APPENDIX 4

Formulae

ETT tube size and position (p. 3)
Neonates Table 32.1 p. 435

Tube size (internal diameter) = (age/4) + 4 mm (for patients over 1 year of age)
Depth of insertion is approximately (age/2) + 12 cm from the lower lip

Anion gap (p. 76)

Anion gap = Na – bicarbonate – Cl

Bicarbonate administration (pp. 76, 83, 303)

mmol of HCO_3 required = basic deficit (mmol/L) × weight (kg) × 0.3 (child)
mmol of HCO_3 required = basic deficit (mmol/L) × weight (kg) × 0.5 (newborn)
Infuse half with cardiac monitoring, then reassess.

Dose Na replacement (p. 82)

Dose of Na^+ (mmol) = bodyweight × 0.8 × (140 – current serum Na^+)

Additives (p. 84)

Molar potassium chloride (0.75 g in 10 mL) = 1 mmol/mL of K^+ and Cl^-
Sodium chloride (20%) = 3.4 mmol/mL of Na^+ and Cl^-
Molar sodium bicarbonate (8.4%) = 1 mmol/mL of Na^+ and HCO_3^-
Calcium gluconate 10% = 0.22 mmol/mL of Ca^{2+}, which is 8.9 mg/mL of Ca^{2+}
Magnesium chloride for injection (0.48 g anhydrous in 5 mL) = 1 mmol/mL of Mg^{2+}

Conversion factors (p. 84)

Sodium chloride 1 g contains 17 mmol Na and 17 mmol Cl
Potassium chloride 1 g contains 13 mmol K and 13 mmol Cl
Sodium bicarbonate 1 g contains 12 mmol Na and 12 mmol HCO_3

Formulae (p. 84)

Anion gap = Na – (bicarbonate + Cl); normal <12
Number mmol = mEq/valence = mass (mg)/mol. wt
Sodium deficit: mL 20% NaCl = wt × 0.2 × (140 – serum Na)
Water deficit (mL) = 600 × wt (kg) × [1 – (140/Na)] (if body Na normal)
Non-catabolic anuria: urea rises of 3–5 mmol/L per day

kcal (p. 92)

$$\text{kcal} = \frac{\text{mJ} \times 1000}{4.2}$$

Estimated weight

Weight = (age + 4) × 2

Surface area (pp. 374, 564)

$$\text{Surface area } (m^2) = \sqrt{\frac{\text{height(cm)} \times \text{weight(kg)}}{3600}}$$

BMI (p. 106)

BMI = bodyweight in kg divided by the square of height in metres (kg/m^2). Standard growth charts now include BMI centile charts.

- Overweight = BMI between 85–95th centile for age and sex.
- Obesity = BMI greater than 95th centile for age and sex.

Osmolality (pp. 300, 303)

Calculated values

Serum osmolality = $(Na^+ \times 2)$ + glucose + urea

Adjusted Na^+ = plasma $Na^+ + 0.3 \times$ (plasma glucose − 5.5)

Normal (270 − 295 mmol/L)

Transfusion volume (pp. 372, 378)

Packed red cells (mL) = weight (kg) × Hb rise required (g/L) × 0.4