1. Neural Impulse
   1. Cell membrane is a semipermeable boundary – ion concentration inside and outside the cell creates all-or-none action potential
   2. Synaptic vesicles release neurotransmitters into synapse. Find receptor sites in a lock-and-key fashion
2. Neurotransmitters
   1. Acetylcholine
      1. Responsible for muscle action
      2. If blocked it can cause paralysis
      3. Botchulism
         1. Botox, essentially blocks release, paralyses your facial muscles
         2. Can be used to treat migraine headaches
         3. Treats excessive sweating
      4. Black widow
         1. If you get bit by one it causes increase in acetylcholine spasms and then death
      5. Linked to memory & Alzheimer’s disease
         1. They tend to have an under supply of acetylcholine
   2. Serotonin
      1. Involved in the regulation of sleep, dreaming, eating behavior, and mood
      2. People who suffer from clinical depression have an undersupply of serotonin
      3. Prozac – SSRI (Selective Serotonin Reuptake Inhibitor)
   3. Dopamine
      1. Parkinsons disease
         1. They tend to have an undersupply of dopamine
         2. Symptoms are tremors and muscle spasms
         3. Treatments
            1. L-Dopa

Will convert into dopamine to be used as a treatment to parkinsons

* + 1. Schizophrenia
       1. Have an over supply of dopamine
       2. Delusion, seeing people who don’t exist, and hearing people who aren’t there.
       3. Treatment
          1. Blocks production of dopamine
    2. Those who start the medication will get the opposite reaction, ie someone with parkinsons will get schizophrenia like symptoms and vice versa
    3. Tardive Dyskinesia
       1. Parkinsons like disorder due to taking medication
  1. Drugs
     1. Heroin, cocaine, and smoking increase dopamine
     2. Dopamine is a feel good
     3. Continually boosting dopamine levels will keep you happy
     4. Smokers are half as likely to get parkinsons disease
  2. Endorphins
     1. The natural high you feel
     2. By taking drugs repeatedly you’re tricking your body to think it’s already producing enough endorphins
        1. Your body will stop producing those natural painkiller
        2. An addict will need more and more of the drug to get not even high, but to feel normal
  3. Cocaine
     1. Blocks reuptake of dopamine thereby increasing dopamine levels
     2. When under the influence of cocaine you may have delusions
     3. You’re simulating a brain of a schizophrenia
  4. Ecstasy
     1. Increases serotonin levels
     2. Damages serotonin receptor
        1. Results in undersupply of serotonin
           1. Linked to depression
     3. Damages dopamine neuron
        1. Linked to parkinsons disease
  5. Legal drugs
     1. Caffeine
        1. Blocks adenosine receptors
        2. Helps you wake up
        3. Increases dopamine
        4. Increases adrenaline
  6. Eating habits
     1. If you find you eat more when you’re stressed, blame it on your neurotransmitters
     2. Stress hormone will increase that neurotransmitter

1. The brain
   1. Tools for studying the brain
      1. Electrical recordings – EEG
         1. Records wavelengths
         2. Detects and records the electrical activity
      2. Brain-imaging techniques – CAT, MRI, PET
         1. CAT Scan
            1. X-ray of brain
         2. MRI
            1. Similar as it takes a picture of brain but more detailed, works uses a magnetic field
         3. PET
            1. Measures brain activity
            2. Tells you which part of your brain is active when you are engaging in certain activities
      3. Experimental interventions – lesions, electrical stimulation
         1. Lesion
            1. Surgical disruption
         2. Sometimes patient is awoken during brain surgery
            1. The brain has no pain receptors
      4. Clinical case studies
         1. Phineas Gage