

Injection Anaesthetics

A red mushroom with white spots, resembling a fly agaric, is centered in the image. The mushroom has a bright red cap with numerous white, irregular spots and a white stem. It is growing in a field of dry, yellowish-brown grass. The text "Injection Anaesthetics" is overlaid in a bold, yellow font across the middle of the mushroom's cap.

definitions

- **general anaesthesia**
- **local anaesthesia**
- **regional anaesthesia**
- **neuroleptanalgesia**
- **dissociative anaesthesia**

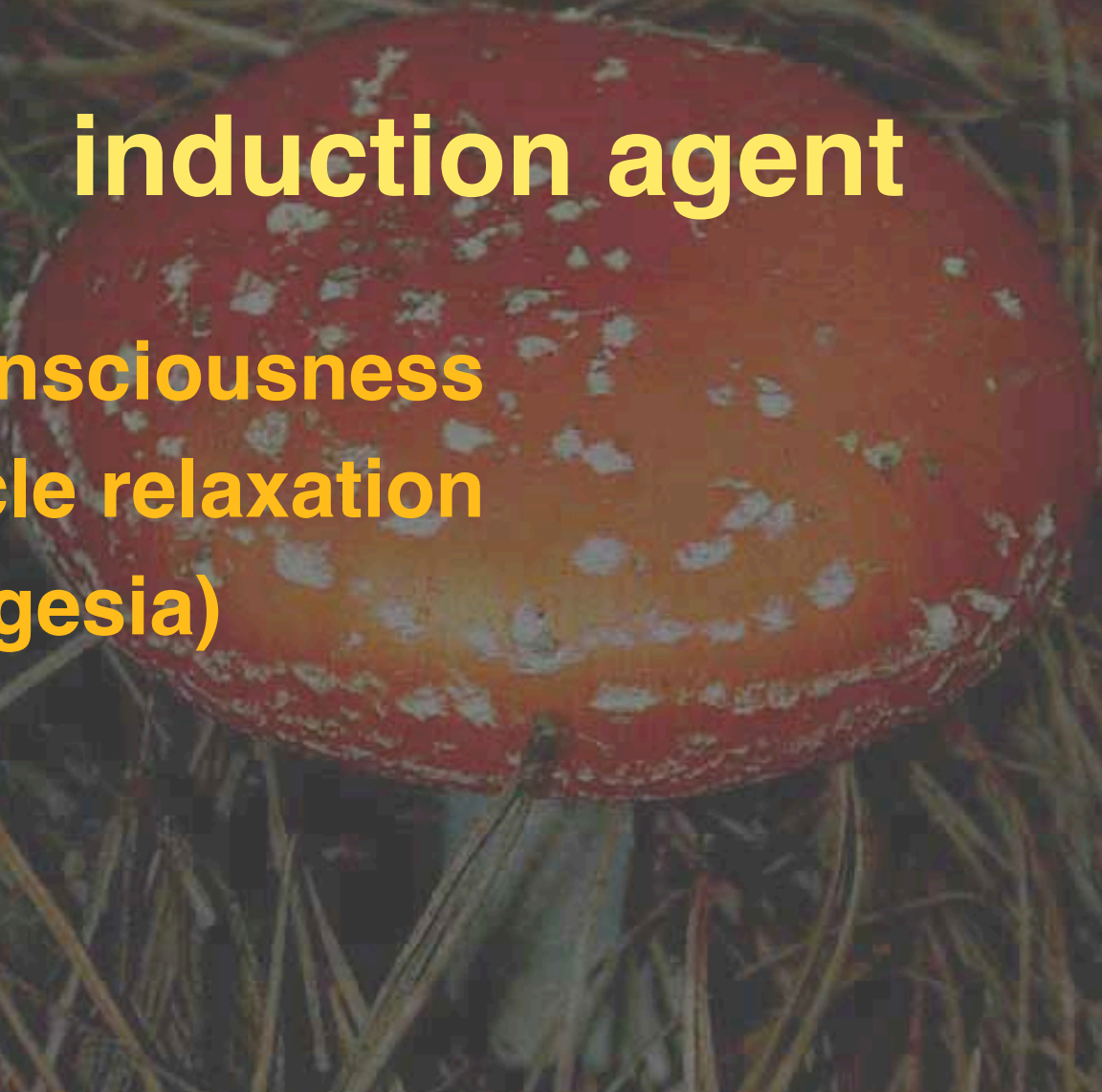
typical anaesthetic

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 background is a dense field of similar grass, creating a textured, natural setting.

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

induction agent

- unconsciousness
- muscle relaxation
- (analgesia)



single drugs

- barbiturates
- propofol
- alphaxalone
- (ketamine)
- (m)etomidate)



consider

A red mushroom with white spots, likely an Amanita muscaria, is 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 background is slightly blurred, emphasizing the mushroom.

- age
- temperament
- health
- species
- breed
- venous access
- cost

A close-up photograph of a red mushroom with white spots, likely an Amanita muscaria, growing in a field of dry grass. The mushroom has a bright red cap with numerous white, irregular spots. The stem is white and appears to have a fine, net-like texture. The background is a dense field of dry, yellowish-brown grass.

age

- **very young & very old**
 - **slower metabolism**

temperament

- control with premed
- treat pain in premed



health

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

- liver function
- kidney function
- anaemia
- debilitation
- shock

consider

A red mushroom with white spots, likely an Amanita muscaria, is 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 background is slightly blurred, emphasizing the mushroom.

- **age**
- **temperament**
- **health**
- **species**
- **breed**
- **venous access**
- **cost**

pharmacokinetics

- given iv usually
- cross blood brain barrier
- act in one circulation time
- redistributed
- animal wakes up before drug metabolised

dose depends on

- rate of administration
- concentration
- redistribution
- protein binding
- ionisation
- stimulation
- (metabolism)
- (acute tolerance)

effective plasma levels



effective plasma levels after sedative

log plasma concentration



asleep

awake

time

infusion

- **continuous iv infusion**
- **rapidly metabolised drugs only**
- **expensive equipment best**



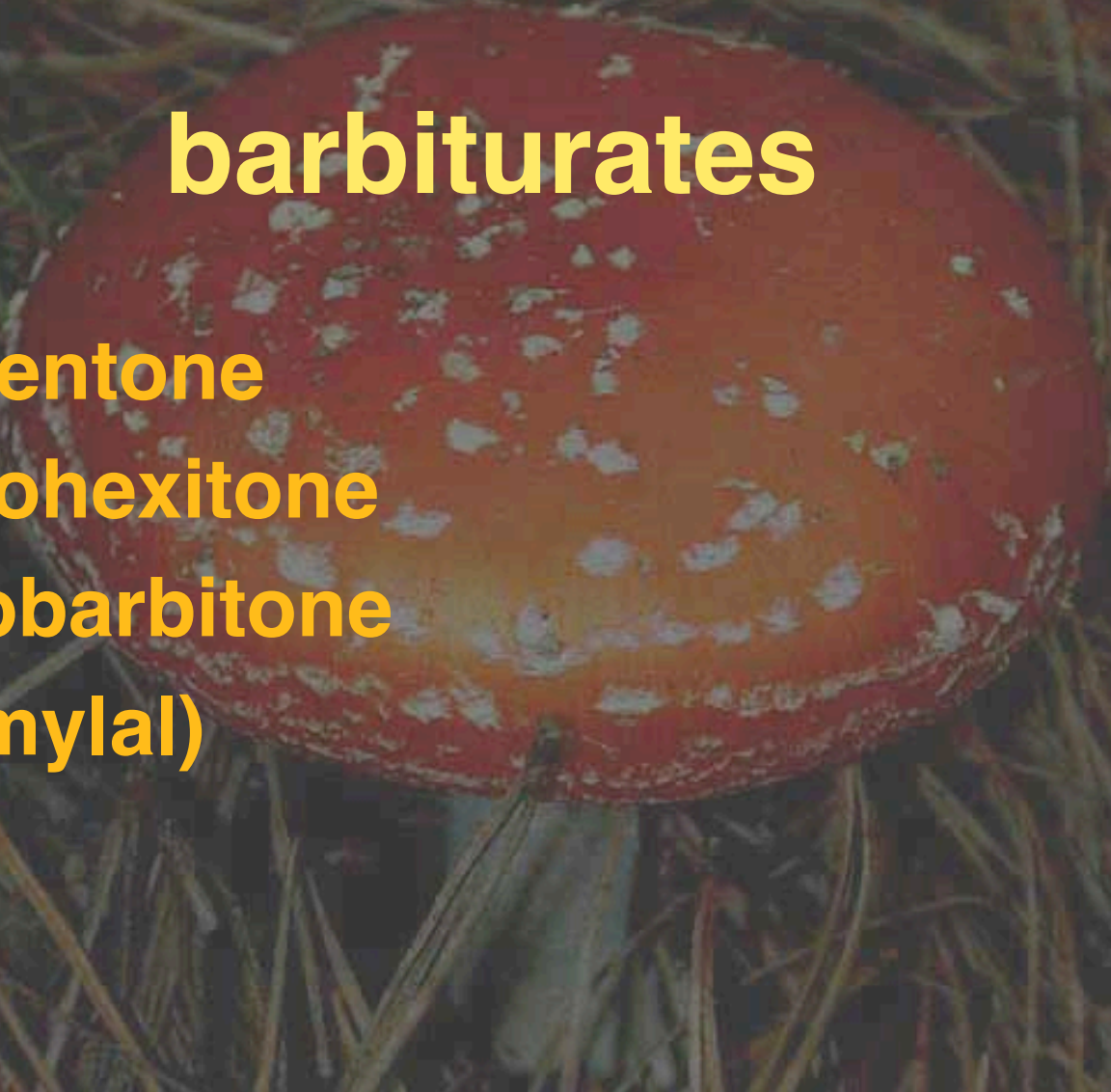
single drugs

- **barbiturates**
- **propofol**
- **alphaxalone**
- **(ketamine)**
- **(m)etomidate**



barbiturates

- thiopentone
- methohexitone
- pentobarbitone
- (thiamylal)



thiopentone

- $t_{1/2\alpha}$ 7 minutes
- $t_{1/2\beta}$ 4.5 hours
- redistributed to muscle then fat

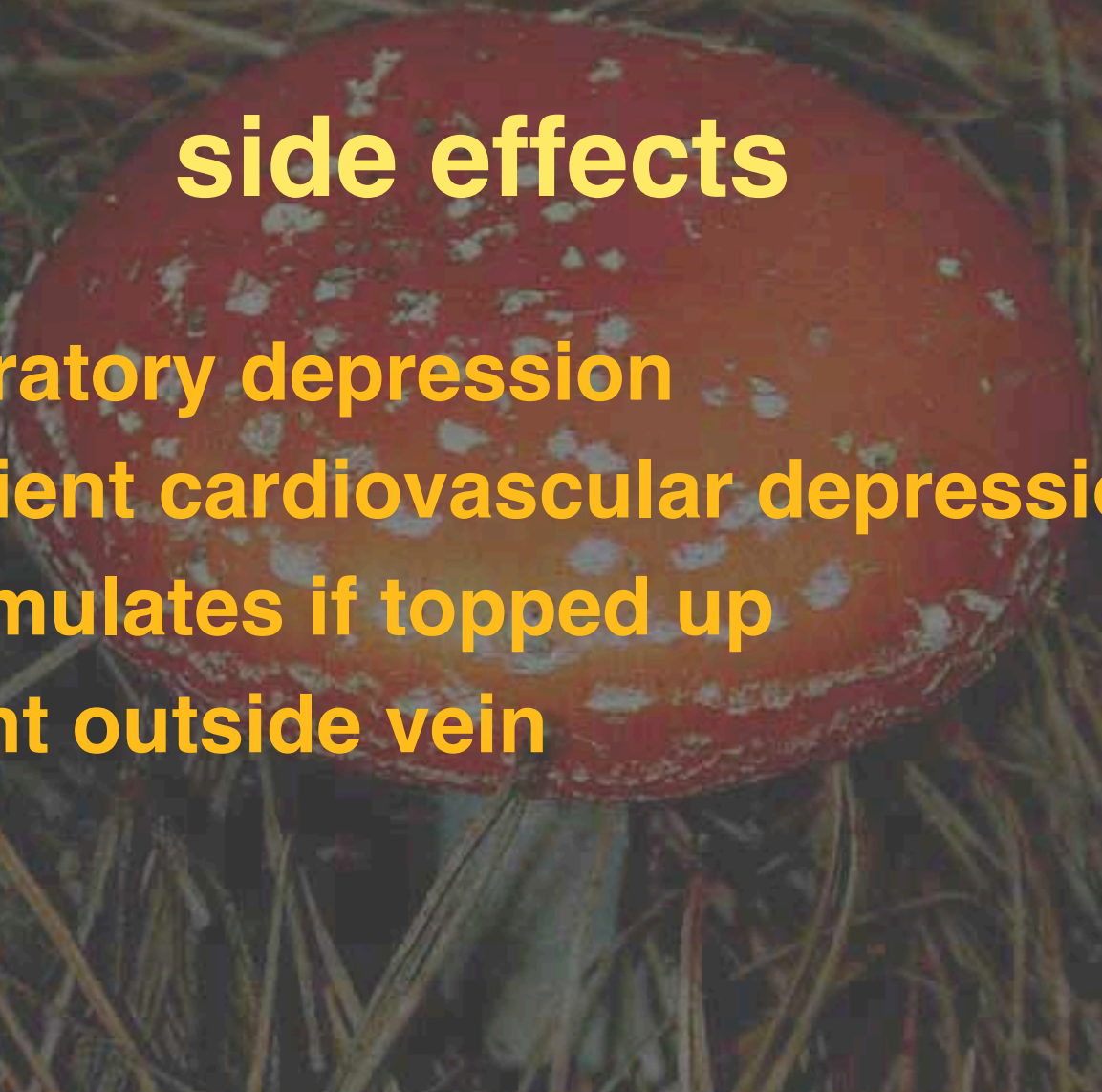
thiopentone

- reliable
- cheap
- works in all species with veins
- but...



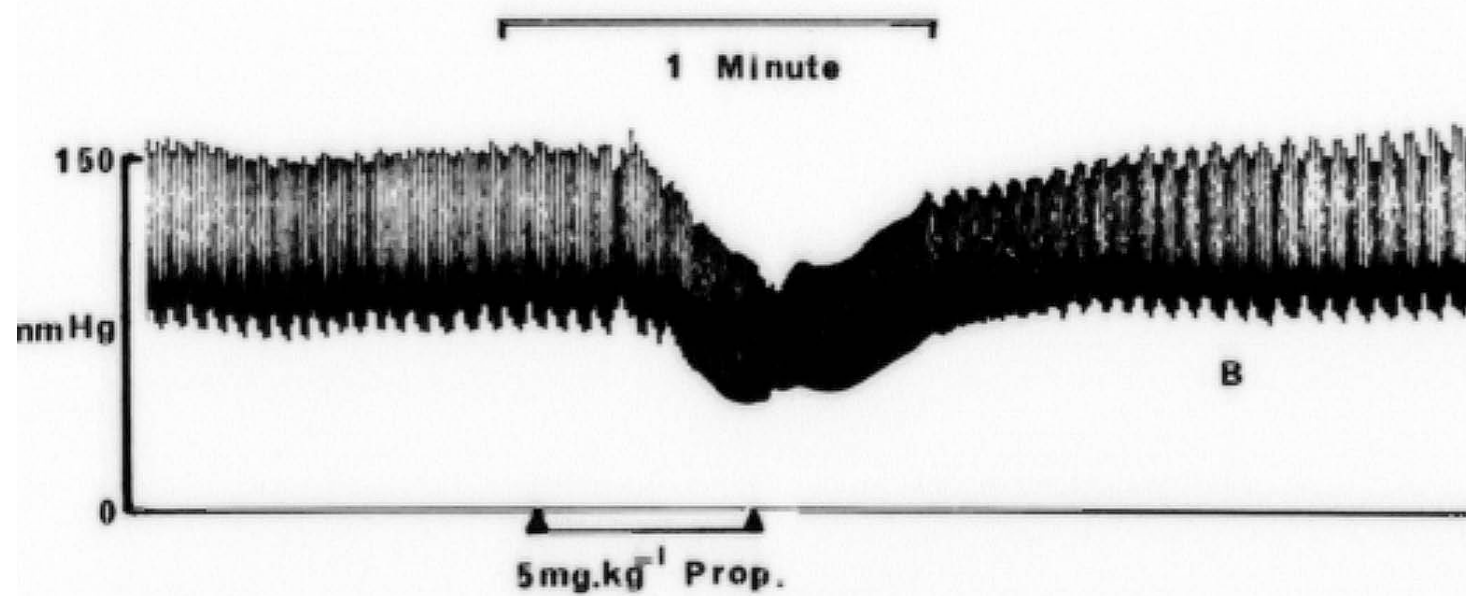
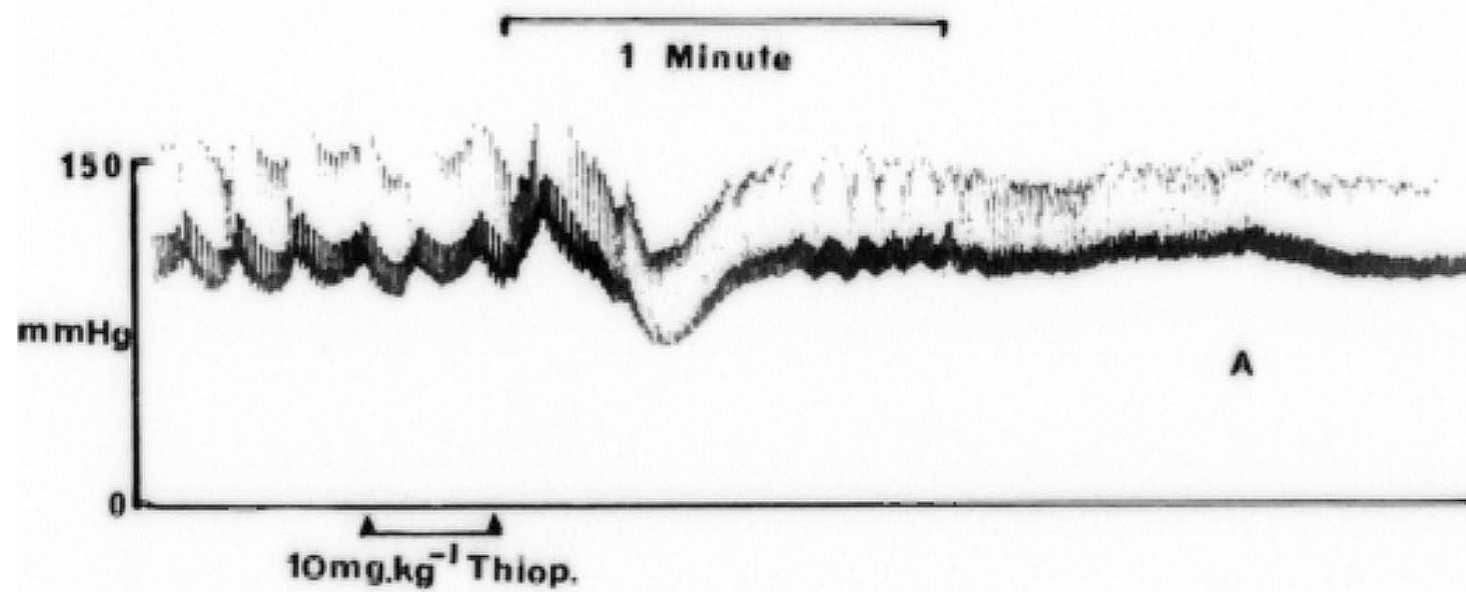
side effects

- **respiratory depression**
- **transient cardiovascular depression**
- **accumulates if topped up**
- **irritant outside vein**









chemistry

- weak acid in NaCO_3
- used as
 - 10% soln in horses – pH 12
 - 2.5% soln in dogs – pH 11
 - 1.25% soln in cats – pH 9.5
- short shelf life once made up

A close-up photograph of a red mushroom with white spots, likely an Amanita muscaria, growing in a field of dry, brown grass. The mushroom's cap is bright red with numerous white, irregular spots. The stem is thick and white. The background is a dense layer of dry grass, some of which is green at the base.

use

- **iv induction only**

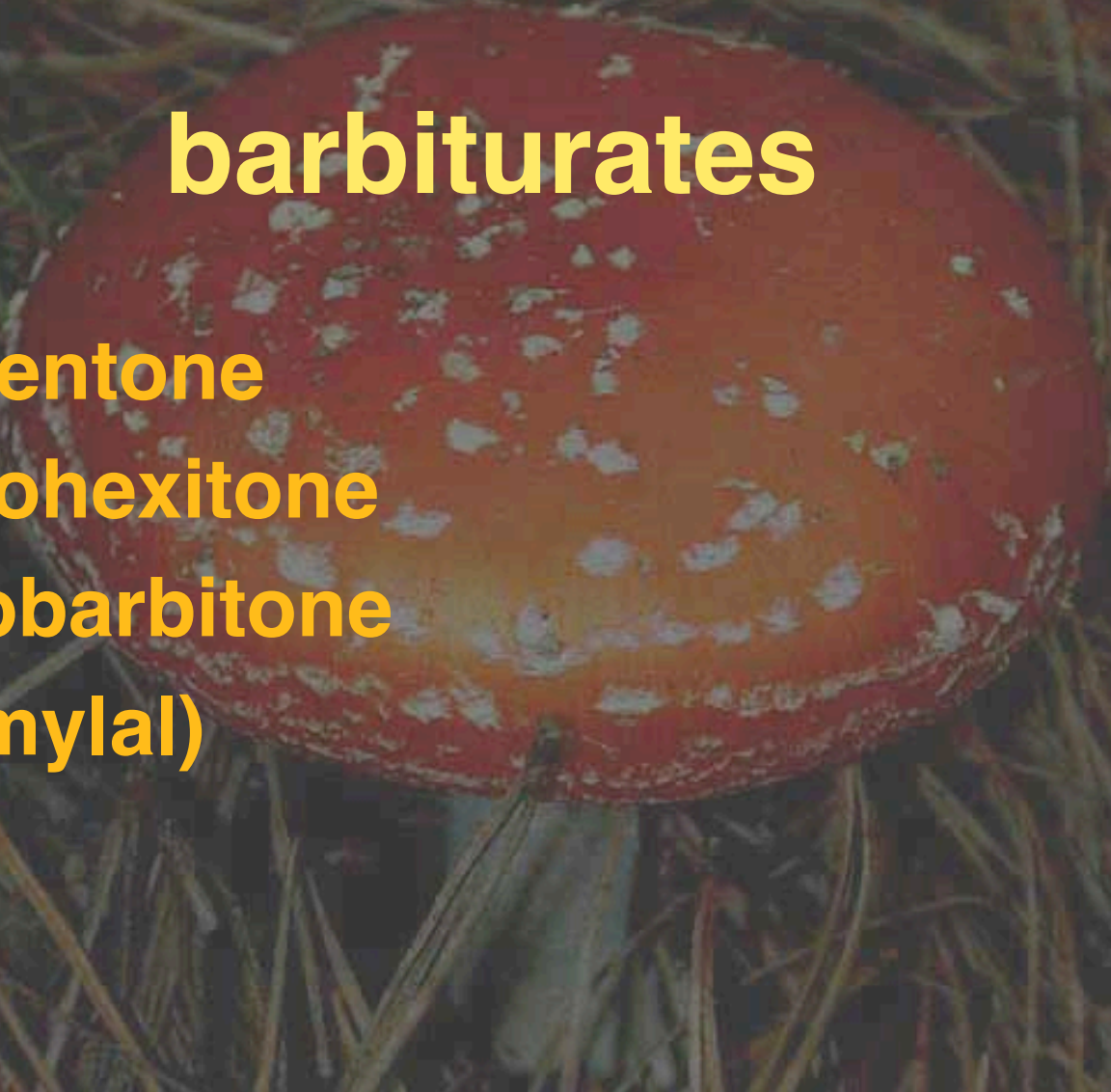
A red mushroom with white spots, likely an Amanita muscaria, is growing in a field of dry grass. The mushroom has a bright red cap with numerous white, irregular spots. The stem is white and appears to have a small, dark, web-like structure at the base. The background is a dense field of dry, yellowish-brown grass.

care

- **greyhound type dogs**
 - **slow recovery**

barbiturates

- thiopentone
- methohexitone
- pentobarbitone
- (thiamylal)



methohexitone

- shorter acting
- excitement on induction and recovery
- very respiratory depressant



pentobarbitone

- usually only used for euthanasia
 - metabolised slowly
- useful in sheep and goats
 - metabolised rapidly
- metaldehyde poisoning

thiamylal

- **American equivalent to thiopentone**
 - **no longer available even in USA**



single drugs

- **barbiturates**
- **propofol**
- **alphaxalone**
- **(ketamine)**
- **(m)etomidate**



propofol

- clinically similar to thio
- less hangover



propofol

- $t_{1/2\alpha}$ 7 minutes
- $t_{1/2\beta}$ 37 minutes
- redistributed to muscle then fat

propofol

- non water soluble
- comes in coconut oil / lethicin emulsion
- new water soluble version now
- opened vials must be thrown away
 - ideal bacterial growth medium

A red mushroom with white spots, resembling a fly agaric, is centered in the background. The mushroom has a bright red cap with irregular white patches and a thick, white, slightly wrinkled stem. It is growing in a field of dry, yellowish-brown grass. The overall image has a dark, semi-transparent overlay, making the text stand out.

side effects

- **same as thiopentone**
- **suitable for greyhounds**
- **slow metabolism in some cats**

single drugs

- barbiturates
- propofol
- alphaxalone
- (ketamine)
- (m)etomidate



alphaxalone

- Saffan
- Alfaxan
- (Althesin)



Saffan

- mixture of alphaxalone & alphadalone
- solubilised in polyethoxylated castor oil



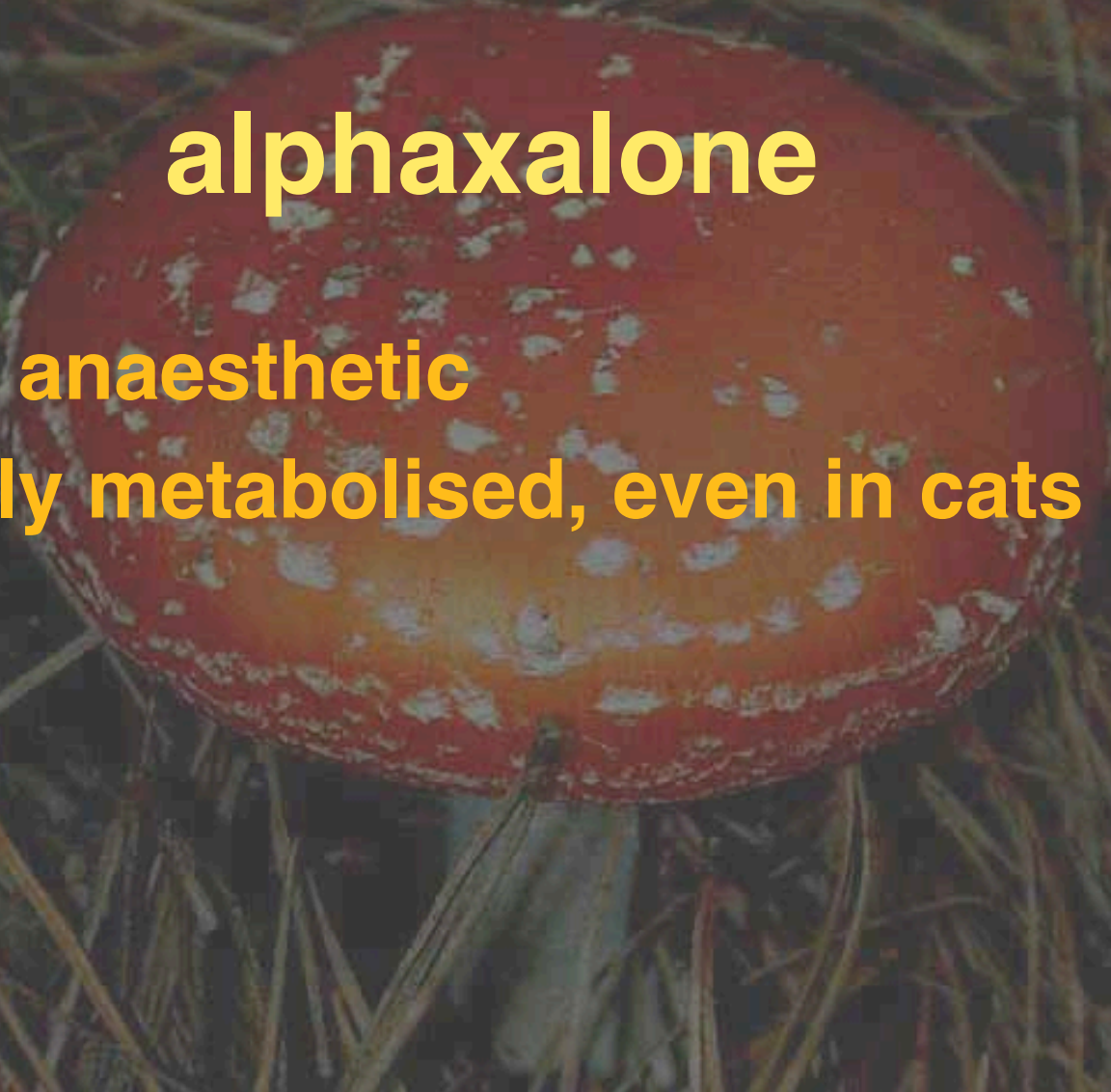
Alfaxan

- **alfaxalone alone**
- **solublised in cyclodextrin**



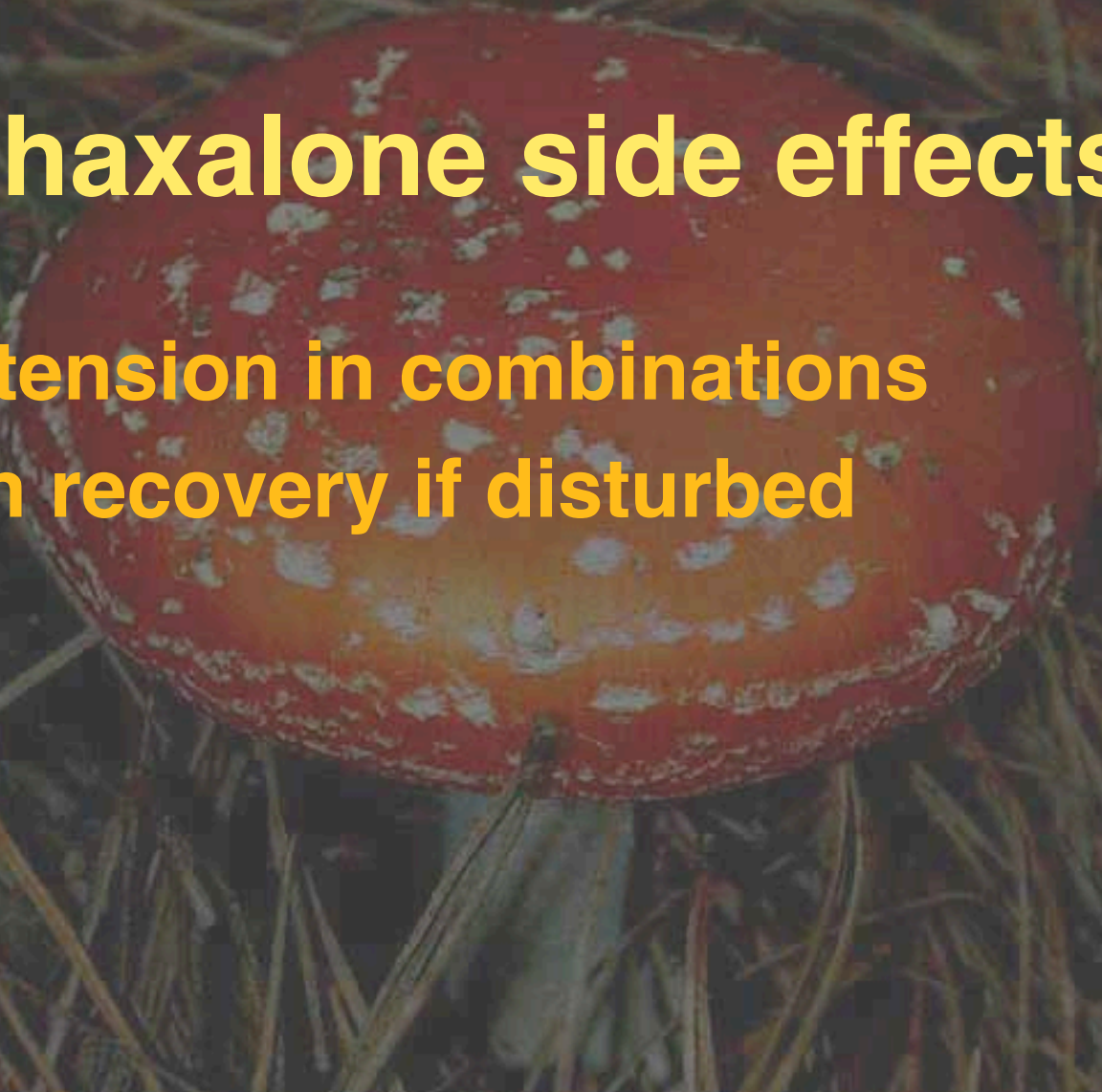
alphaxalone

- good anaesthetic
- rapidly metabolised, even in cats



alphaxalone side effects

- **hypotension in combinations**
- **rough recovery if disturbed**



Saffan side effects

- **allergic reactions**
 - dogs – massive histamine release
 - cats – cutaneous oedema
 - other spp – rarely anaphylactoid reactions

ketamine

- “dissociative” anaesthetic
- blocks NMDA receptors
- analgesic?
- usually used in combinations

ketamine

- **pro**
 - no CV depression
 - swallowing reflexes partially retained
- **con**
 - unpleasant dreams???
 - increased muscle tone

injectable combinations

- $\alpha 2$ agonist & ketamine
- benzodiazepine & ketamine
- zolazepam & tiletamine
- potent opioid & propofol
- potent opioid & sedative

(m)etomidate

- **no CVS depression**
- **no analgesia**
- **excitement on induction**
- **adrenal suppression**

euthanasia

A red mushroom with white spots, likely 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 'euthanasia' is overlaid on the top part of the mushroom's cap.

- pentobarbitone \pm
 - cinchocaine
 - KCl
 - MgSO₄
- T61

9 month old cat for spay



What would you use?

injection anaesthetics

- usually only used for induction
- thiopentone / propofol used for induction
- side effects respiratory and CV depression
- animals wake up from redistribution – metabolism takes much longer
- Saffan used only in cats, Alfaxan can be used in dogs
- ketamine useful in combination, usually with diazepam
- overdose caused transient apnoea
- all drugs are potentially lethal if used incorrectly