

# Dodging Comets: Managing Sick Days and Stress Days

**Laura Jacobsen, MD**  
**Pediatric Endocrinology**  
**University of Florida**



# Who Am I?

Pediatric Endocrinologist at University of Florida

- Clinical, Translational, & Psychosocial Researcher
- Diabetes camp doctor (<http://floridadiabetescamp.org/>)
- Training med students, residents, and fellows
- T1D consortia (TrialNet, TEDDY, nPOD, HIRN, T1DX-QI)



“Houston, we have a problem”

*Apollo 13, 1995*

## Talk Outline:

Healthy day management

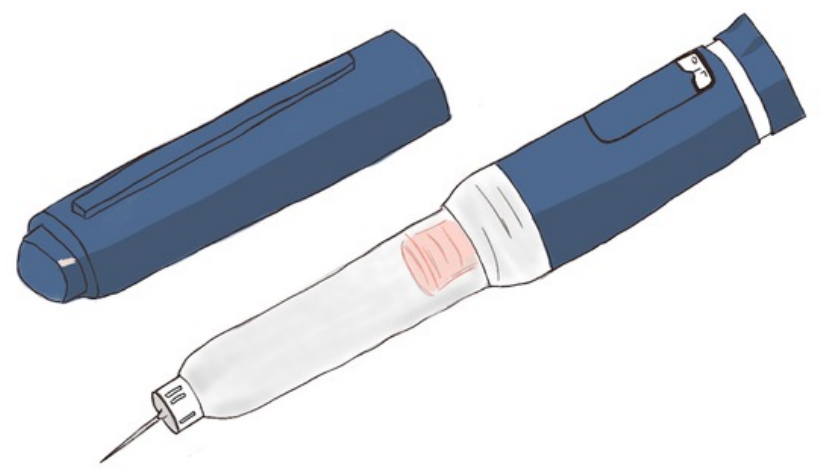
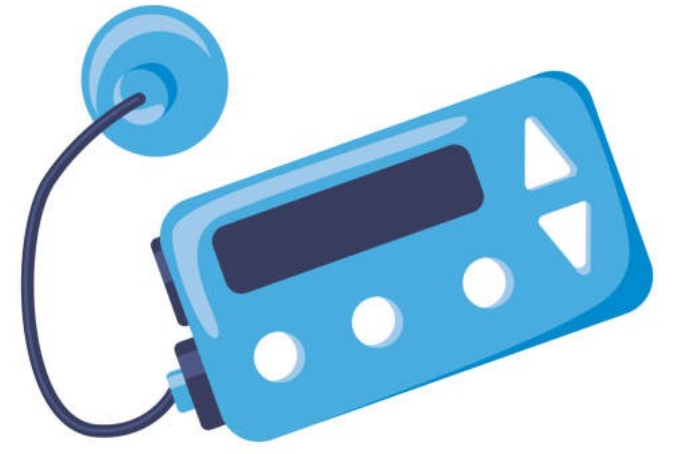
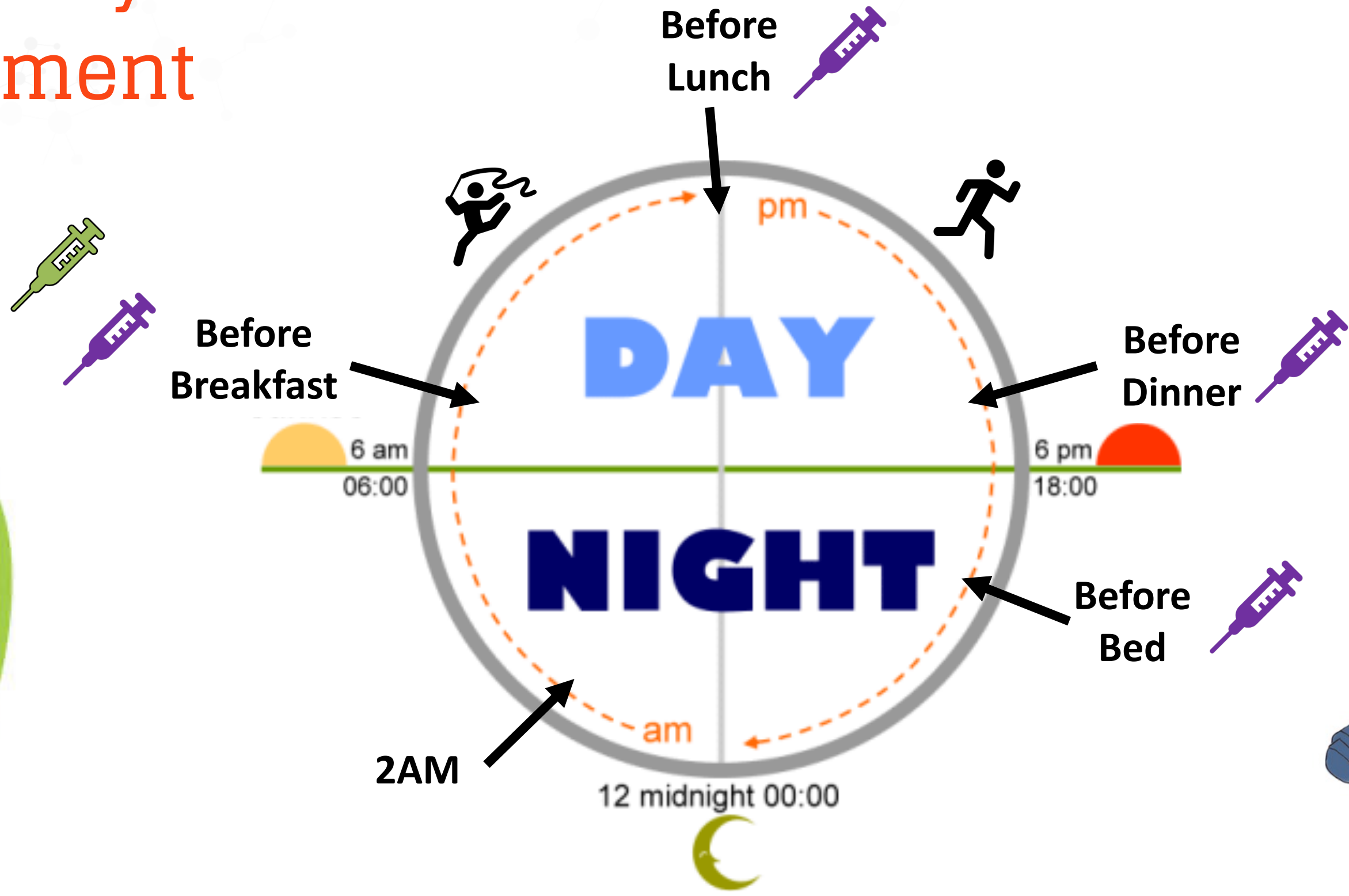
What affects my blood sugar? Stress! Illness!

What to do

When to worry

Some examples

# Healthy Day Management



# What Affects My Blood Sugar?

Everything.  
Every. Single. Thing.

# 42

## Factors That Affect BG

Food	Biological
↑↑ 1. Carbohydrate quantity	↑ 20. Insufficient sleep
→↑ 2. Carbohydrate type	↑ 21. Stress and illness
→↑ 3. Fat	↓ 22. Recent hypoglycemia
→↑ 4. Protein	→↑ 23. During-sleep blood sugars
→↑ 5. Caffeine	↑ 24. Dawn phenomenon
↓↑ 6. Alcohol	↑ 25. Infusion set issues
↓↑ 7. Meal timing	↑ 26. Scar tissue and lipodystrophy
↑ 8. Dehydration	↓↓ 27. Intramuscular insulin delivery
? 9. Personal microbiome	↑ 28. Allergies
Medication	↑ 29. A higher glucose level
→↓ 10. Medication dose	↓↑ 30. Periods (menstruation)
↓↑ 11. Medication timing	↑↑ 31. Puberty
↓↑ 12. Medication interactions	↓ 32. Celiac disease
↑↑ 13. Steroid administration	↑ 33. Smoking
↑ 14. Niacin (Vitamin B3)	Environmental
Activity	↑ 34. Expired insulin
→↓ 15. Light exercise	↑ 35. Inaccurate BG reading
↓↑ 16. High-intensity and moderate exercise	↓↑ 36. Outside temperature
→↓ 17. Level of fitness/training	↑ 37. Sunburn
↓↑ 18. Time of day	? 38. Altitude
↓↑ 19. Food and insulin timing	Behavioral & Decision Making
	↓ 39. Frequency of glucose checks
	↓↑ 40. Default options and choices
	↓↑ 41. Decision-making biases
	↓↑ 42. Family relationships and social pressures

# Hormones & Stress

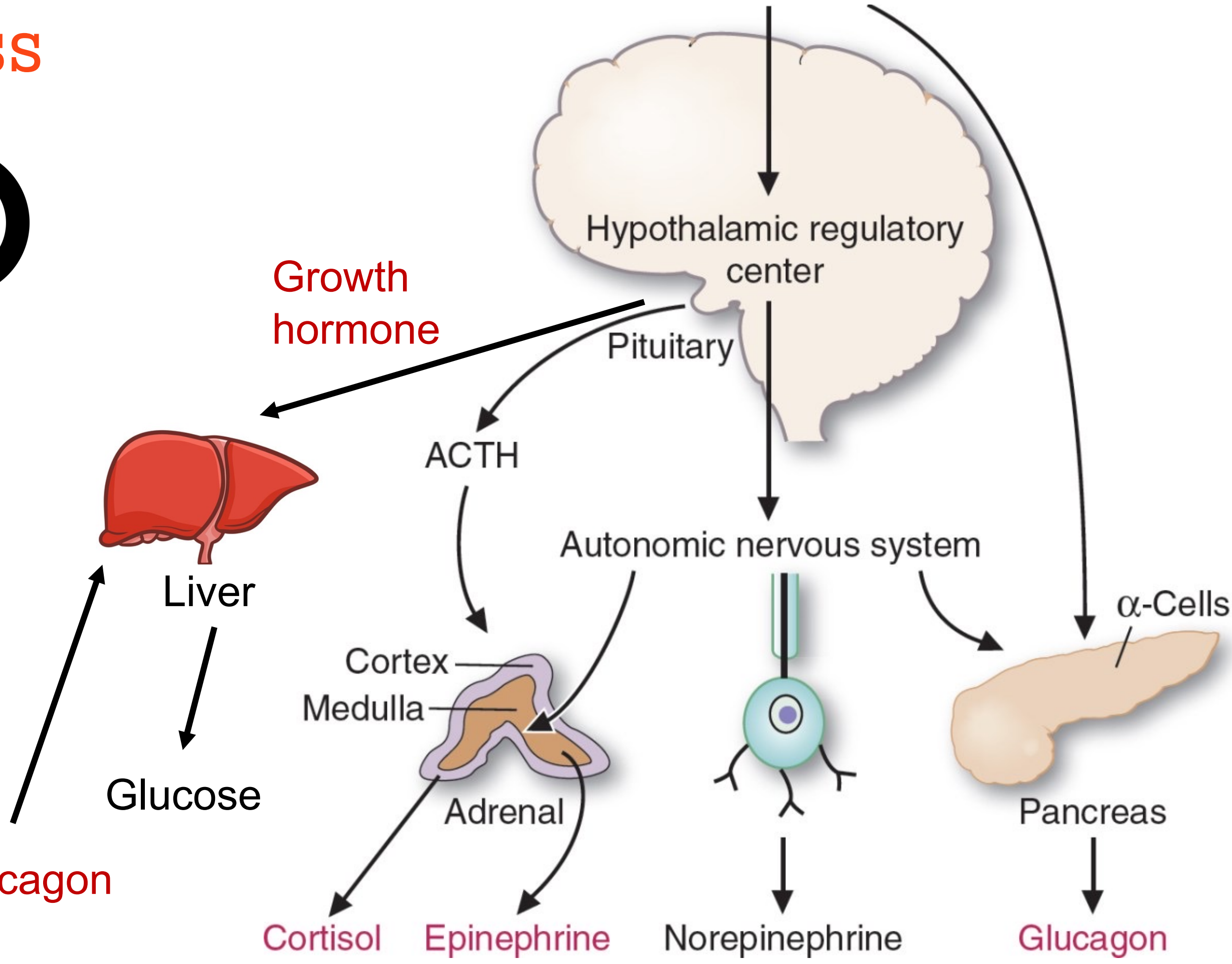
**Insufficient Insulin also causes these hormones to rise (and ketones to form)**

**Increased Insulin Needed to Balance**

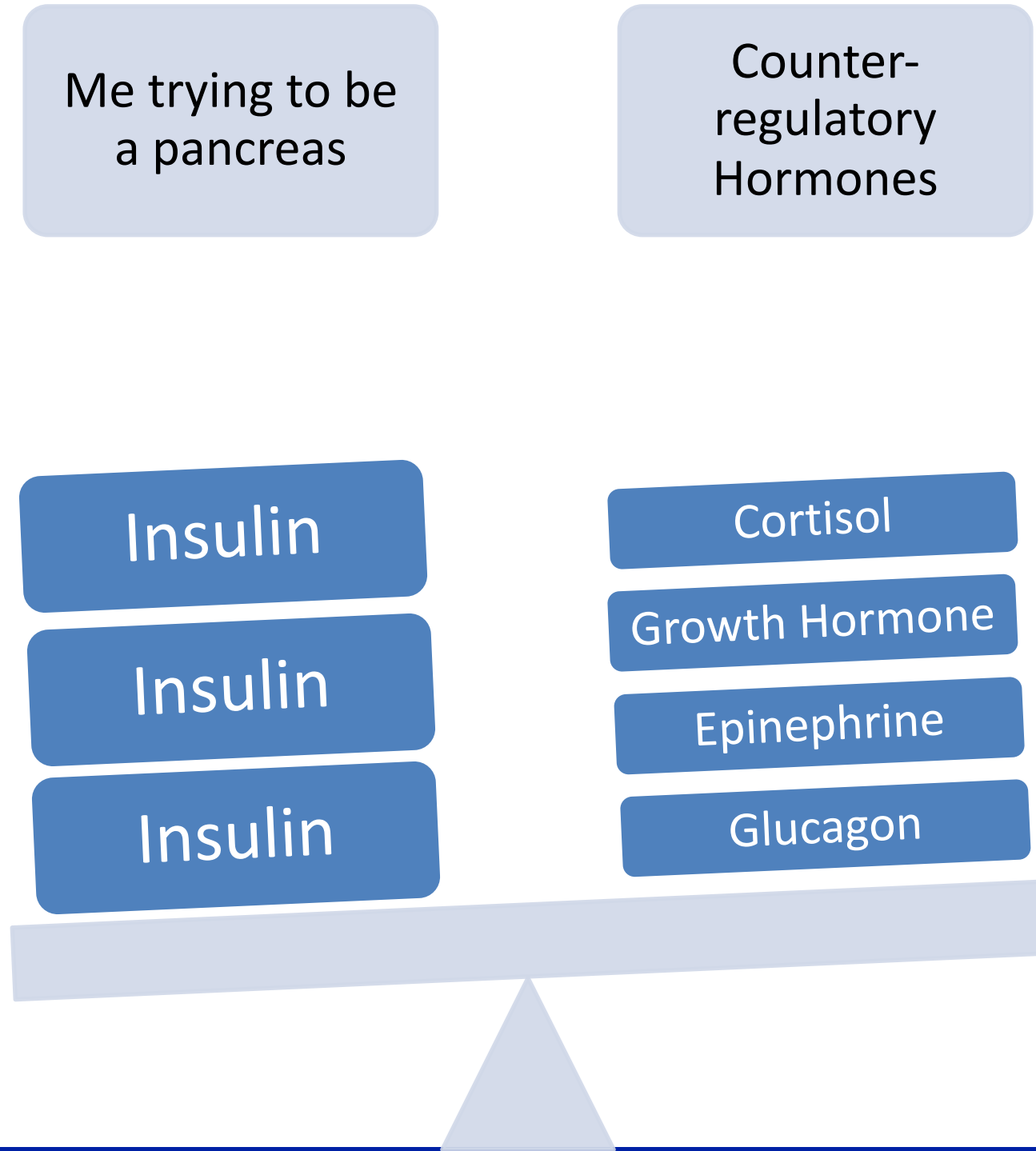
**Glucagon**

**Growth hormone**

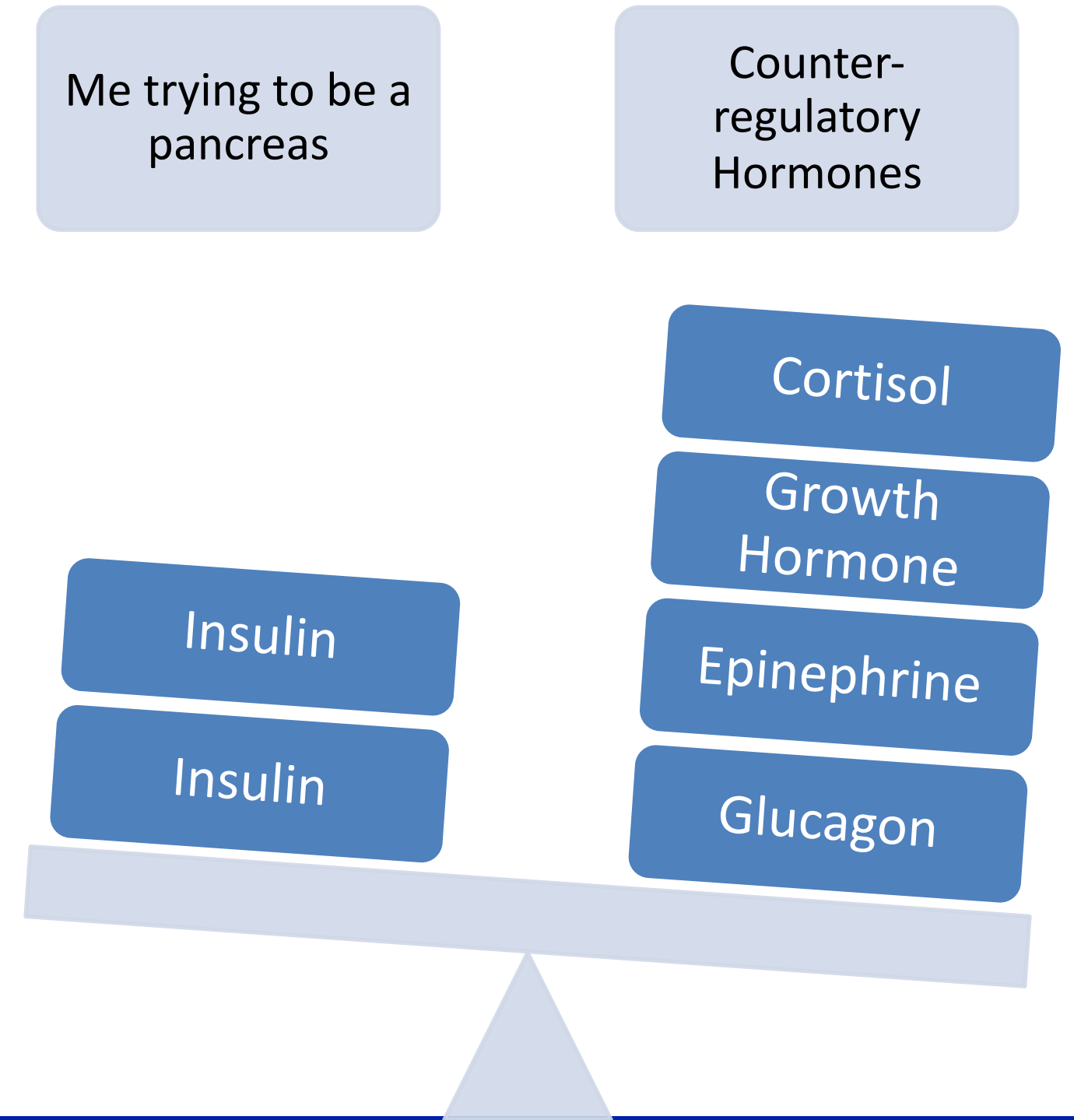
**Illness or Stress**



# Typical Days



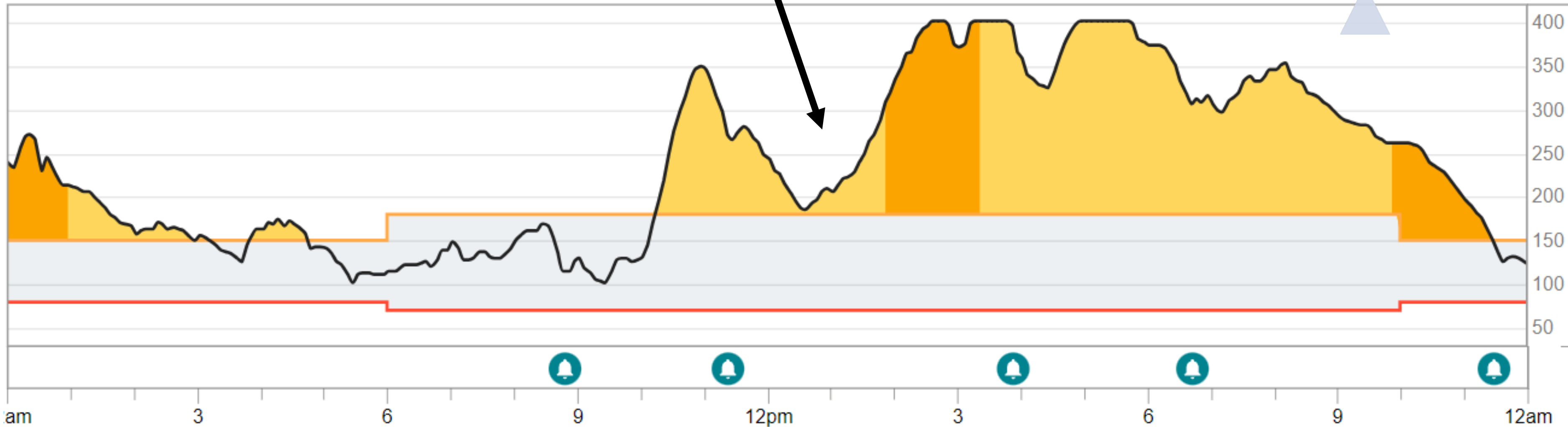
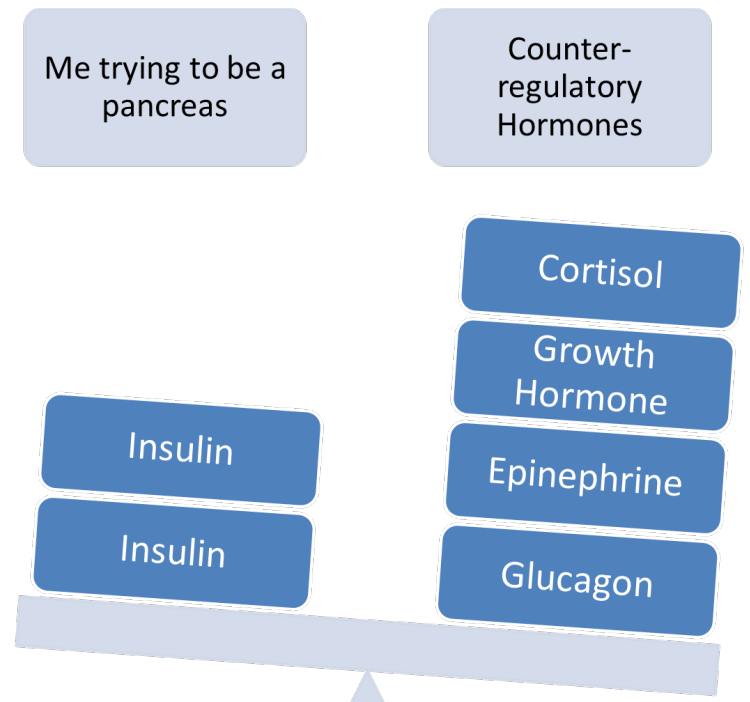
# Stress or Sick Days





# Stress Days

Stress, seriously?!

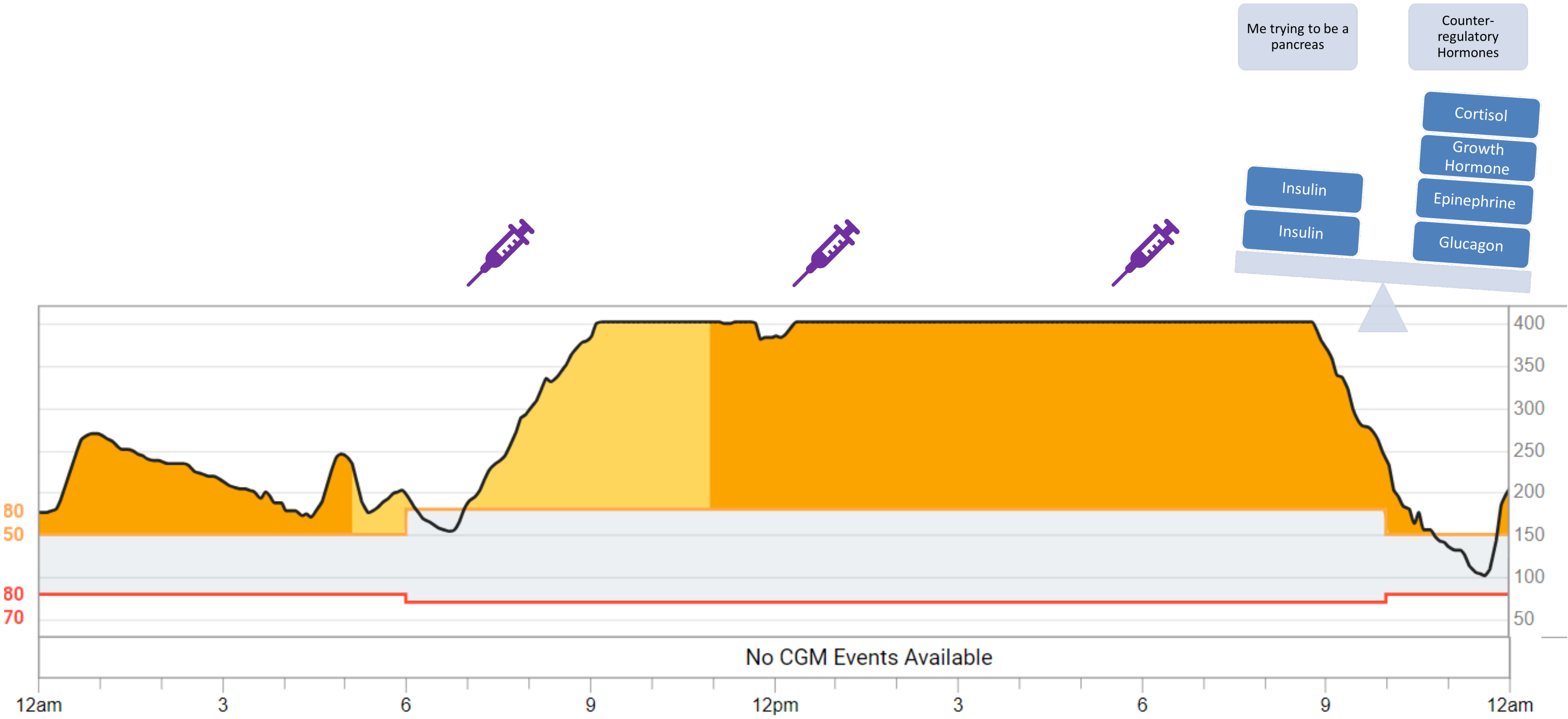


# Sick Days

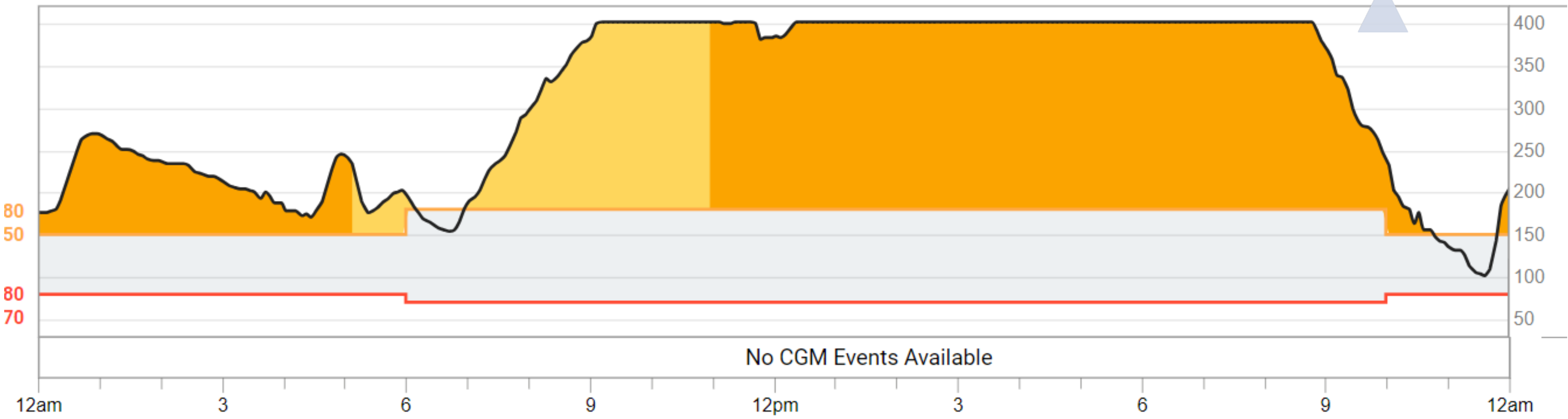
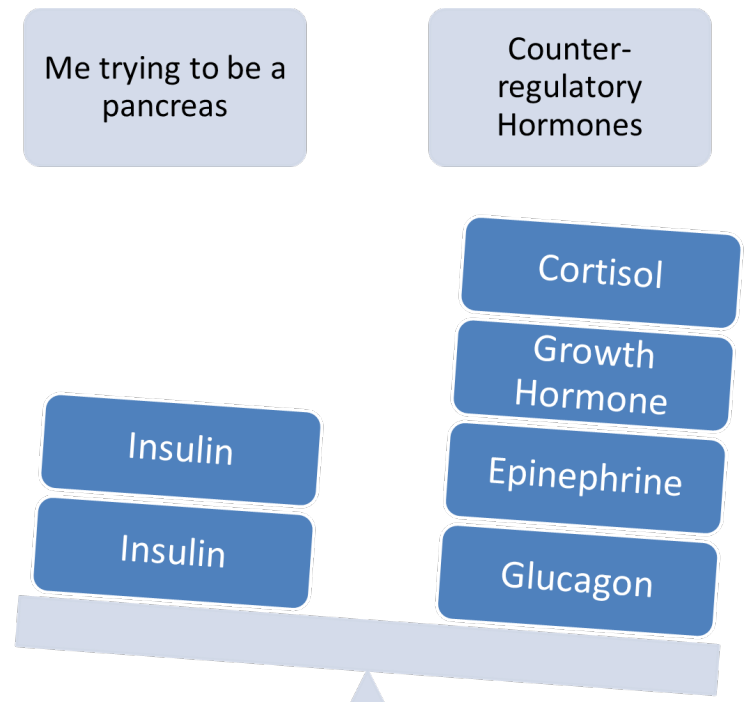
- Cold
- Flu
- COVID-19
- Stomach bug
- Asthma exacerbation
- etc.



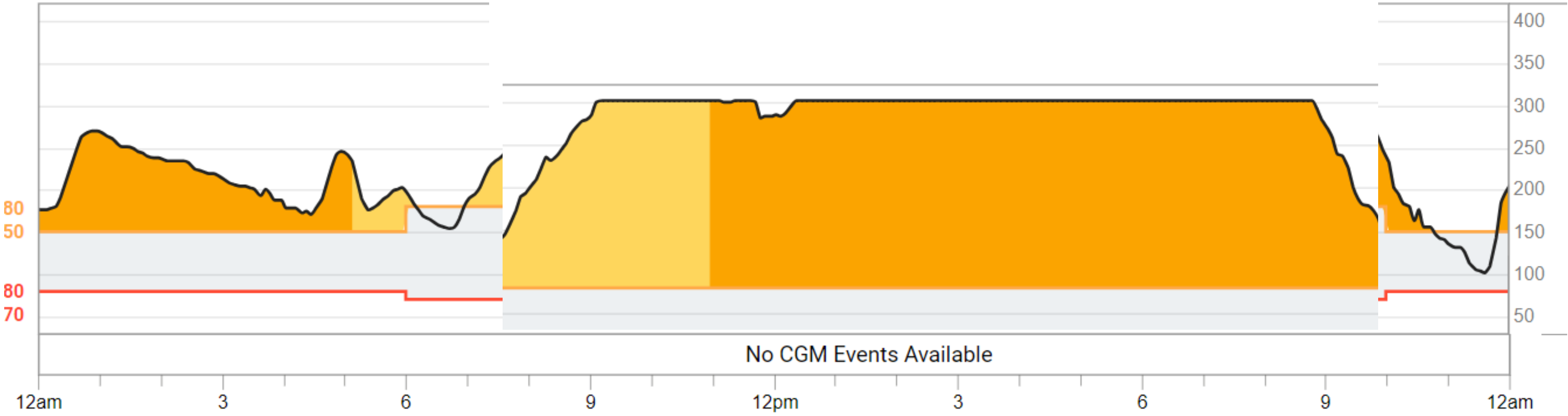
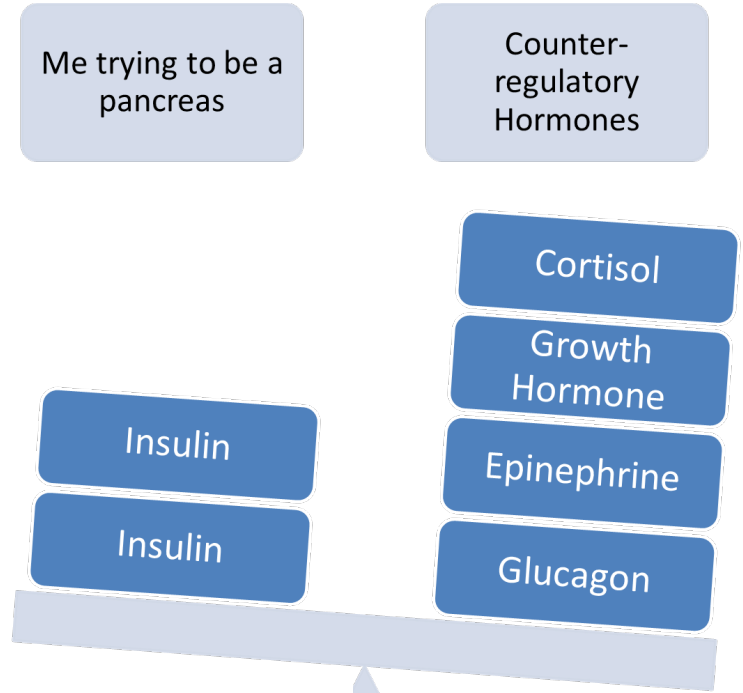
What about steroids?



# "3-hour rule"

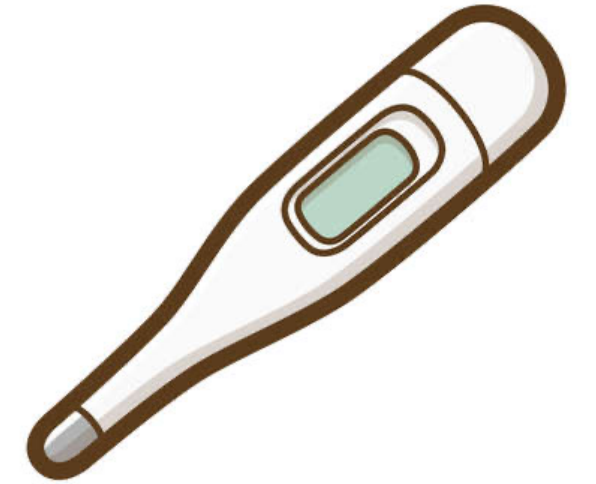


# "3-hour rule"



# Don't forget Over-The-Counter (OTC) symptom management

Acetaminophen & Ibuprofen can help with the stress of illness



Pills over syrups (liquids)

If liquid, check for added sugars

Is there a sugar-free option

Pseudoephedrine or phenylephrine (decongestants) – may raise BG

[Glutenfreedrugs.c](http://Glutenfreedrugs.com)

Steroids (prednisone) – if you need it you need it  
Zofran – ask your provider

## What to do first

- Check glucose frequently
- Check for ketones!
- Don't stop your insulin!
  - Never miss your long-acting insulin
  - May need more rapid-acting insulin
- Zofran (ondansetron) oral disintegrating tablet

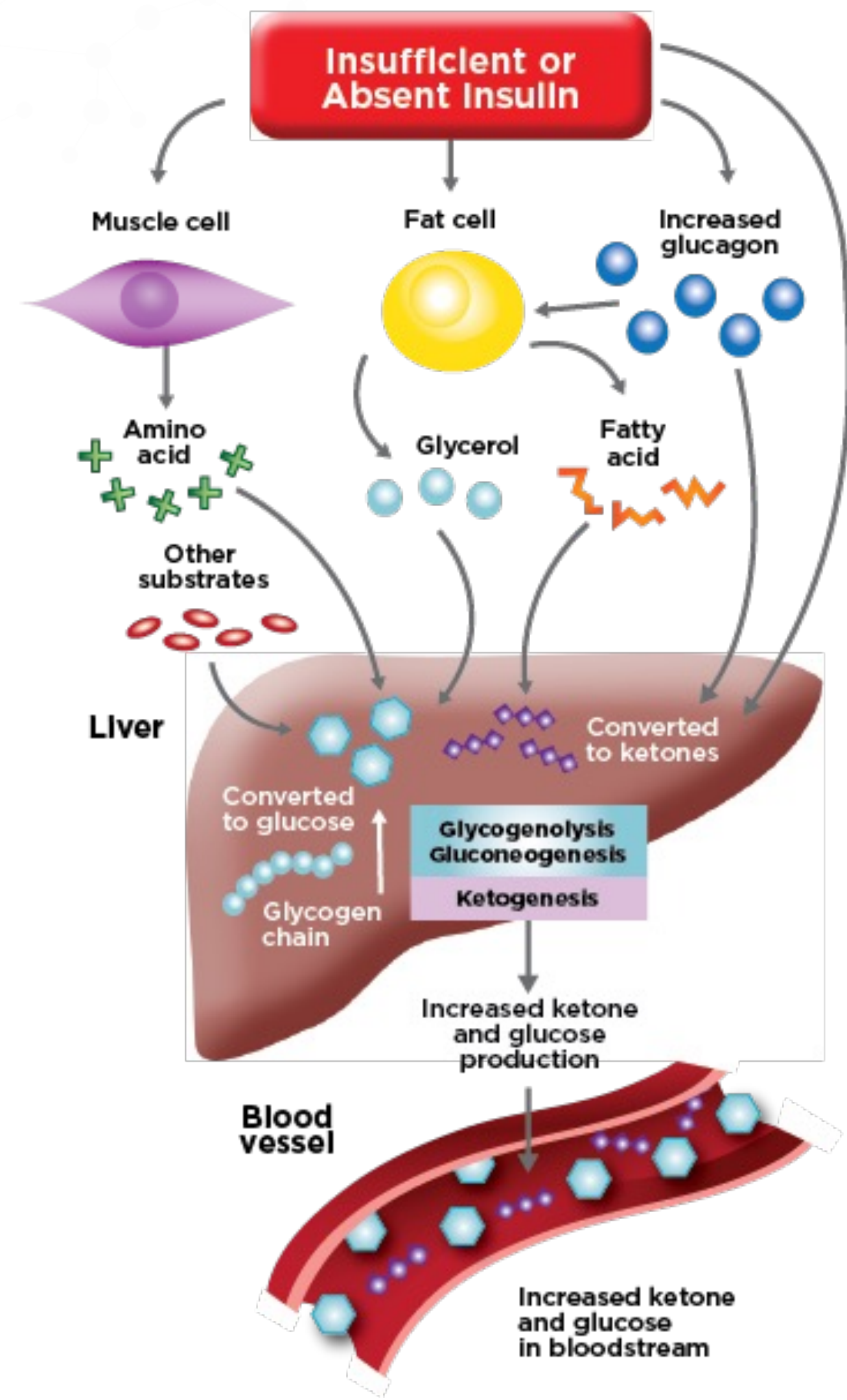


I don't want  
to eat



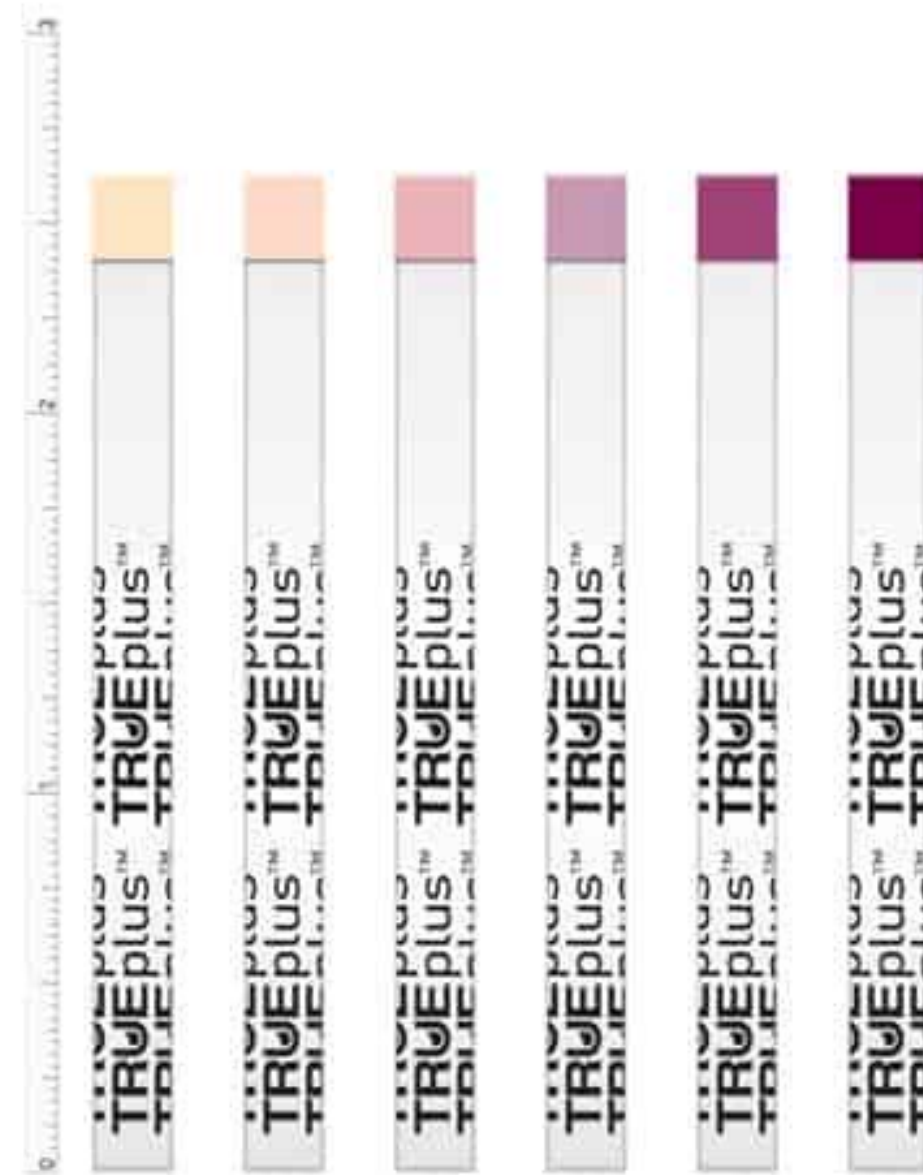
I'm  
nauseated

• Why check for ketones?

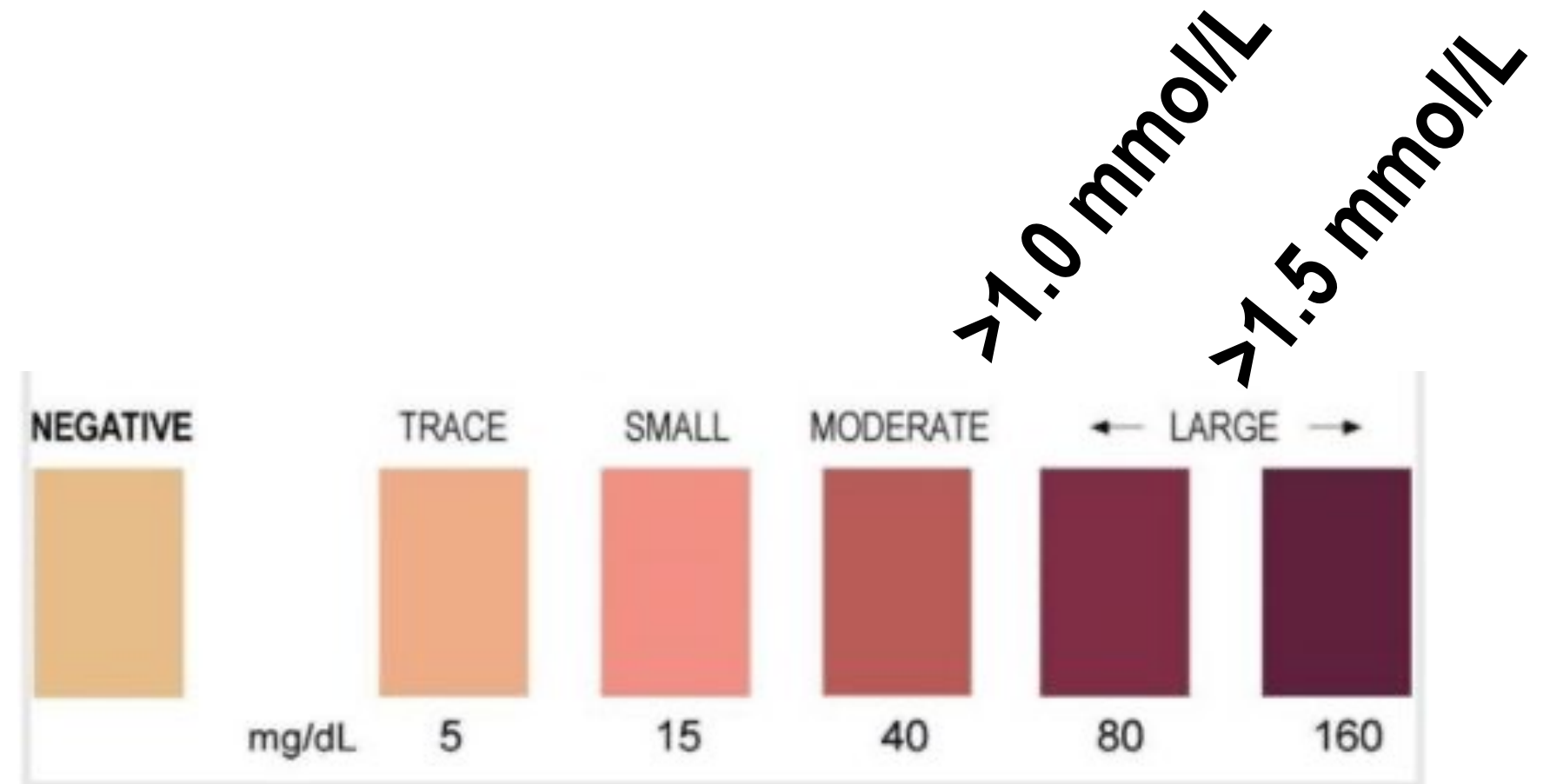




# •Check urine for ketones



•Or check blood for ketones



## What to do next

- Give rapid-acting insulin
  - Give correction for high glucose every 3-4 hours
  - +/- Ketone correction
- Drink fluids!
  - BG high – water and other sugar-free drinks
  - BG low – sips of Gatorade, Powerade, juice, regular soda, popsicle

**But what if my  
blood sugar is  
normal. Can I still  
have ketones  
when I'm sick!?**



**I don't want  
to eat**



**I'm  
nauseated**

## When to worry

- Can't stop vomiting → dehydration
- Trouble treating ketones if BG is low
- Moderate or large ketones that don't resolve with your treatment → DKA
- Any concerns you have – you know your diabetes best
- Contact your health care team

# Potential Signs of DKA

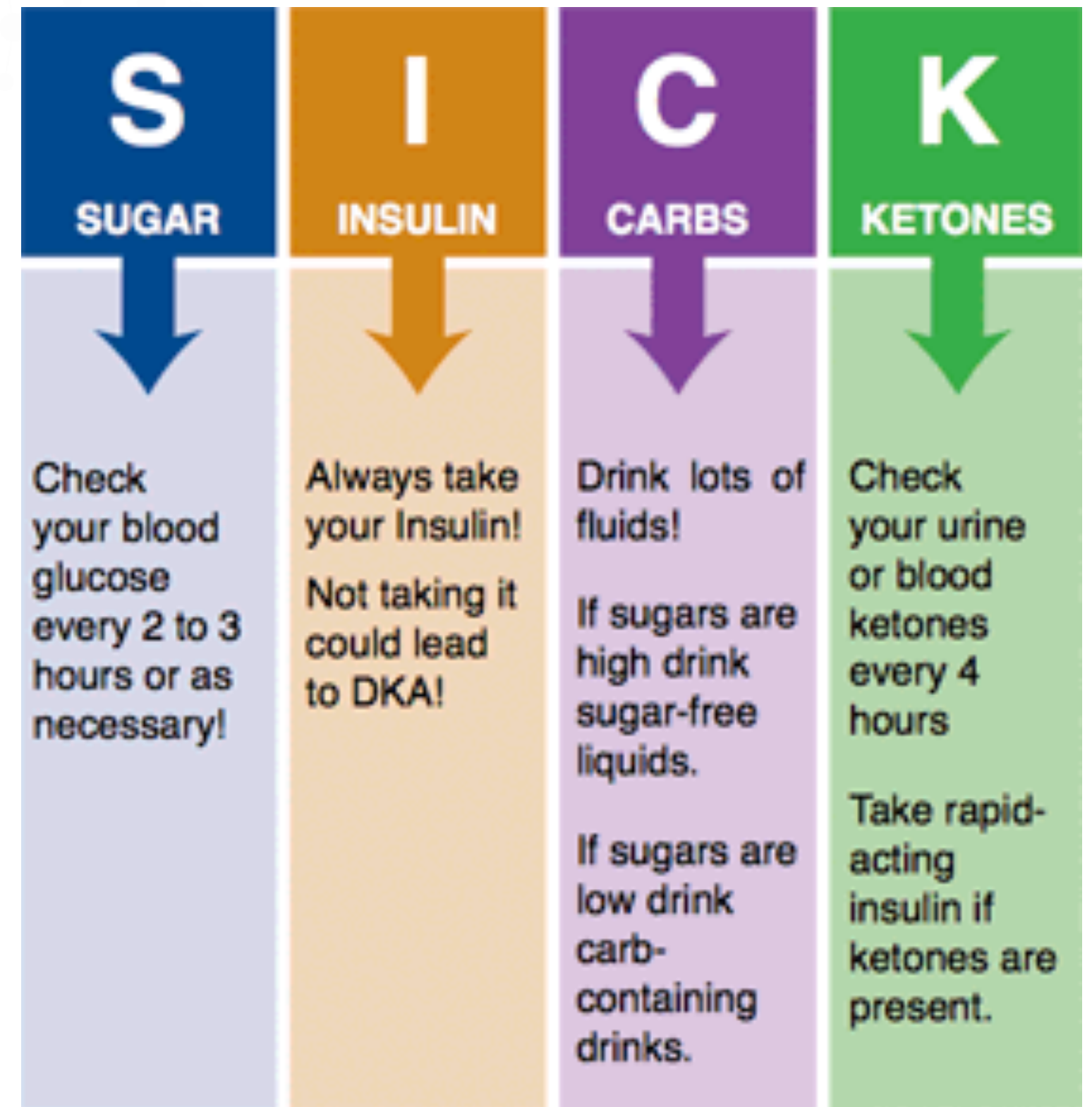
- Repeated vomiting and nausea
- Abdominal pain
- Fast, heavy breathing
- Lethargic, very sleepy, confused

**CHECK FOR KETONES!**

**CALL FOR HELP!**

# Ask your diabetes team about a Sick Day Plan

- Specific recommendations, insulin doses, when and who to call

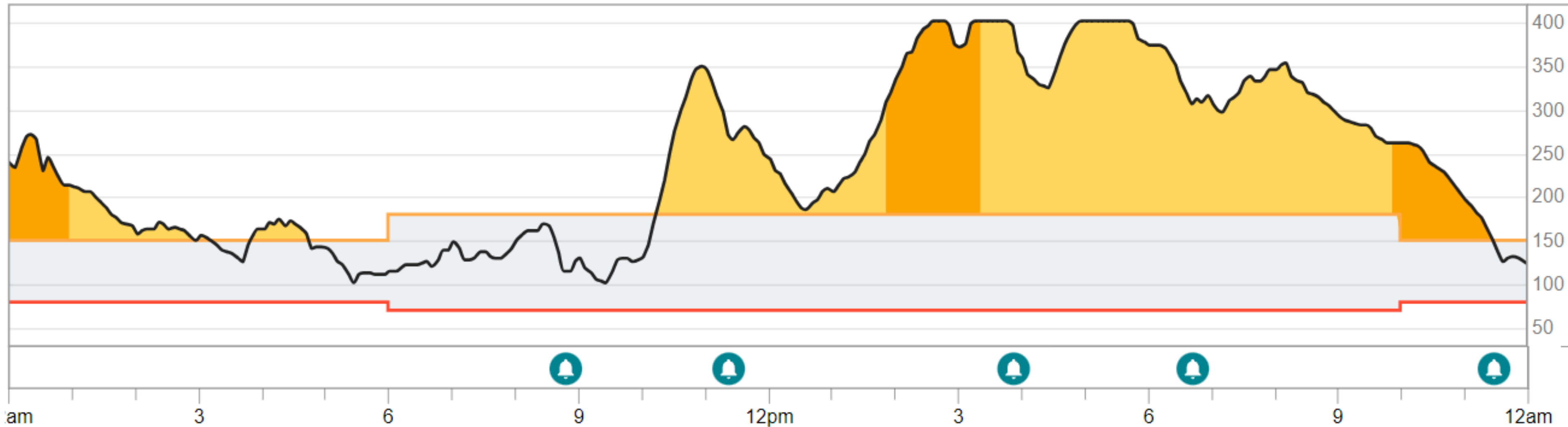


# Stress Days

Can you I.D. the stress?

How long will it last?

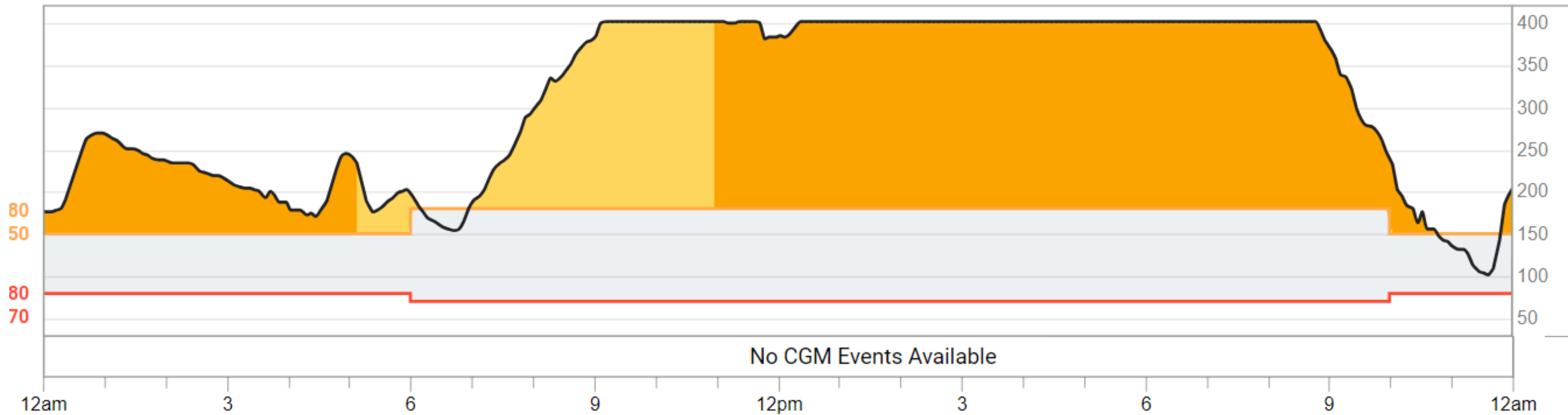
What normally happens with this stress?





# Sick Days

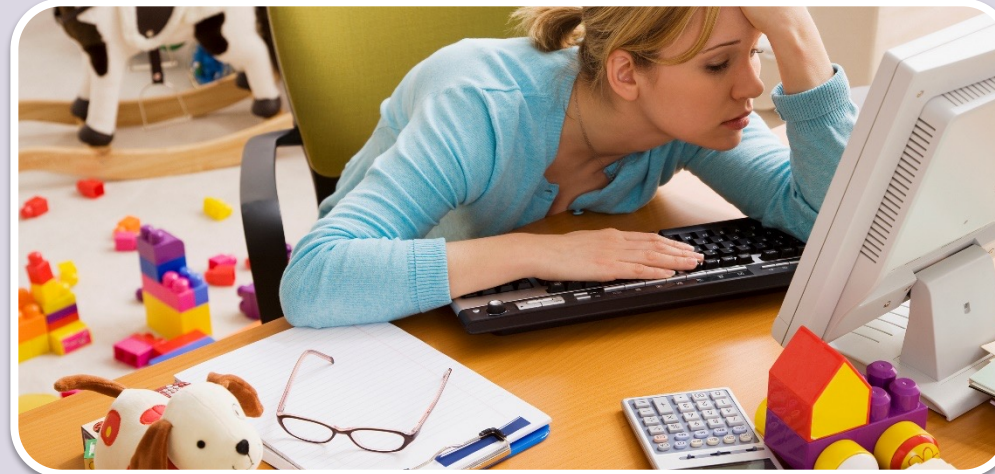
On a pump, consider changing site  
Give a correction via injection  
Every 3-4 hour rapid-acting insulin boluses



# Let's review some examples



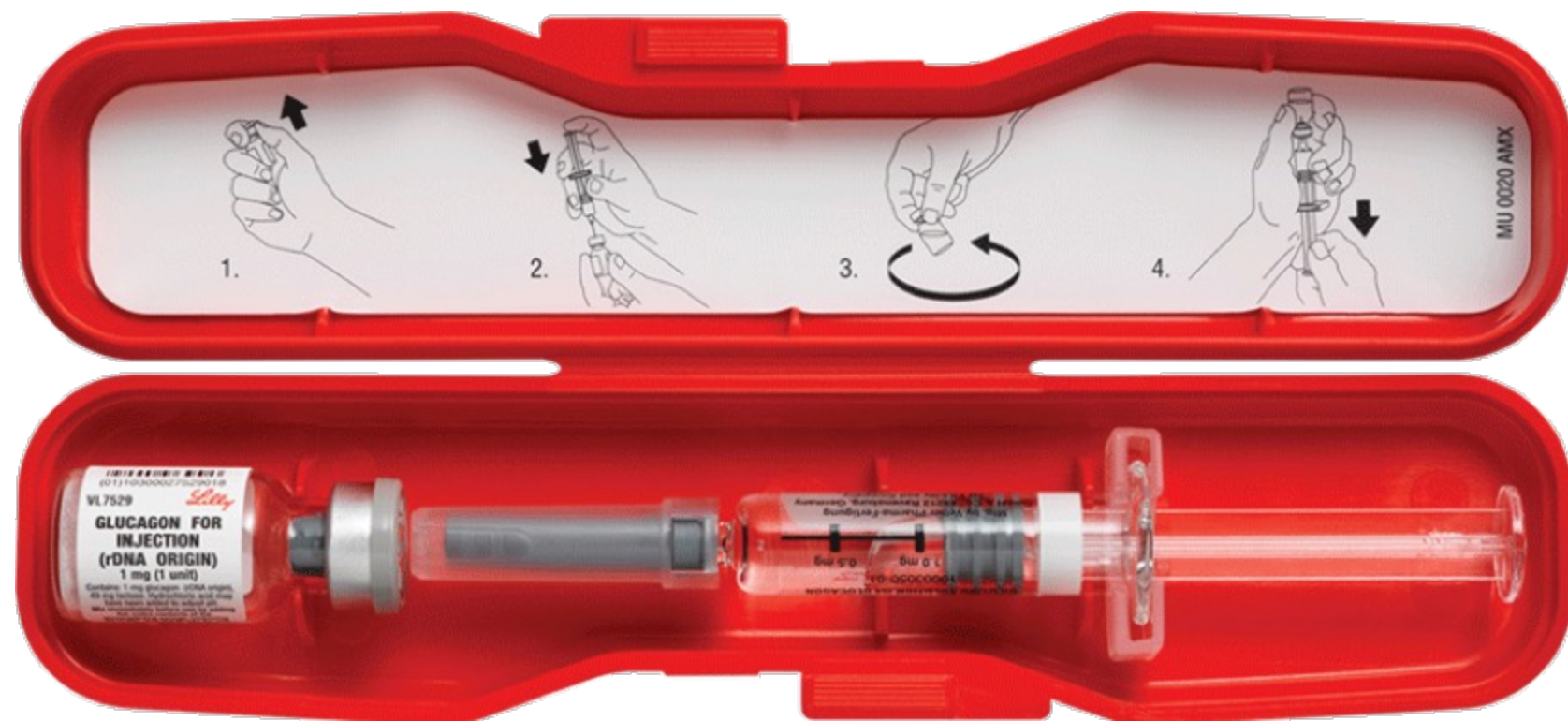
13-year-old girl  
has a cough,  
congestion,  
muscle aches, and  
fever, BG 323 with  
large ketones



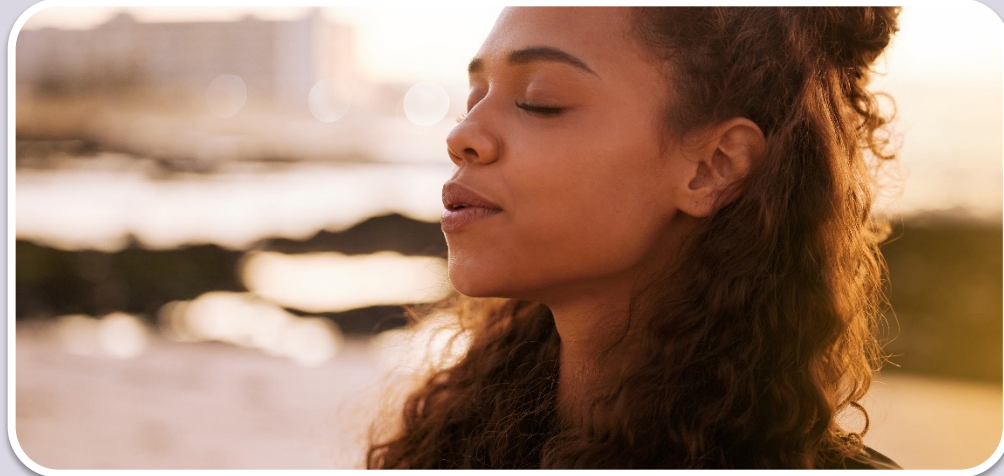
37-year-old  
woman has to give  
a big presentation  
in front of a room  
full of people,  
BG 219 ↑



7-year-old boy  
with a stomach  
bug for 2 days,  
vomiting, no  
ketones, poor  
appetite, BG 68 →



# Let's review some examples



18-year-old young woman with an asthma attack prescribed prednisone

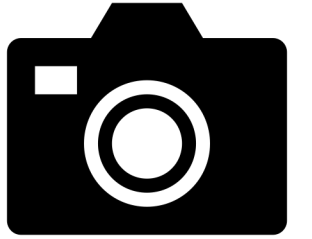


2-year-old boy with COVID, refusing to eat, BG 134 ↓ and moderate ketones



16-year-old girl on a pump with cold symptoms, headache, BG in 300s for last 6 hours

# Take Home Points



- Your body responds to stress and illness by getting ready to “fight or flight”
- Short-term stresses causing high BGs may self-resolve
- Illnesses often need more insulin to balance “counter-regulatory” hormones
  - 1<sup>st</sup>: CHECK FOR KETONES
  - 2<sup>nd</sup>: Continue basal insulin and give more rapid-acting insulin
  - 3<sup>rd</sup>: Fluids, fluids, fluids
  - Don’t forget over-the-counter symptom management
- Reach out to diabetes team if:
  - I’m dehydrated
  - I may have DKA
  - I have ketones and low BG
  - I’m worried
- Set a Sick Day Plan with team

# Questions?

“Sick Day” Resources:

