Overdiagnosis and overtreatment; a hidden challenge

Anuruddha Abeygunasekera*

Consultant Urological Surgeon

Correspondence: Dr. Anuruddha Abeygunasekera
e-mail*: amabey@sltnet.lk*
https://orcid.org/0000-0002-0090-3934

The core teaching of modern medicine is early detection of illnesses and proactive treatment. We accept it as undisputed truth since it appears logical and scientific. With rapid advancements in diagnostic technologies, genetic testing, screening programmes and artificial intelligence, the ability to identify diseases at their early stages has greatly improved. However, this progress has come at a cost: the phenomenon of overdiagnosis - the identification of "disease" that would never have caused harm - and its logical consequence, overtreatment.

Overdiagnosis occurs when a diagnosis is made of a condition that would not have produced symptoms or death during a patient's lifetime (1). Overtreatment follows, when interventions - such as medications, surgeries, or other therapies - are administered unnecessarily. These practices can lead to physical, psychological, and financial harms, undermining the very goal of medicine: to do good and avoid harm. Labelling a person as sick with a non-significant illness can have significant repercussions not only on the patient but on the close family members too.

Overdiagnosis is not simply the result of ignorance. It is deeply intertwined with the conceptual frameworks in medicine, patient expectations, individual and institutional economics, and peoples' fear of disease. As diagnostic thresholds lowered and definitions of diseases expand, more people are labeled as "ill," even when their condition is harmless (2). So much so that at the end of a negative evaluation medical professionals are reluctant to tell that the patient has 'no illness'! Recognizing and addressing these trends is essential for sustainable, equitable and ethical healthcare delivery especially in resource limited settings. At present, even the richest countries cannot provide all the funds required by limitless requirements of health professionals. Countries with weak economies grapple with ever rising health budgets which gulp funds that could have used to help the disadvantaged sections of the population.

It is important to distinguish overdiagnosis from misdiagnosis. While misdiagnosis involves an incorrect diagnosis, overdiagnosis involves a correct identification of a real abnormality that is clinically insignificant. For example, detecting a small, slow-growing prostate cancer that would never have progressed during a man's lifetime constitutes overdiagnosis, even though the diagnosis itself is technically correct (3).

Overtreatment refers to medical interventions that are unnecessary, offer no benefit to the patient, or carry a higher risk of harm than benefit. Overtreatment often arises as a direct consequence of overdiagnosis but can also occur independently due to defensive medicine, financial incentives, or patient demand (4). Inadequate knowledge and experience of the clinician also can contribute to overtreatment. Examples include the unnecessary use of antibiotics for viral infections, excessive use of imaging and biochemistry, unnecessary surgical interventions or aggressive management of mild abnormalities where lifestyle modification would suffice.

* *Editor, Galle Medical Journal (2001, 2004-2006)*

The causes of overdiagnosis and overtreatment are multifactorial, involving technological, professional, psychological, and systemic factors.

Modern imaging and molecular diagnostics can detect minute abnormalities that were previously invisible. While this enhances diagnostic accuracy, it also identifies conditions that might never become clinically relevant. Public health screening programmes often aim for early detection but may inadvertently create harm when they identify low-risk lesions. Moreover, changes in disease definitions - such as lowering blood pressure or cholesterol thresholds - increase the pool of "patients" without necessarily improving outcomes (5).

Fear of litigation drives many clinicians to "do more" (6). Ordering additional tests or treatments, even when not clinically indicated, is often seen as a safer legal option, fostering a culture of overutilization and wastage. Dearth of medico-legal experts with an unbiased view on the totality of the issues has made defensive medicine a ubiquitous problem. In fee-for-service healthcare models, financial rewards are tied to the volume of services rather than outcomes (7). This structure inadvertently promotes unnecessary testing and treatment.

Patients often equate more testing with better care and may pressure clinicians for investigations or treatments "just to be sure" (8). Using investigations to harness the placebo effect has become a convenient short cut used by clinicians. Veneration of early detection, coupled with fear of missing disease, further reinforces overdiagnosis. Marketing campaigns by pharmaceutical and medical device companies often expand disease awareness and encourage both doctors and patients to pursue early and aggressive intervention (9).

Consequences of overdiagnosis and overtreatment are many. Unnecessary treatments can expose patients to complications, side effects, and procedural risks. For instance, unnecessary surgery for a benign thyroid nodule can lead to lifelong hypothyroidism. Similarly, radiation exposure from imaging or aggressive chemotherapy for indolent cancers can cause a multitude of disabling health issues. Surgical intervention for small urinary stones may cause renal damage or ureteric strictures.

Being labeled as "ill" carries significant psychological consequences too. Over-diagnosed patients may experience anxiety, stress, and altered self-perception, even in the absence of symptoms. Even the close family members can be affected. Overdiagnosis and overtreatment strain healthcare systems by diverting resources away from those in genuine need (10). For example, unnecessary flexible cystoscopy would create long waiting periods which would delay the diagnosis of a malignancy in a patient with proper indication for cystoscopy. The large number of negative tests and procedures done in the name of early diagnosis is a huge financial burden for low and middle-income earning countries.

Resources consumed by unnecessary interventions reduce availability for preventive care and essential treatments. When patients suffer harm from unnecessary care, trust in healthcare professionals and institutions is eroded. The ethical principle of *non-maleficence* ("do no harm") is violated, undermining the moral foundation of medicine (2).

Overdiagnosis and overtreatment raise profound ethical questions. Patients have the right to make informed choices, but overdiagnosis often occurs without full understanding of risks. Clinicians must balance potential benefits and harms, ensuring interventions truly help. Resources consumed by unnecessary care reduce access for others, challenging fairness in healthcare distribution. Ethical medicine requires transparency, restraint, and honest communication about uncertainty. Physicians should avoid the temptation to "do something" when doing nothing - or "watchful waiting" - is a safe option.

Potential strategies to reduce overdiagnosis and overtreatment include evidence-based guidelines tailored to the local settings, shared decision-making, choosing wisely campaigns, reforming screening programmes, reconsidering disease definitions, promoting awareness of the issue among medico-legal professionals and making financial audit mandatory for investigations (11). However, the most vital step is to educate medical professionals to be aware of the dangers of overdiagnosis and overtreatment. This cognitive change may not be possible in all medical professionals but some would embrace it when there is adequate emphasis and support.

Clinical guidelines should emphasize outcome-based rather than detection-based metrics. Incorporating "de-implementation" strategies - identifying and stopping low-value practices - can help (12). Engaging patients in open discussions about risks, benefits, and uncertainties helps align care with patient values. Decision aids, risk calculators, and plain-language explanations empower patients to make informed choices. The '*choosing wisely'* encourages physicians and patients to question the necessity of common tests and treatments. Those who have become masters in evidence-based practices can climb a step further and practice equity- based medicine to harness more benefits to patients and health delivery systems (13).

Screening programmes should be carefully evaluated for net benefit (14). For example, risk-based screening - targeting high-risk populations - may reduce overdiagnosis compared to population-wide approaches. Expert panels should avoid lowering diagnostic thresholds and enforcing guidelines without clear evidence of improved outcomes in their own settings. Clinicians must be trained to appreciate diagnostic uncertainty and to resist cultural pressures toward overuse. Medicine should return to its roots of reflective thinking and wise clinical judgment, focusing on the patient's overall well-being rather than numbers or test results. It is imperative to remember all norms including normal test values are creations of man.

Conceptual and systemic changes are essential to minimise overtreatment. Payment models that reward value over volume can discourage unnecessary interventions (15). Regulatory agencies should require evidence of mortality or quality-of-life benefit before approving screening tests or therapies. Public health campaigns should emphasize the message that "more medicine" is not always "better medicine." Transparency about the risks of overdiagnosis should become an ethical obligation, similar to disclosure of treatment risks (16).

In conclusion, overdiagnosis and overtreatment are byproducts of a well-intentioned but materialistic healthcare system. While early detection and technological progress have saved lives, they have also led to a paradox: too much medicine and surgery can be as harmful as too little. Recognizing the limits of medical intervention, fostering shared decision-making, uninterrupted surveillance with audit & research and prioritizing equity-based care are essential steps toward restoring balance. Ultimately, medicine must re-embrace its core mission - to heal, when possible, to relieve always, and above all, to do no harm. Addressing overdiagnosis and overtreatment is not only a scientific necessity but a moral imperative for the future of healthcare.

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