Screening for Disease

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Introduction

A 52-year-old man working in a steel plant industry walks into occupational health clinic with a common complaint: 'Doctor, I feel weak… just generally tired all the time.' No fever, no weight loss, no other symptoms. Vitals are normal. So what do you do?"

You examine him. Everything seems fine. But you're not convinced.

So you order a few **lab tests**:

- ✓CBC
- ✓Fasting Blood Sugar
- ✓Serum Creatinine
- ✓Lipid Profile
- ✓ECG

Introduction

- Next week, he returns — now diagnosed with **Type 2 Diabetes, Stage 2 Hypertension, and Dyslipidemia**.

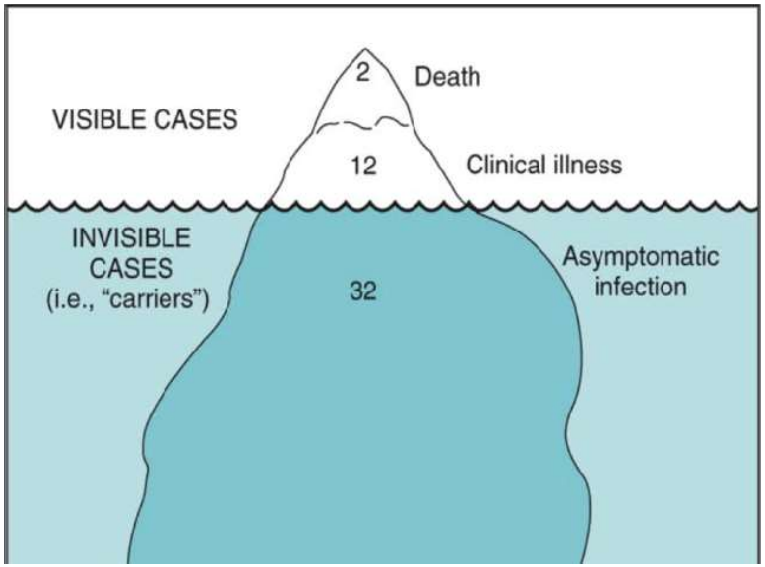
- All **asymptomatic**, all **picked up early**, all now under management — **because you screened him.**

- Now you got a doubt. How many undiagnosed Diabetes, Undiagnosed Hypertension patients are there in the industry.

- "Screening isn't for the sick. It's for the ones who *don't yet know* they're sick."

Iceberg Phenomenon of disease

- What the Clinician sees is only tip of Iceberg.
- The Submerged portion of the iceberg represents the sub Clinical cases, Carriers, Undiagnosed Cases
- The hidden part constitutes the mass of unrecognized disease in the Community
- **Its detection and control is challenge.**



Definition

The search for unrecognized disease or defect

by means of rapidly applied tests, examinations or other procedures

in apparently healthy individuals

Screening differs from periodic Health examinations in following aspects

1. Capable of wide applications

2. Relatively inexpensive

3. Requires little physician time

Screening test and Diagnostic tests

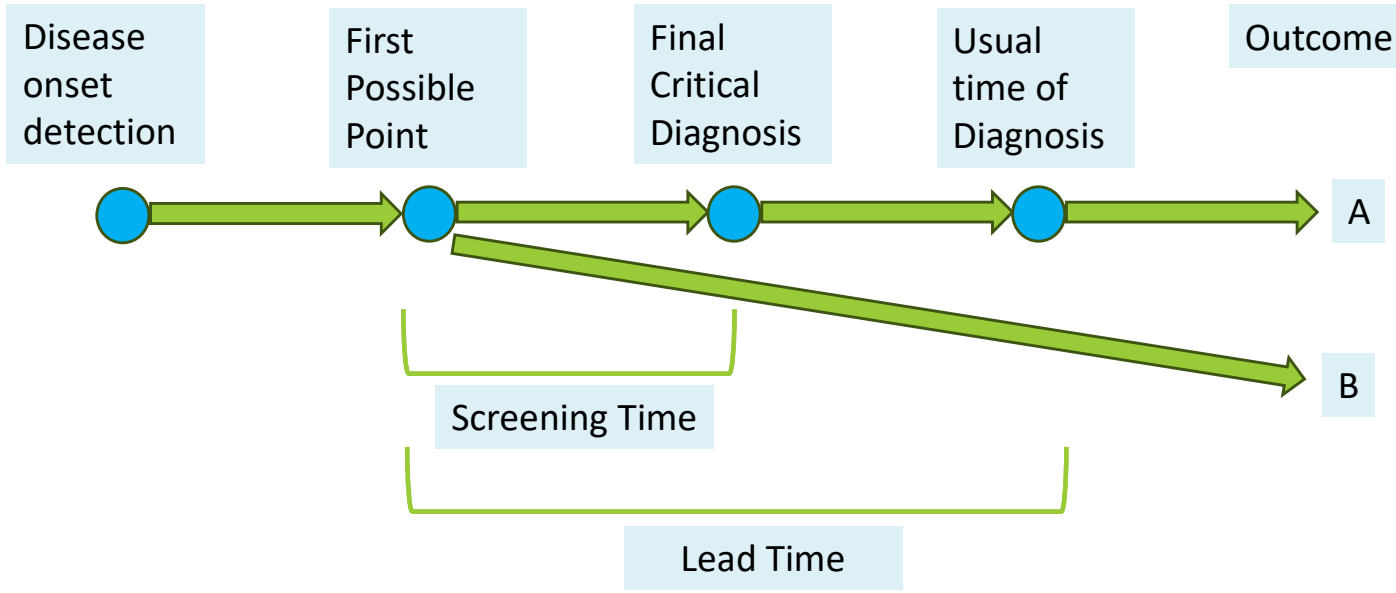
Screening Tests	Diagnostic Tests
Done on apparently healthy	Done on those with indications or sick
Applied to groups	Applied to single patients, all diseases are considered
Test results are arbitrary and final	Diagnosis is not final but modified in light of new evidence, diagnosis is the sum
Based on one criterion or cut-off point	Based on evaluation of a number of symptoms, signs and laboratory findings

Screening test and Diagnostic tests

Screening Tests	Diagnostic Tests
Less accurate	More accurate
Less Expensive	More Expensive
Not a basis for Treatment	Used as a basis for Treatment
The initiative comes from the investigator or agency providing care	The initiative comes from a patient with a complaint

However there are some tests which are used for both screening and diagnosis
Example: HB test for anaemia, Glucose Tolerance test for Diabetes

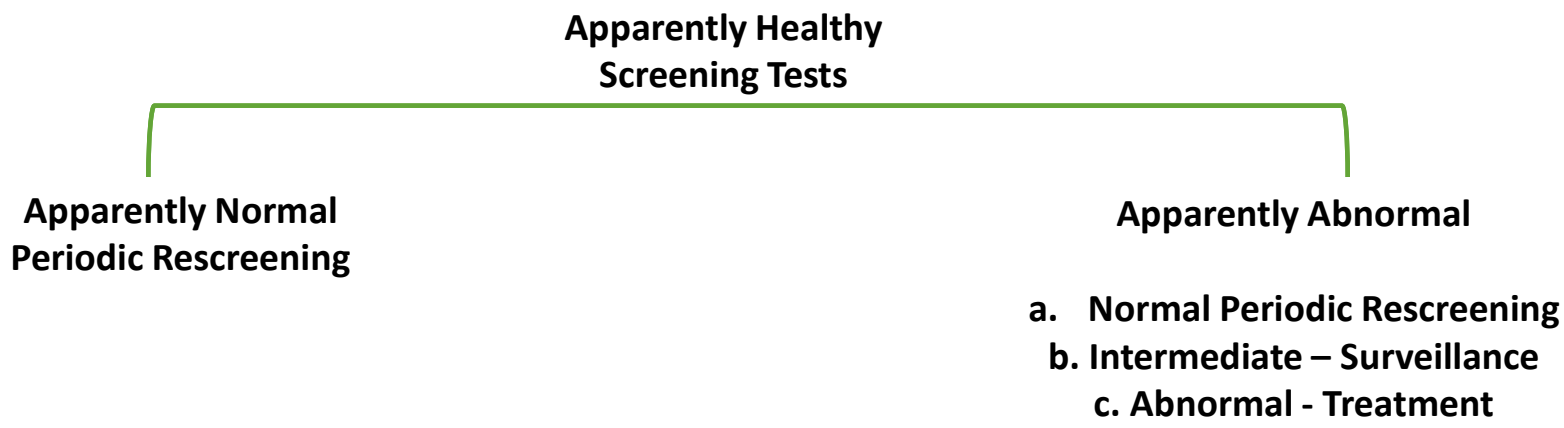
Lead Time



Lead Time is the advantage gained by screening i.e., the period between diagnosis by early detection and diagnosis by other means, i.e., B- A.

Longer lead time allows earlier intervention.
Lead time in cervical cancer via Pap smear may be years

Possible Outcomes of Screening



Uses of Screening

1. Case Detection
2. Control of disease
3. Research Purpose
4. Educational Opportunities

Types of Screening

1. Mass Screening
2. High Risk or Selective Screening
3. Multiphasic Screening
4. Opportunistic Screening
5. Mandatory Screening
6. Multistage Screening

Mass Screening

- **Definition:** Screening of **entire population or subgroups**, regardless of individual risk.
- **Purpose:** Public health strategy to detect disease in asymptomatic individuals.
- **Examples:**
  - Vision and hearing tests in school children
  - COVID-19 rapid antigen testing in airports
  - Neonatal screening for congenital hypothyroidism

High Risk or Selective Screening

- **Definition:** Screening targeted at individuals with **higher-than-average risk** of disease.
- **Purpose:** Cost-effective approach with higher yield.
- **Examples:**
  - BRCA gene testing in women with a family history of breast cancer
  - Annual HbA1c in obese individuals or those with metabolic syndrome
  - Colonoscopy in patients with familial adenomatous polyposis (FAP)

Multiphasic Screening

- **Definition:** Administration of **multiple screening tests simultaneously** during a single screening encounter.
- **Purpose:** Comprehensive health checkup.
- **Examples:**
  - Executive health check-ups (CBC, lipid profile, ECG, LFT, RFT, chest X-ray, etc.)
  - Health camps organized by hospitals or NGOs

Opportunistic Screening

- **Definition:** Screening done **when a person comes for some other health issue**.
- **Purpose:** To identify conditions early in patients visiting the healthcare system.
- **Examples:**
  - Checking blood pressure in a patient presenting with cold symptoms
  - Doing a Pap smear during an antenatal visit

Mandatory Screening

- **Definition:** Screening required by **law or policy**, often regardless of consent.
- **Purpose:** Public health protection.
- **Examples:**
  - HIV screening for blood donors
  - TB screening for visa applications in some countries

Multistage Screening

Definition: Initial, simple, low-cost screening tests are used first, and more specific, detailed, or expensive tests in subsequent stages for those who are positive in first stage

Purpose: To reduce cost and resource use, To minimize unnecessary testing in healthy individuals, To increase efficiency of large-scale screening programs

Example: Screening for diabetes in high-risk groups:

Stage 1: Capillary blood glucose

Stage 2: Fasting Plasma Glucose or HbA1c or OGTT for those flagged as high-risk

Conclusion

- **In an era where chronic diseases** are on the rise and healthcare systems are burdened with late-stage diagnoses, **screening provides a proactive approach**.
- **It enables early detection, timely intervention, and better outcomes**—often at a fraction of the cost required for treating advanced diseases.
- However, for screening to be effective, **it must be applied judiciously, tailored to risk**, and followed by proper diagnostic and therapeutic pathways.
- As public health strategies evolve, **screening remains a cornerstone in the movement from reactive to preventive healthcare.**

Feedback MCQs

What is the primary purpose of screening in healthcare?
A. To confirm the diagnosis of a disease
B. To monitor treatment response
C. To detect unrecognized disease in asymptomatic individuals
D. To treat all patients equally
✅ **Answer:** C

Feedback MCQs

Screening is different from diagnostic testing because it is:
A. Used only in emergency situations
B. Performed only on symptomatic individuals
C. Used on a population level for early detection
D. Always highly specific
✅ **Answer:** C

Feedback MCQs

Lead time in screening refers to:
A. Time taken to perform the test
B. Time between disease onset and death
C. Time between early detection by screening and usual diagnosis
D. Time before treatment starts
✅ **Answer:** C

Thank You