CHEMICALS THAT HARM WITH PLEASURE...

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THE STAGES OF COFFEE ADDICTION

DUNKIN DONUTS

LATTEs

ESPRESSO

COLD BREW

NITRO COLD BREW

SNIORTING BEANS AND SCREAMING
**DRUG ADMINISTRATION**

- **Ingestion**
  - Preferred for many drugs
  - Ease and safety
  - Carried through the body in bloodstream
  - Unpredictable dosage

- **Injection**
  - Preferred by medical professionals
  - Predictable, fast, strong drugs
  - Drug users: IV (in the vein)
INHALATION & ABSORPTION

• Inhalation
  • Through the lungs to the capillaries
  • Anesthetics
  • Tobacco and Marijuana
  • Difficult to regulate dose
  • Lung damage

• Absorption through mucous membranes
  • Nose, mouth
  • cocaine
METABOLISM, ELIMINATION, TOLERANCE

- Actions of drugs are terminated in liver.
DOSE RESPONSE CURVE...
DOSE RESPONSE CURVE...
Drug effect

Withdraw from drug

RELATIONSHIP BETWEEN TOLERANCE AND WITHDRAWAL
Drug effect

Withdrawal effect
PLEASURE CENTERS OF THE BRAIN...

ICSS: intracranial self-stimulation
MESOTELECEPHALIC DA SYSTEM

Nigrostriatal pathway

Mesocorticolimbic pathway
INCREASE IN DA RELEASE IN N. ACCUMBENS...
A rat repeatedly receives a drug in one of two distinctive compartments. Then, on the test, the tendency of the rat now drug-free, to prefer the drug compartment is assessed.
PROJECTIONS OF NOREPINEPHRINE-CONTAINING NEURONS
SEROTONERGIC PROJECTIONS
DOPAMINERGIC PROJECTIONS

Cortex

Nucleus Accumbens

Amygdala

Caudate nucleus and putamen

Arcuate Nucleus

Substantia nigra

Minds and Brains
THIS IS YOUR BRAIN ON ECSTASY.... REALLY!

www.dancesafe.org/slideshow
By Emanuel Sferios
Have You Talked With Your Parents About DRUGS?
Minds and Brains

- Ecstasy is MDMA, or 3,4-Methylenedioxymethamphetamine.
- It belongs to a family of drugs called "entactogens," meaning "touching within."
- Other drugs in this category include MDA, MDE and MBDB.
- Before it was made illegal in 1985, MDMA was used by psychiatrists as a therapeutic tool.
THE EFFECTS ARE...

- MDMA is a "mood elevator" that produces a relaxed, euphoric state.
- It does not produce hallucinations.
- MDMA takes effect a few minutes after taking a tablet, with little rushes of exhilaration which can be accompanied by nausea.
- 60 to 90 minutes after taking the drug, the user feels the peak effects.
• Sensations are enhanced and the user experiences heightened feelings of empathy, emotional warmth, and self-acceptance.

• The effects of 'real' ecstasy subside after about 3-5 hours.

• The drug is in your system for 20 hours.

• Users report that the experience is very pleasant and highly controllable. Even at the peak of the effect, people can usually deal with important matters.
The effect that makes MDMA different from other drugs is empathy, the sensation of understanding and accepting others.
IS IT ADDICTIVE?

• Ecstasy is not physically addictive. However, the drug can often take on great importance in people's lives, and some people become rather compulsive in their use.

• Taken too frequently, however, MDMA loses its special effect.
MOOD ELEVATION

• MDMA releases the brain chemical serotonin, elevating mood and acting as a short-term antidepressant.

• Compulsive users may be unconsciously trying to self-medicate for depression.

• Effective treatments for depression are available with the proper diagnosis by a qualified physician.
SEROTONERGIC PROJECTIONS FROM RAPHÉ NUCLEUS
SEROTONERGIC AXONS-RAT
ECSTASY CAUSES MASSIVE RELEASE OF SEROTONIN
INSIDE THE AXON TERMINAL - SEROTONIN XMTR

Drawing by Gayle Gross de Nuñez and Savantes, 1996
SEROTONERGIC SYNAPSE...
REAL SEROTONERGIC SYNAPSE...
ABOUT AN HOUR OR SO AFTER YOU TAKE ECSTASY
SEROTONIN REUPTAKE TRANSPORTERS
MONOAMINE OXIDASE BREAKS DOWN SEROTONIN
WHEN YOU START COMING DOWN... NO MORE SEROTONIN
THAT "ATE UP" FEELING...
MAKING MORE SEROTONIN...
THE ECSTASY
DEPRESSION...
MDMA NEUROTOXICITY...

MAO breaks down the dopamine into toxic metabolites.

dopamine enters by mistake
ALL SHRIVELED UP...
CAN PROZAC PROTECT?
HOW DOES ECSTASY GET IN, ANYWAY....?
MDMA MAKES THE SEROTONIN TRANSPORTERS WORK IN REVERSE
THIS IS YOUR BRAIN ON ECSTASY, REALLY.
TAKING ECSTASY WHILE ON PROZAC..