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High-frequency breathing support for premature babies could lead to better lung function

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A new study led by researchers at King's College London has found that premature babies supported immediately after birth by high-frequency oscillation - a type of breathing support - had better lung function as adolescents than those who received conventional ventilation. The children ventilated with the high frequency method also showed higher academic achievement in three of eight school subjects.

The findings of the research, funded by the National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme and the NIHR Biomedical Research Centre at Guy's and St Thomas' NHS Foundation Trust and King's College London, could change the use of ventilation in neonatal units across the UK, where around 60,000 babies are born prematurely each year.

Babies born extremely prematurely are at a high risk of developing breathing problems as their lungs are not yet mature and can be damaged by the breathing support that is needed to keep them alive.

Breathing support can be provided by conventional ventilation, which assists their breathing at their breathing rate, or by high-frequency oscillatory ventilation (HFOV). During HFOV smaller, shorter bursts of gas are delivered which may be less damaging to their fragile lungs and therefore may reduce the chronic respiratory problems experienced by babies born very prematurely.

Published today in the *New England Journal of Medicine*, the study at King's is the first to examine whether HFOV improves the lung function in adolescence of children who were born very prematurely. The children supported by HFOV, who were entered into a randomised trial at birth (the United Kingdom Oscillation Study - UKOS), were found to have superior lung function on a number of measures between the ages of 11 and 14 than children who had been supported by conventional ventilation at birth. A series of assessments at King's College Hospital found in particular that the children were able to breathe out more easily.

Results from some early studies had raised concern that HFOV might be associated with an increased risk of bleeding into the brain, which would put the babies at increased risk of neurodevelopmental problems. In UKOS, there were no significant differences in the occurrence of bleeding into the brain and the current follow-up study found no evidence of adverse neurological effects. Indeed, some cognitive skills were found to be enhanced in the HFOV group. The children's teachers completed questionnaires designed to measure academic achievement demonstrated that the children supported by HFOV after birth were rated significantly higher in three of the eight school subjects assessed: art and design, information technology and design and technology suggesting they had better visual and spatial abilities.

Anne Greenough, Professor of Clinical Respiratory Physiology at King's College London, said: 'Poorer lung function in adolescence could have further consequences later in life, such as making children more vulnerable to the damaging effects of smoking and infection.'

Provided by King's College London