HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER MATERNITY AND CHILDREN HOSPITAL

Department:	Laboratory and Blood Bank		
Document:	Multidisciplinary Policy and Procedure		
Title:	Quality Control Procedure and Results for Balance Check and Maintenance		
Applies To:	All Laboratory Staff and Biomedical Engineers		
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1. PURPOSE:

1.1 The purpose of this policy is to provide a standard procedure for set up, operation, cleaning, maintenance and checking the accuracy of calibration of the analytical balances in the laboratory to obtain accurate weighing results.

2. DEFINITONS:

2.1 Analytical Balances: are those balances that go out to 4 decimal places.
2.2 NIST: National Institute of Standards and Technology.

3. POLICY:

3.1 Balances are inspected, cleaned and checked for accuracy of calibration by knowledgeable person.

4. PROCEDURE:

4.1 **Setting up, levelling, preparations for weighing:**

4.1.1 The optimum location: The correct location makes an important contribution to the accuracy of the weighing results of analytical balances.

4.1.1.1 Stable, vibration-free position as horizontal as possible;
4.1.1.2 No direct sunlight;
4.1.1.3 No excessive temperature fluctuations;
4.1.1.4 No drafts;
4.1.1.5 The best location is on a stable bench in a corner protected against drafts, as far away as possible from doors, windows, radiators or the louvers of air conditioners.

4.1.2 Leveling some models are equipped with a level glass and two or four leveling feet to compensate for minor irregularities in the surface on which the balance stands. The balance is exactly horizontal when the air bubble is in the middle of the level glass. Note that the balance should be leveled each time it is moved to a new location. Check the following items before weighing:

4.1.2.1 Balance power supply is on for at least one hour.
4.1.2.2 Balance is clean and free of dust or particulate matter.
4.1.2.3 Balance is properly leveled as per bubble level indicator.
4.1.2.4 Make necessary adjustment if balance is not leveled as per operator's manual.

4.2 **Standardization:**

4.2.1 Balances shall be standardized each day before the first use, using a set of NIST traceable weights that bracket the intended range of use.

4.2.2 For analytical balances (capable of 5 decimal places), check with a 20mg and a 200mg standard NIST traceable weight before use each day. Acceptance criteria are as follows:

NIST Traceable Weight	Specifications
200mg	19.98mg – 20.02mg
200mg	199.80 – 200.20mg

4.2.3 Weights may be added as needed to bracket the range of weighing to be performed, as follows:

NIST Traceable Weight	Specifications
10mg	9.99mg – 10.01mg
50mg	49.95 – 50.05mg
100mg	99.90mg – 100.10mg
1g	0.9990g – 1.0010g
10g	9.9900 – 10.0100g
100g	99.9000g – 100.100g

4.2.4 Be sure not to exceed the load limit for the balance when selecting a different bracket range. For analytical balances (capable of 4 decimal places), check with a 20mg and a 200mg standard NIST traceable weight before use each day. Acceptance criteria are as follows:

NIST Traceable Weight	Specifications
20mg	0.0199 – 0.0201g
200mg	0.1998g – 0.2002g

4.2.5 Weights may be added as needed to bracket the range of weighing to be performed are as follows:

NIST Traceable Weight	Specifications
1g	0.9990g – 1.0010g
10g	9.9900g – 10.0100g
100g	996.9000g – 100.1000g

4.2.6 Be sure not to exceed the load limit for the balance when selecting a different bracket range. For top loading balances, check with a 1g and a 100g standard NIST traceable weight before use each day. Acceptance criteria are as follows:

NIST Traceable Weight	Specifications
1g	0.98g – 1.02g
100g	99.90g – 100.10g

4.2.7 Record the re3sults of the standardization in the sheet prepared and keep it in the records.
4.2.8 Any discrepancies in weight measurement will be confirmed by repeating the operation.
4.2.9 If the standardization does not meet the specifications, place "Do not use" tag on the balance.
4.2.10 Notify the appropriate supervisor.
4.2.11 A service representative will be notified to re-calibrate the instrument when the calibration check shows that the balance is out of tolerance.

4.3 **Operation:**
4.3.1 Place weighing container on the balance (i.e. paper, beaker, etc.).
4.3.2 Tare balance by depressing "zero" button.
4.3.3 Place article to be weighed on center of weighing pan.
4.3.4 Close doors, if applicable, and wait until balance reading stabilizes.
4.3.5 Record weight and remove article from the balance.

4.4 **Cleaning:**
4.4.1 Clean any residue particles from the balance pan and balance using a fine brush.
4.4.2 Clean bench top area around balance using a fine brush or damp cloth.

4.5 **Limitations: Because electronic balances are fragile, you need to observe the following guidelines.**

4.5.1 Always clean the balance after using it -- use a soft brush to remove any extraneous material from the balance pan.

4.5.2 All items and compounds placed on the balance must be at room temperature -- this can come into play when weighing dried compounds. Cool dried compounds in a desiccator before weighing them on the balance.

4.5.3 If you are making repeated weightings in the same container, you are usually better off tarring the empty balance and recording the mass of the empty container. Then, record the mass of the container plus sample, and calculate the mass of the sample by difference.

4.5.4 If you are instructed to "accurately weigh" something, use one of the balances that go out to 4 decimal places. These are referred to as analytical balances (although they are also electronic). Because the analytical balances go out to 4 decimal places, the maximum capacity is usually small (60g or 180g). Therefore, use only weighing boats or weighing paper as containers on the analytical balances. On the electronic balance that goes out to 3 decimal places, you can often use small beakers or flasks as containers.

4.5.5 Calibration of a weigh balance may only be performed by a professional calibration service.

4.5.6 NIST traceable reference weights must be calibrated using a professional calibration service.

5. MATERIALS AND EQUIPMENT:

5.1 Analytical Balance

5.2 NIST traceable weights

6. RESPONSIBILITIES:

6.1 All laboratory staff that use electronic/digital balance

6.2 Biomedical Engineers

7. APPENDICES:

N/A

8. REFERENCES:

8.1 Analytical Methods Committee, Royal Society of Chemistry 1992 Proficiency testing of analytical laboratories. The Analyst, 117, 97-104.

8.1 ISO 1994 Quality Management and Quality Assurance-a Vocabulary. International Standard ISO 8402, International Organization for Standardization, Geneva.

8.1 Mesley, R.J., Pockington, W.D. and Walker, R.F. 1991 Analytical quality assurance-a review, The Analyst, 116, 975-990.

9. APPROVALS:

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