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Self-management support and other alternatives to reduce the burden of asthma and chronic obstructive pulmonary disease

H. K. Reddel,* C. R. Jenkins,† M. R. Partridge‡

*Woolcock Institute of Medical Research, University of Sydney, Sydney, †The George Institute, Sydney, New South Wales, Australia; ‡Imperial College, London, UK

SUMMARY

While pharmacotherapy is important in the management of asthma and chronic obstructive pulmonary disease, it is also important to consider additional interventions that can further reduce the burden of ill health for patients, their families and the health care system. In this review, the evidence in favour of self-management support that leads to successful self-care by the patient is reviewed, and the key components of

successful strategies are outlined; areas where more research is needed are identified. In addition to self-management support, other methods of delivering care, such as telemonitoring, admission avoidance, assisted discharge schemes and use of lay educators, are reviewed.

KEY WORDS: asthma; COPD; self management; action plan

THE HEALTH BURDEN in many countries has moved from predominantly acute need for health care for conditions related to trauma, infection or perinatal problems to the need for health services that support people with long-term conditions such as heart disease, diabetes, hypertension, depression, asthma and chronic obstructive pulmonary disease (COPD). This change in pattern of illness has been accompanied by demographic changes, and in particular an increasingly elderly population often suffering significant multimorbidity. In one European study, it was shown that people with asthma or COPD had only infrequent, short interactions with health professionals—in fact, they self-managed their own condition for well over 364 days and 20 h each year.¹ Whether patients do self-manage their asthma or COPD optimally without suitable advice is debatable.

It is important to distinguish between self management itself, and self-management programmes or education. Effective self management is an outcome,

usually occurring through adaptive behaviour change, which enables patients to effectively exercise judgement about their symptoms, make appropriate treatment and self-care decisions, and sustain management of their underlying disease. The term ‘self-management education’ is generally applied to any formalised education programme aimed at teaching patients the skills they need to carry out specific medical regimens, guide health behaviours and provide support to help patients live functional lives. However, such programmes may be better referred to as ‘self-management support’, to emphasise that the role of health professionals is to provide advice and support in a motivational manner to achieve behaviour change and skills acquisition, rather than by didactic provision of information. Asthma and COPD provide examples of the varied extent to which self management has been integrated into chronic disease management.

KEY COMPONENTS OF SELF-MANAGEMENT SUPPORT IN ASTHMA AND COPD

To effectively self-manage asthma or COPD, the patient needs to:

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Correspondence to: Helen K Reddel, Woolcock Institute of Medical Research, 431 Glebe Point Rd, Glebe NSW 2037, Australia. Tel: (+61) 2 9114 0437. Fax: (+61) 2 9114 0014. e-mail: helen.reddel@sydney.edu.au

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- Accept the diagnosis and understand the condition
- Understand the purpose of the medications and be able to use inhaler devices correctly
- Appreciate the importance of environmental influences, including lifestyle
- Recognise factors that make the condition worse
- Understand the value of self monitoring
- Be able to recognise and treat worsening respiratory symptoms or function
- Know when to seek urgent medical attention
- Appreciate the need for regular structured review.

For most patients with asthma or COPD, much of this information may be summarised in a written action plan, developed in collaboration with the patient. The action plan also provides a structure for sharing information with patients about the following topics:

- information about what represents good asthma control,
- their usual therapy and its purpose,
- signs that suggest that their asthma or COPD is worsening,
- when to increase existing treatment,
- when to start reserve treatments, and
- when to seek urgent medical advice.

A major aim in asthma and COPD is to reduce the need for urgent health care in primary care, emergency departments or hospital. Such admissions are costly to the state or health service, and are also much feared by patients.^{2,3} This paper reports on the evidence for improved outcomes in asthma and COPD with provision of self-management support. It also describes strategies such as hospital-at-home for more severe exacerbations of COPD to reduce the need for hospitalisation or the duration of admission. This paper also addresses why self-management support is not always offered or received, whether it is always the responsibility of health professionals and whether there are alternative methods of delivery.

SELF-MANAGEMENT SUPPORT IN ASTHMA

The rationale for self management in asthma

Asthma is defined by variability in symptoms and airflow limitation,⁴ either spontaneously or in response to environmental 'triggers' such as viral infections and allergens. More substantial worsening occurs in exacerbations, also called 'flare-ups' or 'attacks', that can range in severity from mild to life-threatening. Given this variation, it is axiomatic that asthma treatment should be adjusted over time by the clinician at periodic review and/or by the patient through self management. At its most basic level, asthma self management involves the patient taking regular daily controller medications, together with as-needed bronchodilator medications for symptom

relief. In addition, for the past 25 years, clinical practice guidelines have recommended the provision of a written asthma action plan to provide patients with information about how to change their treatment when asthma worsens and access medical care rapidly when needed.

Terminology

There is substantial confusion in scientific literature and in patient support material in the terminology used for asthma 'plans'.⁵ The term 'written asthma action plan' generally has a consistent meaning (as above), but 'asthma management plan' is sometimes used for an action plan, sometimes for the patient's whole programme of asthma management, including an action plan, and sometimes for organisational systems.⁶

Evidence about the effectiveness of asthma self-management support

The effectiveness of guided self-management support in patients with asthma was unequivocally established in a Cochrane review by Gibson et al.⁷ In this meta-analysis, the term 'asthma self-management education' was given to programmes that included three components: self-monitoring of symptoms and/or peak expiratory flow (PEF), a written asthma action plan and regular medical review. Significant improvements in asthma outcomes were seen with these multicomponent interventions compared to usual care. The benefits were substantial, with relative risks (RRs) for hospitalisation of 0.64 (95% confidence interval [CI] 0.50–0.82), emergency room visits 0.82 (95%CI 0.73–0.94), unscheduled visits to the doctor 0.68 (95%CI 0.56–0.81), days off work or school 0.79 (95%CI 0.67–0.93), nocturnal asthma 0.67 (95%CI 0.56–0.79) and quality of life (standard mean difference 0.29 [95%CI 0.11–0.47]). Furthermore, in a case control study, ownership of a written asthma action plan was found to be associated with a 70% reduction in the risk of death from asthma.⁸

Specific characteristics of written asthma action plans have been examined in several further meta-analyses. For adults and adolescents, action plans based on symptoms and/or PEF were similarly effective in improving asthma outcomes,⁹ whereas in children symptom-based action plans were more effective than those based on PEF.¹⁰ In a subsequent meta-analysis of 17 studies,¹¹ action plans with two, three or four action points were consistently effective across asthma outcomes. Of the nine PEF-based action plans, studies in which 'action points' were based on personal best PEF significantly reduced emergency department visits, days off work and average PEF, whereas the plans based on per cent predicted PEF did not; both types reduced hospitalisation. Substantial variation was found in specified 'action points': the initial action point varied from

70% to 85% of personal best or predicted PEF, and similarly wide variation was noted in a recent review of 69 action plans.¹² However, the use of percentage criteria, while simple to calculate, seems counter-intuitive, as percentages do not take into account the patient's background level of day-to-day variation.¹³ PEF monitoring is at present generally reserved for patients with severe asthma or those with impaired perception of airflow limitation. With increasing use of electronic monitoring, better individualisation with more statistically appropriate criteria may increase the utility of lung function monitoring.¹⁴

In the 1990s, guidelines about action plans generally recommended that inhaled corticosteroid (ICS) doses be doubled when asthma symptoms worsened. The general acceptance of this concept was reflected in the fact that 13 of 17 studies examined by Gibson et al. provided instructions about both doubling ICS and how/when to start corticosteroid tablets;¹¹ when both instructions were provided, action plans consistently improved asthma outcomes compared with usual care. Only two plans recommended no increase in ICS, with too few data to examine whether they were effective.

The specific effect of doubling ICS was investigated in three subsequent randomised placebo-controlled trials in patients taking maintenance ICS. None of these studies showed a significant benefit from doubling ICS, except possibly if doubling resulted in a very high ICS dose.¹⁵ Potential reasons for the negative outcomes included the study populations (patients who were highly adherent both to ICS and to rigorous monitoring and study visit requirements) and the relatively late increase in ICS dose (an average of 5 days after symptoms and lung function started to worsen).^{16,17} The publication of these three studies led to a rapid shift in clinical guidelines to recommend against any change in ICS dose for community patients during worsening asthma. This meant that for several years the recommended approach to worsening asthma was only to increase bronchodilator treatment until the patient deteriorated to the extent that they needed systemic corticosteroids.

In recent years, however, this recommendation has been reconsidered, based on mounting evidence for increased airway inflammation during exacerbations^{18,19} that makes intervention with bronchodilators alone seem inappropriate, and evidence that short-term treatment with either higher doses (e.g., quadrupled) of ICS²⁰ or budesonide/formoterol,²¹ or a smaller but very early increase in ICS/formoterol as part of the maintenance and reliever regimen,^{22–24} significantly reduces the risk of severe exacerbations. There is now also objective evidence of the extent of patient reliance on short-acting beta₂-agonists during worsening asthma,²³ and increasing awareness that adherence to ICS-containing medications by community patients is as low as 20–25%;²⁵ non-adherence is

estimated to contribute to 25% of severe exacerbations.^{25,26} Among community-based patients (as distinct from typically more adherent clinical trial patients), an action plan recommendation to increase the ICS dose may therefore prompt many non-adherent patients to re-start the medication. A further large study is underway to examine the impact of quadrupling the ICS dose, but there is also a clear need for studies to investigate patient attitudes and behaviours that influence use or avoidance of maintenance and action plan medications.²⁷ In the meantime, the recently published Global Initiative for Asthma (GINA) 2014 strategy report has recommended that clinicians should consider advising an early increase in ICS dose in action plans, either through the ICS/formoterol maintenance and reliever regimen or by a short-term increase in the maintenance dose of ICS or ICS/long-acting beta agonist, or by adding an extra ICS inhaler.⁴

What of the other components identified by Gibson et al. as essential for effective self management?¹¹ Asthma education alone, i.e., providing information without an action plan or regular review, improves patient knowledge, but on its own does not improve asthma outcomes such as hospitalisation or lung function,²⁸ with the exception of reduced symptoms in two studies (in one of which the inhaler technique was also corrected).²⁹ Action plans on their own do not appear to improve asthma outcomes.³⁰ Few studies have examined the effectiveness of regular medical review on its own, but in one study it was not as effective as a written asthma action plan and self monitoring,³¹ and in another, in which spirometry was also provided, regular physician review did not change outcomes.³²

Evidence about the design of asthma action plans

The design of health-related materials can significantly impact on their utility for clinical practice. In Gibson et al.'s 2004 evaluation of action plans,¹¹ the only design feature examined was 'traffic light' colouring, a novel concept at the time that is now almost universal.³³ Greater attention is now being paid to the specific design of action plans. Substantial problems with readability, suitability and design were identified in a recent review of 30 paediatric action plans.³³ Of these, 90% were intended to be hand-completed, increasing the burden on the clinician and reducing the chance of retaining a copy in the medical file. Variation in terminology (even for medication classes) was noticeable, and 70% of the plans were assessed as being above sixth-grade reading level, making them inaccessible to a high proportion of community patients.

In recognition of the importance of both general and health-related literacy, Roberts et al. rigorously developed a pictorial action plan, optimising the design not only to minimise literacy and language

problems, but also to enhance communication of self-management concepts; customised software has been developed to minimise time-related barriers.³⁴ The comprehensibility and utility of this plan has been evaluated in three populations in the United Kingdom and Malaysia.³⁵ The importance of visual design was also emphasised by Gupta et al. in a review of 69 written asthma action plans, with only 22/46 plans meeting more than half of pre-specified features for visual appeal and utility.¹² With greater consumer feedback, there is substantial potential for visual design to improve the utility of action plans.³⁶

Visual design has also been shown to be important for PEF monitoring. Graphic displays greatly facilitate the interpretation of time trends; however, many currently available PEF charts have a high aspect ratio (ratio of width to height), and this limits their utility by reducing the visual distinction between normal variation and exacerbations.¹³ A recent study demonstrated that displaying data on a low aspect ratio chart (corresponding to 2 months' data in a landscape-format A4-size page) dramatically reduced the chance of missing a moderate exacerbation (adjusted RR 0.19, 95%CI 0.12–0.30) compared with display on other widely used charts. Standardisation of aspect ratio appears to have been overlooked in the majority of electronic applications that encourage patients to graph their own PEF data.

SELF MANAGEMENT IN COPD

Evidence for the effectiveness of self-management programmes for COPD has accumulated more slowly than for asthma.³⁷ Their efficacy has been debated, in part because some programmes have shown marked effectiveness, while others have shown little. Although it was initially considered that the essential components of COPD self management would be similar to asthma, i.e., self monitoring, a written action plan and regular medical review, COPD is far less responsive to both short- and long-term interventions. Systematic reviews of self management in COPD were initially unable to draw firm conclusions and identified multiple problems—small studies, poorly described interventions, and choice of outcomes relating to knowledge or process measures rather than skills acquisition, self efficacy or improved disease outcomes.^{38,39} A similar conclusion was recently drawn by an expert panel convened to address some of these issues, and recommendations were made to improve study designs with clearly described interventions and clinically important outcomes.⁴⁰ As research has addressed these disease-specific issues with more comprehensive self-management programmes, the essential components of self management in COPD have become clearer.^{41,42}

Effectiveness of self-management programmes in COPD

A recently updated Cochrane review examined the evidence up to 2011 for the effect of self-management education on improved health outcomes and health care utilisation.⁴³ In this review, self management was defined as 'structured interventions for individuals with COPD, aimed at improvement of self-health behaviours and self-management skills'. Furthermore, the intervention had to be iterative, requiring more than one interaction between the participant and health care provider, and ideally also the formulation of goals and provision of feedback. At least two of the following components had to be included: smoking cessation, self recognition and self treatment of exacerbations, an exercise or physical activity component, advice about diet, advice about medication or advice about coping with breathlessness. The inclusion criteria thus resulted in pooling of heterogeneous interventions.

In this Cochrane review, 23/29 studies (3189 participants) compared self management and usual care, with a follow-up of 2–24 months; six studies (499 participants) compared different components of self management on a head-to-head basis. In the studies with usual care as the comparator, there was a statistically significant effect of self management on quality of life, as measured by the St George's Respiratory Questionnaire (SGRQ), with a mean difference in total score of –3.51 (95%CI –5.37 to –1.65); only the change in the 'impact' domain reached the minimum important difference of four points. Importantly, there was a significant reduction in respiratory-related hospitalisations (odds ratio [OR] 0.57, 95%CI 0.43–0.75), but no significant effect on all-cause hospitalisation or mortality. The number needed to treat for 1 year to prevent at least one hospitalisation in one participant was 8 (range 5–14) for participants with a high and 20 (range 15–35) for participants with a low baseline risk of hospitalisation. However, the authors noted that heterogeneity in populations, interventions, follow-up times and outcomes made it difficult to draw clear conclusions or to make recommendations about which were the most effective components of self-management programmes.

Despite this sobering conclusion after so many years of studying COPD self management, it is worth examining in more detail some recent studies that particularly highlight the patients for whom self-management interventions may be most helpful, as well as some uncertain results that necessitate caution regarding self management for COPD.

Bischoff et al. studied the effects of adherence to written action plan instructions on COPD exacerbation recovery and unscheduled health care utilisation in a 1-year prospective cohort study of 252 patients

with COPD.⁴⁴ The action plan included instructions to initiate standing prescriptions for antibiotics and prednisone within 3 days of exacerbation onset. The study found 40% of patients were adherent to the action plan; adherence was associated with reduced recovery time (−5.1 days, $P < 0.0001$) but not unscheduled health care utilisation (OR 0.94, 95%CI 0.49–1.83), with only 10% of all study patients requiring hospitalisation. Influenza vaccination, cardiac comorbidity, younger age and lower forced expiratory volume in 1 s (FEV₁) % predicted were associated with better action plan adherence.

In the Glasgow supported self-management randomised trial, Bucknall et al. assessed a community-based intervention in high-risk patients ($n = 464$); all had recently been hospitalised for a COPD exacerbation, and two thirds were from socio-economically disadvantaged areas.⁴⁵ All patients received optimised COPD management before randomisation, with smoking cessation advice, inhaler technique instruction and the opportunity to attend pulmonary rehabilitation. Participants in the intervention group were trained by nurses in four 2-weekly home visits to detect and treat exacerbations promptly, with further home visits every 6 weeks. There was no difference in the combined primary outcome measure of COPD readmission or death over 12 months (48% vs. 47%, hazard ratio [HR] 1.05, 95%CI 0.80–1.38). In a post hoc assessment based on diary card records of symptoms, antibiotic and prednisolone use, intervention participants were classified at study exit as ‘successful’ or ‘unsuccessful’ self-managers: 42% of patients were classified as successful self-managers; among these, COPD readmissions were reduced compared with unsuccessful self-managers (27% vs. 49%, HR 0.44, 95%CI 0.25–0.76). Younger age ($P = 0.012$) and living with others ($P = 0.010$) were predictors of successful self management.

In summary, these recent trials suggest that self-management strategies do help COPD patients avoid hospital admissions if they are adherent to the self-monitoring and self-initiated treatment decisions required.

Effectiveness of integrated disease management in COPD

Some studies that have demonstrated a major impact on COPD outcomes, such as hospital admissions, have involved more substantial interventions than self management alone,⁴⁶ with ongoing monitoring, contact with a case manager, visits from a responsive outreach team as well as education, an exercise intervention and an action plan; some also included telephone or web-based support, thereby maintaining long-term contact with health care professionals and rapid access during any period of disease aggravation.^{47–52} Many of these are more aptly described as

disease management or integrated disease management programmes.

In a systematic review published in 2008,⁵¹ ‘disease management for COPD’ was defined as including patient education, two or more different intervention components, two or more health care professionals actively involved in patient care and an intervention lasting ≥ 12 months. COPD disease-management programmes fulfilling this definition (which overlap with studies included in the 2014 Cochrane review⁴³) modestly improved exercise capacity, health-related quality of life and hospital admissions, although not all-cause mortality. The authors reported that essential components characterising the successful programmes were:

- a self-management intervention
- individualised action plans
- ongoing contact with skilled health care providers, and
- the incorporation of evidence-based treatments.

These are the essential components for beneficial outcomes for COPD management in general, and are clearly stated and advocated in guidelines. In a disease characterised by slow decline in lung function, quality of life and functional capacity, even small benefits are important for patients, health care providers and the health care system.

In a Dutch integrated disease management programme based largely on recommendations from the American Thoracic Society/European Respiratory Society COPD guidelines, optimal medication prescribing, adherence monitoring, rapid action plans for exacerbations, personalised physical activity training programmes (at least three sessions of at least 40 min of physical activity per week over 3 months) improved quality of life in primary care COPD patients compared to usual care. The difference was clinically relevant and statistically significant, and was greatest in those with higher Medical Research Council dyspnoea scores.⁵³

There is evidence to suggest that integrated disease management programmes are cost-effective, reduce hospital admissions and improve quality of life in COPD, but more research is needed to determine whether they add value to self-management education programmes which include a written action plan, symptom management and regular exercise.

Heterogeneity in outcomes of COPD self-management programmes

While the recent Cochrane systematic review indicates the benefits of COPD self management in improving impact on quality of life and reducing hospital admissions, results for other outcomes (severity, recovery time, need for oral steroids) have been highly variable.⁴³ Some studies point to clear predictors of benefit, suggesting that studies that

showed no improvement may have recruited highly heterogeneous populations, particularly in relation to adherence to either medications⁵⁴ or action plans.^{39,55} Several studies show that adherence to self management is associated with better outcomes, particularly reduced recovery times and admissions.^{44,56} The majority of effective self-management programmes for COPD include three major components: use of an emergency plan, including recognition of symptom change and advice for self administration of corticosteroids, antibiotics and increased inhaled medications; symptom management, especially to reduce dyspnoea; and physical activity or a regular exercise component.^{43,57} The acquisition of 'self efficacy' has been shown to be a vital part of a successful self-management intervention.^{40,58,59}

Some studies have suggested a need to carefully select and review patients. A US study on self-management education which included personal goal-setting by motivational interviewing techniques during four individual sessions and one group session, provision of an action plan for identification and treatment of exacerbations, and scheduled proactive telephone calls for case management,⁶⁰ was terminated early (with 44% of planned enrolment completed and a mean follow-up of 250 days), when there were 28 deaths from all causes in the intervention group vs. 10 in the usual care group (HR 3.00, 95%CI 1.46–6.17, $P < 0.003$); most of the difference was in deaths due to COPD: 10 in the intervention group vs. 3 in the usual care group (HR 3.60, 95%CI 0.99–13.08, $P < 0.053$). Although the data safety monitoring committee had serious concerns about this difference in mortality, the overall rate was low for patients with this disease severity (mean FEV₁ 38% predicted). With lower enrolment numbers and follow-up time shorter than planned, it is difficult to interpret these adverse outcomes; there was no difference in 1-year cumulative incidence of COPD-related hospitalisation, 27% in the intervention and 24% in the usual care group (HR 1.13, 95%CI 0.70–1.80, $P = 0.62$), and no difference in delay in starting antibiotics (2.2 vs. 2.5 days) or prednisone (7 vs. 9 days), although in both cases an earlier commencement may have been more effective.

Clearly, from this and other studies, some patients do very well with self management and integrated disease management programmes, while others respond poorly. It is essential that studies continue to elucidate the features that favour a good response, and help clinicians to identify those who can participate safely and to maximum advantage in self management.

The role of adherence

Adherence has been identified as a predictor of benefit from self-management programmes,^{44,45,56,61}

and adherence to maintenance inhaled therapy also improves COPD outcomes. In a post hoc analysis of the TOWARDS a Revolution in COPD Health (TORCH) study, 79.8% patients had good adherence (>80% use of study medication from dose counters). Of these, 11.3% died compared with 26.4% of the 1232 patients (20.2%) with poor adherence.⁶² Annual rates of hospitalisation for exacerbations were respectively 0.15 and 0.27. There was a significant association between adherence and mortality after adjusting for other factors related to prognosis (HR 0.40, 95%CI 0.35–0.46, $P < 0.001$). These are very substantial reductions, and it has yet to be shown whether non-pharmacological interventions can add to these benefits in treatment-adherent patients. Adherence to inhaled treatments and self-management interventions may be a general marker of patients' understanding, commitment to treatment and avoidance of risk, as well having specific benefit with particular interventions.

COST-EFFECTIVENESS OF SELF MANAGEMENT IN ASTHMA AND COPD

Cost-effectiveness has been assessed in a number of studies.^{63,64} Differences in health care systems, health-related costs, sophistication of non-hospital services and local variability in access, as well as clinical factors such as comorbidities and disease severity, make it exceptionally difficult to generalise across countries and models of health care delivery.^{65,66} Generally, however, exacerbations of COPD and asthma carry high direct costs, such as for admission and intensive care, as well as substantial indirect costs due to work time lost, carer costs and loss of productivity.^{67,68} Overall, self-management programmes in asthma and COPD are modestly cost-effective.^{69–71} It is disappointing that greater cost savings have not been achieved; although hospital admission may be avoided, outreach programmes are not cheap to implement.^{47,72}

IMPLEMENTATION OF SELF-MANAGEMENT SUPPORT

Despite decades of good evidence of improved health outcomes from self-management interventions, especially in asthma, and positive recommendations in guidelines, such as GINA and Global Initiative for Chronic Obstructive Lung Disease, implementation is poor. The majority of studies of action plans in adults and adolescents have shown ownership rates of around 25%,^{73,74} except for after intense media campaigns.⁷⁵ In a study of Scottish practices, only 23% of asthma patients reported having been given an action plan, although two thirds were being treated appropriately with medications.⁷⁴

Barriers to implementation

Persistently poor uptake of an intervention suggests that there are substantial clinician, patient and/or health system barriers to implementation. While some patients may not perceive the need for an action plan,⁷⁶ studies in both asthma and COPD have shown that patients rate 'being offered support to help them manage their condition' highly among attributes that comprise a good consultation.¹ Health professional barriers to the provision of self-management support may be greater than patients' reluctance to receive such support. Barriers include:^{74,76}

- Doubt about the evidence base and relevance to primary care
- Lack of knowledge, skills and misconceptions
- Practical issues, such as perceived lack of time and resources such as paper templates
- Poor teamwork (doctor thinks nurse is doing it and nurse thinks that the doctor will).

Communication barriers

Even if advice is offered and action plans given, they will have limited value if they are not comprehensible. The word 'exacerbation', although frequently used by health professionals, may not be understood by patients with COPD³ or asthma,^{77,78} and there is a similar disconnect with the word 'attack' in asthma.^{77,78} Impaired literacy (and numeracy) affects around 15% of diverse hospital populations in the United Kingdom,⁷⁹ and is even more common in some other countries.⁸⁰ In both COPD⁸¹ and asthma,⁸² impaired health literacy is associated with worse outcomes. Such barriers are frequently not appreciated by physicians.⁸³

Facilitators for self-management support

In a review of qualitative studies,⁷⁶ facilitators for the provision of asthma action plans included simple prompts (e.g., practice mail-out of partly completed action plans, requesting attendance to have it completed,⁸⁴ or a letter from the pharmacist to the general practitioner [GP] requesting an action plan for the patient⁸⁵); encouraging GP-practice nurse teamwork to explain the action plan to the patient;⁷⁴ and building the action plan into routine processes. In a paediatric emergency department, a highly efficient multi-purpose template was developed that integrated information about asthma self management, an asthma control assessment tool, the medical chart, prescriptions, and the patient's take-home action plan.⁸⁶

Problems with impaired health literacy can be mitigated by appropriate approaches,⁸⁷ including simple spoken language, teach-back methods and reinforcement of spoken/written advice with culturally appropriate pictures that enhance recall, even

among the literate. Electronic action plans have been developed for both asthma³⁴ and COPD.⁸⁸ Computerised interventions involving video clips have also been shown to improve assessment of disease control in those with impaired literacy.⁸⁹

OTHER ALTERNATIVES TO TRADITIONAL CARE IN ASTHMA AND COPD*Alternatives to hospital admission for COPD exacerbations*

Programmes for admission avoidance, hospital-at-home and assisted discharge schemes are well-established in COPD, with guidelines for service design and safe selection of patients.⁹⁰ Potential savings are significant if hospitalisation can be safely avoided or duration of admission shortened. These schemes involve patients being supported at home by a nurse/physiotherapist team, with 24/7 access by self-contact or referral by a primary care practitioner or emergency department. Alternatively, the patient is admitted to hospital for 12–24 h before returning home, with visits every 1–2 days by a nursing/physiotherapy team for up to 10 days. With appropriate selection of patients (e.g., those without confusion or acidosis), such approaches have been shown to be both safe⁹¹ and cost-effective.⁹²

Follow-up by non-medical personnel

In Northern Europe, Australia and New Zealand, review visits by nurses with a special respiratory interest have become a common alternative to conventional medical review. Furthermore, in asthma, well-trained lay educators can achieve health-related outcomes indistinguishable from those obtained by nurses, and are more cost-effective.^{93,94} A recent pilot study has shown similarly exciting results for those with COPD.⁹⁵ Such approaches merit further evaluation in both high- and low-resource countries.

Improving access to health care

Review in a hospital clinic is usually associated with long waits, which have an adverse effect upon future attendance.⁹⁶ Patients with long-term conditions such as asthma and COPD prefer seeing the same doctor each time for non-emergency review.⁹⁷ Clinics are not always held at convenient times,⁹⁸ and with worsening disease, patients find attendance increasingly difficult. For such patients, telephone follow-up is effective,⁹⁹ and permits more patients to be reviewed in primary care.¹⁰⁰

Telehealth care

Phone messaging interventions have been used in asthma and other chronic diseases to promote adherence to prescribed medication and medical appointments, with variable results.^{101,102} Definitive

studies with well-described interventions and outcomes are needed; it is important to evaluate safety in such studies, as use of these tools may ultimately be driven more by the overwhelming shift towards electronic communications in society in general than by specific evidence of efficacy or cost-effectiveness compared with traditional modes of health care communication.

More complex telemonitoring has been extensively reviewed for asthma and COPD.^{100,103,104} Study designs and intervention type have varied considerably, but all involve recording of patient data (e.g., oxygen saturation, peak flow or FEV₁) and central monitoring of the results. While some individual outcomes have improved, studies are often of short duration and lack cost-effectiveness evaluations. In some studies, potential savings in health care were negated by equipment costs,¹⁰⁵ although over time these are likely to decrease. A further, potentially underused use of technology is in supporting smoking cessation attempts; positive results have been reported for internet interventions.¹⁰⁶ Overall, telemonitoring is viewed positively by patients, and this alone would seem to justify further, more robust studies.

CONCLUSIONS

There is substantial evidence from well-conducted studies that self management should be included as an essential component of asthma and COPD care. However, which particular components of self management contribute to better outcomes remains to be more clearly defined, although key features of most effective approaches likely include self-management education, a written action plan and support to make decisions about stepping up treatment for exacerbations. New models of care and clinical support are evolving, and it is essential that these interventions be tested in randomised controlled trials to maximise our capacity to determine the essential features of these multifaceted interventions for asthma and COPD.

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R E S U M E

Même si le traitement médicamenteux est important dans la prise en charge de l'asthme et des broncho-pneumopathies chroniques obstructives, il faut également envisager des interventions complémentaires susceptibles de réduire davantage le poids de la maladie pour le patient, sa famille et le système de santé. Cette revue examine les arguments en faveur du soutien à l'autogestion, qui aboutit à une auto-prise en charge

réussie du patient, et présente les éléments essentiels des meilleures stratégies ; elle identifie également les domaines requérant davantage de recherche. En plus du soutien à l'autogestion, sont revues d'autres méthodes de prestations de soins comme la télé surveillance, la lutte contre les hospitalisations inutiles et un système d'assistance à la sortie ainsi que le recours à des éducateurs profanes.

R E S U M E N

Si bien el tratamiento medicamentoso es primordial en el manejo del asma y la enfermedad pulmonar obstructiva crónica, es importante considerar además otras intervenciones que puedan disminuir aun más la carga que impone la enfermedad a los pacientes, a sus familias y al sistema de atención sanitaria. En el presente análisis se consideran los datos que respaldan el apoyo al autocuidado, con el cual se logra un autocontrol

satisfactorio de la enfermedad por parte del paciente y se resumen los principales componentes de las estrategias eficaces; se definen también las esferas que precisan mayor investigación. Además del apoyo al autocuidado, se analizan otros métodos de prestación de atención sanitaria como la televigilancia, la evitación de la hospitalización y los esquemas de alta asistida y también la participación de educadores legos.
