

SUBSTANCE ABUSE

Dr Kobus Roux
MMed; FC Psych CMSA

Substance Abuse

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Biology of Addiction

General Principles of Management

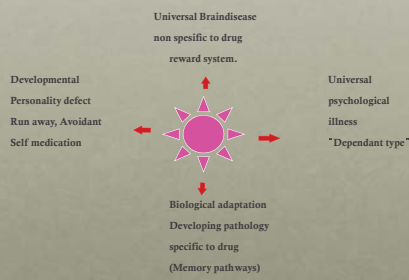
Pharmacology of Different Drugs of Abuse

Substance Abuse

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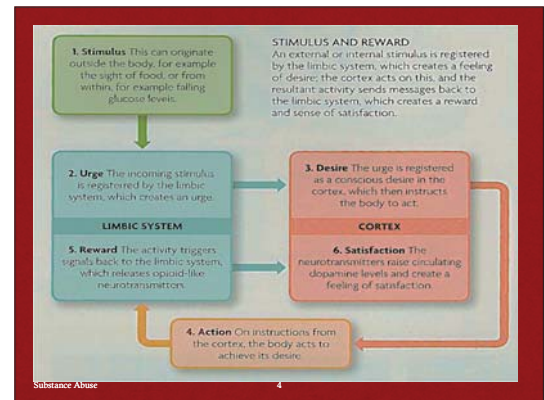
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WHAT IS ADDICTION?



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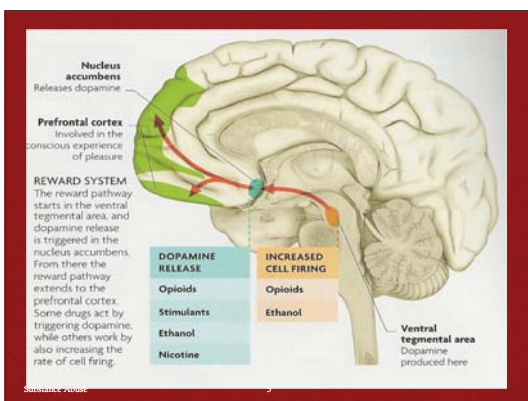
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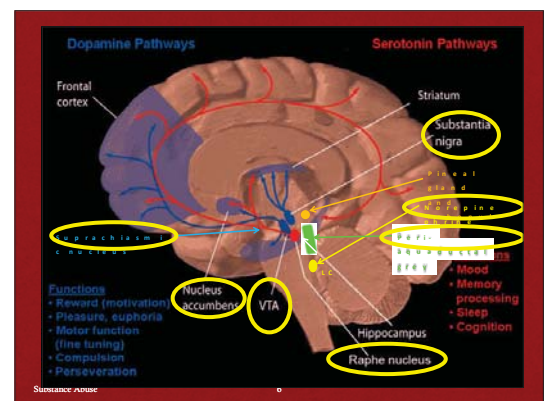
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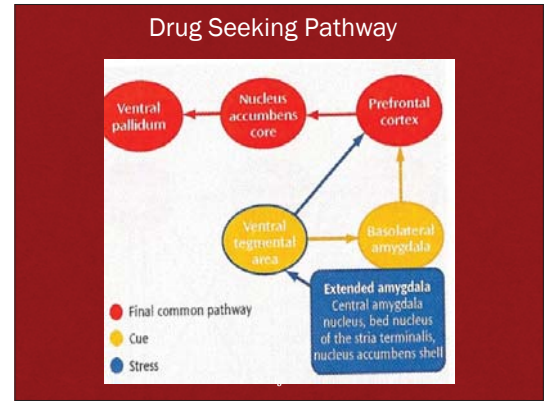
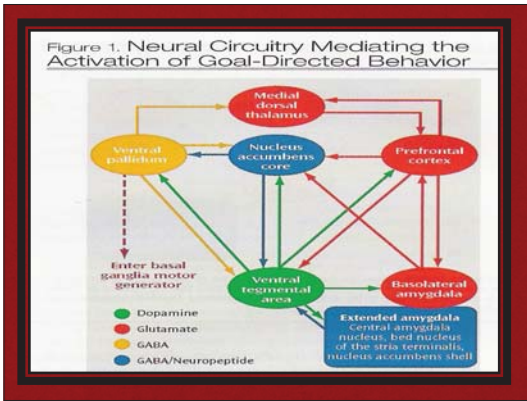
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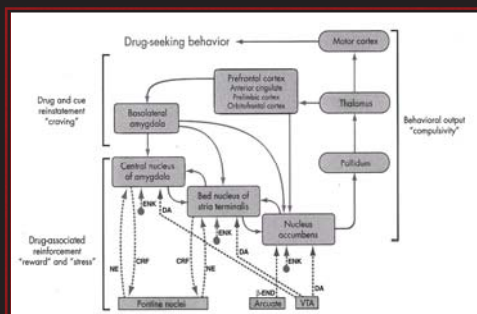
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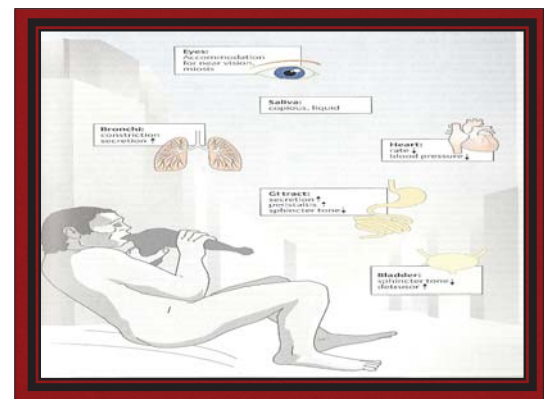
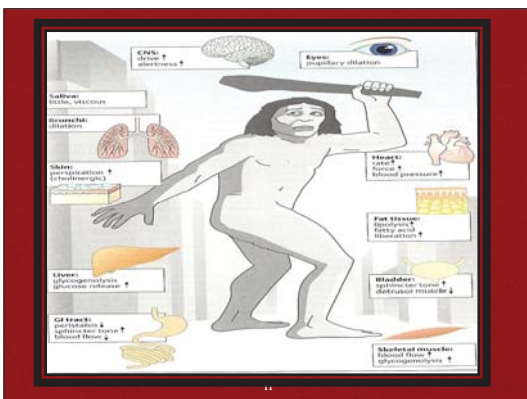
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Neurocircuitry in Drug Seeking Behavior



What makes people use and continue to use drugs?



Clinical Effects of Nicotine

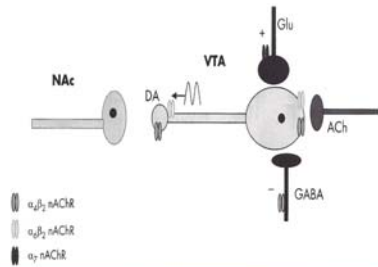
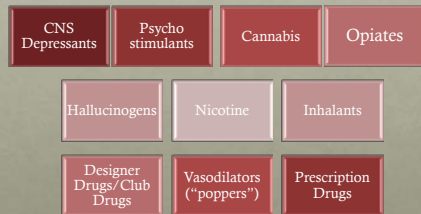


FIGURE 15-1. Mesolimbic dopamine neurons and their regulation by nicotinic, cholinergic, GABAergic, and glutamatergic inputs.

PET studies have shown that smoking two to three puffs from a cigarette produces saturation of AChRs in the brain reward system.

• (Brody et al, 2006)

Substances of Abuse



GENERAL PRINCIPLES

Management of Drug Addiction

4 STAGES

1. Acknowledge that you have a problem.
2. Detox
3. Rehabilitation vs Harm Reduction
4. Maintenance of abstinence vs Harm Reduction

General Principles:

“Detox should not be regarded as treatment per se; but rather the critical first step in initiating ongoing treatment.”

General Principles:

Two goals:

Achieve Detox safe
and comfortable

Enhance motivations
for abstinence and
recovery

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General Principles:

Withdrawal:

Brain

All drugs

Body

Alcohol

SED Hypnotics

Opioids

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General Principles:

When to admit?

Risk of O.D.

Severe withdrawal syndrome

History of failed outpatient treatment

C0-morbidity

Co-occurring medical conditions

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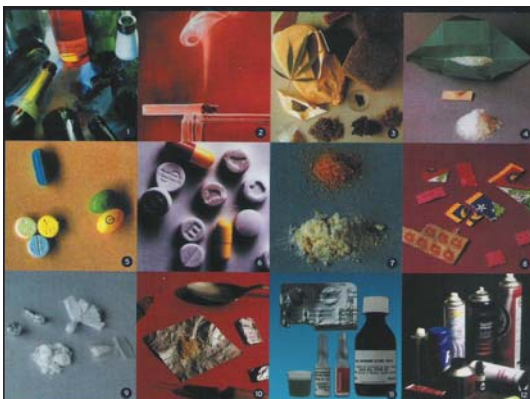
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PHARMACOLOGY OF DRUGS OF ABUSE

Substance Abuse

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Psycho Stimulants

Amphetamine

Methamphetamine

Dextro
amphetamine

Cocaine

Crack cocaine

CAT

PCP

Ephedrine

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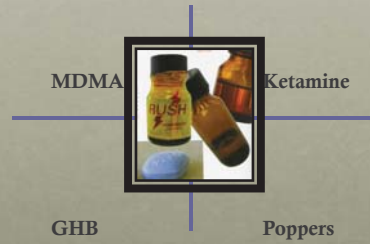
STIMULANTS



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CLUB DRUGS



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NEUROBIOLOGY OF STIMULANTS

- Cocaine: — Methamphetamine
— Dopamine available in Synaptic cleft

Cocaine inhibits Dopamine transporters;
Also Serotonin and NA transporters;
Smoked or IVI more rapid results than snorted or oral routes;
NB: Reinforcement of drug seeking behavior.

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CLINICAL ASPECTS OF STIMULANT ABUSE

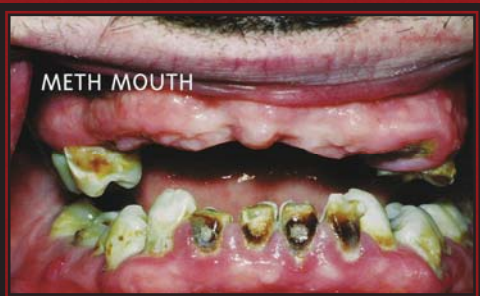
BINGE → 'CRASH'

Euphoria	Dysphoria
Hyper awareness	Anxiety
Hyper vigilance	Agitation
Psychomotor agitation	Intense cravings

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STIMULANTS



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Psycho Stimulants

Signs of amphetamine O.D.

- restlessness
- Delirium
- Panic
- Rapid breathing
- Vomiting and diarrhea
- Arythmias
- seizures

Signs of amphetamine withdrawal

- depression
- Anxiety
- Stomach cramps
- Nausea
- Tremors
- Intense cravings

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Cannabis

Short term effects

- Memory
- Judgment
- Co-ordination and balance
- bloodshot eyes
- Dry mouth
- Munchies

Long term effects

- Paranoia
- Anxiety
- Impaired memory and learning
- Low drive ("dude")
- Decrease testosterone and sperm count
- Psychotic disorders

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Substances of Abuse CNS Depressants

Alcohol

BZD

Barbiturates

GHB

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CNS Depressants

Alcohol

GABA A receptors

- In wall of nerve cells
- Primary inhibitory receptors in brain
- Alcohol opens receptor
- Cut brake cable and put foot on accelerator

BZD also open receptor

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CNS Depressants

Alcohol (cont.)

Withdrawal syndromes

Mild

- Tremor
- Anxiety
- High pulse / BP

Severe

- Seizures
- D.T. (day 3) (15% mortality if untreated)
- Perceptual disturbances

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CNS Depressants

Alcohol withdrawal

Treatment:

- Thiamine 100g daily 7-14 days can prevent Korsakoff Syndrome.
- Magnesium
- Vitamine B Complex
- Benzo's (2-5 days)
- Anti-convulsants
- Anti-psychotics (?)

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CNS Depressants

- GHB
- Date rape drug
- Also used in body building supplements
- Clear fluid, odorless, salty taste
- GHB analogs are available legally as industrial solvents used in produce polyurethane; pesticides; coatings on plastic or metals

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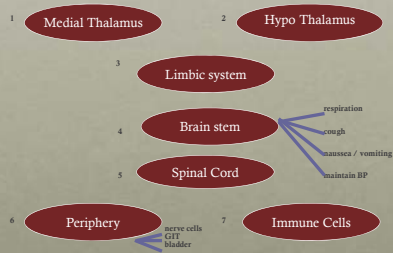
OPIATES



OPIOID RECEPTORS

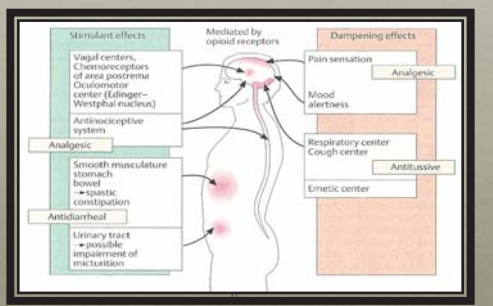
<u>μ</u>		<u>Kappa</u>
$\mu 1$	analgesia euphoria	Analgesia at spinal level Dysphoria Diuresis Sedation
$\mu 2$	resp depression Constipation pupil constriction	
<u>Delta</u>		<u>Sigma</u>
? Analgesia		Dysphoria Psychomimetic cardiovascular
? Addiction		

DISTRIBUTION OF OPIOID RECEPTORS



Strong Agonist	Low Agonist	Partial Agonist	Antagonist
Fentanyl Heroin Methadone Morphine	Codeine Propoxyphene	Buprenorphine Subutex	Naloxone Naltrexone

Effects of Opiates / Opioids

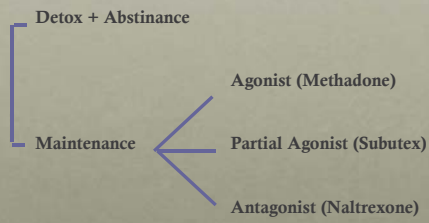


Opioid Withdrawal

"if you have an orifice it will leak"

Mild	More Severe
<ul style="list-style-type: none"> • Runny nose • Pilo erection, goose flesh • Mild anxiety • Muscle aches • Stomach uncomfortable 	<ul style="list-style-type: none"> • sweating • Severe pain • Diarrhea • Vomiting • Muscle cramps • Wretched feeling

TREATMENT OF ADDICTION



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EQUIVALENCE OF OPIOID AGONISTS

- Methadone 1mg
- Codeine 30mg
- Fentanyl 0,01mg
- Heroin 1-2mg
- Morphine 3-4mg

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Opioid Addiction

Management

Detox Rehab Maintenance treatment

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Hallucinogenic Drugs

LSD

Mescaline

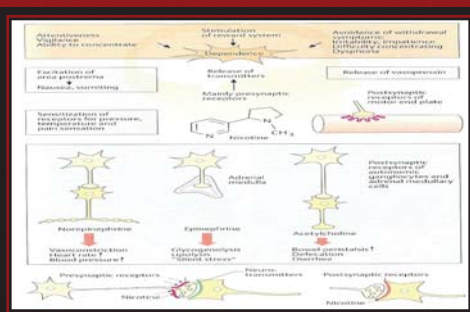
Pilocybin
(mushrooms)

PCP – NMDA
receptor
antagonist
("Angel dust")

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Nicotine



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PHARMACOLOGICAL TREATMENT FOR NICOTINE ADDICTION

- Bupropion - ↑ Dopamine
- Nicotine agonists - gum, stickers, e-cigarettes
- Varenicline - partial Agonist

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Inhalants

Inhalant abuse came to public attention in the 1990's when it was reported in the media that young people were seeking a cheap high by sniffing glue.

CH-CH-CH-.....CH

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Designer Drugs / Club Drugs

MDMA -
ecstasy

Ketamine

“poppers”

Mixtures,
e.g. LSD +
MDMA

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Designer Drugs Club Drugs

Amyl nitrate

Butyl nitrate

Isobutyl nitrate

Produces a short powerful high
which lasts 2-5min.

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Designer Drugs / Club Drugs



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Designer Drugs / Club Drugs

- MDMA (Ecstasy)
- synthetic drug with both stimulant and hallucinogenic qualities
- Chemical structure is similar to methamphetamine; methylenedioxy amphetamine (MDA); and mescaline
- Ocotea cymbarum is an essential oil distilled from the trunk Bark of a tree native to Brazil

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Designer Drugs / Club Drugs

- MDMA (Ecstasy)
- controlled studies show MDMA has potent effects on cardio vascular symptoms and body's ability to regulate temperature
- Known as “hug drug” or “feel good drug”.
- Reduces inhibitions; eliminate anxiety; produce feelings of empathy for others

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Designer Drugs / Club Drugs

- General effects of MDMA use
- ↑ BP + pulse
- ↑ body temperature
- Possible hyperthermia
- Jaw + teeth + muscle clenching
- Dehydration
- Chills + sweating
- Nausea
- Insomnia
- Paranoia
- Reaction to stimulus overload

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Designer Drugs / Club Drugs

- Symptoms and signs of ecstasy overdose:
- Rapid heart beat
- Hypertension
- Muscle cramping
- Panic attacks
- Loss of consciousness
- Seizures
- Breakdown of skeletal muscle with kidney failure (rhabdomyolysis)
- Death has resulted from kidney or cardio vascular failure induced by hyperthermia and dehydration

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Prescription Drugs

- Narcotic analgesics or opioids
- Prescription stimulants
- (Ritalin; Dexedrine; Adderal)
- Prescription depressants
- (Benzodiazepines)
- DXM – Dextromethorphan
- (Cough suppressant)

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The End



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