Safety of acoustic radiation force impulse

Approved by AFSUMB Administrative Council, October 14, 2017.

Since the use of acoustic radiation force impulse (ARFI, called as push pulse) for biological tissues, especially for fetus has not been reached a medical consensus on the safe examination, fetus should not be exposed to acoustic radiation force impulse (push pulse). In the case of the Shear Wave Elastography with ARFI (push pulse) used for the uterine during the pregnancy, even if the fetus is estimated as excluded from ROI, the risk of fetus exposure to ARFI cannot be denied from various points of view<sup>1-4</sup>.

## References

1) The arrhythmogenic effect of ultrasonic exposure with acoustic radiation force (ARF) impulse on the rabbit heart with ultrasound contrast agent perfluorobutane, Journal of Medical Ultrasonics, 2015, Vol. 42(1), pp 47–50, Y. Ishiguro, H. Sasanuma, N. Nitta, N. Taniguchi, Y. Ogata, Y. Yasuda, I. Akiyama

2) Ultrasound exposure (mechanical index 1.8) with acoustic radiation force impulse evokes extrasystolic waves in rabbit heart under concomitant administration of an ultrasound contrast agent, Journal of Medical Ultrasonics, 2016, Vol. 43(1), pp 3–7, Y. Ishiguro, N. Nitta, N. Taniguchi, K. Akai, N. Takakayama, H. Sasanuma, Y. Ogata, Y. Yasuda, I. Akiyama

 The effect of ultrasound with acoustic radiation force on rabbit lung tissue: a preliminary study, Journal of Medical Ultrasonics, 2016, Vol. 43(4), pp 481–485,
N. Takayama, Y. Ishiguro, N. Taniguchi, K. Akai, H. Sasanuma, Y. Yasuda, N. Nitta, I. Akiyama

4) Experimental system for in-situ measurement of temperature rise in animal tissue under exposure to acoustic radiation force impulse, Journal of Medical Ultrasonics, 2015, Vol. 42(1), pp 39–46, N. Nitta, Y. Ishiguro, H. Sasanuma, N. Taniguchi, I. Akiyama