# Flotation Therapy of Non-ambulatory Cows

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Recumbent cows that are unable or unwilling to stand for ≥ 12 h are defined as 'downers' or non-ambulatory cows. The livestock industry, particularly the dairy sector, consider care and management of non-ambulatory cows a major animal welfare concern. Flotation therapy, an alternative therapy for non-ambulatory cows utilizes the buoyancy of the water to evenly support the cows weight and to reduce the secondary pressure damage to the muscles and nerves. The objective of this study was to evaluate the effect of recumbency duration and nursing care provided to the non-ambulatory cows on the outcome of the flotation therapy and to assess the physiological responses to stress related to the floatation therapy. During the study 34 non-ambulatory Holstein dairy cows were subjected to flotation therapy. A veterinarian examined each cow before the floatation procedure was initiated. To assess the effects of the floatation treatment we separated the entire procedure into 5 phases: baseline (before treatment), manipulation (placing the cow into the tank), filling (the tank was filled with warm water), flotation (the cow is inside the filled tank) and draining (removal the water from the tank). Recumbency duration and nursing care provided to the cow before the flotation treatment were assessed based on producer responses to survey questions, and from on-site observations made by the researchers. Heart rate variability was used to assess the stress related to the flotation therapy. The stress related component, high frequency (HF) decreased significantly during the filling and draining phases (2.8 ± 0.3 and 2.8 ± 0.4, respectively) compared to the baseline and floating phase (4.7 ± 0.5 and 4.7 ± 0.3, respectively). The observed heart rate variability changes indicate that the stress related to flotation therapy is primarily associated with the filling and draining phases, when cows were most likely to increase their efforts to transition from recumbency to standing (and remain in the standing position). Cows that were recumbent for longer periods before the flotation therapy were less likely to recover (OR = 0.96; 95% CI = 0.93-0.99, for every 1 h increase in time recumbent before the therapy began). The chances for recovery increased when the non-ambulatory cows received good nursing care.

**Implications:** Non-ambulatory cows have higher chances for recovery if they have been recumbent for less than 24 h and if they were provided with good nursing care while recumbent.