

# Fake womb offers hope

## for pre-term babies

US team's extra-uterine device 'far superior' to what hospitals can do for 23-week-old newborns

By Henry Bodkin

AN ARTIFICIAL womb that promises to "dramatically" improve the survival chances of extremely premature babies has been developed.

The device, which incorporates a plastic bag filled with artificial nutri-

ent-rich amniotic fluid, has successfully been tested on foetal lambs equivalent in age to 23-week-old babies.

Unlike conventional incubators, the extra-uterine support device closely resembles conditions in a real womb.

The foetus's heart circulates blood through the umbilical cord into an external gas-exchange machine taking the place of the mother's placenta.

Scientists believe the device could be ready for human trials in three to five years.

In babies born pre-term, the chance

of survival at less than 23 weeks is close to zero, while at 23 weeks it is 15 per cent, at 24 weeks 55 per cent and at 25 weeks about 80 per cent, according to the charity Tommy's.

The aim of the research is to provide an environment in which premature babies can safely develop lungs and other organs during the critical period from 23 to 28 weeks after conception.

Dr Alan Flake, the director of the Centre for Fetal Research at the Children's Hospital of Philadelphia, which developed the technology, said: "These infants have an urgent need for a

bridge between the mother's womb and the outside world.

"If we can develop an extra-uterine system to support growth and organ maturation for only a few weeks, we can dramatically improve outcomes for extremely premature babies.

"This system is potentially far superior to what hospitals can currently do for a 23-week-old baby born at the cusp of viability."

The research team behind the device stress there is no question of using the system to replace a mother's womb at earlier stages of development.

"There's a lot of sensationalistic conversation about supporting humans artificially from embryo forward," said Dr Flake.

"I would be very concerned if other parties wanted to use this device to try to extend the limits of viability."

Six pre-term lambs were used in tests of the most recent version of the technology, which evolved from a glass tank to the biobag design over three years.

Animals breathed and swallowed normally, opened their eyes, grew wool and developed properly function-

ing nerves and organs, said the researchers writing in the journal *Nature Communications*.

The lambs remained in the "womb" for up to a month.

While most were humanely killed to allow analysis of their brains, lungs and other organs, a few were allowed to survive and were bottle-fed.

"They appear to have normal development in all respects," said Dr Flake.

British expert Prof Colin Duncan, from the University of Edinburgh, said: "This study is a very important step forward."

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