Methamphetamine: the issues

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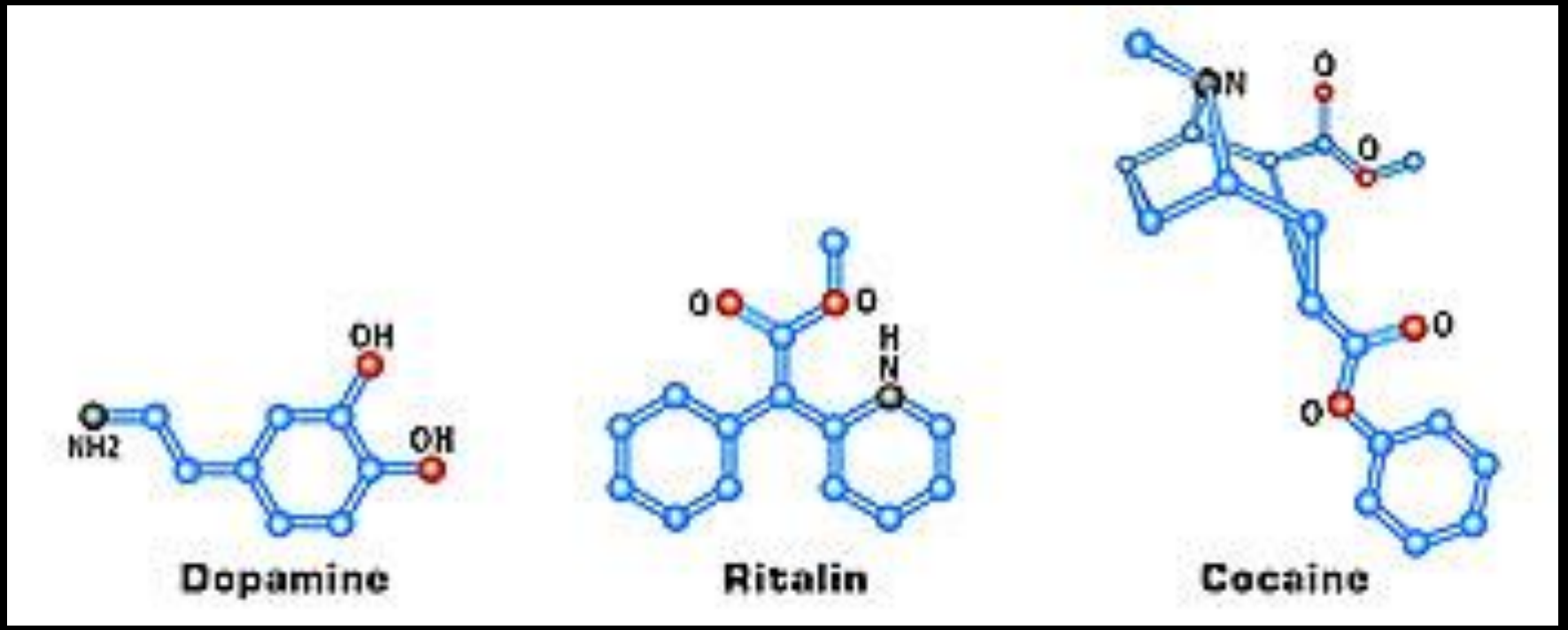
Overview

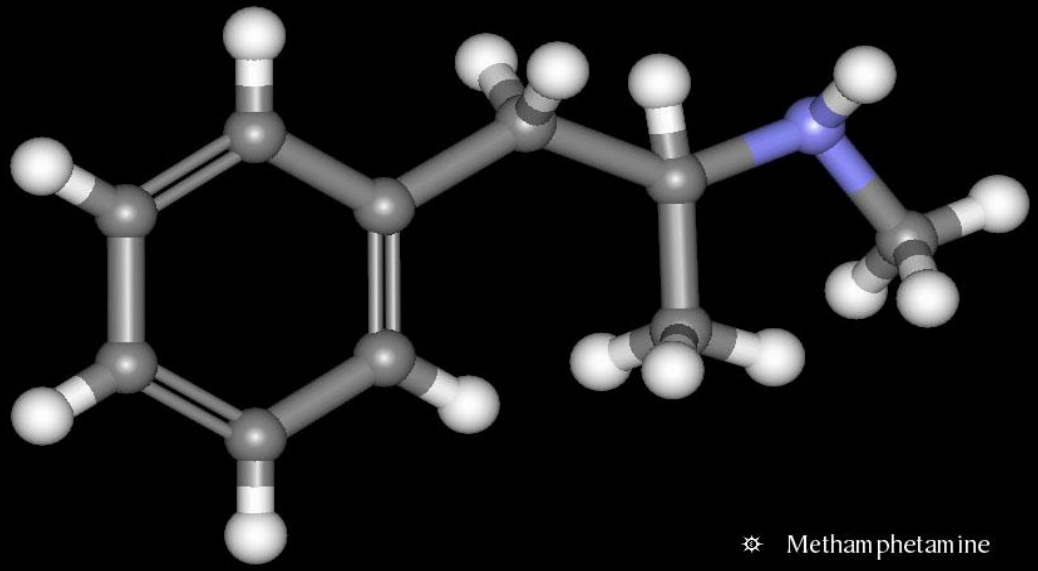
- Science about the drug
- Musings about the community reaction
- Clinical issues:
  - Psychosis
  - Intertwining with sex
  - Harm reduction strategies
  - Treatment
- More musings

The Science

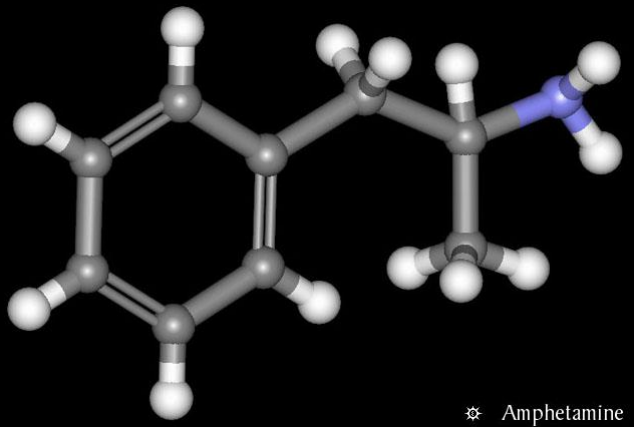
Structure of dopamine



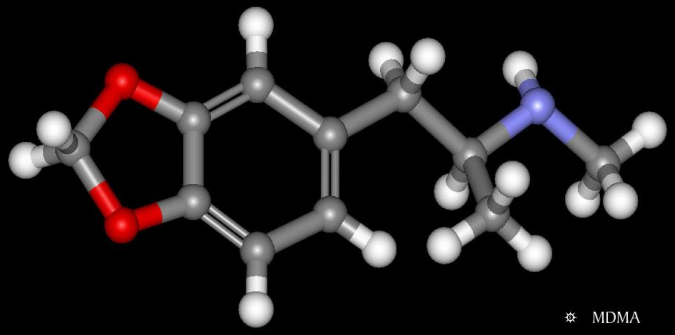
Structures of amphetamines



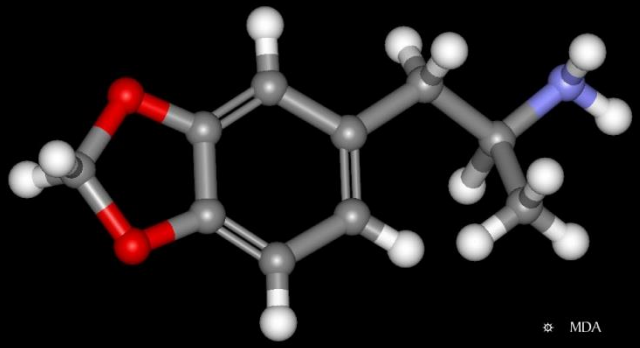
Methamphetamine



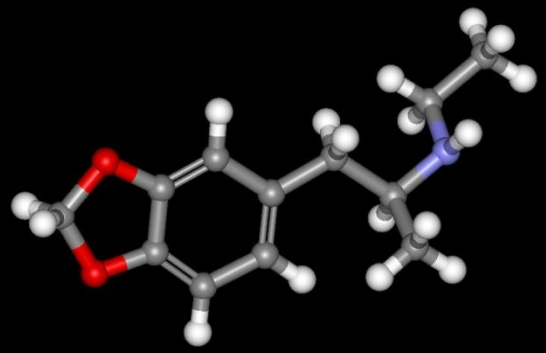
Amphetamine



MDMA



MDA



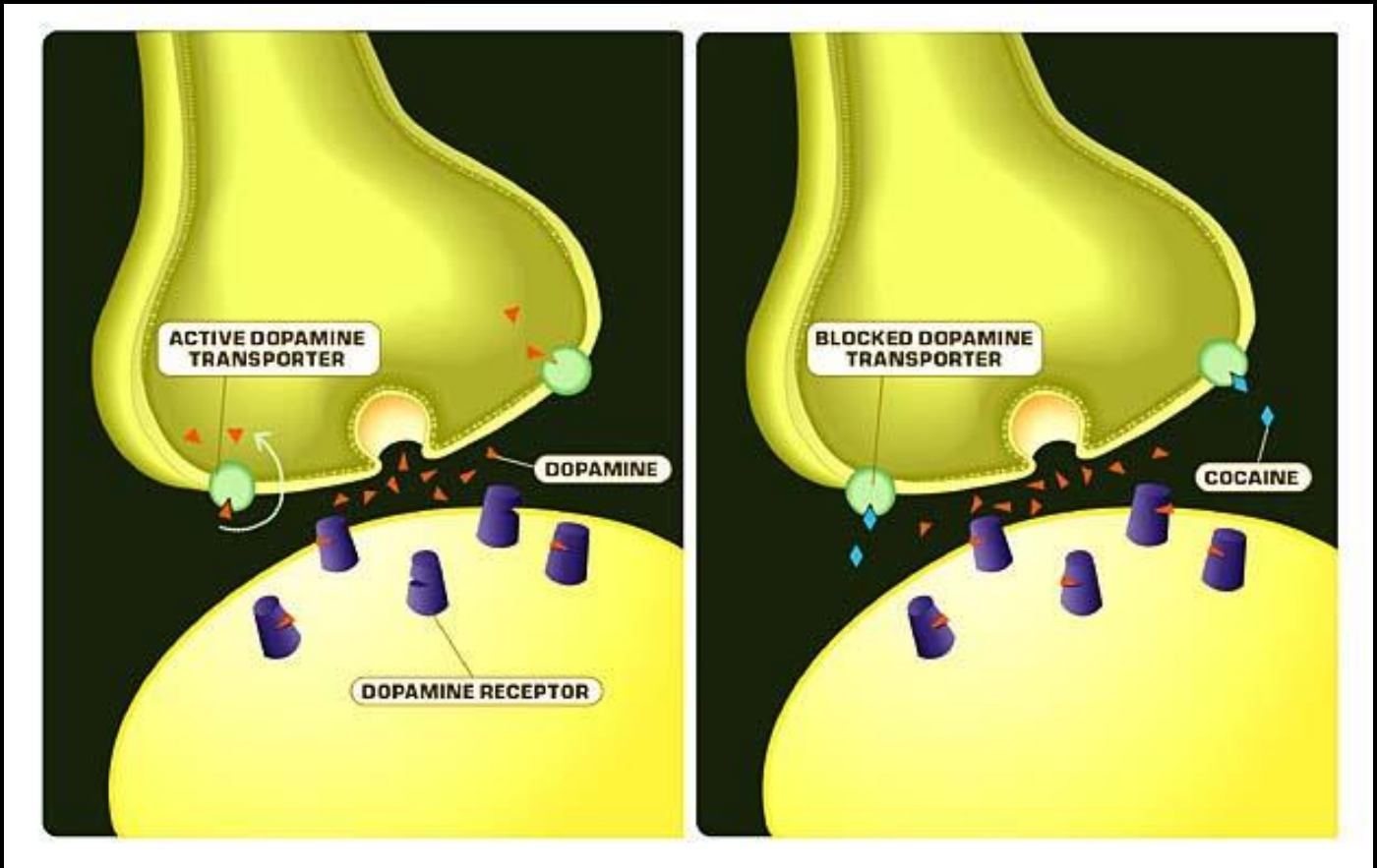
Carbon Hydrogen Nitrogen Oxygen Phosphorous Bromine Iodine Sulphur

Methamphetamine

- Methamphetamine appeared as a recreational drug in early 1940's
- Can be ingested, smoked or used intranasally or intravenously
  - Dependence is related to speed of onset of effects with most drugs
- Half life is ~12 hrs in serum (range 9-13 hours)
- CNS stimulation for 6 to 24 hours
- Two isomers – the d-methamphetamine is more potent

Urbina, A and Jones K. HIV/AIDS 38 (2004) 890-894

Dopamine Transporter



Methamphetamine II

- Sympathomimetic – presynaptic release of dopamine and norepinephrine and some direct postsynaptic catecholamine receptor stimulation
- Also inhibits monoamine oxidase (MAO)
- May also result in tachycardia, hypertension, intracranial hemorrhage, seizures, arrythmias, hyperthermia
- Inability to gain a full erection – may lead men to abuse drugs used for treating erectile dysfunction (Mansbergh et al 2006)

Urbina, A and Jones K. HIV/AIDS 38 (2004) 890-894

Methamphetamine III

- Many routes of administration – oral (67.2% bioavailability), intranasal, injection, inhaled (i.e. smoked – 90.3% bioavailability)
- Of particular concern are the toxicity of contaminants from cladestine synthesis:
  - benzylphenethylamine, benzyl-N-methylphenethylamine which are pro-convulsants
  - Lead has also been implicated in 2 cases of intoxication – gastroenteritis, anaemia, encephalopathy, myalgias or hepatitis

The musings

- Why does this drug cause so much panic
  - Panic does not generally engender a successful response
  - What about those people who use methamphetamine and do NOT develop dependence
- Stimulant drugs have fewer treatment options
- The dependence on stimulants does not seem to be mediated by withdrawal
- The role of dopamine – not reward but salience

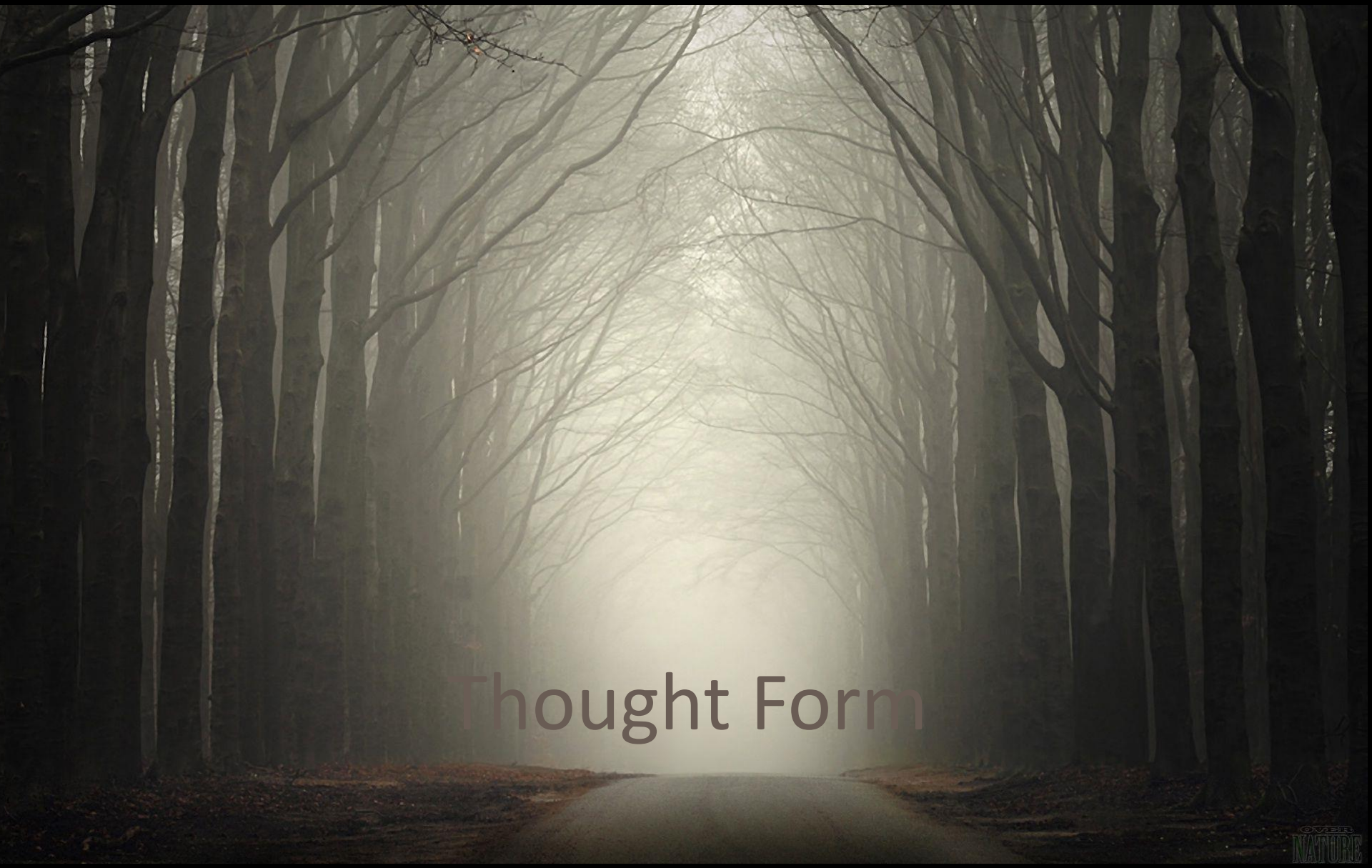
Overview - Psychosis

- Psychosis
  - Hallucinations
    - Visual, Auditory, Tactile
    - Illusions
  - Thought Content
    - Delusions: Bizarre & non-bizarre
  - Thought Process
    - Circumstantial – Tangential – Loose Associations
- Responding to psychosis
- Treatments

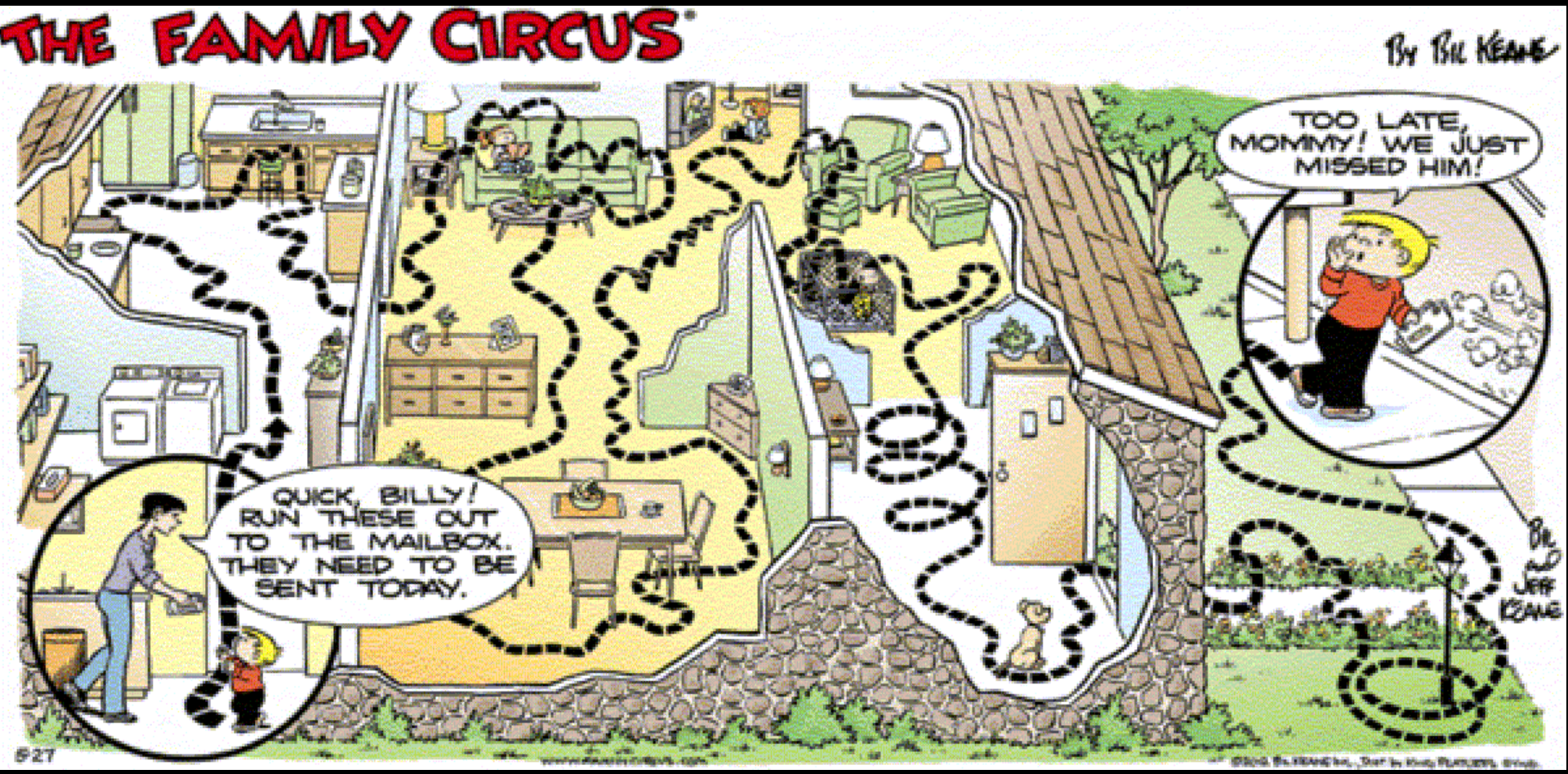
Salience

Illusions

Hallucinations


Thought Form

Circumstantial



Tangential


SHOOT AT DOCTOR DOOM!
3 MORE HITS NEEDED!
TIME LEFT:
ZEN PINBALL THD
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MARVEL
PINBALL

Tips to deal with psychosis

- Focus on the emotions not the delusions or the content of the voices
- Focus on trying to get through this, reminding oneself that it is ‘worse’ because of the drugs
- Keep your voice soothing, be gentle
- Pause and allow time for the person to gather their thoughts, but if they seem distracted gently help them refocus

Thought Process Exercise

- Pick 1 person to play the role of client
- Pick 1 person to play the role of caregiver/outreach worker
- Pick 2 individuals to be voices
- Pick 1 or 2 observers of the client, their speech, behaviours and coherence of the conversation
- Pick 1 or 2 observers of the worker
- The 'worker' describes the setting they work in the 'client' is to come in and ask for the usual services that might be provided, and the client tries to seek help with their 'situation' (client decides: needs more clean needles, wants to stop, wants the voices to go away...)

Thought Process Exercise 2

- The voices sit on either side of the ‘client’ and whisper in his/her ear the entire time
  - Begin using grandiose delusional statements:
    - For example: “You are amazing. Madonna wants you in her next video. You have a cure for addiction. If only people who use crack could start using meth then they would be cured. Tell her your ideas.” be directive.
  - When the bell rings one of you switches to paranoid delusional thoughts:
    - For example: “The FBI is following you. Your dealer has been monitoring your movements. Your phone is bugged.” Again, be directive and make fearful statements about the worker.
  - When the bell rings again, both switch to paranoid

Debrief

Methamphetamine-Induced Psychosis

- Symptoms tend to be:
  - Paranoid ideation
  - Ideas of reference
  - Delusions of persecution
  - Auditory AND visual hallucinations
- Those with > 5 years MA use may be at higher risk of developing a “persistent” form of psychosis
- The role of sleep deprivation is also cited by some as a putative factor
- Important to distinguish from people who suffer from schizophrenia and use methamphetamine, which may also worsen their psychosis (PRISM)

Glasner-Edwards S, Mooney LJ. Methamphetamine Psychosis: Epidemiology and Management. CNS Drugs (2014) 28:1115-1126.

Treatments for psychosis

- Good diagnosis is needed:
  - substance intoxication vs. substance induced vs. primary psychotic disorder
- Behavioural treatments aimed at:
  - Abstinence
  - Reduction in use
- Anti-psychotic medication
  - very small trials; some clinical observations that DRD2 blockade may induce anhedonia and increase relapse

Methamphetamine and Sex

Reasons people may have sex on meth

- It feels good
- Certain contexts include methamphetamine for some:
  - Sex scenes: ‘pig sex’, fisting, bareback
- Sex trade
- Managing impact of sexual abuse or guilt/shame associated with sex

Tips in reduction/recovery when sex overlaps with methamphetamine use

Sex therapy principles are key:

- Reductions or abstinence from methamphetamine may need reduction and abstinence from some sex acts
  - Cast this as a holiday, a rest, a vacation
- Changing to new associations, changing sexual activities and or settings, re-programming our sexual pleasure
  - Explore new activities without meth
- Understand the connections – do a functional analysis (what is the drug doing, when are you using it, what prompts it, what extends it)
- Avoid triggering situations initially, learn alternate ways to get needs met
  - Avoid usual places and types of sex

Harm reduction

- Route of administration based:
  - Instructions on safer injection and inhalation practices
  - Sterile syringes, one's own pipe
- Converting to a route with slower onset may help with dependency forming risk (swallowing, snorting or hooping)
- Testing drugs
- Planning use, enforcing a sleep/rest schedule

Treatments

- Abstinence
  - Matrix Model (16 week model)
    - CBT + family education + self-help participation
    - Focused on relapse prevention, drug avoidance, identification of triggers and drug refusal
  - Contingency management
    - Community Reinforcement?
    - Cognitive behavioural therapy?
- Reduction in use
- Symptom management
  - Anti-psychotic medication
  - Benzodiazepines

Courtney KE, Ray LA. Methamphetamine: An update on epidemiology, pharmacology, clinical phenomenology , and treatment literature. Drug and Alcohol Dependence (2014) 143:11-21.

Treatments 2

- Pharmacologic agents to reduce use:
  - buproprion (mild but not heavy users)
  - modafinil (with HIV + gay men, did not reproduce in further studies)
  - naltrexone (2 trials – one oral, one injectable)
  - mirtazapine (combined with CBT with MSM)
  - topiramate (helped a subgroup who achieved abstinence sustain it)

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Treatments 3

- Pharmacologic agents to reduce cravings:
  - ondansetron, methylphenidate, flumazenil + gabapentin + hydroxyzine, modafinil, topiramate, isradipine, aripriprazole and sertraline have all been tested
    - none were effective, the last two increased or sustained cravings
  - others are still being tested: bupropion, nicotine, naltrexone

Courtney KE, Ray LA. Methamphetamine: An update on epidemiology, pharmacology, clinical phenomenology , and treatment literature. Drug and Alcohol Dependence (2014) 143:11-21.

Final Musings

- Psychosocial treatments have had the best success to date
- Structured treatments that focus on understanding the context of use, actively working to change the context and promoting reward for non-use seem to be important components
- My experience with the psychiatric co-morbidities makes me suspicious that those with early childhood trauma are at greatest risk and benefit from trauma-focused therapy