

## CASE STUDY: Knowledge transfer Partnerships



# EVAC+CHAIR INTERNATIONAL

BIRMINGHAM CITY UNIVERSITY COLLABORATION DEVELOPS INNOVATIVE SYSTEM FOR IMPROVING THE TRANSPORTATION OF NEWBORN BABIES







#### SUMMARY

Evac+Chair International, based in Birmingham, are a leading manufacturer of evacuation chairs and equipment, ensuring those with restricted mobility are able to be transported quickly and effectively in emergency situations. With high spending on post-neonatal care due to excessive impact during ambulance transportation, Evac+Chair identified the opportunity to solve this challenge by partaking in a Knowledge Transfer Partnership (KTP, part-funded by Innovate UK) to reduce the impact on neonates (babies under four weeks old) during transit in ambulances. In order to achieve this, Evac+Chair enlisted the help of Birmingham City University's School of Architecture and Design academics to support the design and development of a g-force reduction ambulance trolley that can also safeguard the neonate in the event of an ambulance crash of up to 40MPH. "THE USE OF G-FORCE DATA LOGGERS IN PATIENT TRANSFERS ON NORMAL TROLLEYS HAS BEEN SIGNIFICANTLY USEFUL, AS THIS KNOWLEDGE IS TRANSFERABLE INTO MANY OTHER PRODUCT DEVELOPMENT APPLICATION AREAS SUCH AS THE COMPANY'S PARAID MEDICAL PRODUCTS DIVISION."

STEVE JINX, PRODUCT DEVELOPMENT MANAGER, EVAC+CHAIR INTERNATIONAL

#### THE OPPORTUNITY

As part of their portfolio Evac+Chair manufactures a range of bespoke incubator stretchers designed for ambulance transport, both emergency and elective. These trolleys have been developed in partnership with clinicians and transport teams and are used to transport neonates.

With the NHS spending up to £1,000,000 or more on post neonatal care if excessive g-forces impact a neonate during ambulance transportation, Evac+Chair identified an opportunity to be at the forefront of ambulance trolley development by reducing the acceleration and deceleration forces experienced by neonates in an incubator attached to the ambulance trolley.

The Evac+Chair partnership with Birmingham City University was to design and develop an Impact Resistant Interface System (IRIS) for neonatal equipment attached to an ambulance trolley, with variations being adapted for custom markets across the world.

### **THE DELIVERY**

Birmingham City University suggested a Knowledge Transfer Partnership (KTP), an Innovate UK funded project that sees a graduate and lead academic from the University work with a company to improve their knowledge base and skills. The KTP saw Alex Round, Product Design Graduate and KTP associate, begin working with Evac+Chair under the supervision of lead academic Dr Panch Suntharalingam.

Dr Suntharalingam was instrumental in providing the engineering knowledge required for developing the damping systems. This included the methodology needed for calculating the forces exerted on a neonate and the damping required within the trolley during normal ambulance transfers and in the event of a crash of up to 40MPH.

Utilising these calculations and a newlycreated intensive software simulation-training programme, graduate and KTP associate Alex Round was able to use the software to assist in the decision-making process for developing the damping system without the need for Evac+Chair conducting time and cost intensive physical testing. The final trolley designs were subsequently physically tested against the calculations, saving Evac+Chair at least £10,000 on consultancy per custommade ambulance trolley. Alex then went on to ensure this process was embedded within all new ambulance trolleys Evac+Chair were producing.

#### **THE RESULTS**

The successful outcome of the KTP has enabled Evac+Chair International to gain international recognition for their safety standards as well as improve sales and develop a more efficient production process. By focusing on reducing g-force and improving products safety standards, Evac+Chair now have new innovative products for sale in home, EU, USA and World markets.

Furthermore, within one month of completing the KTP, the company sold 13 new ambulance trolleys each costing £18,500 (£240,500 in total) to Qatar. Growth in the new Middle Eastern market is expected to continue from this initial order.

#### Other benefits have included:

- Greater customer retention for renewed orders and new customers worldwide
- New service contracts for all neonatal ambulance trolleys using IRIS
- Shorter design to manufacture timescales resulting in increased capability of new products
- Increase in profit margin as a result of continuous new product development techniques developed with Birmingham City University
- A reduction in the need to design/redesign new parts for existing and new neonatal transporters
- Implementation of a documentation control software has ensured zero errors in version control of its technical drawings for production and assembly.



#### WANT TO KNOW MORE ABOUT KNOWLEDGE TRANSFER PARTNERSHIPS?

A Knowledge Transfer Partnership (KTP) with Birmingham City University is a business development collaboration between a **company**, a **graduate**, our **academic expertise** and an Innovate UK grant, with projects ranging in length from 18-36 months.

To discover how a Knowledge Transfer Partnership with Birmingham City University could help you achieve business or project success, visit:

## BCUADVANTAGE.CO.UK/KTP

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