## Appendix

### Health management content

**Health education:** We taught the patients about the characteristics of COPD, COPD development, and the relationship between psychology, diet, emotional life, mental and functional exercise.

**Breathing exercises training**: We taught the patients the following: Before performing breathing exercises, be sure to clean the nose. Reduce mouth breathing. We guided patients' breathing slowly at first, instructing them to inhaling using their noses, turning their mouths into fish shapes as they exhaled through the mouth. We instructed patients to gently press on their abdomens with both hands to expel as much gas as possible. The inspiratory to expiratory ratio was 2:1. In these exercises, patients took 8–10 breaths per minute. The duration of the exercise period was 10–15 minutes. There were two periods per day.

**Abdominal respiration:** Patients were instructed to sit or stand with one hand on their chests and the other on their abdomens, inhale through the nose, and attempt to elongate their abdomens. When the patients exhaled with their mouths held in a whistle-blowing shape, they adducted their abdomens. This exercise was performed 10 times per minute. The duration of the exercise period was 20–30 minutes. There were two periods per day.

**Breathing exercises**: Patients were instructed to breathe calmly, performing orthostatic inhalation, and exhale while leaning forward. Patients were to inhale with one arm elevated and then exhale with their hands gently pressing on their abdomens. They were instructed to inhale with one hand raised and exhale as they brought their arms down. Patients were instructed to inhale while holding their heads and exhale as they turned their bodies at the waist. Patients were instructed to stand and inhale while lifting their upper limbs and exhale from a squatting position. Patients with acute respiratory infections, acute exacerbation of COPD, and other complications that

precluded rehabilitation were permitted to pause training until their conditions resolved. After being assessed, they were permitted to resume rehabilitation training. The abovementioned three breathing exercises were performed no less than 5 days per week.

**Limb training**: Patients were instructed to inhale with the upper limbs lifted and exhale while bringing them down. Patients were asked to jog or walk on a smooth road to meet the sub-maximal requirements (21). They did so once or twice every day. Each walk or job lasted either 15 or 30 minutes. The limit of exercise intensity was not affect normal conversation with people in the patients training. Training frequency, intensity, and duration were increase or decrease as needed according to the lung function. Patients were instructed to exercise in fresh air whenever possible.

**Psychological counseling**: Patients were provided with verbal interaction,, panel discussion, and relaxation therapy to relieve the mental depression, anxiety, irritability, and other symptoms that can accompany COPD. The patients were trained to analyze these issues and encouraged to look at them from multiple perspectives. Patients' ability to regulate psychological balance showed improvement. Patients were taught to self-comfort. For example, patients were instructed to hunt for objective causes for any unpleasant events that they might suffer, such as the environment and chance, rather than blaming themselves unduly. Good family relationships were encouraged and established. In order to promote the understanding and support of their family members, the patients were encouraged to initiate communication with them when they experienced problems stemming from their condition.

**Smoking cessation**: Patients were required to try to avoid contact with main irritants, such as tobacco smoke. Smokers were instructed to postpone smoking and gradually reduce their smoke intake with the ultimate goal of smoking cessation.

For smoking cessation, we made smokers aware of the adverse effects of smoking on health and the benefits of not smoking. We then assessed each smoker's willingness to stop smoking and persuaded many of them to quit. Finally, we made

personalized plans for each smoker who was willing to quit smoking. Regular telephone and home visits were performed every three months during the first year and annually thereafter to check smoking status and exposure to other risk factors and to encourage compliance. To prevent relapse, we held advisory and recreational activities and lectures and provided psychosocial support to help and teach smokers how to cope with withdrawal symptoms such as stress and increases in body weight during smoking cessation. Nicotine replacement therapy (such as smoking cessation teas and patches) was recommended to relieve cravings and withdrawal symptoms.

**Nutrition guidance:** In order to prevent constipation and the abdominal distension that can lead to dyspnea, the patients were encouraged to eat more vegetable oil, seafood, fish, and easily digestible high-fiber foods. The patients limited their intake of sodium in order to prevent water and sodium retention. To prevent sticky sputum, the patients were instructed not eat large quantities of sugar. The patients were told to eat more, lighter meals to reduce fatigue. Patients were told to wash their mouths, keep their mouth clean, and to promote appetite before and after eating.

**Prevention of infection and enhancement of resistance:** Patients were instructed to take pneumococcal vaccines, influenza vaccinations, and immunomodulatory agents

**Medication and guidance:** Patients were taught to apply bronchodilators during their remissions. This education covered $\beta_2$-receptor agonists, anticholinergics, theophylline, the other drugs, how to combine them, and side effects. The patients were mobilized to use the influenza vaccine before the onset of winter. All patients were assisted with respect to making plans in terms of training methods, duration of exercise, and intensity.