

Design for patient safety

Sector: Healthcare

Before 2006, NHS Ambulance Trusts around the UK produced their own vehicle specifications for design. This resulted in over 40 different designs for emergency ambulances in the UK. This posed an increased risk to patient safety due to confusion about the location of equipment and interior layout with variations in each vehicle type.

In May 2004 the Department of Health commissioned a strategic review of NHS ambulance services in England, focusing on how the ambulance service could shift from providing resuscitation, trauma and acute care towards "Taking healthcare to the patient: transforming ambulance services in the community".

The aim was for patients to receive improved care by consistently receiving the right response, first time, in time and that more patients would be treated in the community, resulting in more effective and efficient use of NHS resources.

It was identified that the demand for ambulance services was rising by about 7% per annum (approximately 250,000 extra calls) and that the role of the ambulance service was changing, with only 10% of calls relating to life-threatening emergencies and many of the residual 90% having primary care or social needs.

The challenges of emergency care

A series of projects with East Midlands Ambulance Service, East of England, Great Western, North East, and Yorkshire Ambulance Service was carried out to look at the design of vehicles, equipment, working systems, clinical protocols and patient pathways.

The ergonomists worked with paramedics by 'riding along' for many hundreds of hours during days, nights and weekends to gain an understanding of the challenges faced in delivering pre-hospital urgent and emergency care.

Human factors methods and tools included hierarchical task analysis (a systematic method for unpacking and describing complex tasks), link analysis (a tool to capture interactions and relationships) and postural analysis to understand working activities and compromised safety.

A report was then produced outlining challenges relating to different aspects of ambulance design and detailing specific issues related to those design challenges. Every aspect of the ambulance was looked at in detail.

Participatory design

Working directly with users and manufacturers ensures that user needs are well captured and understood.

By conducting detailed analyses of the way in which tasks are completed, and testing those analyses in mock-ups of proposed redesigns, more effective solutions can be developed and costs from re-engineering can be reduced.

Impact

- Improved working conditions
- Improved wellbeing
- Improved safety
- Financial savings

“Achievement of the single specification ambulance was as a result of a very successful collaboration and I was delighted to note that over £2.5 million has been saved over the past 3 years.”

Chair, National Ambulance Fleet Strategy Group

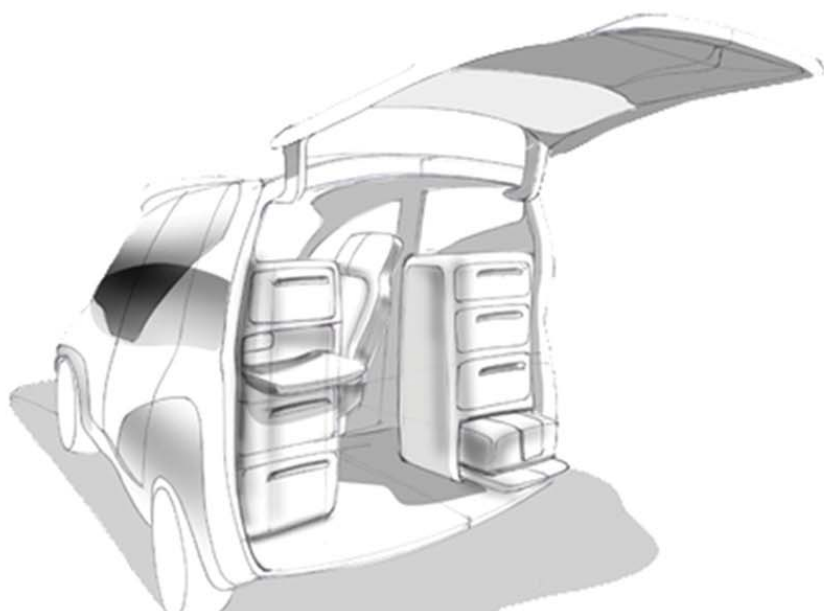
Making a difference

The solutions were developed with manufacturers of vehicles and ambulance equipment and published to share the ideas across the international community.

Prototypes were built and tested to validate design recommendations and then presented to the Chief Executive Officers of the UK Ambulance Services. They were used to develop the national specification for emergency ambulances.

The ergonomics recommendations have had an impressive impact on society, providing tangible benefits not only to healthcare workers but to those being assisted by the UK's ambulance fleet every day. These include:

- Financial savings of £2.5 million over three years.
- Improved patient safety through the standardisation of design.
- Improved working conditions for healthcare workers.
- UK-wide adoption of a standardised interior and exterior design.
- Ergonomics input for the NHS Supply Chain 'Mobile and Relief Clinical Services' national contract.



Wider applications

Wherever there is a need for bespoke design for a work setting, it is vital that manufacturers are engaged in discussions around user needs. This helps them to understand how their products and designs can be most effective, and how their use varies between users and for different work tasks.

There are many applications of this collaborative design approach in healthcare, transport, service industries and manufacturing, where 'off the shelf' products may not be available.

Further information

R Coleman, D Harrow, O Evans, M Kunur, S Halls, D Kafka, A Jones, E Crumpton, S Hignett (2007) *Design for Patient Safety: Future Ambulances*. National Patient Safety Agency/Helen Hamlyn Trust.

S Hignett, A Jones, E Crumpton, D Harrow, O Evans, M Kunur, S Halls, D Kafka, R Coleman (2007) *Designing future ambulance transport for patient safety: research undertaken*. National Patient Safety Agency/Helen Hamlyn Trust.

Acknowledgements

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