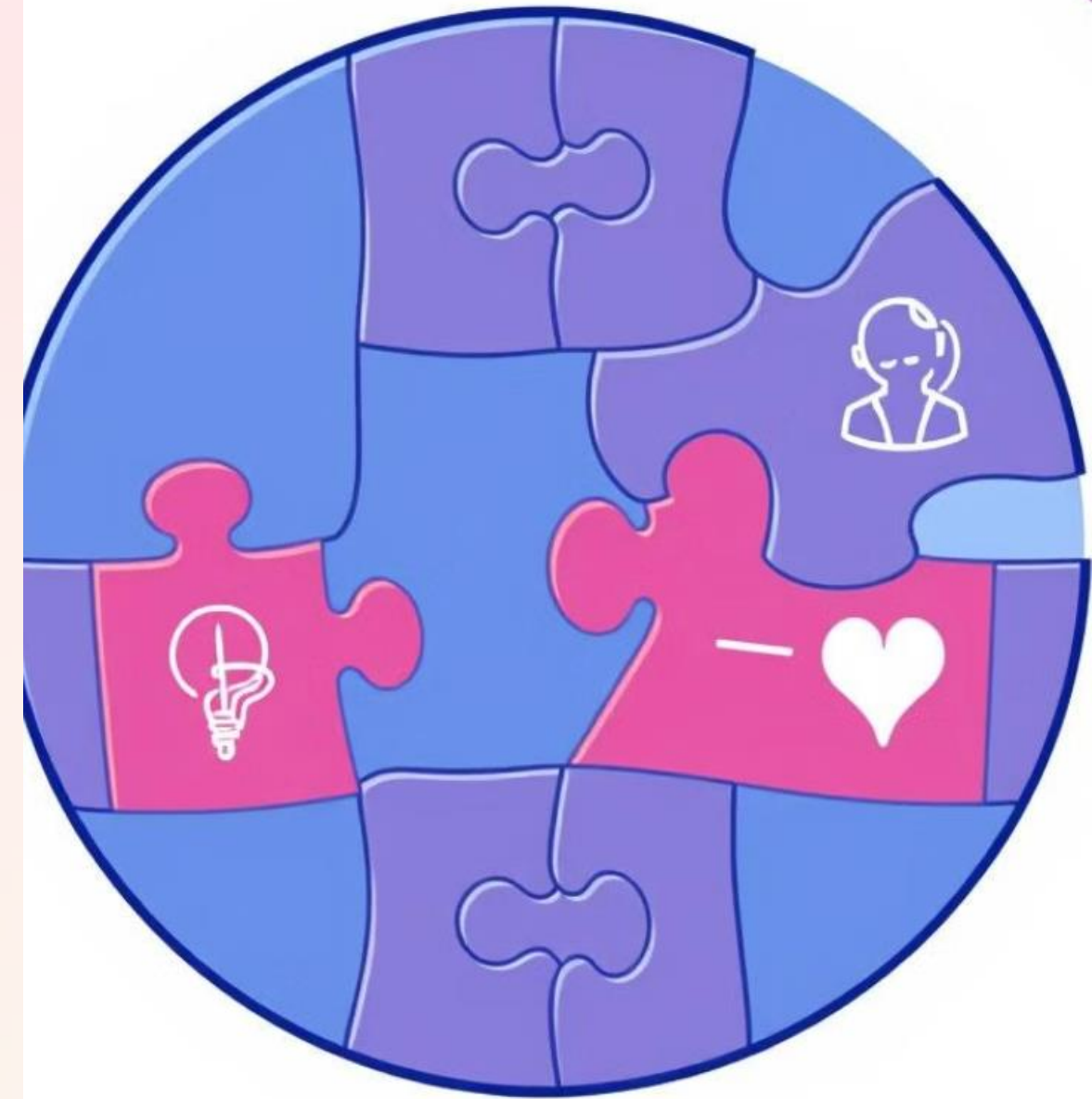
References

1.Bates, D. W., & Gawande, A. A. (2003). Improving safety with information technology. *New England Journal of Medicine*, 348(25), 2526-2534. doi:10.1056/NEJMsb030582.

2.Bodenheimer, T., & Grumbach, K. (2016). *Understanding Health Policy: A Clinical Approach.* New York: McGraw-Hill Education. (Chapters on technology in healthcare management).

3.Buntin, M. B., Burke, M. F., Hoaglin, M. C., & Blumenthal, D. (2011). The Benefits of Health Information Technology: A Review of the Recent Literature Shows Improved Care Quality, Safety, and Efficiency. *Health Affairs*, 30(4), 464-471. doi:10.1377/hlthaff.2011.0172.

4.Chaudhry, B., Wang, J., Wu, S., et al. (2006). Systematic Review: Impact of Health Information Technology on Quality, Efficiency, and Costs of Medical Care. *Annals of Internal Medicine*, 144(10), 742-752. doi:10.7326/0003-4819-144-10-200605160-00125.

5.Graham, M. L., & Anderson, J. G. (2018). Leadership in Health Informatics: Understanding the Role of Informatics in Healthcare Management. *Health Informatics Journal*, 24(3), 238-250. doi:10.1177/1460458217743946.

6.HIMSS. (2020). *The Role of Health Information Technology in Healthcare Management and Leadership.* Healthcare Information and Management Systems Society. Retrieved from HIMSS.

7.Haux, R., & Winter, A. (2017). Health informatics in the context of management and leadership. *International Journal of Medical Informatics*, 101, 36-45. doi:10.1016/j.ijmedinf.2017.01.012.

8.Jha, A. K., & Doolan, N. (2014). The importance of health information technology in improving healthcare quality. *Journal of Healthcare Management*, 59(6), 443-456. doi:10.1097/JHM-D-14-00049.

9.Kellermann, A. L., & Jones, S. S. (2013). What It Will Take to Achieve the Asymmetric Health Information Technology Revolution. *Health Affairs*, 32(1), 63-70. doi:10.1377/hlthaff.2012.1111.

10.McGowan, J. J., & Kharbanda, O. (2019). The role of health information technology in the management of healthcare organizations. *Journal of Health Management*, 21(3), 487-500. doi:10.1177/0972063419855745.