

# Cost-effectiveness of asthma therapy

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## Abstract

An important management strategy in asthma is the application of a cost-effectiveness review to the selected management principles. Efficacy, in the clinical trial setting, is the first determinant of effectiveness. However, in comparing the cost-effectiveness of two or more therapeutic strategies or drugs the determinants of cost-effectiveness may require more than the simple comparison of Rand value and clinical efficacy end-points. The Rand value of a successful outcome is vital. One of the main goals of long-term asthma management is to avoid asthma-related hospital admissions. An effective asthma education programme can resolve most, if not all of the shortcomings in asthma care. In addition, adherence to guideline recommendations would result in a decrease in unnecessary and costly (cost-ineffective) therapies. Many asthmatics in South Africa are not being treated according to local or international guideline recommendations and lastly adherence is a serious problem in asthma therapy, significantly increasing asthma management costs.

(SA Fam Pract 2006;48(2): 44-47)

## Introduction

In South Africa a management strategy for any medical condition, but especially a chronic condition like asthma, requires three equally important steps:

1. Diagnosis
2. Treatment
3. Application of a cost-effectiveness review strategy to the selected management principles

This does not mean compromising on patient care, but rather critically choosing a road forward which benefits not only the patient but also the community. In addition a management plan is more than the use of a pharmacological agent to treat the condition; often a therapeutic strategy may include a more subtle intervention. In the case of asthma such interventions include patient education methods which need to be evaluated by the same cost-effectiveness principles.<sup>1</sup> This article will focus on some of the more direct costs, of pharmacological treatments, for asthma as well as other issues which make treatment cost-effective.

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therapeutic strategies or drugs the determinants of cost-effectiveness may require more than the simple comparison of Rand value and clinical efficacy end-points. To integrate cost and cost-effectiveness of a therapeutic intervention requires both medical and economic justification.<sup>2</sup>

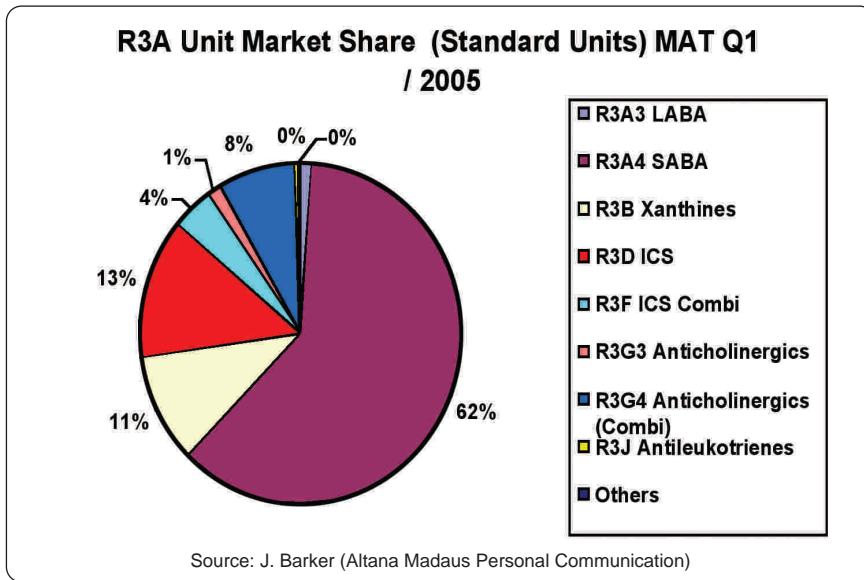
The first of these involves both the efficacy and safety of a particular intervention (medical or surgical, pharmacological or procedural). Economic justification on the other hand, is not the Rand value of such an intervention, but the rand value of a successful outcome. It is therefore a more difficult endpoint to quantify. Likewise, efficacy is not synonymous with effectiveness. A controlled clinical trial of a pharmacological agent can be rigorously assessed by subjection of measurable clinical and/or laboratory parameters to statistical analysis for efficacy. With effectiveness, however, the day-to-day practice reality intervenes, and the choice of whether to use a certain agent, its impact on patients (both adherent and non-adherent), the side-effects, the patient preference and many other variables are tested. In many circumstances an inexpensive agent may be highly cost-ineffective. A drug that is cost-saving improves

outcomes at a lower overall cost, whereas a cost-effective drug may improve outcomes at a 'reasonable' increase in overall cost.<sup>3</sup> In practice therefore, the only way to migrate from cost to cost-effective intervention, is to combine the rand value with outcome measures for a particular disease. Cost may be extremely difficult to quantify because intangible costs (such as quality of life) are not measurable by standard methods.<sup>4</sup> Sometimes the health consequences of treatments are expressed in 'natural' units such as symptom-free days or years of quality-adjusted life saved.<sup>5</sup>

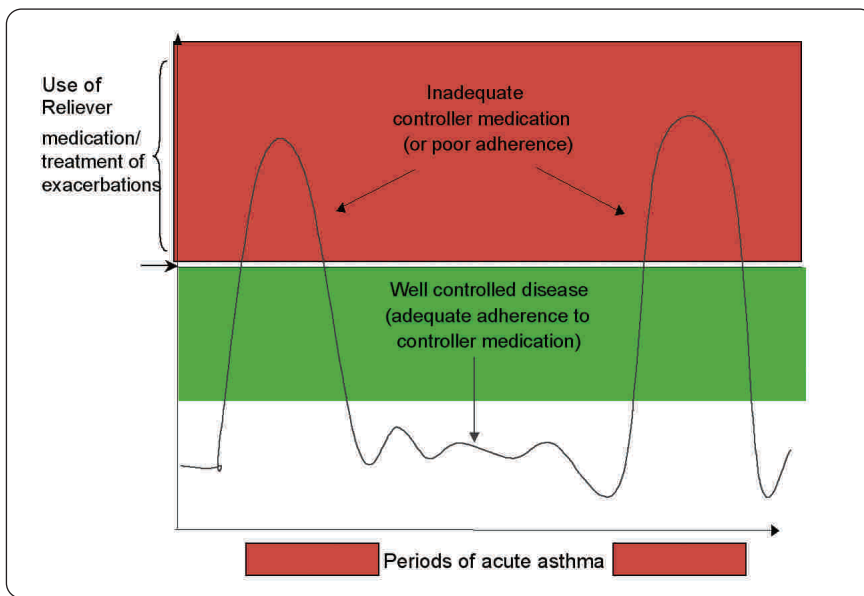
The need for intervention in asthma management is obvious; the method of such intervention is more obscure. In assessing cost-effectiveness of asthma care, cost of direct healthcare interventions can be measured. Indirect health-related cost is defined as lost resources, and includes time off work as a result of the patient's ill health, time spent by the patient's caregivers in the home and premature retirement or death.<sup>6</sup> It is more difficult, and sometimes impossible, to measure.

One of the main goals of long-term asthma management is to avoid asthma-related hospital admissions, which remain the second most

**Figure 1:** Use of bronchodilator therapy in South Africa



**Figure 2:** Relationship between poor adherence and use of reliever medication/treatment of exacerbations



common cause of hospitalizations, at least in children.<sup>7-9</sup> In addition, hospitalization costs account for 46 to 74% of the total direct cost of asthma management in the United States and Europe.<sup>6,10-13</sup> Significant reductions in hospitalization and readmission rates have been reported during the recent decade from Denmark,<sup>14</sup> and also from local regions within other Nordic countries.<sup>15,16</sup> However, a large proportion of children are still hospitalized each year despite extensive educational programs and use of preventive drugs. Any attempt

to treat chronic asthma and thereby reduce acute exacerbations of asthma will prove to be a cost-effective strategy, since acute asthma generates significant costs.<sup>17-19</sup>

**Asthma care in South Africa**

In general, in the field of asthma a window of opportunity now exists for addressing the principle of cost-effective care. An effective asthma education programme can resolve most, if not all of the shortcomings in asthma care. Such programmes in other countries have been shown to result in two- to five-fold real

community cost savings, using the same medication! Asthma management programmes have been shown to save \$11 for every dollar spent on education.<sup>20</sup> In South Africa, Access Health (Pty) Ltd conducted an Asthma Management Programme during 1999. (H Potgieter - personal communication) Participants were encouraged to set goals for managing their condition. Before commencing the programme participants took 4 986 sick days per year from work or school. The index rate decreased by 546 after 120 days of participation. In addition, before commencement of the programme, participants had 676 emergency visits per thousand per year. After 120 days of participation there were no reported emergency visits. Recently Bartlett has shown reduction in asthma costs and improvements in control, with significant reductions in asthma-related hospitalisations from the introduction of a Managed Health Care, Disease Management Programme (J Bartlett – personal communication). Asthma guidelines form an integral part of an education programme and their formulation and dissemination is critical.

**Cost-effectiveness of guidelines approach**

Adherence to guideline recommendations would result in a decrease in unnecessary and costly (cost-ineffective) therapies such as rescue  $\beta_2$ -agonist inhalers, home nebulisation, inappropriate prescription of antibiotics, mucolytics, cough syrups and antihistamines, emergency room visits and hospital admissions.

While an increase in costs would be likely, through additional spirometry tests, inhaled corticosteroid use, and patient education, this would result in a decrease in hospitalisations and the cost of treating uncontrolled symptoms. The cost of a single exacerbation ranges from several hundred to several thousand rands, depending on severity, and the cost of treating uncontrolled symptoms

amounts to several hundred rands if home nebulisation is used. Apart from direct cost savings, guidelines-based management is also likely to result in fewer days off work/school and a better quality of life.<sup>21-23</sup>

Many asthmatics in South Africa are not being treated according to local or international guideline recommendations. There is evidence that only 12-20% of asthmatics receive inhaled corticosteroids, with the majority of sufferers receiving no 'preventer' medication.<sup>24</sup> The frequent use of bronchodilators (7:1) vs corticosteroid, together with the large number of prescriptions for oral steroids (equal to inhaled corticosteroid scripts), highlights the inadequate management of this condition. Figure 1 demonstrates the inappropriate over-use of bronchodilators in the respiratory market in South Africa. This is a short-sighted approach as the cost is borne ultimately in uncontrolled disease and exacerbations.

Adherence is a serious problem in asthma therapy<sup>25</sup> and adherence problems are estimated to occur in around 10-46% of asthma patients. Concerns over systemic (steroid phobia) and local side-effects of current treatments are significant factors in reducing adherence.<sup>25</sup> Reduced adherence and compliance to long-term preventer therapy make symptoms more likely and the cost of the disease is borne in reliever medicine use (Figure 2) and treatment of exacerbations.

### Consequences of an improved side-effect profile of asthma therapy


The side-effect profile and resultant increase in long-term costs associated with systemic corticosteroids, make them inappropriate therapy for all, but the severest chronic asthmatic. Their use, however, in acute exacerbations of asthma, remains undisputed. A drug with a low potential for systemic side-effects will lead to a reduction in serious adverse events such as adrenal suppression, osteoporosis

and fractures in the long-term. Since there are costs associated with these problems, the low incidence of local side-effects will also lead to cost savings. Furthermore, improved side-effect profiles and simplicity of treatment regimes may improve adherence and thereby asthma control. There are now a significant number of pharmacoeconomic studies to document the reduction in direct costs associated with the use of new anti-asthma agents. Costs of acute exacerbations and uncontrolled asthma are reduced with their use. The Rand value of new therapies may be higher than conventional, especially generic, inhaled corticosteroids but their improved adherence and lower side-effect profile make them cost-effective when all end-points are thrown in.<sup>26-29</sup> It is encouraging that cost-effectiveness data is available for newer agents and the reader is encouraged to evaluate this data together with studies of efficacy on any asthma medication. 'Cheap' is not necessarily so and nor is 'expensive'.

### Conclusion

Asthma is a common condition but fortunately eminently treatable. We can afford to manage this condition adequately if we pay attention to the principles of cost-effective care such that everybody involved in asthma care (providers, dispensers, funders and patients) will benefit. Every time we decide to treat an asthmatic, be the motivation either acute or chronic asthma, make the selection of medication and ancillary strategies based on the principle of the most cost-effective long-term intervention. 🙋

See CPD Questionnaire, page 52

 This article has been peer reviewed

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