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### Cost-effective use of investigations in developing countries



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#### A B S T R A C T

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In recent years, the cost of health care around the world has risen at a rate that is deemed unsustainable. It has been estimated that 20% of this could be saved by rationalising laboratory investigations and reducing inappropriate requisitioning of the investigations. There are several reasons for the excessive, redundant, inappropriate or unnecessary investigations and procedures, which in some instances are unethical practices. The impact in financial terms is more in developing countries such as India with <5% of the population having medical insurance and hardly any other third-party payer system. The 'Choosing Wisely' campaign of the American Board of Internal Medicine, Canadian Rheumatology Association's Choosing Wisely Committee and the 'Society for Less Investigative Medicine' (SLIM) initiative of the doctors of All-India Institute of Medical Sciences (AIIMS), New Delhi, all have provided recommendations to reduce unnecessary investigations, and these are among some of the efforts to reduce the cost of investigations without compromising the quality of care.

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## Introduction

In recent years, the cost of health care around the world has been rising at a rate that is unsustainable [1]. For example, in the US, wasteful spending likely accounts for between one-third and one-half of all health-care spending. Pricewaterhouse-Coopers calculated that up to US\$ 1.2 trillion, or half of all health-care spending, is the result of waste [2]. An Institute of Medicine (IOM) report estimated that unnecessary health-care spending totalled US\$ 750 billion in 2009 alone [3]. Similarly, 'The Carter Review', a UK Department of Health-commissioned review of pathology services in England, estimated that 20% of this could be saved by rationalising laboratory investigations and reducing inappropriate requisitioning of the investigations [4]. This UK 'Review' estimated that 25% of laboratory tests were unnecessary, representing a huge potential waste. Another example is from the Netherlands where expenditure on diagnostic tests grew at the rate of 7% a year without parallel improvement in the health status, suggesting that investigations were being overused [5]. A recent Canadian 'Choosing Wisely Committee' report has discussed the problem of wasteful laboratory investigations and pointed out five investigation items with questionable significance in daily-routine rheumatology practice [6]. According to these and several other reports, redundant, inappropriate or unnecessary tests and procedures are sadly becoming rampant [7–11]. Several factors may be responsible for the increasing use of investigations. These could be as simple as 'the tests are available'. Another factor could be the urge to make use of new technology. The fear of litigation may also be driving doctors to practice defensive medicine without realising that on average 5% of test results are outside their reference ranges. Therefore, once an abnormal test result is found, it may result in a cascading effect and doctors may order several other investigations, not realising that 5% of them would again be abnormal by chance [5,6]. More worryingly, in some recent issues of the *British Medical Journal*, it has been discussed that in India some clinical laboratories and hospitals may be involved in the unethical practice of offering a certain percentage of the cost of the investigation as incentives to the referring doctors for ordering more tests and procedures [12,13]. In developing countries such as India, with <5% of the population having medical insurance coverage, hardly any third-party payer system, and a per-capita income of only US\$ 1570 in 2013, ranked 120th out of 164 countries by the World Bank [14], the crippling cost of health care is nothing short of a crisis. Weaker sections of the society are the worst affected [15]. It could therefore be argued that the importance of the cost-effective use of investigations in developing countries is much more than in developed countries such as USA where the per-capita income was US\$ 42,693 in 2012 [14]. These trends have forced clinicians to start campaigns for reducing the overuse of tests and procedures, and to support patients in their efforts to make smart and effective care choices. Some of the efforts to reduce the cost of investigations without compromising the quality of care include the 'Choosing Wisely' campaign of the American Board of Internal Medicine and the American College of Rheumatology (ACR) [16–19], Canadian Rheumatology Association's Choosing Wisely Committee's recommendations [6] and the 'Society for Less Investigative Medicine' (SLIM) initiative of doctors of All-India Institute of Medical Sciences (AIIMS), New Delhi, to reduce unnecessary investigations [20]. In this chapter, we discuss the cost-effective approach to investigations with some examples without attempting to be all-inclusive. To allow the reader a comparison of cost, we have illustrated the cost (in US\$) of investigations as they currently exist in India.

## Tools for making a diagnosis

Traditionally, the tools for making a diagnosis include clinical history, physical examination and laboratory investigations (including imaging and histopathology). Several workers have reported the relative contributions of these 'tools' or 'components' towards diagnosis. Several studies have proven it beyond doubt that clinical history is absolutely critical to making a diagnosis [8,21–23]. Once a provisional diagnosis is made, a short list of differential diagnosis can also be prepared without trying to be comprehensive. Then, a list of wisely chosen focussed laboratory investigations for confirming the provisional diagnosis and refuting a few of the main differential diagnoses can be drawn. Further, if some unexpected results are shown, a few additional investigations related to that diagnosis may be ordered as a 'second round' of investigations. This would be the most cost-effective use of investigations towards making a diagnosis.

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