



# Healthcare and well-being

Systems and technology expertise that make a real difference to the quality of people's lives



**SYSTEMS AND ENGINEERING TECHNOLOGY**

## About Frazer-Nash

Frazer-Nash is a leading systems and engineering technology company.

We've been applying our technical skills to challenges in industries as diverse as renewable energy, marine, defence, rail, transport, nuclear and aerospace.

The depth and breadth of our expertise means we can transfer technical knowledge and know-how from one industry to another.

Within the health and well-being sector, our systems approach enables us to take a fresh perspective – and in doing so, make a real difference to our clients' businesses and the lives of individuals.

We've found new ways of doing things, applied technical skills to both new and existing products, and solved problems using ideas from other industries.

We've even taken safety critical principles from other sectors and applied them to patient care pathways.

Underpinning our work, is our people's desire to solve complex problems; using skills in materials, mechanical design, electrical and electronic systems, fluids, systems and processes, human factors, and project management.

We work closely with healthcare professionals, key stakeholders and patients – combining clinical expertise and patient experiences, with the latest technical thinking.

## Our experience

### Improving renal care

Frazer-Nash, working closely with Nottingham University Hospital, demonstrated how engineering modelling techniques can be used to provide insight into a patient's day in a renal unit – and through a better understanding of an individual's dialysis day, identified tangible ways to improve the overall patient experience.

Based on extensive research and data from thousands of treatments, the model tracked the individual patient pathway through their renal treatment, including transportation from and to their home.

Once the data had been collected, the team developed new schedules for testing. Potential benefits include: increased patient contact time, improving the experience for both patient and staff; increased time for staff to complete necessary paperwork; improved scheduling of transport; enables a more person centred, integrated approach; optimised changeover time of equipment, improving operational resilience and ensuring equipment is ready for the next patient.



### Inflatable splint



Frazer-Nash developed and prototyped a novel vacuum inflatable cushion splint for the National Innovation Centre.

The splint uses a layered combination of vacuum chambers and inflating sections that allow it to act as a semi-stiff support whilst also applying pressure to the injured area.

### Reducing dehydration in patients

Frazer-Nash developed an innovative water jug that reminded dementia patients to drink regularly throughout the day. Based on extensive stakeholder research, the jug recorded the amount and frequency of water consumed and could notify a carer or clinician if the patient did not drink enough.

Our work was based on an 18 month study funded by Anglian Water. The research found that regular drinks of water contributed to patient alertness and mood; improved sleep and reduced falls. The product is currently in development.





## New ambulance carry chair

Within the healthcare industry, transporting patients to an ambulance often involves paramedics lifting loads far greater than normal safe working limits. Despite using a patient carry chair, many paramedics develop back injuries as a result.

Working closely with the National Innovation Centre, Frazer-Nash used the latest computer modelling techniques to design a new chair that minimised the risk of injury. The new design, which incorporates an ergonomic holding position, larger diameter wheels and more effective breaking system, increases manoeuvrability and helps to reduce impact

## Design of a cycle sprint trainer

Frazer-Nash's work on a new cycle sprint trainer provided new insights into how engineering technology can help to improve the performance of UK athletes and how innovative designs can help individuals undergoing rehabilitation.

We have been involved in researching, analysing, advising, designing, developing and applying various technologies within numerous sporting disciplines, with the collective aim of improving the overall performance.

Addressing the ergometer issue, we designed and produced an innovative new cycle sprint trainer which included an adjustable pitch fan to put a speed dependent aerodynamic loading on the rider.



## The Powerwheel

The Centre for Defence Enterprise challenged the engineering industry to develop innovative ways to aid the medical rehabilitation of injured service personnel.

Frazer-Nash developed the Powerwheel – a system that can be fitted to a wheelchair to monitor the driving force used by the user. The data collected, which is fed back to a computer in real-time, provided physiotherapists and clinicians with an insight into an individual's performance – enabling them to tailor a user's training regime and minimise secondary injuries from wheelchair use.

## Chair 4 Life

Frazer-Nash and The National Institute for Health Research Devices for Dignity Healthcare Technology Co-operative were partners in the first phase of the Chair 4 Life project.

The aim of the project was to build a chair which would incorporate the most complex equipment needs such as ventilators and oxygen cylinders, and allow children to get out and about safely, and more independently. The design was based on a number of workshops which put the children's requirements at the heart of the design.



## Ex-Fix bike

The MoD's Defence Medical Rehabilitation Centre (DMRC) asked the engineering community to design a product which would support the rehabilitation programmes of injured service personnel, and help to improve their quality of life.

Our engineers developed the Ex-Fix Bike – a comprehensive training bike, designed with a wide range of adjustments to suit each individual, depending on their specific body shape and injury. This enables independent range of movement for each leg (crank length) and lateral pedal spacing.

The trainer is now in use at DMRC Headley Court. Although the bike was designed for service personnel, NHS patients, with similar injuries, could also benefit from this design.



To find out more about our work  
and how we can add value to your business,  
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**[www.fnc.co.uk](http://www.fnc.co.uk)**