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Editorial OMICS International

High Similitudes and Collaborations Exist Between the Central Nervous System and the Eye

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Editorial Note

Color-coded duplex sonography is a grounded non-obtrusive strategy for vascular and parenchymal assessment in a wide scope of neurological problems including stroke, cerebral venous apoplexy and degenerative infections, among others. A CDS image is composed of a gray-scale and a color part. The gray scale part of the image contains information on the morphology of the object under investigation. The color part of the image indicates movement within the image field. Usually the movement pertains to the flow of blood. Any particle movement or density variations within the fluid or the displacement of tissue can be detected and color encoded. Flow information and morphologic information are gathered in completely different ways. Both parts of the image CDS image are governed by completely different laws. Following a general review of the physics and technology involved in CDS, a close look at the various imaging modalities is presented. How Doppler spectrum analysis works will also be explained because this method is often used. An understanding of Doppler frequency analysis is helpful in working with color duplex sonography. A static image is only of little help in visualizing blood flow dynamics. CDS with its ability to provide a virtually real time depiction of blood flow. Can display dynamic events while they are occurring. The speed of sound is assumed to be constant in all cases. This implies certain restrictions that should be known to the medical user. Often an improvement in one area leads to a disadvantage in another. For instance, a higher frequency resolution leads to a proportionality lower temporal resolution or to take another example a higher line density automatically reduces the image repetition frequency or frame rate by the same amount. The propogation of sound is dependent on the elastic properties of the medium in which the sound waves propagates. Sound waves fall into the category of elastic waves. Particles are excited to mechanical vibrations around their center of gravity or equilibrium position. These temporally periodic vibrations propagates through the medium. In wvae motion energy and momentum are transferred from one particle to the next. In this case kinetic energy – energy of motion is of main concern. The vibrating particles themselves do not move along with the wave. Only the state of motion of the matter itself propagates from one particle to the next. In general the spatial propagation of a periodic disturbance with no net transport of the material of the medium is called a wave. In the case of sound, matter is alternately compressed and decompressed. A sound wave represents a periodic temporal and spatial change of pressure. The stronger the bonding between the particles of the medium the faster the propagation of the change of state i.e the higher the speed of sound within the medium. If blood cells and transducer are moving away from each other the frequency is shifted to lower value. If the transmitted frequency is known, it is possible to calculate the velocity and the direction of movement of the objects relative to one another with the help of a frequency measurement. It might be said that in the measurement of blood flow the effect takes place twice. The transducer emits ultrasound with a certain frequency. The moving blood cells measure a different frequency and send back an echo with that frequency. The transducer itself recevives a signals from moving scaterers and depending on the direction of blood flow measures an even higher or lower frequency.