

# Six Patient Care Items



New designs for everyday items used by patients, nurses and housekeeping staff.



**Pulse Oximeter (O2 clip):**  
A simple design means the device is easier to clean, cutting the risk of cross-infection and reducing patient anxiety



**Blood Pressure Cuff:**  
A wipe-clean cuff that secures without the need for Velcro, which means it can be cleaned easily after use

**Wipe Dispenser:**  
A simple clip-on dispenser provides patients with easy access to detergent based cleaning wipes at the bedside



**Design:**  
Sally Halls and Grace Davey  
Helen Hamlyn Centre  
Royal College of Art

## The challenge

To create new designs for everyday items used by patients, nurses and housekeeping staff. These designs aim to help prevent Healthcare Associated Infections (HCAs) by positively influencing behaviour to reduce their transmission or by further improving cleaning practices.

### 1. Pulse Oximeter (O2 clip)

**Problem:** an everyday item in patient care, it is used on ward rounds to measure blood oxygen levels. Its intricate design contains numerous nooks and crannies, making it difficult to clean effectively. In addition, patients are wary of the existing product due to its overly technical appearance.

**Challenge:** a clip that can easily be cleaned between uses and is more patient friendly.

**Solution:** the simplified design uses encased sprung steel to remove the need for a mechanical hinge. This enables a crevice-free form that can be easily manufactured as a single-shot mould to create a smooth, wipe-clean surface. It has also been designed with a more organic form to help relieve patient anxiety.

### 2. Blood Pressure Cuff

**Problem:** another everyday healthcare item that is hard to clean. Current cleaning practices require the cuff to be wiped clean with a wet cloth between uses, yet this is ineffective on the Velcro fastening and leaves the fabric cold and damp.

**Challenge:** a wipe-clean cuff that is as easy to use as the existing design and secures without the need for Velcro.

**Solution:** a fully adjustable cuff that fastens using magnetic catches, thereby overcoming the need for Velcro. The cover is made from an easy-to-sanitise PVC, and printed with simple-to-follow instructions and cheerful graphics.

### 3. Wipe Dispenser

**Problem:** patients should be able to wash their hands and keep themselves clean, and ideally they would be provided with their own washbasins. Currently, however, bedbound patients wishing to clean their hands need to be proactive and ask nursing staff to provide them with the means to do so. But this additional barrier to cleaning discourages good hygiene practice.

**Challenge:** to provide every bedbound patient with a hygienic way to clean their hands.

Solution: a wipe dispenser that helps patients to maintain their own cleanliness. The dispenser has an integral clip that allows it to be attached anywhere in the bed space area – including the over-bed table, cabinet and bedside rails. By allowing the patient to move it to wherever is most convenient, it encourages a sense of ownership and promotes use. The packaging has been employed as a 'billboard' and uses friendly graphics to convey key pointers on good hygiene.

#### 4. Mattress

Problem: a standard hospital mattress consists of a foam core with a plastic cover. Over time this cover may become damaged or succumb to wear and tear, and if the waterproof surface becomes compromised, bodily fluids can seep through and contaminate the mattress core. A breach of the waterproof cover is often not visible, which makes it very hard to detect. This means that mattresses need to be hand checked by staff, who must remove the cover to examine the foam core. However, the once-yearly audits operated by most hospitals are not regular enough to prevent cross infection.

Challenge: to design a way of easily indicating that a mattress core has been contaminated.

Solution: a mattress cover that contains hydrochromic ink. It immediately indicates when fluid has contaminated the foam core by permanently changing colour when it comes into contact with any moisture. The ink is sandwiched between a nylon fabric and a clear waterproof coating, through which the colour change is visible. This makes it immediately obvious when the mattress has been compromised and needs replacing.



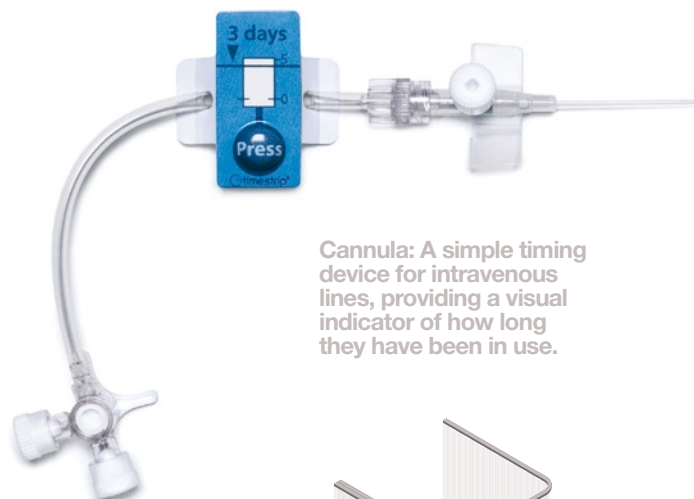
**Mattress:** An inbuilt early warning system allows soiled mattresses to be identified and replaced as soon as they become contaminated

#### 5. Cannula

Problem: cannulas have been identified as a hot spot for infection as they penetrate the skin and sidestep the body's defence mechanisms. Guidelines state that a cannula should be changed every 72 to 96 hours, but monitoring this time is difficult, especially when the cannula has been inserted in an emergency.

Challenge: a cheap, simple and accurate system to monitor how long a cannula has been in situ.

Solution: the team utilised a new technology called Timestrip, a simple timing device that monitors how much time has passed. The strip requires initial activation, after which a clear panel slowly fills up with ink over a prescribed period. This solution provides an immediate visual indicator, directly next to the insertion site, to show when the cannula should be removed. It also has a range of other possible applications from infusion lines to bloodlines and catheters.



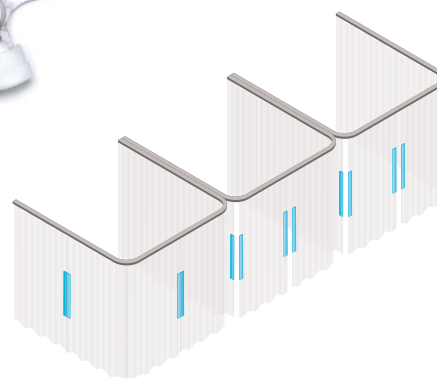
**Cannula:** A simple timing device for intravenous lines, providing a visual indicator of how long they have been in use.

#### 6. Curtain Clip

Problem: ward curtains are used by a wide variety of people each day, and are a common hand touchpoint. Also, the curtain is likely to be the first thing staff touch after treating a patient. But existing curtains cannot be wiped clean and in general tend to be laundered or replaced every six months. Patient privacy is also a problem, with gaps in supposedly closed curtains a common occurrence.

Challenge: to create a common hand-touch site that can be cleaned on a daily basis.

Solution: an elegant handle that slides onto curtains to create a wipe-clean common touchpoint for staff, patients and visitors. Magnetic latches ensure that the curtains close fully, helping to maintain patient dignity and enhance the patient's sense of privacy.



**Curtain Clip:** This detachable curtain handle creates a single wipe-clean touchpoint for staff and patients, reducing the risk of cross infection