

# CONVULSIONS

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Management after the neonatal period



# Objectives

- Recognising a convulsion
- To review the properties of commonly available drugs and their safety
  - Diazepam
  - Phenobarbitone
  - (Phenytoin loading dose or Midazolam infusion if available)
- To have a rational approach to their use in the convulsing child
- To understand the need for appropriate supportive care.

# Recognising a convulsion

This depends on your own observations

Sudden loss of consciousness

plus

jerking and uncontrolled movements of face and limbs

(sometimes twitching of eyes and mouth only)

may have irregular breathing and incontinence

# Partial and febrile convulsions

- A convulsion affecting one part or side of the body only may be a partial convulsion and in a febrile child is likely to be meningitis. Treat as such.
- Many children between 6 months - 6 years are liable to have a febrile convulsion. These are generalised and do not last longer than 20minutes. Treat with diazepam as below



# An easy seizure to miss



Take the covers off!





# Supportive care

- **Airway**
  - Positioning
  - Suction if necessary
  - Support after seizure
- **Breathing**
  - Oxygen
  - Check after seizure
- **Circulation**
  - Temperature gradient?
  - Severe Pallor?
- **Disability**
  - What drugs have been used?
  - Glucose?



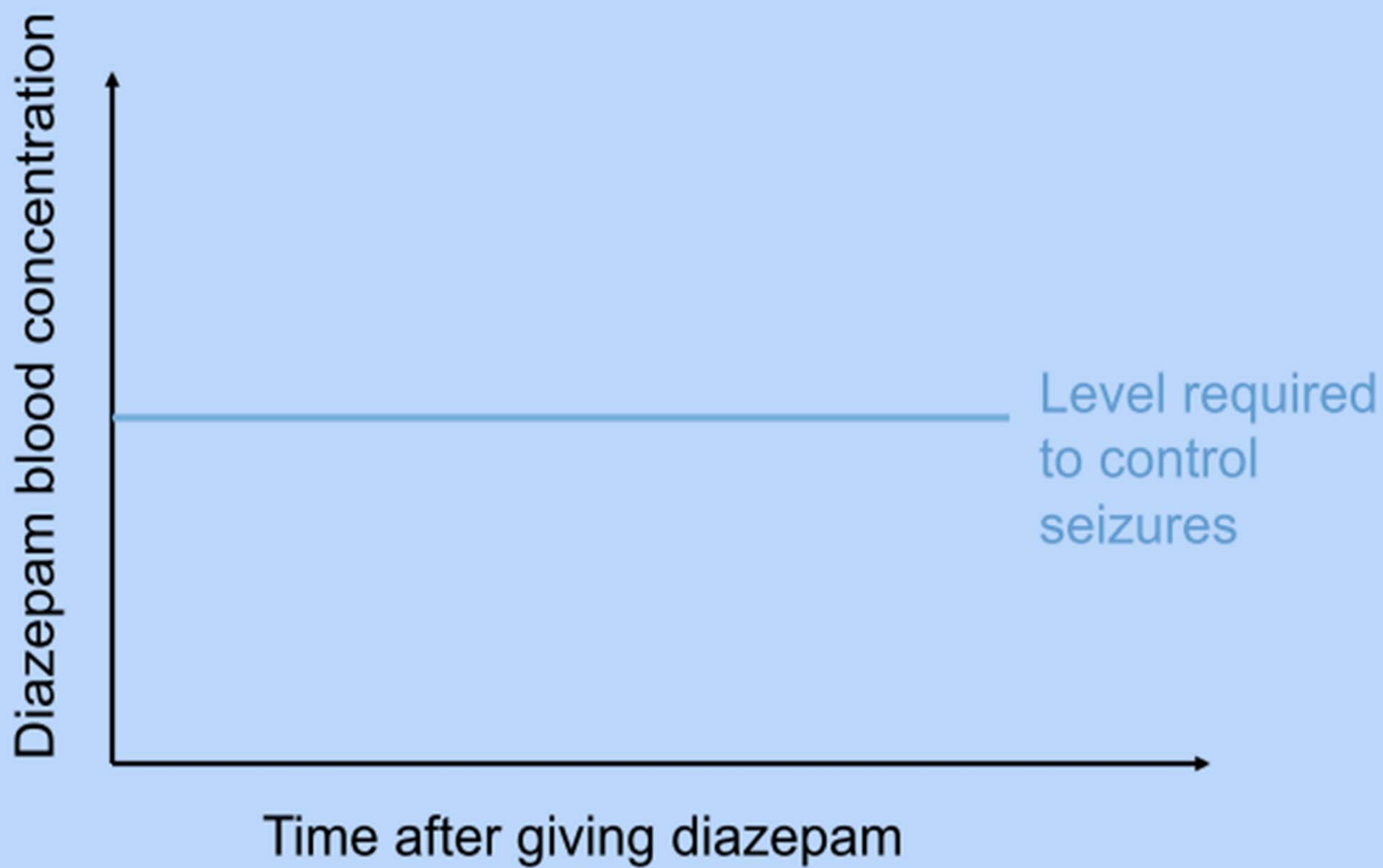
# Diazepam

- First choice: give only if the child is actually fitting at the time
- Half-life, 10-20 hours, longer in newborns.
  - Danger of accumulation
- Predominantly inactivated in the liver
- Can be given by iv and rectal routes

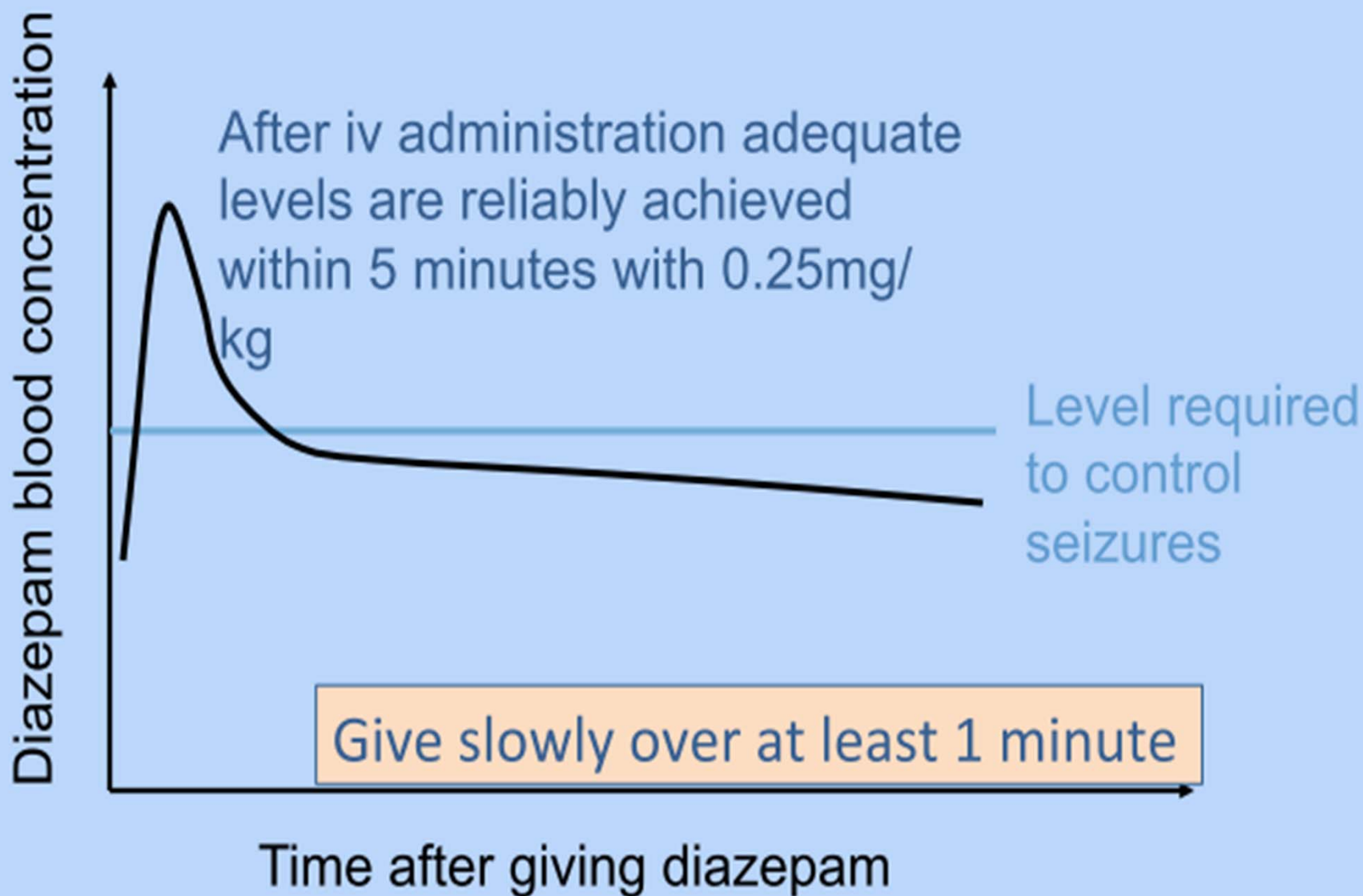
DO NOT USE DIAZEPAM IN FIRST TWO WEEKS OF LIFE



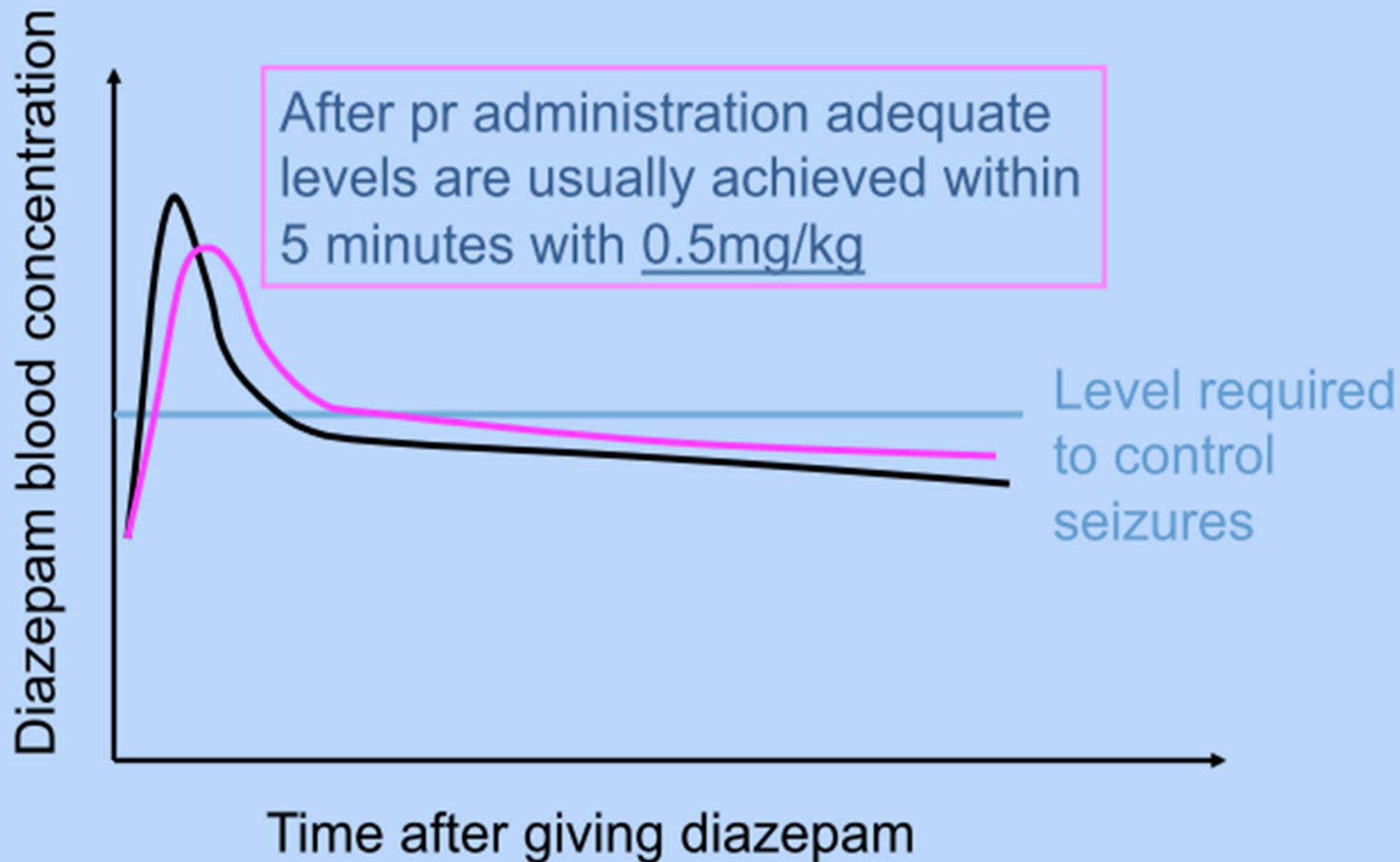
## Diazepam (cont)



# Diazepam intravenous

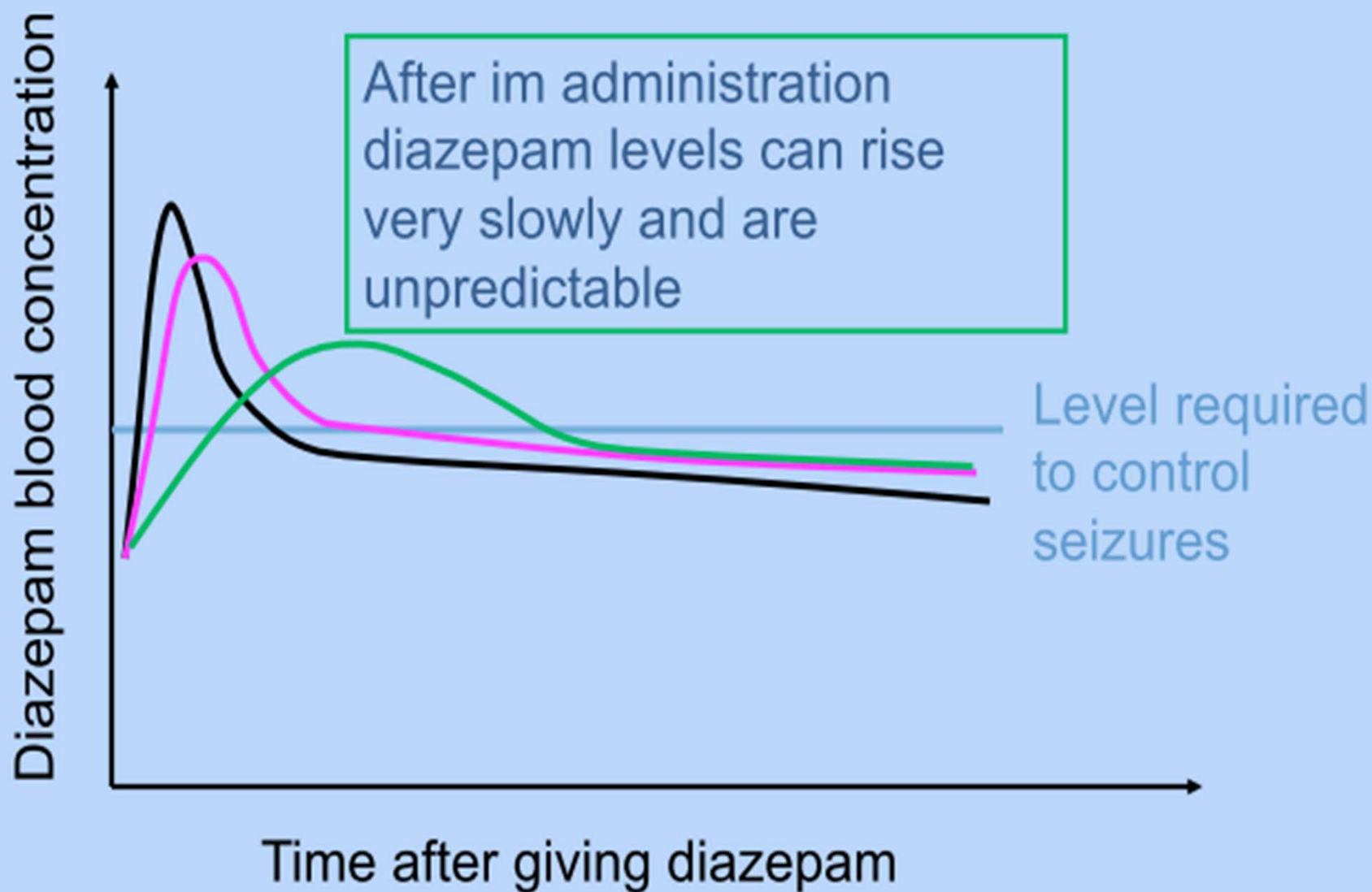


# Diazepam- rectal

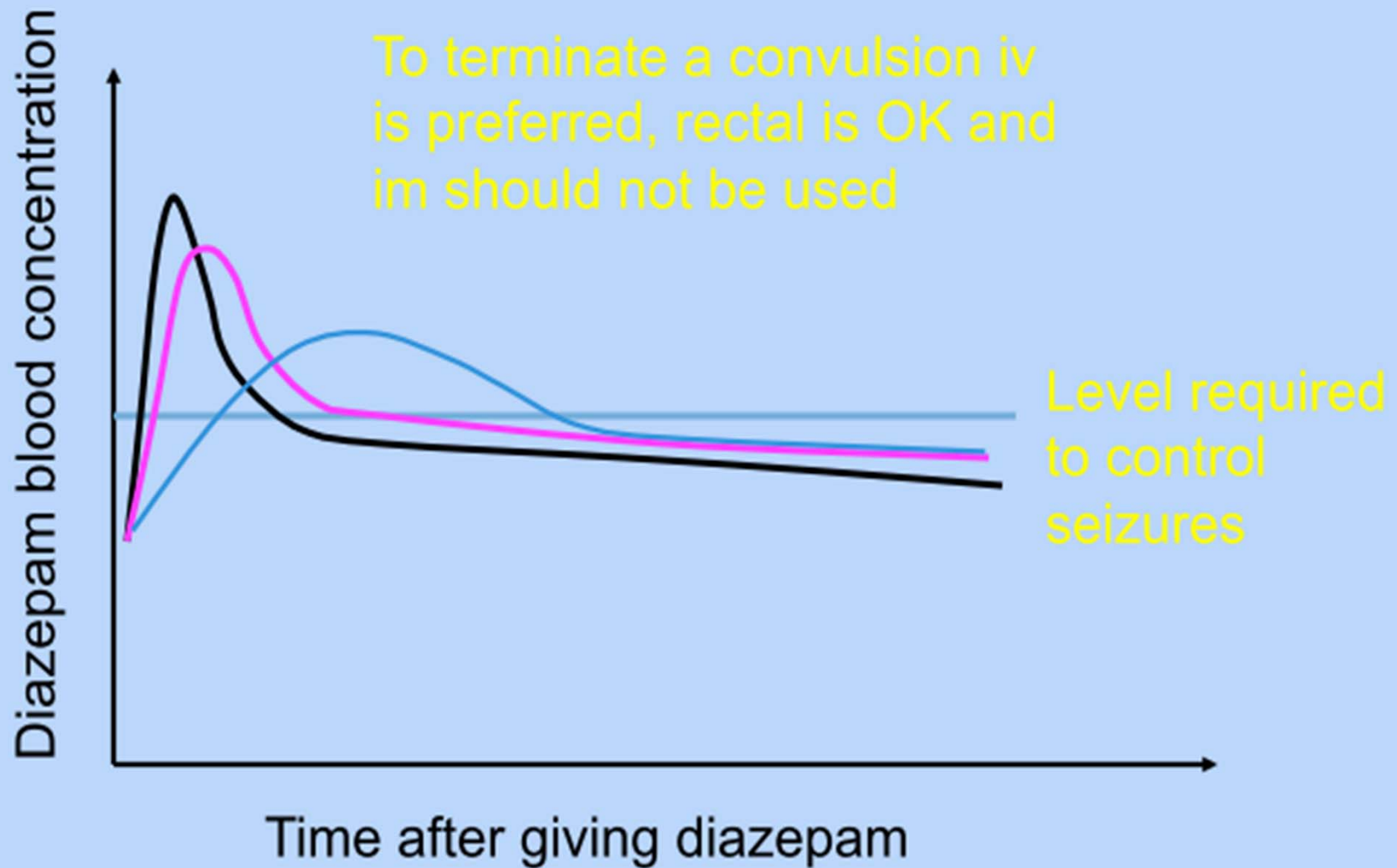




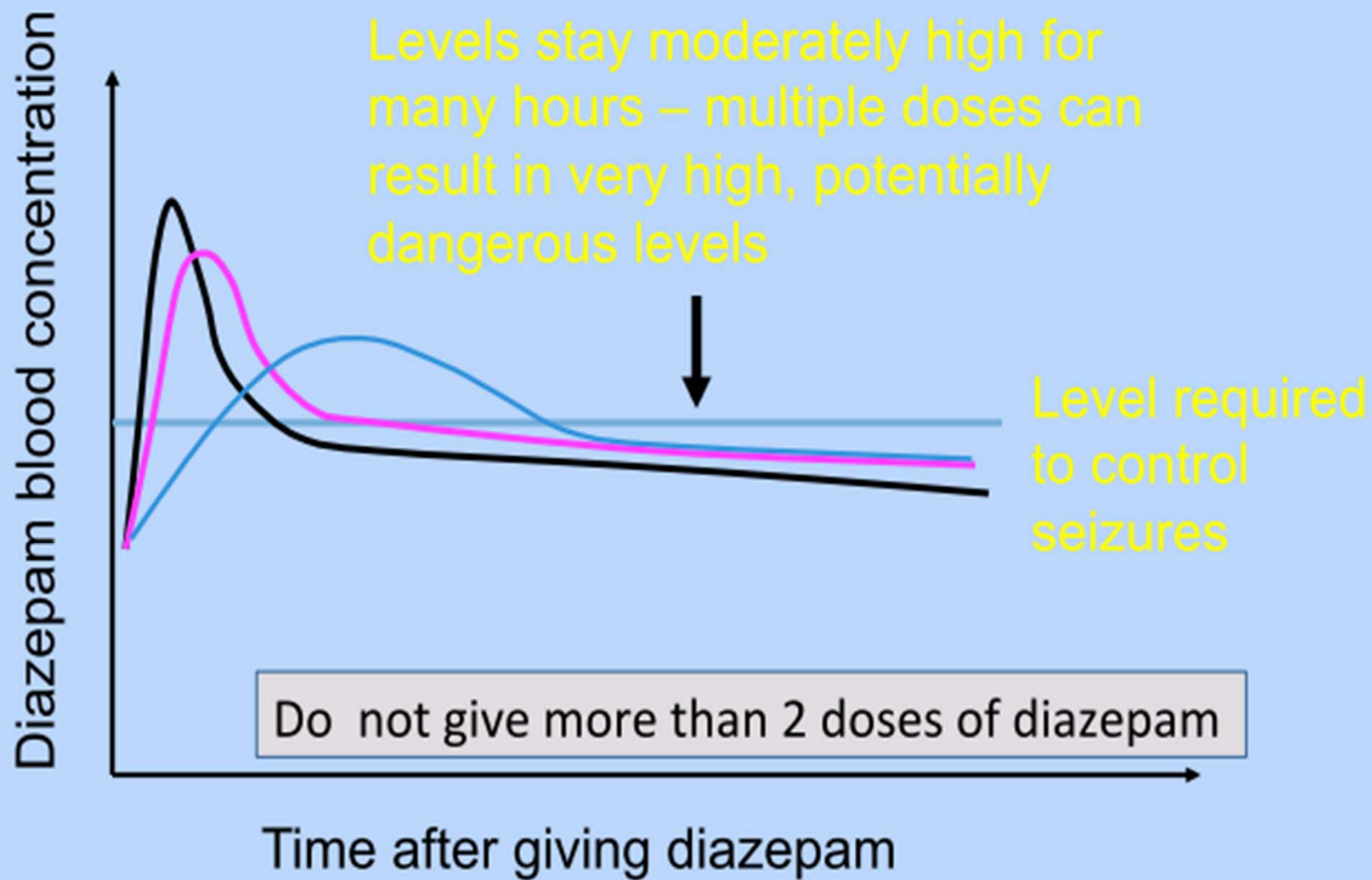
# Diazepam- intramuscular



# Diazepam- clinical implications

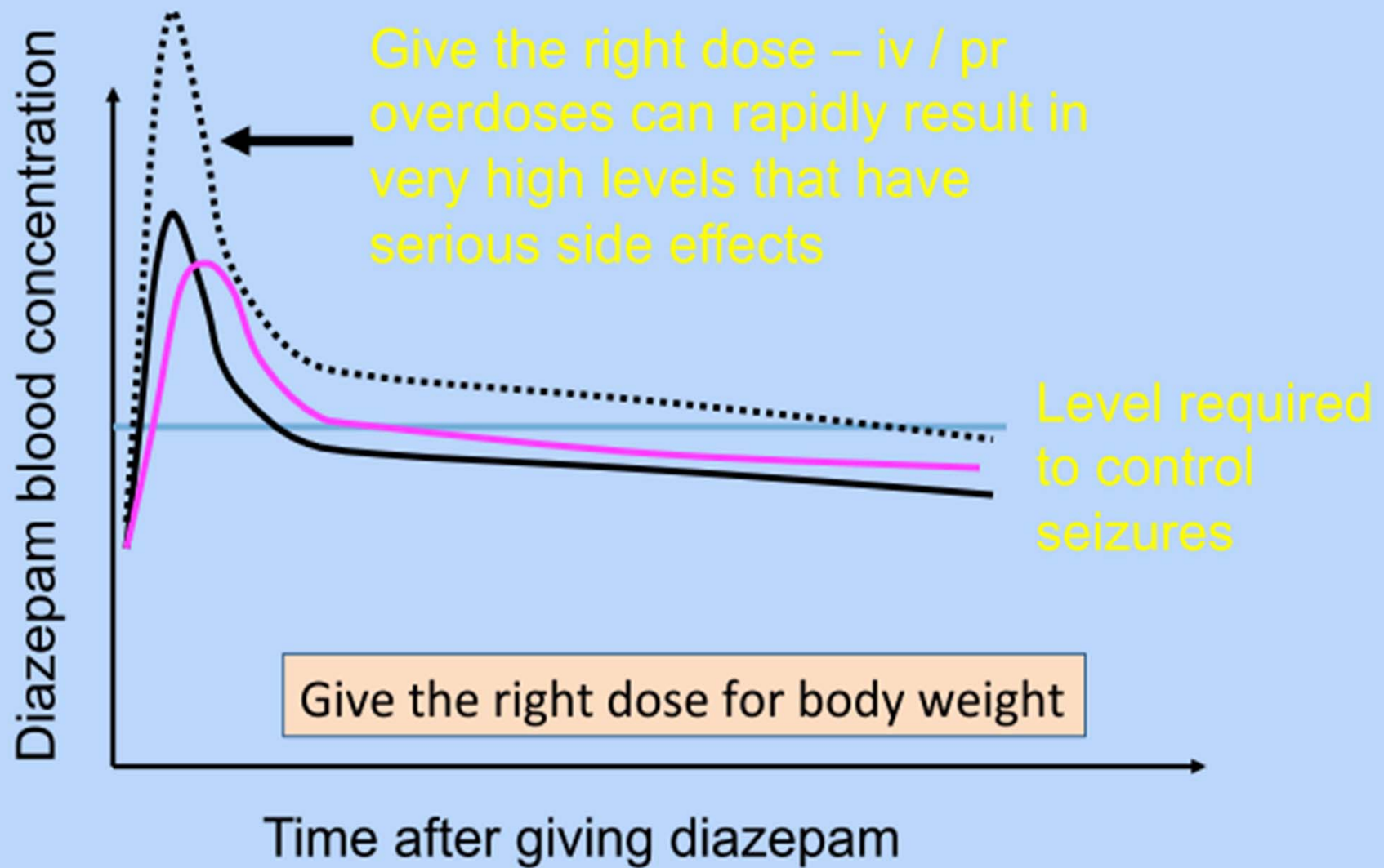


# Diazepam - clinical implications





# Diazepam - clinical implications



## Diazepam – side effects

- Respiratory depression
  - $\uparrow$   $p\text{CO}_2$ , worsens acidosis and can cause an increase in intra-cranial pressure (ICP) possibly precipitating coning and respiratory arrest.
  - $\downarrow$   $p\text{O}_2$ , worsening oxygen delivery to the tissues and brain
- After a single (correct) dose of diazepam up to 10% of children have discernable respiratory depression

# Giving rectal diazepam



4 – 5 cm  
inside the  
anal margin  
All of the  
barrel of a  
2mls syringe  
and nearly  
all of a 1ml  
syringe



## If child continues fitting

- After 5- 10 minutes
  - give a second dose of diazepam iv or pr- **once only**

Then after 10 minutes

- Give phenobarbitone 15-20mg/kg deep intra-muscular injection
- If the child continues fitting repeat phenobarbitone
- If the child continues fitting....
  - Give phenytoin 15-20mg/kg diluted in 20ml saline **very slowly** over 20 minutes

# Phenytoin

Given intravenously

Must be given very slowly to avoid bradycardia and low blood pressure

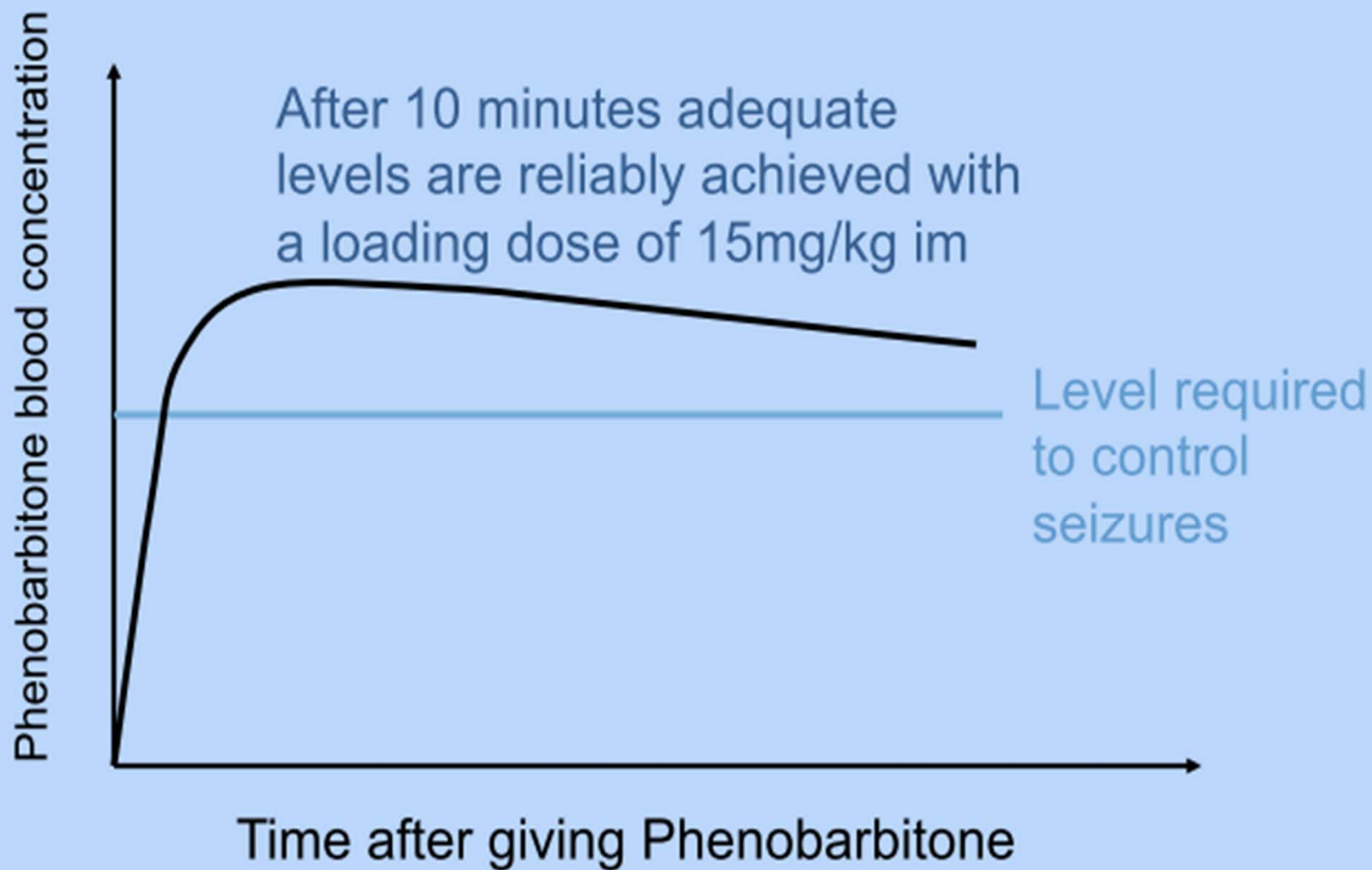
Causes irritation of the vein; flush with normal saline

First dose 15-20 mg/kg -followed if necessary by 5-10mg/kg/day in 2 doses

# Phenobarbitone

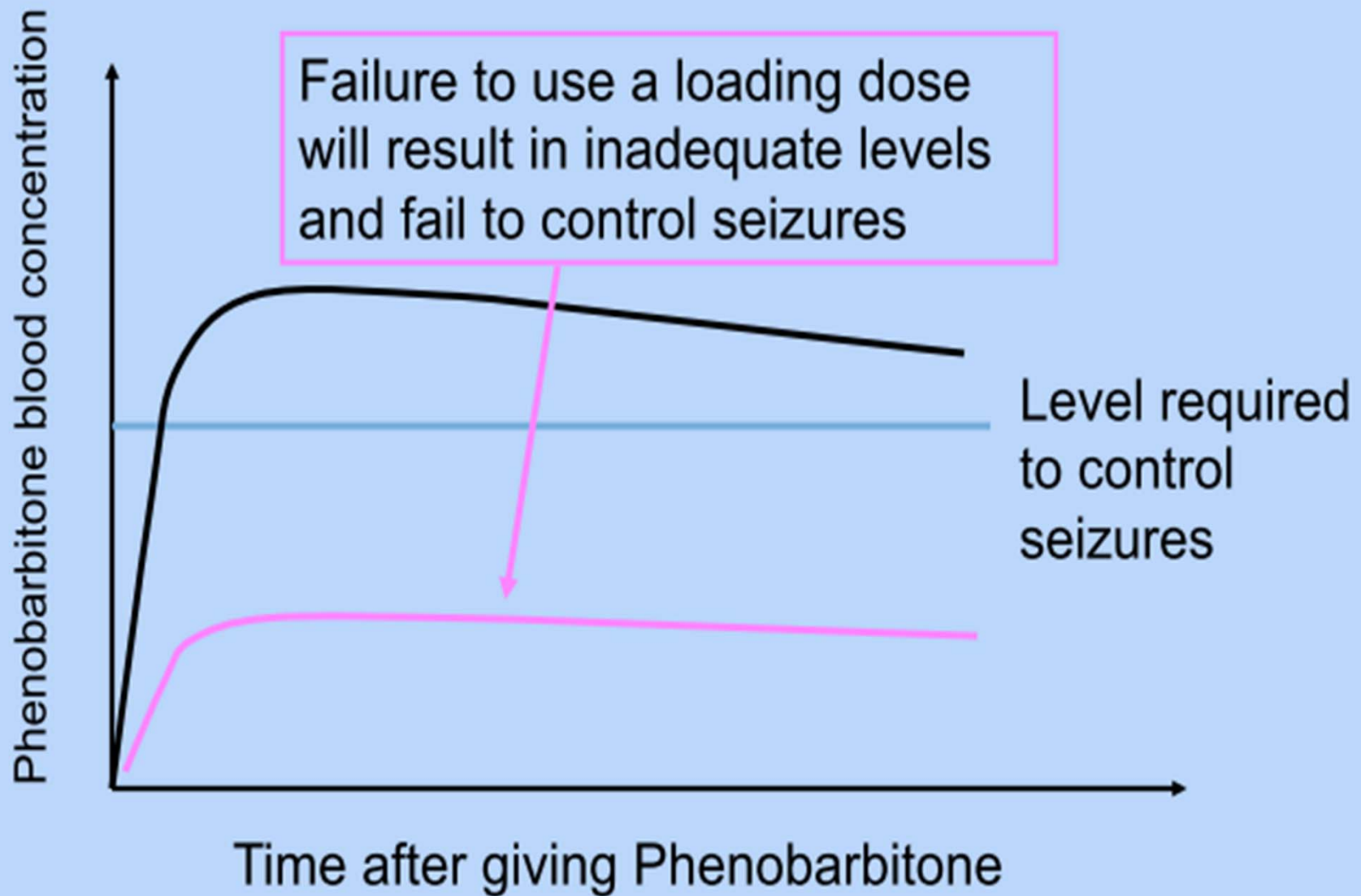
- Half life,  $\geq 2$  days
  - Danger of accumulation
- Eliminated by the liver
- Can be given:
  - Deep im injection
  - Slow iv infusion (max 1mg/kg/min – 15min for loading dose!)
  - ***iv bolus doses are contraindicated.***

# Phenobarbitone (continued)

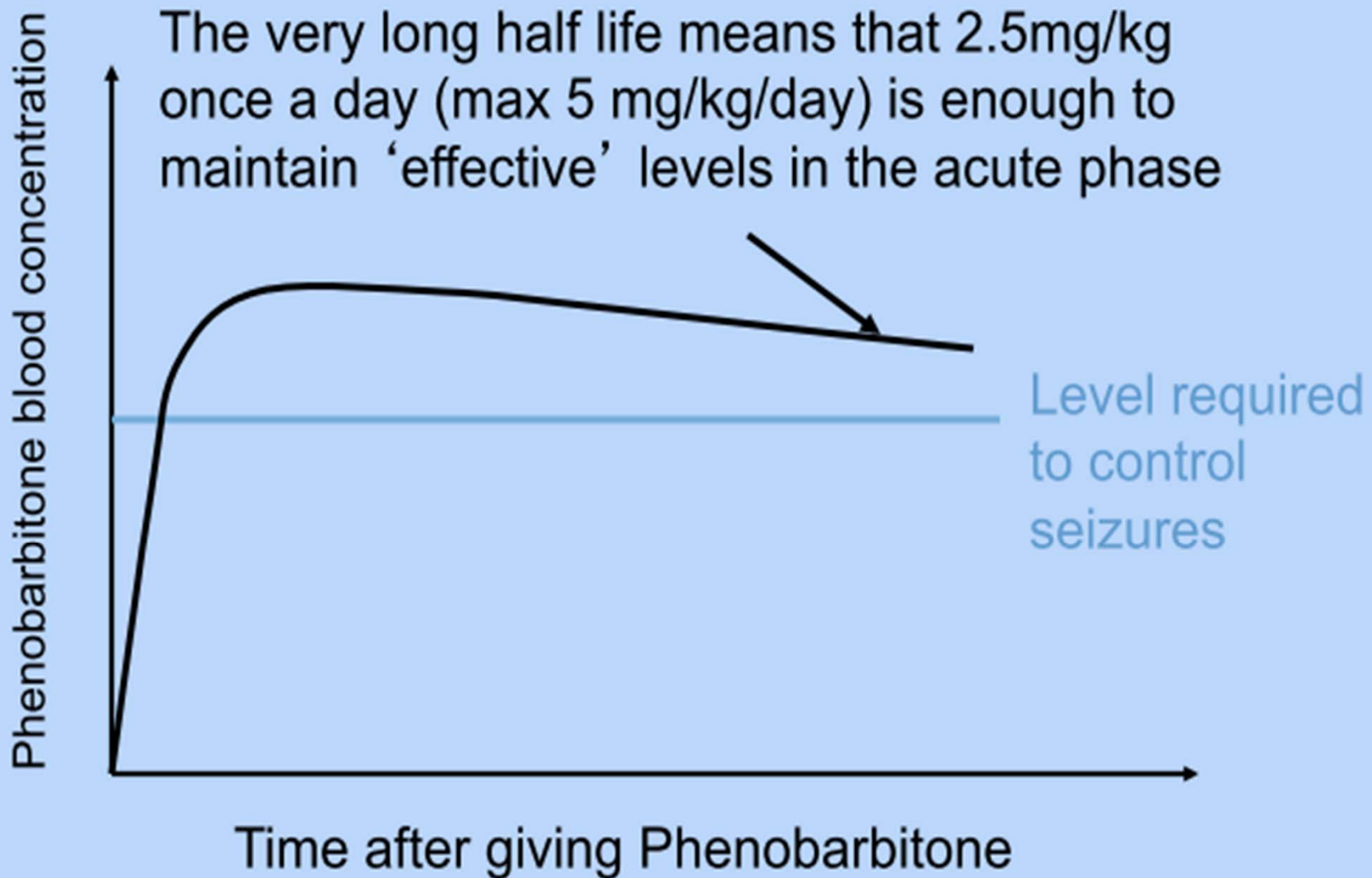




# Phenobarbitone - clinical implications



# Phenobarbitone -clinical implications



# Phenobarbitone – side effects

- Respiratory depression
  - $\uparrow$   $p\text{CO}_2$ , worsens acidosis and can cause an increase in intra-cranial pressure (ICP) possibly precipitating coning and respiratory arrest.
  - $\downarrow$   $p\text{O}_2$ , worsening oxygen delivery to the tissues and brain
- In overdose – coma and hypotension.

# A rational approach – age >1m

1 Diazepam 0.25mg/kg  
iv, or, 0.5mg/kg pr

Consider  
glucose

Wait 5-10 minutes to  
see if effective

2 Diazepam 0.25mg/kg  
iv, or, 0.5mg/kg pr

Wait 5-10 minutes  
to see if effective

3 Phenobarbitone im or phenytoin iv  
15-20mg/kg (if not given previously)

If high fever may tepid sponge



Consider  
glucose

Don't

Ever

Forget

Glucose

# Clinical dilemma?



*Will treatment make things better or worse?*

# Tetanus

Tetanic spasms may be confused with fits

- Symptoms often start with:
  - Stiffness especially of jaw and neck
  - Difficulty swallowing
  - Spasms with stiffening if touched or at a noise
- These painful spasms last several minutes associated with sweating and tachycardia
- Look for a dirty wound
- Ask about immunisations

**GET HELP IF YOU SUSPECT TETANUS**





**Questions?**

# Summary

- Diazepam and phenobarbitone when used appropriately are safe and usually effective. (Phenytoin may also be used if available)
- Overdoses and more than one repeat dose are dangerous
- When seizures continue despite basic treatment the drugs can become as dangerous as the convulsions
- Always support the airway and breathing to prevent death or further brain damage.

# Acknowledgements



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and Sports

**KEMRI** | Wellcome Trust

