Screening in Family Practice: Prevention, Levels of Evidence, and the Pitfalls of Common Sense

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Elsewhere in this issue, a group of family physicians present an informative account of their ten-year experience in screening for cancer in primary care.[1] This report shows us what a highly motivated, effective team can and cannot accomplish.

Such motivation, in kind, if not amount, exists in most clinicians. Thwarted in our efforts to halt the progress of many patients' illnesses toward inexorable disability and untimely death, we seek to prevent these illnesses or, if primary prevention fails, at least to diagnose them as early as possible. Common sense dictates that when we cannot prevent a disease, we ought to at least diagnose it as early as possible.

There are some triumphs that arise from early diagnosis; we can prevent developmental damage by detecting neonatal hypothyroidism; we can prevent stroke and heart failure when we diagnose symptomless hypertension; we can prolong life by detecting presymptomatic breast cancer. Fueled by these successes, common sense ordains that we should seek the early diagnosis of every disorder that causes serious disability or untimely death.

This editorial is a plea against reliance on common sense alone in deciding whether to seek the early diagnosis of presymptomatic disease. I submit that common sense ("the earlier, the better") will fail to distinguish those early detection procedures that do good from those that do harm.

The justifications for this plea are two. First, early detection will always appear to improve clinical outcomes such as survival, even when treatment is ineffective. Second, any procedure that detects early, symptomless disease takes healthy time away from patients.

1. *Early detection will always appear to improve clinical outcomes, such as survival, even when treatment is worthless.*

There are three reasons why this occurs. First, accumulating evidence suggests that high compliance with health recommendations is a "marker" for improved survival, regardless of the efficacy of those recommendations. For example, among the experimental group of women randomized to be invited for breast examination and mammography in the landmark New York Health Insurance Plan trial, only two-thirds actually kept their appointments. Surprisingly, those who did show up for breast cancer screening, when contrasted with those women who stayed away, had only about one half the mortality from cardiovascular and other diseases for which they were not screened.[2] For a second example, in the placebo group of a secondary prevention trial of myocardial infarction, patients who took 80 percent or more of their placeboes were one half as likely to die as those who took fewer of these inert pills (and their improved survival could not be explained by changes in their coronary risk factors).[3]

The second reason that early diagnosis appears to improve outcomes even when therapy is ineffective has to do with slow-growing and fast-growing tumors. We recognize that some tumors grow slowly and remain local, while others, even of the same site, grow quickly, metastasize early, and kill soon. What we often fail to recognize is that, as a direct consequence, the slow-growing cancers are detectable in their presymptomatic stage for a much longer period of time; the slow-growing cancers, with their longer survivals, are much more likely to be detected through screening and case finding than the fast-growing, quick killers.[4] Inevitably, therefore, even when treatment has no effect, we will observe better survival among patients whose cancers are detected by screening.

Finally, early detection is just that; it moves the starting time for measuring the clinical course, response to therapy, and outcome of disease to an earlier point on the calendar. If we fail to correct for the lead time gained through this early diagnosis, and compare the survival of asymptomatic patients diagnosed early to that of symptomatic patients diagnosed later, the former are guaranteed a prolongation in survival equal to that lead time.[5] Suppose, for example, that a cancer becomes symptomatic in a person aged 45 years and kills when that person is 50 years old. Suppose

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further that the cancer can be detected in an asymptomatic form one year earlier, when the person is aged 44 years, but that treatment is ineffective and the cancer still kills the person at the age of 50 years. The asymptomatic patient diagnosed early survives for six years, but the symptomatic one survives for only five years. If we fail to correct for this one year of lead time, early diagnosis appears to improve survival; however, the patient is still dead at the age of 50 years, and we have given her, not an extra year of life, but an extra year of disease.

Common sense misleads us in this case, and the example just cited introduces the second justification for caution.

2. *Any procedure that detects early, symptomless disease takes healthy time away from people.*

People so identified are exposed to the risks of diagnostic procedures and treatments. In addition, the early detection process inevitably labels as unwell those it identifies, and growing evidence testifies to the sick role behavior, absenteeism, and decreased quality of life that can attend this labeling, even in the absence of treatment.[6]

When the consequent treatment increases our ability (over that which attends waiting for symptomatic disease to develop) to preserve function, prevent deterioration, and prolong a life of quality, we and those we serve usually are willing to pay the price of converting a person into a patient. When it does not, what have we accomplished besides harm? Furthermore, is not this harm still worse when it is the result of our unsolicited interventions upon the asymptomatic individual.

If these two justifications are sound, readers must critically appraise the evidence they encounter on the value of early diagnosis for its validity and applicability in front-line clinical practice.[7] They cannot rely on common sense and should direct healthy skepticism toward all so-called experts in the field (including myself). Considerable good can be accomplished through early diagnosis, but to do more good than harm, physicians must keep up to date in their reading on this central topic, and they are well advised to seek evidence of the sort proposed by the World Health Organization before taking healthy time away from their patients.[8]

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