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P-T. TANG, Y-X. LIAO, M-F. ABBOD, J.S. SHIEH. ***Measuring and analysing vibration motors in insoles via accelerometers.*** *Gerontechnology 2014; 13(2):286;* doi:10.4017/gt.2014.13.02.294.00

Purpose Falling is a major public health concern among elderly people, and they often cause serious injuries[1,2]. They most frequently occur during walking and are associated with the chronic deterioration in the neuromuscular and sensory systems, as well as with ankle muscle weakness and lower endurance of these muscles to fatigue[1,3]. Vibrating insoles, providing a subsensory mechanical noise signal to the plantar side of the feet, may improve balance in healthy young and older people and in patients with stroke or diabetic neuropathy[4]. The object of this study is to find the most suitable vibrator to put into the insole which can effectively improve the balance control of the elderlies. **Method** We choose three different vibration actuators (micro vibration motor, brushless motor and eccentric motor) with two different weights on the insole. First, we put three same motors and two accelerometers on the insole, as shown in *Figure1*, then attach another layer on both side of the insole. Second, connect the motors to the power supply and the accelerometer to NI PXI-1033 spectrum analyzer which is used to collect the accelerometers' data. At last, using Fast Fourier Transform (FFT) to analyze and compare the results to see which motor is the most stable and suitable to put into the insole. **Results & Discussion** The results showed that the most stable one is the brushless motor. The reason why the frequency is stable is that the relationship between voltage and frequency is linear, and the error is small through continuous measurements. On the other hand, when a person weight 55 kg stands on the insole, the frequency isn't affected by the weight. These two results appear very similar to each other, as shown in *Figure 2*. According to the result, we use the brushless motor to be our vibrator in the insole, and hope this will help the elderlies improve their balance control ability more efficiency.

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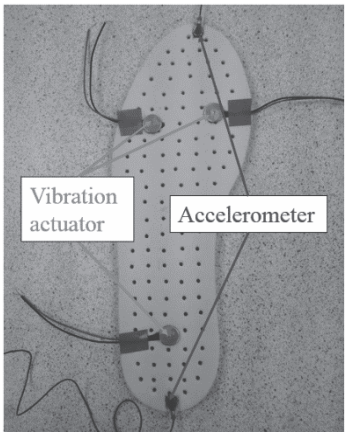

Figure 1. The vibrating insole

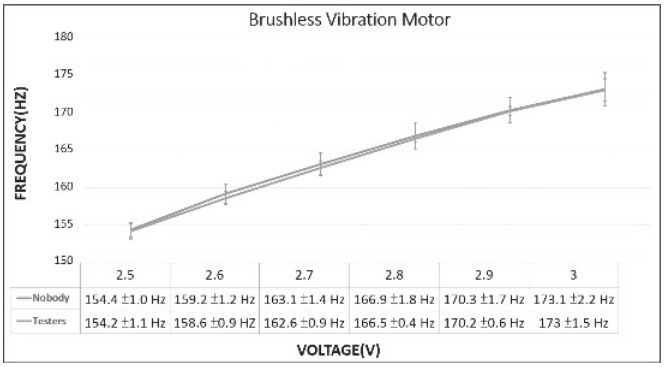

Figure 2. Brushless vibration motor chart