



Anesthesiology Crisis

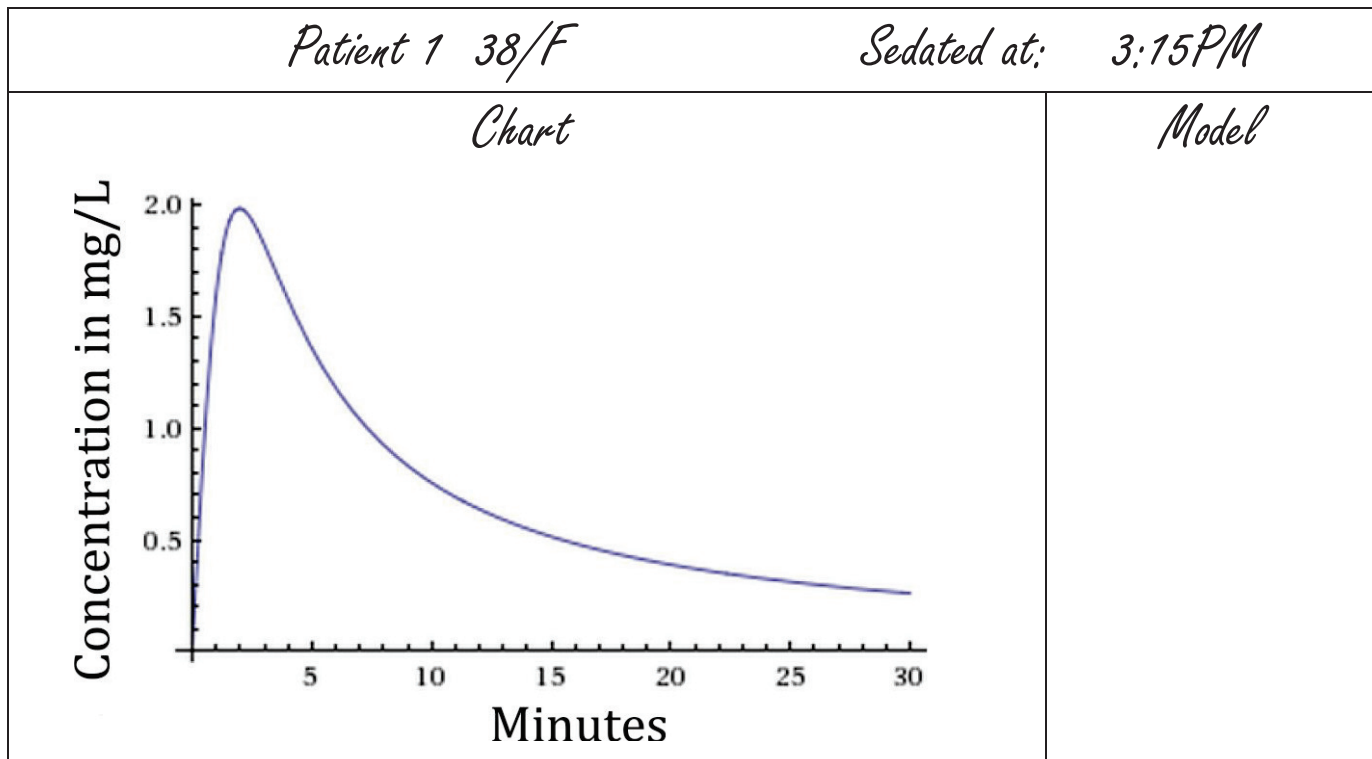
Just as an anesthesiologist begins their shift, a crisis scenario occurs. A patient has unexpectedly awoken from sedation in the middle of a procedure. The information from the previous shift is no longer reliable and they must quickly figure out the concentration of anesthesia in each patient's blood stream.

When a concentration of sedation is below 0.1 mg/L a patient is liable to wake up. You discover there has been a serious paperwork mishap and models were written for the incorrect patients. Currently there are six patients under sedation. You must use what you know about rational functions and modeling to determine which model belongs to which patient and determine when they will wake up.

Name _____

Date _____

Period _____



Conclusion

Based on the chart, when will the patient wake up?

At what approximately time will the patient awaken from the anesthesia?

If the patient is scheduled to be in surgery until 4:45, will more anesthesia need to be given?

Additional anesthesia must be administered 30 minutes before they would awaken. At what time will more anesthesia be needed?



Patient 2 14/F

Sedated at: 2:48PM

Model

Concentration Log

Minutes Since Dose(x)	Concentration in mg/L (y)
5	1.99
10	1.11
20	0.57
30	0.38
60	0.19
When will the concentration be ___ ?	
	0.4
	0.2
	0.1

Conclusion

Based on the model, at what time will the patient wake up?

If the patient is scheduled to have a procedure until 4:25, will she need more anesthesia? Additional anesthesia must be administered 30 minutes before they would awaken. At what time will more anesthesia be needed?

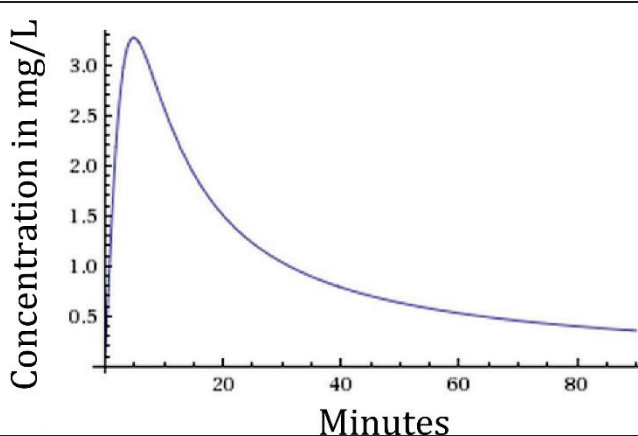


Patient 3 73/F

Sedated at: 11:56 AM

Model

Chart



Conclusion

Based on the model, at what time will the patient wake up?

If the patient is scheduled to have a procedure until 4:45, will she need more anesthesia? Additional anesthesia must be administered 30 minutes before they would awaken. At what time will more anesthesia be needed?



Patient 4 27/M

Sedated at: 10:15 AM

Model

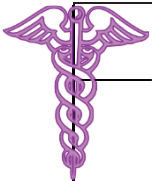
Concentration Log

Minutes Since Dose(x)	Concentration in mg/L (y)
5	4.02
30	1.27
60	0.65
90	0.43
120	0.32
When will the concentration be ___ ?	
	0.4
	0.2
	0.1

Conclusion

Based on the model, at what time will the patient wake up?

If the patient is scheduled to have a procedure until 5:15, will he need more anesthesia? Additional anesthesia must be administered 30 minutes before they would awaken. At what time will more anesthesia be needed?

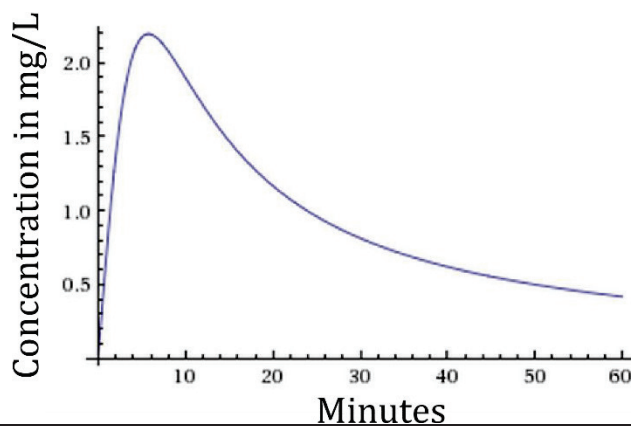


Patient 5 51/F

Sedated at: 12:55 PM

Model

Chart



Conclusion

Based on the model, at what time will the patient wake up?

If the patient is scheduled to have a procedure until 5:00, will she need more anesthesia? Additional anesthesia must be administered 30 minutes before they would awaken. At what time will more anesthesia be needed?

Patient 6 7/M

Sedated at: 2:55 PM



Model

Concentration Log

Minutes Since Dose(x)	Concentration in mg/L (y)
5	2.39
15	0.95
25	0.58
50	0.29
75	0.19
When will the concentration be ___ ?	
	0.4
	0.2
	0.1

Conclusion



















Based on the model, at what time will the patient wake up?

If the patient is scheduled to have a procedure until 5:50, will he need more anesthesia? Additional anesthesia must be administered 30 minutes before they would awaken. At what time will more anesthesia be needed?

Summary

Which patients will need additional anesthesia? Create a schedule for your day to ensure every patient is properly cared for.

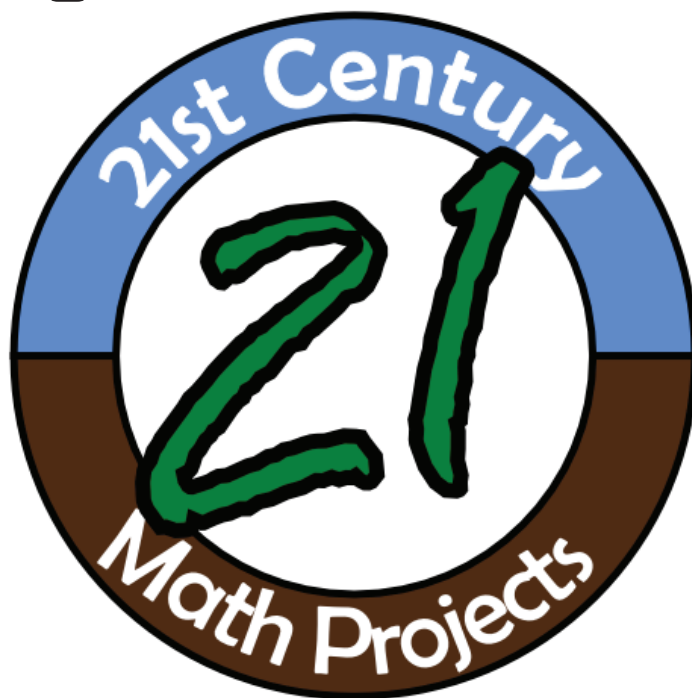
Models

  $A(x) = \frac{7.8x}{0.20x^2 + 4.7}$ 	  $B(x) = \frac{5.1x}{0.35x^2 + 1.9}$ 	  $C(x) = \frac{2.2x}{0.28x^2 + 1.1}$ 
  $D(x) = \frac{4.8x}{0.32x^2 + 6.3}$ 	  $E(x) = \frac{3.5x}{0.11x^2 + 2.6}$ 	  $F(x) = \frac{6.1x}{0.53x^2 + 2.1}$ 

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