

Sleep Pain and Vitamins

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Sleep and Pain

- They're clearly related but which came first?
- Do we have trouble sleeping because we're in pain or
- Do we have pain because we don't sleep correctly?
- First lets learn about sleep and what we do in sleep.

What are Sleep Disorders?

What is normal sleep?

Are we just lying there unconscious?

Why don't we understand sleep?

Why is that important?

- Most physicians have not had specific training in sleep.
- Most of what is written about sleep apnea has been generated by pulmonologists who are not trained in the functions of the brainstem or neurophysiology of sleep paralysis.
- Most neurologist do not know the details of this either.
- Pulmonologists know about tubes, oxygen, bellows, etc and they've made up the story of "fat necks cause OSA".
- Even "sleep experts" say silly things like "you're just not sleeping right".

Sleep is always involuntary you can't really “do it wrong”

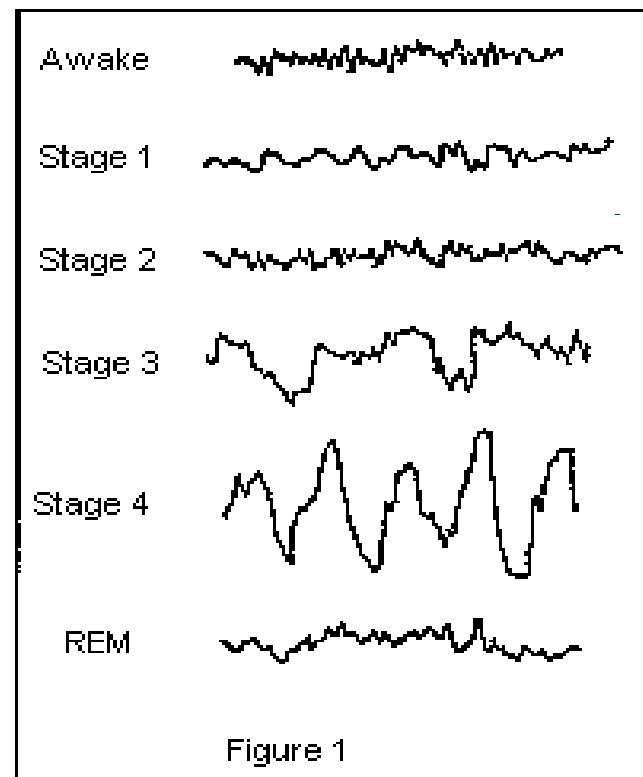
- Our patients are unconscious and can't really report what is happening to them.
- Normal healthy humans all fall asleep at the same time, all do the same things at about the same time and wake up at the same time.
- **Sleep is, by definition, completely involuntary. It is not under our control, never was.**
- We've been trained to generally avoid the conversation about sleep because we really don't know what to do to help our patients have normal sleep.

Normal Sleep is an active, highly organized process.



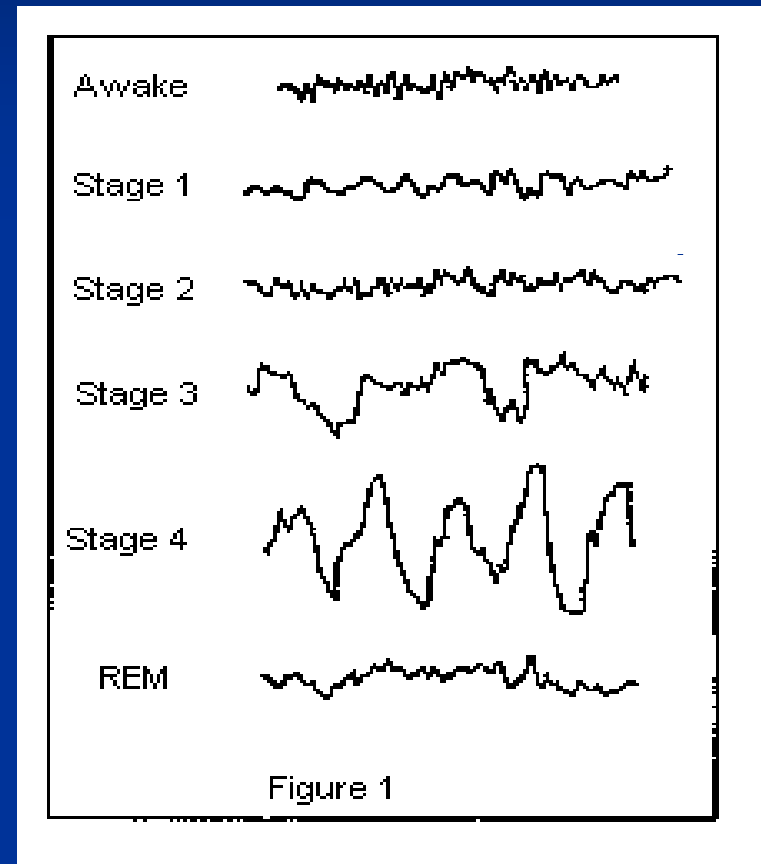
What is Light Sleep?

- Light Sleep: We begin sleep in Stage I light sleep and move to Stage II light sleep after several minutes.
- In light sleep we are asleep but are easily awakened. I think **we are waiting to be sure we're in a safe place to get paralyzed.**
- In light sleep the brain wave pattern is irregular, each little neuron doing its own thing.
- We are asleep but **not doing the work of sleep.**



Deep Sleep: Slow Wave Sleep

- As soon as our brain is sure that we're in a safe place to get paralyzed (lying down) we enter Stage III sleep. (Stage III and what was Stage IV are now grouped together as just Stage III)
- Stage III is called "Slow Wave Sleep" (SWS) because the brain wave pattern becomes slow and synchronized.
- During Stage III sleep our body becomes paralyzed.
- Growth hormone (GH) is released from the brain in a pulsatile fashion in SWS and only SWS. If you don't get and stay in SWS you don't get this GH.



Growth Hormone release in Slow Wave Sleep helps us heal.

- Growth Hormone (GH) is the same hormone that makes kids grow during sleep. In children it is a sustained release in SWS.
- I believe that GH acts as the “boss hormone” that calls out all of the individual muscle, bone, tendon, artery, nerve, repair hormones. They go down as a crew and repair every injury we had during that day.
- I think the repair crew knows they’re only supposed to be working while we’re paralyzed. If your paralysis is frequently interrupted or shortened, your repair phase doesn’t happen normally.



Deep Sleep: REM Sleep

- After SWS we enter REM (Rapid Eye Movement) sleep.
- In REM sleep we're the most paralyzed of all.
- This series: Stage I- II - III then REM, is repeated 3-4 times per night with slightly different average times spent in the separate stages based on age and prior sleep deprivation.

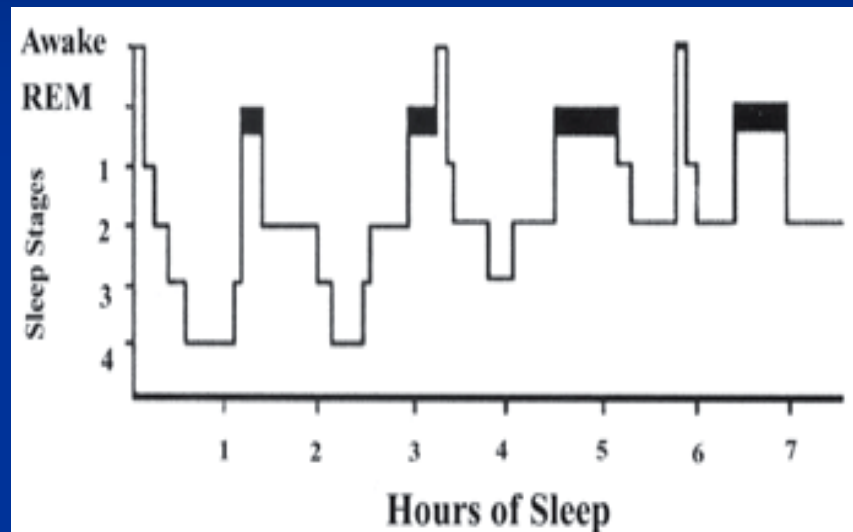
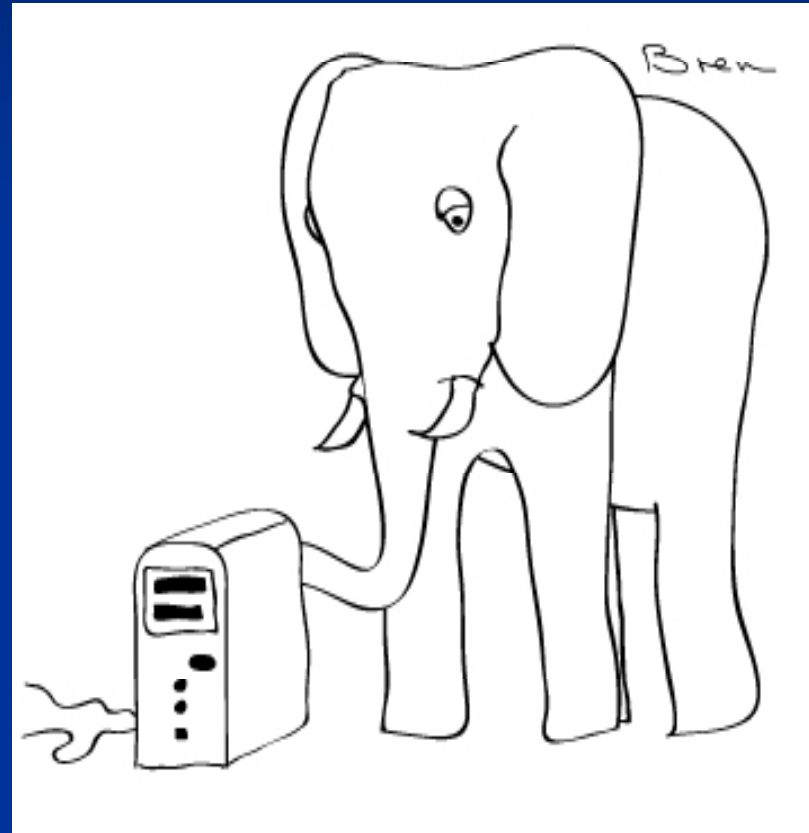


Figure 2 – Representation of a hypnogram obtained throughout a whole night of sleep. REM: rapid eye movement sleep

REM Sleep

- REM sleep appears to be the most important sleep stage for permanent memory formation.
- It's not only new memories, but old memories as well that we must buff every night to keep them fresh and accessible.
- REM sleep also appears to have a lot to do with mood.



Sleep Disorders

- Anyone who does not sleep through the normal 4 stages of sleep, the normal number of times per night for whatever reason may have a Sleep Disorder.
- Does that mean I'll be sleepy the next day?
- Can't I just "catch up" the next night?
- What does this have to do with pain?
- Chronic body pain can result from poor sleep.

Normal Sleep v.s. Non-restorative Sleep

- Healthy sleepers who miss sleep are able to “catch up” the next night or next several nights.
- People with sleep disorders miss certain stages of sleep every night for years on end.
- When the brain and the body are not allowed to replenish and repair many body functions begin to fail.
- We are not only sleepy but can have many other symptoms as well.



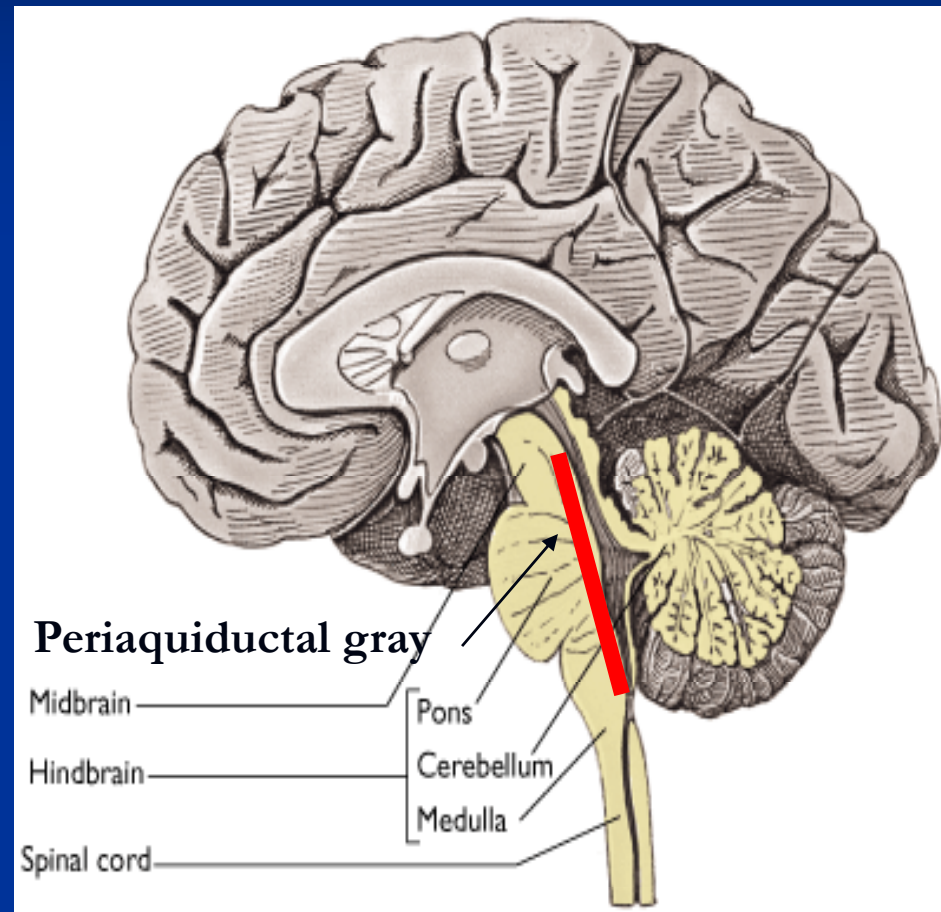
Sleep and Headache

- I became interested in sleep when one of my daily headache patients had sleep apnea.
- Two years of trying medications had failed, 3 weeks of CPAP cured her headaches.
- Why would that be? Could other daily headache sufferers also have sleep disorders?
- Is something happening in the brain during sleep to make chemicals that are like the daily headache preventative medicines we use; Ca^{++} channel blockers or Na^{+} channel blockers?

6 years of sleep studies: 9/10 daily headache sufferers have abnormal sleep

- Obstructive sleep apnea is just one of the sleep disorders seen my young, healthy patients with daily headache.
- Others have multiple unexplained awakenings, no REM sleep, no SW sleep, or REM related apnea. They do not have large O2 drops.
- Most commonly their REM sleep comes late, it is shortened and they have apnea only in REM sleep. Perhaps because we get the most paralyzed of all in REM sleep.
- They often complain not only of daily headache but also of depression, forgetfulness, **and chronic pain.**
- Some also kick their legs in sleep; Periodic Limb Movements of Sleep (PLMS). Why?

Posterior brainstem Periaquiductal Gray plays a large role in sleep and sleep paralysis



The Wobbly Paralysis Switch

- I think the young healthy people with some apnea and some leg kicking are more likely to have only one disease, not two.
- I think they have a paralysis switch that wobbles from “too paralyzed” causing apnea, back to “not paralyzed enough” causing leg kicks, talking, chewing.
- The paralysis switch is in the periaquiductal grey.

9/10 Sleep studies are abnormal

- Some of the daily headache sufferers said their back pain got better on CPAP.
- So I started sending many of my chronic pain patients for sleep studies.
- Then the patients who had back pain and abnormal sleep studies got better on CPAP.
Why?
- Why does every one of my patients seem to have an abnormal sleep study?

Why does everyone and
his brother seem to have
Sleep Apnea?

Did we make it up?

Has it always been there or is it new?

What's causing it?

If you have Sleep Apnea you have an increased risk of:

- High blood pressure
- Heart attack, heart arrhythmia (atrial fibrillation)
- Diabetes
- Stroke
- Obesity
- Daytime sleepiness
- Memory problems
- Depression
- Daily headache
- Unexplained body pain (“Fibromyalgia”)
- Fatigue

I thought Sleep Apnea
only happened to fat
people

Does obesity cause sleep apnea or does sleep apnea cause obesity?

Obesity and Sleep Apnea

- In patients with sleep apnea orexin (hypocretin) and leptin levels are deranged causing increased appetite and increase in fat deposition per calorie consumed.
- Obesity comes with the Sleep Apnea and not the reverse.
- Losing weight is not be the whole story to making Sleep Apnea go away.
- Lap band or gastric bypass may help temporarily but it does not fix the original cause of sleep apnea.

Sleep disorders can result in Pain

- If we don't sleep we don't heal.
- When we stop sleeping normally we start to age.
- Most people think “I don't sleep well because I have pain”
- In fact it is usually “ You have pain because you don't sleep correctly”
- How can I sleep correctly? Can I change my sleep?

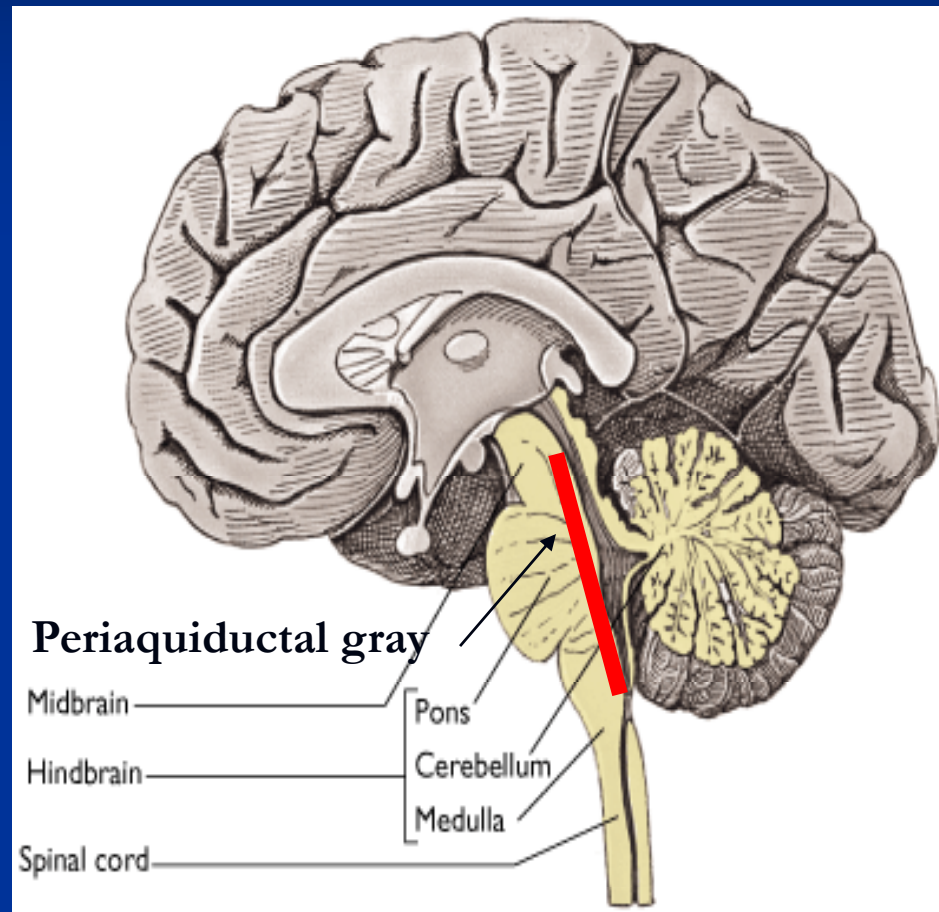
Why is the CPAP experience important?

- I just spent the last 5 years trying to help patients “tolerate” their CPAP mask.
- It is very hard to do, therefore has very little placebo effect in my opinion.
- Despite being hard to do, miraculous things do happen when it’s successful.
- Pain goes away, blood pressure goes down.
- Diabetes gets better, headaches better, mood better, tremor, walking disorders, seizures better.

Why is the CPAP experience important?

- What is happening in there in sleep?
- Why does CPAP make a lot of them better?
- My patients don't have fat necks or drops in oxygen so why do they get better?
- Is it just allowing the patient to stay in deep sleep?
- Why do they get better in 2 weeks after 2 years of medications don't work?
- Why aren't there any medicines that give back REM sleep or SW sleep?

What's happening here that's goofing up my patients' sleep?



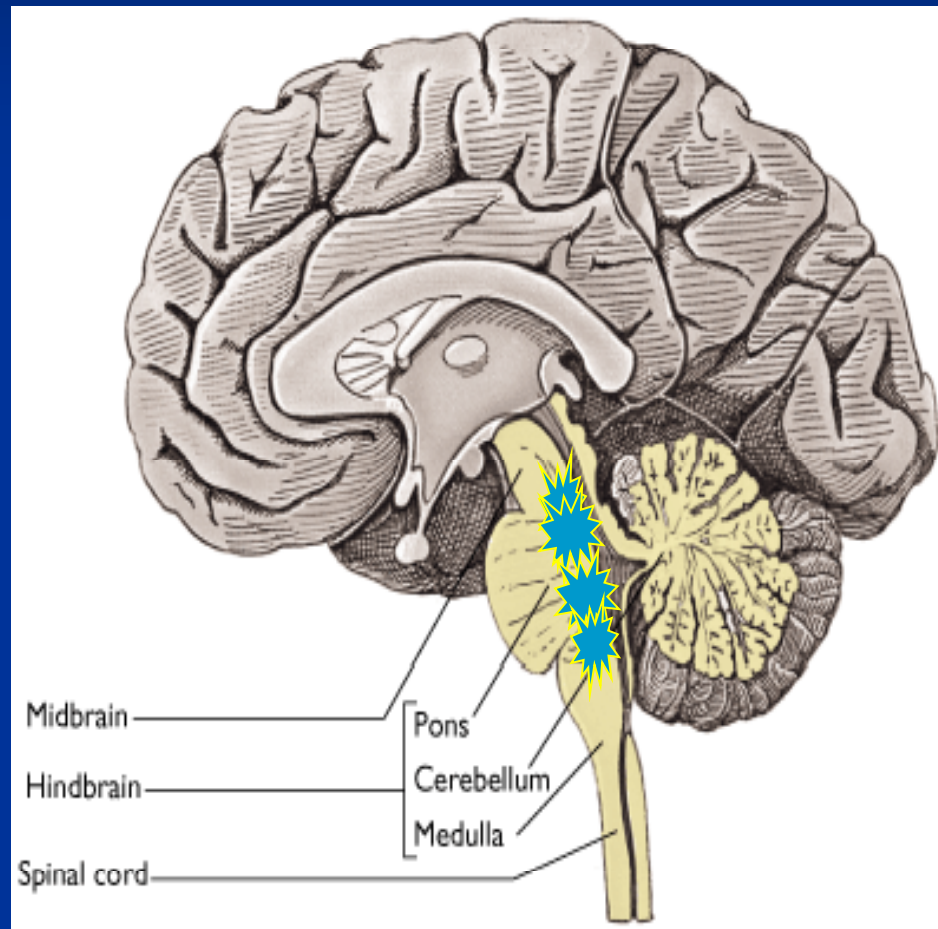
Why don't we fix the sleep instead of patching it?

- In July 2009 one of my patients with daily headache and 35 awakenings/hour turned out to have B12 deficiency.
- Adding back a **vitamin** to fix the sleep?
- The brain still remembers what to do, but it is lacking an essential element?
- In August one of my patients mentioned her doctor gave her vitamin D and it made her pain better.

Vitamins and Sleep

- From 8/09 to 12/09 I measured B12 and Vitamin D levels on every single patient who had a bad sleep study.
- A few had B12 deficiency but every single D was low.
- In December 2 of my CPAP patients came back and said “after three weeks that vitamin D made my sleep better and my headaches went away.” What?
- What is vitamin D and what could it have to do with sleep?
- I thought D was all about bones and calcium.

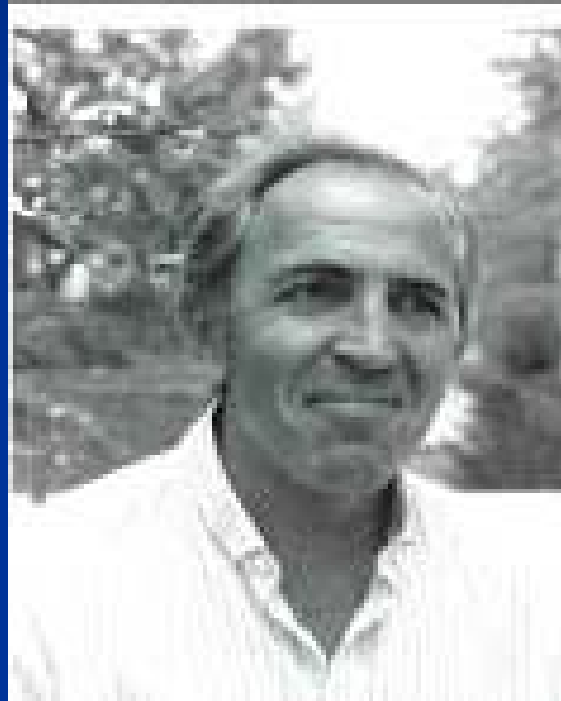
Vitamin D receptors in periaquiductal grey



What is Vitamin D anyway?

- IT'S NOT A VITAMIN!!!
- It's a steroid hormone that we make in our body like thyroid, cortisol, estrogen, testosterone
- UVB light hits the skin and changes cholesterol on our skin to D hormone, cholecalciferol.
- Every animal on the planet; hamsters, birds, reptiles and insects use the exact same chemical made on their skin from UVB light.
- This implies that the Dinosaurs used Hormone D.
- What's it for?
- Could it have anything to do with sleep?

Dr. Walter Stumpf and D hormone



Dr. Walter Stumpf and D hormone

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Dr. Walter Stumpf and D hormone

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Why a hormone linked to UVB?

- Life on a tilted planet.
- 6 months winter 6 months summer.
- This hormone allows our body to adjust metabolism to the two very different states of weather and food availability.

Where are the Hormone D Receptors?

- Where they are suggest what they do.
- Teeth, salivary glands, tongue, esophageal sphincter,
- Stomach cells that make acid
- Liver cells that make bile
- Pancreatic islet cells that make insulin
- How could grandpa eat all of that stuff and not get sick? Why can't I?

The Texas Story of D Hormone



Summer: high D message

- Eat 10,000 calories per day, digest it all easily.
- Put all of those calories into building the body.
- Sleep fewer hours, deep, paralyzed, work sleep done in 6-8 hours.
- The estrogen and testosterone follow the D. September is harvest time, the D is at its highest, it's time to mate and make a baby.
- Thyroid follows the D also. All cellular energy increases.

Winter: lower D message

- Because we only have UVB in the winter after September we start to depend on our D hormone stores. Lower D message: 70-50 ng/ml.
- Sleep longer, less consolidated.
- Eat less but put half of everything I eat into fat. Remember those hormones that make you hungry and tell your body to store more fat?
- Americans have been in a permanent winter for the last 30 years, and the spring never comes.
- Very low D may lead to very goofed up sleep. Could this be the cause of sleep apnea?

D Hormone and Sleep

- *This implies there may be a natural reason and cure for obstructive sleep apnea*
- *There is no Proof of this yet, it is only my hypothesis.*

Disorders of GI tract related to D deficiency

- Gastric reflux
- B 12 deficiency; not enough stomach acid, can't break the B12 off the meat.
- Poor stomach motility
- Gallstones
- Diabetes
- Decreased “good” colonic bacteria with bloating etc.
- Constipation
- Esophageal cancer
- Colon cancer

Other disorders related to D deficiency- same list as sleep apnea

- High blood pressure
- **High cholesterol**
- Heart attack
- Heart arrhythmia (Atrial fibrillation)
- Stroke
- Obesity
- Memory problems
- Depression
- Daily headache
- Unexplained body pain (“Fibromyalgia”)

More D deficiency disorders

- Knee arthritis, replacement
- Hip arthritis, replacement
- Poor healing after surgery
- Osteoporosis
- Foot burning
- Hand burning
- Balance disorders

More D deficiency disorders

- Hyperparathyroidism
- Kidney stones
- Hypothyroidism
- Infertility, male and female.
- Endometriosis?
- Polycystic ovary disease.
- Breast cancer, prostate cancer, colon cancer.

Multiple Autoimmune Diseases due to Vitamin D deficiency

- Rheumatoid arthritis
- Lupus
- Ulcerative Colitis
- Psoriasis
- Celiac Disease
- Asthma
- Allergies
- Multiple Sclerosis

Cholesterol and D Hormone

- If we make vitamin D on our skin from cholesterol does that mean that everyone in my practice with high cholesterol has a low D?
- There is conflicting literature concerning this.
- Are there really two ways to treat this high cholesterol?
- Give the natural D hormone that's lacking or give a statin?

Cholesterol and D Hormone

- When the statin lowers the cholesterol does that mean that 7 dehydrocholesterol, the raw material that makes vitamin D, is lower on the skin too? If so does that imply that I won't be able to make vitamin D now when I go out in the sun?
- Might this also mean that my sun exposed areas are now exposed without the protective effects of vitamin D producing more wrinkling, color changes, and bruising?

How do replace the D to fix the sleep?

- I had given everyone 1000 IU of vitamin D3 because that is what the FDA recommends.
- But in January none of my patients were better.
- They couldn't sleep and had a headache daily.
- Their vitamin D3 25OH levels were all 10 points lower after 4 months of winter (taking 1000 IU/day).
- So what is the right dose? 2000 IU 5,000 IU?

What is up with the FDA?

- By February I was giving 2,000 IU/day. “Call me back about your sleep.”
- And what is a normal D? (30-100) If all of my patients with a level of 28 have lousy sleep and a headache is 30 really “normal”?
- Vitamindcouncil believes the level should be 80-85 in September and no lower than 50 at the end of winter.
- Vitamindcouncil believes it takes 10,000 IU/day to STAY THE SAME.
- What is the normal dose? Why is there no 10,000 IU ?
- Why did the FDA allow the drug companies to make a 50,000 IU pill of D2 that may be less effective, ineffective or a D3 antagonist?

How do we know what's normal?

- Since our body makes this with sun and we don't go out in the sun now don't we need to know what the level was in grandpa's body when he died at 92 (taking no medicines) when he fell off the roof?
- Don't we need to know what the level is where everyone lives outdoors and doesn't take any medicines?
- If "normal" means I take at least 4 medicines to just feel normal is that really normal?
- Don't we want to thrive?

What about our children?

- Babies born to D deficient moms have increased incidence of
 - Asthma
 - Allergies
 - ADD
 - Autism
- Do any of our children or grandchildren know what it's like to wake up rested, alert, curious?

What does a lack of D hormone cause?

- Sleep apnea
- Obesity
- Fatigue, poor sleep
- Headache
- Burning feet and hands
- Acid Reflux
- Gallbladder disease
- Diabetes
- High cholesterol
- Stomach dysmotility
- Bloating, poor digestion
- Depression
- Psychosis
- Muscle weakness
- Urinary incontinence
- Heart arrhythmias
- Chest pain
- Aneurysm
- Sudden death
- Autism
- ADD
- Suicide
- Colon Cancer
- Multiple sclerosis
- Rheumatoid arthritis
- Osteoporosis
- Kidney stones
- Psoriasis
- Lupus
- Ulcerative colitis
- Post partum depression
- Blindness
- Skin rashes
- Parkinson's disease
- Dementia
- Gait disorders
- Tremor
- Joint deterioration
- Atrial fibrillation
- Stroke
- Heart attack
- Renal failure
- Allergies
- Asthma
- Breast Cancer
- Esophageal Cancer

What is the right daily dose 1,000 IU or 10,000 IU?

- The right dose is the dose that allows you and your patients to sleep normally and wake up rested without a pill.
- That dose is much higher than what is being tried in most clinical trials, but we do have one article in Neurology June 2010, showing doses as high as 40,000 IU/day for weeks on end **with no calcium or parathyroid hormone elevation.** (But I'll bet their sleep was terrible- see below.)

I spend a lot of time in the sun could I be D hormone deficient?

- If you spend 12 hours a day in the sun all year long then you're probably not D deficient. UVB is only there in the summer during certain hours, the hottest hours.
- There are whole populations on the planet who do not have electricity or air conditioning and still live outdoors. They are not suffering from this problem, but you probably are.
- All of us animals were made to live outdoors. In the last 50 years we have changed our way of life so dramatically in developed countries that almost everyone is D deficient.
- Darker skinned people who are made for higher sun environments make D at a slower rate. They may be even more D deficient when they live in temperate climates or move indoors.

What does D Hormone deficiency cause?

- I suspect that the majority of the last 2 generations born in developed countries have been born to D deficient moms and have never known a normal D.
- All of the diseases listed above are not new diseases, they're old diseases, but they are moving up into 40, 30, 20 year old people because their bodies begin to deteriorate at a much younger age.
- There are not only the direct effects of D hormone deficiency below the neck, but the additional effects of poor sleep which causes all of us to age more rapidly.

What does this have to do with Pain?

- Patients who wake with pain in the morning (and haven't just been hit by a car) usually have pain because their sleep is abnormal in some way.
- Any reason for interrupted sleep will cause this; shift work, pets on my head, kids crying.
- But the biggest cause that's invisible in the background turns out to be D and B12 deficiency, they lead to inappropriate movement during paralysis phases.
- Steroids consistently disturb sleep so they may help locally but ruin things in the long run.

What does this have to do with Pain?

- Many of the antidepressants we use daily for pain suppress REM sleep. All of the SSRI's and SNRI's suppress normal REM.
- To have perfectly normal sleep those will eventually have to go away.
- Anti-dopaminergics are very bad, they, in addition to the antidepressants guarantee no normal sleep.
- The older generation meds like Nortriptyline and Trazadone do not have those side effects. The benzodiazepines don't appear to prevent return of normal sleep.
- After the brain chemistry improves the benzos will make them more sleepy in the morning as will the muscle relaxants.

What should I do for my myself and my patients?

- Go to pubmed and put in “vitamin D” and start reading everything that comes up. Even reading the abstracts makes you quickly realize how substantially the medical field has goofed this up.
- There are numerous research scientists now publishing article after article about this hormone but we doctors who are supposed to be the liaisons to our patients are clearly not in the loop.
- D articles are not generally in the mainstream medical journals they’re in the nutrition journals that we doctors rarely read. Apparently the word “vitamin” precludes publication in the medical journals you and I usually read.
- There are basic science vitamin D articles about so many things in our body that I am just scratching the surface with the reference list.
- Go to www.vitamindcouncil.org
- Why do I read so much about “toxicity” what does that mean?

Vitamin D Toxicity

- In the 1930's and 40's the dosing of cholecalciferol was completely unknown and they made some people very ill and dead on very high daily doses.
- Because of this experience FDA wisely chose to undercut the doses for supplements.
- All of the “toxicity” that is referred to quotes hypercalcemia.
- My patients had “toxicity” symptoms way before the calcium went up. **THE SLEEP DISORDER RETURNED.**
- In most patients the symptoms of fatigue, pain and poor sleep start to return above a level of 90-95. The movements in sleep come back leading to pain on awakening again.
- As with every Hormone: **go too high things go wrong, go too low things go wrong.**

What should I do for myself and my patients?

- “Vitamin D” will turn out to be a multi level endocrine system with at least 3 separate forms that are active with different effects.
- D 1,25 OH is **not** the only active chemical and D25 OH is **not** just a storage chemical.
- In higher summer doses D25OH is probably active on mood and sleep the day it is given.
- The right test is D25OH. Don't test D1,25 OH it does not fluctuate much and it'll be normal until the patient's dead.
- If the patient has been on D2 your measurement has to test D3 25OH separately from D2 25OH or your level does not really reflect the patient's D3 level.

Why do rats like vitamin D2 and we don't?

- The D2 that comes in the 50,000 IU prescription is **not** what our body naturally uses, it is not better than D3 and it may block D3 at some sites. Its action has only been compared to D3 at bone not the hundreds of other sites in the body. It may make your patient worse in many ways that you have not been told about because we're all thinking it's only active on bone.
- 20,000IU is what our body makes, middle of summer, middle of the day, in the sun in a bathing suit for several hours. That implies that the dose to get to a level of 85 is closer to this dose, and the FDA recommendation of 1000 IU /day is too low.
- I don't think this chemical should ever have been added to food or be over the counter in the first place. We don't put estrogen in the food or thyroid hormone in the food.

What should I do for myself and my patients?

- If your D is very low and has been low for a long time don't expect to feel better rapidly, it's not a drug. If it's been 10 years since you felt good, expect it to take months to feel better.
- Never let it your D fall below 70, get levels done in the spring and fall for a couple of years to determine what replacement to take winter and summer based on your own measurements. Everyone in the family makes D at their own rate, you can't assume yours based on other people in the family.

What should I do for myself and my patients?

- At www.vitamindcouncil.org see how to get your D hormone measured yourself, for \$75.
- All of your patient's levels need to be checked.
- Figure out what dose to take in winter and summer, depending on your sun exposure, so that your level is always 70-85.
- The D is always the chemical the body wants. The side effects are usually from our medications trying to plug the holes created by our misunderstanding of how our body works.
- After sleep is better for several months the patient may experience new side effects from old medications they've been on for years, antidepressants, sleep medications, pain meds may act differently after the brain chemistry has started to correct.
- If they feel better, better, better, then worse again check the D level again, it may be too high now.
- You should probably not give higher than 10K/day in the summer. Use 20,000 per day for no more than 4-8 weeks in the winter, one occasion only, to get the stores back to normal, then 10,000 IU per day forever after for maintenance.

The D Hormone Future

- I believe that if we could all get this chemical back to the normal range the expense for medical care in this country would not be such a problem and we'd all live better, more fulfilling lives.
- Why do we think that it's normal to need so many medicines when people have lived on this planet for millions of years without them?

What does a lack of D hormone cause?

- Horrible suffering of the population of the wealthiest, best fed, most intelligent, highly developed country to exist in the world.
- Why has this been allowed to happen?
- What if we could all get up in the morning and take a 10,000 IU pill and we didn't have any of those problems?

How to know when it's right?

- Like every hormone it should stay in a range; 70-85.
- Try to achieve restful sleep with no pain on awakening.
- Once a week is **not** the same as daily.
- The B12 definitely helps sleep also and needs to be >500. Given as a daily pill.
- Watch the sleep.... After it's better for months then it gets worse it's either a medication having a new effect or the D is too high or too low, check the level.
- Stop the extra Calcium. Osteoporosis is caused by Vitamin D deficiency not Evista or Boniva or Fosamax deficiency. With normal D Ca++ absorption is normal.

Our healthy vitamin D future

