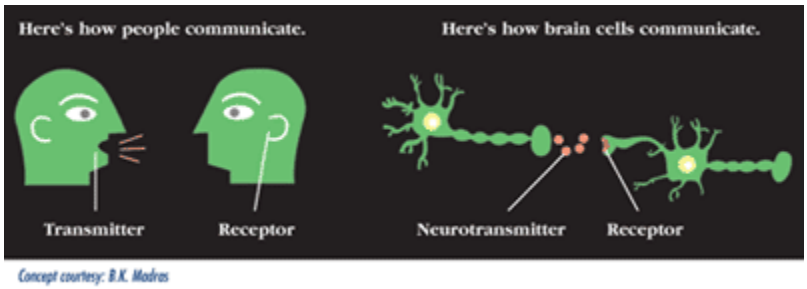
Addiction and The Brain + Tolerance and Withdrawal

**Addiction**

- Addiction is a primary chronic disease of brain reward, motivation, memory and related circuitry.
    - It is considered a disease of the brain because drugs change the brain- they change its structure and how it works.
    - These brain changes can be long lasting and can lead to harmful behaviours seen in people who abuse drugs.

**The Brain**

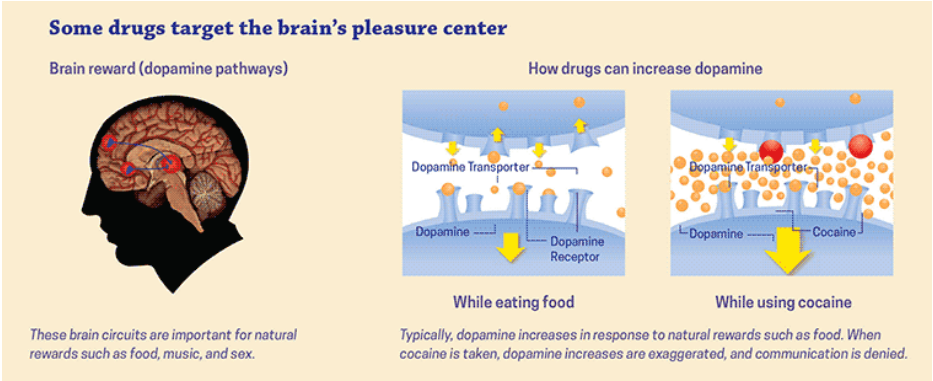
- The brain is a three-pound mass made up of many parts that act together as a team. Each part has a specific function.
- The different areas communicate by sending electrical impulses between brain cells (neurons).



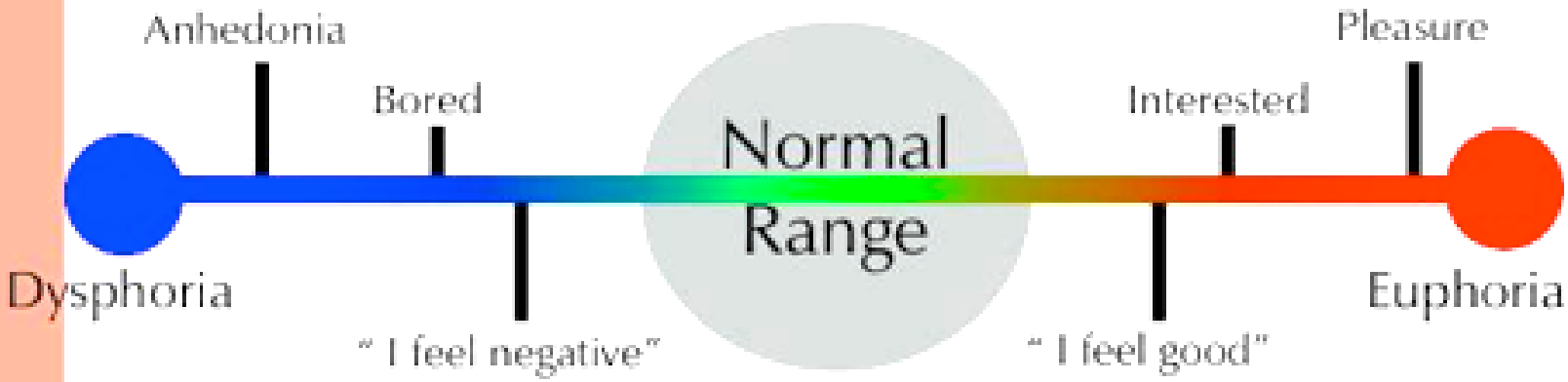

To send a message the brain cells releases a chemical (neurotransmitter) into the space separating the two cells (called the synapse). The neurotransmitter crosses the synapse and attaches to receptors on the receiving cell. This causes changes in the receiving brain cell and the message is delivered.

**Drugs working in the Brain**

- Drugs are chemicals that interfere with the way cells communicate
- Mostly substances target a part of the brain called the Reward System
- The reward system tells us that certain behaviours need to be repeated to survive (eating, drinking water, sex) by releasing a chemical called dopamine (a chemical that makes us feel motivated and pleasure).
- When drugs enter the reward system, the brain notes that something important is happening that needs to be repeated in the future
- When using substances, the amount of dopamine is much greater than natural rewards making it that the reward for using is so powerful it makes people motivated to use again.



# Pleasure Scale



# Progression Towards Addiction


Increasing Loss of Control

Increasing Boredom when Sober

# Dependency on Alcohol and Other Drugs:
## Some Basic Terms

These words are often used when talking about dependency in alcohol and other drugs. For each word, think if an example (perhaps of something that has happened to you) of what this means to you.

| | |
|---|---|
| **Acquired Tolerance** | The body adapts to a certain level of substance use |
| **Reverse Tolerance** | The body loses its ability to break down a substance |
| **Cross Tolerance** | By developing a tolerance to one drug, a person develops a tolerance to all drugs in that class. |
| **Withdrawal** | The body reacts or shows symptoms of physical and/or mental distress because of the absence of the substance |
| **Physical Dependency** | The body develops a tolerance to the substance and shows symptoms of withdrawal when the substance is not used |
| **Psychological Dependency** | The belief that you need to use a substance to function. |

# Classifications of Drugs

| Drug Class | Effects | Examples |
|---|---|---|
| **Depressants** (Downers) | • Slow Down the Central Nervous System (CNS)<br>• Relaxed, less aware of the environment | • Alcohol<br>• Barbiturates<br>• Solvents and Aerosols<br>• Benzodiazepines (Valium, Clonazepam, lorazepam)<br>• General Anaesthesia<br>• Antihistamines |
| **Opiates** (Downers and/or Painkillers) | • Slow down the CNS<br>• Pain relief<br>• Cough suppressant | • Heroin<br>• Morphine<br>• Codeine<br>• Demerol<br>• Percodan/Percocet<br>• Talwin<br>• Dilaudid<br>• Methadone |
| **Stimulants** (Uppers) | • Increased activity of CNS<br>• Increased energy, elevated mood, postponement of fatigue, reduction in appetite | • Amphetamine<br>• Methamphetamine<br>• Cocaine/Crack<br>• Caffeine<br>• Nicotine |
| **Hallucinogens** (Mixer-uppers) | • Profound effects on perception, the way the user sees, hears and feels things.<br>• May effect thinking and moods | • LSD (acid)<br>• Psilocybin<br>• Mescaline<br>• MDA<br>• PCP<br>• Cannabis |
| Psychotherapeutic medicines for Psychiatric Disorders | • Used in the medical treatment of specific psychiatric disorders.<br>• Unpleasant effects in people without the disorder, and not often abused | • Antidepressants<br>  o Prozac, Zoloft, amitriptyline, lithium carbonate)<br>• Antipsychotics<br>  o Chlorpromazine, Haloperidol, Olanzapine) |

# Post Acute Withdrawal Symptoms (PAWS)

PAWS are the withdrawal symptoms that occur after the acute phase of withdrawal is over.

Recovery causes stress. Stress makes withdrawal symptoms worse. These grow to a peak 3-6 months after abstinence. Recovery form nervous system damage takes 6-24 months.

**Symptoms of PAWS**

1. **Difficulty Thinking Clearly**
    - Trouble solving usually simple problems because of rigid, repetitive thinking, difficulty concentrating, and difficulty with abstract reasoning.

2. **Difficulty Managing Feelings and Emotions**
    - Often over-reacts emotionally (feels too much), becomes emotionally numb (feels too little), or develops feelings for no reason at all (feels the wrong thing). These problems are often frightening and cause the person to believe that he or she might be crazy or have an emotional problem.

3. **Memory Problems**
    - Difficulty remembering new things, and when under stress can't remember important things or information previously known.

4. **Difficulty in Recognizing and Managing Stress**
    - Difficulty recognizing stress until it is so severe that he or she can barely function. The person is unable to distinguish between low and high stress, so may over-react to loss/high stress resulting in even higher stress and higher PAWS symptoms.

5. **Difficulty in Sleeping Restfully**
    - Often can't fall asleep easily, sleeps fitfully, has strange dreams and wakes feeling unrested.

6. **Difficulty with Psychomotor Co-ordination**
    - Difficulty with physical co-ordination that results in clumsiness and accident proneness.

Remember all of the above are normal! If you don't understand this, you can feel shame and guilt which produces lower self-esteem and isolation. These can increase stress and lead to higher PAWS symptoms. You need to learn to reduce PAWS when under stress, so as to prevent symptoms or cope with them.

# Managing PAWS Symptoms

PAWS symptoms can lead to relapse if not managed property (and you may be in recovery, but "white knuckling" sobriety.

Paws will affect everyone differently, but here are some tips to manage:

1. Stabilization – talk honestly to people who will not accuse, criticize or minimize how you are feeling
2. Education – learning about all aspects of recovery from chemical dependency helps keep PAWS symptoms in perspective
3. Self- Protective Behaviour – you are responsible for protecting yourself from threats to your sobriety
4. Nutrition – 3 well balanced meals a day, 3 nutritious snacks a day, minimizing caffeine, fats and sugars.
5. Exercise – this can reduce tension, and is a great stress reliever
6. Relaxation – spend time daily on yourself, doing something you enjoy
7. Spirituality – this means different things to different people, but can be helpful
8. Balancing Living – try not to overdo some thins and neglect other parts of your life