Designing and Manufacture of Training Simulator for Injecting and Fluid Removing of Knee Joint

Sir,

Joint diseases are common causes of referral of patients to emergency and clinics. Trauma, mechanical pain, and inflammatory joint diseases are the main causes.[1] Joint fluid accumulation is one of the most common manifestations. In most cases, fluid aspiration should be considered to check the cause.[2] In both interventions (drug injection or joint aspiration), sufficient skill is needed to prevent injury to the periarticular tissues.[3] Today, this diagnostic and therapeutic intervention is done by traditional way and under the guidance of ultrasound. General practitioners and residents of internal disease and orthopedics and infectious diseases require appropriate training in this field. Training on medical simulators is known as one of the best educational methods. In many recent studies, the group that trained by the simulators had better results compared to the control group.[4-6] The knee joint is one of the most commonly involved joints in a variety of joint diseases. We designed and manufactured an Iranian knee tap simulator for medical students to practice joint aspiration or intra-articular injection [Figure 1]. This simulator is designed like a human's knee. Knee anatomy is considered in its design. The parts of this simulator include bones (femur, tibia, fibula, and patella), plastic bands that tie these bones together (as ligaments), and silicone bag located on the knee joint. The fluid is injected through a hose into the bag. A thin aluminum layer covers the joint surface. This layer is connected to an electronic circuit. During the procedure, if the needle hits this layer, the beep sound will generate by the electronic circuit. There is a plenty of soft foam around these complexes instead of the muscles. There is a skin-like silicone layer also covers all of these sim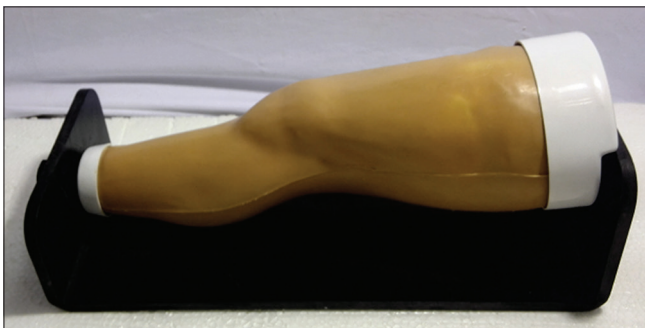ulators. All the simulator parts are produced in Iran. The lower price and the existence of an electronic circuit are the main differences between this simulator and the foreign simulators. We thank all the people who helped us in this research, especially the Clinical Training Center of Isfahan University of Medical Sciences.

Conflicts of interest

There are no conflicts of interest.

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Figure 1: Knee tap simulator

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