Here is the information, as of February 2014, provided by "Batch," which is the screen name of the person who developed and has done the most to popularize the "D3" approach.  To see the images that accompany the original post by Batch, and/or to read the long thread associated with it, go to [www.clusterheadaches.com/cgi-bin/yabb2/YaBB.pl?num=1324046404](http://www.clusterheadaches.com/cgi-bin/yabb2/YaBB.pl?num=1324046404)

**UPDATE: July 4, 2015**: This table from Batch shows the D3 regimen in a nutshell.  There are some possible variations, particularly regarding "loading" with high doses of D3. Those are all covered in the text below, which should be read. But these are the essential elements:



**Back to the update Batch sent me in February, 2014** (*be sure to read the part beginning in* ***bold****, starting at the sixth paragraph below*).

The accelerated dosing strategy is basically for CH'ers starting the anti-inflammatory regimen for the first time and who have a 25(OH)D at or below 30 ng/mL.  It involves taking 600,000 IU of vitamin D3 over a 4-week period in order to elevate serum 25(OH)D as fast as possible... (We CH'ers tend to be impatient when waiting for a medication to start working to stop the CH pain).

This dosing schedule starts with two weeks at 20,000 IU/day vitamin D3 followed by two weeks at 15,000 IU/day.  During the first two weeks you take a single 50,000 IU loading dose of vitamin D3 each week on top of the daily dose...

At  the end of this 4-week accelerated vitamin D3 dosing schedule you drop the vitamin D3 intake to a maintenance dose of 10,000 IU/day.  It's also prudent to see your PCP or neurologist for another lab test of serum 25(OH)D.

We've also found that 10,000 IU/day vitamin D3 may not be sufficient for some CH'ers to keep their 25(OH)D up around 85 ng/mL...  particularly if cold or flu symptoms are present.  If that's the case, and CH symptoms persist, up the dose to 15,000 IU/day.  In some cases CH'ers may need up to 20,000 IU/day for a month or so.  The best rule of thumb is get the lab test for 25(OH)D on a frequent basis (once a month) until you're on a stable vitamin D3 dose and 25(OH)D serum concentrations have stabilized.

The other area where "tuning" of the anti-inflammatory regimen may be required is when the CH'er has his or her 25(OH)D serum concentration up around 85 ng/mL and they're still experiencing CH on a daily basis.  What we've found in this case over the last three years is cutting out the calcium supplement for a few weeks proves effective in reducing CH symptoms...

**Regarding the accelerated vitamin D3 dosing schedule, it should start with a few days at a dose of 10,000 IU/day.**  The reason for this is the probability of a reaction to vitamin D3.  Although rare, some experts in vitamin D3 therapy say the chance of some kind of reaction to vitamin D3 may be as high as 1 in 300.

I'd also like to point out that in three years, with between 400 and 500 CH'ers taking this regimen, we've not had a single report of an adverse reaction to vitamin D3 posted on CH.com, PM or email.

A more conservative approach would be to take a single dose of 10,000 IU of vitamin D3 then wait 3 days to make sure there's no reaction, then start the accelerated dosing schedule.  The following link explains in detail:

[http://www.vitamindw...on to vitamin D](http://www.vitamindwiki.com/Overview%2BRare%2BAllergic%2Breaction%2Bto%2Bvitamin%2BD)

The rationale for picking 600,000 IU of vitamin D3 for the first month's accelerated dosing schedule was based on a study that gave a single oral dose 600,000 IU vitamin D3 to 48 otherwise people who were vitamin D3 deficient.  Results of that study (attached): No vitamin D3 intoxication, i.e., calcium and PTH serum concentrations remained within their respective normal reference ranges.  The average increase in 25(OH)D was 60 ng/mL after three days.  There are at least three other studies that used a single dose of 600,000 IU vitamin D3 without any problems.

An important takeaway from this study, other than the safety of a vitamin D3 dose this high is the urinary calcium and magnesium response...  They both went up.  This points out the importance of taking 400 to 500 mg/day magnesium and calcium.

**Basic and Complete Anti-inflammatory Regimen
Treatment Protocol and Dosing Guide**

*Note: ... indicates where an image has been removed*
*Also note that he says this about verapamil*, later in his document: >>\*\* If you are presently taking verapamil as a cluster headache preventative or for a heart condition, studies have shown that after repetitive dosing with verapamil, its serum half-life can be in a range from 4.5 to 12 hours.  Other studies indicated calcium supplements interfere with calcium channel blockers like verapamil.  Calcium gluconate is also used to treat reactions to oral verapamil.  Accordingly, in order to minimize a possible interaction with calcium that may limit verapamil effectiveness, separate the verapamil and calcium doses by at least 8 to 12 hours.  Discus this regimen with your PCP, neurologist, or cardiologist in order to work out an optimum dosing schedule.<<

Disclaimer:  The following Anti-Inflammatory Regimen, treatment protocol and dosing guide to prevent cluster headaches are provided for information purposes only.  Discuss them with your primary care physician (PCP) or neurologist whoever is most aware of your overall medical health and other prescribed medications before starting this regimen.

If possible, have your PCP or neurologist schedule a lab test for 25-Hydroxyvitamin D, a.k.a. 25(OH)D before starting this regimen.  If not, don't delay, start this regimen then get the lab test.

This lab test measures the serum concentration of 25-Hydroxyvitamin D, also called 25(OH)D, (calcidiol).  This is a metabolite of vitamin D3.

The normal reference range for 25(OH)D in the US is 30-100 ng/mL, (50-200 nmol/L in the EU, UK and elsewhere.)  However, results from the online survey indicate CH'ers presenting with active CH before starting the anti-inflammatory regimen have tested at an average of 28.7 ng/mL, (71.75 nmol/L), min = 8.4 ng/mL, max = 64.0 ng/mL.   Moreover, CH'ers who have used this regimen and experienced a significant reduction in the frequency and severity of their CH or gone pain free and then had this test have had an average 25(OH)D serum concentration of 81.4 ng/mL. (203.5 nmol/L), min = 34.0 ng/mL, max = 149.0 ng/mL.

At last count, data harvested from posts here at CH.com as of January 2013, indicate 240 out of the 300 CH'ers who posted about their experience with the anti-inflammatory regimen, experienced a significant reduction in the frequency, severity and duration of their cluster headache for an overall raw efficacy of 80%.

Similarly, data from 115 CH'ers who participated in the online survey of CH'ers using this regimen indicate a raw efficacy of 81%. (equally effective for episodic and chronic CH'ers).

Taken at face value, this data clearly suggest a causal relationship between a vitamin D3 deficiency and cluster headache.

If you think your PCP or neurologist will have questions about this regimen, please feel free to take a printed copy of this post with you to the next appointment or email the link.

*Anti-Inflammatory Regimen Supplements*

The original or "Basic" anti-inflammatory regimen I've used since Oct 2010 consists of the three supplements shown below purchased from Costco here in the US for $35 or 20 cents a day for a five-month supply. I've since added a Centrum Silver tablet a day to pick up the vitamin A (retinol) and vitamin K2.

...

The basic daily dose is two tablets/capsules of each supplement as shown below.

\* New \*...Studies have shown that taking vitamin D3 with the largest meal of the day can increase absorption with resulting serum concentrations of 25(OH)D increased by as much as 50% higher after two to three months than taking it on an empty stomach.  Accordingly, take this regimen of supplements with the largest meal of the day for optimum results.

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For the CH'ers who don't have access to Costco or who live outside the US, I've listed the complete anti-inflammatory regimen below.  Most of these supplements are available at pharmacies, major supermarkets, health food stores, and over the Internet.  Citracal Plus has a similar formulation to the Kirkland brand of calcium citrate.

Omega 3 Fish Oil - 1000 to 1200 mg/day (EPA 360
                            mg/day, DHA 240 mg/day)
Vitamin D3 \*        - 10,000 IU/day
Calcium \*\*           - 500 mg/day (calcium citrate preferred)
Magnesium           - 400 mg/day (magnesium citrate, magnesium glycinate,                                                        magnesium malate or magnesium orotate)

Vitamin K2\*\*\*      - MK-4 1000 mcg/day,  MK-7 200 mcg/day
Vitamin A \*\*\*\*     - 900 mcg (3,000 IU) for men and
                           - 700 mcg (2,333 IU) for women
Zinc                      -  10 mg/day
Boron                   -    1 mg/day

Vitamin D3 Dosing Strategy:
Several studies have shown that the healthy adult processes 25(OH)D at a rate equivalent to an intake of 3,000 to 5,000 I.U. vitamin D3 a day.  As the rate at which the body metabolizes vitamin D3 from all sources into 25(OH)D can and will vary, it is entirely possible that 25(OH)D and 1,25(OH)2D3 are being consumed as fast or faster than it's being metabolized from vitamin D3.

Under these conditions, the body may be unable to build enough 25(OH)D reserves to reach a therapeutic level sufficient to prevent CH at a vitamin D3 dose of 10,000 IU/day.

Accordingly, if you don't experience a favorable response with a significant reduction in the frequency and severity of your CH or go pain free for at least 24 hours after a week on the basic regimen, you may need to titrate up on the vitamin D3 dose.

You do this by increasing the daily dose of vitamin D3 by 5,000 I.U. on the 8th day of using this regimen from 10,000 IU/day to a total of 15,000 IU/day.  Continue to take the calcium, Omega 3 Fish Oil, and vitamin D3 cofactors at the same dose.

In addition to increasing the daily intake of vitamin D3, add a loading dose of 50,000 IU vitamin D3 one day each week.  This will bring your weekly total intake to 155,000 IU vitamin D3.

Continue at this dosing rate for one week.  If there is no change in your cluster headache pattern by then, add an additional 5,000 IU/day vitamin D3 and continue the once a week loading dose.  This will bring your weekly total vitamin D3 intake to 190,000 IU vtamin D3.

Continue at this dose for another week. If you haven't experience a favorable response by the time, then schedule a lab test for 25(OH)D.  If your 25(OH)D level is still below 60 ng/mL, (150 nmol/L), continue at this dose for another month then repeat the lab test for 25(OH)D.

If your 25(OH)D level is in the 60 to 110 ng/mL range and you still have not had a favorable response, reduce the vitamin D3 dose to 10,000 IU/day, see your PCP and ask for a consult with an endocrinologist.

As an alternative, try to see an integrative or Homeopathic physician.  They are generally more experienced in testing and treating vitamin and mineral deficient conditions than are neurologists or GPs.

This regimen can be taken any time of the day, but it's best taken with the largest meal of the day.  You can also take it with an 8oz glass of lemonade, limeade, orange juice or any fruit juice high in citric acid sweetened with a little honey.  Honey is a natural source of Boron, which is listed as one of the "cofactors" along with magnesium, vitamin A, vitamin K2 and zinc.

The Vitamin D Council indicates these cofactors help in metabolizing vitamin D3 into 25(OH)D and 1,25(OH)2D3, (calcitriol), the active hormonal metabolite of vitamin D3.  This regimen also aids in maintaining calcium homeostasis.  The calcium citrate and citric acid also combine to form a buffer that elevates the pH of stomach gastric juices and maintains this elevated pH for up to 7 hours.  An elevated arterial pH can aid in stimulating vasoconstriction in and around the trigeminal nerves.  See the following link at the Vitamin D Council for an explanation of the vitamin D cofactors and their natural sources:

[http://www.vitamindc...in-d-cofactors/](http://www.vitamindcouncil.org/about-vitamin-d/vitamin-d-cofactors/)

Safety

The anti-inflammatory regimen is very safe and well tolerated. There haven't been any reports of CH'ers experiencing adverse reactions requiring attention by a physician.

Notes:
(1) Medication Interactions and Contraindications:

The best practice to consider before taking any over the counter supplement is to read the label and any available supporting documentation on drug interactions and contraindications.  Check the serving size.  In many cases, the serving size will be two tablets/soft gel capsules to get the dose shown on the supplement label.

The following are examples of drug reactions and contraindications associated with the supplements used in the anti-inflammatory regimen.  There are obviously others so read the supplement labels carefully:

     \* Reactions to vitamin D3 are very rare as skin exposed to the UVB in direct sunlight produces vitamin D3 naturally. It is generally considered to be one of the safest vitamin supplements you can take. However, if you are allergic to sunlight or you suffer from sarcoidosis, do not start this regimen without contacting your PCP or neurologist first.

If you experience a reaction to this regimen including, but not limited to, an upset stomach and or loose stool for more than a day, swelling in and around the mouth or face, or an obvious allergic reaction, discontinue the entire regimen and contact your family physician.

The best course of action if this occurs is to start taking the vitamin D3 and if there's no reaction, add each of the other supplements one at a time, every 3 to 4 days to use the process of elimination to determine what is actually causing the reaction.

   \*\* If you are presently taking verapamil as a cluster headache preventative or for a heart condition, studies have shown that after repetitive dosing with verapamil, its serum half-life can be in a range from 4.5 to 12 hours.  Other studies indicated calcium supplements interfere with calcium channel blockers like verapamil.  Calcium gluconate is also used to treat reactions to oral verapamil.

Accordingly, in order to minimize a possible interaction with calcium that may limit verapamil effectiveness, separate the verapamil and calcium doses by at least 8 to 12 hours.  Discus this regimen with your PCP, neurologist, or cardiologist in order to work out an optimum dosing schedule.

   \*\*\* If you are presently using blood-thinning drugs such as Warfarin or Coumadin for cluster headache or for a heart condition, vitamin K2 (the clotting vitamin) is generally contraindicated.  However, studies have found vitamin K2 to be an effective stabilizer in anticoagulant therapy, proving beneficial in situations of over-anticoagulation or when the response to therapy has been variable.  There are also several reports and studies that indicate vitamin K2 has the capacity to improve bone mineral density and at the same time reduce arterial calcification.  Vitamin K2 has two of the menaquinone analogs, (MK-4 and MK-7).  Of the two forms of vitamin K2, (MK-4) appears to be more effective in these two roles.  On top of that there are several reports and studies that try to rationalize the use of MK-4 over MK-7 or MK-7 over MK-4...

However, at this point there's no general consensus with clear or conclusive evidence to the advantage of one over the other form of vitamin K2.  Be prepared to switch between the two or take them in combination... See your PCP, neurologist, and or cardiologist.

  \*\*\*\* Vitamin A is an important part of this regimen as long as it's not taken in excess of the RDA...  Taking too much vitamin A can be harmful...  A daily serving of carrots, spinach, or squash are a great source of beta carotene, a precursor to vitamin A.  A serving a day will meet your RDA...  A serving of chicken or beef liver a week will also meet most of your vitamin A (retinol) needs.

The rationale for taking vitamin A is important.  It's essential for the second mode of vitamin D3 metabolism from the 25(OH)D in the blood serum into 1,25(OH)2D3, (calcitriol) that takes place in all the different types of body cells.  These cell types include heart muscle, skeletal muscle, smooth muscle, bone, skin, brain, nerve, and the list goes on.

We're not sure at this point, but this mode of cellular metabolism of vitamin D3 into it's active metabolite may be responsible for the prophylactic effect on cluster headache.

(2) Safety: This regimen is generally quite safe and well tolerated with many potential health benefits.  However, some physicians and CH'ers may be concerned about the apparent "high" dose of vitamin D3.  There are several studies that have clinically proven that the skin of a fair skinned adult clad in a bathing suit without sun block and exposed to the sun's UVB at midday, can generate 10,000 - 15,000 I.U. vitamin D3 (cholecalciferol) in as little as 15 minutes.

Researchers at GrassRootsHealth, a public health promotion organization, recently published the results of their D\*action Project where 3667 people have been taking vitamin D3 and having their 25(OH)D levels tested every 6 months since 2008.  Participants also fill out questionnaires with each lab test in order to capture the essential demographic and epidemiological information.

See: <http://www.grassrootshealth.net/>

439 of these D\*action project participants reported taking vitamin D3 at doses up to and including 10,000 IU/day.  43 participants have had two or more consecutive tests for 25(OH)D while dosing on vitamin D3 at 10,000 IU/day.  As you can see in the graph illustrated on the GrassrootsHealth home page shown below and used with their permission, none of the 3667 participants dosing at 10,000 IU/day or less had lab tests for 25(OH)D anywhere near the lower threshold for vitamin D3 intoxication at 200 ng/mL, (500 nmol/L).

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A recent study by Garland, Heaney et al titled: Vitamin D Supplement Doses and Serum 25-Hydroxyvitamin D in the Range Associated with Cancer Prevention is based on the GrassRootsHealth D\*action Project data.  It provides further proof that long term use of vitamin D3 at doses as high as 10,000 IU/day are very safe.  This study further concludes that: "Universal intake of up to 40,000 IU vitamin D per day is unlikely to result in vitamin D toxicity."

(3) Efficacy and Response Time:  240 out of the 300 CH'ers (both episodic and chronic), who have tried this regimen since Jan 2011 have had a significant reduction in the frequency and severity of their CH and better than 90% of them have gone pain free.  Typical response times to this regimen range from less than 24 hours to three full weeks with the majority occurring by the end of the second week.  A few have taken longer than a month.  The following chart of response times after starting the anti-inflammatory regimen is based on current results from the online survey:

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The typical/average time course response to this regimen in terms of 25(OH)D concentration at given vitamin D3 doses is illustrated in the following chart developed by Dr. Robert Heaney, M.D.  I've overlaid his chart with color bands that represent 25(OH)D data and CH response collected from CH'ers here at CH.com.

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There have been a handful of CH'ers who took over a month to respond to this regimen and several clinical studies have shown it can take upwards of three months to elevate 25(OH)D levels from 20 ng/mL to 60 ng/mL, (50 to 150 nmol/L) at a vitamin D3 dose of 10,000 IU/day.  Moreover, chronic CH'ers who stop taking this regimen after going pain free for an extended period of use greater than six months, may experience a relapse with a resumption of CH in as little as a week.

(4) Comorbidities:  Some comorbid conditions may interfere with the capacity of the anti-inflammatory regimen to prevent CH.  Some of these medical conditions include, but are not limited to: cardiac, thyroid, parathyroid, renal, hepatic, and pancreatic insufficiencies.  Disorders of the small intestine and sub-clinical allergic reactions including sinusitis are also suspect.

If you have one or more of these conditions, work with your PCP to make sure they are being treated.  This may help make the anti-inflammatory regimen more effective as a CH preventative.