

Screening for disease part 2

In the last article we began to look at screening for disease. This article explores more about screening.

There are four kind of preventive medicine

Primary prevention - the prevention of illness before it occurs

An example is immunization. Get a flu shot every year, get a pneumonia shot if you have a chronic illness or you are over 65. Immunize your children, use seatbelts always, and helmets for biking. This is true prevention; you are well, and stay well.

Half way between primary and secondary prevention is the PAP test. Cervical cancer was common when I was a medical student, but I have not seen a case of full blown invasive cervical cancer in the last 25 years in my practice. An abnormal PAP actually indicates the presence of the virus that causes cervical cancer. It catches changes before they become cancer. The progression from early pre-cancerous changes to invasive cancer is slow, and so it is possible to screen every 2-3 years and still catch all the potentially risky lesions.

Secondary prevention - catching a disease early while it is curable

Mammography is a good example - the intent is to catch disease at a time when it is both not producing symptoms so the patient is unaware of it, AND is early enough to make a difference to the outcome.

Tertiary prevention - the prevention of complications and disability from established illness

This is the work doctors do to manage acute and chronic illness - really most of what doctors do to prolong life and improve its quality and function.

and Quaternary prevention - the prevention of unnecessary and even harmful effects of over-diagnosis and over-treatment

This is a relatively new type of prevention as we have only become aware of the harmful effects of screening more recently. The point here is that screening is not a benign activity. There are consequences.

Murray McLauchlan, a Canadian folk singer, told his story at a concert I was attending. He flies small planes, and every year Transport Canada required him to undergo a treadmill exercise stress test. One year this screening test was positive. To follow up he had coronary angiography, a procedure where a thin flexible plastic tube is threaded through his arteries 'til it comes to the heart's blood supply. The good news was that his arteries were normal. The bad news is that during the procedure, the plastic tube accidentally pierced one of the arteries necessitating emergency heart surgery and a prolonged recovery. You can argue that public safety dictates that pilots have to take the risk for the greater good, but not everyone. That is why we do not do angiograms as a screening test. This is why when I have a worried patient who wants a specific test I only do it unless the conditions are right and the BENEFIT outweighs the risk.

So what about testing for cancer? It SEEMS like early detection ought to be a good thing, but that idea does not always hold up under the scrutiny of science. Sometimes we detect cancers early so it LOOKS like people live longer, but what we have done actually is make them aware earlier without influencing the actual age at which they die. Sometimes we detect cancers that will never kill you in the rest of your natural lifespan. Screening for prostate cancer in an 89 year old man is silly. By the time the cancer can kill him, he will have died of natural causes long before. So would you want to know about this cancer? Not me!

A new Canadian study compared women who got yearly mammograms for 5 years to women who didn't, and followed them over a 25 year period. The overall death rate was the same in both groups! How can THAT be? There are some problems with this study, but one possibility is that mammography does save some women but the unnecessary biopsies and surgeries also kill an equal number so it balances. Women who had a mammogram and subsequent successful treatment will always say that the mammogram saved their life, but those who died of complications from surgery or from a cancer that was not curable never get to tell their stories. Stories are not science. And this one study is not the be-all and end-all either. The process of science is to test theories, evaluate all the facts, and look for reproducibility. "Science" said Thomas Henry Huxley is "the assassination of beautiful theories by ugly facts". We haven't assassinated this one yet... mammograms are still recommended.

Any screening interval that is long enough to be practical detects mostly cancers that are slow growing and miss bad ones that come up quickly between the screens. The only effective antidote is to look for the root causes of cancers and work on prevention, for example smoking in lung cancer.

So, early detection is more complex than it seems at first glance. When I want to know whether a screening procedure is actually valid, I listen to the doctors in the system who have no bone to pick, no agenda to push and who do not benefit financially from the tests and treatments... the epidemiologists. Keep talking with your doctor about being appropriately screened based on your own family history and risk profile, and based on the best available evidence.