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# **Biomedical Research , Health Services Technology and Technology Assessment**

## **Chapter 10**



# Objectives

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- Provide an overview of Biomedical Research, Health Service Technology and Technology Assessment
- Discuss the techniques in new technology
- Discuss the role of Technology Assessment



# Introduction

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- Biomedical Research
  - Developments in health services technology
  - Include drugs, devices, medical and surgical procedures use in medical care



# Biomedical Research

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- Funding sources for biomedical research
  - Including drugs, equipment, and supplies,
  - \$36 billion in 1995



# Steps in the Development of a New Technology

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- The development or innovation of a new technology occurs in several stages that may not always reflect a studied progression or a necessarily sequential order

# Health Services Technology



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# Steps in the Developing of a New Technology

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# Steps in the Developing of a New Technology

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- McKinley (1998) provides one model for considering the developing of a new technology, noting the following usual stages of an innovation as:
  - Promising report
  - Professional and organizational acceptance
  - Public acceptance and state and third-party payer endorsements
  - Standard procedure, observational reports, and descriptive accounts
  - Randomized clinical trails
  - Professional denunciation
  - Erosion and discreditation



## Technology's Effects on Health Services Expenditures

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- The development and use of new drugs is an important part of the U.S. Health Services System
  - Through per capital drug utilization and proportion of national health expenditures spend on drug play a smaller role in this culture than in others such as France and Germany.



# Drug Regulation

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- The first major act to regulate the pharmaceutical industry
  - The Biological Act of 1902-required premarket batch testing and licensing of all biologic drug.
  - The Food and Drug Act of 1906-standardized drug strength and purity and prohibited drug adulteration and misbranding.



# New Drug Development

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- The development of new drugs takes time
  - An average of 12 years and is expensive
  - It costs the manufacturer on an average of \$802 million to get a new drug from the laboratory to the patient.



# Orphan Drugs

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- The Orphan Drug Act of 1983- ensure that such essential but low demand drugs remain available to the population
  - Orphan Drugs are those conditions affecting fewer than 200,000 people.



# Drug Expenditures

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- 90 percent of total personal health service expenditures are directed to purchase of drugs.
  - Drug prices periodically come under fire from consumers and from such payers as the federal government.
  - The Bureau of Labor Statistics prepares a Producer Price Index for Prescription Drugs, called PPI-DRUGS, that reports drug price statistics.



# Medical Devices

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- A medical device is any item promoted for a medical purpose that does not rely on a chemical action to achieve its desired effect.
- Types of medical devices range from the simple tongue depressor to complex imaging equipment.
- Medical devices are typically used by the health services provider, rather than the patient



## FDA Review Medical Devices

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- As of 1976, medical devices must be reviewed by the FDA to ensure their safety and effectiveness



# Durable Medical Equipment

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- Durable Medical Equipment (DME) such as wheelchairs and supplies such as surgical dressing, prostheses, orthoses are aspect of health service technology that are sometimes overlooked.



# Half-Way Technologies

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- Half-Way Technology is an interim procedure that can be use effectively until scientific advances provide more a complete solution.
- Renal dialysis was considered to be a half-way technology for maintaining life of end-stage renal disease (ESRD) patients until a kidney transplantation was fully developed enough to replace it for suitable patients.



# Technology Assessment (TA)

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- Assessing the readiness of a new procedure for general application is a relative recent field of scientific endeavor called technology assessment.
  - TA is any process of examining and reporting properties of medical technology use in health services such as safety, efficacy, feasibility, indications for the use, cost, cost-effectiveness, and the social, economic, and ethical consequences, whether intended or unintended.



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# Eradicating an Ineffective Technology

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- Upon initial assessment or reassessment, if a technology is found to be ineffective, that finding alone is not always sufficient to eradicate the practice or usually.



# Technology Reassessment

Even if technology is assessed, a one-time assessment may not be sufficient

- Health services technology has a life cycle, and period reassessment is important to take into account other changes in health services delivery and to assess the technology's effectiveness over a long period of time.



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## The Role of Technology Assessment in a Changing Health Services System

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- Pressure to contain or reduce the U.S. health services system are being exerted by employers who provide health insurance to their employees, by third-party payers such as Medicare and Medicaid, and other concerned about this industry's growth rates.
- The development and application of health services technology has had a significant role in the growth of health services expenditure



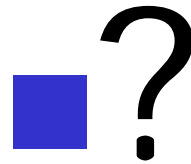
## Proposed Control on the Use of Health Services Technology

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- Limit the development of certain technologies while they are still in the pipeline.
- Use benefit-cost studies to set priorities for the development and distribution of technologies.
- Limit distribution of big and expensive technologies epidemiologic characteristics.
- Eliminate the use of technologies that have no clinical value.
- Provide reimbursement for technologies only when they are used according to protocols.

# Questions

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# Reference

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- Barton, P.L. (2007). *Understanding the U. S. Health Service Systems*, Third Edition; Phoebe Lindsey Health Administration Press.