The collage of images illustrates results of APL’s work that offer capability for advancements in medical diagnosis and therapy in several aspects of the human anatomy and physiology. The Advanced Multiple-Projection Dual-energy X-ray Absorptiometry (AMPDXA) scanning system (lower left) is capable of assessing bone and muscle density. The AMPDXA and advanced modeling and simulation capabilities (represented by the thigh bone/hip joint) may be used to assess susceptibility to stress fractures. Advances in navigation systems and visualization technologies will facilitate computer-assisted surgery, which will lead to new, more accurate, and less invasive surgical techniques. Telemedicine systems such as TeleWatch offer potential to monitor patients nearly continuously in their homes rather than episodically in a physician’s office or clinic. Devices such as the Far Forward Life Support System (lower right) will increase the likelihood of recovery by providing ventilation and physiological sensing capabilities during the period immediately following injury.