



Recovering from Valley Fever Using The EmBrace® Exercise Device To Address Fatigue And Deconditioning

By Dr. Darwyn Bartsch, PT, DPT, and
Gem Bartsch, FNP-BC

Valley Fever, caused by the inhaled fungal spores of *coccidioides*, affects more than 20,000 people each year, with flu-like symptoms lasting from weeks to months, along with a delayed recovery including low energy and poor endurance (cdc.gov).

Management of the initial fungal infection is addressed with medications, but ongoing symptoms have a significant impact on life. Symptoms of fatigue, inability to participate in former activities, and shortness of breath with very little physical activity are frequent complaints. Additional issues can include joint pains, chronic respiratory infections, being emotionally run down, and even depression, to name a few. Those who have been diagnosed with Valley Fever often feel that they are left without answers when it comes to the long-term effects of fatigue and shortness of breath. They report poor improvement and no options (<http://www.valleyfeversurvivor.com>).

This is to share the story of one person's struggle to recover from the long-term symptoms of fatigue, low activity tolerance, and ongoing exhaustion she was dealing with during and following her acute infection with Valley Fever. In June of 2013, Mary, a 52-year-old female, experienced many of the symptoms associated with coccidioidomycosis, and was diagnosed with Valley Fever. Following a hospital stay and a recovery period of several months to clear the masses in her lungs, she continued to require oxygen, and her energy level remained extremely low.

By December of 2013, she continued to require oxygen, could only stand at the kitchen counter for several minutes at a time, and required significant rest by frequently lying down for long periods most of the day. Her maximum tolerance to physical exertion was being able to walk less than 50 feet from the bedroom to the kitchen before needing to sit down and rest.

Although she was released medically to return to her job of deskwork in December, she found it very difficult to concentrate on her duties, had trouble speaking loud enough to be heard, and reported that it was all she could do to stay awake from 9:00 a.m. through the rest of the work day. Even the effort of getting ready for work each day was a challenge. She was unable to do her hair in the mornings, as she did not have the endurance to complete this activity. Most days she found it to be too much effort to put on her makeup.

Although her lung masses had cleared by the end of 2013, her medical appointments focused on the issues of low energy level and shortness of breath. She had repeated visits to the cardiologist and pulmonologists only to hear that her heart and lungs



were fine. Her doctors remained unsure of what would cause her ongoing complaint of severe shortness of breath with minimal exertion, her elevated heart rate and excessive fatigue.

She was a self-referral to Physical Therapy, and in review of her issues and concerns, all signs and symptoms indicated that she had weak breathing muscles and strengthening these muscles would be critical for her recovery. Using any form of flow restriction to strengthen the breathing muscles would not be possible because her elevated breathing rate was 22 breaths/min and her heart rate was >100 bpm at rest. The EmBrace[®] Exercise Device (patent pending) was selected for Mary for the following reasons: it targets the respiratory accessory muscles; it exercises these muscles at low force levels and is easy to use as a home exercise program.

Mary was fitted with The EmBrace[®] Exercise Device to strengthen the accessory breathing muscles and followed the protocol as instructed. Due to her poor endurance, no other therapeutic activity, exercise, or therapy interventions were introduced during the six months of using The EmBrace[®] Exercise Device. Follow-up therapy sessions occurred monthly for monitoring progress and making adjustments to The EmBrace[®] Exercise Device.

By the end of six months:

- All issues of fatigue and exhaustion during work were resolved
- No shortness of breath with climbing 2 flights of stairs
- Resting HR: 69 bpm
- SaO₂: 98%
- Respiration Rate: 13-15 breaths per minute
- Cough quality – Excellent, strong
- She had presented two 3-hour inservices on the same day, standing and walking, and speaking to a room full of 40 people the entire time without a microphone
- She had attended Universal Studios for a day and participated in all the activities with her family along with providing care for her grandchild while there

Deconditioning of the respiratory accessory muscles is not age specific or diagnosis specific. The significance of the strength, or weakness of the breathing muscles on many aspects of life cannot be stressed enough (He, Bottinelli, Pellegrino, et al., 2000). Strengthening of the respiratory accessory muscles generates greater movement of the ribcage (Park, Kang, Lee, Choi, Kim, 2010) and greater lung volume with inspiration (Enright, Unnithan, 2011), resulting in a lower respiration rate, a lower heart rate (Shahrizaila, Kinnear, Wills, 2006), a greater tidal volume, a greater cough capability (Polla, D'Antona, Bottinelli, Reggiani, 2004), a decrease in shortness of breath and fatigue (Shahrizaila, Kinnear, Wills, 2006; Syabbalo, 1998), increased energy for daily activities (Siafakas, Mitrouska, Bouros, Georgopoulos, 1999), and improved speaking volume (Huber, 2008).

Generally, Speech Therapy, Occupational Therapy, Physical Therapy and even Respiratory Therapy do not have tools to effectively address the weakness of the respiratory accessory muscles, and especially in cases like Valley Fever, where the client is very deconditioned. Likewise, medical providers lack the tools to address this



sequela of Valley Fever. In Mary's case, she had been treated with medication along with a referred to Speech Therapy, but Speech Therapy, Pulmonology, and Cardiology were all unable to offer valuable interventions for her ongoing fatigue, shortness of breath and difficulty speaking.

Symptoms of Valley Fever and recovery periods may vary. The EmBrace® Exercise Device allows exercise and strengthening of breathing muscles without overtaxing endurance or breathing. As breathing improves, general endurance and the ability to return to former activities of life become available. The EmBrace® Exercise Device, as a component of the recovery plan, is now an option to deal with the long-term effects of fatigue and low activity tolerance due to Valley Fever. Mary can testify to this.

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