The most important component of the conference was the inclusion of sessions on the quality of life. It is clear that the previously vague benefits of rehabilitation can now be quantified with a number of general utility and disease specific instruments. Internationally eminent speakers, including Gordon Guyatt and Paul Jones, emphasised that we now have the ability to assess the clinical and economic consequences of treatment. Historically pulmonary rehabilitation has fallen from grace because of an inability to measure its effects, but now its benefits can be subjected to trial and sensitive scrutiny.[2] It may require very little physiological improvement to produce an appreciable increase in the quality of life. This conference and hopefully its successors will give confidence to clinicians who believe that they have more to offer than just the prescription of drugs.

1 Donner CF, Howard P, eds. Pulmonary rehabilitation in chronic obstructive pulmonary disease (COPD) with recommendations for its use. *Eur Respir J* 1991;1: review No 6.
2 Neiderman MS, Clemente PH, Fein AM, Feinsilver SH, Robinson DA, Ilowite JS, *et al.* Benefits of a multidisciplinary pulmonary rehabilitation program. *Chest* 1991;**99**:798–804.

Adventitia

"Doping" with β_2 agonists in the 1960s?

Olympic skiers were reported in 1992 to inhale β_2 agonists to help them win medals in the Olympic winter games in Albertville. Exercise and cold air induced airways constriction have been well known phenomena for many years. In the early 1960s I worked for a couple of years at the Laboratory for Respiratory Physiology at the University Lung Clinic, Renström's Hospital in Gothenburg, Sweden. After contact with Professor Tiffeneau around 1960 I started to test bronchial reactivity by acetylcholine inhalation provocation tests. Gunnar Grimby, well known for his work on rehabilitation of respiratory patients, at that time also treated some top athletes for various ailments, among them some skiers with apparent exercise induced bronchoconstriction. Some of these athletes were referred to me for testing and possible treatment. One of them held a number of Swedish championships in skiing and had won the original long distance ski race (Vasaloppet, over 90 km) several times. He had obvious breathing difficulties, however, in cold weather, especially at short distances (10–15 km) which needed fast immediate speed and large minute ventilation. At that time we only had non-selective β agonists, isoproterenol, and the slightly more selective orciprenaline for treatment of acute bronchoconstriction. Preventive inhalation of these dose aerosols before skiing had obvious benefits. Several top skiers have since used inhaled β_2 agonists to improve or keep up their performance. Exercise induced bronchoconstriction is thought to be one expression for bronchial hyperresponsiveness leading to bronchoconstriction. Recent studies suggest that bronchial hyperresponsiveness is very common among top athletes, especially skiers.

Recently a peroral β_2 agonist, clenbuterol, has been used as a protein anabolic and thermogenic agent in athletes. It seems unlikely that inhalation of β_2 agonists in the doses used for prevention of exercise induced bronchoconstriction have a similar effect. The benefit is more likely to result from inhibition of exercise and cold air induced bronchoconstriction preventing an increase in the work of breathing. Another type of prevention against cold and exercise induced bronchoconstriction appeared on the Swedish market in the 1980s, namely air conditioning devices which warm and moisturise the inhaled air. They were extensions of the heat and moisture exchanger reported by Toremalm in 1960 for use after tracheotomy. Swedish pharmacies now offer such a device which is much used by athletes who need hard outdoor training all the year round despite cold weather. One such device is called "LungPlus" and represents an excellent non-pharmacological method of preventing exercise and cold induced airways constriction in our asthmatic patients who also benefit from the larger series manufactured for the larger number of training athletes.

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