Telehealth and Telemedicine

Foundational Curriculum:
Cluster 6: System Connectivity
Module 11: Telehealth, Telemedicine and mHealth
Unit 1: Telehealth and Telemedicine
FC-C6M11U1

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Unit Objectives

• Define telematics, telehealth and telemedicine, and describe the role they play in the overall health IT system

• Identify the basic concepts of telehealth and telemedicine in enabling patient care

• Discuss the relationship telematics and telehealth have to health organizations and users of health information

• Describe the role that telehealth and remote, wireless-enabled and network-linked technologies play in clinical practice, including the impact they have on productivity and resources

• Discuss the role of telecommunications and telecommunications technology in the collection and transport of data
Telematics, Telehealth and Telemedicine in Patient Care

• eHealth is another related term, used particularly in the United Kingdom and Europe, as an umbrella term that includes telehealth, electronic medical records, and other components of health information technology
• eHealth supports a range of services or systems at the interface of medicine and information technology
• Different eHealth services include:
  – Electronic health records
  – Computerized order entries
  – ePrescriptions
• Telematics, telehealth and telemedicine can all be considered part of eHealth, with an emphasis on the remote uses of the technology
Telematics is a term that refers to the interdisciplinary field that encompasses telecommunications, electrical engineering and computer science

– In the United States, the term is now usually exclusively associated with vehicular technology; however, in Europe it is still sometimes used in the health information technology related disciplines

– An example of this terminology use is by EHTEL, the European Health Telematics Association (www.ehtel.eu)
Telemedicine Versus Telehealth

- The definition of telemedicine is somewhat ambiguous. The World Health Organization states, “Some distinguish telemedicine from telehealth with the former restricted to service delivery by physicians only, and the latter signifying services provided by health professionals in general, including nurses, pharmacists, and others. However...telemedicine and telehealth are synonymous and used interchangeably.”

- The American Telemedicine Association also uses the terms telemedicine and telehealth interchangeably, although it acknowledges that telehealth is sometimes used more broadly for remote health not involving active clinical treatments.

- In these materials, the terms telemedicine and telehealth will have slight variations.
Although Telemedicine and telehealth seem to have similar definitions, the differences in this material are noted as such:

**Telehealth:**
- More universal, broader term
- “Consumer-facing approach”
- Healthcare tools and methods that aid in care delivery as well as education

**Telemedicine:**
- the older of the two concepts
- The clinical application of technology
- Provides remote diagnosis and treatment by a provider
Telehealth involves the distribution of health-related services and information via electronic information and telecommunication technologies

- It enables long distance patient/clinician contact and care, advice, reminders, education, intervention, monitoring and remote admissions
- It also facilitates provider distance-learning; meetings, supervision, and presentations between practitioners; online information and health data management; and healthcare system integration
Telemedicine

• **Telemedicine** is the use of telecommunication and information technology to provide clinical health care from a distance

• It has been used to overcome distance barriers and to improve access to medical services not consistently available in distant rural communities.

• It is also used to save lives in critical care and emergency situations.
Categories of Telemedicine

Telemedicine can be broken into three main categories: store-and-forward, remote patient monitoring and (real-time) interactive services

1. **Store-and-forward, or asynchronous**, telemedicine involves acquiring medical data (like medical images, biosignals, etc.) and then transmitting this data to a doctor or health provider remotely for assessment offline. It does not require the presence of both parties at the same time

- Asynchronous or “store-and-forward” distance applications are delayed communications, such as those that transfer diagnostic images or video from one site to another for viewing in preparation for a consult
  - Dermatology, radiology, and pathology are common specialties that are conducive to asynchronous telemedicine
  - An EHR with a history and report, along with audio/video information, is a necessary component of this transfer
Remote Monitoring

2. **Remote monitoring**, or monitoring of patients outside of conventional clinical settings (for example, at home). It is also sometimes known as **self-monitoring**. Remote monitoring enables healthcare professionals to monitor a patient remotely using various technological devices.

- Remote monitoring reduces unnecessary control visits to a care facility. For example, remote monitoring of a patient with a pacemaker allows:
  - The doctor to monitor the heart function from his office and act, if the device settings are not correct, or there are other symptoms
  - The patient to refer to a hospital in acute situations or if there are any problems
  - Reduced check-ups for the patient
  - Monitoring centres to react in acute situations

- This method is primarily used for managing chronic diseases or specific conditions, such as heart disease, diabetes mellitus, or asthma
  - Remote patient monitoring services can provide comparable health outcomes to traditional in-person patient encounters, supply greater satisfaction to patients, and may be cost-effective
  - Examples include home-based nocturnal dialysis monitoring, weight management and blood pressure self-checks

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3. **Real-time interactive telemedicine** is where healthcare providers are enabled to provide care, assessments, treatment and consultations electronically through telemedicine services

- Real-time active online communications make electronic consultations possible through interactive telemedicine services, which provide live interactions between patient and provider.

- Videoconferencing has been used in a wide range of clinical disciplines and settings for various purposes including management, diagnosis, counselling and monitoring of patients.

- Also, providers have been able to assist or participate remotely in surgical procedures and complex medical services have been able to be provided remotely by proxy through real-time interactive telemedicine.
Telehealth in Enabling Patient Care

- Telehealth means using telecommunication technologies in health care and education
- Telehealth includes
  - Video conferences for care and education with live video, independent of place
  - Asynchronous communication, independent of time and place, e.g. protected e-mail communication
  - Virtual reality possibilities for education, e.g. virtual operating theatre
  - Remote patient monitoring, data is transmitted to the practitioner or a care center from the patient. This is more controlled monitoring than just off-line long-term recording, but the patient is not tied into the care facility
Example of a telehealth process

Patient calls telehealth centre

Call centre executive forwards the call to clinical officers

Clinical officers gathers patient symptoms and forwards the call to doctor

Doctor gives e-Prescription

Patient receives e-Prescription through SMS/e-Mail/Patient Portal

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Telehealth Tools

• Telehealth tools can include:
  – **Apps** (applications) on smart phones that monitor weight, health information, daily exercise regimes, or medications, for the patients personal data or to send encrypted data to doctors
  – Apps that educate the public on health awareness
  – **Patient portals:** online access points (websites) for patients with secured access to personal health information. They are used to view test results, schedule appointments, request prescription refills, view allergies or other health information, or email providers
  – Online ordering sites that enable patients to order testing supplies and medications
  – Scheduling apps for doctors’ appointments
  – Email, text or phone reminders for flu shots or other preventive care
Notifications, Reminders and Health Maintenance Advice for Patients

- Telehealth applications can provide assistance for self-care and health management, with notifications, reminders and health maintenance advice (HIMA), including helping patients:
  - Remember medications
  - Measure blood glucose level
  - Stand up and be more active
  - Note lab work and upcoming appointments
  - Receive notifications (HMAs) regarding needed mammographies (women), prostate checks (males), etc.

- Depending on the patients overall health, mobile applications could be used to monitor and manage eating habits, exercise or to provide physiotherapy instructions
Consultations Through Telemedicine

• Often, proof via a doctor’s consultation is required for an employee to receive sick leave. Telemedicine using virtual consultation with a healthcare professional enables:
  – Prevention of illness, such as the flu, spreading further
  – Guiding more severe sicknesses to a medical facility and less severe sicknesses to home care instructions
  – Access to medical experts (wider range of experts with no travel time for doctor or patient)
  – Patients consulting with doctors without leaving home or work
  – Further services for employees in rural areas
  – Increased patient engagement
  – Cost-effective options for both employees and employers
Care Transition

• As covered in earlier units, **care transition** is the smooth movement between different forms of care from an acute care facility to home, to primary care, to emergency room, to skilled nursing facilities, and to other healthcare settings.

• Care transition an important part of the care process. When a patient is discharged from the hospital, he/she is seldom fully recovered and healthy. Thus, accurate instructions for medication, follow-up etc. are needed. These can be enabled further using telemedicine.
Electronic Registration and Scheduling

- **Electronic patient registration** is an effective way to keep track of the patients in the healthcare facility: patients with reserved appointments can be checked in to know they have arrived, and patient information can be directly sent to the practitioner
  - Registration also reduces waiting times, since the assistant knows which of the patients have arrived
  - The first encounter with the assistant acknowledges and notes the patients’ arrival, registration, and the patient’s position in the waiting queue
  - Electronic scheduling allows the patient to choose the most suitable available time from the appointment calendar, and he/she can have reminders (text message or email) notifications about the reserved time
Collection and Transport of Health Data with Telecommunication

- Data collection and transportation is not just an issue for developing countries: use of mobile solutions to access patient records at the point-of-care increases the quality of care and reduces treatment errors due lack of knowledge of the patient history
  - Mobile phones were tested as a data collection tool in South Africa (Tomlinson et al. 2009): Comprehensive real-time supervision of community health worker performance with no data loss (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2811102/, accessed 2.2.2018)
  - Strengthening of the data collection infrastructure is a prerequisite for data analysis, machine learning and other methods to improve the health in developing areas (Bram et al. 2015 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4605478/, accessed 2.2.2018)
- WHO findings of mobile patient records all over the world (http://www.who.int/goe/publications/goe_mhealth_web.pdf, accessed 2.2.2018):
  - The level of adoption of mobile patient records was moderate across all WHO regions and World Bank income groups.
  - The European (47%) and Americas (42%) Regions reported the highest levels of activity.
  - Countries in the high-income group had the highest level of uptake, with 65% of countries reporting a patient record initiative.
Unit Review Checklist

- Defined telematics, telehealth and telemedicine, and described the role they play in the overall health IT system (IN01)
- Identified the basic concepts of telehealth and telemedicine in enabling patient care (IB01)
- Discussed the relationship telematics and telehealth have to health organizations and users of health information (IN02)
- Described the role that telehealth and remote, wireless-enabled and network-linked technologies play in clinical practice, including the impact they have on productivity and resources (IN03)
- Discussed the role of telecommunications and telecommunications technology in the collection and transport of data (IN04)
1. Out of the following, pick a graphic that accurately represents the concepts of eHealth, Telehealth, Telemedicine, and Telematics:
2. Describe the difference between telehealth and telemedicine. Explain why the two are easily interchangeable.
1. Which of the following is not an example of tools used in telehealth:
   a) Apps
   b) Patient Portal
   c) Regular mail
   d) SMS

2. Which of the following is not an example of the three main categories of Telemedicine?
   a) Remote monitoring
   b) Real-time interactive telemedicine
   c) Telehealth
   d) Store-and-forward
   e) Asynchronous
3. True or False. Telemedicine is the more universal, broader term that encompasses telehealth.
   a) True
   b) False

4. True or False. Telehealth is never used for education.
   a) True
   b) False