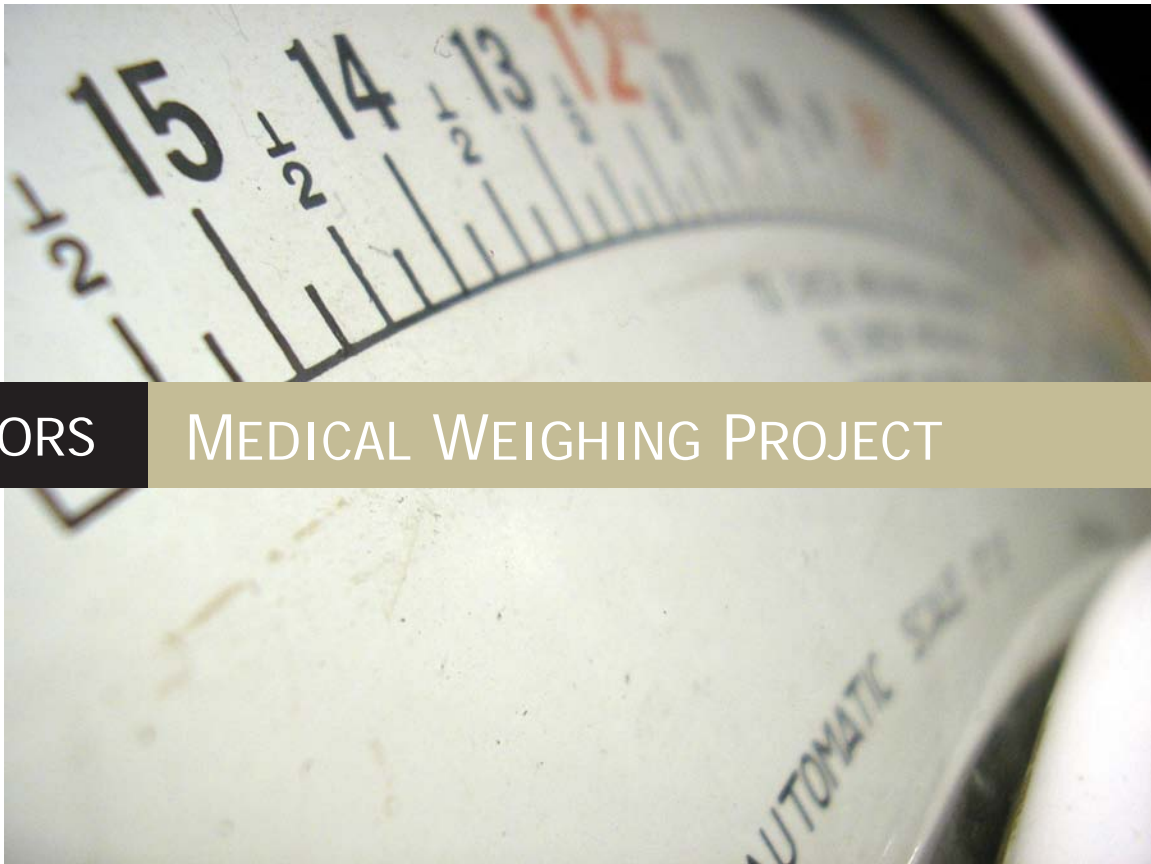


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LACORS

MEDICAL WEIGHING PROJECT

**LACORS** | Robert Kidd  
promoting quality regulation

# National Medical Weighing Project 2008 / 09

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## *Improving standards of hospital weighing equipment and practice through partnership working*

### **Aim**

To improve standards in medical weighing equipment across the UK

### **Objectives**

- To enable partnership working between local authority trading standards departments and NHS Trusts
- To assess current standards of weighing equipment in hospitals
- To make achievable recommendations for improvement leading to measurable gains in patient care
- To address local authorities' local agendas in respect of community health and protecting the vulnerable
- To raise the profile of legal metrology

### **Background**

Imagine a situation whereby, following a routine weights and measures inspection, a local hospital is shown to have serious inadequacies which could be detrimental to patient care. The most serious is an error in accuracy on scales in the department of nuclear medicine, which is responsible for calculating radiation dosage to cancer patients. Other problems could include the use of uncontrolled / non-compliant equipment, including weighing scales purchased from high street chemists, and domestic kitchen scales being used in maternity / postnatal intensive care units. There could also be administrative problems with quality systems and consistency.

It is understood that such a scenario may not be unusual; indeed, a real-life example is given at Appendix A – Patient Testimony. As such, LACORS is running a national project to identify the problems, recommend solutions and work with hospital trusts to improve standards. Following pilot studies, it is felt that the potential to effect positive change is so great that this project should be run across the UK in the first instance.

## Methodology

LWMAs are asked to carry out two inspections, one at the start of the year and one at the end. When doing so, they are asked to complete a short survey on each occasion, submitting these to LACORS for collation. The survey questions can be found at Appendix B. The project runs for the financial year 2008/09. Key milestones are as follows:

March / April 2008	Trading standards officers make contact with hospitals
April 2008	Initial inspections take place
May 2008 – February 2009	Regular contact between hospital and trading standards where necessary
March 2009	Follow-up inspections take place
April 2009	Collation of results by LACORS

This is not designed to be a punitive exercise. Rather, the emphasis should be placed on finding development points and areas with the potential for improvement as opposed to simply pointing out errors. Before the initial inspection, the inspecting officer should have made contact with the person(s) responsible for procurement of appropriate weighing equipment, training of staff and management of quality systems. They should agree in advance a date and time for the inspection and, following the inspection, discuss and agree on improvements to be made and timescales in which to do this.

Officers are asked to complete the Assessment Form, which also doubles as an inventory for the hospital for all their weighing equipment. They may ask the hospital to complete parts of it before the inspection, or to fill it in themselves as they go around. This may be done using a laptop or on hardcopy. It is designed to allow all parties to track pieces of equipment, providing a snapshot of the hospital's resources. The Assessment Form is available as a spreadsheet from the LACORS website. Guidance notes can be found at Appendix C.

Over the course of the year, regular contact should be maintained hospitals to ensure that changes are made and upheld. At the end of the year, an inspection should again be scheduled and carried out, and another survey should be completed. While this would be the end of the project, it is hoped that a strong and productive relationship would continue between hospital trust and local authority.

## **Areas for inspection**

These have been divided into qualitative and quantitative. The former should be carried out in a preliminary discussion with the hospital, preferably with the department responsible for procurement and maintenance of weighing equipment. The latter should be carried out during a standard inspection, a form for which is provided, along with guidance notes, at the end of the pack.

## **Qualitative**

### *Inspection / calibration regimes*

Each hospital should have in place a system for checking the accuracy of their weighing equipment. To make any checks meaningful, calibrated weights (traceable to National Standards) must be used. Such inspections should be sufficiently regular to ensure consistency, particularly in areas with high traffic or requiring high sensitivity. The department responsible for weighing equipment should know the limits of their responsibilities; while they may make simple repairs, they should not be recalibrating stamped equipment.

### *Procurement*

Equipment should be procured by the department responsible for maintaining it. This will tend to be a central department within the hospital (often known as electronic medical engineering – EME). In reality, a lot of equipment is sourced by individual departments, with no knowledge of current legislative or technical requirements. As a result, it is not uncommon to find wards with domestic scales brought from home, which the EME department (or similar) will have no knowledge of. Such a situation is not acceptable because accuracy cannot be maintained. It is significantly cheaper for a hospital to buy the correct scale from an appropriate source than to pay damages following legal action from an over- or under-dosed patient.

### *Inventory*

A list should be kept of all weighing equipment owned by a hospital, with each item labelled such that it can be referenced on the list. It should be clear where each item can be located. It is suggested that the assessment form included in this pack be used as an inventory – electronic copies can be obtained from the LACORS website.

### *Training*

Brief training should be given to all staff on how to use the equipment provided by the hospital. This should include zeroing and use of mechanical equipment, finding an appropriate class (III or IIII) of equipment for their task, and reporting defects.

## Quantitative

### *Instrument Class (II, III or IIII)*

There are three classes of weighing equipment used in hospitals at present: class II (more sensitive, smaller divisions), Class III and Class IIII (less sensitive, greater divisions).

For example, a Postnatal Intensive Care Unit may need an accuracy of 5g to calculate the precise dosage of medication for underweight babies. Therefore, a baby weigher with a scale interval of 20g (class IIII) would not be appropriate; a class III with 5g intervals would be. In contrast, a dietician would not need such a high level of precision; the consequences would not be detrimental to the health of the patient as the weight is used for monitoring rather than dosage calculation.

Some wards, e.g. oncology, are unwittingly using two classes of machines to calculate dosage where only one is appropriate; only class III machines will give sufficiently precise readings. It is recommended that, in wards or departments that weigh for a variety of reasons (diagnosis, dosage, monitoring etc), only class III instruments should be used.

Class II equipment is extremely accurate and will only be found in laboratories or pharmaceutical applications. There are only likely to be two or three of these scales in each hospital. It may be that trading standards departments do not have the appropriate equipment to test such scales. If they did, it would be very time consuming to do so, taking into account the precautions necessary. For this reason, officers are asked to find out how many Class IIs (if any) there are in use, and whether there is a service agreement for them. **No accuracy testing should be carried out on Class II equipment.** For the purposes of the survey questions, Class II equipment should be assumed to pass the accuracy section.

### *Correctly Stamped / stickered*

If the equipment was brought into use before 2003, it does not need to be stamped or stickered to be used. From 1<sup>st</sup> January 2003, all medical equipment, used for weighing patients for “the purposes of monitoring, diagnosis and medical treatment,” should be verified and stamped or stickered under the Non-automatic Weighing Regulations 2000. There have been instances whereby unstamped equipment has been sold to hospitals post-2003. We need to assess whether hospitals know what equipment they need to buy, whether they have been mis-sold equipment or whether equipment has been purchased in error. In trial studies, domestic (kitchen / bathroom) scales have been found in use for a variety of applications, including dosage calculation for babies.

### ***Accuracy***

For obvious reasons, scales used for all medical applications should be accurate within permitted tolerances.

### ***Zero before use***

With older, mechanical scales (particularly chair scales and upright sliding-weight scales) the weighing instrument should be set to zero before use. In trials, the zeroing device had often been pushed in to avoid people catching themselves as they walked past. Therefore, all the instruments were being used without first being set to zero.

### ***Switchable***

A lot of electronic scales have the ability to display weight in both metric and imperial units. There have been instances where staff have administered a wrong dose to a patient as a result of confusing pounds with kilograms or vice versa. For example, it would not be infeasible for an infant to weigh 8kg or 8lb pounds (3.63kg). It is important to establish whether dosage is calculated based on metric or imperial units; the scales should be set accordingly in metric or imperial. Some staff may not be familiar with imperial units and the numbered values of weight could be similar under each unit of weight.

## FAQs – for inspectors

### *Do I have powers to inspect hospitals as part of my statutory duties?*

Yes. Under the Non-automatic Weighing Instrument (NAWI) Regulations 2000, Part III section 38, a weights and measures inspector may ‘inspect and test any instrument in such a manner as he considers appropriate.’ To do this, he may ‘enter any premises at which he has reasonable cause to believe there to be any instrument...’ covered by the regulations. Medical weighing equipment is covered in Schedule 3 of the NAWI 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.’

### *Can I visit private hospitals (e.g. BUPA)?*

Yes. The above guidelines also apply to non-NHS hospitals. You may wish to make your own comparisons between private and NHS hospitals. However, for the purposes of this project, *please do not include data from private hospitals* in the results you submit.

### *What about Doctor’s Surgeries, Health Centres, NHS Walk-in Centres, community-based clinics?*

Such premises are not included in this survey. While you may visit all manner of medical premises, we have decided to focus on hospitals for a number of reasons. Firstly, they are smaller in number than surgeries and other clinics, and as such are easier to identify. There are around 29,000 GP’s surgeries in the UK, compared to 1,600 NHS hospitals<sup>1</sup>. Secondly, hospitals are more likely to use weighing equipment for dosage calculation, whereas GPs would use patient weight for monitoring purposes only. Therefore, the potential to effect positive change in patient care is increased by focussing on hospitals.

### *I have a number of hospitals in my area. Should I visit all of them?*

Ideally, yes. It may be the case that different hospitals could pool resources, e.g. maintaining one set of calibrated standards, or using a central procurement department to achieve economies of scale. You could advise them on how to do this.

### *How can I ensure I work in a hygienic manner and reduce risks to myself and patients?*

There are two things to consider: yourself and your equipment. A general guideline is to ensure you wash your hands on entering and leaving a ward, before and after eating, smoking etc, and upon leaving the hospital. Hospitals should provide facilities for you to

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<sup>1</sup> Source: Wikipedia

do this, for example cleansing gels that don't require water mounted near doors. You should always follow the advice given by hospital staff.

Given that weighing equipment will normally be sat in or stood upon, it should not be necessary to sterilise weights before use. Weights should be free from dust and dirt in the normal manner, and a clean piece of paper towelling should be used to protect the scale. If a patient is likely to come into direct contact with the weighing equipment, such as a babyweigher, the scale should be wiped down after testing with an alcohol-based cleansing wipe.

There may be instances whereby hygiene controls are tighter. In all cases, you should explain to ward staff the purpose of your visit (this would be a good opportunity to find out what class of equipment they require). If you explain how you would normally test equipment and ask them if there are any special precautions to take, this will ensure you work in a safe and hygienic manner.

***What will happen to the data I submit?***

You will be asked to submit data to LACORS on two occasions: once after your initial visit and then again after your final visit (at the end of the project). This data will be used to develop regional trends and also to (hopefully) show an improvement in standards as a result of the project. You will not be asked to disclose your authority name to LACORS, just the region in which you work. However, it is suggested that regions may wish to discuss the results at regional level in order to plan future projects and resource allocation.

***I prefer to submit my survey responses in writing. Can I do this?***

No. We will only be accepting returns using the online survey form. This is to make collation and analysis of the data easier and more transparent. It is also a more environmentally-friendly approach. If you need any help with the online survey, please contact LACORS.

## **FAQs – Heads of Service**

### ***Will resources be made available for this project?***

No. Hospital inspections can easily form part of a LWMA's normal inspection or project programme. It is hoped that the benefits of this project will be sufficient to persuade Heads of Service to make resources available.

### ***How much will it cost my department? Will I have to spend any money?***

The costs associated with this project are Officers' time and their travel to hospitals. No new equipment needs to be purchased, nor will any specialist training be required. One hospital would generally require an officer with an assistant between one and four days to inspect, depending on the size of the hospital and how effective its systems are. The final inspection tends to be quicker than the first.

### ***What if I do not have the resources required to take part in this project?***

It may be that you have a very small department with a large hospital in your area. If you are not able to commit to inspecting an entire hospital, it would still be beneficial to visit part of it. You can still give advice to the hospital staff that can then be cascaded throughout the building. If this applies to you, officers should focus on the equipment that is used for dosage calculation, particularly oncology / nuclear medicine, and postnatal intensive care / paediatrics. Departments that use scales for monitoring only, like dietetics / nutrition, are lower priority.

### ***What will be the benefits of committing officer time to this as opposed to visiting shops and services?***

This project meets the local agenda requirements of improving community health and protecting the vulnerable. There will still be time left over for more conventional inspections of scales used for trade. In light of the Hampton Review it shows public bodies working together in partnership for the benefit of the local communities they serve. Finally, it is hoped that the initiative should raise the profile of trading standards among the general public.

## **FAQs – Medical Practitioners**

*I would like to work with my local authority to improve our weighing standards, but have not been contacted. How do I get in touch with them?*

Visit [www.tradingstandards.gov.uk](http://www.tradingstandards.gov.uk) and enter your postcode to find your nearest trading standards department. They will be able to arrange a visit for you.

*Will the results be used to ‘name and shame’ poorly performing hospital trusts?*

No. This project is designed to enable partnership working and improve standards through regular dialogue, rather than being a one-off inspection. While overall results and regional trends will be reported publicly, individual hospitals will not be named by LACORS. Conversely, if a hospital or trust really stands out as having consistently high standards, and we are notified of this, we may (with their permission) make this known, or use them as an exemplar of good practice in the field of medical weighing.

*What will happen at the end of the project?*

While LACORS’ involvement will finish, it is hoped that the working relationships built up over the course of the year will continue. You can always contact your local trading standards department (responsible for weights and measures) to ask for advice or request a visit.

*Where can I find more information about the legal requirements for medical weighing systems?*

The United Kingdom Weighing Federation has a section on its website called Medical Scales: see [www.ukwf.org.uk](http://www.ukwf.org.uk).

## Acknowledgements

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## Appendix A – Patient Testimony

The patient was four years old and weighed around 12kg. She was undergoing chemotherapy as part of her treatment for cancer in a paediatric oncology ward. The weight of the patient was a key factor in determining the amount of medication to be administered. The patient had been weighed in the morning as part of the ongoing monitoring of her condition. A nurse repeated the weighing during the course of the day, to see if the patient had lost any weight. The patient's appearance was gaunt and the staff were concerned about dehydration. The scales to be used were a set of ordinary bathroom scales with 1kg divisions.

The patient appeared to have gained weight, which was not possible, as she had not eaten. Her mother was asked if she could remember which set of scales had been used as there were known differences in readings from the scales on the ward. Another set was found but it was realised that these were unlikely to be the set which was used initially. Both pieces of (apparently inaccurate) equipment bore calibration stickers from an independent engineer. In any case, a set of scales with 1kg divisions was unlikely to register a readable difference from earlier in the day, in one who only weighed 12kg. As such, they were not capable of reading to the degree of accuracy required for this particular weighing or others common to the ward.

### Solutions

As a result of intervention from the family and advice from a trading standards officer, ward staff made the following improvements:

- Subsequent evaluations were carried out using more accurate scales with 0.1kg scale divisions
- To aid the staff, the scales were given the names of characters that both they and the child / parents would remember, so the same set could be used for each weighing
- If there were enough pieces of equipment, one was left under each patient's bed during their stay in hospital

### Conclusions

The scales encountered may well be tested and calibrated regularly. However, this incident suggests that the scales' suitability for the use to which they are put, together with the knowledge of the scale operator, are key factors which could be detrimental to patient care.

## Appendix B – Survey Questions

The following questions will form the survey to be completed at the start and end of the project:

- In which regional group is your authority?
- How many hospitals did you visit?
  - Of these, how many had a consistent regime for the inspection and calibration of their equipment?
  - Of these, how many used calibrated weights, traceable to national standards, in the process of calibration?
- How many hospitals maintained an inventory of all medical weighing equipment they carry?
- How many hospitals ordered all, or nearly all, of their medical weighing equipment through one central procurement department (e.g. Electronic Medical Engineering (EME) Department)?
- How many hospitals had systems in place to ensure that staff were trained in the basic use of weighing equipment (e.g. zeroing scales, switching to metric etc)?
- What was the total number of medical weighing devices you inspected (across all hospitals if you visited more than one)?
  - Of these, how many were class II, III or IIII?
  - Of the Class IIs, how many had service agreements?
  - Of the Class IIIIs, how many of these were fit for purpose (i.e. how many had sufficiently close divisions)?
- How many scales passed the 'stamped / stickered' section (i.e. how many were correctly stamped / stickered, or were put into use before 2003 and are exempt)?
- How many scales passed the 'accuracy' section (i.e. how many were accurate within permissible error)?
- How many scales passed the 'zero before use' section (i.e. how many scales were set to zero at the time of testing, and were not altered such that setting to zero would be difficult)?
- How many scales were switchable between metric and imperial units?
  - Of these, how many were found to be set to imperial units at the time of testing?

## **Appendix C – Guidance notes for completing the Assessment Form**

### **Location (ward)**

Where in the hospital the equipment is located. Some equipment may be used off-site (e.g. midwives scales being taken for home visits); the hospital should be able to advise where this equipment is and when it could be tested. Other pieces may simply be 'missing' (e.g. taken to another hospital, or stolen). This applies if the hospital has a record for the equipment but it cannot be found.

### **Brand**

Name of the manufacturer, e.g. SECA, Weighlux.

### **Model**

The model name / number, e.g. System 51.

### **Description (including capacity and divisions)**

What type of weighing equipment is it, e.g. baby weigher, stand-on patient weigher, chair scale, barometric bed, hoist? What is its capacity and what are the scale divisions, e.g. 230kg x 200g.

### **Asset number**

The hospital's own traceability number for inventory purposes.

### **Serial number**

The weighing machine's individual serial number. It may not have one.

### **Class**

Either class II, III or IIII.

### **Appropriate Class**

Having asked the ward staff what level of accuracy they require (this may need some explaining), is this equipment of an appropriate class for its purpose? For example, if used for calculating dosage for a baby, it would need to be class III. If the scale were used for monitoring obese patients in dietetics, class IIII would be acceptable.

### **Correctly Stamped / Stickered**

Is the equipment correctly stamped / stickered? For example, if the equipment is unstickered, but it was brought into use before 2003, this would be a 'pass.' If it was unstickered but dated 2004, this would be a 'fail.'

### **Accuracy**

Is the equipment accurate within acceptable tolerances? Pass or fail.

### **Comments**

Use this section for comments relating to 'stamped / stickered' (e.g. dates, notified body numbers etc), as well as level of inaccuracy if not within TNE, or actions, e.g. sent for recalibration, withdrawn from use.

### **Zero before use**

Was the scale set to zero before use? Was the scale set up in such a way that it could be easily zeroed before use? Particularly for scales with sliders or winders, had these been removed, withdrawn or wound all the way in? Pass or fail.

### **Switchable**

Is the device switchable between metric and imperial measurements? Yes or no.

### **Which setting**

Metric or imperial.



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