

## Chapter 6. Future Research

Our analysis of the evidence reveals numerous gaps in the literature regarding the efficacy and safety of ephedrine and ephedra-containing dietary supplements. The most important of these gaps are the following:

- Long-term assessments of the effectiveness of ephedra or ephedrine at promoting weight loss. We identified no study having a treatment duration of more than six months. In order to improve health outcomes and reduce the risk of morbidities associated with being overweight, sufficient weight loss (5 to 10 percent of body weight) and long-term weight maintenance are necessary.
- A study of the effect of repeated use of ephedra or ephedrine on athletic performance in a variety of people including women and adolescents who are known users of these products. If use of ephedra-containing dietary supplements is going to continue to be promoted for improving athletic performance, then evidence is needed regarding their efficacy in individuals who represent the general population.
- A proper study to assess the possible association of ephedra or ephedrine consumption and the occurrence of serious adverse events. Continued analysis of case reports cannot substitute for a properly designed study to assess causality. A case-control study would probably be the study design of choice.

A partial list of other possible future research activities includes the following:

- Consider a dose-response study that would determine the minimum effective dose of ephedra and caffeine-containing herbs, or ephedra combined with other botanicals such as citrus aurantium, garcinia cambogia, and other herbal diuretics and cathartics, for weight loss.
- Assess whether ephedra/ephedrine and exercise training interact in their effects on weight loss and adverse events.
- Assess adverse events for ephedrine and other prescription obesity drugs in Denmark, where doctors began prescribing an ephedrine-containing diet drug more than 20 years ago.
- Conduct studies to determine if the use of ephedrine or ephedrine-containing alkaloids increases the risk of development of heat-related conditions such as heat exhaustion, heat stroke, and rhabdomyolysis.
- Investigate further the interactions between ephedra/ephedrine and other products commonly used in the United States for weight loss and/or athletic performance.