



Figure 1. The impact testing apparatus of hip protectors and the FEM simulate impact testing

## HIP PROTECTORS: COMPARATIVE STUDY OF FEM SIMULATION AND TESTING

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Falls and osteoporosis cause to hip fracture. The hip fracture is a serious problem especially for elderly. However, hip protector can protect hip fracture from falling. Finite element method (FEM) was used to predict engineering problem. In this study, the FEM was used to simulate the testing of hip protector and was compared with testing apparatus. The impact testing apparatus of hip protectors is shown in figure 1a. The impact test was performed by dropping the weight of 4.75 kilograms from the height of 52 cm on a pelvis. The impact force was measured and recorded directly from a load cell. The measured impact force from load cell was 7,570 N. The FEM simulate impact testing is shown in figure 1b. The simulation impact force was 7,720 N. Discrepancy of both testing and simulation results is 200 N. In addition, the simulation can be observed the concentration of load transmission on load cell.