

A photograph of a baby sitting on a white weighing scale. The baby is wearing a white long-sleeved shirt and white pants. The scale is white with a digital display and some markings. The background is a plain, light-colored wall.

# the weight of the matter

**LACORS**  
promoting quality regulation

## Interim report of the National Medical Weighing Project – August 2008

Patients are weighed to calculate medication dosage, diagnose illness, monitor treatment and assess nutritional status.

Anecdotal evidence, and work done by trading standards officers in Wales, suggested there may be problems with the equipment used in medical environments like hospitals.

LACORS commissioned a pilot study in South East England to explore these issues, which subsequently identified a number of problem areas. The equipment available was frequently inaccurate, inappropriate or not used correctly. In addition, quality systems around the procurement and maintenance of scales were found to be inconsistent. The consequences could have devastating effects on patient care.

To help hospitals address these problems, LACORS developed the National Medical Weighing Project. Local authority trading standards officers have visited their local hospitals to

check the weighing equipment. As well as testing the scales, they have talked to staff to explain the importance of using accurate and appropriate equipment, finding out what the equipment is used for and how accurate it needs to be as part of the process. The aim was to help hospitals to improve their standards by raising the importance of weighing equipment in a medical environment.

The findings of the officers' visits have been recorded as part of the survey; the collated results are shown overleaf. LACORS, working on behalf of councils' trading standards services, have used this data to produce a series of recommendations for hospital trusts. While local councils will continue to work with their local hospitals, we hope the NHS will work with trusts nationally to ensure that necessary changes are made to help safeguard patient care.

- 46 per cent of UK local authorities participated
- between them, they visited 203 hospitals
- 7875 individual weighing scales were inspected

### Who is LACORS?

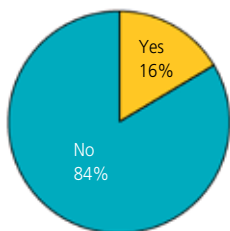
LACORS is the Local Authorities Coordinators of Regulatory Services. We coordinate the regulatory services delivered by councils, like trading standards and environmental health.

### What does the law say?

Medical weighing equipment is covered in Schedule 3 of the Non Automatic Weighing Instrument regulations: it is equipment used for the 'determination of mass in the practice of medicine for weighing patients for the purpose of monitoring, diagnosis and medical treatment.' These regulations make it a legal requirement to use equipment that is appropriately accurate.

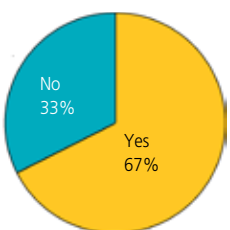
# analysis of systems

## How many hospitals trained their staff in basic use of weighing equipment?



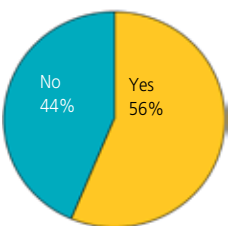
Of the hospitals visited, 16% provided training for their staff in how to use the equipment correctly. This might include checking the scale is on a level surface and set to zero before use. Failing to do so means ward staff can be unaware of the importance of the equipment and its correct use. This means patients may not be weighed consistently or correctly.

## How many hospitals had a consistent regime for inspection?



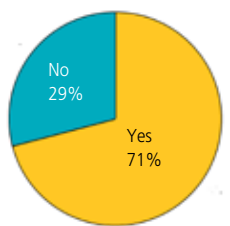
Just under one third of hospitals did not inspect their equipment at all. Regular inspection and maintenance is necessary to make sure the scales are working correctly and fit for purpose. This is due, in part, to there being no single department (e.g. electromechanical engineering) that has responsibility for the equipment.

## How many hospitals used calibrated weights to test their scales?



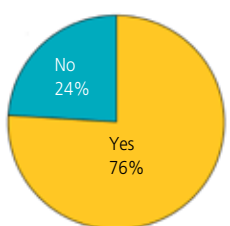
Encouragingly, many hospitals do perform regular checks on their scales. However, of these, almost half did not use calibrated weights to check their scales. While it is important to carry out the checks, if a patient brought about legal action based on inaccurate weighing equipment, the hospital would not be able to prove due diligence if it did not use traceable, calibrated weights.

## How many hospitals ordered their weighing equipment through one department?



Almost one third of hospitals allow wards and departments to order their own equipment individually. This causes a series of problems. The hospital cannot take advantage of economies of scale. The ward staff may not know which equipment they need, so they order the cheapest. The hospital has no record of what equipment there is and when it has been maintained.

## How many hospitals maintained an inventory of their weighing equipment?



It is encouraging that three quarters of hospitals did keep a record of the equipment on site. However, many of these inventories were not kept up-to-date, and inspectors found many unrecorded scales when visiting wards. There were also many 'lost' pieces of equipment, that move from ward to ward, or even out of the hospital completely. This has obvious cost implications for hospitals, but a 'borrowed' scale may not be appropriate for the job.

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The nurses purchased scales from Argos

Baby scales put on foam mats or a wobbly trolley, which affects accuracy

Mechanical equipment is still in use which is difficult to use

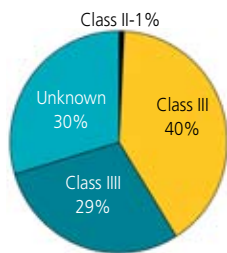
Midwives equipment is not subject to frequent testing

As a result of our findings they have already started to completely overhaul their systems

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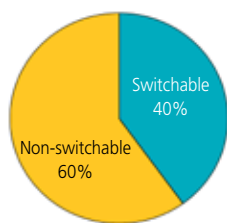
# inspection of equipment

## Break down of instruments by class (level of accuracy)



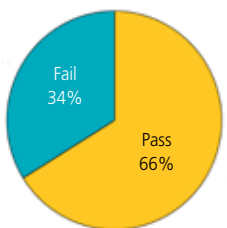
Of the 7,875 scales tested, 74 were Class II. These are high precision scales used in special care baby units and pharmacies. A further 3,171 were Class III: suitably precise for medical applications. The remainder (more than two thirds) was either Class IIII or unmarked. Class IIII is not recommended for medical applications because the scale divisions tend to be too great, leading to imprecise measurements. Based on conversations with ward staff, inspectors assessed around two fifths of scales tested as being unfit for purpose due to their level of imprecision.

## Was the scale switchable between metric and imperial units?



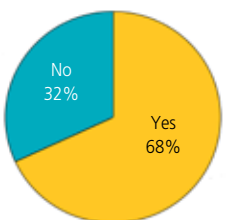
One of the most potentially harmful issues is that of switchable scales – those that can display metric, imperial and other units. The risk is that medication could be administered based on a readout that was assumed to be metric. Such confusion was responsible for the \$125m failure of the Mars Climate Orbiter spacecraft, and could easily happen in hospitals. Of the equipment surveyed, 303 scales were set to imperial units at the time of testing.

## Was the machine accurate within legal tolerance?



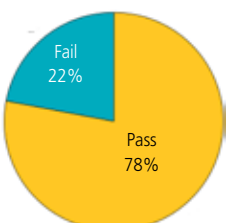
One third of all the equipment (2654 scales in total) was inaccurate. Some of these inaccuracies will have been minor, but others much more serious – potentially leading to big under- and overdoses of radiation, chemotherapy, anaesthetic, pain relief and other medicine. It is often difficult for a patient to know if their weight has been recorded inaccurately, as they may be unfamiliar with the units of measurement, preoccupied by their illness/treatment, or not be confident enough to challenge the weight displayed.

## Was the machine correctly stamped/stickered (or exempt)?



In order to be used for medical purposes, weighing equipment is legally required to go through a series of checks during its design, manufacture and installation. These checks are 'verified' using stamps and stickers. Of the equipment tested, around one third was not stamped / stickered as being suitable for its use (or exempt due to its age). Again, this could have implications if a clinical negligence claim were to arise.

## Was the machine set to zero at the point of testing?



A scale may show a small reading even when there is nothing on it. This means the next patient weighed on the scale might have some weight added or subtracted, potentially causing an under- or overdose. 22% of the scales tested did not read zero. This can be easily corrected, so long as staff are trained to do so.

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Staff do not consider scales to be medical equipment

The amount of cheap bathroom scales in critical locations is astonishing

Appropriate control systems are often not in place; there is no ownership of the issue

Training in appropriate use of scales appears to be non-existent

With regular contact and assistance, standards are improving

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# Recommendations to hospital trusts

LACORS has formulated a series of recommendations for hospital trusts as a result of the initial findings of the project.

1. One department in each hospital or trust should be responsible for the inventory procurement, provision and maintenance of all medical weighing equipment for that hospital or trust. This will ordinarily be the biomechanical / electromechanical engineering department (or similar). It will be for the Risk Manager to decide upon where this responsibility will lie. All wards must be notified that procurement must go through this department to ensure that the equipment meets legal requirements and is fit for purpose.
2. Each trust should instigate an appropriate programme of testing for their equipment. This may be done in-house, given the relevant training, or procured externally.
3. Basic training for the use of weighing equipment should be incorporated into trusts' training and induction procedures. Furthermore, whenever new equipment is purchased, training should be given in its use by the installer and cascaded to relevant ward staff. Training should focus on the importance of setting to zero before use, and correct weighing procedures.
4. Any equipment that is found to be inaccurate (outside of legal tolerance) should be immediately removed from service and either repaired or replaced.
5. While some Class III scales may be suitable for some medical purposes, we recommend, for the avoidance of error, that all new medical weighing equipment ordered should be of accuracy Class III (or higher if appropriate).
6. From now on, scales purchased for medical purposes should only be capable of metric display. There should be no capacity for switching or dual readouts. Trusts should be aware of the pitfalls of using switchable scales and may wish to consider replacing them, or having the switches removed. Conversion charts can be provided for those patients who wish to know their weight in imperial.

If these recommendations are followed, it is LACORS' firm belief that hospitals will achieve the following:

- Significant improvements in patient care by ensuring accuracy in dosage and diagnosis based on weight
- Immediate savings from achieving greater economies of scale and efficiencies in the procurement process
- The potential ability to demonstrate due diligence in relevant clinical negligence claims. The value of this should not be underestimated: during 2006/07, £613,274,000 was paid out by the NHS Litigation Authority on claims settlements.

## What happens next?

Over the course of this financial year, council trading standards services will be working with hospitals to help deliver these improvements. As well as explaining the legal position, trading standards officers provide impartial advice on choosing appropriate equipment, reputable suppliers and suitable asset managers. They can also advise hospitals on designing quality systems to ensure lasting change. There will be a repeat inspection in Spring 2009 to offer further advice, following which a final report will be written.



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