

HEY, LET ME ASK YOU THIS QUESTION -- WHY IS IT NECESSARY THAT YOU UNDERSTAND THE BRAIN AND SOME OF THESE NEUROTRANSMITTERS AND NEUROMODULATORS ON HORMONES? WHY IS IT THAT IMPORTANT TO AN ADDICTION SPECIALIST? YES, MA'AM? (STUDENT RESPONSE - NOT AUDIBLE.) BECAUSE YOU KNOW THEN WHAT AREAS ARE BEING AFFECTED OR NOT BEING AFFECTED AND WE WILL GET INTO THAT INTO A LITTLE MORE DETAIL WHEN WE TALK ABOUT IT. WHY IS IT THAT YOU KNOW SOME OF THESE BASIC NEUROTRANSMITTERS? WHY IS THAT IMPORTANT THAT YOU KNOW THAT? HELLO? WHY IS THAT IMPORTANT? (STUDENT RESPONSE - NOT AUDIBLE.) WHAT IT'S GOING TO BE DOING, THAT'S CORRECT. WHAT SHE SAID WAS, WHAT IS IMPORTANT ABOUT IT ARE SEVERAL THINGS. ONE, SOME OF THE DRUGS THAT PEOPLE TAKE ARE VERY SIMILAR CHEMICALLY TO WHAT OUR BODY IS ALREADY PRODUCING, OKAY? AND SOME OF THE DRUGS THAT A PERSON TAKES ARE NOT ONLY VERY SIMILAR BUT THEY MAY FORCE THE BODY TO BE ABLE TO RELEASE THOSE CHEMICALS AND DEPENDING UPON THAT, AND DEPENDING UPON ON WHAT HAPPENS WITH THOSE CHEMICALS MAY ULTIMATELY CREATE SOME MEDICAL COMPLICATIONS, AS WE KNOW, IN AN INDIVIDUAL WHO HAS EXPERIENCED TOO MUCH OR AN IMBALANCE OF DOPAMINE IN THEIR BODY, WE MAY HAVE SOME VERY RABIC PSYCHOTIC BEHAVIOR. THAT AGAIN, IS ONE OF THE REASONS WHY WE SEE WHEN PEOPLE ARE TAKING AMPHETAMINES OR MAJOR STIMULANTS FOR AN

EXTENDED PERIOD OF TIME WHY THEIR BEHAVIOR IS SO HIGHLY UNPREDICTABLE AND VERY, VERY DANGEROUS. PLUS, IT IS ALSO IMPORTANT FOR US TO UNDERSTAND THAT IF I AM TAKING COCAINE AND IT IS ACTIVATING THE SYMPATHETIC BRANCH OF MY AUTONOMIC NERVOUS SYSTEM AND WE KNOW THAT TO BE THE FIGHT OR FLIGHT RESPONSE, THAT IF WE KNOW THAT THAT CHEMICAL IS DOING THAT, THEN THAT ALLOWS US TO BE ABLE TO UNDERSTAND WHAT BEHAVIOR IS PREDICTABLE OR NOT PREDICTABLE WITH THE UPSET PERSON. SO AGAIN, IF WE ARE GOING TO STUDY A DRUG'S AFFECT UPON THE BODY WE MUST UNDERSTAND THAT THE BODY IS FULL OF CHEMICALS AND WE ARE ADDING ANOTHER ONE TO IT AND WHAT IT IS DOING TO THE BODY MAY CREATE SOMETHING COMPLETELY THE OPPOSITE THAN WE INTENDED. BUT IF WE UNDERSTAND IT THEN, THEREFORE, THAT ALLOWS US TO BE ABLE TO NOT ONLY HELP THE CLIENT BUT KNOWLEDGE IS POWER, SO, THEREFORE, WHEN YOU KNOW AS MUCH OR MORE ABOUT THAT DRUG'S INTERACTION WITH THE PERSON'S BODY THEN YOU AT SOME LEVEL HAVE CONTROL OR AT SOME LEVEL SOME POWER OVER IT. OKAY, NOW, LET'S GO OVER THOSE NEUROTRANSMITTERS. WHAT DO WE CALL A SUBSTANCE THAT EGGS ON OR ACTIVATES THE NEURON OR ALLOWS THE NEURON TO BE ABLE TO FIRE EASILY? WHAT DO WE CALL THAT SUBSTANCE? IT IS AN AGONIST. GOOD JOB! WHAT IS THE NAME OF THE SUBSTANCE THAT BLOCKS THE ABSORPTION OF CHEMICALS INTO THE NEURON OR REDUCES ITS ABILITY TO BE ABSORBED BY THE NEURON? WHAT IS IT CALLED? AN ANTAGONIST. NAME

ME ONE OF THE SUBSTANCES THAT IS SO POPULAR THESE DAYS THAT IS WHAT IS CALLED AN OPIATE ANTAGONIST THAT HAS LOST THE ABSORPTION? WHAT IS THAT CALLED? OKAY, IT IS NELTREXON, NELTREXON. NOW ALSO REMEMBER THAT THOSE RECEPTOR CITES PREVIOUSLY IN CLASS I TALKED ABOUT HOW ALCOHOL IS RECEIVED BY THE OPIATE RECEPTOR SIGHTS AND ONE OF THE THINGS I SAID WAS THAT WHEN WE STUDY ALCOHOL WE MUST ALSO UNDERSTAND THE OPIATE SYSTEM, THE ENDORPHINS, THE ENKEPHALINS AND HOW THAT OCCURS. SO, WHEN WE STUDY THAT, IT AGAIN GIVES US A BETTER UNDERSTANDING AS TO WHAT REALLY IS OCCURRING. NOW, LET'S GO DOWN THROUGH SOME OF THESE NEUROTRANSMITTERS. THIS NEUROTRANSMITTER, THE CHEMICAL THAT MIGHT ACTIVATE THIS NEUROTRANSMITTER OR HAVE AN AFFECT UPON THE BODY IS NICOTINE. THIS MAY CAUSE MUSCLE CONSTRICTION. THIS MAY CAUSE A PARKINSON'S DISORDER. THE IMBALANCE OF THIS CHEMICAL OR THE LACK OF THIS CHEMICAL MAY CREATE SOME ALZHEIMER TYPE SYMPTOMOLOGY. THE DRUG, OR WHAT NEUROCHEMICAL ARE WE TALKING ABOUT HERE? ACETYLCHOLINE, THAT'S CORRECT. WHAT NEUROTRANSMITTER OR NEUROCHEMICAL ARE WE TALKING ABOUT THAT HAS A LOT TO DO WITH REGARDS TO THE PRIMARY PLEASURE RESPONSE AND WHEN IT IS OUT OF BALANCE IT MAY CREATE PSYCHOTIC FEATURES OR PSYCHOTIC BEHAVIOR. DOPAMINE. WHICH CHEMICALS HAVE WE TALKED ABOUT IN CLASS, STIMULANTS OR DEPRESSANTS, THAT MAY CREATE AN IMBALANCE WITH THE DOPAMINE

FEATURES? (STUDENT RESPONSE - NOT AUDIBLE.) WHICH? (STUDENT RESPONSE - NOT AUDIBLE.) STIMULANTS WOULD DO THAT. THAT'S CORRECT! WHICH NEUROTRANSMITTER IS A BODY PRODUCED STIMULANT? NOREPINEPHRINE, THAT'S CORRECT. SO, IF I'M TAKING COCAINE AND I AM FORCING THE RELEASE OF DOPAMINE AND NOREPINEPHRINE, THEN, THEREFORE, OR I AM INTERACTING WITH THE BODY IN THAT WAY THEN WE UNDERSTAND A LITTLE BIT ABOUT WHAT'S HAPPENING. WHAT NEUROTRANSMITTER WOULD WE TALK ABOUT IN HERE THAT MIMICS THE BODY OR IS VERY SIMILAR TO MORPHINE OR IS CONSIDERED AN OPIATE TYPE STRUCTURE WITHIN THE BODY AND THE BRAIN? WITH TWO STRUCTURES. ENDORPHINS AND ENKEPHALINS. NOW, THERE IS A FUNDAMENTAL DIFFERENCE BETWEEN THE TWO OF THOSE, BUT AGAIN, THAT IS NOT THE PURPOSE OF OUR CLASS THAT WE KNOW THE DIFFERENCE HERE. WHAT NEUROTRANSMITTER WOULD WE SAY IS RESPONSIBLE FOR MODULATING OR REGULATING THE OVER EXCITABILITY OF THE BRAIN AND THE NERVOUS SYSTEM? JUST USE ITS INITIALS. WHAT'S ITS INITIALS? GABA, THAT'S CORRECT. SO, THEREFORE, IF I HAVE A SUBSTANCE THAT IS VERY SIMILAR TO THAT OR IS RECEIVED AT THE GABA RECEPTOR SITES, THEN WE ARE GOING TO BE BALANCING IT OUT. NOW, NAME ME SOME SUBSTANCES THAT MAY ACT LIKE GABA ON THE NERVOUS SYSTEM. NAME ME ONE. ALCOHOL, WHAT'S ANOTHER ONE? BARBITURATES, WHAT'S ANOTHER ONE? MINOR TRANQUILIZERS OR BENZODIAZEPINES, VERY GOOD! NOW, WHAT

NEUROTRANSMITTER HAVE WE TALKED ABOUT IN CLASS THAT MIGHT HAVE TO DO WITH WAKING/SLEEPING CYCLES, MIGHT HAVE TO DO WITH DEPRESSION/ANXIETY, HAS A LOT TO DO WITH DIFFERENT MEDICATIONS LIKE PROZAC OR SEROTONAL RE-UPTAKE INHIBITORS, SEROTONIN. OKAY, VERY GOOD. NOW, REAL QUICKLY, WE BEGAN TALKING ABOUT THE PERIPHERAL NERVOUS SYSTEM. TRUE OR FALSE, THIS IS THE PORTION OF THE NERVOUS SYSTEM THAT CONTROLS THE BRAIN AND THE SPINAL CORD? THAT IS -- FALSE. WHAT NERVOUS SYSTEM CONTROLS THE BRAIN AND THE SPINAL CORD? THE CENTRAL NERVOUS SYSTEM. WHICH PORTION OF THE NERVOUS SYSTEM CONTROLS THE DISTAL OR DISTANT NEURONS OF THE BODY? WHAT IS THAT CALLED? THE PERIPHERAL, THE PERIPHERAL NERVOUS SYSTEM. THE PERIPHERAL NERVOUS SYSTEM, TRUE OR FALSE, IS BROKEN DOWN INTO THREE SUB-SYSTEMS? FALSE. HOW MANY? TWO OF THEM. WHICH ONE IS PRIMARILY RESPONSIBLE FOR THE STRIATED, STRIPED MUSCLES OF THE BODY AND HAS A LOT TO DO WITH SENSATION? SOMATIC. WHAT DOES SOMA STAND FOR? BODY. REMEMBER THAT IS A PNEUMONIC DEVICE BECAUSE WE ARE DEALING WITH MUSCLE GROUPS HERE. OKAY, NOW, WHICH ONE WOULD WE SAY CONTROLS OR IS SELF-GOVERNING ITSELF (PORTION OF THE NERVOUS SYSTEM)? AUTONOMIC. THE AUTONOMIC NERVOUS SYSTEM IS BROKEN DOWN INTO TWO SUB-SYSTEMS, TRUE OR FALSE? TRUE. NAME ME THE ONE THAT EXCITES US. THE SYMPATHETIC, WE HAVE SYMPATHY, THIS IS THE FIGHT OR FLIGHT RESPONSE, TRUE? THAT IS RIGHT. NAME ME THE ONE

THAT RELAXES US OR CALMS US DOWN. NOW, WHICH NEUROTRANSMITTER UP HERE WOULD BE RESPONSIBLE FOR ACTIVATING OR STIMULATING THE SYMPATHETIC BRANCH OF THE AUTONOMIC NERVOUS SYSTEM THAT WE TALKED ABOUT? THINK ABOUT IT, LOOK AT THEM. WHICH NEUROTRANSMITTER HAVE WE TALKED ABOUT IN CLASS THAT WOULD BE RESPONSIBLE FOR ACTIVATING THE SYMPATHETIC BRANCH, THE FIGHT OR FLIGHT BRANCH OF THE NERVOUS SYSTEM? NOREPINEPHRINE. WHICH NEUROTRANSMITTERS HAVE WE TALKED UP HERE THAT MIGHT BE A PART OF THE AUTONOMIC NERVOUS SYSTEM OR THE PARASYMPATHETIC PORTION OF THE NERVOUS SYSTEM? NAME ME THE MOST OBVIOUS. WHAT'S ITS INITIALS? GABA. WOULD SEROTONIN ALSO BE A PART OF THIS? COULD BE. WOULD THERE BE ANY, WOULD DOPAMINE BE A PART OF THIS? MIGHT BE, WE WILL LOOK AT THAT LATER.

NOW, WHAT WE ARE GOING TO TALK ABOUT IS WE ARE GOING TO TALK ABOUT THE BRAIN. THE PORTION OF THE BRAIN THAT WE ARE GOING TO BE DEALING WITH HERE, WE ARE PRIMARILY FOCUSING ON THE AUTONOMIC NERVOUS SYSTEM. OKAY? NOW, REMEMBER WE SAID THAT THE PERIPHERAL NERVOUS SYSTEM RECEIVES INFORMATION FROM THE DISTANT REGIONS AROUND THE BODY, THE FINGERS, THE NOSE AND THE TOES, USES THE NEUROLOGICAL TRACK FROM THE OUTSIDE, BRINGS IT INTO THE SPINAL CORD AND THEN SENDS THAT INFORMATION TO THE PROPER REGIONS IN THE BRAIN, OKAY?

NOW, FOR OUR UNDERSTANDING WE NEED TO REALIZE THAT WE ARE TALKING HERE POTENTIALLY ABOUT TWO BRAINS. OKAY, BECAUSE WE ARE GOING TO THINK THAT WE HAVE TWO BASIC BRAINS. NOW, LET'S UNDERSTAND THAT OUR BRAIN IS ABOUT AS LARGE AS (NOT AUDIBLE) TIED TOGETHER, LIKE ABOUT SUCH. THERE IS ABSOLUTELY NO EVIDENCE THAT INDICATES THAT THE SIZE OF YOUR BRAIN HAS VERY LITTLE TO DO WITH YOUR IQ LEVEL. INSTEAD IT IS HOW DEFINED THE BRAIN FEATURES ARE THAT MAY HAVE A LOT TO DO WITH IT, GENETICS AND OTHER VARIOUS THINGS LIKE THAT. NOW, THIS PORTION OF THE BRAIN STEM WHEN WE ARE TALKING ABOUT THE BRAIN, WE NEED TO UNDERSTAND THAT THE BRAIN STEM BEGINS WHERE THE SPINAL CORD ENDS. THE BRAIN STEM BEGINS WHERE THE SPINAL CORD ENDS. NOW, THERE ARE MANY FEATURES IN THE BRAIN STEM, BUT AGAIN, THE FOCUS OF OUR CLASS IS NOT TO GO INTO EVERY LITTLE FEATURE THAT MIGHT BE OCCURRING. THE LOCOSURREAL, THE OTHER FEATURES THAT WOULD BE WITHIN THE BRAIN AND THE BRAIN FEATURE. WE CAN DO THAT AT A LATTER POINT, BUT FOR OUR SCOPE OF THIS CLASS MAYBE IN AN ADVANCED CLASS WE COULD GET INTO SOME OF THE OTHER FACTORS AND FEATURES THAT MIGHT BE TAKING PLACE WITH REGARDS TO THAT, BUT FOR YOU AND I IT IS NOT NECESSARY. ALL WE NEED TO UNDERSTAND ARE JUST BASICALLY THREE OR FOUR OF THESE FEATURES RIGHT NOW. THE BRAIN STEM RECEIVES INFORMATION FROM THE SPINAL CORD. THE BRAIN STEM HAS THESE THREE PRIMARY FEATURES THAT I WANT YOU TO KNOW. FIRST OF ALL, THE

MEDULLA. NOW, SOMETIMES YOU WILL HEAR IT REFERRED TO BUT IT IS NOT REFERRED TO THIS WAY VERY OFTEN ANYMORE, BUT WHEN I WAS IN TRAINING THEY USED TO CALL IT THE MEDULLA OBLONGATA. BUT WE ARE GOING TO CALL IT JUST THE MEDULLA. NOW, THE MEDULLA IS RESPONSIBLE FOR SOME VERY IMPORTANT, VITAL FUNCTIONS WITHIN OUR BODY. IT IS RESPONSIBLE FOR BREATHING, RESPIRATION, YOUR BREATHING REFLEX, YOUR RESPIRATORY REFLEX, ALL OF THOSE FEATURES, YOUR HEART BEAT, AND IT IS VERY IMPORTANT WITH REGARDS TO THE SWALLOW REFLEX. NOW, I WANT YOU TO UNDERSTAND SOMETHING AND I WANT YOU TO BE VERY SERIOUS ABOUT THIS BECAUSE A LOT OF TIMES I WILL HEAR PEOPLE AND THEY WILL COME IN AND THEY WILL TELL ME HOW DRUNK THEY GOT. AND ONE OF THE THINGS THAT THEY WILL TELL ME IS THEY WILL TELL ME HOW SICK THEY GOT OR THEY HELPED SOMEBODY GET SICK OR SOMEBODY WAS SICK AND THEY ATTENDED TO THEM. I WANT TO SHARE SOMETHING WITH YOU AND I WANT YOU TO BE VERY SERIOUS ABOUT THIS. WHEN AN INDIVIDUAL IS DRUNK ENOUGH TO THE POINT THAT THEY ARE THROWING UP OR THEY ARE DRUNK ENOUGH TO THE POINT TO WHERE THEY HAVE PASSED OUT, THEY ARE IN A SIGNIFICANT MEDICAL CRISIS, DO NOT LEAVE THEM UNATTENDED, THEY COULD POTENTIALLY DIE. YOUR BRAIN HAS THE ABILITY TO WANT TO SHUT YOU OFF, IN OTHER WORDS WHEN IT IS IN DANGER, IT HAS A TENDENCY TO SHUT YOU OFF. FOR INSTANCE, LET'S TALK ABOUT PSYCHIC NUMBING. A LOT OF TIMES I WILL WORK WITH PATIENTS OR PEOPLE WHO HAVE COME INTO THE

OFFICE AND ONE OF THE THINGS THEY WILL SAY IS THAT THEY SAW THIS VERY HORRIBLE EVENT AND THEY ARE NUMB TO IT OR THEY WITNESSED SOMETHING THAT WAS VERY TRAGIC. SOME PEOPLE WHO, FOR INSTANCE, MIGHT HAVE WITNESSED SOMETHING OR BEEN A PART OF SOMETHING, OR SOMEBODY WALKS IN TO YOU AND SAYS HEY, BY THE WAY, A VERY CLOSE LOVED ONE HAS JUST DIED, THE FIRST THING THAT YOUR BODY DOES IS IT TRIES TO PROTECT ITSELF. PSYCHOLOGICALLY THAT DETAILED POWERFUL INFORMATION MAY BE SO OVERWHELMING THAT IN ORDER FOR YOU TO NOT COLLAPSE AS AN ORGANISM, IT SHUTS YOU DOWN, SO YOU GO INTO A NUMBING PHASE. OUR BODY NUMBS US, IT PROTECTS US. SO, WE ARE PSYCHOLOGICALLY PREPARED FOR SOME TYPE OF BAD THING THAT HAS OCCURRED. YOU MAY HAVE NOTICED A LOT OF TIMES IN THE PICTURES WITH THE OKLAHOMA CITY BOMBING, THAT YOU NOTICE AND IF YOU KNOW WHAT YOU ARE LOOKING FOR, YOU CAN SEE THAT PSYCHIC SHOCK IN THEIR FACES, THAT THEY ARE JUST NUMB, THEY ARE JUST MANUALLY DOING WHATEVER THEY NEED TO BE DOING BUT THEY ARE VOID OF THAT FEELING, THEY HAVE SHUT DOWN. IN ONE ARTICLE I WAS READING AS WELL AS I SAW THIS INDIVIDUAL ON TELEVISION, HE WAS AN EMERGENCY ROOM PHYSICIAN AND HE DID A WONDERFUL JOB OF BEING ABLE TO SAY, YOU KNOW FOLKS I HAVE SEEN SOME OF THE WORST THINGS THAT COULD EVER COME INTO THE OFFICE BUT THIS WAS THE FIRST TIME THAT I FELT MYSELF JUST DO MY JOB AND NOT EXPERIENCE THE EMOTION BECAUSE I JUST SHUT DOWN. AND HE

SAID A LOT OF THOSE WORKERS THAT WERE PULLING OUT PEOPLE AND RESCUING PEOPLE AND TRYING TO GET PEOPLE TO SAFETY, THEY WERE NUMB. LATER ON, AFTER THE CRISIS IS OVER WITH, THEY WILL EXPERIENCE THAT, WE MAY CALL THAT ACUTE DISTRESS DISORDER OR POST-TRAUMATIC STRESS DISORDER. BUT, THERE IS NO TRUTH TO THE FACT OR AT LEAST THERE IS VERY LITTLE TRUTH TO THE FACT THAT WHEN A PERSON IS ENDURING A VERY HORRIFIC EVENT THAT THEY SIMPLY COLLAPSE, THEY DON'T DO THAT. YOU ARE A VERY POWERFUL AND COMPLEX ORGANISM AND EVEN WHEN YOU DON'T THINK YOU CAN HANDLE IT YOUR BODY CAN HANDLE IT AND IT WILL GET YOU THROUGH THE CRISIS. BUT ONCE YOU ARE THROUGH IT THEN OFTEN TIMES YOUR BODY SAYS OKAY, WE DON'T HAVE TO PUT YOU ON AUTOPILOT ANYMORE, BUT NOW YOU ARE GOING TO HAVE TO START DEALING WITH THE PAIN AND THAT CAN BE VERY OVERWHELMING. A LOT OF TIMES PEOPLE WILL SHOW UP IN YOUR OFFICE IN TRAUMA OR PAIN. AS A PART OF THIS CLASS I HAVE A LADY THAT WILL BE COMING IN AND TALKING WITH US, DR. HEATHER WELKER, WHO DID AND WAS REQUESTED TO GO TO OKLAHOMA CITY AND SHE HAS A VERY POWERFUL PRESENTATION, SHE IS A TRAUMA EXPERT. SHE CAME BACK NOT ONLY HAS SHE BEEN THROUGH EVERYTHING SHE HAS BEEN AND I TOTALLY RESPECT HER ABILITIES, SHE CAME BACK AND SHE SAID, I WAS PROFOUNDLY AFFECTED. YES, AFFECTING ME ALSO. OUR BODY WHEN IT HAS A CHEMICAL IN IT THAT MAY ULTIMATELY KILL IT WILL CHOOSE TO SHUT US DOWN. AND LIKE IT PULLS THE PLUG YOU GOT TOO

MUCH SURGE COMING THROUGH, WE ARE NOT GOING TO LET YOU GO ON. BUT THE PROBLEM HAPPENS IS WHEN I HAVE INGESTED WAY TOO MUCH OF A MOOD ALTERING SUBSTANCE, MORE THAN WHAT MY BODY IS CAPABLE OF HANDLING, A LOT OF TIMES IT WILL TRY TO GET RID OF IT, SO THEN WE THROW UP. ALCOHOL HITS THE LINING OF THE STOMACH, THE PYLORIC VALVE DECIDES TO SPASM, CONTENTS OF THE STOMACH MAKES A RETURN VISIT NO MATTER WHERE YOU ARE OR (NOT AUDIBLE) RECYCLING. AND WHAT HAPPENS HERE IS PRETTY MUCH THE SAME THING, THE BRAIN IS GOING TO TRY TO PROTECT YOU FROM HURTING YOURSELF. SO, IT WILL DO WHATEVER IT CAN DO. BUT WHEN YOU SHUT DOWN THE CAPACITY TO BREATHE, YOUR HEART NO LONGER IS FUNCTIONING, YOU ARE GOING TO DIE AND IT IS NOT GOING TO BE PRETTY. IF YOU HAVE EVER BEEN AROUND SOMEBODY WHO HAS PASSED OUT FROM WAY TOO MUCH ALCOHOL, IF YOU HAVE THE OPPORTUNITY LOOK AT THEM. IF YOU NOTICE THAT THEIR BLOOD PRESSURE IS VERY, VERY LIGHT, THEIR BREATHING IS SLOW AND VERY LABORED. WHAT YOU ARE SEEING IS YOU ARE SEEING AN INSTALLMENT PLAN ON AN UNPLANNED SUICIDE AND THAT'S WHAT IS HAPPENING. BECAUSE THIS INDIVIDUAL HAS CONSUMED AN EXTREMELY POWERFUL, TOXIC SUBSTANCE AND THEY ARE SLOWLY ALLOWING THEMSELVES TO DIE. AND HERE IS WHAT IS SCARY, A LOT OF TIMES WHEN AN INDIVIDUAL HAS CONSUMED FAR TOO MUCH ALCOHOL, THE BODY WILL STILL TRY TO REMOVE ITS CONTENTS. YOU HAVE ALREADY TENDED TO YOUR FRIEND, THEY HAVE PASSED OUT, YOU LET

THEM LAY THERE, BUT THE PROBLEM MAY OCCUR THAT IN THAT THEY MAY THROW UP WHILE THEY ARE STILL PASSED OUT AND IN THE PROCESS OF DOING THAT THEY MAY REINHALE OR BREATHE IN THE VOMIT OR NOT BE ABLE TO REMOVE IT BECAUSE THE SWALLOW REFLEX IS NOT FUNCTIONING. SO, THEREFORE, THE GAG REFLEX DOES NOT OCCUR AND THAT PERSON SIMPLY DROWNS ON THEIR OWN INTERNAL FLUID. THEY SET OUT FOR A GOOD TIME AND THEY ENDED UP DEAD. I DON'T THINK THAT THAT IS WHAT IT IS ALL ABOUT. SO, WHEN I HEAR SOMEBODY, SORRY TO BLOW SOMEBODY'S GOOD TIME, SO WHEN I HEAR SOMEBODY COME IN AND SAY, "YEAH, I GOT REALLY DRUNK AND I GOT PASSED OUT AND I THREW UP", I'M NOT THINKING THAT'S CUTE. I DON'T THINK THAT'S FUNNY ANYMORE TO ME BECAUSE WHAT THAT TELLS ME IS THAT THIS PERSON BY LUCK MADE IT BACK. THE MEDULLA IS RESPONSIBLE FOR THOSE ACTIVITIES YOU WERE NOT CONSUMING ENOUGH TO SHUT THEM DOWN YOU MAY SHUT YOURSELF DOWN.

THE CEREBELLUM. YES? (STUDENT REPLY - NOT AUDIBLE.) YEAH, THAT'S FINE. (STUDENT REPLY - NOT AUDIBLE.) ABSOLUTELY, ABSOLUTELY, YOU CAN RUN INTO THE SAME PROBLEM. THE GREATER PROBLEM IS COMBINING THE TWO. THE MOST COMMON CAUSE OF DEATH OR OVERDOSE WITH VALIUM OR LIBRIUM OR XANAX OR SARENTAL OR OTHER KINDS OF ATIVAN OR OTHER TYPES OF MINOR TRANQUILIZERS, IS THAT YOU MUST UNDERSTAND THAT MINOR TRANQUILIZERS, BENZODIAZEPINES, ACT VERY, VERY SIMILARLY TO

THE BRAIN AS ALCOHOL DOES. NOW, THAT WE'VE GOT A LITTLE BIT OF A DIFFERENT OFFER THERE. BUT OTHER COMBINATIONS OF OPIATES, BARBITURATES, ALCOHOL, COMBINATION WITH ALL THESE SUBSTANCES YOU AGGRAVATE THE AFFECT. NOW, YOUR BOOK CALLS IT, I CALL IT POTENTIATE, ALRIGHT? BUT WHAT HAPPENS IS THAT IT ELEVATES THE POWER OF IT. I USED THIS EXAMPLE EARLIER. ONE PLUS ONE EQUALS THREE. IT IS FAIR TO ASSUME THAT I CONSUMED AN OUNCE OF ALCOHOL AND A 10 MG. VALIUM, THAT THE IMPACT OF THOSE TWO IN COMBINATION IS THAT OF A 30 MG. VALIUM, VERY CLOSE TO THAT. SO, WE FIND THAT OFTEN TIMES A PERSON WHO SETS OUT TO HAVE A GOOD TIME MAY CONSUME SIX TO EIGHT BEERS BUT ON TOP OF THAT THEY HAVE TAKEN ONE 10 MG. VALIUM, THE RESULT MAY BE ABSOLUTELY LETHAL AND WE KNOW OF CASES THAT HAVE BEEN IN THE NEWS IN TIMES GONE BY WHERE LITTLE ONES WILL GO OUT, THEY'LL TAKE A SUBSTANCE AND AS A RESULT END UP EITHER IN A COMA OR END UP DEAD BECAUSE THEIR BODY CANNOT TOLERATE OR THEY CAN'T DEAL WITH IT. SO, THE COMBINATION OF THOSE SUBSTANCES COULD BE AND ARE TYPICALLY VERY, VERY LETHAL. NOW, WITH AMPHETAMINES AND STIMULANTS YOU HAVE AN ALTERING AFFECT. FOR INSTANCE, JOHN BELUSHI DIED OF A COMBINATION OF METHAMPHETAMINES, OR COCAINE, AND A VERY POWERFUL NARCOTIC. I THINK IT WAS EITHER HEROINE OR MORPHINE. IT IS CALLED SPEEDBALLING. THE COMBINATION OF THE TWO WERE SO OVERWHELMING THAT SOMETIMES THE SYSTEM JUST FLAT SHUTS DOWN. SO, WE RUN INTO THE PROBLEM --

ANYTIME YOU ARE TAKING A SUBSTANCE INTO YOUR SYSTEM AT A LETHAL AND POTENTIALLY VERY DANGEROUS DOSE, YOU ARE PLAYING WITH THE CHEMISTRY OF YOUR BODY. IT WASN'T INTENDED TO HAPPEN THAT BUT YOU ARE GOING TO RUN IN, OR AT LEAST YOU RUN THE POTENTIAL FOR RUNNING INTO SOME SERIOUS PROBLEMS. YES, MA'AM, DID YOU HAVE A QUESTION? YOU LOOKED VERY PENSIVE. BUT, YOU WANT TO ASK A QUESTION, DON'T YOU? (STUDENT REPLY) OKAY, MAYBE NOT. NOW, LET'S GO ONTO THE CEREBELLUM. THE CEREBELLUM SOMETIMES, WHEN I WAS GROWING UP, THEY REFERRED TO IT AS THE LITTLE BRAIN. IT IS ACTUALLY KIND OF INTERESTING BECAUSE THE CEREBELLUM IS THAT CAULIFLOWER LIKE FEATURE -- RIGHT ABOUT HERE. THIS BEING THE BRAIN STEM, THIS BEING THE BACK OF THE OCCIPITAL LOBE, OR VISION LOBES, AND IT ATTACHES ITSELF TO THE BRAIN STEM AND TO THE LOWER PORTION OF THE OCCIPITAL LOBE. THE CEREBELLUM IS RESPONSIBLE FOR A LOT OF THINGS. BUT WHAT WE NEED TO UNDERSTAND IS THAT THE CEREBELLUM HAS A LOT TO DO WITH MUSCLE COORDINATION. IT RECEIVES INFORMATION FROM THE SPINAL CORD, AND IT HAS A LOT TO DO WITH MUSCLE COORDINATION -- GROSS MOTOR COORDINATION, BODY BALANCE AND MUSCLE BALANCE. SO, THEREFORE, ATHLETES TYPICALLY HAVE A VERY WELL DEVELOPED AND ESPECIALLY A VERY COMPLEX CEREBELLUM. THIS BECOME PARTICULARLY IMPORTANT WHEN WE CONSUME A MOOD ALTERING SUBSTANCE. IF I AM TAKING A STIMULANT, THEN I MAY FIND THAT MY MOTOR SKILLS ARE HEIGHTENED AND

MY ABILITY TO PERFORM IS STRONGER. THAT IS WHY WE HAVE SEEN IN MANY INSTANCES WHY ATHLETES WILL MAYBE TAKE SPEED OR SOME AMPHETAMINES OR SOMETHING BECAUSE IT ENHANCES THEIR PHYSICAL PERFORMANCE. THIS CHARGES THAT PORTION OF THE BRAIN, THE MOTOR CORTEX AND THE FRONTAL PORTIONS OF THE BRAIN, SO THEREFORE, THE PERSON CAN PERFORM MUCH BETTER. SO, THE USE OF THOSE MAY END UP CREATING THAT OR BEING A FACTOR. HOWEVER, AT THE SAME TIME, IF I CONSUME ENOUGH ALCOHOL TO IMPAIR THIS MUSCLE COORDINATION, THEN THEREFORE, I AM DANGEROUS IF I AM DRIVING, WALKING, TALKING OR ENGAGING IN ANY KIND OF DANGEROUS ACTIVITY WHERE MY MUSCLE COORDINATION IS NECESSARY. SO, THE CEREBELLUM, FOR OUR CLASS, IS RESPONSIBLE FOR MUSCLE COORDINATION AND RECEIVES INFORMATION FROM THE SPINAL CORD.

THE NEXT FEATURE HERE IS WHAT WE REFER TO AS THE RETICULAR FORMATION. NOW, THIS IS MORE OF AN AREA OF THE BRAIN STEM. THIS IS MORE OF A REGION OF THE BRAIN STEM. NOT SO MUCH A FEATURE BUT MORE OF A REGION. THERE IS ANOTHER STRUCTURE ASSOCIATED WITH THE RETICULAR FORMATION CALLED THE PAVNS BUT WE ARE NOT GOING TO BE INTERESTED IN THAT. BUT WE ARE GOING TO SAY FOR OUR CLASS' SAKE THAT THE RETICULAR FORMATION IS PARTICULARLY RESPONSIBLE FOR THE WAKING AND THE SLEEPING CYCLES. WE ARE ALSO GOING TO SAY THAT THE

RETICULAR FORMATION IS ALSO RESPONSIBLE FOR SOME REFLEXES. SO, IF I AM DRINKING COFFEE, CAFFEINE, XANTHENE (WHICH WOULD BE TEA OR ITS DERIVATIVES), METHAMPHETAMINES (AMPHETAMINES), STIMULANTS, PHENYLPROPANOLAMINE, WHICH IS OFTEN TIMES SUBSTANCES THAT IS USED IN COLD MEDICATION BUT THERE ARE SOME QUESTIONS THAT THEY MAY REMOVE SOME OF THAT, OR ANY KIND OF STIMULANT TYPE SUBSTANCE THAT MIGHT BE AN INGREDIENT, WE WILL BE ACTIVATING THE RETICULAR FORMATION AND THAT WILL MAKE US WAKE UP. SO, WHICH NEUROTRANSMITTER MIGHT IMPACT THE RETICULAR FORMATION THAT WAKES US UP? WHICH DID WE SAY? NOREPINEPHRINE. WHICH NEUROTRANSMITTERS MIGHT BE RESPONSIBLE FOR PUTTING US ASLEEP? SEROTONIN, GABA, OTHER SUBSTANCES IN THAT REGARD. SO, THEREFORE, WE KNOW THAT THERE IS A PORTION OF THE RETICULAR FORMATION THAT HELPS US REST. SO, IF I AM CONSUMING ALCOHOL, BARBITURATES OR OTHER FEATURES LIKE THIS, THEN OFTEN TIMES WHAT MAY HAPPEN IS IT MAY IMPACT THE RETICULAR FORMATION BY ALLOWING US TO REST. SO, AT ABOUT 10:30 AT MOST NIGHTS, MY RETICULAR FORMATION THEN ALLOWS ME TO START GOING INTO SLEEP. USUALLY, AT ABOUT, UNFORTUNATELY ABOUT, 6:00 OR 6:30, IT STARTS WAKING ME BACK UP AGAIN. IT IS THE SLEEPING CYCLE AND HAS A LOT TO DO WITH THE MOODS THAT SOMETIMES THAT THE SLEEPING MOODS THAT WE MAY PARTICULARLY GO THROUGH AND A LOT OF THE CYCLES THAT WE MIGHT EXPERIENCE IN THAT REGARD. OKAY.

WE ARE GOING TO GO NOW INTO THE MIDDLE PORTION OF THE BRAIN. WE ARE GOING TO LEAVE THE BRAIN STEM. NOW, AGAIN, THERE ARE OTHER FEATURES OF THE BRAIN STEM THAT BUT IT IS NOT IMPORTANT FOR US TO GO INTO THAT RIGHT NOW. NOW, WHAT I WANT TO DO IS I WANT TO GO INTO THE MIDDLE AREA OF THE BRAIN. NOW, I WANT US TO UNDERSTAND THAT EARLIER I SAID THAT WE HAVE TWO BRAINS. WE HAVE THIS MIDDLE AREA OF THE BRAIN AND THE BRAIN STEM. WE HAVE ANOTHER FEATURE OF THE BRAIN THAT WE'LL MAYBE GET TO TALK A LITTLE BIT ABOUT TODAY AND THAT IS CALLED THE CEREBRUM. THAT IS THE THINKING PART. IN THESE AREAS OF OUR BRAIN, THIS IS THE NON-THINKING PART. THIS IS WHERE THE BODY IS CONTROLLING YOU, YOU ARE NOT CONTROLLING IT, OR AT LEAST VERY LITTLE IF YOU TRY. WITHIN THE AREA OF THE LIMBIC SYSTEM, THE LIMBIC SYSTEM TENDS TO BE MORE IN THE MIDDLE OF THE BRAIN, THE LIMBIC SYSTEM'S RESPONSIBILITIES ARE MANY. HOWEVER, WE ARE GOING TO BE INTERESTED IN TWO FEATURES WITHIN THE LIMBIC AREA AND WE ARE GOING TO BE INTERESTED THAT THE LIMBIC SYSTEM FOR US, IN HERE, IS RESPONSIBLE FOR THE PLEASURE/REWARD SYSTEM. THEREFORE, CHEMICALS THAT ALLOW US TO FEEL GOOD, CHEMICALS THAT OUR BODY PRODUCES THAT ALLOWS US TO FEEL GOOD, CHEMICALS THAT WE TAKE TO STIMULATE THIS AREA OF THE BRAIN TO ALLOW US TO FEEL GOOD, THESE ARE PRIMARILY THE AREAS THAT WE ARE TALKING ABOUT. SO, THE REWARD CENTER OF THE BRAIN, OR THE

PLEASURE CENTERS OF THE BRAIN, WE ARE GOING TO CALL IT THE LIMBIC SYSTEM. TWO THINGS HERE IN THE LIMBIC AREA, HOWEVER, THE HIPPOCAMPUS AND THE AMIGULA. I WANT TO TALK ABOUT THE AMIGULA REAL QUICK BECAUSE I WANT TO SPEND SOME TIME WITH THE HIPPOCAMPUS. THE AMIGULA IS A FEATURE IN THE BRAIN, ACTUALLY, SOMETIMES RESEARCH WILL REFER TO THESE CONSECUTIVELY OR SIMULTANEOUSLY, THEY WILL TALK ABOUT THE AMIGULA/HIPPOCAMPAL AXIS OR THEY WILL REFER TO THEM BOTH TOGETHER. THE REASON WHY THEY DO THAT IS BECAUSE SOME OF THE ACTIVITIES THAT THE AMIGULA AND THE HIPPOCAMPUS SUPERSEDE ONE ANOTHER AND THEY BOTH SHARE IN SOME RESPONSIBILITY. WITH REGARDS TO THE AMIGULA, WE KNOW, FOR OUR SAKE IN HERE THAT THERE ARE TWO BASIC RESPONSIBILITIES. ONE OF THEM IS WITH REGARDS TO MEMORY. THE OTHER ONE AND THE MEMORY IS SHARED WITH THE HIPPOCAMPUS, SO, IF ON A TEST QUESTION I ASK YOU WHICH FEATURES OF THE BRAIN WE ARE GOING TO SAY ARE IMPORTANT FOR THE MEMORY PROCESS OR THE LEARNING PROCESS YOU ARE GOING TO MAKE SURE THAT THERE ARE TWO. NOW, THE HIPPOCAMPUS IS MORE IMPORTANT TO US WITH REGARDS TO MEMORY BUT IN THIS CASE WE WANT THE AMIGULA HAS SOME WORK TO DO WITH THE MEMORY AND THE LEARNING PROCESS. BUT WE ALSO KNOW THAT THE AMIGULA IS A FEATURE THAT HAS TO DO WITH EXTREME DEGREES OF EMOTION. SO, IF I COME ALONG AND STIMULATE THE AMIGULA, THAT CERTAIN AREAS I MAY GIVE A LITTLE TINY HOUSE MOUSE TO BE ABSOLUTELY

BERATIOUS AND ATTACK ME, OKAY? SO, WE KNOW THAT THE AMIGULA HAS A LOT TO DO WITH EXTREME EMOTIONS AND HAS A LOT TO DO WITH MEMORY. THE HIPPOCAMPUS. THE HIPPOCAMPUS IS WHAT WE ARE GOING TO SAY, AND I DON'T WANT TO SIMPLIFY IT TOO COMPLETELY BUT I AM GOING TO DO IT FOR HERE, THE HIPPOCAMPUS IS BASICALLY RESPONSIBLE FOR LEARNING ACQUISITION AND MEMORY. NOW, LET'S GO OVER SOME MEMORY STUFF. REMEMBER IN YOUR INTRO TO PSYCHOLOGY, REMEMBER YOU SPENT ALL THAT TIME WITH REGARDS TO MEMORY AND HOW WE LEARN, WELL I AM GOING TO GO OVER A LITTLE BIT OF THAT WITH YOU RIGHT NOW. BECAUSE I WANT YOU TO UNDERSTAND THIS, ESPECIALLY THE HIPPOCAMPUS AND THE AMIGULAR ARE GOING TO BECOME VERY IMPORTANT TO US WHEN WE START STUDYING MARIJUANA AND ITS IMPACT UPON THE BODY. THE HIPPOCAMPUS, WHAT WE ARE GOING TO SAY AND WE ARE GOING TO PUT IT RIGHT ABOUT SUCH, THE HIPPOCAMPUS, FIRST OF ALL LET'S GO OVER MEMORY. WE KNOW THAT THERE ARE THREE KINDS OF MEMORY, OR THREE KINDS OF INCOMING. WE KNOW THAT THERE IS SENSORY MEMORY, FOR INSTANCE IT IS REAL EASY TO BE ABLE TO KNOW SENSORY MEMORY. LET'S DO IT REAL QUICK. I WANT YOU TO LOOK AT THE LIGHTS, STUDY THE LIGHTS, LOOK AT THEM, LOOK AT THEM, LOOK AT THEM. WHEN I COUNT TO THREE, I SAY THE NUMBER THREE, I WANT YOU TO CLOSE YOUR EYES AND SQUINT THEM, LOOK AT THEM, LOOK AT THEM, ONE, TWO, THREE, SQUINT. NOW, WITH YOUR EYES CLOSED, YOU MAY THEN CONTINUE TO SEE AN IMAGE WITH YOUR EYES CLOSED FOR A PERIOD

OF TIME. THIS IS SENSORY MEMORY. THIS WILL ONLY LAST MAYBE A SECOND OR TWO. IT IS NOT THERE FOR VERY LONG. SO, IT IS THERE AND GONE, REAL QUICK. THIS IS ALSO WHAT HAPPENS WHEN WE DO DOUBLE TAKES -- WE ARE DRIVING DOWN THE ROAD AND AS WE DRIVE DOWN THE ROAD WE LOOK OVER AND WE SOMEBODY WE THINK WE KNOW AND WE GO, OH. AND THAT IS THE SENSORY MEMORY AND SAYS MAYBE I WANT TO GO TAKE A LOOK AT THAT PERSON AGAIN, TAKE ANOTHER ONE. WE HAVE SHORT TERM MEMORY. SHORT TERM MEMORY IS THAT 20 - 30 SECOND MEMORY. JUST LONG ENOUGH FOR US TO BE ABLE TO WRITE INFORMATION DOWN. NOW, SHORT TERM MEMORY USUALLY COMES THROUGH THE YEARS. DON'T WRITE THIS DOWN BUT IT IS CALLED A CULEX -- COMES THROUGH THE YEARS. SO, YOU MIGHT TELL ME YOUR NAME, I MIGHT REMEMBER FOR 20 - 30 SECONDS AND THERE IS THE LONG TERM MEMORY. AND WE KNOW THAT LONG TERM MEMORY IS SUPPOSED TO BE THE FOREVER MEMORY AND THAT IS USUALLY ACQUIRED BY WHAT WE CALL ENCODED, THROUGH THE EYES. SO, THEREFORE, THIS LADY CAN TELL ME HER NAME AND IF I DON'T TRY TO USE A PNEUMONIC DEVICE TO REMEMBER IT, I MAY BE ABLE TO REMEMBER THE FACE, I WILL KNOW THAT I HAD YOU IN CLASS, BUT IT IS NOT DOUBTFUL, OR IT IS VERY DOUBTFUL, THAT I WILL REMEMBER WHAT YOUR NAME IS IF I HEAR IT. SO, HERE IS SOMETHING THAT WE MUST UNDERSTAND -- THE HIPPOCAMPUS IS VERY IMPORTANT IN WHAT YOU AND I ARE DOING RIGHT NOW. AS A MATTER OF FACT, THE TRUTH OF THE MATTER IS, I AM NOT TALKING TO YOU. IF I AM REALLY WANTING YOU

TO LEARN SOMETHING, I AM TALKING TO THE HIPPOCAMPUS. OKAY? NOW, LET'S UNDERSTAND, HOW DO WE GET INFORMATION FROM WHAT I HAVE TO SAY AND CONVERT IT INTO LONG TERM MEMORY? THE WAY THAT WE GET THAT DONE IS SIMPLE. WE REPEAT IT, WE REPEAT IT, WE REPEAT IT, AND WE REPEAT IT. AGAIN, AND AGAIN, AND AGAIN. HOW MANY OF YOU HAVE EVER TRIED TO CRAM FOR A TEST AND MADE IT INTO THE TEST AND YOU COULDN'T QUITE REMEMBER ALL OF IT? SURE! YOU KNOW WHY? BECAUSE UNLESS YOU ARE GOING TO BE HOLDING ON TO THAT, UNLESS YOU ARE GOING TO BE TAKING THE TEST WITHIN 20 - 30 SECONDS FOLLOWING CRAMMING THAT INFORMATION, YOU ARE NOT GOING TO GET IT. YOU KNOW, AND THERE IS INTERFERENCE LEARNING. SO, THEREFORE, STUFF YOU HAVE LEARNED HERE MAY GET IN THE WAY OF STUFF THAT YOU HAVE LEARNED HERE, ALL KINDS OF DIFFERENT THINGS. SO, CRAMMING REALLY WON'T WORK. THE EASIEST WAY TO STUDY IS VERY, VERY SIMPLE. I DO THAT WITH YOU BY THE WAY. WE ARE DOING ALL KINDS OF MEMORY LEARNING FOR YOU. FOR INSTANCE, I TELL YOU SOMETHING. IT GOES HERE, RIGHT? YOU THEN TAKE IT AND WRITE IT DOWN ON A PIECE OF PAPER BECAUSE YOU KNOW IN 30 SECONDS YOU ARE NOT GOING TO BE ABLE TO RECALL IT. WE KNOW FROM LEARNING RESEARCH THAT YOU ARE PROBABLY TWO, THREE, FOUR HOURS FOLLOWING THIS, MAYBE ONLY ARE GOING TO REMEMBER ONE THING AND MOST OF THE TIME IT IS SOME GOD AWFUL STORY I'VE TOLD YOU. SO, YOU WRITE IT DOWN. BY WRITING IT DOWN, YOU HAVE TO USE THE NON-VERBAL PART OF YOUR BRAIN,

WHICH IS YOUR RIGHT, AND THEREFORE, THAT IS WHERE A LOT OF MEMORY IS STORED AND THEN WHAT HAPPENS IS HOPEFULLY, OF COURSE, EVERYONE OF YOU GO HOME AND YOU REHEARSE THE INFORMATION. THEN YOU COME BACK IN HERE AND I GO OVER THE INFORMATION AGAIN AND I TRY TO USE LITTLE DEVICES OR THINGS TO BE ABLE TO CLUE THE MEMORY -- THIS IS WHERE IT IS. THEN HOPEFULLY, DURING THE TIME OF STUDY I WILL GO OVER AND SAY, THIS IS IT. SO, YOU NOTICE, I REPEAT MYSELF A LOT. I AM NOT REPEATING MYSELF BECAUSE I LIKE TO HEAR MYSELF REPEAT IT, I AM REPEATING IT WITH THE FACT THAT I KNOW HOW YOU ARE GOING TO LEARN AND I KNOW THAT BY REPEATING, REPEATING, REPEATING, THAT EVENTUALLY, THE HIPPOCAMPUS WILL TAKE THAT INFORMATION AND IT WILL STORE IT SOMEWHERE. NOW, HERE IS WHAT WE'VE GOT TO UNDERSTAND. IF I TEACH YOU $1 + 1 =$ (OH, MY MATH IS GREAT TODAY!), IF I TEACH YOU $1 + 1 = 2$, THAT INFORMATION ENTERS INTO THE HIPPOCAMPUS. THEN THE HIPPOCAMPUS HAS TO REMEMBER WHICH HIGHWAY, OR NEUROLOGICAL PATHWAY, IT USED TO STORE THAT INFORMATION OVER HERE. NOW, NOT ONLY DOES IT HAVE TO REMEMBER WHICH ROAD IT TOOK, BUT IT ALSO MUST REMEMBER WHERE DID IT PUT IT! SO, THAT ON A TEST, IF YOU PRACTICED ENOUGH, YOU PRACTICED YOUR HIPPOCAMPUS ENOUGH TIMES, IT DOES NOT HAVE TO KNOW WHERE IT IS STORED, IT JUST HAS TO KNOW HOW DO I GO TO IT. SO, REALLY, WHEN I AM REHEARSING WITH YOU, I AM TEACHING YOUR HIPPOCAMPUS TO KNOW WHERE IT WAS PUT SO THAT IT CAN TAKE IT FROM

STORAGE, PULL IT OUT AND RETRIEVE IT. THAT IS THE LEARNING PROCESS IN A VERY SIMPLE NUTSHELL. BUT, YOU CAN'T LEARN IT IN 20 - 30 SECONDS. SO, THEREFORE, IN ORDER TO GET YOUR HIPPOCAMPUS TO FUNCTION IT MUST WORK CONTINUALLY AND YOU HAVE GOT TO KEEP REPEATING, REPEATING, AND REPEATING AND USING DEVICES IN ORDER TO REMEMBER THAT. NOW, HERE IS A PROBLEM. THE PROBLEM IS NOW WE ARE STARTING TO UNDERSTAND THAT WITH REGARDS TO THE USE OF MARIJUANA, AND NOW WE'VE GOT TO UNDERSTAND THAT THERE IS ABOUT 400+ CHEMICALS IN MARIJUANA. THE REASON WHY THE PERSON IS SMOKING IT IS ROUTINELY FOR ONE PRIMARY CHEMICAL, DELTA 9 TETRAHYDROCANNABINOL (THC). NOW, WE KNOW A LOT OF THINGS ABOUT THIS SUBSTANCE, BUT I CALL THIS DRUG A CREEPER DRUG, THAT IS MY NAME FOR IT BECAUSE IT CREEPS UP ON A PERSON BEFORE THEY REALLY KNOW WHAT HAS OCCURRED. BUT THE ONE THING THAT WE DO KNOW, IS THAT WE KNOW THAT MARIJUANA INTERFERES WITH THE LEARNING PROCESS. WHAT IS INTERFERING IS, AND SOME WILL SAY, WELL IT MAKES A PERSON VERY LETHARGIC, WELL, YEAH, THAT MAY BE TRUE TOO BECAUSE IT DOES INTERFERE WITH THE GABA RECEPTION, BUT MORE IMPORTANTLY WHAT WE KNOW IS THAT IT DIRECTLY ATTACKS THE LEARNING PROCESS OF THE HIPPOCAMPUS. SO, THEREFORE, WHEN A PERSON IS ACTIVELY SMOKING DOPE, I CAN BE REST ASSURED THAT THEY ARE PROBABLY GOING TO BE EXPERIENCING SOME LEARNING IMPAIRMENT. BUT HERE IS WHAT IS EVEN WORSE, WHAT'S WORSE IS THE FACT IF I LEARN A

MATHEMATICAL EQUATION UNDER THE INFLUENCE OF MARIJUANA, OKAY, AND I COME INTO A TEST AND I TRY TO TAKE THE TEST WITHOUT THE INFLUENCE OF MARIJUANA, IT IS NOT LIKELY THAT I AM NOT GOING TO RECALL THE INFORMATION. WE CALL THAT STATE DEPENDENT LEARNING. WHAT THAT MEANS IS IS IF I AM DRUNK WHEN I LEARN SOMETHING, I AM GOING TO RECALL IT BETTER BECAUSE THE HIPPOCAMPUS KNOWS WHERE IT PUT IT WHEN IT WAS DRUNK. PLUS, AT THE SAME TIME NOW I AM SOBER AND I AM TRYING TO REMEMBER THIS INFORMATION AND IT IS VERY DIFFICULT TO BE ABLE TO DO. SO, I AM NOT SAYING IF YOU'VE GOTTEN STONED PRIOR TO CLASS THAT YOU NEED TO BE STONED WHEN YOU COME HERE, BUT I AM SAYING, UNDERSTAND THAT THAT IS A FACTOR, THE STATE THAT YOU ARE IN AND WE WILL GET INTO THAT A LITTLE BIT LATER ON. BUT THAT IS WHAT HAPPENS A LOT OF TIMES WITH MARIJUANA USERS. THEY MAY ACQUIRE A WEALTH OF INFORMATION UNDER THE INFLUENCE IF THEIR BRAIN IS UNDER THE INFLUENCE OF POT, BUT IRONICALLY ENOUGH ONCE THEY STOP SMOKING, BOY THEIR MEMORY IS REALLY EVEN WORSE. MOST OF THE TIME WE FIND THAT THAT HAS A POTENTIAL TO BE REVERSIBLE. IN OTHER WORDS THE PERSON CAN COME AROUND. I WILL SHARE SOME OTHER REAL QUICK RESEARCH WITH YOU. I READ THIS ABOUT SIX MONTHS PRIOR TO THIS CLASS AND WHAT HAD HAPPENED WAS THAT A RESEARCHER HAD DONE A BLIND STUDY AND WHAT HE HAD DONE WAS HE HAD TAKEN, ARE YOU ALL FAMILIAR WITH BRAIN SCANS, DO YOU KNOW WHAT A PET SCAN IS (A POSITRON EMISSION TOMOGRAPHY)?

OKAY, WELL, HERE IS THE BETTER WAY TO SAY IT. YOU TAKE A PICTURE OF A PERSON'S BRAIN. THEY CONCEDE BY TAKING A PICTURE OF THE PERSON'S BRAIN BY USING THIS PARTICULAR SCAN WHERE THE BRAIN IS DAMAGED. THEY KNOW THAT CERTAIN ALZHEIMERS PATIENTS SHOW PARTICULAR, VERY PREDICTABLE SYMPTOM DAMAGE IN THE BRAIN IN OR ABOUT THE AREA OF THE HIPPOCAMPUS. AND WE HAVE A LOT OF THEORIES AS TO WHY THE PERSON CANNOT REMEMBER. ONE, WE SAY, WELL, IF HERE'S THE HIPPOCAMPUS, THAT THE OUTER SHELL OF THE HIPPOCAMPUS MAY BE DETERIORATING AND SO, THEREFORE, AS THE OUTER TISSUE AROUND THE HIPPOCAMPUS BEGINS TO DETERIORATE, THE ELECTRICAL CHEMICAL INFORMATION THAT GOES INTO THE HIPPOCAMPUS MAY GET BLOCKED, SO THE PERSON JUST DOESN'T REMEMBER. WELL, THEY ARE ALSO SAYING THAT WHILE IT MAY BE POSSIBLE THAT THE ACTUAL NEURON IS DETERIORATING. SO, AS THE CHEMICAL OR THE ELECTRICAL CHEMICAL INFORMATION TRIES TO ENTER IN, IT CAN'T MAKE IT INTO THE HIPPOCAMPUS. WELL, THERE ARE A LOT OF THINGS THAT ARE GOING ON THERE, BUT WE KNOW THAT THAT IS INTERFERING WITH THE LEARNING PROCESS. BACK TO THE RESEARCH. WHAT THIS INDIVIDUAL DID WAS, AND I AM JUST GOING TO KIND OF SHORTEN IT FOR TIME'S SAKE, WHAT HE DID WAS HE WENT AND HE TOOK PICTURES OF ALZHEIMER PATIENTS. BUT HE DID NOT MARK THEM AS ALZHEIMER PATIENTS. HE THEN TOOK PICTURES OF PEOPLE WHO HAD BEEN SMOKING MARIJUANA ON A DAILY BASIS FOR THREE YEARS. BUT, HE DID NOT LIST THEM AS

MARIJUANA BRAINS. HE TOOK THEM, SHUFFLED THEM ALL UP, BROUGHT IN A BUNCH OF PEOPLE WHO KNOW WHAT TO LOOK FOR WITH REGARDS TO BRAIN DIFFICULTIES WITH ALZHEIMER PATIENTS AND SET THEM IN THE ROOM AND SAID WHAT ARE LOOKING AT HERE. HE GAVE THEM NO CLUE WHATSOEVER WHAT THEY WERE IDENTIFYING. EACH PERSON, EACH PHYSICIAN, NEUROLOGISTS, CAME IN AND SAID, IN SOME CASES WE ARE DEALING WITH ADVANCED ALZHEIMERS AND IN OTHER CASES WE ARE DEALING WITH EARLY SYMPTOMS, PERDROMAL PHASE, EARLY STAGE ALZHEIMER PROBLEMS. NONE OF THEM KNEW WHAT THEY WERE ACTUALLY LOOKING AT. ALL OF THE BASIC ESSENTIAL FEATURES OF ALZHEIMERS WERE THERE. THEY THEN CAME BACK AND FOUND THAT WITH THOSE WITH ADVANCED ALZHEIMER TYPE SYMPTOMS WERE TRULY THE ALZHEIMER PATIENTS. BUT, THOSE WITH EARLY STAGE ALZHEIMER SYMPTOMOLOGY WAS NOT THAT DISTINGUISHABLE FROM EARLY STAGE MARIJUANA USE OR EARLY STAGE ALZHEIMER DETERIORATION. THE POINT IS WE GOT TROUBLE. DON'T TELL ME THIS IS A SAFE DRUG, IT IS NOT. IT IS NOT A SAFE DRUG IF IT IS GOING TO INTERFERE WITH MY NATURAL AND MY NORMAL FUNCTIONING OR IF IT IS GOING TO IMPAIR A PERSON'S ABILITY TO BE ABLE TO PERFORM TO THEIR ULTIMATE LEVEL. YES, WE WILL KNOW A THOUSAND PEOPLE OUT THERE THAT WILL COME IN AND SAY, WELL, I'VE BEEN SMOKING DOPE ALL MY LIFE AND IT HAS NEVER HURT ME AND I'M GOING TO SAY, GOOD FOR YOU, I AM GLAD THAT IT HAS NOT. BUT, I AM GOING TO SAY, I WONDER WHAT YOU WOULD BE LIKE IF YOU HADN'T SMOKED WEED, WHERE

WOULD YOU BE? NOW, THERE IS NO ANSWER TO ANY OF THAT AND I WILL NOT DEBATE ANYBODY WITH REGARDS TO THAT BUT MY POINT IS CLEAR, WHY WOULD I WANT TO TAKE A SUBSTANCE THAT IS GOING TO IMPAIR THE ABILITY THAT I HAVE. I DON'T HAVE MUCH ABILITY IN THAT REGARD SO I AM CERTAINLY NOT GOING TO DO TOO MUCH DAMAGE, BUT THIS IS WHAT THE HIPPOCAMPUS IS RESPONSIBLE FOR. AND VERY IMPORTANT TO US IN THE LEARNING PROCESS AND THE MEMORY PROCESS THAT IS OCCURRING AND WE DO FIND THAT ONCE THE INDIVIDUAL STOPS SMOKING MARIJUANA AFTER A PERIOD OF TIME, THAT THEIR MEMORY DOES SEEM TO HEIGHTEN. AS A MATTER OF FACT, A LOT OF TIMES WHEN I AM DOING ASSESSMENTS, I WILL ASK A PERSON JUST FOR MY OWN KNOWLEDGE, "WELL, YOU'VE BEEN SMOKING FOR HOW LONG?" "OH, FIVE SIX YEARS, OFF AND ON." "WELL, WHEN YOU QUIT SMOKING, WHAT," OR I'LL ASK THE QUESTION, "HOW BAD IS YOUR MEMORY." A LOT OF TIMES THEY WILL COME RIGHT OUT AND SAY, "OH, YEAH, MY MEMORY IS PRETTY WELL SHOT." IN SOME CASES I'VE FOUND THAT THE MEMORY HAS COME BACK VERY NICELY AND IN OTHER CASES, PEOPLE WILL STILL COMPLAIN WITH THE FACT THAT IT HAS BEEN IMPAIRED AND THEY POTENTIALLY STAY THAT WAY FOR A LONG TIME. SOME EXAMPLES IN THAT AREA. NOW, LET'S GO ON.

ANOTHER IMPORTANT FEATURE TO US IN THE BRAIN, TWO IMPORTANT FEATURES, IS THE THALAMUS AND THE HYPOTHALAMUS. THE HYPOTHALAMUS HAS POTENTIALLY BEEN SO OVERSTUDIED, IT IS AN ENORMOUS AND

IMPORTANT VALUABLE STRUCTURE WITHIN THE BRAIN. FIRST OF ALL, LET'S START OFF WITH THE THALAMUS. THE THALAMUS SOMETIMES CAN BE REFERRED TO AS THE GRAND CENTRAL STATION. THE REASON THAT IT IS REFERRED TO AS THE GRAND CENTRAL STATION IS PRIMARILY BECAUSE IT RECEIVES A LOT OF SENSORY INFORMATION. IT RECEIVES A LOT OF INFORMATION FROM THE MIDDLE BRAIN AND TRANSPORTS THAT INFORMATION ONTO THE CEREBRAL CORTEX, OUR THINKING PORTION OF OUR BRAIN. SO, IT GRABS INFORMATION FROM ONE AREA AND IT SENDS IT ELSEWHERE. SO, FOR INSTANCE, IF I AM TOUCHING THE TOP OF THIS TABLE, THAT INFORMATION MAKES ITS WAY THROUGH THE PERIPHERAL NEURONS INTO THE SPINAL CORD, INTO THE BRAIN STEM, INTO THE THALAMUS, AND FROM THERE IT MAY TRANSPORT ONTO THE PARIETAL CORTEX FOR ME TO BE ABLE TO EXPERIENCE THAT. SO, IT IS A CENTRAL STATION. AND ONE OF THE RESPONSIBILITIES WITH REGARDS TO THIS IN TERMS ALSO, IT HAS A LOT OF CONTROL OVER SENSORY EXPERIENCES. IT ALSO HAS RESPONSIBILITIES FOR CRUDE SENSATION. FOR INSTANCE, LIKE PRESSURE. I GRAB YOUR HAND OR I TAKE YOUR ARM AND I PUSH MY HAND AGAINST YOURS, THE SENSATION OF PRESSURE, SOMETHING PUSHING AGAINST YOU. CRUDE PAIN HAS SOME RESPONSIBILITIES WITH REGARDS TO TEMPERATURE, BODY TEMPERATURE. AND IT DOES HAVE SOME RESPONSIBILITIES IN TERMS OF BODY POSITIONING, WHERE ARE YOU, WHERE IS YOUR HEAD IN REFERENCE TO THE REST OF YOUR BODY? THE HYPOTHALAMUS HAS AN ENORMOUS AMOUNT OF

RESPONSIBILITY AND THE WORD HYPO MEANS JUST EXACTLY THAT, BELOW. SO, THEREFORE, HYPOTHALAMUS MEANS THAT THIS IS A STRUCTURE, A FEATURE JUST BELOW THE THALAMUS. NOW, THE HYPOTHALAMUS, AGAIN, IS A VERY, VERY IMPORTANT FEATURE OF OUR BRAIN. FOR INSTANCE, THE HYPOTHALAMUS HAS AN ENORMOUS AMOUNT OF RESPONSIBILITY FOR THE METABOLIC ACTIVITIES OF OUR BODY. LET'S STUDY THAT WORD FOR JUST A MINUTE. WE ALL KNOW THAT THE PITUITARY GLAND, "THE MASTER GLAND", IS A GLAND THAT HAS AN ENORMOUS AMOUNT OF WORK IN TERMS OF OUR HORMONAL SYSTEM. WE KNOW THAT THE HYPOTHALAMUS COMMUNICATES VERY DIRECTLY WITH THE MASTER GLAND, OR THE PITUITARY GLAND. SO, WE KNOW THAT A LOT OF METABOLIC ACTIVITIES ARE BEING CONTROLLED BY THE HYPOTHALAMUS. WE KNOW THAT THE HYPOTHALAMUS HAS A LOT OF RESPONSIBILITY WITH REGULATING THE DEGREE OF SUGAR THAT IS IN YOUR BODY, DEGREE OF WATER. LIKE THE THALAMUS, THIS HAS A LOT OF RESPONSIBILITY IN TERMS OF TEMPERATURE CONTROL. LEVELS OF FAT IN YOUR BODY. AND IT IS VERY IMPORTANT IN TERMS OF EMOTION ALSO. EMOTIONS. YOU KNOW THAT IT HAS A LOT TO DO WITH REGARDS TO SEX, POTENTIALLY PART OF THE SEX DRIVE. SOME RESEARCH HAS TRIED TO SAY THAT DEPENDING UPON THE HYPOTHALAMUS, I THINK THAT SEVERAL YEARS BACK OR MAYBE EVEN A YEAR AGO, I'M NOT SURE WHEN IT WAS, WOULD COME BACK AND SAY THAT, WELL, THE PERSON'S SEXUAL CHOICE MAY BE A CONSEQUENCE OF THE HYPOTHALAMUS, BUT I'M NOT SURE THAT THEY HAVE

NECESSARILY EVER PROVEN THAT. BUT, NONETHELESS, THE HYPOTHALAMUS HAS A LOT TO DO WITH YOUR SEXUAL CYCLES, YOUR SEXUAL NEEDS, AND VARIOUS THINGS OF SUCH LIKE THAT. AND IT ALSO HAS A LOT TO DO WITH THE FEATURES OF THE AUTONOMIC NERVOUS SYSTEM. THE SYMPATHETIC AND PARASYMPATHETIC PORTIONS OF THE BRAIN. JUST A LITTLE BIT MORE AND I WILL LET YOU OUT OF HERE.

NOW WHAT I WANT TO TALK ABOUT IS, I WANT TO TALK ABOUT, SO FAR WE HAVE BEEN TALKING ABOUT A PORTION OF THE BRAIN THAT IS RESPONSIBLE, THAT TAKES CARE OF US. THIS IS A PART OF THE BRAIN THAT DOES ITS OWN REGULATING. IT IS A PART OF THE BRAIN THAT SAYS, WHAT'S HAPPENING TO US AND WHAT'S NOT HAPPENING TO US. OH, BY THE WAY, WE ALSO KNOW THAT THE HYPOTHALAMUS HAS A LOT TO DO WITH BD BEHAVIOR. SOME RESEARCH IS TRYING TO SAY, WELL, THAT CERTAIN EATING DISORDERS MAY BE A CONSEQUENCE OF THE HYPOTHALAMIC PROBLEMS THAT MAY BE OCCURRING. SO, WE KNOW THAT CERTAIN ANTIDEPRESSANTS, FOR INSTANCE, PROZAC, HAS A TENDENCY TO DECREASE THE PERSON'S HUNGER CYCLE OR SATIETY LEVEL. IT IS NOT A GOOD AND SHOULD NOT BE USED FOR TREATMENT OF OBESITY AND IT IS NOT DESIGNED TO DO THAT. BUT, PROZAC HAS A TENDENCY TO DO THAT OR THERE MAY BE A TENDENCY FOR A PERSON TO EXPERIENCE A LITTLE BIT OF A DECREASE OF THE HUNGER CYCLE. BUT, AGAIN, I STRONGLY URGE AND CAUTION PEOPLE FROM USING THESE. AN

ANTIDEPRESSANT SHOULD BE USED FOR THAT PURPOSE ONLY. BUT, ANYWAY, ONWARD NOW TO THE CEREBRUM. WE HAVE BEEN TALKING ABOUT THE PORTION OF THE BRAIN THAT WE REALLY DON'T HAVE A WHOLE LOT OF CONTROL OVER. THIS IS THE PORTION OF THE BRAIN THAT IS CONTROLLING US. IT IS REGULATING US, IT IS BALANCING US, IT'S HOMEOSTATIC BALANCING US, IT IS TRYING TO KEEP US IN A PLACE WHERE WE ARE COMFORTABLE AND WE ARE SAFE AND WE FEEL GOOD. NOW, WHAT WE ARE GOING TO TALK ABOUT IS WE ARE GOING TO TALK ABOUT THE CEREBRUM. THE CEREBRUM IS THE PART OF THE BRAIN THAT SEPARATES FROM MOST AND ALL OTHER ANIMALS. THIS IS THE PART OF OUR BRAIN THAT IS VERY RESPONSIBLE FOR A LOT OF WHAT YOU AND I ARE DOING RIGHT NOW. THIS IS OUR THINKING BRAIN. AS YET SO FAR, WE FIGURED OUT THAT WE PROBABLY HAVE THE MOST ADVANCED CEREBRUM. WE KNOW THAT ANIMALS THAT ARE VERY INTELLIGENT HAVE A WELL DEFINED FEATURED CEREBRUM. SO, WE KNOW THAT THE MORE DEFINED THE CEREBRUM, THE GREATER IT IS, THE LARGER CAPACITY IT IS, AND WE KNOW THE POTENTIAL FOR HIGHER INTELLIGENCE IN TERMS OF THAT ANIMAL. SO, THE CEREBRUM FOR THAT MATTER, IS WHAT SEPARATES YOU AND ME FROM MOST EVERYTHING ELSE. BUT, LITERALLY, THE INTERNAL PARTS OF THE BRAIN REALLY AREN'T THAT MUCH DIFFERENT. NOW, THE CEREBRUM WE ARE GOING TO SAY IS THE KNOWLEDGE PART OF THE BRAIN. THIS IS WHAT ALLOWS US TO THINK, IT ALLOWS US TO BE ABLE TO COMMUNICATE, TO USE DIFFERENT LANGUAGES, TO HAVE SYMBOLS THAT ALL

MAKE SENSE TO US. THIS IS THE PART OF OUR BRAIN THAT WE THINK WITH. NOW, THE CEREBRUM, LET'S TAKE A LOOK AT TWO DIFFERENT PARTS OF IT. THE LEFT BRAIN AND THE RIGHT BRAIN. WE KNOW THAT THE LEFT BRAIN AND WHEN WE SAY THE LEFT BRAIN, WE ARE SAYING THE LEFT CEREBRAL CORTEX. NOW, LET ME DEFINE A WORD FOR YOU HERE. CORTEX MEANS OUTER COVERING, ALRIGHT? SO, LITERALLY, THE BRAIN STEM AND THE MID-BRAIN SET HERE AND THE CEREBRUM IS LIKE A FOLD OVER THE TOP OF IT, THE CORTEX AN OUTER COVERING. THE LEFT HEMISPHERES OF THE BRAIN HAVE A LOT TO DO WITH LANGUAGE. CERTAIN MATHEMATICAL SKILLS, LANGUAGE SKILLS, VERBAL SKILLS. IF I EXPERIENCE DAMAGE TO THE LEFT BRAIN, LET'S SAY WITHIN THE AREA OF THE TEMPORAL AREA RIGHT THROUGH HERE, I MAY EXPERIENCE A SPEECH DISORDER. I MAY HAVE DIFFICULTY IN BEING ABLE TO REMEMBER WORDS, DEFINE WORDS OR EVEN BE ABLE TO FORMULATE THE WORD. THAT IS AN APHASIC CONDITION, DON'T WORRY ABOUT THAT NOW. BUT, WE DO FIND THAT WHEN WE FIND MORE ADVANCED CASES OF ORGANIC BRAIN DAMAGE WITH ALCOHOLICS AND SUBSTANCE ABUSERS. AND YOU WILL NOTICE A LOT OF TIMES HOW THEY SPEAK, (INSTRUCTOR MUMBLES). ACTUALLY WHAT YOU ARE SEEING IS YOU ARE SEEING EVIDENCE VERBALLY OF THIS BRAIN DYSFUNCTION THAT IS OCCURRING, THERE IS A LOT OF THAT GURGLING SPEECH. YOU NOTICE BOXERS A LOT OF TIMES, (INSTRUCTOR MUMBLES). A LOT OF THAT IS THAT BRAIN DAMAGE BECAUSE ACTUALLY WHEN YOU GET PUNCHED IN THE HEAD,

YOU ARE GETTING PUNCHED TWICE. YOU HIT ME IN THE HEAD, THE BRAIN PUSHES AGAINST THAT ONE WALL OF THE SCULL AND THEN IT SLAMS ITSELF TO THE NEXT. SO, THE COMBINATION OF WHERE YOU ARE GETTING HIT CONTINUES TO BE AN ONGOING PROBLEM. PEOPLE WHO HAVE BEEN IN SEVERE CAR ACCIDENTS, WHERE THERE IS DAMAGE TO THE LEFT HEMISPHERIC LOBE OFTEN TIMES MAY HAVE DIFFICULTY SPEAKING FOR A WHILE UNTIL POTENTIALLY THE BRAIN HELPS HER HEAL. THE RIGHT SIDE OF THE BRAIN TENDS TO BE OUR NON-VERBAL SIDE. IT TENDS TO DEAL WITH THINGS MORE SPATIALLY. FOR INSTANCE, A GOOD ARTIST WOULD TEND TO BE MORE RIGHT BRAINED. A GOOD SPEAKER WOULD BE MORE LEFT BRAINED. AN ARTISTIC SPEAKER, I GUESS, NAH! BUT, THE LEFT BRAIN, AGAIN, IS MORE VERBAL, YOU TEND TO SEE MORE OF THOSE ACTIVITIES THERE. NOW, A REALLY GOOD BOOK, BY THE WAY, I RECOMMEND, IS CALLED MEN ARE FROM MARS AND WOMEN ARE FROM VENUS REALLY, ALTHOUGH THE BOOK POKES A LOT OF FUN AT THE FACT THAT MEN ARE DIFFERENT THAN WOMEN BIOLOGICALLY, YEAH, WE REALLY, REALLY ARE, NOT JUST ANATOMICALLY, BUT CHEMICALLY AS WELL AS THE WAY THAT WE THINK AND THE WAYS THAT WE PROCESS INFORMATION IS ALSO VERY, VERY DIFFERENTLY. AND THAT IS ALSO ONE OF THE THINGS WE ARE FINDING THAT A LOT OF THERAPISTS ARE TRYING TO GET, THAT PEOPLE WHO ARE TRAINING US THESE DAYS ARE TRYING TO SAY, MAKE SURE THAT IN MARRIAGE AND FAMILY YOU GET THE COUPLE TO UNDERSTAND THAT DIFFERENCES EXISTS WITHIN THEIR

MARRIAGE. BECAUSE A LOT OF TIMES PEOPLE WILL TRY TO SAY, WELL, WE ARE NOT A LIKE, AND SO, THEREFORE, THAT IS WHY WE ARE NOT GETTING ALONG. NO, IT IS THE DIFFERENCES THAT ARE OFTEN TIMES AT PRACTICE. BUT, THEREFORE, WE'VE GOT TO GET PEOPLE TO UNDERSTAND THAT MEN AND WOMEN ARE PHYSICALLY AND IN MANY WAYS, VERY, VERY DIFFERENT THAN ONE ANOTHER AND UNTIL WE UNDERSTAND THAT DIFFERENCE AND ALLOW FOR THAT DIFFERENCE, WE GET OURSELVES IN A LOT OF TROUBLE. WE GET OURSELVES, AND NOT JUST BECAUSE I AM IN A ROOM FULL OF MOSTLY WOMEN, BUT WOMEN HAVE A TENDENCY TO BE A TAD MORE FLEXIBLE THAN MEN DO WITH REGARDS TO THAT RIGIDITY. SO, SOME RESEARCH HAS TRIED TO SAY THAT WOMEN ARE MORE LEFT BRAINED AND MEN TEND TO BE MORE RIGHT BRAINED. MAYBE THAT IS WHY THEY SIT THERE AND FLIP THROUGH THE CHANNELS, IT IS SPACIAL ISN'T IT? AND WOMEN ARE OVER THERE TALKING. WE WILL FIGURE THAT ONE OUT LATER AND I BET I WILL GET LETTERS ON THAT ONE TOO. BUT, ANYWAY, SO, I WILL SEE YOU ALL LATER.