Effects of water-based exercise training for people with COPD

Review question
What are the effects of water-based exercise training in people with chronic obstructive pulmonary disease?

Study characteristics
This Cochrane systematic review is based on three randomised controlled trials, one semi-randomised controlled trial and one randomised cross-over trial. The participants were adults with stable clinically diagnosed COPD classified using the Global Initiative for Chronic Obstructive Lung Disease at stages II and III.

The five studies involved a total of 176 participants aged between 57 and 73 years. All of the studies compared water-based exercise training with land-based exercise training and/or no exercise training. The interventions were supervised or unsupervised and were conducted two to three times per week, over periods from four to 12 weeks and lasted between 35 and 90 minutes. In most cases, the water-based training involved similar exercises to those conducted on land and included walking and cycling type movements, strength training and the use of flotation devices to increase intensity.

The primary outcomes were exercise capacity and quality of life. Secondary outcomes included pulmonary function, upper and lower limb strength, oxygen saturation, symptoms, level of activity, psychological status, self-management/self-efficacy, healthcare use, cost effectiveness, adverse events and withdrawal.

Summary of key evidence
Seventy-one participants took part in water-based exercise training; 54 in land-based exercise training; and 51 completed no exercise training. Sample sizes ranged from 11 to 53 participants.

Exercise capacity
In three studies that looked at functional exercise capacity, water-based exercise training improved the six-minute walk distance over no exercise. There was no significant difference between land-based exercise training and water-based exercise training in three studies.

In one study, water-based exercise training was favoured over no exercise when peak exercise capacity was studied. There were no major differences between land-based and water-based exercise training regarding the incremental shuttle walk distance in two studies.

The endurance shuttle walk distance was used in one study to compare water-based exercise training with no exercise; this found the water-based exercise training improved endurance. Endurance improved more following water-based exercise training than following land-based exercise training in two studies.

Quality of life
Two studies found QoL improved with water-based training compared with no exercise. There were no significant differences between land-based and water-based exercise training in four studies. Only one study reported long-term outcomes for QoL after water-based exercise training compared to land-based exercise training and no exercise training; no significant change was observed between baseline results and six-month follow-up.

Summary of secondary outcomes
Pulmonary function improved with water-based exercise training compared with no exercise in two studies. When water-based exercise training was compared with land-based exercise training, there were no statistically significant effects.

Compared with no exercise, water-based exercise training significantly improved respiratory muscle strength. When water-based exercise training was compared with land-based exercise training, there were no statistically significant effects.

In two studies, 49% of participants preferred water-based exercise training, 37% preferred land-based exercise training and 15% had no preference for either.

Best practice recommendations
Although there is an obvious need for further research in this area, when compared with no training, water-based exercise training is safe for people with COPD (GOLD stage II) and improves exercise capacity and health-related QoL immediately following training for people with COPD (GOLD stage II and III). Additionally, there is some evidence that water-based exercise training is more advantageous than land-based exercise training, especially in improving endurance exercise capacity, but this claim cannot be made for QoL. The authors suggest people with COPD (GOLD stage II and III) can participate in water-based exercise training and this could be particularly useful if they have concurrent physical comorbidities or no other alternatives are available.

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Reference

The full review report can be accessed at tinyurl.com/COPD-water

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