

Chapter 07: Methods of Calculation for Individualized Drug Dosing
Kee: Clinical Calculations: With Applications to General and Specialty Areas, 9th Edition

OTHER

Body Surface Area by Square Root

- Order: cyclophosphamide 500 mg/m² in 500 mL of normal saline solution (NSS) over 90 minutes
Patient height and weight: 5 ft 10 in, 142 lb
Drug available: cyclophosphamide 100 mg dilute with 5 mL of sterile water; yields 20 mg/mL
 - What is the patient's body surface area (BSA) (m²)?
 - What is the total dose?
 - How many milliliters should you prepare?

ANS:

- $\sqrt{\frac{70 \times 142}{3131}} = 1.78 \text{ m}^2$
- $500 \text{ mg/m}^2 \times 1.78 \text{ m}^2 = 890 \text{ mg}$
- FE: $890 \text{ mg}/100 \text{ mg} \times 5 \text{ mL} = 44.5 \text{ mL}$

OR

$$\text{BF: } \frac{D}{H} \times V = \frac{890 \text{ mg}}{100 \text{ mg}} \times 5 \text{ mL} = 44.5 \text{ mL}$$

- Order: cisplatin 50 mg/m² in 500 mL of NSS intravenously over 90 minutes
Patient height and weight: 5 ft 6 in, 160 lb
Drug available: cisplatin 100 mg/100 mL
 - What is the patient's BSA (m²)?
 - What is the total dose?
 - How many milliliters should you prepare?

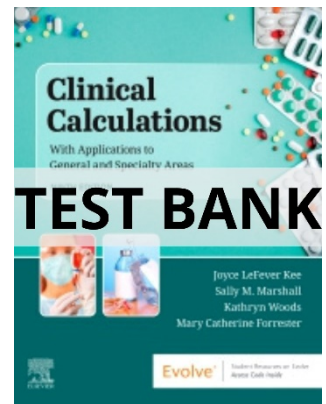
ANS:

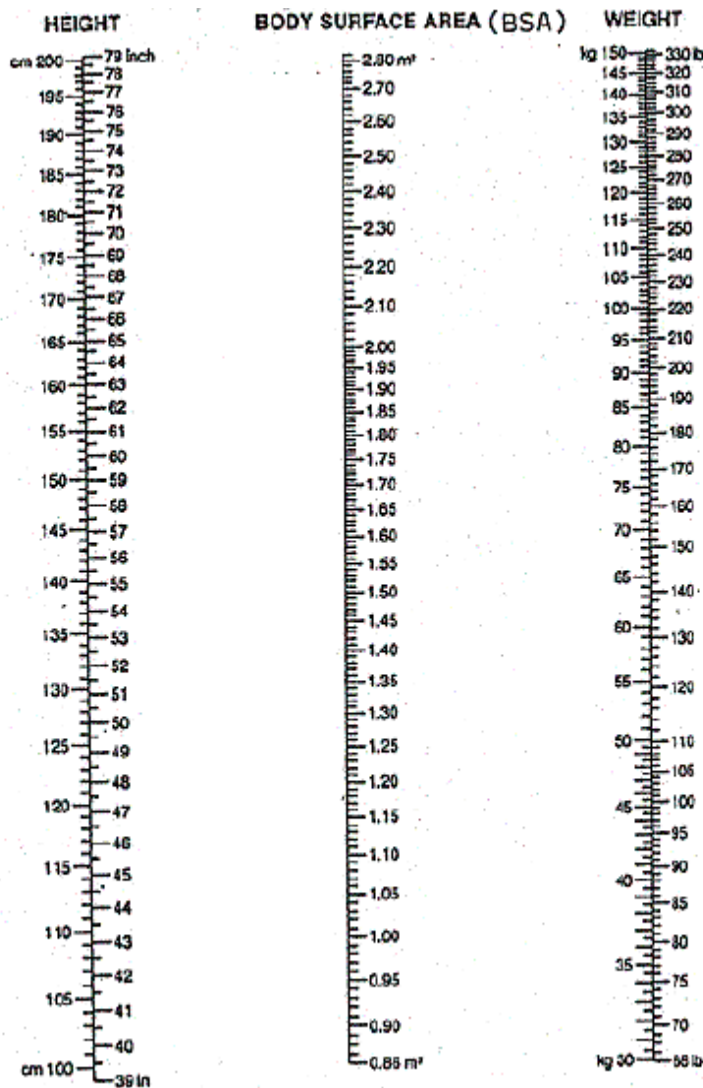
- $\sqrt{\frac{66 \times 160}{3131}} = 1.84 \text{ m}^2$
- $50 \text{ mg} \times 1.84 \text{ m}^2 = 92 \text{ mg}$
- FE: $92 \text{ mg}/100 \text{ mg} \times 100 \text{ mL} = 92 \text{ mL}$

OR

$$\text{BF: } \frac{D}{H} \times V = \frac{92 \text{ mg}}{100 \text{ mg}} \times 100 \text{ mL} = 92 \text{ mL}$$

- For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.





Give dacarbazine $250 \text{ mg/m}^2/\text{day} \times 5 \text{ days}$.

Patient height: 5 ft 10 in

Patient weight: 173 lb

What is the daily dose with

a. square root method?

b. nomogram?

ANS:

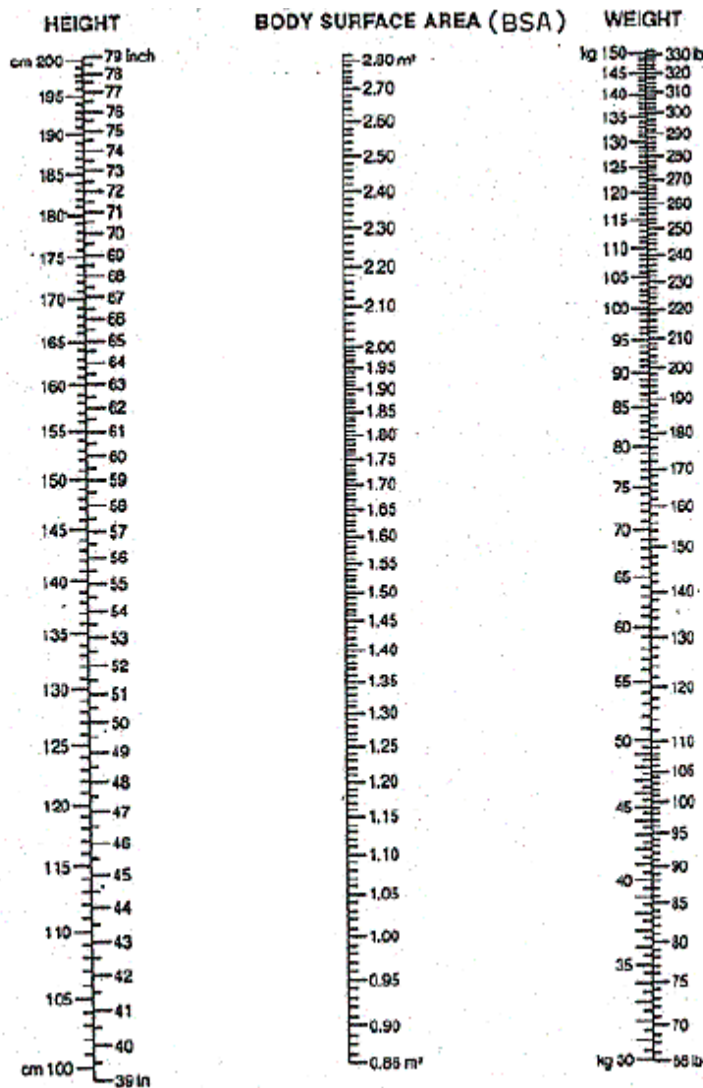
a.
$$\sqrt{\frac{70 \times 173}{3131}} = \sqrt{3.8677} = 1.97 \text{ m}^2$$

$250 \text{ mg/m}^2/\text{day} \times 1.97 \text{ m}^2 = 493 \text{ mg/day}$

b. Height 70 in, weight 173 lb, intersects 2.02 m^2

$250 \text{ mg/m}^2/\text{day} \times 2.02 \text{ m}^2 = 505 \approx 500 \text{ mg/day}$

4. For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.



Give 5-fluorouracil 450 mg/m²/wk.

Patient height: 5 ft 6 in

Patient weight: 210 lb

What is the weekly dose with

a. square root method?

b. nomogram?

ANS:

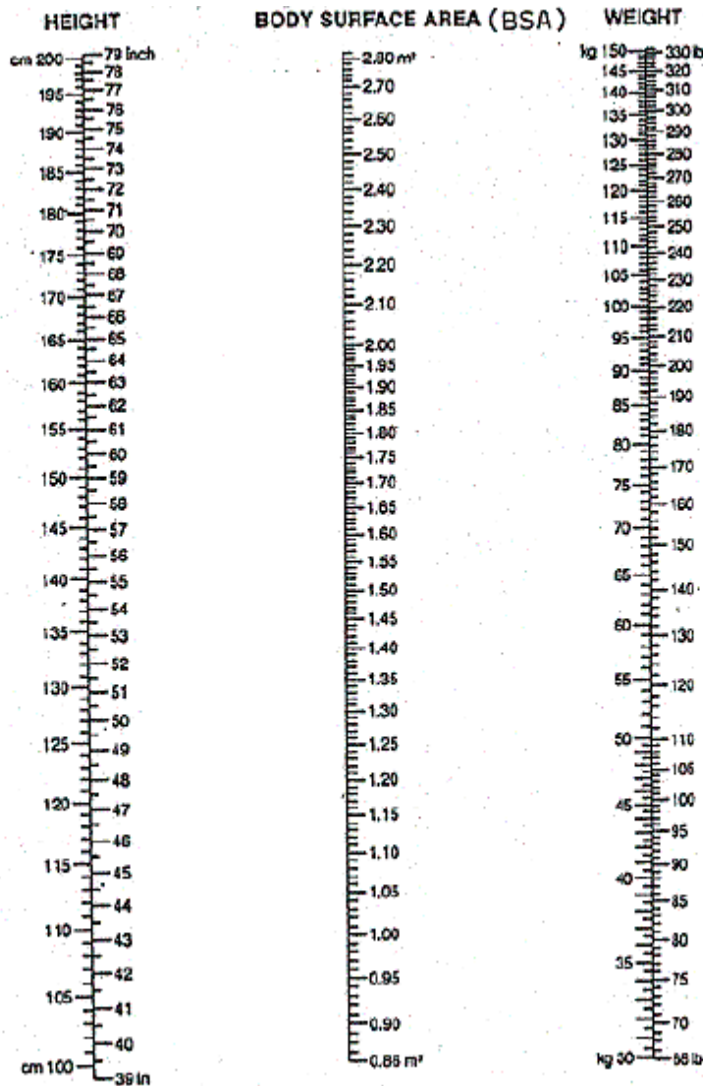
a.
$$\sqrt{\frac{66 \times 210}{3131}} = \sqrt{4.43} = 2.10 \text{ m}^2$$

$450 \text{ mg/m}^2/\text{wk} \times 2.10 \text{ m}^2 = 945 \text{ mg/wk}$

b. Height 66 in, weight 210 lb, intersects 2.04 m²

$450 \text{ mg/m}^2/\text{wk} \times 2.04 \text{ m}^2 = 918 \approx 920 \text{ mg/wk}$

5. For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.



Give leucovorin 200 mg/m²/wk.

Patient height: 5 ft 6 in

Patient weight: 210 lb

What is the weekly dose with

a. square root method?

b. nomogram?

ANS:

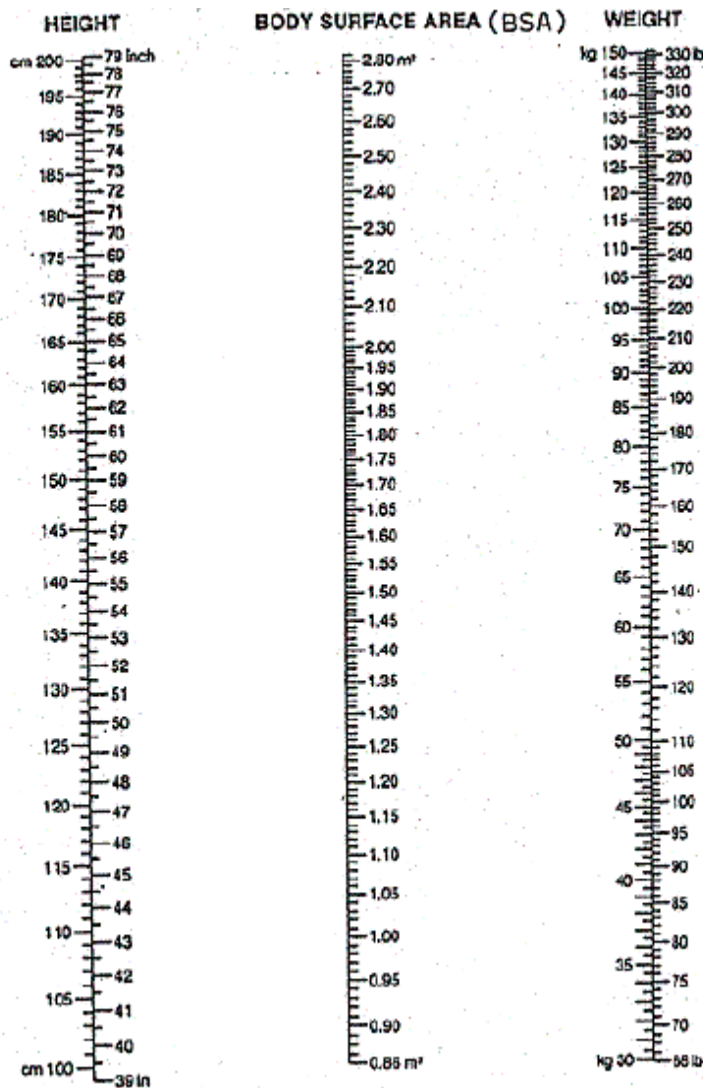
a.
$$\sqrt{\frac{66 \times 210}{3131}} = \sqrt{4.43} = 2.10 \text{ m}^2$$

$200 \text{ mg/m}^2/\text{wk} \times 2.10 \text{ m}^2 = 420 \text{ mg/wk}$

b. Height 66 in, weight 210 lb, intersects 2.04 m²

$200 \text{ mg/m}^2/\text{wk} \times 2.04 \text{ m}^2 = 408.00 \approx 400 \text{ mg/wk}$

6. For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.



Give cisplatin $30 \text{ mg/m}^2/\text{day} \times 3 \text{ days}$.

Patient height: 70 in

Patient weight: 80 kg

What is the daily dose with

- square root method?
- nomogram?

ANS:

a. $80 \text{ kg} \times 2.2 = 176 \text{ lb}$

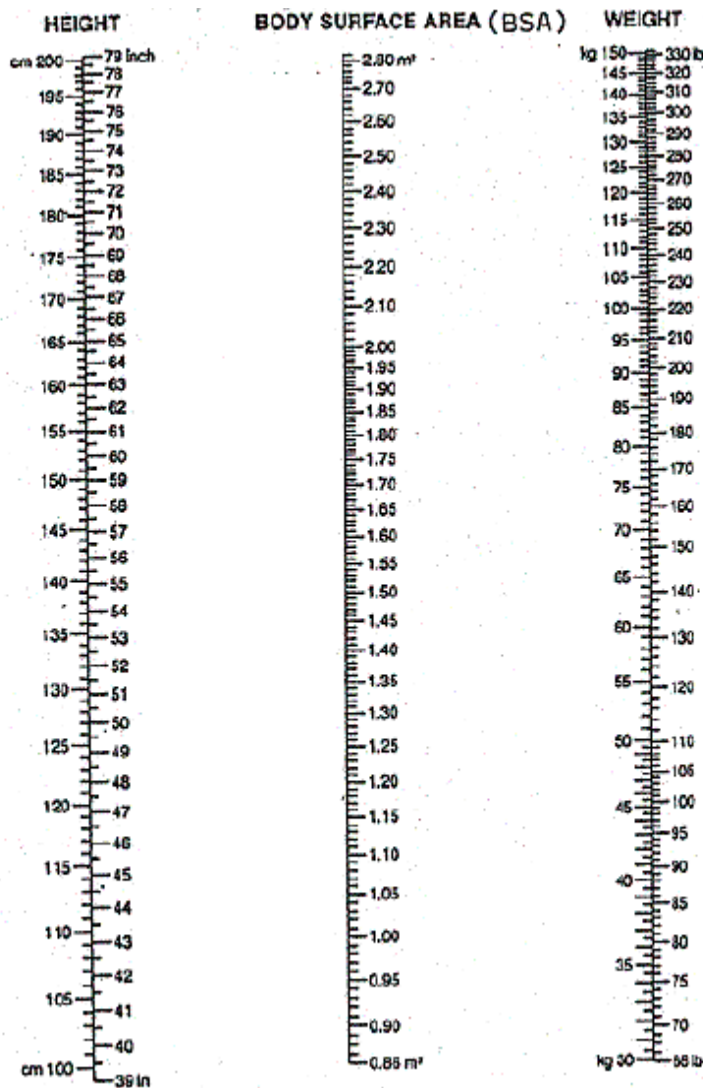
$$\sqrt{\frac{70 \times 176}{3131}} = \sqrt{3.93} = 1.98 \text{ m}^2$$

$$30 \text{ mg/m}^2/\text{day} \times 1.98 \text{ m}^2 = 59.4 \approx 59 \text{ mg/day}$$

b. Height 70 in, weight 80 kg, intersects 2.08 m^2

$$30 \text{ mg/m}^2/\text{day} \times 2.08 \text{ m}^2 = 62.4 \approx 62 \text{ mg/day}$$

- For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.



Give cisplatinum 80 mg/m²/wk.

Patient height: 6 ft 2 in

Patient weight: 186 lb

What is the weekly dose with

a. square root method?

b. nomogram?

ANS:

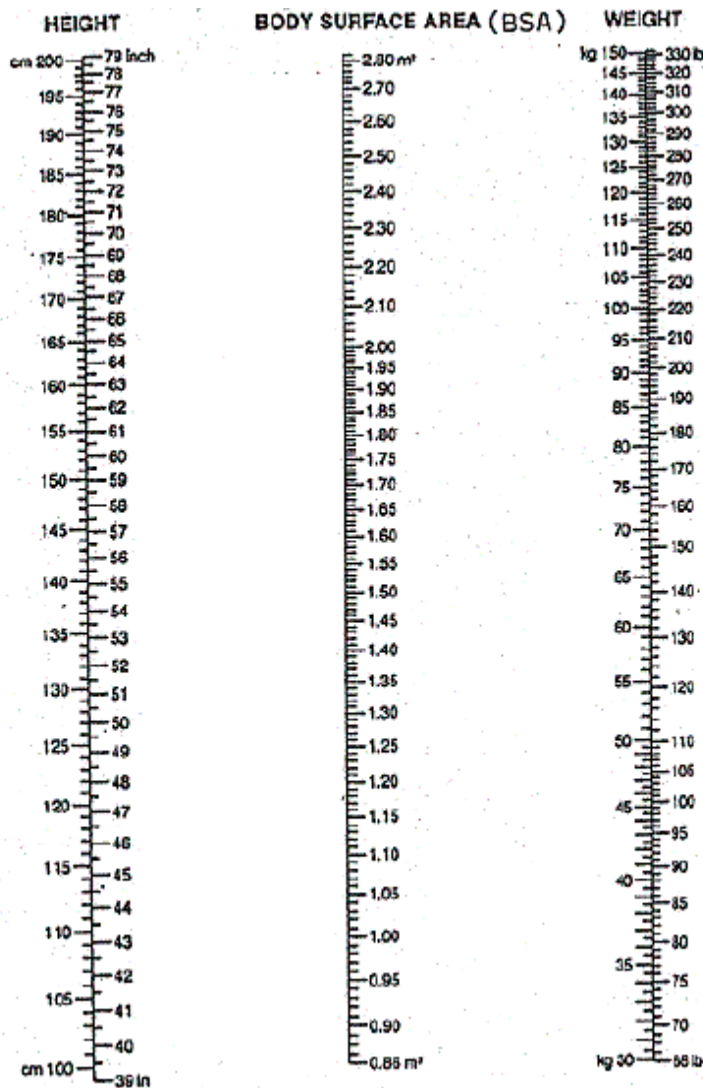
a.
$$\sqrt{\frac{74 \times 186}{3131}} = \sqrt{4.39} = 2.09 \text{ m}^2$$

$80 \text{ mg/m}^2/\text{wk} \times 2.09 \text{ m}^2 = 167.2 \text{ mg/wk}$

b. Height 74 in, weight 186 lb, intersects 2.10 m²

$80 \text{ mg/m}^2/\text{wk} \times 2.10 \text{ m}^2 = 168 \approx 170 \text{ mg/wk}$

8. For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.



Give etoposide 120 mg/m²/wk.

Patient height: 74 in

Patient weight: 70 kg

What is the weekly dose with

- square root method?
- nomogram?

ANS:

a. $70 \text{ kg} \times 2.2 = 154 \text{ lb}$

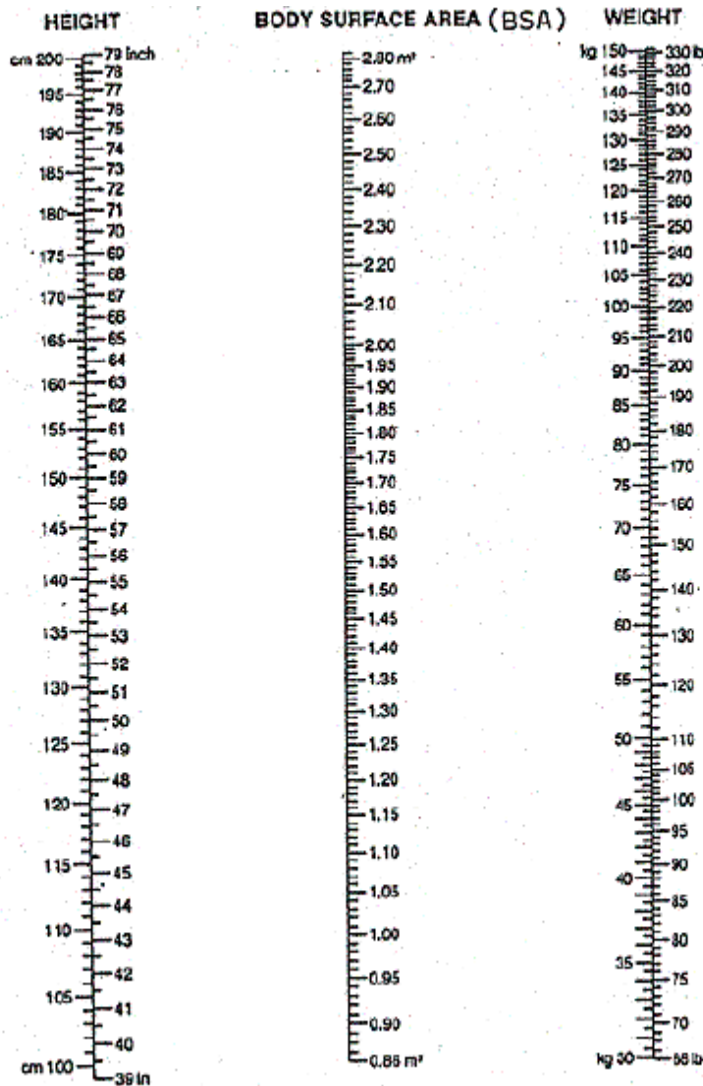
$$\sqrt{\frac{74 \times 154}{3131}} = \sqrt{3.639} = 1.91 \text{ m}^2$$

$120 \text{ mg/m}^2/\text{wk} \times 1.91 \text{ m}^2 = 229.2 \text{ mg/wk}$

b. Height 74 in, weight 70 kg, intersects 2.06 m²

$120 \text{ mg/m}^2/\text{wk} \times 2.06 \text{ m}^2 = 247.2 \approx 250 \text{ mg/wk}$

9. For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.



Give Cytoxan 600 mg/m²/wk.

Patient height: 70 in

Patient weight: 85 kg

What is the weekly dose with

a. square root method?

b. nomogram?

ANS:

a. $85 \text{ kg} \times 2.2 = 187 \text{ lb}$

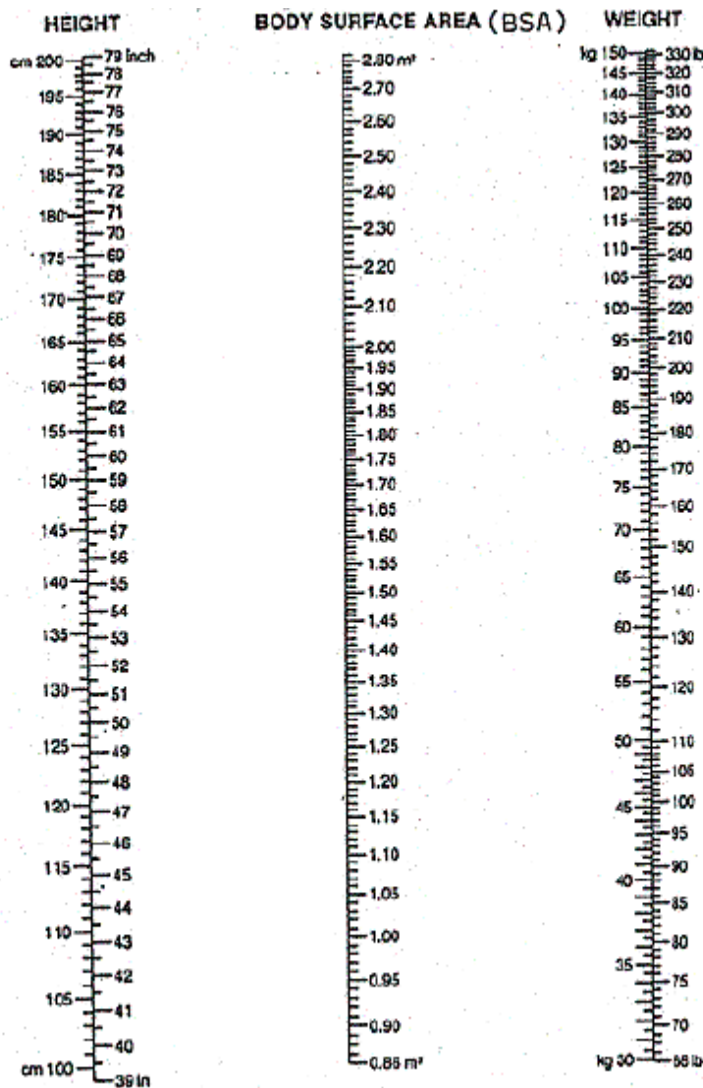
$$\sqrt{\frac{70 \times 187}{3131}} = \sqrt{4.18} = 2.04 \text{ m}^2$$

$600 \text{ mg/m}^2/\text{wk} \times 2.04 \text{ m}^2 = 1224 \text{ or } 1225 \text{ mg/wk}$

b. Height 70 in, weight 85 kg, intersects 2.08 m²

$600 \text{ mg/m}^2/\text{wk} \times 2.08 \text{ m}^2 = 1248 \approx 1250 \text{ mg/wk}$

10. For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.



Give Adriamycin 60 mg/m²/wk.

Patient height: 70 in

Patient weight: 80 kg

What is the weekly dose with

a. square root method?

b. nomogram?

ANS:

a. $80 \text{ kg} \times 2.2 = 176 \text{ lb}$

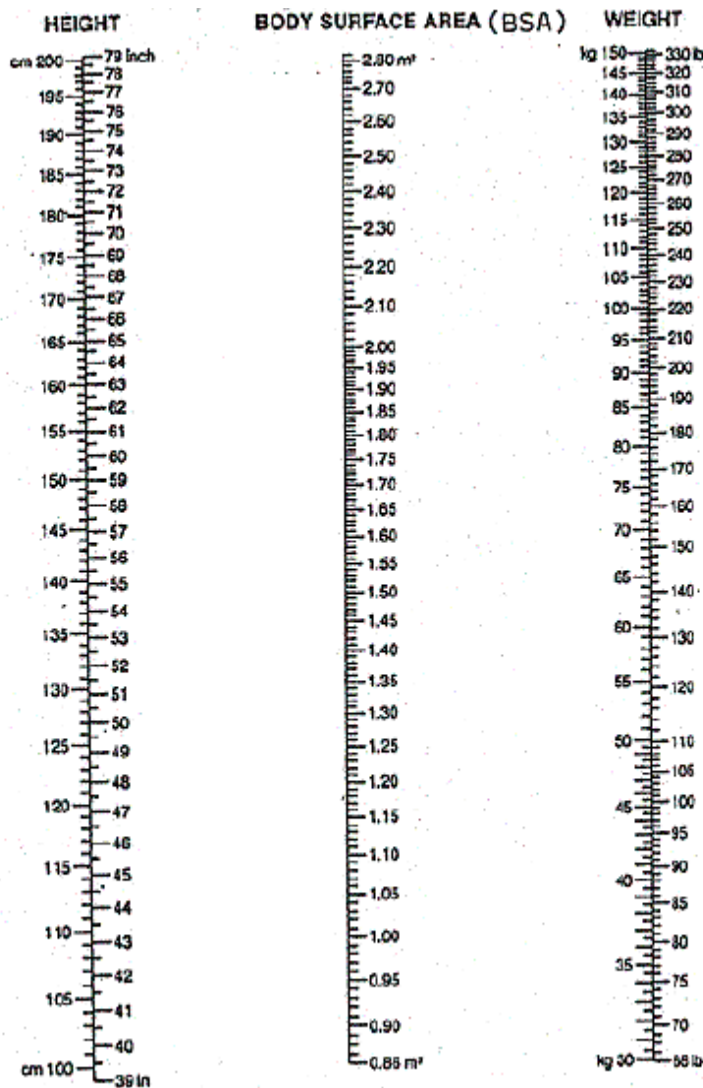
$$\sqrt{\frac{70 \times 176}{3131}} = \sqrt{3.93} = 1.98 \text{ m}^2$$

$60 \text{ mg/m}^2/\text{wk} \times 1.98 \text{ m}^2 = 118.8 \text{ mg/wk} = 119 \text{ mg/wk}$

b. Height 70 in, weight 80 kg, intersects 2.04 m²

$60 \text{ mg/m}^2/\text{wk} \times 2.04 \text{ m}^2 = 122.4 \text{ mg/wk}$

11. For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.



Give vincristine 2 mg/m²/week.

Patient height: 62 in

Patient weight: 75 kg

What is the weekly dose with

- square root method?
- nomogram?

ANS:

a. $75 \text{ kg} \times 2.2 = 165 \text{ lb}$

$$\sqrt{\frac{62 \times 165}{3131}} = \sqrt{3.27} = 1.81 \text{ m}^2$$

$2 \text{ mg/m}^2/\text{wk} \times 1.81 \text{ m}^2 = 3.62 = 3.6 \text{ mg/wk}$

b. Height 62 in, weight 75 kg, intersects 1.78 m²

$2 \text{ mg/m}^2/\text{wk} \times 1.78 \text{ m}^2 = 3.56 \approx 3.6 \text{ mg/wk}$

12. For the following questions, use the square root method and/or nomogram. Note discrepancies between methods.