**Screening** is the process of identifying a disease, condition or risk factor in asymptomatic patients regardless of setting (practical definition).

- It is useful to think of screening as a type of therapeutic intervention, but screening embodies elements of both diagnosis and treatment.
- Screening may appear to be a good thing, when, in fact, harms might outweigh benefits.
- In addition to usual considerations for interventions, clinically meaningful screening requires that early detection and treatment improve outcomes more than later (symptomatic) diagnosis and treatment.

**Screening categories** are—

- **Primary Prevention**: Prevention of disease by eliminating causes OR interrupting disease processes before they become established or symptomatic.
- **Secondary Prevention**: Limiting the harms (symptoms, functioning, mortality) done by established disease processes.

**Special bias issues in screening**—

- **Lead Time Bias** occurs when early detection makes it look like there is longer survival time, but the date death occurs is no different.
- **Length Bias** is a “disease-spectrum” bias and occurs when screening “appears” to improve survival due to missing the most deadly tumors and finding tumors that people are more likely to live with or live a long time with. Screening is more likely to find slower growing tumors that may not be harmful, or as harmful (aka “overdiagnosis bias”).
- **Volunteers** participating in screening have been shown to have better outcomes than those who don’t (i.e., those who are persuaded to participate), possibly due to the healthy user effect.

**Lead Time Bias**

Early diagnosis always increases “survival” (death from time of diagnosis):

survival appears longer from time cancer is found.

**Length Bias (Disease-Spectrum Bias or Overdiagnosis Bias)**

Disease progressing rapidly is likely to be missed by screening.

**Considerations & Critical Appraisal Issues**

- Requires valid studies of diagnostic tests and interventions demonstrating improved outcomes with early interventions compared with intervening after symptoms develop.
- Assess potential for lead-time bias, length bias and volunteer bias.