

'Science is used to solve problems for the benefit of society.'

Justify this statement with reference to the scientific knowledge used to solve ONE problem in hearing and ONE problem in visual accommodation. (7 marks)

Sensorineural hearing loss is a severe type of hearing loss due to the internal damage of the ear. This potentially could be the disfunction of the cochlea due to the inability of the internal cilia to move according to mechanical vibrations interpreted by the external environment, it could also possibly be the inefficient signalling and neurotransmission of the auditory cord of the ear. The cochlear implant in this case "is used to solve problems for the benefit of society" as it replaces the function of the damaged cochlea within a patient. Electrodes leading to the organ of Corti replace the function of the cilia detecting the physical movement of sound waves, it is rather that they undergo to transmit electric signals towards the patient's brain to thus effectively allow them to interpret sound. This is fundamentally beneficial for society for the specific demographic that depend on sign language, interpretation or barriers to language.

Furthermore, it is in a different sense for visual accommodation that the technology LASIK eye surgery efficiently benefits patients diagnosed with cataracts. This is the disease where the lens clouds due to the pigments scattered around its jelly-like substance, and thus blurs the image interpreted by the patient. Through the direct beam of laser, LASIK eye surgery would clear the pigments situated within the lens, following the cornea flap to open. This as a result allows for the lens to clear and importantly manages the visually impaired within society to see.

The bone-conduction implant utilises mechanical vibrations through using an interpreter situated just above the ear of the patient. This as a result allows for sound to be detected efficiently above the ear, specialised for patients with mild to severe hearing loss. The negative situation in regard to the surgery prior to this is that integrating the bone-conduction implant, this process requires a drill within the head

to transmit each mechanical vibration detected externally. As a result of this, sound waves exposed to the implant power the motor to subsequently transfer its vibrations via the skull towards the ear drum (middle ear). This in turn allows for human communication to be transmitted.

In another sense, visual impairment including hyperopia and myopia fall the focal point either below or above the retina. In the way that spectacles can demonstrate to correct such biological problems, convex or concave lens can either disperse or concentrate the image shown by the environment. Visual accommodation is fundamental to human communication and thus through the use of spectacles, this is highly advantageous for sight.

UPLIFT EDUCATION