Chapter 6

Healthcare Systems and Public health

6. Healthcare Systems and Public Health

Objectives:

- Understand the different types of insurance programs and payment options available in the United States.
- Define the four levels of prevention.
- List the leading causes of death, by age, in the United States, as well as leading causes of hospital readmissions.
- Describe the PDSA cycle and the swiss-cheese model as they relate to quality improvement.
- Describe the two types of medical errors and the purpose of a root cause analysis in investigating errors.

Health is defined as the state of being free from illness or injury. **Healthcare** is defined as the maintenance and improvement in physical and mental health through the provision of medical services by a licensed healthcare provider. It is estimated that only 10% of health is attributable to healthcare received (the rest is attributable to lifestyle, environment, genetics, etc.). **Health insurance** is a guarantee of compensation (to the provider) for medical services received by a patient and protection from financial loss that could result from medical services received. Most insurance plans have monthly or annual fees that must be paid to have the plan (before any medical services are received). In addition, most plans have both a deductible amount as well as a copay amount which are paid when medical services are received. A **deductible** is the amount the patient must pay before insurance coverage starts (for example, if a deductible is $500, the patient must pay all medical bills up to $500 before insurance coverage starts). A **copay** is a flat amount that a patient must pay for medical services (for example, a plan may have a $25 copay for each office visit, meaning the patient pays $25 for each office visit, and insurance pays for costs beyond $25).

In the United States there is no national healthcare insurance. People obtain insurance through other sources, often through their employers, and there are a number of different plans:

- **Health Maintenance Organization (HMO):**
  A medical insurance group that provides insurance, however, coverage is restricted to a limited group of providers who are said to be "in network". Care outside of evidence-based guidelines is not covered. Patients need a referral before they are able to see a specialist. In emergency situations a patient may receive covered care out-of-network.
- **Preferred Provider Organization:**
  In this insurance plan patients can see any provider (within or outside of the network), and are able to see specialists without a referral from a primary care provider. However, there are higher out-of-pocket fees for this plan (copays and deductibles).
- **Point of Service:**
  This plan is like a combination of the health maintenance organization and preferred provider organization. There is a "preferred provider network" from which patients can receive care. Patients are also able to receive care from out-of-network providers, but this care is covered by the insurance plan at a lower level (meaning higher copays and deductibles). Patients do need a primary care referral to see a specialist.
- **Exclusive Provider Organization:**
  Very similar to an HMO: coverage is restricted to providers in-network, but patients do not need a primary care referral to see a specialist.
- **Medicaid:**
  A federal and state social healthcare insurance program for people with low incomes, the elderly, and those with disabilities.
- **Medicare:**
  A federal social healthcare insurance program for people ages 65 years and older. Premiums vary based on whether the patient worked and paid Medicare (social security) taxes. Some people under age 65 may qualify (e.g. those with disabilities or with end-stage renal disease).

  There are 4 parts of Medicare.
  - **Part A:** hospital insurance and home hospice care.
  - **Part B:** outpatient medical care coverage.
  - **Part C:** also known as "Medicare Advantage Plan" are plans that patients buy through a third party that include coverage for all Part A and B services.
  - **Part D:** prescription drug coverage.

In addition to different insurance plans, there are also different healthcare payment models:

Capitation	The hospital or physician receives a certain amount of money per patient regardless of how much time the physician spends with the patient or how much healthcare the patient receives.
Discounted fee-for-service	The provider agrees to provide services and charges a fee for each individual service, but the fee is discounted from the usual charges.
Global Payment	The patient pays for all expenses associated with a service in one payment. This type of payment method is often seen for pregnancy; one fee for all prenatal visits and the delivery. Also, this can be used for surgeries; one price for the surgery, including immediate pre- and post-surgical care.

Although hospitals are where patients receive care, and insurance plans are what help patients to pay for that care, many studies would suggest that only 10-20% of a patient's wellbeing can be attributed to medical care. The rest can be attributed to health behaviors, genetics, socioeconomic factors, and environmental factors. Modifying these social determinants of health, and preventing disease from occurring in the first place is the role of Public Health Agencies. **Public Health** is the science of preventing disease and promoting health. There are four levels of prevention:

Primary Prevention	Preventing a disease before it occurs (e.g. vaccination)
Secondary Prevention	Early detection of disease (through screening) and preventing progression of disease (e.g. screening for high blood pressure)
Tertiary Prevention	Reducing symptoms and complications of a disease once a patient has the disease (e.g. colectomy for ulcerative colitis)
Quaternary Prevention	Identifying patients at risk of overmedicalization to prevent excessive medical treatments (e.g. reviewing required laboratory tests for hospitalizations to limit excessive blood draws)

To guide preventive interventions, public health agencies at the local, state, and national level track disease prevalence, incidence, and mortality. For example, as discussed in the Ethics Chapter (Chapter 5), there are certain communicable diseases which are required to be reported to public health agencies by physicians. This allows public health experts to perform disease contact tracing (identifying, testing, and treating people who came into contact with the ill patient to prevent further spread). Because of this, it is important to keep track of the leading causes of death.

Leading causes of death in the US, by age, with approximate absolute counts:

Age	<1 year	1-34 years	35-44 years	45-64 years	≥65 years
#1	Congenital anomalies (4,500)	Unintentional Injuries (40,000)	Unintentional Injuries (22,000)	Malignant Neoplasms (150,000)	Heart Disease (500,000)
#2	Short gestation (3,500)	Suicide (14,500)	Malignant Neoplasms (10,000)	Heart Disease (110,000)	Malignant Neoplasms (430,000)
#3	Pregnancy complications (1,300)	Homicide (10,000)	Heart Disease (10,000)	Unintentional Injuries (50,000)	Chronic lower respiratory disease (135,000)

*Source: Centers for Disease Control and Prevention, 2018

Hospitals and insurance agencies also track other metrics. For example, the Centers for Medicare and Medicaid Services has a hospital readmissions reduction program that focuses on reducing the leading causes of readmission among Medicaid/Medicare patients:

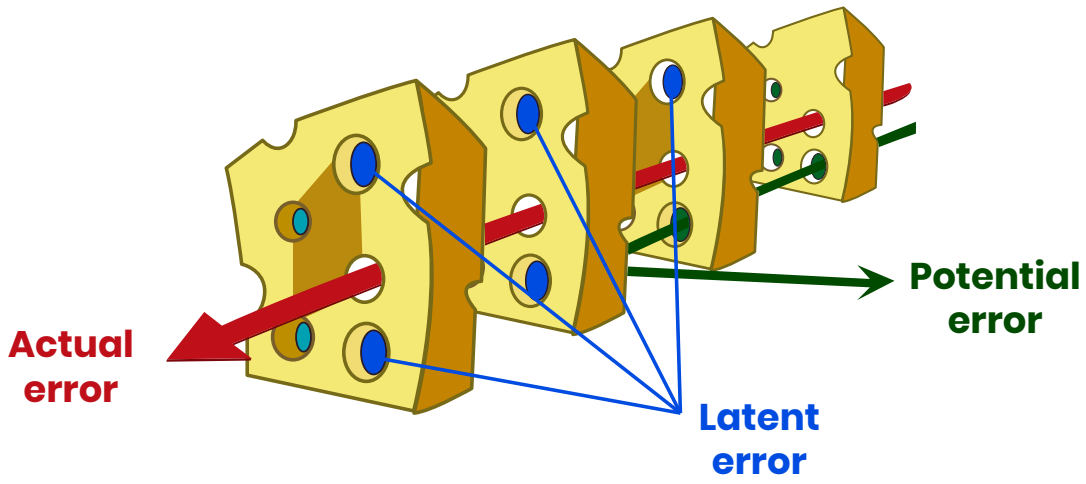
- Heart Failure
- Acute Myocardial Infarction
- Chronic Obstructive Pulmonary Disease
- Pneumonia
- Coronary Artery Bypass Graft Surgery
- Elective Primary Total Hip Arthroplasty and/or Total Knee Arthroplasty

Once a hospital has identified an area in which they would like to make improvements, for example reducing readmissions, one way in which quality improvement teams implement changes is through **PDSA cycles.**

- **Plan:** Identify and define the problem, then develop a measurable plan that can be implemented to address the problem.
- **Do:** Implement the plan and collect data.
- **Study:** Analyze the data, determine if the plan worked, or if it should be altered.
- **Act:** Make any necessary changes to the plan, then repeat the cycle, starting again at planning (with the altered plan).

Although quality improvement, tracking metrics, and safety policies help healthcare systems and public health agencies prevent medical errors, errors still occur. When errors do occur, it is usually because several weaknesses in the system all happen at the same time. This is called the Swiss cheese model.

19. THE SWISS CHEESE MODEL OF ERRORS



The swiss cheese model is used in risk management and error analysis to identify system flaws and weak points that could (or have) caused errors. When multiple system weak points (holes in the cheese) align, errors can occur.

- **Swiss Cheese Model:**

  A harm or error may occur when multiple weak points in multiple system safe-guards align. Imagine a stack of Swiss cheese, each piece represents a system safe-guard. Each hole in a slice of cheese represents a latent or potential weakness. Errors occur when all the holes line up, allowing harm to pass through successive layers of cheese, each a safety check. For example, for a patient to get a medication in a hospital, the order must pass through multiple system safe-guards.

  Check 1:

  The physician prescribed dose must be available in the electronic health system

  Check 2:

  The pharmacist must check the dose and indication before releasing the medication to the nurse.

  Check 3:

  The nurse then checks that the right medication is being given to the right patient at the right time.

  All 3 of these check points would have to fail in order for a medication error to occur. Despite this, there are more than 3 million in-patient medication errors each year in the US.

There are two types of medical errors:

- **Active errors:**

  Have immediate impact on the patient, and the effects are felt immediately (e.g drawing blood on the wrong patient).

- **Latent errors:**

  Errors that are likely to occur due to failure of organization or system design. For example, having two similarly named medications with similar looking labels kept in the same cart without requiring a medication and dose double-check-verification prior to administration.

When errors occur in public health or in hospitals, it is important to do a **root cause analysis** to determine what caused the error. Root cause analyses involve interviewing all personnel involved and examining processes and procedures in place that led to the error with the goal of fixing systematic or environmental problems.

The goal of a root cause analysis is NOT to identify a person responsible for an error or assign blame.