

Electronic Weighing Scales

Weight record is essential to monitor the adequacy of nutrition as well as fluid balance. Accurate weighing scale is a fundamental need for all special care neonatal units and delivery rooms. Recording weight at birth and daily is essential for the management of Very Low Birth Weight (VLBW) babies. Weight of birth is the single most useful predictor of neonatal morbidity and mortality. Birth weight helps in identifying the level of care required for the baby and classification into weight for dates categories. Babies below 2000 grams have special needs and need nursery care. Small for dates and large for dates babies also need special newborn care. Hence, a weighing scale for measuring the weight at birth is essential for all facilities where deliveries take place and where neonates are looked after.

Indications

- All babies at birth.
- All LBW babies at 2 weeks (to check regaining of the birth weight), 4 weeks (to ascertain a weight gain of 80-100 g/kg per week) and then every month.
- Sick newborn once or twice a day.
- VLBW (<1500 g) babies once or twice daily to monitor fluid therapy.
- Measuring urine output by pre-weighed napkins.

Sick and VLBW babies need daily weighing to decide fluid requirements, drug dosages and weight gain patterns. Excessive weight gain would raise suspicion of fluid overload or of congestive cardiac failure / acute renal failure. Sudden weight loss in a baby who had been gaining weight satisfactorily suggests the possibility of dehydration. Adequate daily weight gain in a newborn is a sensitive index of its well being. Term babies lose about 10% of birth weight and regain birth weight at 7 to 10 days of age while preterm babies lose weight during the first 3-4 days of life and can lose upto 10-15 percent of the birth weight and regain birth weight usually by 14 days of age. After the initial weight loss, babies start gaining weight at a rate of 1-1.5% of birth weight per day. Scales with an accuracy of ± 5 gm are essential in the weight of monitoring of VLBW babies. Newborn units that manage babies under 1000g in weight need weighing scale with accuracy of 1 gm. Excessive weight loss, delay in regaining birth weight or slow weight gain suggest that either the baby is not being fed adequately or the newborn is unwell and needs attention.

A weighing scale can be employed to measure the urine output of the babies. Pre-weighed nappies should be used for nursing babies. Weighing the nappies post voiding would be helpful in assessing the urine output of sick babies. Weighing a baby pre and post feed is helpful in assessing adequacy of feeding in breast fed newborns.

Desirable specifications

- Table top, light and portable.
- Built in rechargeable battery.
- Hygienic, easy to clean baby tray.
- Acrylic (non metallic) baby tray.
- Reproducible weights.
- Resolution of ± 5 g (optional ± 1 gm).
- Freeze reading display.
- Zero weight adjustment facility.
- Quick, clear digital read outs.
- Measurement does not change with position of baby on the pan.

Types of weighing scales

- 1) Spring balance
- 2) Beam balances
- 3) Electronic weighing scales (preferable)

In all weighing scales there is a weight sensitive device attached beneath the baby pan, a spring for a conventional spring balance weighing scale and an electronic sensor for a electronic weighing scale. For most scales the baby should be placed in the center of the pan for an accurate reading and the reading may vary with the position of the baby on the pan. Newer electronic scales have tried to overcome this disadvantage of position variation by using a special type of electronic weight measuring device (called load cell). In weighing scales with this facility the baby may be placed anywhere on the baby pan and the reading will always be the same. Newer scales have the option to measure the weight in different units of measurement like pounds, grams and kilograms.

Electronic weighing scales are preferable to spring balance scales because of greater reproducibility, reliability and resolution. They also provide quick digital readout.

Procedure

1. Clean the baby tray and put the weighing scale on a flat, stable surface.
2. Record weight prior to feeding.
3. Detach as many tubes/equipment as possible. Keep the naked baby on the towel and record the weight (subtract the weight of the towel if the scale has no facility to zero).
4. Keep baby in middle of scale pan; hold the remaining tubes and lines in hand.
5. Use separate sterile towel for each baby.
6. If using pre-weighed splint, reduce the weight from baby's weight.
7. For quality assurance check accuracy of weighing scale with standard known weights every week.

Operating instructions

- 1) The weighing pan should be cleaned before weighing each baby
- 2) Connect to the mains and switch on the machine
- 3) The digital display will show some figure
- 4) Place a sterile towel or paper on the pan to reduce the chances of hypothermia and cross infection.
- 5) Adjust the digital display to zero by manually adjusting the knob. Some weighing scales have automatic zero facility.
- 6) Place the infant on the towel/ paper, in the middle of the pan.
- 7) Note the reading on the digital display. Freeze reading facility will continue to show the reading even after the infant is removed from the scales.
- 8) The machine should be switched off after use.
- 9) Do not press the weighing pan with your hand. It could damage the load cell system in the weighing machine.

Cleaning instructions

Avoid strong solutions. It can be done by soap and water or spirit. Spirit swabs can be used for cleaning the tray between patients use.

Troubleshoot and alarms

Read the instruction manual provided by the manufacturer. Different manufacturers have different types of display words for alarms. Common alarms include low battery and overload,

**Remember overloading on the weighing scale is harmful and will damage the functioning of machine.*