



Protect, Rinse and Dry

BHTA guidance on the care, cleaning and inspection of healthcare mattresses



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BHTA guidance on the care, cleaning and inspection of healthcare mattresses

August 2016





Introduction

Medical Device Alert Ref: MDA/2010/002 issued on 5th January 2010 highlighted that mattress covers can become damaged at any time during use or storage, for example from needle stick, strikethrough, damage from sharp objects, abrasion during handling, transport or movement and inappropriate cleaning and decontamination procedures.

Purpose

The purpose of this guidance is to respond to this Medical Device Alert by informing users of mattresses as to the causes and consequences of damage and provide guidance on caring for the mattress in accordance with best practice.

This guidance was produced by members of the Beds and Support Surfaces section of the British Healthcare Trades Association (BHTA) in collaboration with representatives from the Textile Coaters and Coated Fabrics industry and representatives of the UK Cleaning Products Industry Association (UKCPI) and the Healthcare Ergonomics and Patient Safety Unit (HEPSU), Loughborough University.

This guidance does not absolve manufacturers or suppliers of their responsibility or obligations under the Sale and Supply of Goods Act 1994.

The British Healthcare Trades Association

The BHTA is the UK's largest healthcare trades association, representing over 500 companies. At the heart of the Association is the Code of Practice, which sets out the standards that all members must meet to demonstrate best practice in their business dealings. The Code is recognised as the UK industry standard and means that member companies trade ethically and professionally. The Code of Practice - the first for consumers in the healthcare industry - has achieved approval under the Chartered Trading Standards Institute's Consumer Codes Approval Scheme <http://www.tradingstandards.uk/advice/ConsumerCodes.cfm>

Background

Healthcare mattresses including foam, active and reactive mattresses are covered in a protective waterproof, multi stretch, moisture vapour permeable cover which is designed to both protect the patient's skin and the inner mattress from damage. Adherence to this guide will protect the properties and extend the life of the mattress.

Polyurethane coated fabrics are hydrophilic and can absorb liquids for short periods causing a temporary change to the polyurethane characteristics. The mattress cover swells temporarily and is more vulnerable to physical damage for a period after it is completely dry, by which time it will revert to its previous state.

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The incidence of mattress damage appears to be significantly higher in the UK compared to neighbouring European countries which use the same mattress products. Typically the UK has a higher bed occupancy rate and as a consequence may clean and disinfect mattresses more frequently.

The increase in failures of mattress covers appears to have coincided with an increase in inspection rates, more frequent cleaning and disinfection of mattresses as a result of an increased focus on MRSA, E. Coli and Clostridium Difficile. Bed occupancy rates of 90% or higher could result in insufficient time to allow the mattress to dry after cleaning. The NHS has also adopted current moving and handling guidance which involves more frequent use of mechanical transfer devices. This combination could result in mattress covers being more vulnerable to damage.

Polyurethane coated fabrics may differ in formulation and performance characteristics. Cleaning regimes and the frequency and use of disinfectants do differ between healthcare facilities. Frequent and prolonged exposure to higher concentration disinfectant solutions may prematurely age the fabric cover of mattresses. Surfaces must be **protected** in use and **rinsed** and thoroughly **dried** after application of a disinfectant. This document is intended to provide guidance which is appropriate to this challenging environment.

Design life of mattress covers

All polyurethane coated mattress covers have a minimum design life expectation of 12 months. Most covers are expected to last longer with normal wear and tear. Design life can be adversely affected by an increase in frequency of usage which might include more frequent cleaning and disinfection and transfer of patients using mechanical aids.

Care must be taken to thoroughly **rinse and dry** covers between and after cleaning or disinfection. Mattress covers are more susceptible to physical damage when wet and will remain susceptible for a period of time after being dried.

Care also needs to be taken to provide **protection** between the mattress cover and any mechanical patient transfer devices including protecting against sharp edges of bridging boards and buckles on hoists which can snag and damage the mattress cover during transfer. There is an increased risk of permanent damage being caused to mattress covers if the cover is not completely **dry** before a patient is mechanically transferred onto the mattress.

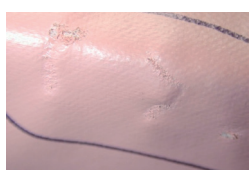
Mechanical abrasions and damage

The increase in failures of mattress covers also appears to coincide with more frequent use of bridging boards and hoists in line with the application of moving and handling guidance.

Mattress audits have identified the following as likely causes of mechanical damage:

Damage during transportation:

- Movement of a mattress by one person will cause damage due to the size and shape of the mattress. Moving a mattress from one location to another requires two people for lifting and a trolley or a bed frame or similar to transport the mattress.
- Do not drag along the floor.
- Do not transport in roll cages unless completely protected from sharp edges of the cage.
- Do not scrape against walls, door frames, door catches or locks.
- Avoid any protruding and or sharp objects.



Scrape damage



Physical tear

Handling, storage, packaging and preservation:

- Mattresses should be stored in a secure location away from the general public.
- Never store other items on top of a mattress.
- Always store mattresses flat.
- Do not store directly on the floor.
- Place a protective covering over mattresses during storage.
- Do not store mattresses next to radiators or other heating devices.
- Always ensure mattresses are handled by a minimum of two people.

In use:

- Read the Instructions for Use. Mattresses should be used in accordance with intended use and in line with manufacturer's guidelines (instructions for use).
- Check ancillary handling equipment such as slide boards, buckles and straps on slide sheets and slings for sharp edges that can scratch or tear fabric during use.
- Do not insert used needles into mattresses – adopt RCN and EPINET guidance utilising point of use Near Patient Sharps Disposal methodology.

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- Remove or cover all jewellery on staff and patients in contact with mattresses.
- Do not permit staff or visitors to sit on beds. Advise visitors to take care to avoid contact with their jewellery and the mattress.

Patient transfer:

Slide transfer:

- Protect the surface of the mattress. During patient transfer the hospital sheet must always be in position on the mattress surface.
- After cleaning and disinfection the mattress cover must be thoroughly rinsed with cold water and dried. The cover will remain susceptible to mechanical damage for a period, until completely dry.
- Bridging boards should never come into direct contact with the mattress surfaces. Sharp edges and burs will damage the mattress surface and render the mattress unusable.

Hoist transfer:

- Examination of covers regularly demonstrates evidence of scraping on the surface which correlates directly with the swinging action of slings during use.
- Protect the surface of the mattress. Hoists and slings must never be in direct contact with the mattress surface.

Training:

- Persons responsible for the storage, transportation, usage, cleaning and disinfecting of mattresses should be fully trained and competent in correct use of the equipment.



Cleaning and disinfection

Polyurethane coated fabrics are hydrophilic and can absorb liquids for short periods causing a temporary change to the polyurethane characteristics. The mattress cover swells temporarily and is more vulnerable to physical damage for a period until it is completely dry, by which time it will revert to its previous state.

Blood and other body fluids must be removed with paper towels or by other means before application of cleaning agents and disinfectants. After cleaning and disinfection the polyurethane coating must be thoroughly **rinsed** with water and dried until it is completely **dry**.

Abrasive cleaners and sponges must not be used. Failure to do so could cause the Polyurethane coated surface to break down and allow fluids to pass through, otherwise known as 'strikerthrough'.



Strikerthrough

A clean water rinse **MUST** also be applied immediately after the activation phase of chlorine and alcohol based disinfectants.

Chemical reactions can be categorised into three groups regarding their effect on coated fabrics.

Group 1. Rapid attack and breakdown

- Dimethyl formamide (DMF) and tetrahydrofuran (THF) – both lead to dissolution of the coating.
- Concentrated inorganic acids, ie sulphuric, phosphoric, etc.
- Concentrated alkalis, ie caustic soda.
- Phenol/cresol based chemicals.

Group 2. Temporary swelling with possible change in surface appearance

- Ketones ie acetone, MEK etc.
- Organic acids (acetic, formic etc).
- Chlorinated hydrocarbons (trike/dry cleaning fluid).
- Aromatic hydrocarbons (toluene, benzene etc).
- Alcohols (methylated spirits, ethanol, methanol etc).
- Hydrocarbons (paraffin, petrol, oil etc).
- Esters (amyl acetate, ethyl acetate etc).

Group 3. No short term effect but avoid long term contact

- Ammonia.
- Aqueous alkalis ie strong detergents
- Bleach (sodium hypochlorite, hydrogen peroxide).
- Dilute aqueous acids.
- Waxes/greases (petroleum jelly, etc).
- Water based chemicals (iodine based products).

The above categories are intended as guidelines only. The actual concentration and period of contact with the various chemicals will determine the exact effect.



Consequences

Group 1. These products will permanently damage the fabric. This damage is immediate and irrevocable. These products should not be used.

Group 2. These products have a temporary effect. They must be used with consideration, taking note that whilst in the temporary state after application, the probability of physical damage increases. After use of these products the surface must be dry and a sheet used to protect the cover before re-use.

If the cover is subjected to mechanical stress when not dry, less physical force is needed to damage the polymer coat permanently. By applying the Group 2 products, the material undergoes a temporary physical change which swells the polymer surface. When dry, the polymer will return to its former state. However for a period of time the product will be vulnerable.

Group 3. These have no short term effect when applied. Prolonged use may impact life. Best practice is to thoroughly rinse after any application. The item must be dried prior to use or storage.

Frequent applications of cleaning and disinfection solutions may accelerate degradation of the cover surface if the cover is not thoroughly dry before re-use.

Further guidance and recommendations

THE REVISED HEALTHCARE CLEANING MANUAL 2009 is the guidance commonly used by NHS facilities. The guidance is absent some important actions specific to the removal of body fluid and the cleaning of mattresses, in particular rinsing immediately post the activation phase of disinfectants and ensuring that the mattress cover is thoroughly dry before re-use.

This guidance recommends the following revisions (*in bold italics*) be adopted immediately in order to reduce the incidence of chemical damage to mattress covers.

Page 135. **PROPOSED REVISIONS** Task **MATTRESS AND CUSHIONS.**

Equipment and materials required:

- colour-coded bucket or ***solution containers***;
- colour-coded cloths;
- colour-coded domestic gloves;
- non-abrasive ***cloth***;
- cleaning trolley;
- ***Neutral detergents or neutral detergents combined with disinfectants.***
- alcohol disinfectant wipes
- warning signs.

Method

1. Wash hands and put on gloves.
2. Display warning signs.
3. Prepare the solution in the bucket **or container** in strict accordance with the **cleaning products** manufacturer instructions and with your training. Do not mix chemicals and only use a cleaning product as provided.
4. Place the bucket or **solution container** on a cleaning trolley.
5. Dampen or rinse a **clean** cloth in the cleaning solution **and remove excess fluid**.
6. Wipe **all external cover surfaces clean. Ensure they are dry before replacing the mattress in position. For greasy or stubborn soiling use the non-abrasive cloth.**
7. **A clean cloth should be used with each application. Each application of solution should be made in accordance with the manufacturer's instructions. Rinse after application with clean water using a clean cloth.**
8. **If a combined detergent and disinfectant solution is used, rinse after application with clean water using a clean cloth.**
9. Allow the mattress to dry.
10. Wipe all surfaces with an alcohol disinfectant wipe.
11. On completion, dispose of the cloth, clean and dry all equipment and store safely and tidily in a secure storage area, segregated according to colour-coding where appropriate.
12. Remove gloves and wash hands.

Note: Use of alcohol wipes and cleaning solutions may make a temporary change to the surface of the cover fabric and leave more susceptible to mechanical damage. Allow to dry fully before re-use. After processing, replace sheet carefully to help prevent mechanical damage. Refer to BHTA Guidance on the care, cleaning and inspection of healthcare mattresses as shown.

8.4. Dual function NaDCC cleaner/disinfectants

A number of products now exist which combine a detergent cleaning effect with chlorine disinfection. These products are designed to eliminate the need for separate cleaning and disinfection processes to be carried out consecutively by combining them into a single process. This technology is currently in widespread use in UK healthcare premises. The most common use is for terminal cleans. It is also frequently used, for a short defined period, for all routine cleaning in a ward or area where there is an outbreak of infection. In some hospitals, the technology is being used in a routine manner for all cleaning.

How does it work?

This technology works through the use of a surfactant which does not inhibit the release of chlorine. This allows a detergent effect to coexist in a solution with a concentration, typically, of 1,000 parts per million available chlorine. The detergent effect removes organic and oily soiling into the solution, while the chlorine kills microbes by oxidisation.

Benefits

Page 118. PROPOSED REVISIONS Task SPILLAGES OF BODILY FLUIDS

Note: The term “bodily fluids” includes blood, urine, faeces, sputum, wound exudate and all other bodily secretions. All spillages should be cleared as soon as possible. The responsibility for performance of this task has been a contentious issue in some healthcare providers, and therefore it is particularly important that this responsibility is clearly defined for each area (refer to Section 3). The most usual practice is for nursing or departmental staff to perform this task within their respective wards or departments, and for cleaning staff to perform it in public circulation areas.

Equipment and materials required:

- colour-coded bucket **or suitable container**;
- colour-coded cloth;
- single-use gloves suitable for chemical resistance and complying with the PPE Directive (89/686/EEC);
- plastic apron;
- paper towels;
- chlorine-based absorbent granules;
- **disinfectant product giving 10,000 parts per million available chlorine**;
- clinical waste bags;
- warning signs.

Method

1. Wash hands and put on gloves.
2. Display warning signs.
3. Clear spillages of urine or faeces with

paper towels and place directly into the clinical waste bag. The bag should be next to the spillage in readiness for this. Tie the bag following waste disposal policy and dispose of at the central point as soon as possible.

4. Large spillages of blood **on hard surfaces** should be absorbed using chlorine-based absorbent granules. Allow to remain in contact for two minutes then place debris in a clinical waste bag as at point 3. Large spillages of blood **on soft surfaces** including mattresses or cushions should be disinfected by use of chlorine releasing solutions instead of granules; other body fluids should **be absorbed and removed with paper towels followed by use of chlorine releasing solutions instead of granules. The surface should then be rinsed using clean water with a clean cloth.**
5. Prepare the disinfectant solution in the bucket in strict accordance with the manufacturer’s instructions and with your training. Do not mix chemicals and only use a cleaning product provided by your employer.
6. Dampen or rinse a cloth in the cleaning solution.
7. Disinfect thoroughly, changing the cloth as necessary. On completion, dispose of cloths, gloves and other protective wear used as clinical waste, as at point 3.
8. If the spillage is on a mattress or cushion, follow steps 1-7 but use chlorine releasing solutions instead of granules (as



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- point 4 above), and then rinse using clean water with a clean cloth.
9. If **a hard surface is affected**, damp mop the affected area (refer to damp mopping method statement).

BHTA Member companies will include warning notices similar to these below in their Cleaning Instructions and/or Instructions for use with polyurethane coated fabric mattress covers.

BHTA member company specific instructions

Member companies may choose to use one or more adaptation of the notices below in their cleaning instructions for use with polyurethane coated fabric mattress covers, but if not adopting any of these, must nevertheless address the points covered in the guidance.

Mechanical damage

Particular care must be taken to protect mattress covers from damage by sharp edges of bridging boards and straps or buckles of patient hoists. It is important that no mechanical devices are used to transfer patients unless the mattress cover is completely dry and covered with a sheet.

Cleaning and disinfection

Frequent or prolonged exposure to higher concentration disinfectant solutions may prematurely age the fabric cover of mattresses. Surfaces must be **protected**

during use and **rinsed** and thoroughly **dried** after application of a disinfectant. The mattress cover may be cleaned in accordance with The Revised Healthcare Cleaning Manual June 2009 subject to the following action: Following the use of a detergent and or disinfectant solution the mattress cover should be rinsed with clean water using a clean cloth and manually dried using clean disposable paper towels.

High temperature disinfection

Alternatively disinfection may be achieved by laundering at temperatures not exceeding 65°C for 10 minutes or 73°C for 3 minutes which may include a 150ppm¹ HSG (95) 18 chlorine rinse.

Low temperature disinfection

Alternatively, disinfection may be achieved at lower temperatures where ozone is continually fed and dissolved into wash water throughout an automatic laundry wash cycle.

Reference: DH Rapid Review Panel

Recommendation 3 (February 2005) and Recommendation 1 (September 2009).

Manufacturers and suppliers may specify the use of cleaning or disinfectant agents or processes not included in the Revised Healthcare Cleaning Manual 2009, (subject to the revisions recommended in this Guidance).

¹ HSG (95) 18

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Protect, Rinse and Dry

BHTA quick guide on the care, cleaning and inspection of pressure reducing foam mattresses

Introduction

Healthcare mattresses are covered in a protective waterproof, multi stretch, moisture vapour permeable cover which is designed to both protect the patient's skin and the inner foam core of the mattress from damage. Adherence to this guide will help protect the properties and extend the life of the mattress.

Storage

- Mattresses should be stored in a protective cover.
- Do not store other objects such as side rails or bed ends on top of mattresses.
- Mattresses should be handled by two people one at either end of the mattress.
- Do not drag or pull a mattress by its cover.
- Mattresses should be transported on a bed or trolley suitable for the purpose.

Before use

- Check the mattress is suitable for the intended patient in terms of pressure care risk assessment and safe working load of the mattress as indicated.
- Avoid using any additional covers or padding between the patient and the support surface, as this may affect its pressure reducing qualities.

Preventing damage to the mattress

- Take care not to puncture the cover as this may permit fluid ingress to contaminate the foam core.
- Do not place sharp objects such as scissors, **needles**, syringes, scalpels or other sharps on the mattress surface.
- Remove or cover hand **jewellery** including rings with sharp edges.
- Take extra care when using medical equipment such as monitors, drip stands, side rails, **transfer boards**.
- When using slings and slide sheets take care to ensure that **buckles** do not scratch or snag the mattress cover during use.

Mattress cleaning and care

Mattress covers should be cleaned regularly including between patients in accordance with The Revised Healthcare Cleaning Manual 2009 and the guidance below:

General cleaning

- Wipe the whole surface of the mattress with soap and water, **rinse** with clean water and allow to **dry**.
- If a disinfectant wipe is applied the mattress cover must be allowed to **dry**.

Contaminated with blood or body fluids

- If the cover is heavily soiled or has been exposed to bodily fluids such as blood, it will require a more thorough cleaning procedure.
- Large spillages of blood on soft surfaces including mattresses or cushions should be disinfected by use of chlorine releasing solutions instead of granules; other body fluids should be absorbed and removed with paper towels followed by use of chlorine releasing solutions instead of granules.
- The surface should then be rinsed using clean water with a clean cloth.
- Wipe the cover using a single use wipe and a 0.1% Chlorine Solution (1,000ppm) and cold water. If required a 1% Chlorine Solution (10,000ppm) and cold water may be applied.
- Rinse thoroughly with clean water and a damp single use wipe. Make sure the mattress and cover is completely dried before being re-used.
- Frequent or prolonged exposure to higher concentration disinfectant solutions may prematurely age the fabric cover of mattresses.

High temperature laundering

Before laundering, mattress covers should be completely removed. Where required, mattress covers can be laundered as follows:

- Pre wash < 65°C for 10 minutes followed by main wash < 73°C for three minutes which may include 150ppm chlorine solution in the wash.
- This should be followed by a cold rinse and extraction.

Low temperature ozone laundering

Alternatively, disinfection may be achieved at lower temperatures where ozone is continually fed and dissolved into wash water throughout an automatic laundry wash cycle.

Reference: Department of Health Rapid Review Panel Recommendation 3 (September 2005) and Recommendation 1 (September 2009)

Drying post laundry

- Covers must be completely dried before refitting to the mattress.

Mattress inspection

How to check the cover and foam mattress and what to look for both between patients or weekly:

1. Check for any signs of tearing and/or punctures.
2. Check all the seams for any signs of splitting.
3. Check the zip(s) for any signs of damage.
4. Check for any signs of permanent staining.
5. If any of the indicators in steps 1-4 are present check the condition of the mattress using the Mount Vernon Test (See Figures 1-4).

The Mount Vernon Test – Testing the condition of the foam mattress for ‘bottoming’:

The Mount Vernon Test should be performed **monthly** or when any doubt exists about the condition of the foam mattress. The test will check if the mattress is still delivering adequate support and protection for the patient or if the mattress has ‘bottomed out’.

- With the cover in place adjust the height of the bed surface to level with the tester’s hips.

- Stand at the side of the bed and link your hands to form a fist (Figure 1) or for visco elastic foam use two flat crossed hands – CPR motion.
- Keeping your elbows straight, lean forward and push the fist or CPR motion for visco elastic foam into the mattress along the seven points indicated below (Figure 2).

If any signs of contamination are identified the mattress should be withdrawn from use until the cover and/or inner foam insert or mattress is replaced.



Figure 1

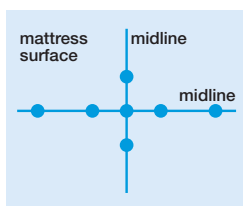


Figure 2

- If the base of the bed can be felt at any point the mattress has likely bottomed out and the additional checks should be undertaken (Figure 3).
- Unzip and remove the cover, check the inner cover and foam mattress for signs of discoloured staining or smell for confirmation of fluid ingress into the foam (Figure 4).



Figure 3



Figure 4

BHTA guidance on the care, cleaning and inspection of healthcare mattresses

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