Equations to remember:

$$BSA = \frac{\sqrt{height(cm) \times mass(kg)}}{60} = \frac{\sqrt{h \times m}}{60} \quad (1)$$

$$Dose = \frac{BSA(m^2) \times usual\ dose}{1.73m^2} \quad (2)$$

A dose of Doxorubicin is 30mg/m^2. How many mg does a 44lb, 40in child need?

First convert lb→kg and in→cm

$$\frac{44lb}{} \times \left(\frac{1kg}{2.2lb} \right) = 20kg$$

$$\frac{40in}{} \times \left(\frac{2.54cm}{1in} \right) = 101.6cm$$

So, let's look all variables.

$$h = 101.6cm$$
$$m = 20kg$$
$$dose = 30mg/m^2$$

First we need to calculate the BSA. The units in this equation don't work, so just slap on m^2 at the end.

$$BSA = \frac{\sqrt{h \times m}}{60} = \frac{\sqrt{101.6cm \times 20kg}}{60} = 0.751m^2$$

Now determine the dose based on the BSA.

$$\frac{0.751m^2}{} \times \left(\frac{30mg}{m^2} \right) = \underline{\underline{22.5mg}}$$

The doctor has ordered a medication with an average adult dose of 100mg. Calculate the dose for a child who is 100cm tall and has a mass of 20kg.

So, let's look all variables.

$$h = 100cm$$
$$m = 20kg$$
$$usual\ dose = 100mg$$

First we need to calculate the BSA.

$$BSA = \frac{\sqrt{h \times m}}{60} = \frac{\sqrt{100cm \times 20kg}}{60} = 0.745m^2$$

Now we'll use equation 2 from up top.

$$Dose = \frac{BSA(m^2) \times usual\ dose}{1.73m^2}$$

$$Dose = \frac{0.745m^2 \times 100mg}{1.73} = \underline{\underline{43.1mg}}$$

An anticancer treatment includes methotrexate, 35mg/m^2. How many mg would a 5ft 5in, 165lb patient receive during his course of therapy?

First convert lb→kg and in→cm

$$\underline{165lb} \times \left(\frac{1kg}{2.2lb}\right) = 75kg$$

5'5" = 65in

$$\underline{65in} \times \left(\frac{2.54cm}{1in}\right) = 165.1cm$$

Now look at our variables and calculate BSA

$$m = 75kg$$

$$h = 165.1cm$$

$$dose = 35mg/m^2$$

$$BSA = \frac{\sqrt{h \times m}}{60} = \frac{\sqrt{165.1cm \times 75kg}}{60} = 1.85m^2$$

Now using the dose/m^2 calculate the actual dose for our patient.

$$\underline{1.85m^2} \times \left(\frac{35mg}{m^2}\right) = \underline{\underline{64.9m^2}}$$

Rx

Vincristine	0.4mg/day, IV days 1-4
Doxorubicin	9mg/m^2/day, IV days 1-4
Dexamethasone	40mg/day, p.o. days 1-4, 9-12, 17-20

Calculate the total dose of each drug through the course of treatment for a patient with BSA=1.5m^2.

Vincristine

$$usual\ dose = 0.4mg/day$$

$$duration = 4days$$

$$BSA = 1.5m^2$$

Calculate the dose for four days.

$$dose = \frac{BSA \times usual\ dose}{1.73m^2} = \frac{1.5m^2 \times 0.4mg/day}{1.73m^2} \times 4days = \underline{\underline{1.39m^2}}$$

Doxorubican

$$dose = 9mg/m^2/day$$
$$duration = 4days$$
$$BSA = 1.5m^2$$

$$\underline{1.5m^2} \times \left(\frac{9mg}{m^2 \cdot day} \right) \times \underline{4days} = \underline{\underline{54mg}}$$

Dexamethasone

$$usual\ dose = 40mg/day$$
$$duration = 12days$$
$$BSA = 1.5m^2$$

Calculate the dose for 12 days.

$$dose = \frac{BSA \times usual\ dose}{1.73m^2} = \frac{1.5m^2 \times 40mg/day}{1.73m^2} \times 12days = \underline{\underline{416.2m^2}}$$