

Improvements to the health and safety of premature babies
Development of a shock and vibration damping system for neo-natal transport



Industry:	Medical
Application:	Isolation Design
Benefits:	Improved Transport Environment for critical care of premature babies

Issue

Throughout the UK, specialist ambulance teams provide a critical service transferring premature babies between hospitals. A highly sensitive procedure with upmost care given to the baby, minimising the shocks and vibration they are exposed to is of key importance. In an ambulance the neonate trolley is securely and rigidly connected to the floor of the ambulance. Protection from shock relies purely on the vehicle’s suspension, which also has the job of keeping the ambulance on the road.

Solution

In order to develop an effective solution it is necessary to understand the dynamics of the problem. The first stage of this was to measure the accelerations experienced during a typical journey and use that information to design a system that targets the shock and vibration specifically. Combining measurement and analysis capability with experience of design and practical implementation Xi was able to develop and implement a test procedure to monitor the vibration dynamics typically experienced. This allowed an isolation system to be designed that could then be implemented into the existing system providing isolation of the premature babies whilst maintaining the practicality of maintenance.

Skill set used

- Vibration transmissibility analysis to identify main vibration pathways into the neonatal crib
- Structural resonance analysis on ambulance, frame and crib
- Design and installation of vibration isolation
- Design new mounting apparatus for isolated mounting of neonate crib

Xi’s Role

Xi’s team have experience grounded in the practicalities of real world design. Working closely with Paramedics and maintenance engineers, Xi ensured the new system would work for all parties.

Client Benefits

- Solid understanding of the dynamic characteristics of the vehicle and neonate crib
- Able to verify that isolating the table will reduce the amount of vibrations in the neonate crib
- Worked closely with Xi to develop a compact and efficient design for the neonate crib
- All relevant standards were adhered to during the testing and design of the new neonate crib mounting