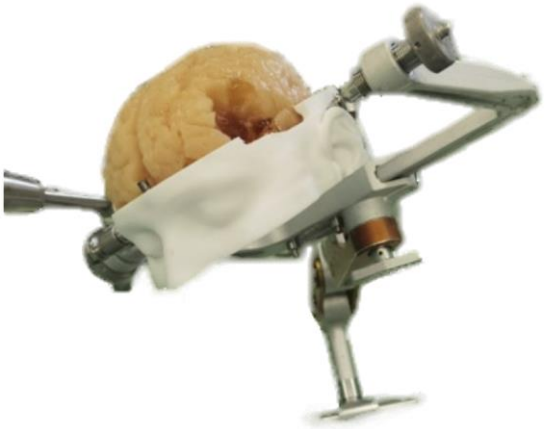
CTBT
Centre for Transfer of Biomedical Technologies

TECHNOLOGY SUMMARY

Brain Phantom



Technology Owner
University Hospital Hradec Králové

Inventors
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IPR Status
Know-how

Stage of Development
Proof-of-Concept

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Background
A very promising way to control the course of brain tumor surgery is through a combination of several imaging methods. The "underlying three-dimensional detailed maps" of the whole brain are composed in advance of magnetic resonance imaging and computed tomography. During and before the operation, some parts of the brain move, and these "maps" are then slightly - but significantly - inaccurate. Therefore, just before the procedure and during the work of the neurosurgeon, real-time ultrasound control helps to show the current exact situation of tumor removal, movement of parts of the brain, etc. on previously obtained "maps" - thus serving as a surgeon's navigation. This procedure is not easy to handle and usable and meaningful options, how the surgeon can build a skill, gain experience is not for many reasons enough. There is no available and practically usable training model on the market for acquiring all the necessary skills in a way close to the actual operation.

Description of the Invention
Operable brain model (phantom) contains key brain structures and includes several tumors. Compared to available solutions (expensive silicone models - useful for practicing imaging, not surgical procedures, or virtual models - good for basic orientation but rather unreal to "manual" work training), a way to produce a relatively inexpensive disposable phantom that is truly "consumed" in an exercise which, with its texture and other physical properties, truly simulates individual parts of the brain and the imaging methods used to depict it very closely, as real parts of the brain.

The system includes a method of manufacturing individual parts, a method of assembling the entire brain phantom with great precision, a method of manufacturing materials for individual brain parts, recipes for the production of materials ensuring fidelity to the original, protection during transport and longer and easier storage.

Commercial Use
Due to the rise of perioperative guided ultrasound technology, which is being promoted by companies like Brainlab AG and BK Medical (R), sophisticated phantoms are already in great demand for training in this technology. The presentation of this "hands-on" technology is impossible without a quality phantom. Such a phantom should be used in areas ranging from R+D, marketing, presentation at congresses, holding hands-on workshops, for direct sales to neurosurgical workplaces and individuals. There is currently no such phantom on the market.

Intended for target users - physicians, manufacturers of medical equipment to demonstrate the function and organize workshops for physicians - users.