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The natural history of a disease classifies into five stages: underlying, susceptible, subclinical, clinical, and recovery/disability/death. Corresponding preventive health measures have been grouped into similar stages to target the prevention of these stages of a disease. These preventive stages are primordial prevention, primary prevention, secondary prevention, and tertiary prevention. Combined, these strategies not only aim to prevent the onset of disease through risk reduction, but also downstream complications of a manifested disease.

## **Primordial Prevention**

In 1978, the most recent addition to preventive strategies, primordial prevention, was described. It consists of risk factor reduction targeted towards an entire population through a focus on social and environmental conditions. Such measures typically get promoted through laws and national policy. Because primordial prevention is the earliest prevention modality, it is often aimed at children to decrease as much risk exposure as possible. Primordial prevention targets the underlying stage of natural disease by targeting the underlying social conditions that promote disease onset. An example includes improving access to an urban neighborhood to safe sidewalks to promote physical activity; this, in turn, decreases risk factors for obesity, cardiovascular disease, type 2 diabetes, etc.



## Primary Prevention

Primary prevention consists of measures aimed at a susceptible population or individual. The purpose of primary prevention is to prevent a disease from ever occurring. Thus, its target population is healthy individuals. It commonly institutes activities that limit risk exposure or increase the immunity of individuals at risk to prevent a disease from progressing in a susceptible individual to subclinical disease. For example, immunizations are a form of primary prevention.

## Secondary Prevention

Secondary prevention emphasizes early disease detection, and its target is healthy-appearing individuals with subclinical forms of the disease. The subclinical disease consists of pathologic changes, but no overt symptoms that are diagnosable in a doctor's visit. Secondary prevention often occurs in the form of screenings. For example, a Papanicolaou (Pap) smear is a form of secondary prevention aimed to diagnose cervical cancer in its

subclinical state before progression.



Tertiary prevention targets both the clinical and outcome stages of a disease. It is implemented in symptomatic patients and aims to reduce the severity of the disease as well as of any associated sequelae. While secondary prevention seeks to prevent the onset of illness, tertiary prevention aims to reduce the effects of the disease once established in an individual. Forms of tertiary prevention are commonly rehabilitation efforts.

## **Quaternary Prevention**

According to the Wonca International Dictionary for General/Family Practice, Quaternary prevention is: “action taken to identify patients at risk of overmedicalization, to protect him from new medical invasion, and to suggest to him interventions, which are ethically acceptable.” Marc Jamouille initially proposed this concept, and the targets were mainly patients with illness but without the disease. The definition has undergone recent modification as” ‘an action taken to protect individuals (persons/patients) from medical interventions that are likely to cause more harm than good.”

## **Issues of Concern**

In the United States, several governing bodies make prevention recommendations. For example, the United States Preventive Services Task Force (USPSTF) is a governing body that makes recommendations for primary and secondary prevention strategies. The Advisory Committee on Immunizations Practices (ACIP) through the Centers for Disease Control and Prevention (CDC) makes recommendations for vaccinations, while the Women’s Preventive Services Initiative (WPSI) makes recommendations appropriate for females. Additionally, various specialty organizations such as the American College of Obstetrics and Gynecology (ACOG), the American Cancer Society (ACS), etc. also make prevention recommendations. With the multitude of information and recommending bodies, it is often challenging for healthcare professionals to remain up to date on changing endorsements.

Further, while preventive services are regulated and must undergo scrutinous safety testing, there is risk involved with prevention. Particularly, primary and secondary preventive factors targeted at intervening in healthy-appearing individuals. It is often challenging to gain buy-in with patients regarding the risk-benefit ratio of various preventive services.

Finally, the cost of preventive services is commonly a topic of discussion. Several cost-benefit analyses have been undertaken regarding the evaluation of preventive services with varying degrees of confidence. While often a long-term gain of healthy life-years is noted, preventive services are not inexpensive, which can limit the use of these services by both healthcare systems and patients and is a consideration when promoting preventive services.

## Clinical Significance

Preventive services have proven an essential aspect of healthcare; however, they appear consistently underutilized in the United States. With cost, time, and resource constraints on physicians, many preventive services get overlooked for patients. Physicians need to remain up to date on the prevention guidelines and ensure all patients are offered appropriate services with a full explanation of risks and benefits.

Some examples of commonly used prevention strategies are:

### Primordial:

- Government policy: Increasing taxes on cigarettes; Decreasing advertisement of tobacco
- Built Environment: Access to safe walking paths; access to stores with healthy food options

### Primary:

- Immunizations
- Tobacco Cessation Programs
- Needle Exchange Programs
- Micro-Nutrient Supplementation Programs

### Secondary:

- Papanicolaou (Pap) smear for early detection of cervical cancer<sup>[8]</sup>
- Mammography, for early detection of breast cancer
- Colonoscopies, for early detection of colon cancer
- Blood Pressure Screening

### Tertiary:

- Occupational and physical therapy in burn patients

- Cardiac rehab in post-myocardial infarction patients
- Diabetic foot care

### Quarternary:

The following conditions are susceptible to over-treatment:

- Radiological incidentalomas
- The use of antiarrhythmic drugs after myocardial infarction that reduced arrhythmias but increased mortality
- The use of hormone replacement therapy led to an increased number of cases of breast cancers, stroke, and thromboembolic events. It was also a failure in reducing cardiovascular mortality.
- Medically unexplained symptoms
- Functional disorders
- Bodily distress syndrome

### Nursing, Allied Health and Interprofessional Team Interventions

Proper communication among the various health care personnel should be there to provide appropriate levels of prevention to the general public and patients. School staff and other ancillary staff require education on the importance of providing prevention as an important aspect of caring for an individual while he/she is a student.

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