

Managing the (highly) adrenaalised animal in a rescue situation



Animal Emergency Incident Management Network
(Australia & New Zealand)

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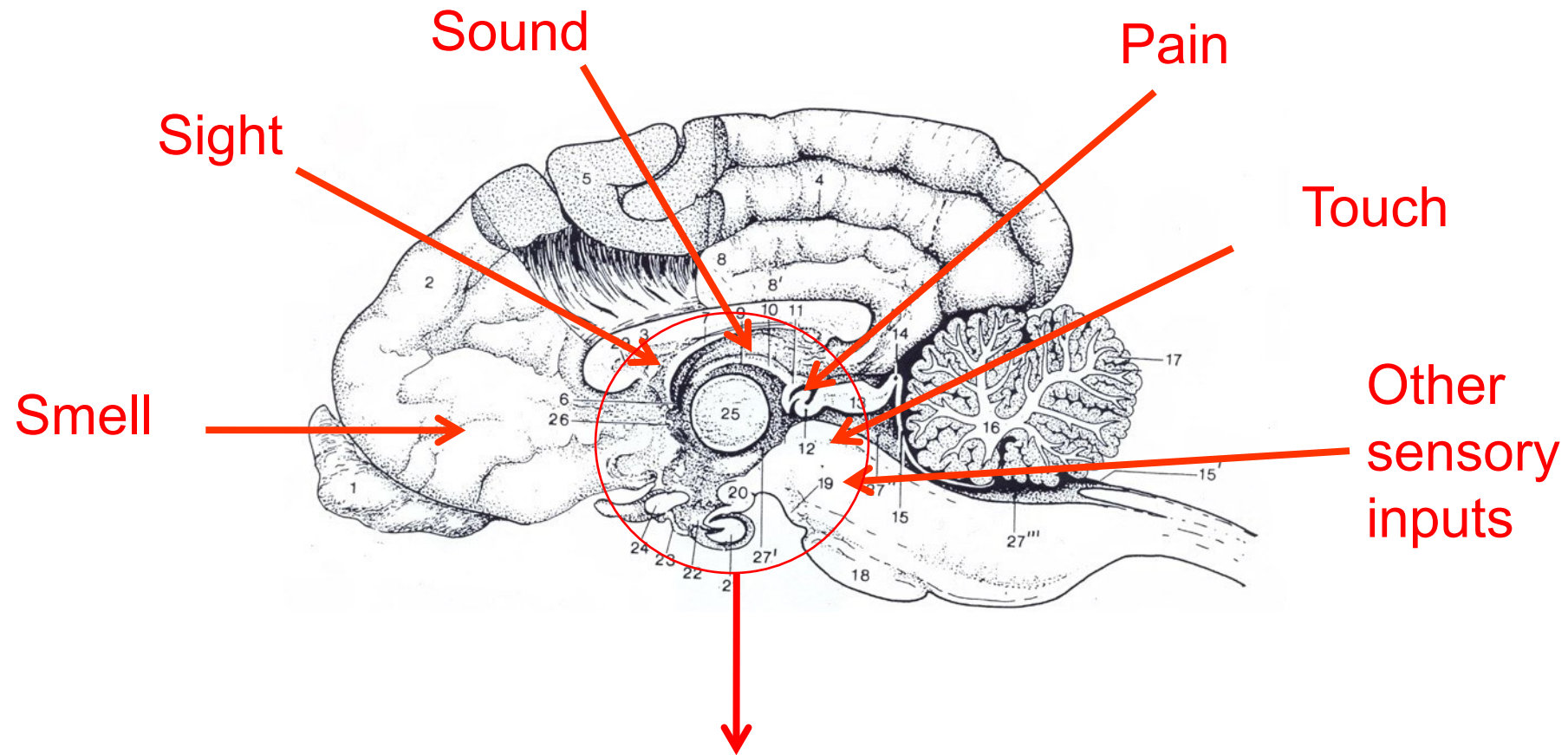
What is this animal thinking and feeling?



Let's talk chemistry.....



Fear, panic, happiness and other emotions: it's all chemistry



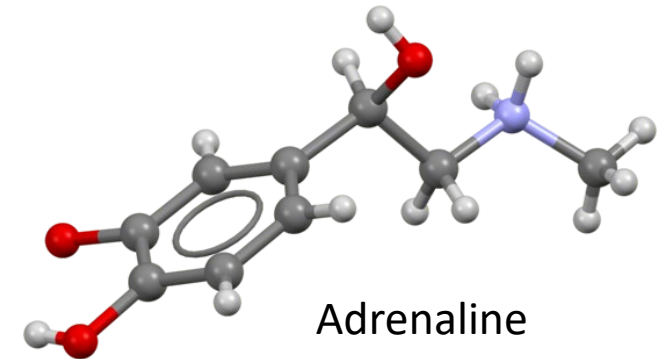
This is the Control and Command Centre:
Chemical regulation of emotional and physical responses

Fight or flight response

- Body wide stress response
 - Increased cardiovascular and respiratory function
 - Increased muscular effort
 - Decreased gut activity
 - Pupil dilation
 - Mental sharpness
 - Acceleration of reflexes

Lights up = More adrenaline

Lights down = Less adrenaline

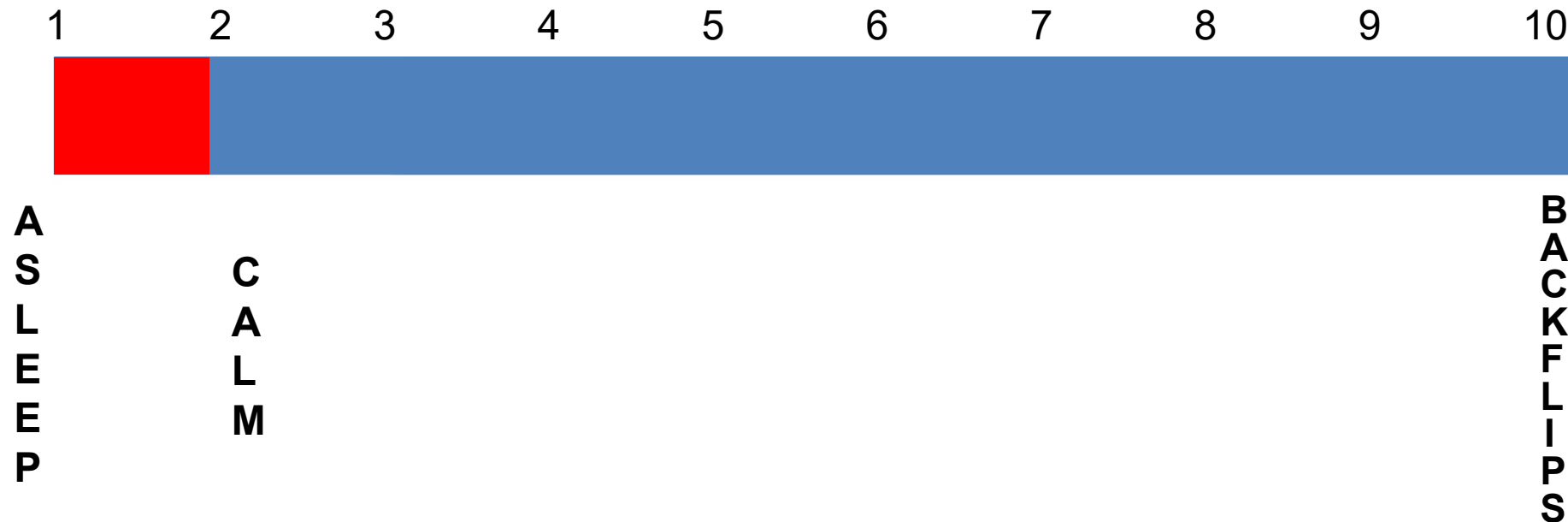


Hatchy Adrenaline and Sedation Scale

Where would you expect adrenalin level of a **horse in a stable** to be?

The Vet gives **sedation to rasp its teeth**

Where would you expect adrenalin level of the horse to be now ?



Different chemicals cause different responses

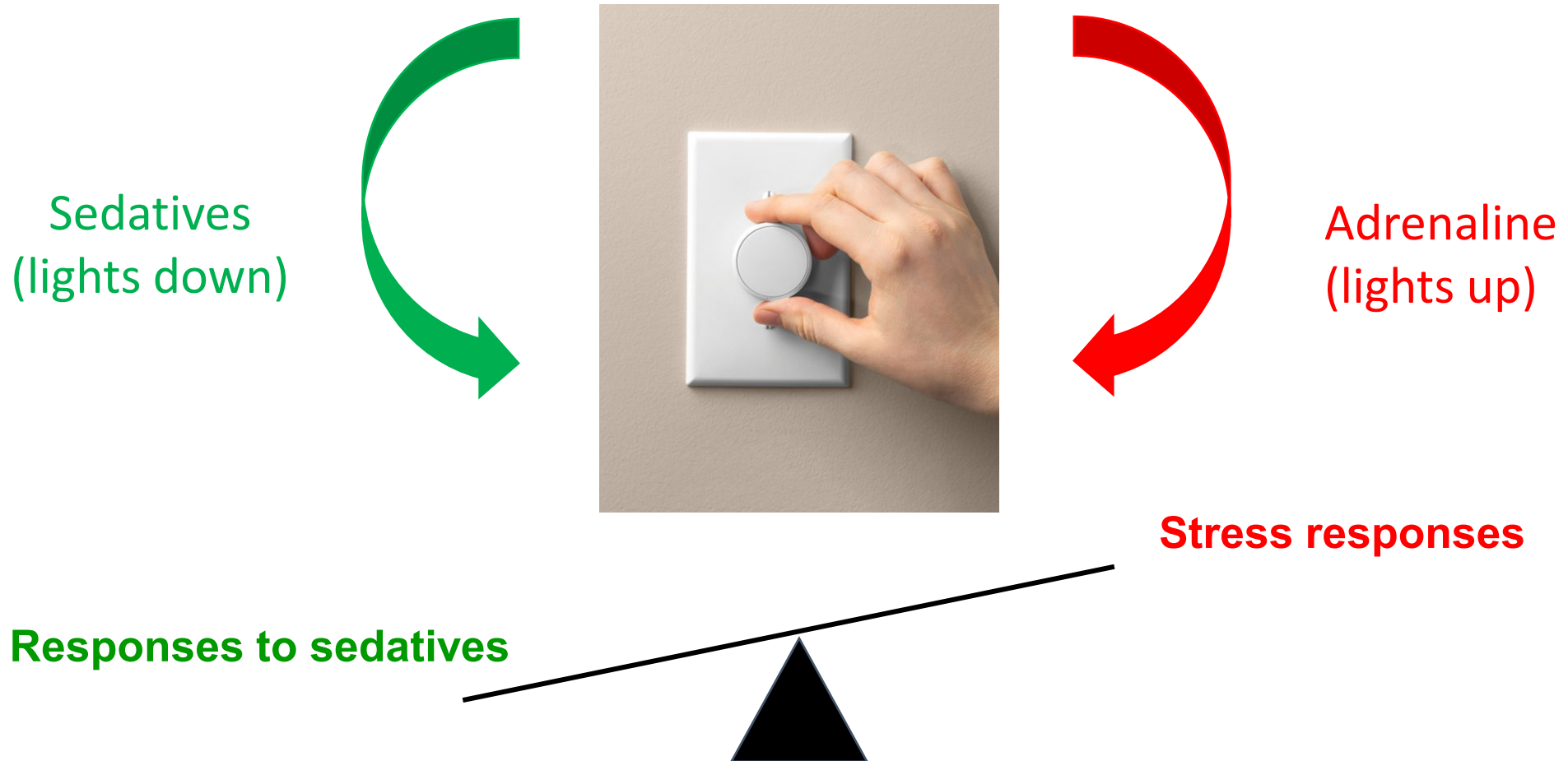
- Adrenaline and sedatives alter the chemical balance in the brain
- Adrenaline increases brain activity: lights up
- Sedatives decrease brain activity: lights down

Lights up = more alert and responsive
Lights down = less alert and responsive



The problem with adrenaline

- Sedatives and adrenaline act on the same dimmer switches in the brain



The casualty centered rescue



What do horses need?

Five freedoms.....

Five domains.....

- Safety
- Leadership
- Food (and water)
- Social interaction
- Choice



What can we do or provide at the incident?

Clear, calm communication

- Horses, like people, react to the way they are handled
- Bad temper, nervousness and panic are reflected by the horse
- Communicate your intentions clearly: be consistent and clear
- Think about your body language
- Stay calm & use a calm, even tone of voice
- Constant communication with the horse is vital throughout
- **Avoid winding the horse up more than it already is**

Think about what the horse can hear

- A quiet scene is a good scene
- Turn off sirens
- Keep people quiet
- No loud machinery near the (unsedated) horse
- Cotton wool in the animal's ears to decrease stimulation



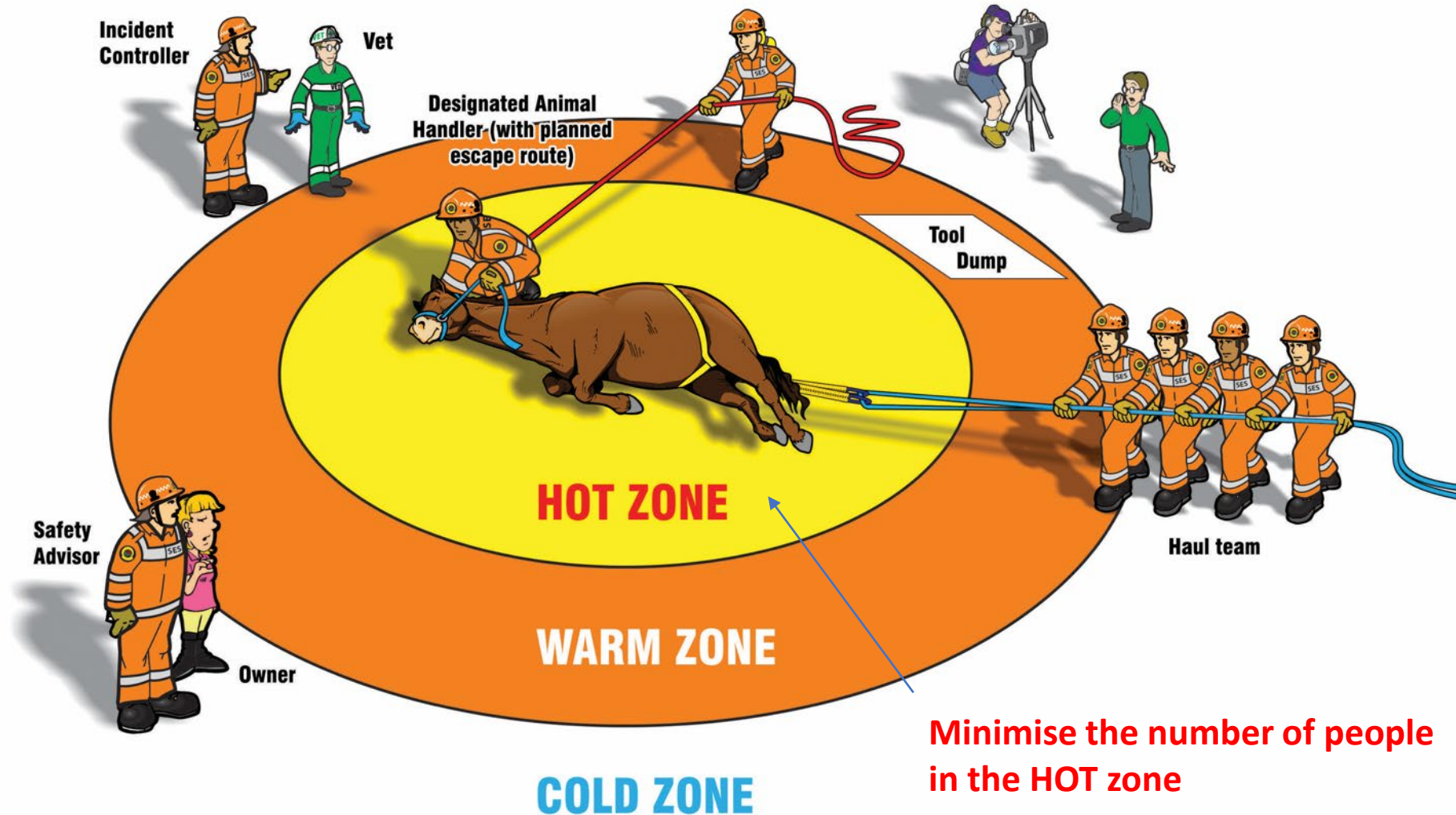
Think about what the horse can see



Panoramic vision



Think about what the horse can see

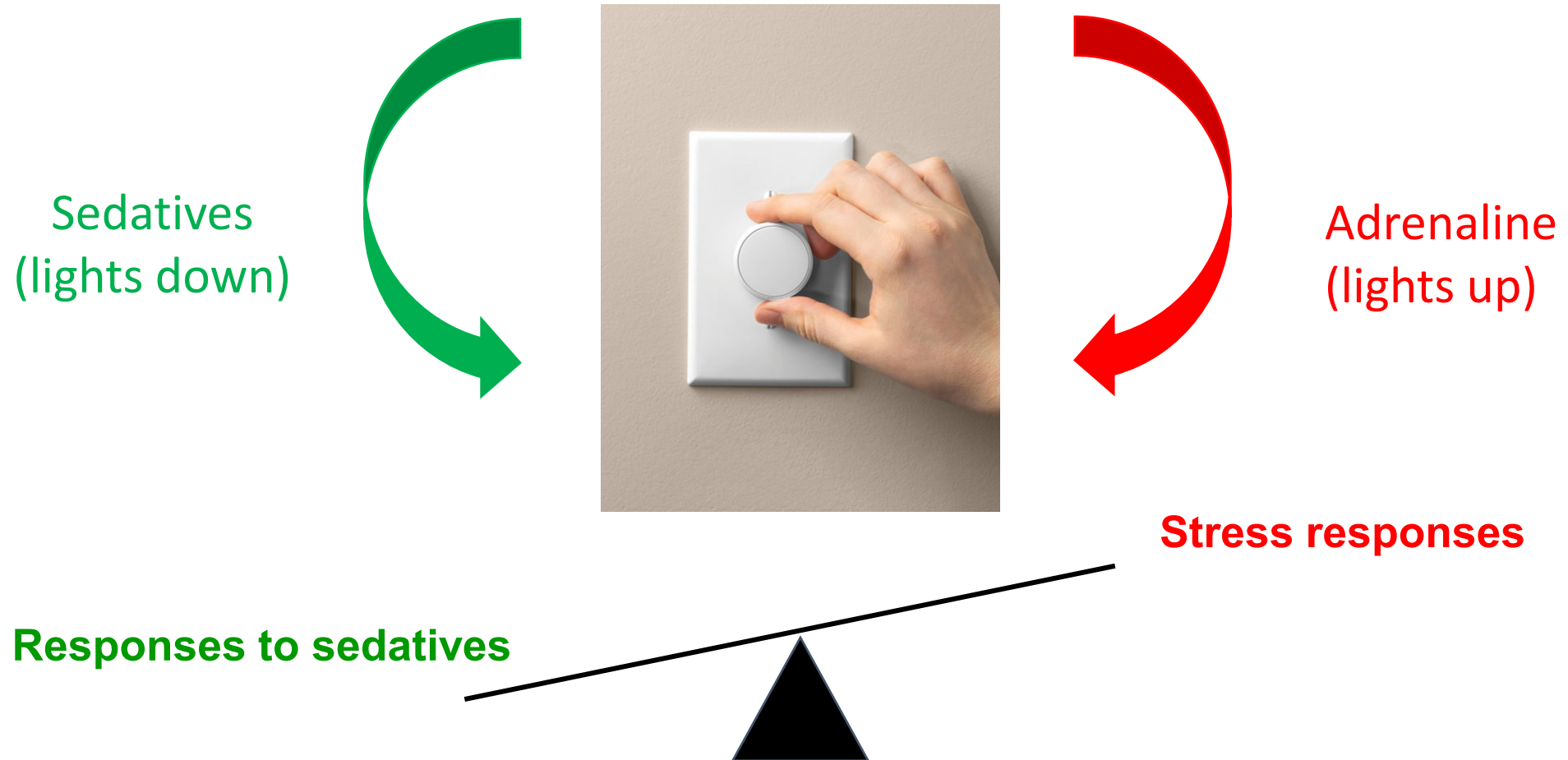


Blindfolds



Adrenaline, sedatives and dimmer switches

- Sedatives and adrenaline act on the same dimmer switches in the brain

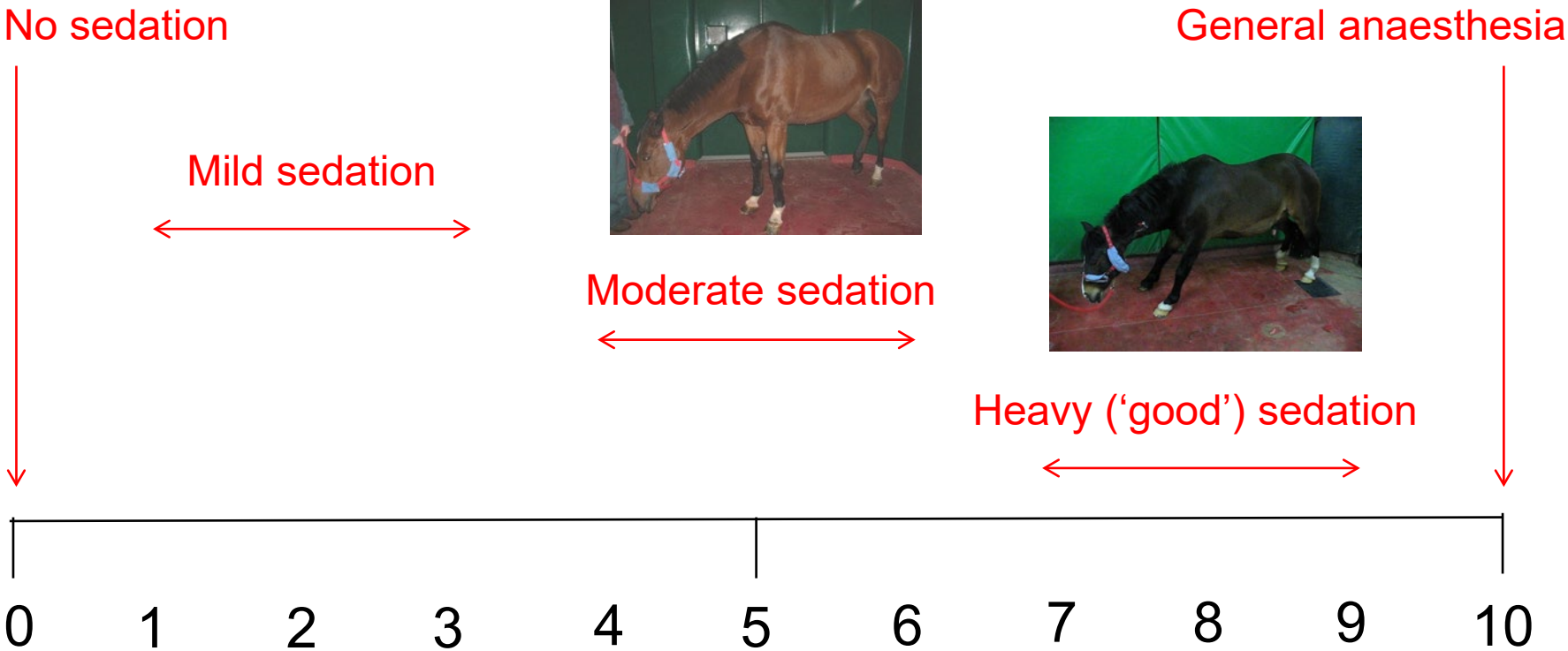


Sedation

- Is safe and dose dependent
 - giving more drug produces more effect
- Combinations of drugs are more potent
 - different drugs have different effects
 - combinations produce synergistic chemical restraint
- Is heavily dependent on how adrenalized the animal is
- Can be topped up but is much less effective if a too small dose is given to start with
 - You need to get it right the first time!



Effective communication on scene



Numerical scale for chemical restraint

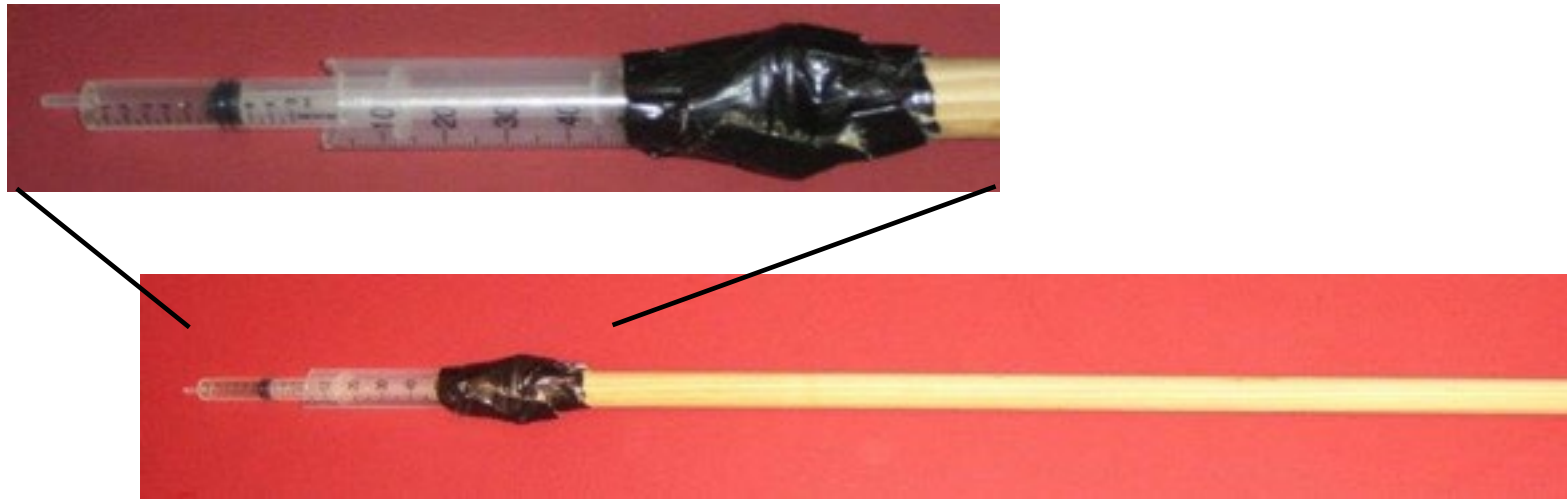
Tactical plan: routes of administration

- Safe access may not be possible for jugular or tail vein IV injection
 - confined space, debris, fencing, mud, water, slurry
- Initial control can be achieved IM (remote injection pole?) to give safer access, followed by IV



Remote injection poles

- You can improvise
 - Broom stick (or other pole), 50ml syringe plus 20ml syringe



Multimodal regimes

- Combining α_2 agonists with opioids increases depth and quality of sedation
- Adding ACP further improves sedation quality
- ACP/detomidine/butorphanol combinations
 - ‘standard’ IV protocol **ACP (2ml/500kg), detomidine (0.5ml/500kg), butorphanol 1ml/500/kg)**
 - ‘standard’ IM protocol **ACP (2ml/500kg), detomidine (1ml/500kg), butorphanol 2ml/500/kg)**
- ‘standard’ regimes effective in calm horses only

Adjusting IV regimes to fit the casualty

Drug	'Standard' practice dose	Moderately stressed horse	Extremely stressed horse
ACP	2ml/500kg	2ml/500kg	2ml/500
Detomidine	0.5ml/500kg	1ml/500kg	2ml/500kg
Butorphanol	1.0ml/500kg	1.5ml/500kg	2ml/500kg

Note: assessing stress/panic/pain is not easy in horses, especially in entrapments with limited visibility or access

Extended sedation protocols

- Some complex rescues require extended periods of sedation
- Repeated bolus administration not ideal
 - repeated venous access
 - oscillating depth of sedation and scene safety as plasma drug levels fluctuate in and out of optimal range
- CRI is a better option



How to: Detomidine CRI (500 kg horse)

- Place IV catheter
- Sedate horse with 0.3ml detomidine IV
- Inject 1ml butorphanol IV
- Make up infusion
 - add 12 mg detomidine (1.2 ml) to 500ml saline
- Wait 5 min then start infusion
- Start at 4 drops/s
- Slow to 1-2 drops/s when good sedation achieved then dose to effect...
- Recovery around 15-20 min after stopping CRI



General anaesthesia

Tactical plans may need to include options for GA:

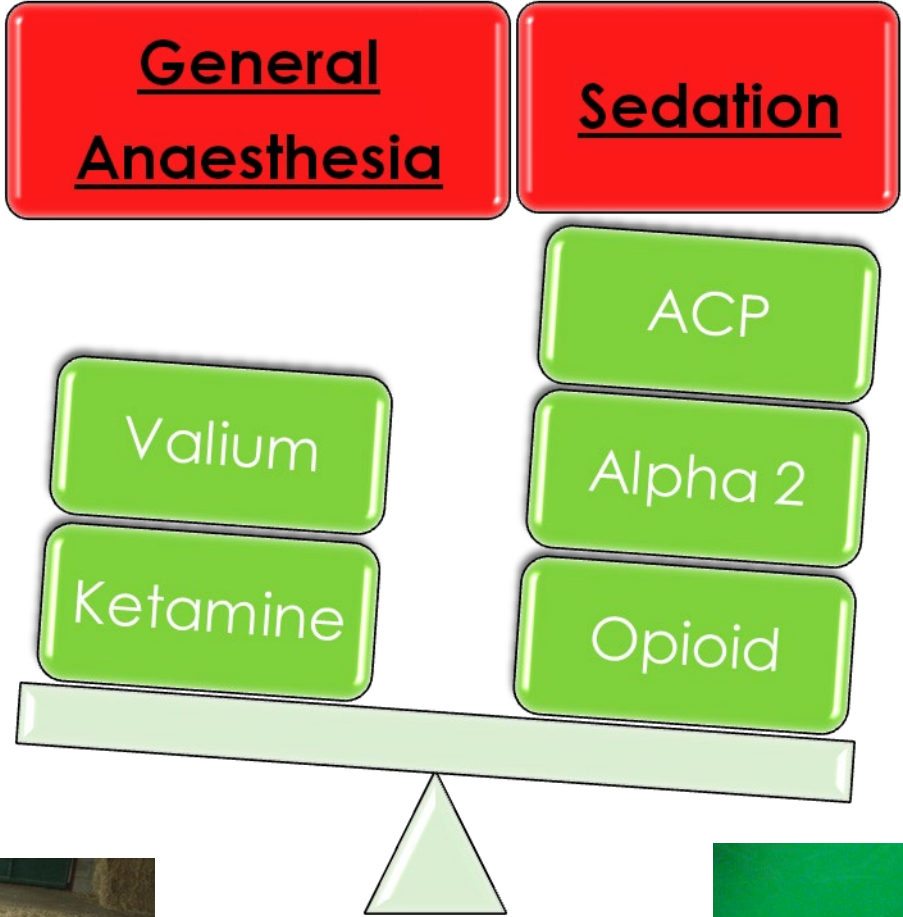
- Hobbled lifts
- High levels of stimulation (noise, vibration)
- Confined space working (RTC's)
- Sedation fails to provide adequate control



Ketamine protocols: a flexible approach

- Tactical plan may include GA from start of rescue, or sedation regimes can be converted to GA if the situation changes





Ketamine/diazepam GA protocols

- Sedate horse using multimodal regime IV
 - α_2 agonist plus opioid or ACP/ α_2 /opioid (better)
 - wait for maximum effect (at least 5-10 min)
 - horse must be well sedated (top up if needed)
- Ensure everyone is briefed and ready to go Give ketamine 3mg/kg **(15ml/500kg)** and diazepam 0.05mg/kg **(6ml/500kg)** in same syringe
- Time to onset of GA: 2-3 min; duration 10-15 min (20 min max)
- Give top up every 10 min (one third initial dose of α_2 and ketamine)
- Protect head & eyes, consider blindfold, cotton wool in ears

Sedation versus anaesthesia

Sedation

- Makes scene *safer* (note: not a *safe* scene – care still needed)
- Decreases casualty anxiety and stress
- Decreases secondary trauma from struggling
- Assess patient before sedation (viability and resuscitation)

General anaesthesia

- Makes scene *safer* – care still needed
- Safe recovery area needed for animal
- Advisable for
 - Confined spaces (RTC's)
 - Very active/struggling horse
- Mandatory for hobbled lifts
- Assess and stabilise patient before anaesthesia
- Use protocols that allow conversion of sedation to GA (Plan A to Plan B)

Chemical restraint: overview

Benefits

- Default for all rescues
- Reduction of anxiety
- Reduction of pain
- Makes animal more tractable
- Allow recumbent transport (rescue glide - short duration only)
- Personnel & scene safety

Care needed

- Recumbency or falling
 - water (head position)
 - entrapment
 - vertical drop
- Condition of casualty
- Personnel safety – false sense of security with sedation and GA!
- Safe recovery areas needed after GA

How to achieve good sedation at rescues

- Assess the horse and scene carefully
- choose an appropriate
 - drug(s)
 - dose (at least double your ‘normal’ dose)
 - route (IM and/or IV; remote injection techniques)
- Don’t expect too much
- Keep the horse calm at start
- Give enough time for effect
- Be prepared to re-sedate or change to GA (‘lights off’)



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