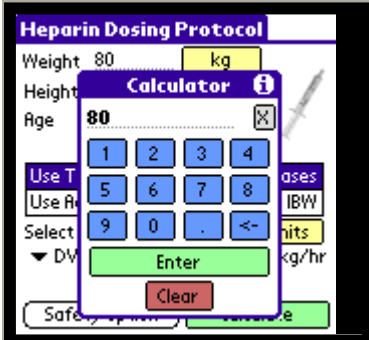


# HEPARIN DOSING NOMOGRAM

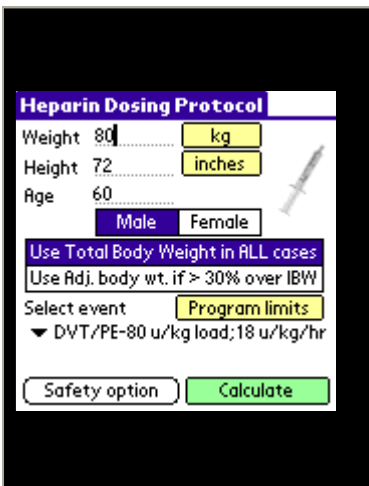
This software application automates the calculations required for managing a patient on a weight-based heparin nomogram. The user may select the standard Raschke nomogram (see references below) or a modified version of this nomogram.

1. Hirsh J, Raschke RA. Heparin and Low-Molecular-Weight Heparin: The Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. Chest. 2004;126:188S-203S.
2. Raschke RA, Reilly BM, Guidry JR, Fontana JR, Srinivas S. The weight-based heparin dosing nomogram compared with a standard care nomogram: a randomized controlled trial. Ann Intern Med 1993; 119:874-81.
3. The Sixth ACCP Consensus Conference on Antithrombotic Therapy. Chest 2001; 119: [Supp 1] 176s.



## Basic operation:

**Step 1)** Enter the weight of the patient. You will notice a pop-up entry keyboard as soon as you tap the entry area. The popup keyboard was designed to provide greater efficiency in entering the required data. Simply tap the desired numbers and then hit the [enter] key. After the entry is made, a simple tap of the [kg] button on the main screen will switch between kilograms or pounds.



**Step 2)** Next, enter the height and age of the patient.

**Step 3)** Next, select the sex of the patient. Note: this selection is necessary if the [adjusted body weight] option is selected.

IBW for female = 45.5 kg + 2.3kg for each inch > 60.

IBW for male = 50.0 kg + 2.3kg for each inch > 60.

Adjusted weight = [(Actual BW - IBW) 0.4] + IBW

**Step 4)** Select the dosing weight used in the calculations:

- a) Use total body weight in ALL cases or
- b) Use adjusted body weight if > 30% over the IBW.

Overall, there is a lack of consensus in the medical literature regarding the appropriate dosing weight in the morbidly obese patient. Recommendation: follow your local protocol.



**Step 5)** If your institution places limits on the maximum initial bolus dose or infusion rate, tap the [safety option] button found on the main screen to access the safety screen seen on the left.

You may alter the default values listed: 7500 units and 1800 units respectively. In order to enforce these restrictions, simply tap the box next to 'Use safety option' and then tap the [Done] button to return to the main screen. If you want to remove these restrictions, simply return to this screen and tap the 'Use safety option' again to remove the selection.



**Step 6a)** Next, select the weight-based nomogram that coincides with your local protocol.

**Option 1:**

Standard Raschke et al. nomogram<sup>1</sup>:

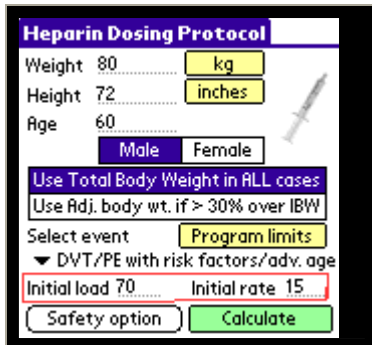
aPTT	Dose
Initial dose	80 U/kg bolus, then 18 U/kg/h
< 35 s	80 U/kg bolus, then 4 U/kg/h
35-45 s	40 U/kg bolus, then 2 U/kg/h
46-70 s†	No change
71-90 s	Decrease infusion rate by 2 U/kg/h
> 90 s	Hold infusion 1 h, then decrease infusion rate by 3 U/kg/h

1. Hirsh J, Raschke RA. Heparin and Low-Molecular-Weight Heparin: The Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. *Chest*. 2004; 126: 188S-203S.

**Option 2:**

'DVT/PE with risk factors/Advanced age'

This second option allows the user to modify the weight-based nomogram based on local protocol(s). This option may be especially useful if a less intensive regimen is desired in a patient with potential risk factors that may increase the risk of bleeding such as increased age (>70), malignancy, or recent trauma. See **step 6b** below.



**Step 6b)** If option 2 is selected above, you will immediately see the entries seen in the red box (see image). Here you can modify the initial bolus dose and the initial infusion rate. The default values are set at 70 units/kg (bolus) and an initial infusion rate of 15 units/kg/hr.

**Example:** The American College of Cardiology (ACC) recommends a heparin bolus of 60 to 70 U/kg (Max: 5,000 U) and an infusion of 12 to 15 U/kg/h (Max: 1000 units/hr) for acute coronary syndromes. Using the safety option above to limit the maximum dosages, and selecting option 2 above will allow you to quickly calculate these values. The default intervention levels found on the results screen will help titrate the dose in order to target an aPTT of 50-70 sec.

**Step 7)** After all the entries/selections are made, hit the [Calculate] button to display the finished nomogram.

**Important:** verify that the height, weight, initial bolus, and initial infusion rate match your previous entries.

**Results:** All of the results are rounded to the nearest 100 units. (*Most institutions use a standard heparin infusion concentration of 100 units/ml: 25,000 units/250 ml D5W*)

**Scrolling:** Simply tap the toggling icon in the lower right-hand corner of the screen to scroll through the results. Intervention levels are based on the Raschke nomogram.

**Editing entries:** In order to edit the original entries or selections or to simply return to the main screen, hit the [Done] button at the bottom of the results screen.

**Heparin dosing protocol** ⓘ

Height: 72 inches  
Weight: 80 kg  
Dosing weight: 80 kg

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Initial bolus dose (80 units/kg):  
6400 units  
Initial infusion rate (18 units/kg/hr):  
1400 units/hour

Done Warnings ⚠

**Heparin dosing protocol** ⓘ

**<35 seconds**  
Increase by 4 units/kg/hr  
300 units  
Rebolus with 80 units/kg  
6400 units  
Next aPTT in 6 hours

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**35 to 45 seconds**  
Increase by 2 units/kg/hr  
200 units

Done Warnings ⚠

**Heparin dosing protocol** ⓘ

**46 to 70 seconds**  
No change  
Next aPTT in 6 hours.

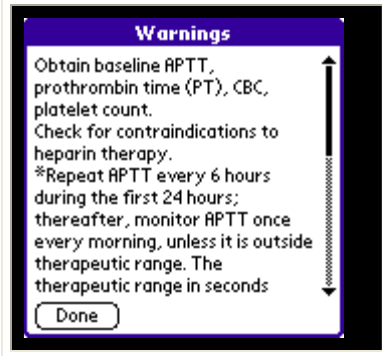
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**71 to 90 seconds**  
Decrease by 2 units/kg/hr  
200 units  
Next aPTT in 6 hours

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**>90 seconds**  
Stop infusion 1 hour. Decrease by 3

Done Warnings ⚠



**Warnings:**

Tapping the [Warning] button at the bottom of the results screen will pull up the following screen seen on the left. Here you will find some general monitoring recommendations and warnings. **IN ALL CASES,** you should follow your local protocol(s) and locally published monitoring criteria when managing a patient on heparin.