The cost-effectiveness of strategies preventing late-onset infection in preterm infants

Alessandro Grosso, Rita Faria and Laura Bojke
Centre for Health Economics, University of York, UK

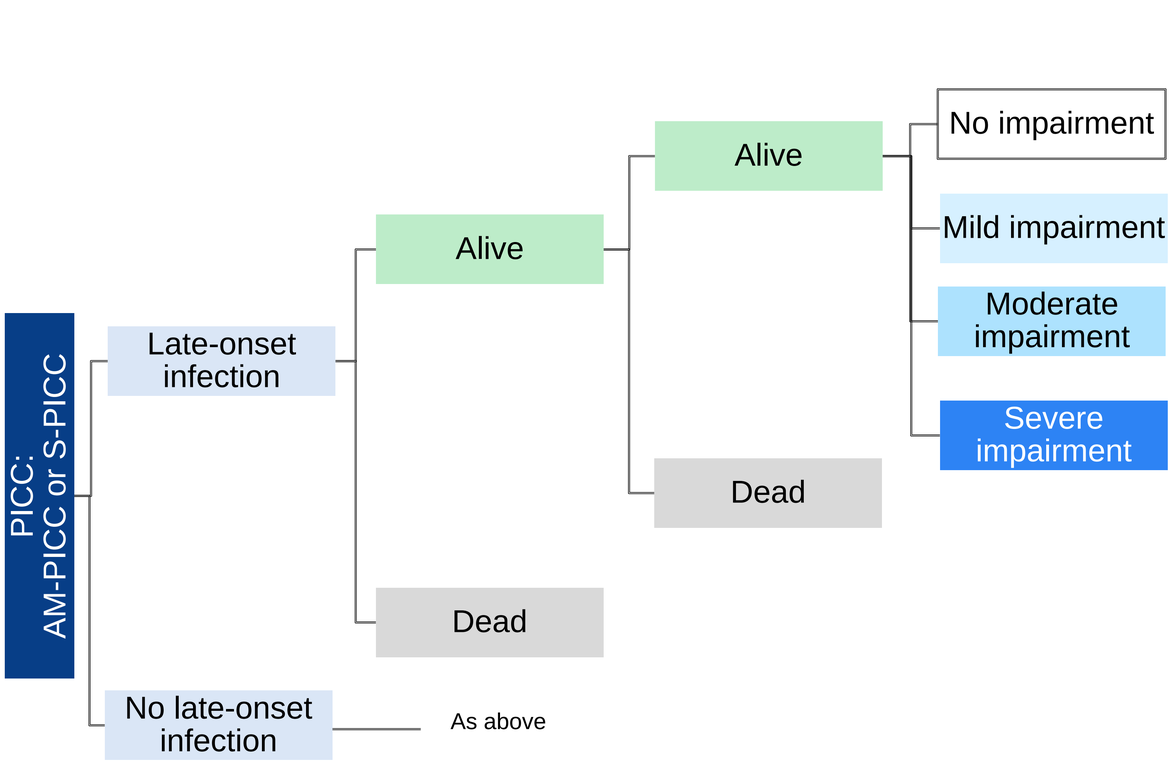
Background

- Preterm infants in the Neonatal Intensive Care Unit often need PICCs to administer medicines or fluids like parenteral nutrition.
- Their use avoids the need for repeated procedures, but it is thought to increase the risk of late-onset infection.
- Late-onset infection may cause health complications in the short and long-term, such as increasing the risks of death and neurodevelopmental impairment (NDI).

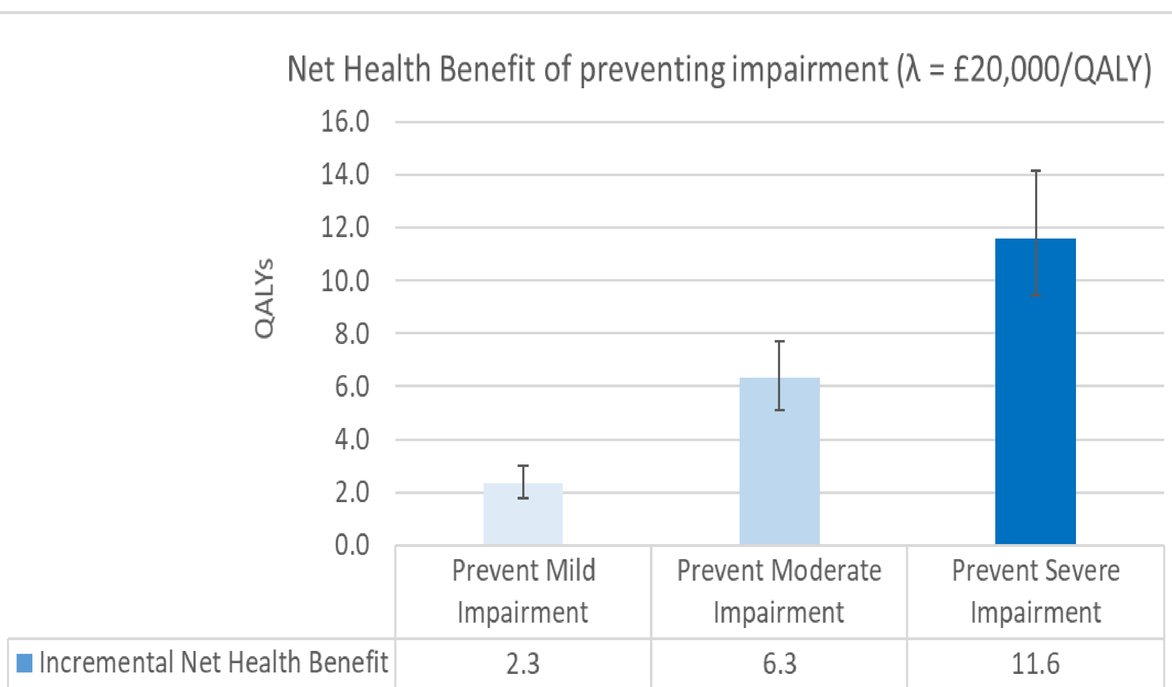
Objectives

- To develop a cost-effectiveness model to establish the long-term value of preventing late-onset infection in preterm infants hospitalised in Neonatal Intensive Care Unit.
- To apply the model to evaluate the cost-effectiveness of antimicrobial-impregnated PICCs (AM-PICCs) versus standard PICCs (S-PICCs) over an infant's lifetime.

The model

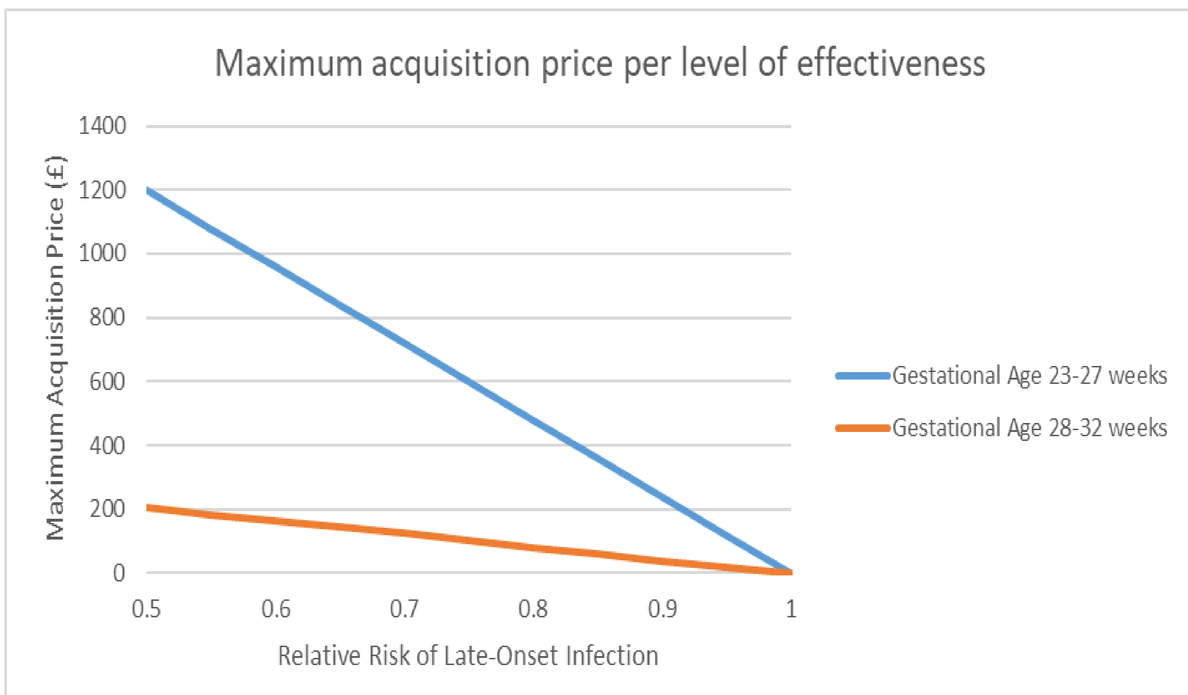


Long-term value of preventing impairment



- Preventing impairment improves life expectancy, quality-adjusted life expectancy and reduces costs to the healthcare service.

Long-term value of preventing late-onset infection



An intervention that reduced late-onset infection by 10% (RR = 0.9) in infants born 23-27 weeks gestational age, could cost up to £239 pounds.

Cost-effectiveness Results

- The PREVAIL Trial results show that AM-PICCs are more costly and with no evidence of benefits over S-PICC. As expected, AM-PICC is dominated by S-PICC.
- Value of information results show that, if the UK NHS were to invest in more research to reduce the uncertainty around cost-effectiveness results, the maximum investment would be £2.4 million over 10 years.
- Additional research effort should be focussed on reducing uncertainty around the effect of AM-PICC in reducing infection.

Conclusions

- Under the assumption the late-onset infection increases the risk of death and impairment in the long-term, preventative strategies can improve quality-adjusted life expectancy and reduce costs.
- Depending on the cost of a preventative strategy, a small reduction in the risk of late-onset infection would be sufficient for it to be deemed cost-effective.

References and Acknowledgements

Chloe Donohue, Caroline Fraser, Katie Harron, Sam Oddie, Ruth Gilbert also provided contribution to this study.
This project was funded by the National Institute for Health Research Health Technology Assessment Programme (NIHR HTA 12/167/102). Alessandro Grosso is funded by the National Institute for Health Research (NIHR)– Research Methods Fellowship Programme NIHR-RMFI-2016-07-16 The views expressed are those of the authors and not necessarily those of the NIHR HTA Programme. Any errors are the responsibility of the authors.
We acknowledge the data providers: NHS Digital, NNRD, PICANet, HQIP