Freeplay Fetal Heart Rate Monitor a winner

The Freeplay Fetal Heart Rate Monitor, a human-powered device that monitors an unborn child's heart rate during labour, was the recipient recently of a 2009 Index Award in Copenhagen, Denmark.

The device, which was fully developed in South Africa, is intended as a robust, inexpensive, fit-for-purpose Doppler ultrasound fetal heart rate monitor for developing countries with the aim of reducing the incidences of stillbirth and neonatal mortality rates in these regions.

'A lot of the equipment used in developing countries has been developed for First World countries. It is expensive, it breaks easily, it is difficult to get repaired, and it's often inappropriate to the needs of an under-resourced area,' says David Woods, emeritus professor of Child Health at the University of Cape Town, one of the developers of the device.

To get round this the Freeplay monitor was developed – a joint project between the Freeplay Energy team of Philip Goodwin (industrial designer), Stefan Zwahlen (electronics designer), and John Hutchinson (project leader), the makers of wind-up radios and flash lights, and three paediatricians, Woods and colleagues Dr Joy Lawn from the Medical Research Council and Professor John Wyatt from University College London.

The key to the device is its power source – human power – with power generated by winding a crank, enabling it to be used in the many areas of Africa and in other developing countries that lack access to electricity. Just 1 minute of cranking is sufficient to power the device, which comprises an obstetrics ultrasound device connected to the main unit by a cord, for 10 minutes. In addition to the crank for winding the device, the main unit contains a power management electronic module and a sound amplifier, and also processes and displays the signal.

In terms of 'form', the device is solid, robust, and durable, with few components, and its operation is intuitive, enabling first-time users to grasp how to use it quickly.

Cost is another issue and indeed in the developing world is one of the most important parameters affecting the availability of medical equipment. The Freeplay Fetal Heart Rate Monitor costs only $200, which is a fraction of the price of competitor products that often sell at up to $1 000.

Woods comments that the potential of the device speaks for itself. Over 99% of the world's 4 million yearly deaths of newborns, and half a million maternal deaths, occur in the developing world, the vast majority of which are deemed preventable by the UN if a basic programme of trained personnel, reliable equipment and adequate facilities are provided.

'The Freeplay Fetal Heart Rate Monitor is the first in a range of fit-for-purpose, low-cost, appropriate medical devices to combat this problem and make available such technology in affected low-resource settings,' says Woods. 'It brings the benefit of electronic and accurate measuring of the fetal heart rate to health care workers, thus empowering them to make timely and life-saving decisions during childbirth.'

With neonatal deaths accounting for almost a third of deaths in children under 5 years of age, it is a key to achieving Millennium Development Goal 4, which is a reduction by two-thirds of under-5 deaths. Furthermore, with fetal hypoxia during labour a major cause of neonatal deaths – in South Africa, for example, accounting for 29% of neonatal deaths – this must be reduced substantially, especially in under-resourced countries. In addition almost half of all fresh stillbirths are due to intrapartum hypoxia, while the burden of brain-damaged children following intrapartum hypoxia is uncertain but remains tragically high.

The Index awards are made for designs to improve life and are made in five categories, Body, Home, Work, Play and Community. The Freeplay Fetal Heart Rate Monitor was the recipient in the 'Body' category.

The device has just ended the first field tests and, Woods says, was enthusiastically received by both midwives and doctors while mothers preferred it to other forms of fetal monitoring.

The challenge in the coming years is to gain widespread distribution to clinics and hospitals in need of the device, and project leader John Hutchinson has committed to using the award to this end as well as for the development of a related product.

Source: www.freeplayenergy.com