

## Q&amp;A

**Q. What is Design Bugs Out?**

Design Bugs Out is a project by the Design Council commissioned by the NHS Purchasing and Supply Agency (NHS PASA) as part of the HCAI Technology Innovation Programme. The programme is funded by the Department of Health.

Design Bugs Out has set out to identify key items used in healthcare and redesign them to help reduce and prevent infection by making them easier to clean. It also aims to positively influence the behaviour of hospital staff and patients to reduce exposure to and transmission of HCAIs.

Four teams comprising UK designers and manufacturers were selected through a national competition and challenged to re-design and prototype items of furniture and equipment for hospital wards to help to reduce Healthcare Associated Infections (HCAIs).

Following user research with hospital staff, patients, cross-infection control experts and microbiologists, design briefs were developed to direct the teams to focus on equipment or furniture where redesign could have most potential in helping to reduce patients' exposure to HCAIs.

These areas were 'the bedside environment' (chair, bedside cabinet and over-bed table), the commode, and 'patient transport' (porter's chair).

The new prototypes use cutting edge design and manufacturing techniques, and high-tech materials. They eliminate hard-to-clean joins and inaccessible areas, reduce numbers of components to allow easy disassembling and cleaning, use tougher smoother surfaces which don't harbour bacteria and feature various innovations which reduce 'touchpoints' and improve usability, comfort and functionality for a better patient experience.

In parallel, the Design Council appointed specialists in healthcare design at The Royal College of Art's Helen Hamlyn Centre to design and prototype 'quick win' innovations in five further priority areas in hospital wards, identified through 'grounded' research in NHS hospitals. These included:

- Blood pressure cuff
- Pulse oximeter finger clip
- Patient bed mattress
- Cubicle curtain handles
- Cannula time tracker.

**Q. Why was this project started?**

Healthcare Associated Infections can affect both patients and healthcare workers. They may be resistant to antibiotics, making them difficult to treat, and can complicate illnesses, cause distress, and in some cases may even be fatal.

They are also a huge financial burden to the NHS. It is estimated that in 2004, HCAIs cost the NHS £1bn. Evidence suggests that patients with an MRSA bacteraemia spend on average an additional 10 days in hospital and, for *C.difficile*, the additional length of stay is 21 days. Infection can cost a trust an extra £4,000 – £10,000 per patient.

The HCAI Technology Innovation Programme aims to identify and fast track the implementation of new technologies and design-led innovation to combat these infections.

**Q. What evidence is there that new furniture and equipment will help in the battle against HCAIs?**

A recent study ('Importance of the environment in meticillin-resistant *Staphylococcus aureus* acquisition: the case for hospital cleaning' – Lancet Vol 8 Feb 2008 101-113) concluded that: 'The greatest risk for patients is contaminated near-patient hand-touch sites in clinical areas. This is borne out by studies that have seeded viral or other molecular fragments onto a door handle or a telephone, and then charted their movements over the course of a few days. Such studies show the importance of sites that human hands touch more frequently, and can be used as an indicator for what might happen regarding the spread of MRSA.'

Anecdotal research among healthcare staff who regularly clean ward-based furniture and equipment indicates that redesigning furniture and equipment to enable better cleaning could have two benefits:

- Improving the efficiency of cleaning – creating items which are easier to clean, for example by eliminating crevices, joins and hard-to-reach contours
- Overcoming inertia around cleaning awkward items – if items which have previously been difficult to maintain are made easier and quicker to clean, the regularity of cleaning is likely to increase.

The Design Council has consulted widely with world-leading microbiologists, experts in Healthcare Associated Infections and healthcare practitioners to ascertain the most important clinical areas, procedures and equipment where design could have the most impact in reducing HCAIs.

A team of designers, ergonomists and researchers has conducted research among all users (healthcare staff, patients, housekeeping staff and others) in a variety of NHS hospitals. Using observational research methods (firsthand immersive experience of procedures and environments as well as shadowing staff, conducting interviews on camera and recording demonstrations in situ) the research team gained firsthand insights into the clinical environment. Journey maps of staff, equipment and furniture were plotted to understand the important cross-infection zones.

Significant design opportunities for infection control through changes in behaviour, new materials and processes, ease of cleaning and elimination of inefficiency were identified and have been central to developing the specific design briefs on which the competition was based.

Evaluation methods are also being considered, with a view to measuring and quantifying the impact of the designs on the incidence of healthcare associated infections.

#### **Q. How were the design teams chosen?**

The Design Council launched a national design challenge through the Design Business Association, asking designers to join forces with manufacturers, and nominate themselves to develop design solutions in one of four key ward-based areas. The five selected teams each received £25,000 to cover research, design and production of full-scale working prototypes.

#### **Q. What will happen to the prototypes? Will they be fast-tracked?**

Between April and June 2009 the Design Bugs Out prototypes will be exhibited at seven NHS Showcase Hospitals and at several high-profile healthcare conferences around the country.

The NHS has committed to promoting the design teams' prototypes and to actively engaging with those responsible for procurement at a local level to maximise the likelihood of the prototypes being ordered in commercial quantities. The 'quick wins' designs will be further evaluated by the NHS and, for those selected, their production will be put out to tender with a view to manufacturing sufficient quantities for full scale trials in NHS hospitals, and subsequent widespread introduction.

#### **Q. Is there any guarantee that the winning designs will be purchased by the NHS – or anyone else?**

There are no guarantees – each design will be judged on its merits. But the early indications are that the winning designs will offer exciting commercial opportunities to the winning teams of designers and manufacturers.

#### **Q. How will you measure whether the furniture and equipment are effective in combating HCAs?**

The Design Council has commissioned a study to scope potential evaluation methods and plans to share high level recommendations with NHS PASA in May 2009.