


A photograph of a red mushroom with white spots, likely a fly agaric, growing in a field of dry grass. The mushroom is the central focus, with its bright red cap and white spots contrasting sharply with the dry, brownish-yellow grass. The text 'General Anaesthetics & Sedatives' is overlaid in a bold, yellow font on the mushroom's cap.

General Anaesthetics & Sedatives

anaesthesia

A red mushroom with white spots, likely an Amanita muscaria, is growing in a field of dry grass. The mushroom has a bright red cap with numerous white, irregular spots and a white stem. The background is a dense field of dry, yellowish-brown grass.

- no feeling
 - unconsciousness
 - analgesia

A red mushroom with white spots is positioned in the upper center of the image, resting on a bed of dry, brown grass. The mushroom's cap is a vibrant red with several small, white, irregular spots. Its stem is thick and appears to be a pale, almost white color. The background is a dense layer of dry, brown grass, creating a textured, natural setting.

general anaesthetics
neuroleptanalgesics
heavy sedatives
light sedatives
tranquillisers
anxiolytics



barbiturates, halothane, etc
opioid & sedative
 α_2 agonists
phenothiazines
butyrophenones
benzodiazepines



sedative indications

A red mushroom with white spots, likely a fly agaric, growing in a field of dry grass. The mushroom is the central focus of the image, with its bright red cap and white spots contrasting sharply with the dry, brownish-yellow grass. The text is overlaid on the left side of the image.

- restraint
- (analgesia)
- potentiation of other drugs
- useful side effects
 - antiemetic

anaesthetic indications

- restraint
- analgesia
- euthanasia



balanced anaesthesia

- **unconsciousness**
- **analgesia**
- **muscle relaxation**



balanced anaesthesia

- 3 different drugs
- large doses of 1 drug



balanced anaesthesia

- unconsciousness
 - analgesia
 - muscle relaxation
- sedation {
- } neurolept
analgesia

choose drugs to produce correct balance for each animal

unconsciousness

- ascending reticular formation ?
- inputs from
 - nociceptors via spinal cord
 - proprioceptors
 - cortex
 - lots of others?

anaesthetic mechanisms

A red mushroom with white spots, likely an Amanita muscaria, is the central visual element. It is positioned in the upper right quadrant of the slide, partially overlapping the title and the first bullet point. The mushroom has a bright red cap with numerous white, irregular spots. Its stem is thick and appears to have a white or light-colored base. The background is a dense field of dry, yellowish-brown grass, which is slightly out of focus, creating a naturalistic setting for the mushroom.

- **interactions with**
 - **water**
 - Pauling, 1960
 - **lipids**
 - Meyer & Overton, 1900
 - **proteins**
 - current theories

anaesthetic mechanisms

- GABA_A R potentiation
- glycine R potentiation
- nAChR blockade
- NMDA R blockade
- 5HT_3 R blockade
- Ca channel blockade
- Na channel blockade

BARBITURATES

OTHER INJECTION ANAESTHETICS?

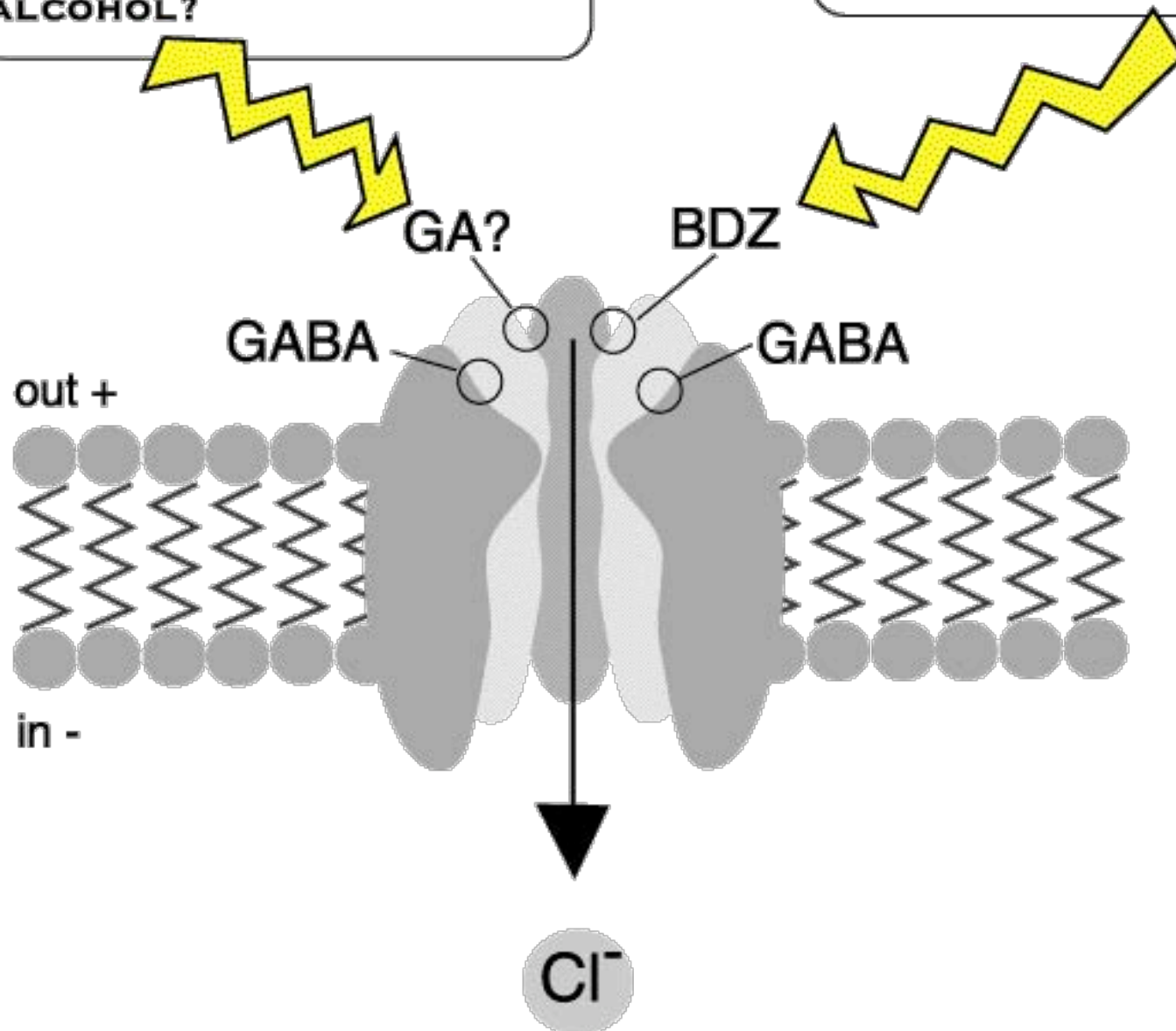
INHALATION ANAESTHETICS?

ALCOHOL?

agonist DIAZEPAM

antagonist FLUMAZENIL

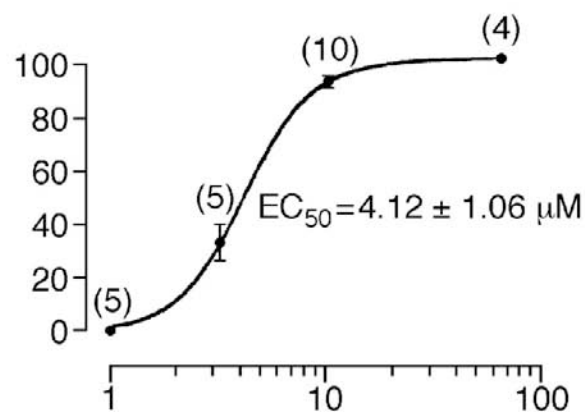
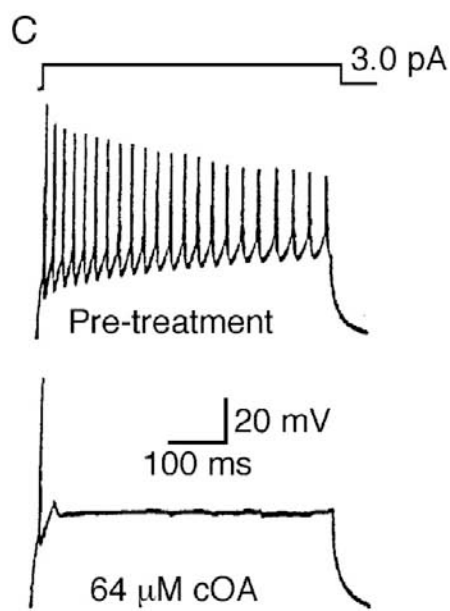
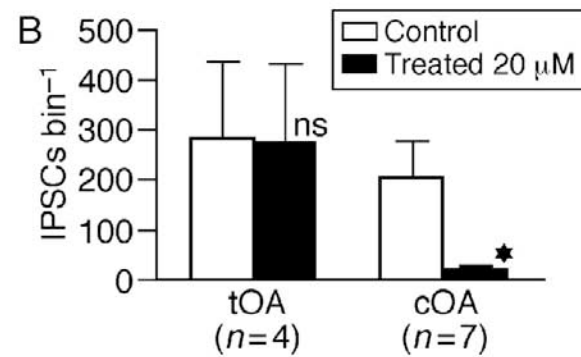
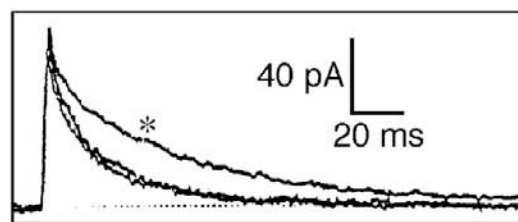
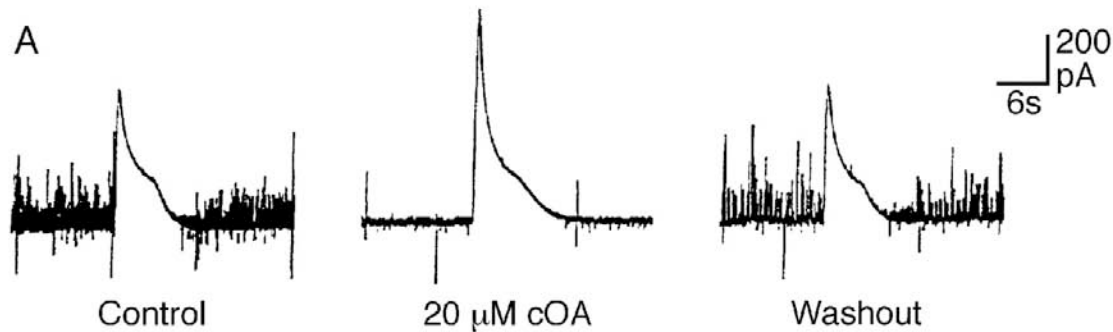
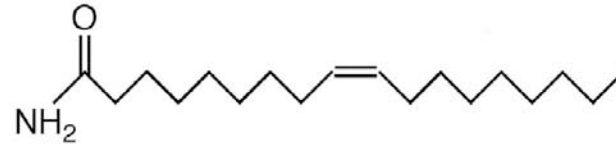
inverse agonist β CARBOLINE



anaesthetic mechanisms

- GABA_A potentiation
- Ca channel blockade
- Na channel blockade
- nACh blockade

'OLEAMIDE' (cOA)



high pressure nervous syndrome

- high pressures reverse anaesthesia (tadpoles)
- high pressures cause excitation (man)



typical anaesthetic

A red mushroom with white spots, resembling Amanita muscaria, growing in a field of dry grass. The mushroom is the central focus of the image, with its bright red cap and white spots contrasting sharply with the dry, brownish-yellow grass. The text is overlaid on the left side of the image.

- **premed**
 - sedative and analgesic
- **induction**
 - injection anaesthetic
- **maintenance**
 - inhalation anaesthetic & oxygen
 - muscle relaxant?
- **recovery**
 - analgesic

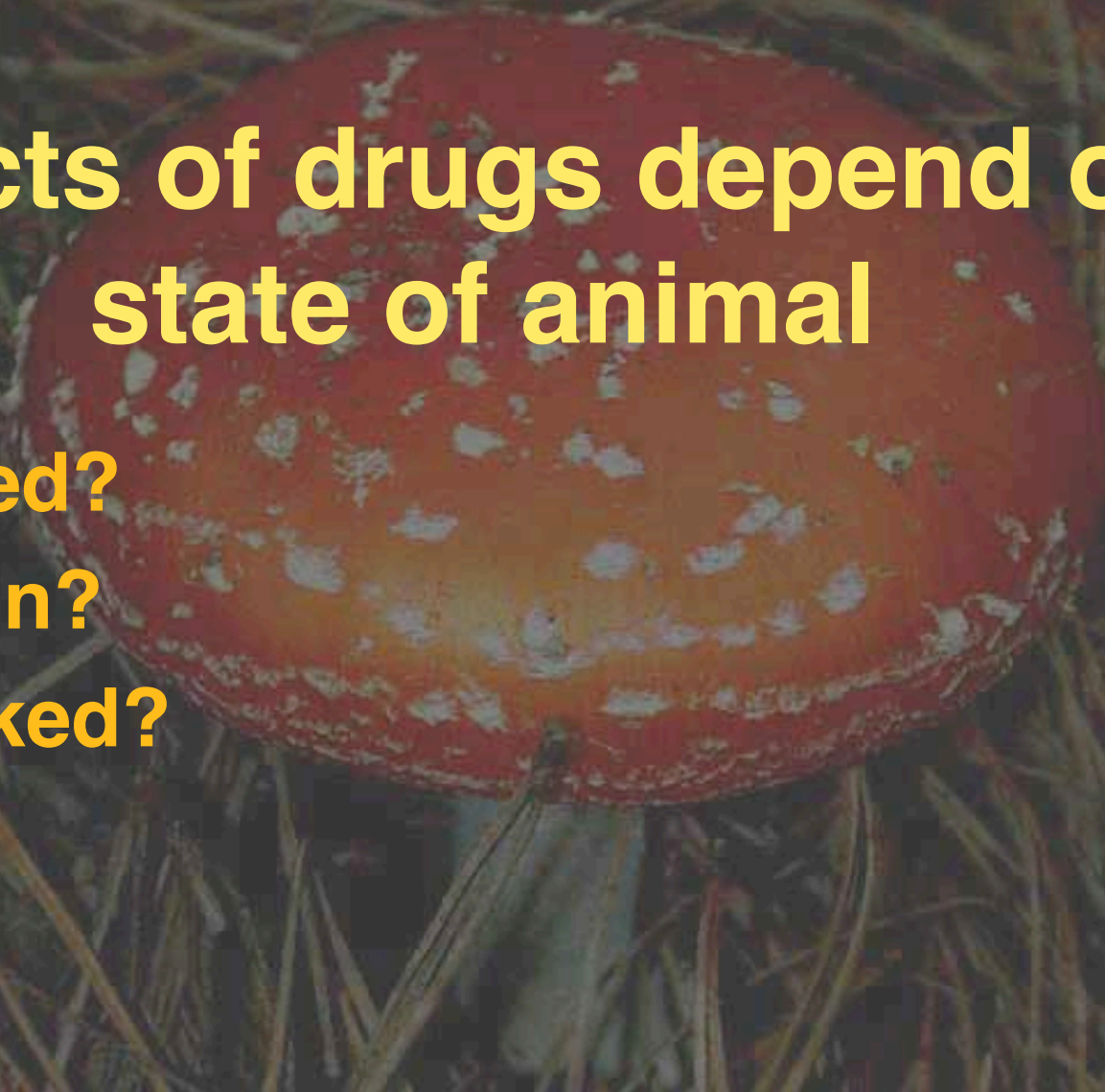
A red mushroom with white spots is centered in the image, growing from a bed of dry, brown grass. The mushroom has a bright red cap with numerous small, white, irregular spots. The background is a dense layer of dry grass, creating a textured, natural setting.

**ie, lots of drugs which
interact!**

**you need to know your
pharmacology!!!**

effects of drugs depend on state of animal

- excited?
- in pain?
- shocked?

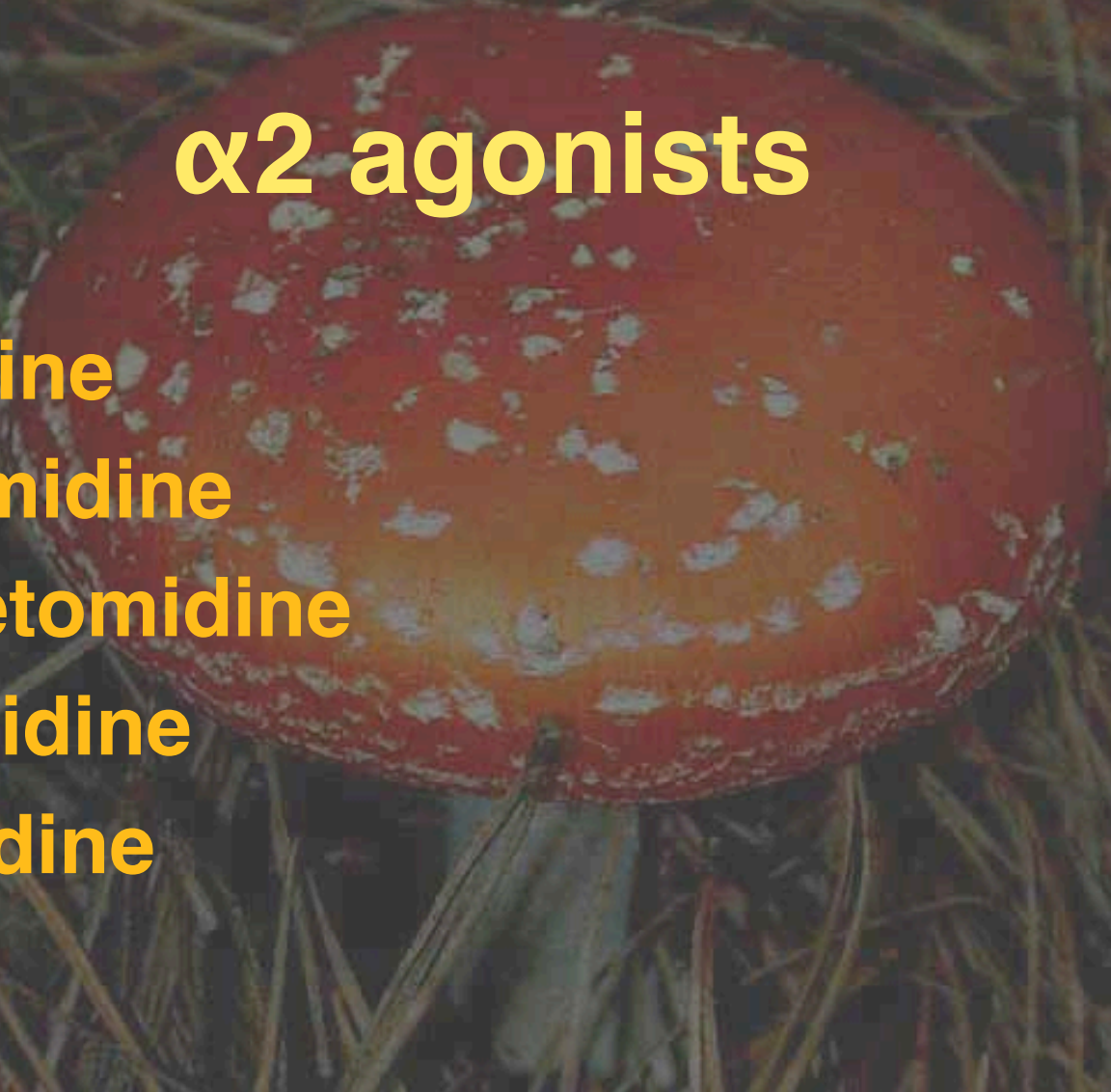


sedatives

- **$\alpha 2$ agonists**
 - $\alpha 2$ adrenergic R
- **phenothiazines**
 - D2 R, H, $\alpha 1$ & most others (antagonist)
- **benzodiazepines**
 - GABA_A R (agonist)
- **butyrophenones**
 - D2 R (antagonist)

$\alpha 2$ agonists

- xylazine
- detomidine
- medetomidine
- romifidine
- clonidine



α 2 agonists

- **xylazine**
 - all spp, especially ruminants
- **detomidine**
 - horses
- **medetomidine**
 - dogs & cats (people)
- **romifidine**
 - horses
- **clonidine**
 - people

α 2 agonist effects

- sedation
- analgesia
- hyper / hypotension
- bradycardia
- smooth muscle spasm then relaxation
- vomiting (dog & cat)
- hypoxaemia (ruminants)
- idiosyncratic reactions (deer)
- hypothermia

α 2 antagonists

- atipamezole
- yohimbine
- idazoxan



phenothiazines

- acepromazine
- chlorpromazine
- methotrimeprazine
- promethazine



phenothiazine effects

- sedation
- antiemetic
- vasodilatation
- antimuscarinic
- antihistamine
- lowers temperature
- extrapyramidal stimulation
- analgesic / hyperalgesic

A red mushroom with white spots, likely an Amanita muscaria, is growing in a field of dry grass. The mushroom has a bright red cap with numerous white, irregular spots. The stem is thick and appears to have a white or light-colored base. The background is a dense field of dry, yellowish-brown grass.

care

- stress / shock
- convulsions
- cardiovascular disease
- Boxers
- stallions

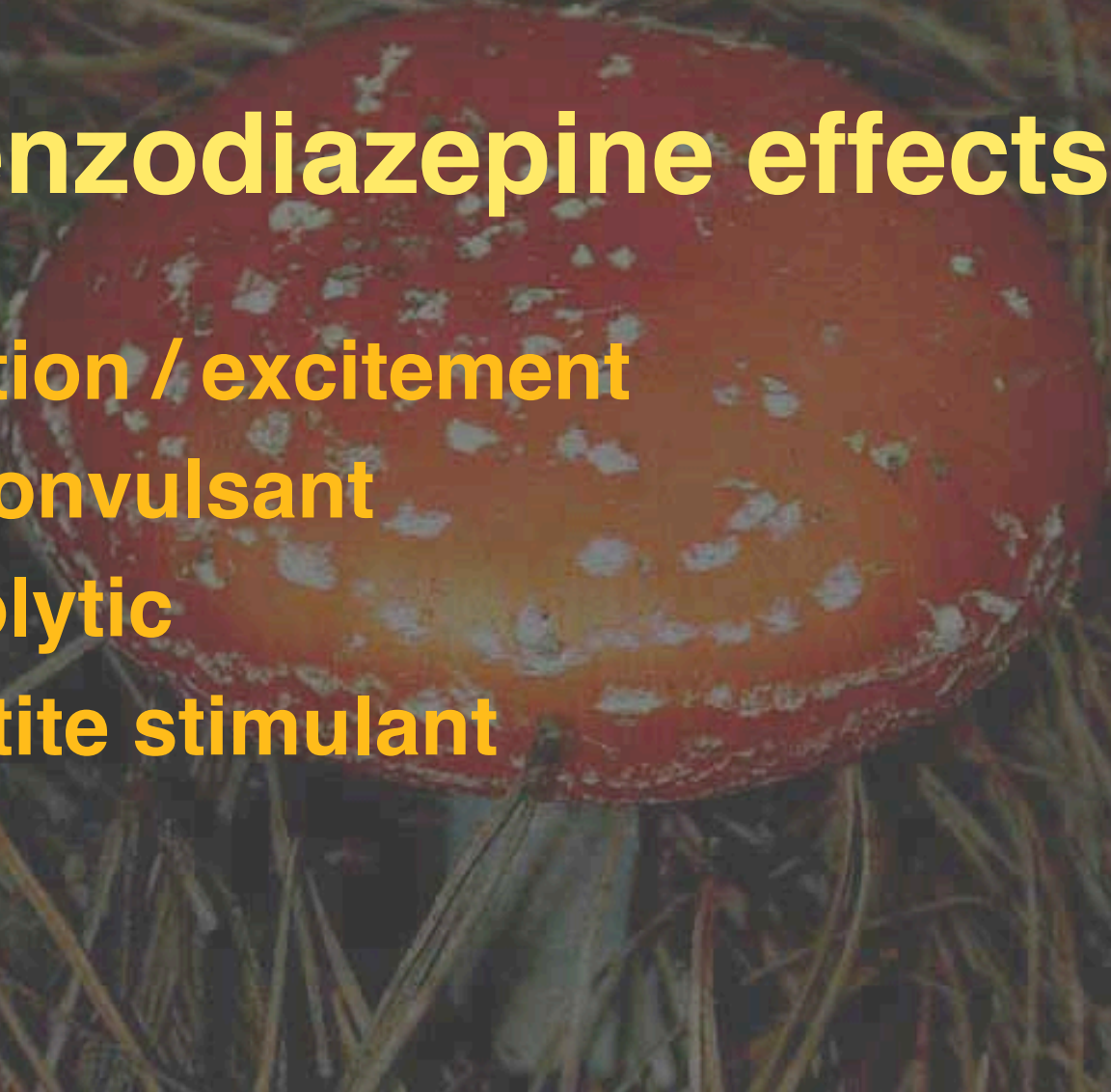
benzodiazepines

- midazolam
- diazepam
- hundreds of others in human use



benzodiazepine effects

- sedation / excitement
- anticonvulsant
- anxiolytic
- appetite stimulant



A red mushroom with white spots, likely a Amanita muscaria, is centered in the background. The text is overlaid on this image.

side effects

- **safe even at high doses**
- **diazepam vehicle?**
 - propylene glycol
 - polyethoxylated castor oil
 - **coconut oil emulsion**

A red mushroom with white spots, resembling a fly agaric, is growing in a field of dry, brown grass. The mushroom has a thick, white stem and a slightly flattened, red cap with numerous white, irregular spots. The background is a dense field of dry grass, creating a textured, brownish-gold environment.

benzodiazepine antagonist

- **flumazenil**

- **expensive**

butyrophenones

- azaperone
- droperidol
- haloperidol



butyrophenones

- sedative???
- antiemetic
- use something else



obsolete as sedatives

- chloral hydrate
- guaiphenesin
- phenobarbitone
- reserpine
- magnesium
- do not use



neuroleptanalgesia

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- **sedative**
 - **phenothiazine**
 - acepromazine
 - **butyrophenone**
 - droperidol
- **& analgesic**
 - **opioid**
 - morphine
 - buprenorphine

4 yr old German Shepherd

- wobbly in hind legs
- for hip x rays



2 week old foal

- hit by car
- restraint needed for examination



sedatives

- acepromazine produces mild sedation with cardiovascular depression
- diazepam is unreliable on its own but safe
- $\alpha 2$ agonists used in large animals but cause cardiovascular depression and vomiting in dogs & cats
- combinations of a sedative with an opioid give deeper sedation
- deeply sedated animals need to be monitored as for general anaesthesia