# Can Vibrational Frequencies Assess Joint Health?

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The ambition for our research was to test out if the at home monitoring device is reliable as the market advertiser's it to be. Many people around the world suffer from chronic joint pain whether that's from old age or playing sports. (Being a noninvasive wearable brace) We did not invent/create the wearable brace, but we used multiple analytical models/formulas (hooks law, T-test, and a One Degree of Freedom) in order to find the end result (T/F). We believe that Natural frequencies will depend on the mass and stiffness properties each the analyzed system. First, we had to test all the springs and measure their spring constant by using hooks law and categorize them from stiffest to lose. Then we added masses varying from 1kg-5kg and observed what effect they had on each spring within 10 occultations and timed it. This was all calculated manually by hand, but because we are human, and we make mistakes we wanted pure data that wouldn't be inaccurate, so we added an accelerometer to measure the true vibrations and compare it to our math that we did. In order to see how far we were off from our measured and calculated results we made a T-Test. The T-Test did not show major polarity between them. $p>0.05$

**Awards Won:**