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Editorial

Native vitamin D
and its relation with
COVID-19

Vitamin D, immunity
and inflammation:
the experience
of the SARS-CoV-2
pandemic

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selection

EDITORIAL

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UpDates

2021;4(3):72-73

Because of this accursed and seemingly never-ending SARS-CoV-2 pandemic, we felt it our duty to devote this entire issue of the journal to an update on the possible role of vitamin D deficiency and its supplementation on the risk of COVID-19. Moreover, the scientific work product on this topic continues to abound, to such an extent that a dedicated bibliography selection became necessary for this issue as well.

It is interesting to note how the prestigious authors entrusted with the task of issuing an update on the relationship between vitamin D, immunity, inflammation, and especially on the risk of falling ill with COVID-19, have reached the same honestly cautious conclusions, albeit with broadly differing motivations and supporting arguments:

- "Considering the volume and significance of the findings accumulated so far, several double-blind, randomised controlled trials have been initiated and are under way... Therefore, it is frankly possible that in a reasonably short time the role of vitamin D, and of cholecalciferol specifically, as a possible medicine to help fight the SARS-CoV-2 pandemic could be confirmed";
- "There are copious indications that vitamin D may exert effective protective action through modulation of the immunological response, attenuation of the cytokine storm and the inflammatory response, preservation of the integrity of the pulmonary epithelial barrier and through its antithrombotic action... Nevertheless, conclusive findings on the effects of supplementation in COVID-19 patients are not yet available. This is because, although they tend to show a favourable effect overall, results from the several observational studies and the few clinical trials available today have not been unambiguous. The discrepancies among the different studies can be explained on the basis of... Clearly there is a need to wait for the results of the additional trials currently in progress...".

In light of this, in my opinion, the following statement reiterated in the recent Ministry of Health Circular on home management of patients infected with SARS-CoV-2, updated on 26 April 2021, appears to be understandable and acceptable [1]: "It should be noted that, to date, there are no solid and incontrovertible findings (i.e., drawn from controlled clinical trials) demonstrating the effectiveness of vitamins and food supplements (e.g., vitamins, including vitamin D, lactoferrin, quercetin)...".

On the other hand, I do believe that the following conclusion may be revised... or better supported in the near future: "... the use of which for this indication is therefore not recommended". I understand our Ministry's concern that it not promote supposed protective interventions, which in reality cannot guarantee protection from SARS-CoV-2 with any degree of certainty, and which may perhaps falsely induce imprudent behaviour which ignores established precautionary measures that do indeed reduce the risk of infection.

I do believe, nonetheless, that the conclusion could be misinterpreted as a recommenda-

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tion to not use. I think that one can only recommend not to use that which may involve health risks or which has solid and incontrovertible evidence of inefficacy. I do not think that this currently applies to vitamin D supplementation in deficient subjects, given:

- the physiological-immunomodulatory role of vitamin D, also acknowledged by AIFA, the Italian Medicines Agency, in its background to Note 96;
- the presumed pathophysiological involvement of vitamin D;
- the results of many observational studies indicating a possible association between hypovitaminosis D and the risk of becoming infected by SARS-CoV-2 or seriously ill with COVID-19;
- the strong rationale and the widely acknowledged need for specific clinical trials on vitamin D supplementation, as recently concluded in a dedicated Cochrane review [2].

It seems to me that all this generates at least a reasonable doubt that today, vitamin D's contribution to preventing the

risk of contracting the COVID-19 infection and/or its more severe clinical manifestations should not be ruled out.

I would also like to point out that among the Ministry of Health's Fake News reports, along with, for example, the item according to which "applying Vaseline or other creams around the nostrils traps the virus so that it cannot enter the nose", there is still the item published on 9 April 2020 [3], which asserts that "vitamin D protects against infection by the novel coronavirus". At the time, that item's classification as a hoax might have been justified because that statement could have given rise to hazardous illusions, given that, at the time, there was not enough scientific evidence that vitamin D could play a role in protection against the virus. However, can we still be certain of that today? Would it not be wise to now exclude such an assertion from the hoaxes while awaiting the imminent results of controlled clinical trials? This since there is now current scientific evidence that vitamin D does indeed play a role in protect-

ing against infection by the novel coronavirus or at least against some of its more serious manifestations.

After reading the two articles and the specific selected bibliography in this issue, it will be interesting to see what you think about these points.

Happy reading and take care.

Reference

- ¹ www.trovanorme.salute.gov.it/norme/renderNormsanPdf?anno=2021&codLeg=80056&parte=1%20&serie=null
- ² Stroehlein JK, Wallqvist J, Iannizzi C, et al. Vitamin D supplementation for the treatment of COVID-19: a living systematic review. Cochrane Database Syst Rev 2021;5:CD015043. <https://doi.org/10.1002/14651858.CD015043>
- ³ www.salute.gov.it/portale/nuovocoronavirus/dettaglioNotizieNuovoCoronavirus.jsp?lingua=italiano&menu=notizie&p=dalministero&id=4430

Native vitamin D and its relation with COVID-19

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INTRODUCTION

The first case of severe SARS-CoV-2 (Severe Acute Respiratory Syndrome-CoronaVirus-2) disease, later named COVID-19 (Corona Virus Disease-19) was reported in the city of Wuhan, China, in January 2020 [1]. Subsequently, the viral infection and disease spread rapidly to many geographical areas of the world. In March 2020, the disease was recognised as a pandemic by the World Health Organisation (WHO) [2]. By 23 March 2021, just under 125,000,000 confirmed cases had been recorded worldwide since the start of the pandemic, with 2,727,837 deaths [3]. As is known, in Italy and in a large part of the planet, also in relation to the infection containment measures adopted by different countries, the infection and the disease have been characterised by successive waves (Fig. 1). Patients with COVID-19 typically present with signs and symptoms of severe infectious respiratory disease, increased leucocytes and frequent lymphocytopenia [4]. Interstitial pneumonia of variable severity is also usually evident. A considerable proportion of individuals infected by SARS-CoV-2 may actually remain asymptomatic or develop very mild symptoms. Conversely, a not insignificant proportion of individuals develop such severe disease that they require hospitalisation. Approximately 20% of these individuals present with respiratory conditions requiring transfer to an Intensive Care Unit (ICU) [5]. Mortality among these patients can be very high, particularly those from older age groups with significant comorbidities [6].

VITAMIN D AND COVID-19: WHAT IS THEIR RELATIONSHIP?

To date, no real therapy has been identified for the treatment of SARSCoV-2 infection. Although several vaccines appear to be promising, the scientific community is looking very carefully at any drug that can slow viral replication and/or improve the course of the disease [7]. Activation of the vitamin D receptor (VDR) signalling pathway seems to generate

positive effects in acute respiratory distress syndrome (ARDS) [8], inducing a mitigation of the so-called "cytokine storm", thus playing an important immunomodulatory and anti-inflammatory role [9]. The possible protective role of vitamin D supplementation is supported by many observational studies and meta-analyses of clinical trials studying the prevention of acute respiratory viral infections [10]. An insufficient vitamin D status has been proposed as a risk factor for virus-induced acute respiratory diseases [11,12]. However, a compromised vitamin D status is common in our nation and in many other countries as well [13]. This fact has drawn attention to a possible relationship between hypovitaminosis D, SARS-CoV-2 infection and COVID-19 [14,15]. Analysing data from 20 European countries, Ilie et al. [16] observed a negative correlation ($r = -0.44$, $p = 0.05$) between serum vitamin D (56.8 ± 10.6 nmol/L) and the number of cases of COVID-19 per million inhabitants. In the same study, COVID-19 mortality was higher in subjects with low levels of vitamin D. A dose-response relationship was shown in a cohort of > 190,000 patients in whom SARS-CoV-2 infection was correlated with serum vitamin D levels over the previous 12 months [17]. In this cohort, an inverse correlation was observed between vitamin D levels and SARS-CoV-2 positivity. Furthermore, the rate of virus positivity was significantly higher in the 39,190 patients with vitamin D < 20 ng/mL (12.5%, 95% CI: 12.2-12.8%), compared to the 27,870 patients with "adequate" serum levels (30-34 ng/mL) (8.1%, 95% CI: 7.8-8.4%) and subjects with serum levels > 55 ng/mL (5.9%, 95% CI: 5.5-6.4%). In a multivariate analysis, those with serum vitamin D < 20 ng/mL had a 54% higher positivity rate than those with normal levels.

The risk of contracting SARS-CoV-2 decreased progressively until levels of 55 ng/mL were reached. Numerous other studies have further confirmed the relationship between hypovitaminosis D, SARS-CoV-2 infection and COVID-19 mortality. In recent months, two

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Conflict of interest

The author states that there is no conflict of interest.

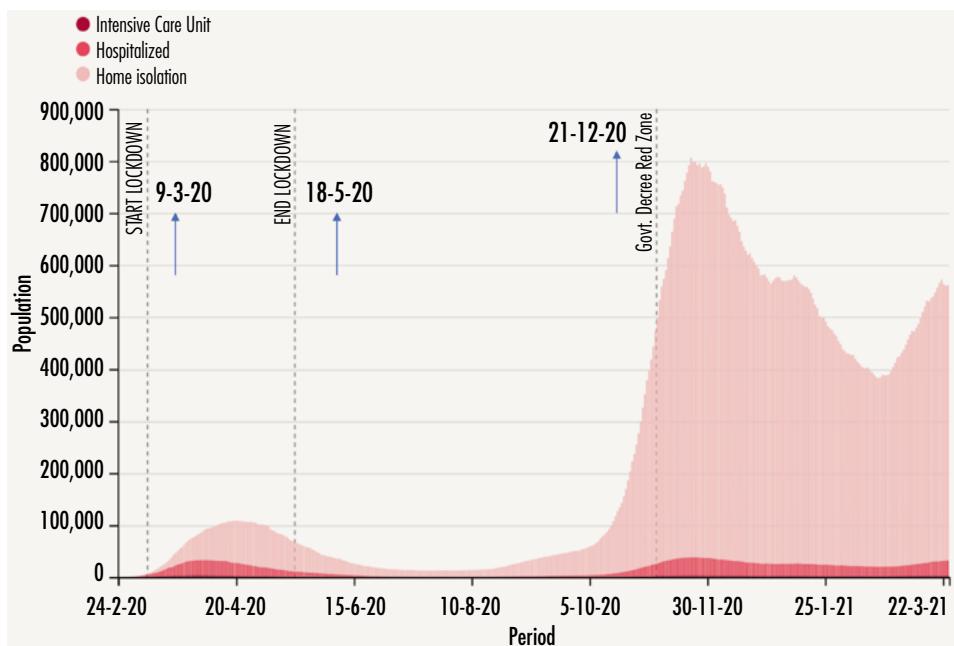
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**FIGURE 1.**

Trend of the SARS-CoV-2 pandemic in Italy (source: <https://lab24.ilsole24ore.com/mod>).

Italian studies have helped to strengthen the hypothesis of a relationship between hypovitaminosis D and COVID-19. A retrospective study of 137 patients, mean age 65 years, hospitalized for COVID-19, showed a 100% prevalence of hypovitaminosis D. Those who died, however, had significantly lower serum vitamin D levels than those who survived the disease (12 ng/ml vs 8 ng/ml, $p < 0.01$). In a multivariate logistic regression analysis, vitamin D levels showed an inverse correlation with in-hospital mortality ($OR = 0.91$; 95% CI: 0.85-0.98; $p < 0.01$) [18].

In a retrospective study, conducted at the University of Verona, in a cohort of 61 patients, mean age 69 years, admitted because of COVID-19, 72.1% were vitamin D-deficient (< 20 ng/ml) and 57.4% had serum levels of $25(OH)D < 15$ ng/mL. Patients with respiratory failure ($PaO_2 < 60$ mmHg) showed lower vitamin D levels compared to subjects with a normal blood oxygen level (13.3 ng/ml vs 20.4 ng/ml, respectively, $p = 0.03$). Hypovitaminosis D was associated with a three-fold increase in risk of hypoxaemia, increased CRP and the degree of dyspnoea [19].

VITAMIN D TREATMENT OF COVID-19

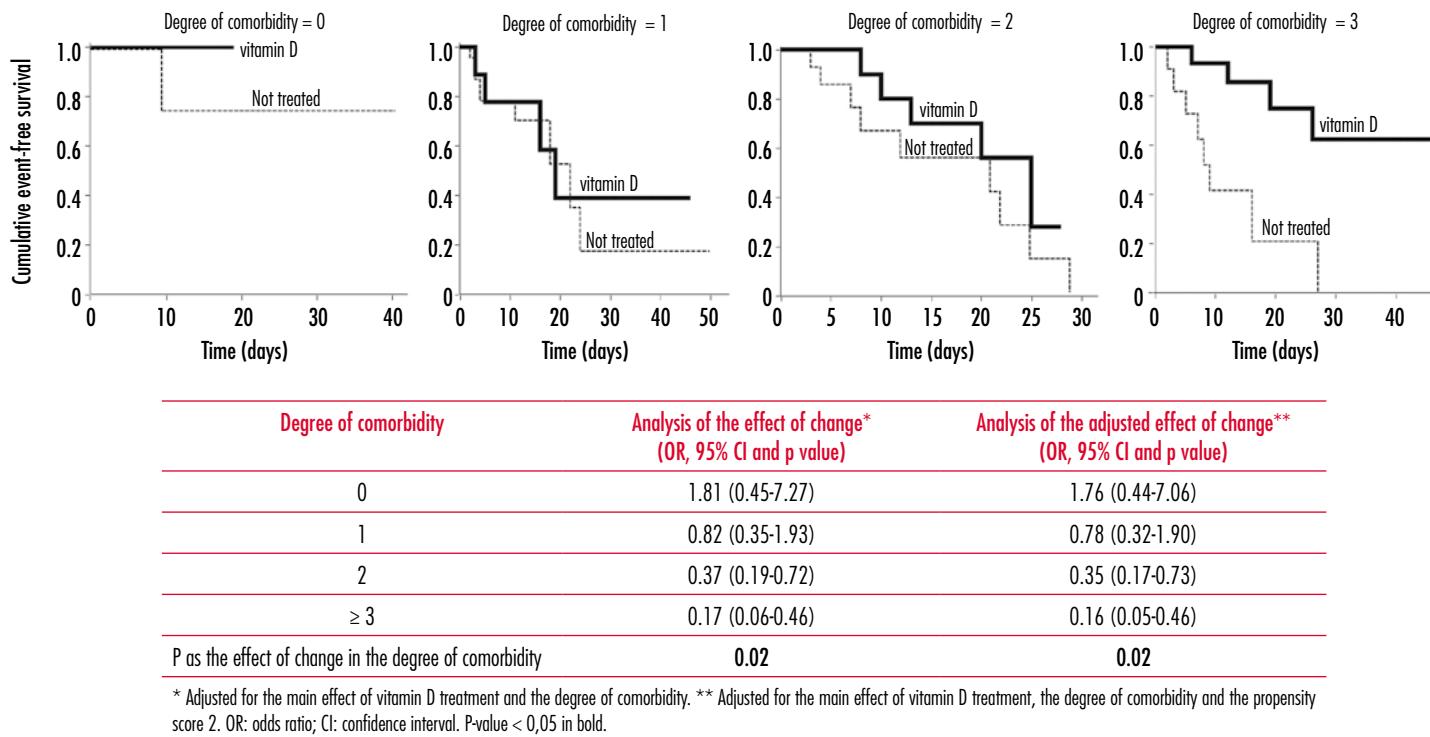
A truly different issue is whether there is a link between vitamin D administration and

the clinical course of COVID-19. In other words, can cholecalciferol have a positive effect on the course of COVID-19?

Certainly, the latest study [20] did not provide any encouraging results. Regardless, although the cohort was large in terms of the number of subjects considered (240), their average age was rather low (around 56 years); the vitamin D (cholecalciferol) therapy, 200,000 IU, was administered more than 10 days after the onset of symptoms. The principal outcome, which was the duration of hospitalisation, did not differ between the active treatment and the placebo subjects. Nonetheless, hospitalisation was only seven days, which indicates that the subjects selected did not present with an exceptionally severe development of the disease. Among the secondary outcomes, neither mortality nor the need for transfer to the ICU differed between the groups. Still, once again, overall mortality of these patients was, whole, low (around 6%), as was the need for transfer to the ICU, which affected around 18% of patients. These results were also entirely similar among those subjects included in the study who showed baseline serum vitamin D levels at < 20 ng/ml, who were however in the minority. In contrast, a double-blind with the controlled trial [21] provided much more encouraging results. Subjects with SARS-CoV-2 infection

and vitamin D deficiency (< 20 ng/ml, mean level circa 9 ng/ml), received more than 400,000 IU over about 7 days. Patients treated with native vitamin D, compared to those on placebo, showed earlier virus negativity and a significant drop in fibrinogen, one of the potential markers of disease severity. A retrospective British study of elderly hospitalised patients (mean age 74 years) also showed that a high dose of cholecalciferol ($> 200,000$ IU) was able to decrease mortality in patients hospitalised for COVID-19 [22]. Annweiler et al. [23], in a prospective study of very elderly (88 ± 5 years) and very frail subjects, the researchers divided the 77 patients in the study into three groups: Group 1: hospitalised COVID-19 patients who, over the previous year, had received cholecalciferol at doses between 50,000 IU per month or up to 100,000 IU every 2-3 months; Group 2: hospitalised COVID-19 patients who had not received stable supplementation with native vitamin D, but who did receive 80,000 IU of cholecalciferol once admitted; Group 3: hospitalised COVID-19 patients who had never received vitamin D, nor did they receive it during their hospital stay. The primary outcome was mortality during hospitalisation. The secondary outcome was the Ordinal Scale for Clinical Improvement Score for COVID-19 in Acute Phase (OSCI). Given the patients' morbidity and frailty, a long series of covariates were used as confounding factors for the outcome of the analyses. Of the patients in Group 1, 93% survived to 14 days, compared to 81% in Group 2 and 68% in Group 3 ($p < 0.05$). Taking Group 3 (untreated) as a reference, the HR for 14-day mortality, largely corrected for possible confounding factors, was 0.07 ($p < 0.05$), for Group 1 (treated the year before hospitalisation with cholecalciferol) and 0.37 ($p \text{ ns}$) for Group 2, treated only during hospitalisation. Group 1 was also associated with a better OSCI than Group 3 ($p < 0.05$). The authors concluded that cholecalciferol therapy among the frail and elderly had a positive effect in inducing less severe COVID-19 and in increasing survival.

Similar results were obtained from a retrospective study we conducted on 91 patients of advanced age (74 years), hospitalised for COVID-19, with significant comorbidities and very low baseline vitamin D levels (36 nmol/L, interquartile range 16-60) [24].

**FIGURE 2.**

Kaplan-Meier curves showing the effect of modification by the degree of comorbidity on the efficacy of cholecalciferol on the combined endpoint "death/transfer to ICU" (from Giannini et al., 2021, mod.)²⁴.

In 36 subjects (39.6%) cholecalciferol was administered orally at a dose of 400,000 IU, split over two consecutive days upon admission. The remaining 55 patients (60.4%) were not treated with vitamin D. The aim of the study was to evaluate whether the proportion of patients who were transferred to the ICU and/or who died could be influenced by vitamin D intake. During a follow-up period of approximately 14 days, 27 (29.7%) patients were transferred to the ICU and 22 (24.2%) died.

Overall, 43 patients (47.3%) faced either "Death or transfer to the ICU". A statistical analysis revealed that the "weighting" of the comorbidities (represented by a history of cardiovascular diseases, COPD, chronic kidney impairment, neoplastic diseases not in remission, diabetes mellitus, haematological diseases and endocrine diseases) significantly and broadly modified, the protective effect of vitamin D on the study objective, such that the greater the number of comorbidities present, the more marked was the benefit induced by the vitamin D. Specifically, the risk of facing either "death/transfer to the ICU" was reduced by about 80% compared with subjects who did not take

vitamin D (OR = 0.18, 95% CI: 0.04-0.83, $p < 0.05$, after correction for multiple confounding factors). The Kaplan-Meier analysis fully confirmed this result (Fig. 2).

In conclusion, in elderly, highly comorbid patients with COVID-19, cholecalciferol significantly reduced mortality and disease severity.

CONCLUSIONS

Considering the volume and the significance of the findings accumulated to date, several controlled, randomised, double-blind trials (RCTs) are currently underway to confirm the importance of the use of vitamin D in patients with COVID-19. At the present time, at least three large RCTs [25-27] are in advanced stages and at least two of these [25,26] appear to suggest highly robust outcomes. Therefore, it is categorically possible that in a reasonably short time the role of vitamin D, and of cholecalciferol in particular, may be confirmed as a possible medicine to help fight against the pandemic brought about by SARS-CoV-2, which has been afflicting almost all the inhabitants of our planet for quite some time

now, with consequences that continue to be all too often fatal.

References

- Wu F, Zhao S, Yu B, et al. A new coronavirus associated with human respiratory disease in China. *Nature* 2020;579:265-269. <https://doi.org/10.1038/s41586-020-2008-3>
- Grasselli G, Zangrillo A, Zanella A, et al. Baseline characteristics and outcomes of 1591 patients infected with SARS-CoV-2 admitted to ICUs of the Lombardy Region, Italy. *JAMA* 2020;323:1574-1581. <https://doi.org/10.1001/jama.2020.5394>
- <https://covid19.who.int>
- Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020;395:497-506. [https://doi.org/10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5)
- Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus Pneumonia in Wuhan, China: a descriptive study. *Lancet* 2020;395:507-513. [https://doi.org/10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7)

- ⁶ Fan E, Brodie D, Slutsky AS. Acute respiratory distress syndrome: advances in diagnosis and treatment. *JAMA* 2018;319:698-710. <https://doi.org/10.1001/jama.2017.21907>
- ⁷ Shaffer L. 15 drugs being tested to treat COVID-19 and how they would work. *Nat Med* 2020 May 15. <https://doi.org/10.1038/d41591-020-00019-9>
- ⁸ Quesada-Gomez JM, Entrenas-Castillo M, Bouillon R. Vitamin D receptor stimulation to reduce acute respiratory distress syndrome (ARDS) in patients with coronavirus SARS-CoV-2 infections. *J. Steroid Biochem Mol Biol* 2020;202:105719. <https://doi.org/10.1016/j.jsbmb.2020.105719>
- ⁹ Daneshkhah A, Agrawal V, Eshein A, et al. Evidence for possible association of vitamin D status with cytokine storm and unregulated inflammation in COVID-19 patients. *Aging Clin Exp Res* 2020;32:2141-2158. <https://doi.org/10.1007/s40520-020-01677-y>
- ¹⁰ Malaguarnera L. Vitamin D₃ as potential treatment adjuncts for COVID-19. *Nutrients* 2020;12:3512. <https://doi.org/10.3390/nu12113512>
- ¹¹ Aibana O, Huang C-C, Aboud S, et al. Vitamin D status and risk of incident tuberculosis disease: a nested case-control study, systematic review, and individual-participant data meta-analysis. *PLoS Med* 2019;16:e1002907. <https://doi.org/10.1371/journal.pmed.1002907>
- ¹² Martineau AR, Jolliffe DA, Hooper RL, et al. Vitamin D Supplementation to prevent acute respiratory tract infections: systematic review and meta-analysis of individual participant data. *BMJ* 2017;356:i6583. <https://doi.org/10.1136/bmj.i6583>.
- ¹³ Isaia G, Giorgino R, Rini GB, et al. Prevalence of hypovitaminosis D in elderly women in Italy: clinical consequences and risk factors. *Osteoporos Int* 2003;14:577-582. <https://doi.org/10.1007/s00198-003-1390-7>
- ¹⁴ Mitchell F. Vitamin-D and COVID-19: do deficient risk a poorer outcome? *Lancet Diabetes Endocrinol* 2020;8:570. [https://doi.org/10.1016/S2213-8587\(20\)30183-2](https://doi.org/10.1016/S2213-8587(20)30183-2)
- ¹⁵ Martineau AR, Forouhi NG. Vitamin D for COVID-19: a case to answer? *Lancet Diabetes Endocrinol* 2020;8:735-736. [https://doi.org/10.1016/S2213-8587\(20\)30268-0](https://doi.org/10.1016/S2213-8587(20)30268-0)
- ¹⁶ Ilie PC, Stefanescu S, Smith, L. The role of vitamin D in the prevention of coronavirus disease 2019 infection and mortality. *Aging Clin Exp Res* 2020;May 6:1-4. <https://doi.org/10.1007/s40520-020-01570-8>
- ¹⁷ Kaufman HW, Niles JK, Kroll MH, et al. SARS-CoV-2 positivity rates associated with circulating 25-hydroxyvitamin D levels. *PLoS ONE* 2020;15:e0239252. <https://doi.org/10.1371/journal.pone.0239252>
- ¹⁸ Infante M, Buoso A, Pieri M, et al. Low vitamin D status at admission as a risk factor for poor survival in hospitalized patients with COVID-19: an Italian retrospective study. *J Am Coll Nutr* 2021;Feb 18;1-16. <https://doi.org/10.1080/07315724.2021.1877580>
- ¹⁹ Adami G, Giollo A, Fassio A, et al. Vitamin D and disease severity in coronavirus disease 19 (COVID-19). *Reumatismo* 2020;72:189-196. <https://doi.org/10.4081/reumatismo.2020.1333>
- ²⁰ Murai IH, Fernandes AL, Sales LP, et al. Effect of a single high dose of vitamin D₃ on hospital length of stay in patients with moderate to severe COVID-19: a randomized clinical trial. *JAMA* 2021;325:1053-1060. <https://doi.org/10.1001/jama.2020.26848>
- ²¹ Rastogi A, Bhansali A, Khare N, et al. Short term, high-dose vitamin D supplementation for COVID-19 disease: a randomised, placebo-controlled, study (SHADE study). *Postgraduate Medical Journal Published Online First*: 12 November 2020. <https://doi.org/10.1136/postgradmedj-2020-13906599>
- ²² Ling SF, Broad E, Murphy R, et al. High-dose cholecalciferol booster therapy is associated with a reduced risk of mortality in patients with COVID-19: a cross-sectional multi-centre observational study. *Nutrients* 2020;12:3799. <https://doi.org/10.3390/nu12123799>
- ²³ Annweiler G, Corvaisier M, Gautier J, et al., on behalf of the GERIA-COVID study group. Vitamin D supplementation associated to better survival in hospitalized frail elderly COVID-19 patients: the GERIA-COVID Quasi-experimental study. *Nutrients* 2020;12:3377. <https://doi.org/10.3390/nu12113377>
- ²⁴ Giannini S, Passeri G, Tripepi G, et al. Effectiveness of in-hospital cholecalciferol use on clinical outcomes in comorbid COVID-19 patients: a hypothesis-generating study. *Nutrients* 2021;13:219. <https://doi.org/10.3390/nu13010219>
- ²⁵ Annweiler C, Beaudenon M, Gautier J, et al., and on behalf of the COVIT-TRIAL study group. COVID-19 and high-dose Vitamin D supplementation TRIAL in high-risk older patients (COVIT-TRIAL): study protocol for a randomized controlled trial. *Trials* 2020;21:1031 <https://doi.org/10.1186/s13063-020-04928-5>
- ²⁶ Mariani J, Tajer C, Antonietti L, et al. High-dose vitamin D versus placebo to prevent complications in COVID-19 patients: A structured summary of a study protocol for a randomised controlled trial (CARED-TRIAL). *Trials* 2021;22:111 <https://doi.org/10.1186/s13063-021-05073-3>
- ²⁷ Trial of vitamin D to reduce risk and severity of COVID-19 and other acute respiratory infections (CORONAVIT). <https://clinicaltrials.gov/ct2/show/NCT04579640>

Vitamin D, immunity and inflammation: the experience of the SARS-CoV-2 pandemic

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INTRODUCTION

The biological system of vitamin D comprises active metabolites, enzymes and receptors that give rise to genomic and non-genomic effects at a systemic level. In addition to its impact on the health and attributes of the musculoskeletal system, the vitamin D system has been shown to influence numerous physiological functions at a level of the metabolism and the cardiovascular system [1]. For some time now, important effects of vitamin D and its metabolites on the immune system and its dependent inflammatory reactions have also been acknowledged [2]. The recent outbreak of the COVID-19 pandemic has engaged numerous research centres in an attempt to highlight the possible role of vitamin D in relation to susceptibility to infection, clinical expression of the disease and its clinical course. The aim of this brief review is to summarise the state of knowledge on the role of vitamin D in relation to immunity and inflammation, with particular emphasis on what we have learned so far in relation to its impact on the SARS-CoV-2 infection, whereas, due to a lack of space, its impact on autoimmune diseases will not be considered.

VITAMIN D AND NON-SPECIFIC IMMUNE RESPONSE (NATURAL IMMUNITY)

In the course of infection, all cellular elements of innate immunity, primarily macrophages and monocytes, significantly express the CYP27B1 factor, which converts 25(OH)D into 1,25(OH)₂D: the latter increases the antimicrobial activity of macrophages and monocytes in an autocrine manner through the VDR-RXR signal, which in turn stimulates the production of the antimicrobial agent cathelicidin LL-37. This latter agent acts against invading bacteria and fungi by destabilising their plasma membrane and it exerts direct antiviral activity against many respiratory viruses, destroying their protein coating and altering the viability of target cells (Fig. 1). The macrophage

production of cathelicidin LL-37 is such that it can also affect the function of surrounding lymphocytes by leaving the cellular environment [2]. Then, 1,25(OH)₂D also modulates the differentiation and function of APCs (*Antigen Presenting Cells*), primarily dendritic cells and macrophages, making them more immature and immune-tolerant, which results in a reduction in antigen presentation and production of the inflammatory interleukin IL-12 and conversely an increase in IL-10 production. Furthermore, 1,25(OH)₂D also suppresses the expression of TLRs (*Toll-Like Receptors*) on monocytes and inhibits the production of other inflammatory cytokines, such as IL-2, IL-6 and IL-17. Experimental studies have also suggested that the differentiation of NK (*Natural Killer*) lymphocytes may be modulated by 1,25(OH)₂D [3,4].

VITAMIN D AND SPECIFIC IMMUNE RESPONSE (ACQUIRED IMMUNITY)

Once T lymphocytes have been activated, they are also able to express CYP27B1, and therefore the conversion of 25(OH)D into 1,25(OH)₂D, as well as the vitamin D receptor (VDR). On the other hand, the 1,25(OH)₂D produced by monocytes and macrophages is responsible for a clear shift in the system towards a condition of greater immune tolerance, by acting on the proliferation and differentiation of the same T lymphocytes, meaning a reduced formation of T_H1 and T_H17 cells and an increase in the T_H2 cells. This is associated with the reduced expression of pro-inflammatory cytokines and, conversely, with the increased production of antagonistic cytokines [2,5]. Other mechanisms for the modulation of inflammation include inhibition of COX-2 expression and to stimulate the differentiation of regulatory T-cell (Treg), either directly or indirectly through interaction with APC cells [6]. In addition, it has been reported that 1,25(OH)₂D exerts an anti-oxidative action on monocytes by increasing

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Conflict of interest

The author states that there is no conflict of interest.

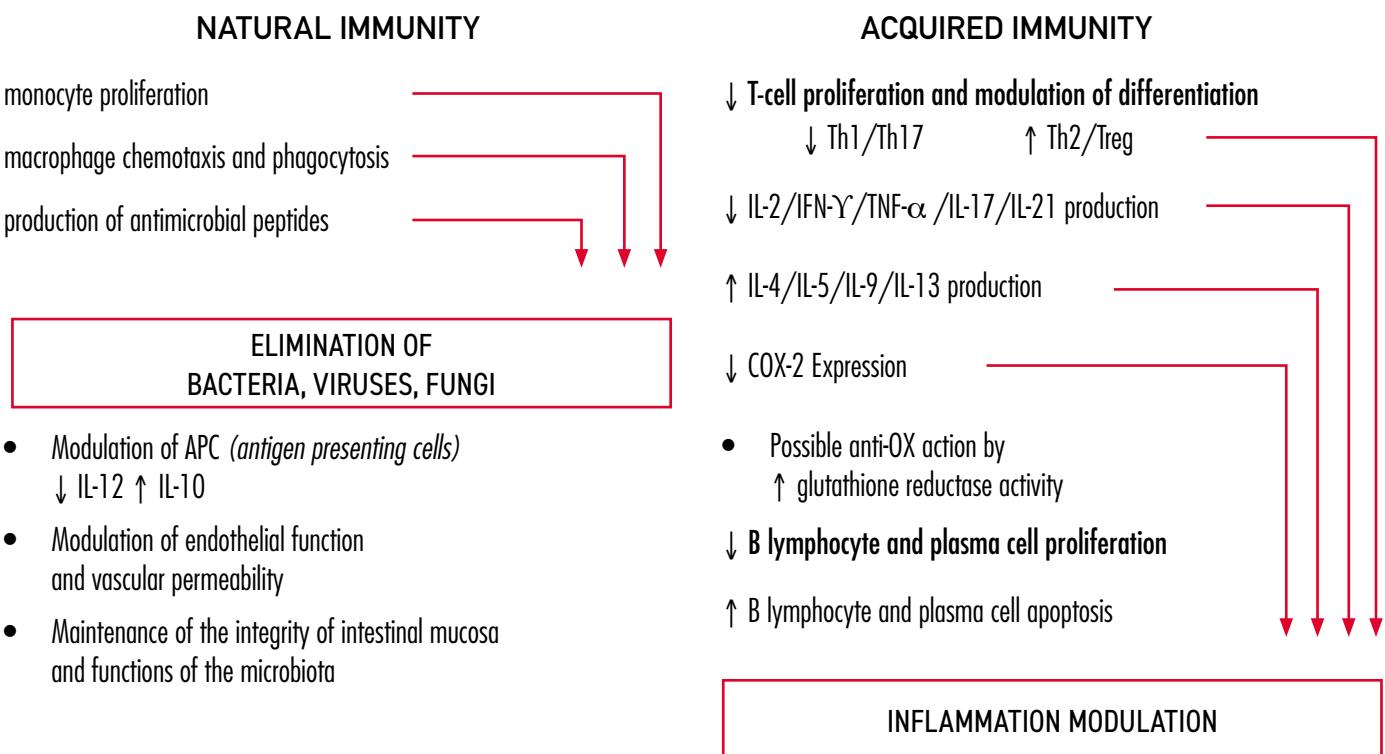
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**FIGURE 1.**

Vitamin D and the immune system. The figure summarises the current state of knowledge regarding the main effects of vitamin D on the immune system.

glutathione reductase activity, resulting in a reduction in the formation of oxygen free radicals [7] (Fig 1).

It has been shown that 1,25(OH)₂D modulates the activity of B lymphocytes as well as T lymphocytes. When the system has been activated, 1,25(OH)₂D reduces plasma cell formation and induces apoptosis of both activated B lymphocytes and the same plasma cells. Furthermore, it inhibits cytokine-mediated B lymphocyte activation by acting on the T helper lymphocytes, while it directly promotes the production of the anti-inflammatory cytokines IL-10 and CCR10 by B lymphocytes. Finally, 1,25(OH)₂D suppresses the differentiation of mature B lymphocytes into plasma cells and immunological memory B cells. It is believed that these actions may reduce the likelihood of autoimmune-type responses often present in conditions of inflammatory response exacerbated by an external agent [8].

VITAMIN D AND INFECTION: CLINICAL FINDINGS

Still common in many developing countries is a latent form of tuberculosis character-

ised by the formation of a granuloma that confines the mycobacterium in an attempt to control its proliferation. When this containment fails, the patient becomes symptomatic and a diagnosis of active TB can be made [9]. In this condition, vitamin D appears to play an important role in combating the infection by activating macrophages and monocytes as well as by producing cathelicidin. A meta-analysis of seven observational studies showed that the likelihood of contracting TB is significantly higher in the presence of a vitamin D deficiency [10]. Several observational studies have also reported an association between low circulating vitamin D levels and the risk of sepsis, as well as increased morbidity, mortality and ICU stay by septic patients. This relationship could be explained by the modulating effect of 1,25(OH)₂D on the over-expression of inflammatory cytokines in the critical patient and also by non-genomic actions on the vascular endothelium oriented toward containing the increase in vascular permeability, an important factor in the pathogenesis of septic shock. On the other hand, a reverse-causality mechanism could also be

possible, whereby the low levels of circulating vitamin D in sepsis could instead be explained by extravascular translocation of vitamin D binding protein and an increase in 25(OH)D-24 hydroxylase activity in relation to systemic inflammation. Unfortunately, controlled clinical trials in sepsis have provided mixed results, although most studies have found positive effects on length of stay in the ICU and inpatient mortality [11].

Many studies bear out an independent association between low vitamin D levels and the incidence or severity of respiratory tract infections in children and adults. Respiratory viruses penetrate epithelium of the airways and cause cell and tissue damage, stimulating the immune response resulting in inflammation of the respiratory tract and, in severe cases, even acute respiratory distress syndrome. 1,25(OH)₂D exerts antiviral activity, fostering the production of antimicrobial agents such as cathelicidin, modulating the expression of toll-like receptors in lymphocytes, along with NK cell function, and controlling the over-expression of pro-inflammatory cytokines. A recent meta-analysis of 25 randomised controlled trials showed that

vitamin D₂ and D₃ supplementation can provide significant protection against the development of acute respiratory tract infections compared to placebo [12].

VITAMIN D AND SARS-CoV-2 INFECTION

The key element of pulmonary involvement in virus-induced airway disease is intense inflammatory reaction. Although pro-inflammatory cytokine production is an important factor in the response to infection, an intense and prolonged inflammatory response will cause tissue damage and, in severe cases, may lead to acute respiratory distress syndrome, contributing to fatal outcomes. This sequence of events has been well documented for SARS-CoV-2 infection, leading to the use of suitable drugs to quell the cytokine storm and reduce the level of inflammation in severe cases [13]. The established impact of vitamin D on the immune response in various respiratory tract diseases, such as tuberculosis, influenza and other viral conditions, provides support for the significant role

that vitamin D can also play in the immune response to SARS-CoV-2 infection, where an excessive inflammatory response has been deemed responsible for severe and sometimes irreversible lung, heart, kidney and liver damage in the course of the disease [14]. Furthermore, SARS-CoV-2 binds to the ACE2 (angiotensin-converting enzyme 2) receptor on the surface of the epithelial cells of the respiratory mucosa, the alveolar cells of the lung, vascular endothelial cells and macrophages [15]. Coronavirus infection depresses the expression of the ACE2 receptor, thereby inducing a multi-organ accumulation of angiotensin II, which increases the cytokine storm [16]. Vice versa, vitamin D promotes the expression of the ACE2 receptor gene and reduces the expression of the REN gene, thereby modulating, through inhibition, the overall activity of the renin-angiotensin system [17]. Lastly, an additional important pathogenetic element is given by activation of the haemocoagulative cascade with increased levels of D-dimer and fibrinogen in the circulation and diffuse thrombo-

embolic phenomena [18]. A central mechanism of thrombotic events is the generation of thrombin mediated by the massive release of Tissue Factor (TF) secondary to inflammatory vascular damage. In this regard, vitamin D metabolites have been shown to regulate the haemocoagulative cascade by reducing TF expression and activity and, conversely, increasing the expression of thrombomodulin (TM) [19].

Unfortunately, the results of clinical and epidemiological research have unambiguously supplemented these findings from studies in clinical pathology. One ecological study conducted in 20 European countries showed an inverse correlation between the average level of circulating vitamin D in each country and the respective incidence of COVID-19, as well as between the average level of vitamin D and the number of deaths from COVID-19 [20].

Two systematic reviews and related meta-analyses of observational studies on the relationship between vitamin D and SARS-CoV-2 infection have also been published:

TABLE I. Review of clinical trials on vitamin D and SARS-CoV-2 infection.

Author	Study type	Key Findings
Ilie et al. Aging Clin Exp Res 2020	Ecological	In a comparison among European countries: a) inverse correlation between mean level of circulating vitamin D and number of cases of COVID-19 per million inhabitants ($r = -0.44$; $p = 0.050$); b) inverse correlation between mean level of circulating vitamin D and number of deaths from COVID-19 ($r = -0.43$; $p = 0.050$)
Butler-Laporte et al. PLoS Med 2021	Mendelian randomisation	In a Mendelian randomisation study based on more than 14,000 cases of COVID-19 and approximately 1,300,000 participants without the disease, genetic predisposition to higher vs lower levels of 25(OH)D was not found to be associated with disease risk (OR = 0.95; 95% CI: 0.84, 1.08), hospitalisation (OR = 1.09; CI 95: 0.89, 1.33; $p = 0.41$) or severe disease (OR = 0.97; 95% CI: 0.77, 1.22; $p = 0.77$)
Petrelli et al. J Steroid Biochem Mol Biol 2020	Systematic review and meta-analysis of observational studies	Includes 43 cross-sectional, case-control and cohort studies (retrospective or prospective), with over 600,000 patients in total: suggests that vitamin D deficiency is associated with greater severity of COVID-19 disease (OR = 2.6; 95% CI: 1.84-3.67; $p < 0.01$ - and higher mortality (OR = 1.22; 95% CI: 1.04-1.43; $p < 0.01$) compared to normal levels. Low study quality on average, high heterogeneity and high level of bias with regard to patient selection criteria, threshold levels used and confounding factors
Bassetne et al. Metab Clin Exp 2021	Systematic review and meta-analysis of observational studies	Compared to the other systematic review, only 31 studies were considered because they were published in peer-reviewed journals. They also found a trend towards higher mortality and higher risk of admission to intensive care and need for assisted ventilation for patients with 25(OH)D levels < 20 ng/mL compared to those with higher levels. However, this trend did not reach statistical significance, partly due to the smaller number of studies available for each type of outcome and, moreover, the quality of the studies was generally low and the level of heterogeneity conspicuous with a high risk of bias
Entrenas Castillo et al. J Steroid Biochem Mol Biol 2020	Clinical trial	Among 76 patients hospitalised for COVID-19 (of whom only 50 had received treatment including calcifediol), only 1 calcifediol-treated patient required intensive care compared with half of the untreated patients ($p < 0.001$)
Rastogi et al. J Postgrad Med 2020	Clinical trial	In a trial of COVID-19 patients with 25(OH)D levels < 20 ng/mL, randomised to treatment with cholecalciferol (n = 16) or placebo (n = 24), after 2 weeks 62.5% of treated patients were SARS-CoV-2 negative vs 20.8% of controls. In the first Group there was a reduction in fibrinogen but not in serum CRP, procalcitonin, ferritin or D-dimer
Murai et al. JAMA 2021	Clinical trial	In a trial of 240 COVID-19 patients, half randomised to a single oral dose of 200,000 IU vitamin D ₃ , and half to placebo, no differences were found in length of hospital stay, use of intensive care and assisted ventilation or mortality

both included cross-sectional observations, case-control comparisons and retrospective or prospective cohort studies. The meta-analysis by Petrelli et al. included 43 studies with a total exceeding 600,000 patients. It suggested that vitamin D deficiency is associated with greater severity of COVID-19 disease (OR = 2.6; 95% CI: 1.84-3.67; p < 0.01) and higher mortality (OR = 1.22; 95% CI: 1.04-1.43; p < 0.01) compared with normal levels [21]. The second analysis, by Bassatne et al., considered only 31 studies published in peer-reviewed journals. They found a trend towards higher mortality and higher risk of admission to intensive care and need for assisted ventilation for patients with 25(OH)D levels < 20 ng/ml compared to those with higher levels. However, this trend did not reach statistical significance, partly because of the lower number of studies available for each type of outcome: the quality of the studies was generally low whilst the level of heterogeneity in the analysis was very high [22]. Still within the scope of observational studies, added recently was a Mendelian randomisation study, which, by contrasting subjects with a genetic predisposition to lower or higher plasma levels of 25(OH)D, found no differences in susceptibility to infection by SARS-CoV-2, the need for hospitalisation or in disease severity [23]. An important limitation of this research was however, that it did not include subjects with 25(OH)D levels < 20 ng/ml.

At the moment, there are three current clinical trials that have been completed and are available. In the first, conducted on 76 patients hospitalised for COVID-19, of whom 50 were treated with calcifediol and 26 were used as controls, only 1 treated patient out of the 50 required hospitalisation in intensive care compared with 50% of the untreated patients [24]. In the second small trial, in India, on COVID-19 patients with 25(OH)D levels < 20 ng/ml, randomised to treatment with cholecalciferol (n = 16) or placebo (n = 24), after about two weeks, two-thirds of treated participants were SARS-CoV-2 negative vs about one-fifth of controls. Furthermore, plasma levels of fibrinogen (but not CRP, procalcitonin, ferritin or D-dimer) were reduced in the treatment Group [25]. In a trial of 240 COVID-19 patients, half randomised to a single oral dose of 200,000 IU vitamin D₃ and half to placebo, no differences were found in the various clinical outcomes analysed [26]. All

three of these trials so far published present a risk of significant bias linked mainly to patient selection and randomisation methods. In conclusion, the findings provided by the experimental studies on the physiological role of vitamin D in regulating the functions of the immune system are extensive and robust. In addition, the benefit of maintaining adequate levels of vitamin D in the prevention of acute respiratory tract infections seems to have been clinically and epidemiologically established. With regards to patients with SARS CoV-2 infections, there are copious indications that vitamin D may exert effective protective action through modulation of the immunological response, attenuation of the cytokine storm and the inflammatory response, preservation of the integrity of the pulmonary epithelial barrier and through its antithrombotic action in turn related to the anti-inflammatory action and modulation of the renin-angiotensin system. Nevertheless, conclusive findings on the effects of supplementation in COVID-19 patients are not yet available. This is because, although they tend to show a favourable effect overall, results from the several observational studies and the few clinical trials available today have not been unambiguous. The discrepancies among the different studies can be explained by the contributions of several factors: the small size of many of the studies conducted, the heterogeneity in patient selection and in disease stage, differences in the cut-off used to define vitamin D deficiency or in the doses and methods of its administration, the possibility that the level of circulating 25(OH)D did not reflect the true bioavailability of the vitamin and its metabolites in the body and, again, the possibility of broad variability among individuals in their response to supplementation due to genetic and/or acquired factors (e.g. presence of obesity). Hence, clearly, we need to await the results of additional ongoing trials [22], some of which are notably large.

References

- ¹ Zittermann A. Vitamin D status, supplementation and cardiovascular disease. *Anticancer Res* 2018;38:1179-1186. <https://doi.org/10.21873/anticancres.12338>
- ² Baeke F, Takiishi T, Korf H, et al. Vitamin D: modulator of the immune system. *Curr Opin Pharmacol* 2010;10:482-496. <https://doi.org/10.1016/j.coph.2010.04.001>
- ³ Aranow C. Vitamin D and the immune system. *J Investig Med* 2011;59:881-886. <https://doi.org/10.2311/JIM.0b013e31821b8755>
- ⁴ Bscheider M, Butcher EC. Vitamin D immunoregulation through dendritic cells. *Immunology* 2016;148:227-236. <https://doi.org/10.1111/imm.12610>
- ⁵ Kongsbak M, Levring TB, Geisler C, et al. The vitamin d receptor and T cell function. *Front Immunol* 2013;4:148. <https://doi.org/10.3389/fimmu.2013.00148>
- ⁶ Wang Q, He Y, Shen Y, et al. Vitamin D inhibits COX-2 expression and inflammatory response by targeting thioesterase superfamily member 4. *J Biol Chem* 2014;289:11681-11694. <https://doi.org/10.1074/jbc.M113.517581>
- ⁷ Jain SK, Micinski D. Vitamin D upregulates glutamate cysteine ligase and glutathione reductase, and GSH formation, and decreases ROS and MCP-1 and IL-8 secretion in high-glucose exposed U937 monocytes. *Biochem Biophys Res Commun* 2013;437:7-11. <https://doi.org/10.1016/j.bbrc.2013.06.004>
- ⁸ Chen S, Sims GP, Chen XX, et al. Modulatory effects of 1,25-dihydroxyvitamin D₃ on human B cell differentiation. *J Immunol* 2007;179:1634-1647. <https://doi.org/10.4049/jimmunol.179.3.1634>
- ⁹ Sasindran SJ, Torrelles JB. Mycobacterium Tuberculosis infection and inflammation: what is beneficial for the host and for the bacterium? *Front Microbiol* 2011;2:2. <https://doi.org/10.3389/fmicb.2011.00002>
- ¹⁰ Abana O, Huang CC, Aboud S, et al. Vitamin D status and risk of incident tuberculosis disease: a nested case-control study, systematic review, and individual-participant data meta-analysis. *PLoS Med* 2019;16:e1002907. <https://doi.org/10.1371/journal.pmed.1002907>
- ¹¹ Charoenngam N, Holick MF. Immunologic effects of Vitamin D on human health and disease. *Nutrients* 2020;12:2097. <https://doi.org/10.3390/nu12072097>
- ¹² Martineau AR, Jollie DA, Hooper RL, et al. Vitamin D supplementation to prevent acute respiratory tract infections: systematic review and meta-analysis of individual participant data. *Br Med J* 2017;356:i6583. <https://doi.org/10.1136/bmj.i6583>
- ¹³ Felsenstein S, Herbert JA, McNamara PS, et al. COVID-19: immunology and treatment options. *Clin Immunol* 2020;215:108448. <https://doi.org/10.1016/j.clim.2020.108448>

- ¹⁴ Cao X. COVID-19: immunopathology and its implications for therapy. *Nat Rev Immunol* 2020;20:269-270. <https://doi.org/10.1038/s41577-020-0308-3>
- ¹⁵ Hamming I, Timens W, Bulthuis M, et al. Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus. A first step in understanding SARS pathogenesis. *J Pathol* 2004;203:631-637. <https://doi.org/10.1002/path.1570>
- ¹⁶ Kuba K, Imai Y, Rao S, et al. A crucial role of angiotensin converting enzyme 2 (ACE2) in SARS coronavirus-induced lung injury. *Nat Med* 2005;11:875-879. <https://doi.org/10.1038/nm1267>
- ¹⁷ Giménez VMM, Sanz RL, Marón FJM, et al. Vitamin D-RAS connection: an integrative standpoint into cardiovascular and neuroinflammatory disorders. *Curr Protein Pept Sci* 2020;21:948-954. <https://doi.org/10.2174/1389203721666200606220719>
- ¹⁸ Tang N, Li D, Wang X, Sun Z. Abnormal coagulation parameters are associated with poor prognosis in patients with novel coronavirus pneumonia. *J Thromb Haemost* 2020;18:844-847. <https://doi.org/10.1111/jth.14768>
- ¹⁹ Ohsawa M, Koyama T, Yamamoto K, et al. 1,25-Dihydroxyvitamin D₃ and its potent synthetic analogs downregulate tissue factor and upregulate thrombomodulin expression in monocytic cells, counteracting the effects of Tumor Necrosis Factor and oxidized LDL. *Circulation* 2000;102:2867-2872. <https://doi.org/10.1161/01.cir.102.23.2867>
- ²⁰ Ilie PC, Stefanescu S, Smith L. The role of vitamin D in the prevention of coronavirus disease 2019 infection and mortality. *Aging Clin Exp Res* 2020;32:1195-1198. <https://doi.org/10.1007/s40520-020-01570-8>
- ²¹ Petrelli F, Luciani A, Perego G, et al. Therapeutic and prognostic role of vitamin D for COVID-19 infection: a systematic review and meta-analysis of 43 observational studies. *J Steroid Biochem Mol Biol* 2021;211:105883. <https://doi.org/10.1016/j.jsbmb.2021.105883>
- ²² Bassatne A, Basbous M, Chakhtoura M, et al. The link between COVID-19 and Vitamin D (ViViD): a systematic review and meta-analysis. *Metab Clin Exper* 2021;119:154753. <https://doi.org/10.1016/j.metabol.2021.154753>
- ²³ Butler-Laporte G, Nakanishi T, Mooser V, et al. Vitamin D and COVID-19 susceptibility and severity in the COVID-19 Host Genetics Initiative: a Mendelian randomization study. *PLoS Med* 2021;18:e1003605. <https://doi.org/10.1371/journal.pmed.1003605>
- ²⁴ Entrenas Castillo M, Entrenas Costa LM, Vaquero Barrios JM, et al. Effect of calcifediol treatment and best available therapy versus best available therapy on intensive care unit admission and mortality among patients hospitalized for COVID-19: a pilot randomized clinical study. *J Steroid Biochem Mol Biol* 2020;203:105751. <https://doi.org/10.1016/j.jsbmb.2020.105751>
- ²⁵ Rastogi A, Bhansali A, Khare N, et al. Short term, high-dose vitamin D supplementation for COVID-19 disease: a randomised, placebo controlled, study (SHADE study). *Postgrad Med J* 2020. <https://doi.org/10.1136/postgrad-medj-2020-139065>
- ²⁶ Murai IH, Fernandes AL, Sales LP, et al. Effect of a single high dose of vitamin D₃ on hospital length of stay in patients with moderate to severe COVID-19: a randomized clinical trial. *JAMA* 2021;17:2021. <https://doi.org/10.1001/jama.2020.26848>

BIBLIOGRAPHIC SELECTION

CARDIOLOGY

- Al-Ishaq RK, Kubatka P, Brozmanova M, et al. Health implication of vitamin D on the cardiovascular and the renal system. *Arch Physiol Biochem.* 2021 Jun;127(3):195-209. <https://doi.org/10.1080/13813455.2019.1628064>. Epub 2019 Jul 10. PMID: 31291127
- Albert CM, Cook NR, Pester J, et al. Effect of Marine Omega-3 Fatty Acid and Vitamin D Supplementation on Incident Atrial Fibrillation: A Randomized Clinical Trial. *JAMA.* 2021 Mar 16;325(11):1061-1073. <https://doi.org/10.1001/jama.2021.1489>. PMID: 33724323 Clinical Trial
- Allahyari E, Hanachi P, Mirmoosavi SJ, et al. Association between Cardiometabolic risk factor and responsiveness to vitamin D supplementation: a new approach using artificial neural network analysis. *BMC Nutr.* 2021 Apr 8;7(1):7. <https://doi.org/10.1186/s40795-021-00413-7>. PMID: 33827712
- Bima AI, Mahdi AS, Al Fayed FF, et al. Cellular Senescence and Vitamin D Deficiency Play a Role in the Pathogenesis of Obesity-Associated Subclinical Atherosclerosis: Study of the Potential Protective Role of Vitamin D Supplementation. *Cells.* 2021 Apr 16;10(4):920. <https://doi.org/10.3390/cells10040920>. PMID: 33923622
- Cakal S, Çakal B, Karaca O. Association of vitamin D deficiency with arterial stiffness in newly diagnosed hypertension. *Blood Press Monit.* 2021 Apr 1;26(2):113-117. <https://doi.org/10.1097/MBP.0000000000000497>. PMID: 33234810
- Callejo M, Morales-Cano D, Mondejar-Parreño G, et al. Restoration of Vitamin D Levels Improves Endothelial Function and Increases TASK-Like K(+) Currents in Pulmonary Arterial Hypertension Associated with Vitamin D Deficiency. *Biomolecules.* 2021 May 26;11(6):795. <https://doi.org/10.3390/biom11060795>. PMID: 34073580
- Cayir A, Akyigit A, Gullu UU, et al. Clinical, biochemical, and echocardiographic evaluation of neonates with vitamin D deficiency due to maternal vitamin D deficiency. *Cardiol Young.* 2021 May 4:1-6. <https://doi.org/10.1080/1047951121001633>. Online ahead of print. PMID: 33941295
- Compton ALP, Pepin MJ, Katzenberger DR, et al. Vitamin D Supplementation During Statin Rechallenge in Patients With a History of Intolerance. *Ann Pharmacother.* 2021 Jun;55(6):814-815. <https://doi.org/10.1177/1060028020966546>. Epub 2020 Oct 15. PMID: 33054316
- Da Porto A, Cavarape A, Catena C, et al. Interactions between vitamin D levels, cardiovascular risk factors, and atherothrombosis markers in patients with symptomatic peripheral artery disease. *Vasc Med.* 2021 Jun;26(3):315-316. <https://doi.org/10.1177/1358863X20979360>. Epub 2021 Jan 15. PMID: 33448908
- Dantas-Komatsu RCS, Freire FLA, de Lira NRD, et al. Vitamin D status and predictors of 25-hydroxyvitamin D levels in patients with heart failure living in a sunny region. *Nutr Hosp.* 2021 Apr 19;38(2):349-357. <https://doi.org/10.20960/nh.03291>. PMID: 33615819
- de Boer IH, Prince DK, Williams K, et al. The Multi-Ethnic Study of Atherosclerosis individual response to vitamin D trial: Building a randomized clinical trial into an observational cohort study. *Contemp Clin Trials.* 2021 Apr;103:106318. <https://doi.org/10.1016/j.cct.2021.106318>. Epub 2021 Feb 12. PMID: 33588078
- de la Guía-Galipienso F, Martínez-Ferran M, Vallecillo N, et al. Vitamin D and cardiovascular health. *Clin Nutr.* 2021 May;40(5):2946-2957. <https://doi.org/10.1016/j.clnu.2020.12.025>. Epub 2020 Dec 29. PMID: 33397599 Free PMC article. Review
- El Mokadem M, Boshra H, Abd El Hady Y, et al. Relationship of serum vitamin D deficiency with coronary artery disease severity using multislice CT coronary angiography. *Clin Investig Arterioscler.* 2021 Apr 24:S0214-9168(21)00041-3. <https://doi.org/10.1016/j.arteri.2021.02.008>. Online ahead of print. PMID: 33906751
- Elbehairy MM, Abdennasser HY, Hanafi RS, et al. An intronic DHCR7 genetic polymorphism



- associates with vitamin D serum level and incidence of acute coronary syndrome. *Steroids*. 2021 May;169:108825. <https://doi.org/10.1016/j.steroids.2021.108825>. Epub 2021 Mar 17. PMID: 33741398
- Fontányi Z, Sziva RE, Pál É, et al. Vitamin D Deficiency Reduces Vascular Reactivity of Coronary Arterioles in Male Rats. *Curr Issues Mol Biol*. 2021 May 7;43(1):79-92. <https://doi.org/10.3390/cimb43010007>. PMID: 34066967
 - Foulkes S, Kukuljan S, Nowson CA, et al. Effects of a multi-modal resistance exercise program and calcium-vitamin D(3) fortified milk on blood pressure and blood lipids in middle-aged and older men: secondary analysis of an 18-month factorial design randomised controlled trial. *Eur J Nutr*. 2021 Apr;60(3):1289-1299. <https://doi.org/10.1007/s00394-020-02325-x>. Epub 2020 Jul 14. PMID: 32666313 Clinical Trial
 - Garcia Carretero R, Vigil-Medina L, Barquero-Perez O, et al. Machine learning approaches to constructing predictive models of vitamin D deficiency in a hypertensive population: a comparative study. *Inform Health Soc Care*. 2021 Apr 1:1-15. <https://doi.org/10.1080/17538157.2021.1896524>. Online ahead of print. PMID: 33792475
 - Govender D, Damjanovic I, Gaza CA, et al. Vitamin D decreases silencer methylation to downregulate renin gene expression. *Gene*. 2021 Jun 20;786:145623. <https://doi.org/10.1016/j.gene.2021.145623>. Epub 2021 Mar 31. PMID: 33798678
 - Izzo M, Carrizzo A, Izzo C, et al. Vitamin D: Not Just Bone Metabolism but a Key Player in Cardiovascular Diseases. *Life (Basel)*. 2021 May 18;11(5):452. <https://doi.org/10.3390/life11050452>. PMID: 34070202 Free PMC article. Review.
 - Korkmaz UTK, Ersoy S, Yuksel A, et al. Association between vitamin D levels and lower-extremity deep vein thrombosis: a case-control study. *Sao Paulo Med J*. 2021 May 28;139(3):279-284. <https://doi.org/10.1590/1516-3180.2020.0457.R1.04022021>. eCollection 2021. PMID: 34076230
 - Lajtai K, Tarszabó R, Bánya B, et al. Effect of Vitamin D Status on Vascular Function of the Aorta in a Rat Model of PCOS. *Oxid Med Cell Longev*. 2021 Mar 18;2021:8865979. <https://doi.org/10.1155/2021/8865979>. eCollection 2021. PMID: 33791074
 - Luchi WM, Crajoinas RO, Martins FL, et al. High blood pressure induced by vitamin D deficiency is associated with renal overexpression and hyperphosphorylation of Na⁺-K⁺-2Cl⁻ cotransporter type 2. *J Hypertens*. 2021 May 1;39(5):880-891. <https://doi.org/10.1097/HJH.0000000000002745>. PMID: 33337598
 - Mehdipoor M, Damirchi A, Tousi SMTR, et al. Correction to: Concurrent vitamin D supplementation and exercise training improve cardiac fibrosis via TGF-beta/Smad signaling in myocardial infarction model of rats. *J Physiol Biochem*. 2021 May;77(2):341. <https://doi.org/10.1007/s13105-021-00795-z>. PMID: 33713016
 - Miao J, Bachmann KN, Huang S, et al. Effects of Vitamin D Supplementation on Cardiovascular and Glycemic Biomarkers. *J Am Heart Assoc*. 2021 May 18;10(10):e017727. <https://doi.org/10.1161/JAHA.120.017727>. Epub 2021 May 7. PMID: 33960201
 - Naghedi A, Haghanejad H, Varastehrvan H, et al. Effect of vitamin D supplements on left ventricular ejection fraction in patients with heart failure: A systematic review and meta-analysis of randomized controlled trials. *Rev Port Cardiol*. 2021 Jun;40(6):447-455. <https://doi.org/10.1016/j.repc.2020.10.014>. Epub 2021 May 28. PMID: 34053778
 - Nikolova M, Nazirova-Tasinova N, Vanekova D, et al. Vitamin D Status in Patients with Atrial Fibrillation and Heart Failure - Is there a Link? *Clin Lab*. 2021 Jun 1;67(6). <https://doi.org/10.7754/Clin.Lab.2020.200902>. PMID: 34107623
 - Nikooyeh B, Abdollahi Z, Shariatzadeh N, et al. Effect of latitude on seasonal variations of vitamin D and some cardiometabolic risk factors: national food and nutrition surveillance. *East Mediterr Health J*. 2021 Mar 23;27(3):269-278. <https://doi.org/10.26719/emhj.20.119>. PMID: 33788216
 - Ortega-Ramírez AD, Cabrera-Macedo A, Del Toro-Equihua M, et al. Vitamin D and its correlation with blood lipids and intima-media thickness in term infants. *Nutr Hosp*. 2021 May 24. <https://doi.org/10.20960/nh.03516>. Online ahead of print. PMID: 34024110
 - Philouze C, Martin JC, Riva C, et al. Vitamin D(3) Supplementation Alleviates Left Ventricular Dysfunction in a Mouse Model of Diet-Induced Type 2 Diabetes: Potential Involvement of Cardiac Lipotoxicity Modulation. *Cardiovasc Drugs Ther*. 2021 Mar 4. <https://doi.org/10.1007/s10557-021-07143-9>. Online ahead of print. PMID: 33661433
 - Pokhrel S, Giri N, Pokhrel R, et al. Vitamin D deficiency and cardiovascular risk in type 2 diabetes population. *Open Life Sci*. 2021 May 10;16(1):464-474. <https://doi.org/10.1515/biol-2021-0050>. eCollection 2021. PMID: 34017921
 - Prasad M, Rajarajeswari D, Aruna P, et al. Status of Vitamin D Receptor Gene Polymorphism and 25-Hydroxy Vitamin D Deficiency with Essential Hypertension. *Indian J Clin Biochem*. 2021 Jun 15:1-7. <https://doi.org/10.1007/s12291-021-00984-z>. Online ahead of print. PMID: 34149207
 - Raljević D, Peršić V, Markova-Car E, et al. Study of vitamin D receptor gene polymorphisms in a cohort of myocardial infarction patients with coronary artery disease. *BMC Cardiovasc Disord*. 2021 Apr 16;21(1):188. <https://doi.org/10.1186/s12872-021-01959-x>. PMID: 33863283
 - Rodrigues IG, Pinho CPS, Sobral Filho D, et al. The impact of visceral fat and levels of vitamin D on coronary artery calcification. *Rev Assoc Med Bras* (1992). 2021 Jun 9;S0104-42302021005002204. <https://doi.org/10.1590/1806-9282.67.01.20200388>. Online ahead of print. PMID: 34133694
 - Santos BR, Casanova G, Silva TR, et al. Are vitamin D deficiency and VDR gene polymorphisms associated with high blood pressure as defined by the ACC/AHA 2017 criteria in postmenopausal women? *Maturitas*. 2021 Jul;149:26-33. <https://doi.org/10.1016/j.maturitas.2021.05.004>. Epub 2021 May 24. PMID: 34134887
 - Santos PPD, Rafacho BPM, Gonçalves AF, et al. Vitamin D Supplementation Induces Cardiac Remodeling in Rats: Association with Thioredoxin-Interacting Protein and Thioredoxin. *Arq Bras Cardiol*. 2021 May;116(5):970-978. <https://doi.org/10.36660-abc.20190633>. PMID: 34008824
 - Sharifan P, Ziae A, Darroudi S, et al. Effect of low-fat dairy products fortified with 1500IU nano encapsulated vitamin D(3) on cardiometabolic indicators in adults with abdominal obesity: a total blinded random-

- ized controlled trial. *Curr Med Res Opin.* 2021 Apr;37(4):579-588. <https://doi.org/10.1080/03007995.2021.1874324>. Epub 2021 Mar 8. PMID: 33434080
- Soh V, Tan SJX, Sehgal R, et al. The Relationship Between Vitamin D Status and Cardiovascular Diseases. *Curr Probl Cardiol.* 2021 Jul;46(7):100836. <https://doi.org/10.1016/j.cpcardiol.2021.100836>. Epub 2021 Mar 19. PMID: 33848960
 - Tintut Y, Demer LL. Potential impact of the steroid hormone, vitamin D, on the vasculature. *Am Heart J.* 2021 May 27;239:147-153. <https://doi.org/10.1016/j.ahj.2021.05.012>. Online ahead of print. PMID: 34051171 Review
 - Verdoia M, Nardin M, Rolla R, et al. Association of lower vitamin D levels with inflammation and leucocytes parameters in patients with and without diabetes mellitus undergoing coronary angiography. *Eur J Clin Invest.* 2021 Apr;51(4):e13439. <https://doi.org/10.1111/eci.13439>. Epub 2020 Nov 20. PMID: 33112413
 - Vinet A, Morrissey C, Perez-Martin A, et al. Effect of vitamin D supplementation on microvascular reactivity in obese adolescents: A randomized controlled trial. *Nutr Metab Cardiovasc Dis.* 2021 May 10:S0939-4753(21)00218-0. <https://doi.org/10.1016/j.numecd.2021.04.025>. Online ahead of print. PMID: 34090775
 - Zittermann A, Trummer C, Theiler-Schwetz V, et al. Vitamin D and Cardiovascular Disease: An Updated Narrative Review. *Int J Mol Sci.* 2021 Mar 12;22(6):2896. <https://doi.org/10.3390/ijms22062896>. PMID: 33809311
 - Abdollahi A, Kamali Sarvestani H, et al. The association between the level of serum 25(OH) vitamin D, obesity, and underlying diseases with the risk of developing COVID-19 infection: A case-control study of hospitalized patients in Tehran, Iran. *J Med Virol.* 2021 Apr;93(4):2359-2364. <https://doi.org/10.1002/jmv.26726>. Epub 2020 Dec 29. PMID: 33314166
 - Abdollahi H, Salehinia F, Badeli M, et al. The Biochemical Parameters and Vitamin D Levels in ICU Patients with Covid-19: A Cross-Sectional Study. *Endocr Metab Immune Disord Drug Targets.* 2021 Mar 15. <https://doi.org/10.2174/187153032166210316103403>. Online ahead of print. PMID: 33726658
 - Abdulateef DS, Rahman HS, Salih JM, et al. COVID-19 severity in relation to socio-demographics and vitamin D use. *Open Med (Wars).* 2021 Apr 8;16(1):591-609. <https://doi.org/10.1515/med-2021-0273>. eCollection 2021. PMID: 33869781
 - Abrishami A, Dalili N, Mohammadi Torbati P, et al. Possible association of vitamin D status with lung involvement and outcome in patients with COVID-19: a retrospective study. *Eur J Nutr.* 2021 Jun;60(4):2249-2257. <https://doi.org/10.1007/s00394-020-02411-0>. Epub 2020 Oct 30. PMID: 33123774
 - Akbar MR, Wibowo A, Pranata R, et al. Low Serum 25-hydroxyvitamin D (Vitamin D) Level Is Associated With Susceptibility to COVID-19, Severity, and Mortality: A Systematic Review and Meta-Analysis. *Front Nutr.* 2021 Mar 29;8:660420. <https://doi.org/10.3389/fnut.2021.660420>. eCollection 2021. PMID: 33855042
 - Akkam Y, Rababah T, Costa R, et al. Pea Protein Nanoemulsion Effectively Stabilizes Vitamin D in Food Products: A Potential Supplementation during the COVID-19 Pandemic. *Nanomaterials (Basel).* 2021 Mar 31;11(4):887. <https://doi.org/10.3390/nano11040887>. PMID: 33807206
 - Al Khalili H, Gokhale A, Khamis F, Osman W, et al. Serum Calcium and Vitamin D levels: Correlation with severity of COVID-19 in hospitalized patients in Royal Hospital, Oman. *Int J Infect Dis.* 2021 Jun;107:153-163. <https://doi.org/10.1016/j.ijid.2021.04.050>. Epub 2021 Apr 20. PMID: 33892191
 - Al-Daghri NM, Amer OE, Alotaibi NH, et al. Vitamin D status of Arab Gulf residents screened for SARS-CoV-2 and its association with COVID-19 infection: a multi-centre case-control study. *J Transl Med.* 2021 Apr 26;19(1):166. <https://doi.org/10.1186/s12967-021-02838-x>. PMID: 33902635
 - Al-Jarallah M, Rajan R, Dashti R, et al. In-hospital mortality in SARS-CoV-2 stratified by serum 25-hydroxy-vitamin D levels: A retrospective study. *J Med Virol.* 2021 Jun 7. <https://doi.org/10.1002/jmv.27133>. Online ahead of print. PMID: 34101207
 - Aleebrahim-Dehkordi E, Deravi N, Yaghoobpoor S, et al. The roles of vitamin D in increasing the body's immunity and reducing injuries due to viral infections: With an emphasis on its possible role in SARS-CoV-2 (COVID-19). *Curr Pharm Des.* 2021 Jun 8. <https://doi.org/10.2174/138161282766210608145236>. Online ahead of print. PMID: 34102962
 - Alguwaihes AM, Sabico S, Hasanato R, et al. Severe vitamin D deficiency is not related to SARS-CoV-2 infection but may increase mortality risk in hospitalized adults: a retrospective case-control study in an Arab Gulf country. *Aging Clin Exp Res.* 2021 May;33(5):1415-1422. <https://doi.org/10.1007/s40520-021-01831-0>. Epub 2021 Mar 31. PMID: 33788172
 - AlSafar H, Grant WB, Hijazi R, et al. COVID-19 Disease Severity and Death in Relation to Vitamin D Status among SARS-CoV-2-Positive UAE Residents. *Nutrients.* 2021 May 19;13(5):1714. <https://doi.org/10.3390/nu13051714>. PMID: 34069412
 - Alshahawey M. A genetic insight into vitamin D binding protein and COVID-19. *Med Hypotheses.* 2021 Apr;149:110531. <https://doi.org/10.1016/j.mehy.2021.110531>. Epub 2021 Feb 9. PMID: 33607405
 - Angelidi AM, Belanger MJ, Lorinsky MK, et al. Vitamin D Status Is Associated With In-Hospital Mortality and Mechanical Ventilation: A Cohort of COVID-19 Hospitalized Patients. *Mayo Clin Proc.* 2021 Apr;96(4):875-886. <https://doi.org/10.1016/j.mayocp.2021.01.001>. Epub 2021 Jan 9. PMID: 33714594
 - Annweiler C, Mercat A, Souberbielle JC. Learning from previous methodological pitfalls to propose well-designed trials on vitamin D in COVID-19. *J Steroid Biochem Mol Biol.* 2021 Jul;211:105901. <https://doi.org/10.1016/j.jsbmb.2021.105901>. Epub 2021 Apr 14. PMID: 33864925
 - Annweiler C, Souberbielle JC. [Vitamin D supplementation and COVID-19: expert consensus and guidelines]. *Geriatr Psychol Neuropsychiatr Vieil.* 2021 Mar 1;19(1):20-29. <https://doi.org/10.1684/pnv.2020.0907>. PMID: 33350389 French
 - Arab-Ahmadi M, Behnam B, Abrishami A, et al. Reply to: A key role for vitamin D binding protein in COVID-19? *Eur J Nutr.* 2021 Jun;60(4):2261. <https://doi.org/10.1007/s00394-020-02480-1>. Epub 2021 Feb 12. PMID: 33576843

- Banerjee A, Ganguly U, Saha S, et al. Vitamin D and immuno-pathology of COVID-19: many interactions but uncertain therapeutic benefits. *Expert Rev Anti Infect Ther.* 2021 Apr;1:1-14. <https://doi.org/10.1080/14787210.2021.1905519>. Online ahead of print. PMID: 33739215
- Bassatne A, Basbous M, Chakhtoura M, et al. The link between COVID-19 and Vitamin D (ViViD): A systematic review and meta-analysis. *Metabolism.* 2021 Jun;119:154753. <https://doi.org/10.1016/j.metabol.2021.154753>. Epub 2021 Mar 24. PMID: 33774074
- Bayramoğlu E, Akkoç G, Ağbaş A, et al. Authors' reply: the biologic importance of the vitamin D binding protein polymorphism in pediatric COVID-19 patients. *Eur J Pediatr.* 2021 May 14;1-2. <https://doi.org/10.1007/s00431-021-04109-9>. Online ahead of print. PMID: 33990871
- Bayramoğlu E, Akkoç G, Ağbaş A, et al. The association between vitamin D levels and the clinical severity and inflammation markers in pediatric COVID-19 patients: single-center experience from a pandemic hospital. *Eur J Pediatr.* 2021 Mar 31;1-7. <https://doi.org/10.1007/s00431-021-04030-1>. Online ahead of print. PMID: 33788001
- Bezerra Espinola MS, Bertelli M, Bizzarri M, et al. Inositol and vitamin D may naturally protect human reproduction and women undergoing assisted reproduction from Covid-19 risk. *J Reprod Immunol.* 2021 Apr;144:103271. <https://doi.org/10.1016/j.jri.2021.103271>. Epub 2021 Jan 8. PMID: 33493945
- Bleizgys A. Vitamin D and COVID-19: It is time to act. *Int J Clin Pract.* 2021 Mar;75(3):e13748. <https://doi.org/10.1111/ijcp.13748>. Epub 2020 Oct 27. PMID: 33012103
- Bókkon I, Kapócs G, Vucskits A, et al. COVID-19: The significance of platelets, mitochondria, vitamin D, serotonin and the gut microbiota. *Curr Med Chem.* 2021 May 25. <https://doi.org/10.2174/0929867328666210526100147>. Online ahead of print. PMID: 34042025
- Brandão CMÁ, Chiamolera MI, Biscola RPM, et al. No association between vitamin D status and COVID-19 infection in São Paulo, Brazil. *Arch Endocrinol Metab.* 2021 Mar 19;2359-3997000000343. <https://doi.org/10.20945/2359-3997000000343>. Online ahead of print. PMID: 33740339
- Brighthope I, Sali Am A, Ried K. Vitamin-D and COVID-19: Time for the profession to take a stand. *Adv Integr Med.* 2021 May;8(2):77-78. <https://doi.org/10.1016/j.aimed.2021.01.003>. Epub 2021 Jan 21. PMID: 33520645
- Bui L, Zhu Z, Hawkins S, et al. Vitamin D regulation of the immune system and its implications for COVID-19: A mini review. *SAGE Open Med.* 2021 May 18;9:20503121211014073. <https://doi.org/10.1177/20503121211014073>. eCollection 2021. PMID: 34046177
- Butler-Laporte G, Nakanishi T, Mooser V, et al. Vitamin D and COVID-19 susceptibility and severity in the COVID-19 Host Genetics Initiative: A Mendelian randomization study. *PLoS Med.* 2021 Jun 1;18(6):e1003605. <https://doi.org/10.1371/journal.pmed.1003605>. eCollection 2021 Jun. PMID: 34061844
- Bychinin MV, Klypa TV, Mandel IA, et al. Low Circulating Vitamin D in Intensive Care Unit-Admitted COVID-19 Patients as a Predictor of Negative Outcomes. *J Nutr.* 2021 May 12:nxab107. <https://doi.org/10.1093/jn/nxab107>. Online ahead of print. PMID: 33982128
- Campbell PA, Young MW, Lee RC. Vitamin D Clinical Pharmacology: Relevance to COVID-19 Pathogenesis. *J Natl Med Assoc.* 2021 Apr;113(2):208-211. <https://doi.org/10.1016/j.jnma.2020.09.152>. Epub 2020 Nov 2. PMID: 33148446
- Campi I, Gennari L, Merlotti D, et al. Vitamin D and COVID-19 severity and related mortality: a prospective study in Italy. *BMC Infect Dis.* 2021 Jun 14;21(1):566. <https://doi.org/10.1186/s12879-021-06281-7>. PMID: 34126960
- Campos DMO, Silva ED Jr, Fulco UL, et al. The link between vitamin D and COVID-19. *Contemp Clin Trials.* 2021 Jun;105:106395. <https://doi.org/10.1016/j.cct.2021.106395>. Epub 2021 May 29. PMID: 34074458
- Carpagnano GE, Di Lecce V, Quaranta VN, et al. Vitamin D deficiency as a predictor of poor prognosis in patients with acute respiratory failure due to COVID-19. *J Endocrinol Invest.* 2021 Apr;44(4):765-771. <https://doi.org/10.1007/s40618-020-01370-x>. Epub 2020 Aug 9. PMID: 32772324
- Ccoicca Casaverde BL, Paravicino Hoces N. [Vitamin D and its importance for infection with SARS-CoV-2]. *Nutr Hosp.* 2021 Jun 16. <https://doi.org/10.20960/nh.03715>. Online ahead of print. PMID: 34132561 Spanish
- Celikbilek A. Vitamin D axis status and the severity of COVID-19. *J Med Virol.* 2021 Jul;93(7):4085. <https://doi.org/10.1002/jmv.26920>. Epub 2021 Mar 14. PMID: 33666241
- Ceolin G, Mano GPR, Hames NS, et al. Vitamin D, Depressive Symptoms, and Covid-19 Pandemic. *Front Neurosci.* 2021 May 13;15:670879. <https://doi.org/10.3389/fnins.2021.670879>. eCollection 2021. PMID: 34054418
- Cereda E, Bogliolo L, Klerys C, et al. Vitamin D 25OH deficiency in COVID-19 patients admitted to a tertiary referral hospital. *Clin Nutr.* 2021 Apr;40(4):2469-2472. <https://doi.org/10.1016/j.clnu.2020.10.055>. Epub 2020 Nov 2. PMID: 33187772
- Charoenngam N, Shirvani A, Holick MF. Vitamin D and Its Potential Benefit for the COVID-19 Pandemic. *Endocr Pract.* 2021 May;27(5):484-493. <https://doi.org/10.1016/j.eprac.2021.03.006>. Epub 2021 Mar 17. PMID: 33744444
- Charoenngam N, Shirvani A, Reddy N, et al. Association of Vitamin D Status With Hospital Morbidity and Mortality in Adult Hospitalized Patients With COVID-19. *Endocr Pract.* 2021 Apr;27(4):271-278. <https://doi.org/10.1016/j.eprac.2021.02.013>. Epub 2021 Mar 9. PMID: 33705975
- Charoenngam N, Shirvani A, Reddy N, et al. Authors' Reply: Vitamin D Sufficiency and COVID-19: Is Vitamin D Binding Protein (and Its Polymorphism) the Missing Link? *Endocr Pract.* 2021 Jun;27(6):646-647. <https://doi.org/10.1016/j.eprac.2021.03.016>. Epub 2021 Apr 2. PMID: 33819635
- Chetty WV, Chetty M. Potential benefit of vitamin d supplementation in people with respiratory illnesses, during the Covid-19 pandemic. *Clin Transl Sci.* 2021 May 31. <https://doi.org/10.1111/cts.13044>. Online ahead of print. PMID: 34057814

- Christopher DJ, Isaac BT, Thangakunam B. The link between vitamin D deficiency and COVID-19. *Lung India*. 2021 Mar;38(Supplement):S4-S5. https://doi.org/10.4103/lungindia.lungindia_921_20. PMID: 33686972
- Corrao S, Mallaci Bocchio R, Lo Monaco M, et al. Does Evidence Exist to Blunt Inflammatory Response by Nutraceutical Supplementation during COVID-19 Pandemic? An Overview of Systematic Reviews of Vitamin D, Vitamin C, Melatonin, and Zinc. *Nutrients*. 2021 Apr 12;13(4):1261. <https://doi.org/10.3390/nu13041261>. PMID: 33921297
- Corrigendum for Luo et al. Vitamin D Deficiency Is Inversely Associated with COVID-19 Incidence and Disease Severity in Chinese People. *J Nutr* 2020;151(1): 98-103. *J Nutr*. 2021 Mar 11;151(3):742-743. <https://doi.org/10.1093/jn/nxaa460>. PMID: 33704501
- Darren A, Osman M, Masilamani K, et al. Vitamin D status of children with Paediatric Inflammatory Multisystem Syndrome Temporally associated with Severe acute respiratory syndrome coronavirus 2 (PIMS-TS). *Br J Nutr*. 2021 May 12;1-26. <https://doi.org/10.1017/S0007114521001562>. Online ahead of print. PMID: 33977890
- Davies G, Mazess RB, Benskin LL. Letter to the editor in response to the article: "Vitamin D concentrations and COVID-19 infection in UK biobank" (Hastie et al.). *Diabetes Metab Syndr*. 2021 Mar-Apr;15(2):643-644. <https://doi.org/10.1016/j.dsx.2021.02.016>. Epub 2021 Feb 9. PMID: 33722481
- Davoudi A, Najafi N, Aarabi M, et al. Lack of association between vitamin D insufficiency and clinical outcomes of patients with COVID-19 infection. *BMC Infect Dis*. 2021 May 18;21(1):450. <https://doi.org/10.1186/s12879-021-06168-7>. PMID: 34006228
- Demir M, Demir F, Aygun H. Vitamin D deficiency is associated with COVID-19 positivity and severity of the disease. *J Med Virol*. 2021 May;93(5):2992-2999. <https://doi.org/10.1002/jmv.26832>. Epub 2021 Feb 9. PMID: 33512007
- Diaz-Curiel M, Cabello A, Arboiro-Pinel R, et al. The relationship between 25(OH) vitamin D levels and COVID-19 onset and disease course in Spanish patients. *J Steroid Biochem Mol Biol*. 2021 Jun 3:105928. <https://doi.org/10.1016/j.jsbmb.2021.105928>. Online ahead of print. PMID: 34091026
- Dixit V, Garg B, Mehta N, et al. COVID-19 infection, inception and immunity: Observations and recommendations in the light of vitamin D? *J Infect Public Health*. 2021 Apr;14(4):444-445. <https://doi.org/10.1016/j.jiph.2021.01.007>. Epub 2021 Jan 19. PMID: 33751982
- Dos Santos RN, Maeda SS, Jardim JR, et al. Reasons to avoid vitamin D deficiency during COVID-19 pandemic. *Arch Endocrinol Metab*. 2021 May 18;64(5):498-506. <https://doi.org/10.20945/2359-3997000000291>. PMID: 34033288 Review
- Dramé M, Cofais C, Hentzien M, et al. Relation between Vitamin D and COVID-19 in Aged People: A Systematic Review. *Nutrients*. 2021 Apr 17;13(4):1339. <https://doi.org/10.3390/nu13041339>. PMID: 33920639
- Easty DJ, Farr CJ, Hennessy BT. New Roles for Vitamin D Superagonists: From COVID to Cancer. *Front Endocrinol (Lausanne)*. 2021 Mar 31;12:644298. <https://doi.org/10.3389/fendo.2021.644298>. eCollection 2021. PMID: 33868174
- Elham AS, Azam K, Azam J, et al. Serum vitamin D, calcium, and zinc levels in patients with COVID-19. *Clin Nutr ESPEN*. 2021 Jun;43:276-282. <https://doi.org/10.1016/j.clnesp.2021.03.040>. Epub 2021 Apr 18. PMID: 34024527
- Faniyi AA, Lugg ST, Faustini SE, et al. Genetic polymorphisms, vitamin D binding protein and vitamin D deficiency in COVID-19. *Eur Respir J*. 2021 May 6;57(5):2100653. <https://doi.org/10.1183/13993003.00653-2021>. Print 2021 May. PMID: 33888522
- Faniyi AA, Lugg ST, Faustini SE, et al. Vitamin D status and seroconversion for COVID-19 in UK healthcare workers. *Eur Respir J*. 2021 Apr 8;57(4):2004234. <https://doi.org/10.1183/13993003.04234-2020>. Print 2021 Apr. PMID: 33303541
- Feketea G, Vlacha V, Bocsan IC, et al. Vitamin D in Corona Virus Disease 2019 (COVID-19) Related Multisystem Inflammatory Syndrome in Children (MIS-C). *Front Immunol*. 2021 Mar 8;12:648546. <https://doi.org/10.3389/fimmu.2021.648546>. eCollection 2021. PMID: 33763085
- Ferrari D, Locatelli M, Faraldi M, et al. Changes in 25-(OH) Vitamin D Levels during the SARS-CoV-2 Outbreak: Lockdown-Related Effects and First-to-Second Wave Difference-An Observational Study from Northern Italy. *Biology (Basel)*. 2021 Mar 19;10(3):237. <https://doi.org/10.3390/biology10030237>. PMID: 33808612
- Ferrari D, Locatelli M. No significant association between vitamin D and COVID-19: A retrospective study from a northern Italian hospital. *Int J Vitam Nutr Res*. 2021 Jun;91(3-4):200-203. <https://doi.org/10.1024/0300-9831/a000687>. Epub 2020 Nov 2. PMID: 33135597
- Ganmaa D, Wang R, Willett WC, et al. Response to the letter to the editor: "The link between Vitamin D and COVID-19". *Contemp Clin Trials*. 2021 Jun;105:106418. <https://doi.org/10.1016/j.cct.2021.106418>. Epub 2021 May 29. PMID: 34074457 Free PMC article
- Gaudio A, Murabito AR, Agodi A, et al. Vitamin D Levels Are Reduced at the Time of Hospital Admission in Sicilian SARS-CoV-2-Positive Patients. *Int J Environ Res Public Health*. 2021 Mar 27;18(7):3491. <https://doi.org/10.3390/ijerph18073491>. PMID: 33801759
- George B, Amjesh R, Paul AM, et al. Evidence of a dysregulated vitamin D endocrine system in SARS-CoV-2 infected patient's lung cells. *Sci Rep*. 2021 Apr 21;11(1):8570. <https://doi.org/10.1038/s41598-021-87703-z>. PMID: 33883570
- Getachew B, Tizabi Y. Vitamin D and COVID-19: Role of ACE2, age, gender, and ethnicity. *J Med Virol*. 2021 May 14. <https://doi.org/10.1002/jmv.27075>. Online ahead of print. PMID: 33990955 Review
- Gibson-Moore H. Vitamin D: What's new a year on from the COVID-19 outbreak? *Nutr Bull*. 2021 Jun;46(2):195-205. <https://doi.org/10.1111/nbu.12499>. Epub 2021 Jun 4. PMID: 34149314
- Gilani SJ, Bin-Jumah M, Nadeem MS, et al. Vitamin D attenuates COVID-19 complications via modulation of proinflammatory cytokines, antiviral proteins, and autophagy. *Expert Rev Anti Infect Ther*. 2021 Jun 10. <https://doi.org/10.1080/14787210>.

- 2021.1941871. Online ahead of print. PMID: 34112047
- Griffin G, Hewison M, Hopkin J, et al. Perspective: Vitamin D supplementation prevents rickets and acute respiratory infections when given as daily maintenance but not as intermittent bolus: implications for COVID-19. *Clin Med (Lond)*. 2021 Mar;21(2):e144-e149. <https://doi.org/10.7861/clinmed.2021-0035>. Epub 2021 Feb 16. PMID: 33593830
 - Grove A, Osokogu O, Al-Khudairy L, et al. Association between vitamin D supplementation or serum vitamin D level and susceptibility to SARS-CoV-2 infection or COVID-19 including clinical course, morbidity and mortality outcomes? A systematic review. *BMJ Open*. 2021 May 28;11(5):e043737. <https://doi.org/10.1136/bmjopen-2020-043737>. PMID: 34049903
 - Haghghi M, Ebadi SS, Soleimantabar H, et al. Association between vitamin D level and prognostic factors among patients infected with SARS-CoV-2. *Horm Mol Biol Clin Investig*. 2021 May 19. <https://doi.org/10.1515/hmbci-2021-0008>. Online ahead of print. PMID: 34005841
 - Hernández JL, Nan D, Fernandez-Ayala M, et al. Vitamin D Status in Hospitalized Patients with SARS-CoV-2 Infection. *J Clin Endocrinol Metab*. 2021 Mar 8;106(3):e1343-e1353. <https://doi.org/10.1210/clinem/dgaa733>. PMID: 33159440
 - Jayawardena R, Jeyakumar DT, Francis TV, et al. Impact of the vitamin D deficiency on COVID-19 infection and mortality in Asian countries. *Diabetes Metab Syndr*. 2021 May-Jun;15(3):757-764. <https://doi.org/10.1016/j.dsx.2021.03.006>. Epub 2021 Mar 13. PMID: 33823331
 - Jude EB, Ling SF, Allcock R, et al. Vitamin D deficiency is associated with higher hospitalisation risk from COVID-19: a retrospective case-control study. *J Clin Endocrinol Metab*. 2021 Jun 17;dgab439. <https://doi.org/10.1210/clinem/dgab439>. Online ahead of print. PMID: 34139758
 - Kaler J, Hussain A, Azim D, et al. Optimising vitamin D levels in patients with COVID-19. *Hong Kong Med J*. 2021 Apr;27(2):154-156. <https://doi.org/10.12809/hkmj208824>. Epub 2021 Mar 29. PMID: 33790052
 - Karimi E, Azari H, Yari M, et al. Interplay between SARS-CoV-2-derived miRNAs, immune system, vitamin D pathway and respiratory system. *J Cell Mol Med*. 2021 Jun 22. <https://doi.org/10.1111/jcmm.16694>. Online ahead of print. PMID: 34159729
 - Katz J, Yue S, Xue W. Increased risk for COVID-19 in patients with vitamin D deficiency. *Nutrition*. 2021 Apr;84:111106. <https://doi.org/10.1016/j.nut.2020.111106>. Epub 2020 Dec 4. PMID: 33418230
 - Kazemi A, Mohammadi V, Aghababaei SK, et al. Association of Vitamin D Status with SARS-CoV-2 Infection or COVID-19 Severity: A Systematic Review and Meta-analysis. *Adv Nutr*. 2021 Mar 5:nmab012. <https://doi.org/10.1093/advances/nmab012>. Online ahead of print. PMID: 33751020
 - Khalili F, Yarani R, Haghgoos SM, et al. Letter to Editor in response to the article "Vitamin D insufficiency as a potential culprit in critical COVID-19 patients". *J Med Virol*. 2021 Jul;93(7):4081-4082. <https://doi.org/10.1002/jmv.26912>. Epub 2021 Apr 14. PMID: 33656189
 - Khan AH, Nasir N, Nasir N, et al. Vitamin D and COVID-19: is there a role? *J Diabetes Metab Disord*. 2021 Mar 29:1-8. <https://doi.org/10.1007/s40200-021-00775-6>. Online ahead of print. PMID: 33816359
 - Kotur N, Skakic A, Klaassen K, et al. Association of Vitamin D, Zinc and Selenium Related Genetic Variants With COVID-19 Disease Severity. *Front Nutr*. 2021 Jun 4;8:689419. <https://doi.org/10.3389/fnut.2021.689419>. eCollection 2021. PMID: 34150833
 - Kralj M, Jakovac H. Vitamin D and COVID-19 in an immunocompromised patient with multiple comorbidities-A Case Report. *Clin Case Rep*. 2021 Mar 5;9(4):2269-75. <https://doi.org/10.1002/ccr3.4010>. Online ahead of print. PMID: 33821193
 - Lagadinou M, Zorbas B, Velissaris D. Vitamin D plasma levels in patients with COVID-19: a case series. *Infez Med*. 2021 Jun 1;29(2):224-228. PMID: 34061787
 - Lakkireddy M, Gadiga SG, Malathi RD, et al. Impact of daily high dose oral vitamin D therapy on the inflammatory markers in patients with COVID-19 disease. *Sci Rep*. 2021 May 20;11(1):10641. <https://doi.org/10.1038/s41598-021-90189-4>. PMID: 34017029
 - Li Y, Tong CH, Bare LA, et al. Assessment of the Association of Vitamin D Level With SARS-CoV-2 Seropositivity Among Working-Age Adults. *JAMA Netw Open*. 2021 May 3;4(5):e2111634. <https://doi.org/10.1001/jamanetworkopen.2021.11634>. PMID: 34009346
 - Lippi G, Ferrari A, Targher G. Is COVID-19 lockdown associated with vitamin D deficiency? *Eur J Public Health*. 2021 Apr 24;31(2):278-279. <https://doi.org/10.1093/eurpub/ckab004>. PMID: 33508085
 - Liu N, Sun J, Wang X, et al. Low vitamin D status is associated with coronavirus disease 2019 outcomes: a systematic review and meta-analysis. *Int J Infect Dis*. 2021 Mar;104:58-64. <https://doi.org/10.1016/j.ijid.2020.12.077>. Epub 2021 Jan 2. PMID: 33401034
 - Livingston M, Plant A, Dunmore S, et al. Detectable respiratory SARS-CoV-2 RNA is associated with low vitamin D levels and high social deprivation. *Int J Clin Pract*. 2021 Apr 2:e14166. <https://doi.org/10.1111/ijcp.14166>. Online ahead of print. PMID: 33797849
 - Liyanage G, de Silva Y. Vitamin D Deficiency Rickets and COVID-19 Pandemic. *Case Rep Pediatr*. 2021 Apr 15;2021:5512668. <https://doi.org/10.1155/2021/5512668>. eCollection 2021. PMID: 33927910 Free PMC article
 - Lohia P, Kapur S, Patel P, et al. Letter to the editor: Vitamin D levels in acute illness and clinical severity in COVID-19 patients. *Respir Res*. 2021 Apr 9;22(1):102. <https://doi.org/10.1186/s12931-021-01703-1>. PMID: 33832495
 - Lohia P, Nguyen P, Patel N, et al. Exploring the link between vitamin D and clinical outcomes in COVID-19. *Am J Physiol Endocrinol Metab*. 2021 Mar 1;320(3):E520-E526. <https://doi.org/10.1152/ajpendo.00517.2020>. Epub 2021 Jan 6. PMID: 33404354
 - Ma H, Zhou T, Heianza Y, et al. Habitual use of vitamin D supplements and risk of coronavirus disease 2019 (COVID-19) infection: a prospective study in UK Biobank. *Am J Clin Nutr*. 2021 May 8;113(5):1275-

1281. <https://doi.org/10.1093/ajcn/nqaa381>. PMID: 33515005
- Maha Q, Talal M. Can Vitamin D Deficiency Increase the Susceptibility to COVID-19? *Front Physiol.* 2021 May 21;12:630956. <https://doi.org/10.3389/fphys.2021.630956>. eCollection 2021. PMID: 34093219
 - Mandal AKJ, Baktash V, Hosack T, et al. Vitamin D status may indeed be a prognosticator for morbidity and mortality in patients with COVID-19. *J Med Virol.* 2021 Mar;93(3):1225. <https://doi.org/10.1002/jmv.26569>. Epub 2020 Oct 8. PMID: 32990950
 - Mariani J, Giménez VMM, Bergam I, et al. Association Between Vitamin D Deficiency and COVID-19 Incidence, Complications, and Mortality in 46 Countries: An Ecological Study. *Health Secur.* 2021 May-Jun;19(3):302-308. <https://doi.org/10.1089/hs.2020.0137>. Epub 2020 Dec 14. PMID: 33325788
 - Martín Giménez VM, Inserra F, Ferder L, et al. Vitamin D deficiency in African Americans is associated with a high risk of severe disease and mortality by SARS-CoV-2. *J Hum Hypertens.* 2021 Apr;35(4):378-380. <https://doi.org/10.1038/s41371-020-00398-z>. Epub 2020 Aug 13. PMID: 32792611
 - Mazziotti G, Lavezzi E, Brunetti A, et al. Vitamin D deficiency, secondary hyperparathyroidism and respiratory insufficiency in hospitalized patients with COVID-19. *J Endocrinol Invest.* 2021 Mar 5:1-9. <https://doi.org/10.1007/s40618-021-01535-2>. Online ahead of print. PMID: 33666876
 - Megna M, Marasca C, Fabbrocini G, et al. Ultraviolet radiation, vitamin D and COVID-19. *Ital J Dermatol Venerol.* 2021 Apr 29. <https://doi.org/10.23736/S2784-8671.21.06833-4>. Online ahead of print. PMID: 33913665
 - Meltzer DO, Best TJ, Zhang H, et al. Association of Vitamin D Levels, Race/Ethnicity, and Clinical Characteristics With COVID-19 Test Results. *JAMA Netw Open.* 2021 Mar 1;4(3):e214117. <https://doi.org/10.1001/jamanetworkopen.2021.4117>. PMID: 33739433
 - Meoli M, Muggli F, Lava SAG, et al. Vitamin D Status in Adolescents during COVID-19 Pandemic: A Cross-Sectional Comparative Study. *Nutrients.* 2021 Apr 26;13(5):1467. <https://doi.org/10.3390/nu13051467>. PMID: 33925932
 - Name JJ, Vasconcelos AR, Souza ACR, et al. Vitamin D, zinc and glutamine: Synergistic action with OncoTherad immunomodulator in interferon signaling and COVID-19 (Review). *Int J Mol Med.* 2021 Mar;47(3):11. <https://doi.org/10.3892/ijmm.2021.4844>. Epub 2021 Jan 15. PMID: 33448317
 - Nasiri M, Khodadadi J, Molaei S. Does vitamin D serum level affect prognosis of COVID-19 patients? *Int J Infect Dis.* 2021 Jun;107:264-267. <https://doi.org/10.1016/j.ijid.2021.04.083>. Epub 2021 Apr 30. PMID: 33940189
 - Nie X, Chen J, Ye F, et al. Oral high dose vitamin D for the treatment of diabetic patients with COVID-19: A protocol for systematic review and meta-analysis. *Medicine (Baltimore).* 2021 Mar 5;100(9):e24517. <https://doi.org/10.1097/MD.00000000000024517>. PMID: 33655919
 - Notz Q, Herrmann J, Schlesinger T, et al. Vitamin D deficiency in critically ill COVID-19 ARDS patients. *Clin Nutr.* 2021 Mar 7:S0261-5614(21)00135-7. <https://doi.org/10.1016/j.clnu.2021.03.001>. Online ahead of print. PMID: 33745749
 - Orchard L, Baldry M, Nasim-Mohi M, et al. Vitamin-D levels and intensive care unit outcomes of a cohort of critically ill COVID-19 patients. *Clin Chem Lab Med.* 2021 Jan 19;59(6):1155-1163. <https://doi.org/10.1515/cclm-2020-1567>. Print 2021 May 26. PMID: 33554566
 - Paiz N, Alonso P, Portillo AL. Vitamin D Status: Can It Affect the Risk of Infection and the Severity of COVID-19 Symptoms? *Curr Trop Med Rep.* 2021 Mar 31:1-8. <https://doi.org/10.1007/s40475-021-00236-3>. Online ahead of print. PMID: 33816060
 - Pal R, Banerjee M, Bhadada SK, et al. Vitamin D supplementation and clinical outcomes in COVID-19: a systematic review and meta-analysis. *J Endocrinol Invest.* 2021 Jun 24:1-16. <https://doi.org/10.1007/s40618-021-01614-4>. Online ahead of print. PMID: 34165766
 - Papadimitriou DT, Vassaras AK, Holick MF. Association between population vitamin D status and SARS-CoV-2 related serious-critical illness and deaths: An ecological integrative approach. *World J Virol.* 2021 May 25;10(3):111-129. <https://doi.org/10.5501/wjv.v10.i3.111>. PMID: 34079693
 - Pell JP, Hastie CE, Sattar N. Reply to letter of Davie et al. regarding the article: "Vitamin D concentrations and COVID-19 infection in UK Biobank" (Hastie et al.). *Diabetes Metab Syndr.* 2021 Mar-Apr;15(2):642. <https://doi.org/10.1016/j.dsx.2021.02.017>. Epub 2021 Feb 12. PMID: 33663970
 - Peng MY, Liu WC, Zheng JQ, et al. Immunological Aspects of SARS-CoV-2 Infection and the Putative Beneficial Role of Vitamin-D. *Int J Mol Sci.* 2021 May 16;22(10):5251. <https://doi.org/10.3390/ijms22105251>. PMID: 34065735 Free PMC article. Review
 - Peruzzi D, Pagano MT, Pierdominici M, et al. Synergy Between Vitamin D and Sex Hormones in Respiratory Functionality of Patients Affected by COVID-19. *Front Pharmacol.* 2021 May 13;12:683529. <https://doi.org/10.3389/fphar.2021.683529>. eCollection 2021. PMID: 34054557
 - Petrelli F, Luciani A, Perego G, et al. Therapeutic and prognostic role of vitamin D for COVID-19 infection: A systematic review and meta-analysis of 43 observational studies. *J Steroid Biochem Mol Biol.* 2021 Jul;211:105883. <https://doi.org/10.1016/j.jsbmb.2021.105883>. Epub 2021 Mar 26. PMID: 33775818
 - Pinheiro MM, Fabbri A, Infante M. Cytokine storm modulation in COVID-19: a proposed role for vitamin D and DPP-4 inhibitor combination therapy (VIDPP-4i). *Immunotherapy.* 2021 Jun;13(9):753-765. <https://doi.org/10.2217/imt-2020-0349>. Epub 2021 Apr 28. PMID: 33906375
 - Piraux A. [Interest of vitamin D in COVID-19]. *Actual Pharm.* 2021 Apr;60(605):52-55. <https://doi.org/10.1016/j.actpharm.2021.02.012>. Epub 2021 Feb 15. PMID: 33612960
 - Polis MA. Reassessing the Association of Vitamin D Level With SARS-CoV-2 Seropositivity. *JAMA Netw Open.* 2021 May 3;4(5):e2111750. <https://doi.org/10.1001/jamanetworkopen.2021.11750>. PMID: 34009353
 - Pugach IZ, Pugach S. Strong correlation between prevalence of severe vitamin D deficiency and population mortality rate

- from COVID-19 in Europe. *Wien Klin Wochenschr.* 2021 Apr;133(7-8):403-405. <https://doi.org/10.1007/s00508-021-01833-y>. Epub 2021 Mar 15. PMID: 33721102
- Raisi-Estabragh Z, Martineau AR, Curtis EM, et al. Vitamin D and coronavirus disease 2019 (COVID-19): rapid evidence review. *Aging Clin Exp Res.* 2021 Jun 12:1-11. <https://doi.org/10.1007/s40520-021-01894-z>. Online ahead of print. PMID: 34118024
 - Reis BZ, Fernandes AI, Sales LP, et al. Influence of vitamin D status on hospital length of stay and prognosis in hospitalized patients with moderate to severe COVID-19: a multicenter prospective cohort study. *Am J Clin Nutr.* 2021 May 21:nqab151. <https://doi.org/10.1093/ajcn/nqab151>. Online ahead of print. PMID: 34020451
 - Ricci A, Pagliuca A, D'Ascanio M, et al. Circulating Vitamin D levels status and clinical prognostic indices in COVID-19 patients. *Respir Res.* 2021 Mar 3;22(1):76. <https://doi.org/10.1186/s12931-021-01666-3>. PMID: 33658032
 - Sánchez-Zuno GA, González-Estevez G, Matuz-Flores MG, et al. Vitamin D Levels in COVID-19 Outpatients from Western Mexico: Clinical Correlation and Effect of Its Supplementation. *J Clin Med.* 2021 May 28;10(11):2378. <https://doi.org/10.3390/jcm10112378>. PMID: 34071293
 - Saxena S. Vitamin D supplementation in diabetic retinopathy in the era of COVID-19. *Indian J Ophthalmol.* 2021 Mar;69(3):483-484. https://doi.org/10.4103/ijo.IJO_3798_20. PMID: 33595460
 - Sengupta T, Majumder R, Majumder S. Role of vitamin D in treating COVID-19-associated coagulopathy: problems and perspectives. *Mol Cell Biochem.* 2021 Jun;476(6):2421-2427. <https://doi.org/10.1007/s11010-021-04093-6>. Epub 2021 Feb 18. PMID: 33604809
 - Shah Alam M, Czajkowsky DM, Aminul Islam M, et al. The role of vitamin D in reducing SARS-CoV-2 infection: An update. *Int Immunopharmacol.* 2021 Apr 17;97:107686. <https://doi.org/10.1016/j.intimp.2021.107686>. Online ahead of print. PMID: 33930705
 - Shah K, Saxena D, Mavalankar D. Vitamin D supplementation, COVID-19 and disease severity: a meta-analysis. *QJM.* 2021 May 19;114(3):175-181. <https://doi.org/10.1093/qjmed/hcab009>. PMID: 33486522
 - Shakoor H, Feehan J, Al Dhaheri AS, et al. Role of vitamin D supplementation in aging patients with COVID-19. *Maturitas.* 2021 Mar 16:S0378-5122(21)00041-4. <https://doi.org/10.1016/j.maturitas.2021.03.006>. Online ahead of print. PMID: 33757717
 - Shimi G, Zand H. Association of alpha-1-antitrypsin deficiency with vitamin D status: who is most at risk of getting severe COVID-19? *Inflamm Res.* 2021 Apr;70(4):375-377. <https://doi.org/10.1007/s00011-021-01456-z>. Epub 2021 Mar 19. PMID: 33740066
 - Silberstein M. COVID-19 and IL-6: Why vitamin D (probably) helps but tocilizumab might not. *Eur J Pharmacol.* 2021 May 15;899:174031. <https://doi.org/10.1016/j.ejphar.2021.174031>. Epub 2021 Mar 13. PMID: 33722593
 - Simonson W. Erratum to Vitamin D dosing considerations in COVID-19. *Geriatr Nurs.* 2021 May-Jun;42(3):786. <https://doi.org/10.1016/j.gerinurse.2021.01.003>. Epub 2021 Jan 9. PMID: 33593490
 - Singh S, Nimavat N, Kumar Singh A, et al. Prevalence of Low Level of Vitamin D Among COVID-19 Patients and Associated Risk Factors in India - A Hospital-Based Study. *Int J Gen Med.* 2021 Jun 15;14:2523-2531. <https://doi.org/10.2147/IJGM.S309003>. eCollection 2021. PMID: 34163220
 - Speeckaert MM, Delanghe JR. A key role for vitamin D binding protein in COVID-19? *Eur J Nutr.* 2021 Jun;60(4):2259-2260. <https://doi.org/10.1007/s00394-020-02479-8>. Epub 2021 Feb 14. PMID: 33585950
 - Speeckaert MM, Delanghe JR. Importance of the Lipid-Bound Character of Vitamin D Binding Protein in the Evaluation of Vitamin D Status in COVID-19 Patients. *Am J Clin Pathol.* 2021 Apr 26;155(5):766-767. <https://doi.org/10.1093/ajcp/aqaa271>. PMID: 33399186
 - Speeckaert MM, Delanghe JR. The influence of the genetic background of the host on vitamin D deficiency in children with COVID-19. *Pediatr Pulmonol.* 2021 May;56(5):1259-1260. <https://doi.org/10.1002/ppul.25196>. Epub 2020 Dec 14. PMID: 33316149
 - Speeckaert MM, Delanghe JR. The potential significance of vitamin D binding protein polymorphism in COVID-19. *Int J Infect Dis.* 2021 Jun 23:S1201-9712(21)00532-4. <https://doi.org/10.1016/j.ijid.2021.06.044>. Online ahead of print. PMID: 34174433
 - Speeckaert MM, Delanghe JR. Vitamin D binding protein: A polymorphic protein with actin-binding capacity in COVID-19. *Nutrition.* 2021 May 18:111347. <https://doi.org/10.1016/j.nut.2021.111347>. Online ahead of print. PMID: 34167880
 - Speeckaert MM, Delanghe JR. Genetic polymorphisms, vitamin D binding protein and vitamin D deficiency in COVID-19. *Eur Respir J.* 2021 May 6;57(5):2004638. <https://doi.org/10.1183/13993003.04638-2020>. Print 2021 May. PMID: 33542051
 - Speeckaert MM, Speeckaert R, Delanghe JR. The biologic importance of the vitamin D binding protein polymorphism in pediatric COVID-19 patients. *Eur J Pediatr.* 2021 May 23:1-2. <https://doi.org/10.1007/s00431-021-04110-2>. Online ahead of print. PMID: 34027625
 - Speeckaert MM, Speeckaert R, Delanghe JR. Vitamin D and Vitamin D binding protein: the inseparable duo in COVID-19. *J Endocrinol Invest.* 2021 Apr 11:1-2. <https://doi.org/10.1007/s40618-021-01573-w>. Online ahead of print. PMID: 33840080
 - Speeckaert MM, Speeckaert R, Delanghe JR. Vitamin D Sufficiency and COVID-19: Is Vitamin D Binding Protein (and Its Polymorphism) the Missing Link? *Endocr Pract.* 2021 Jun;27(6):645. <https://doi.org/10.1016/j.eprac.2021.03.011>. Epub 2021 Apr 2. PMID: 33819636
 - Story MJ. Essential sufficiency of zinc, omega-3 polyunsaturated fatty acids, vitamin D and magnesium for prevention and treatment of COVID-19, diabetes, cardiovascular diseases, lung diseases and cancer. *Biochimie.* 2021 May 31;187:94-109. <https://doi.org/10.1016/j.biochi.2021.05.013>. Online ahead of print. PMID: 34082041
 - Stroehlein JK, Wallqvist J, Iannizzi C, et al. Vitamin D supplementation for the treatment of COVID-19: a living systematic review. *Cochrane Database Syst Rev.* 2021 May 24;5:CD015043. <https://doi.org/10.1002/14651858.CD015043>

org/10.1002/14651858.CD015043. PMID: 34029377

- Tehrani S, Khabiri N, Moradi H, et al. Evaluation of vitamin D levels in COVID-19 patients referred to Labafinejad hospital in Tehran and its relationship with disease severity and mortality. *Clin Nutr ESPEN*. 2021 Apr;42:313-317. <https://doi.org/10.1016/j.clnesp.2021.01.014>. Epub 2021 Jan 26. PMID: 33745598
 - Teshome A, Adane A, Girma B, et al. The Impact of Vitamin D Level on COVID-19 Infection: Systematic Review and Meta-Analysis. *Front Public Health*. 2021 Mar 5;9:624559. <https://doi.org/10.3389/fpubh.2021.624559>. eCollection 2021. PMID: 33748066
 - Teymoori-Rad M, Marashi SM. Vitamin D and Covid-19: From potential therapeutic effects to unanswered questions. *Rev Med Virol*. 2021 Mar;31(2):e2159. <https://doi.org/10.1002/rmv.2159>. Epub 2020 Aug 28. PMID: 32856339 Review
 - Thacher TD. Vitamin D and COVID-19. *Mayo Clin Proc*. 2021 Apr;96(4):838-840. <https://doi.org/10.1016/j.mayocp.2021.02.014>. Epub 2021 Feb 25. PMID: 33814087
 - Trovas G, Tournis S. Vitamin D and COVID-19. *Hormones (Athens)*. 2021 Mar;20(1):207-208. <https://doi.org/10.1007/s42000-020-00231-9>. Epub 2020 Jul 14. PMID: 32666357
 - Turrubiates-Hernández FJ, Sánchez-Zuno GA, González-Estevez G, et al. Potential immunomodulatory effects of vitamin D in the prevention of severe coronavirus disease 2019: An ally for Latin America (Review). *Int J Mol Med*. 2021 Apr;47(4):32. <https://doi.org/10.3892/ijmm.2021.4865>. Epub 2021 Feb 4. PMID: 33537824
 - Ulivieri FM, Banfi G, Camozzi V, et al. Vitamin D in the Covid-19 era: a review with recommendations from a G.I.O.S.E.G. expert panel. *Endocrine*. 2021 Jun;72(3):597-603. <https://doi.org/10.1007/s12020-021-02749-3>. Epub 2021 May 17. PMID: 33999367
 - Ünsal YA, Güllü ÖÖ, Cander S, et al. Retrospective analysis of vitamin D status on inflammatory markers and course of the disease in patients with COVID-19 infection. *J Endocrinol Invest*. 2021 Apr 5:1-7. <https://doi.org/10.1007/s40618-021-01566-9>. Online ahead of print. PMID: 33818731
 - Vimaleswaran KS, Forouhi NG, Khunti K. Vitamin D and covid-19. *BMJ*. 2021 Mar 4;372:n544. <https://doi.org/10.1136/bmj.n544>. PMID: 33664083
 - Wang Z, Joshi A, Leopold K, et al. Association of Vitamin D Deficiency with COVID-19 Infection Severity: Systematic Review and Meta-analysis. *Clin Endocrinol (Oxf)*. 2021 Jun 23. <https://doi.org/10.1111/cen.14540>. Online ahead of print. PMID: 34160843
 - Weiss ST. Vitamin D and COVID-19: Can it be protective? *Am J Clin Nutr*. 2021 May 8;113(5):1079-1080. <https://doi.org/10.1093/ajcn/nqab040>. PMID: 33742196
 - Wong RS, Tung KTS, So HK, et al. Impact of COVID-19 Pandemic on Serum Vitamin D Level among Infants and Toddlers: An Interrupted Time Series Analysis and before-and-after Comparison. *Nutrients*. 2021 Apr 13;13(4):1270. <https://doi.org/10.3390/nu13041270>. PMID: 33924387
 - Žmitek K, Hribar M, Lavriša Ž, et al. Socio-Demographic and Knowledge-Related Determinants of Vitamin D Supplementation in the Context of the COVID-19 Pandemic: Assessment of an Educational Intervention. *Front Nutr*. 2021 Jun 2;8:648450. <https://doi.org/10.3389/fnut.2021.648450>. eCollection 2021. PMID: 34150825
- DERMATOLOGY**
- Ahmed Mohamed A, Salah Ahmed EM, Farag YM, et al. Dose-response association between vitamin D deficiency and atopic dermatitis in children, and effect modification by gender: a case-control study. *J Dermatolog Treat*. 2021 Mar;32(2):174-179. <https://doi.org/10.1080/0954634.2019.1643447>. Epub 2019 Aug 2. PMID: 31296076
 - Alamoudi SM, Marghalani SM, Alajmi RS, et al. Association Between Vitamin D and Zinc Levels With Alopecia Areata Phenotypes at a Tertiary Care Center. *Cureus*. 2021 Apr 28;13(4):e14738. <https://doi.org/10.7759/cureus.14738>. PMID: 34079683
 - Drodge DR, Budu-Aggrey A, Paternoster L. Causal Analysis Shows Evidence of Atopic Dermatitis Leading to an Increase in Vitamin D Levels. *J Invest Dermatol*. 2021 May;141(5):1339-1341. <https://doi.org/10.1186/s12948-021-00145-w>. PMID: 34044815
 - El Hadidi HH, Sobhi RM, Nada AM, et al. Does vitamin D deficiency predispose to keloids via dysregulation of koebnerisin (S100A15)? A case-control study. *Wound Repair Regen*. 2021 May;29(3):425-431. <https://doi.org/10.1111/wrr.12894>. Epub 2021 Jan 21. PMID: 33476473
 - El-Husseiny R, Alrigg NT, Abdel Fattah NSA. Epidemiological and biochemical factors (serum ferritin and vitamin D) associated with premature hair graying in Egyptian population. *J Cosmet Dermatol*. 2021 Jun;20(6):1860-1866. <https://doi.org/10.1111/jocd.13747>. Epub 2020 Oct 15. PMID: 33001544
 - Elsayed Ghaly N, El-Ashmawy AA, Abou Zeid M, et al. Efficacy and safety of intraleisional injection of vitamin D(3) versus tuberculin PPD in the treatment of plantar warts: A comparative controlled study. *J Cosmet Dermatol*. 2021 Apr;20(4):1231-1240. <https://doi.org/10.1111/jocd.13712>. Epub 2020 Sep 21. PMID: 32892493 Clinical Trial
 - Esenboga S, Cetinkaya PG, Sahiner N, et al. Infantile atopic dermatitis: Serum vitamin D, zinc and TARC levels and their relationship with disease phenotype and severity. *Allergol Immunopathol (Madr)*. 2021 May 1;49(3):162-168. <https://doi.org/10.15586/aei.v49i3.191>. eCollection 2021. PMID: 33938202
 - Filoni A, Congedo M, Lobreglio D, et al. Free and total vitamin D in psoriatic patients treated with biological drugs. *Exp Dermatol*. 2021 Mar 9. <https://doi.org/10.1111/exd.14322>. Online ahead of print. PMID: 33687755
 - Imoto RR, Uber M, Abagge KT, et al. Vitamin D supplementation and severity of atopic dermatitis: pre-post assessment. *Allergol Immunopathol (Madr)*. 2021 Mar 1;49(2):66-71. <https://doi.org/10.15586/aei.v49i2.67>. eCollection 2021. PMID: 33641296
 - Khoshkhui M, Iravani F, Jabbari-Azad F, et al. Significant association between Taq1 gene polymorphism in vitamin D receptor and chronic spontaneous urticaria in the Northeast of Iran. *Clin Mol Allergy*. 2021 May 27;19(1):6. <https://doi.org/10.1186/s12948-021-00145-w>. PMID: 34044815

- Li Y, Cao Z, Guo J, et al. Effects of Serum Vitamin D Levels and Vitamin D Supplementation on Urticaria: A Systematic Review and Meta-Analysis. *Int J Environ Res Public Health*. 2021 May; 18(9):4911. <https://doi.org/10.3390/ijerph18094911>. PMID: 34062998
 - Lombardo M, Vigezzi A, Ietto G, et al. Role of vitamin D serum levels in prevention of primary and recurrent melanoma. *Sci Rep*. 2021 Mar 12;11(1):5815. <https://doi.org/10.1038/s41598-021-85294-3>. PMID: 33712642
 - Mamdouh M, Omar GA, Hafiz HSA, et al. Role of vitamin D in treatment of keloid. *J Cosmet Dermatol*. 2021 Mar 15. <https://doi.org/10.1111/jocd.14070>. Online ahead of print. PMID: 33721390
 - Manav V, Türk CB, Kara Polat A, et al. Evaluation of the serum magnesium and vitamin D levels and the risk of anxiety in primary hyperhidrosis. *J Cosmet Dermatol*. 2021 Mar 18. <https://doi.org/10.1111/jocd.14075>. Online ahead of print. PMID: 33738914
 - McCullough PJ, McCullough WP, Lehner D, et al. Oral and Topical Vitamin D, Sunshine, and UVB Phototherapy Safely Control Psoriasis in Patients with Normal Pretreatment Serum 25-Hydroxyvitamin D Concentrations: A Literature Review and Discussion of Health Implications. *Nutrients*. 2021 Apr 29;13(5):1511. <https://doi.org/10.3390/nu13051511>. PMID: 33947070
 - Petriashvili M. Impact of Maternal Vitamin D Status on the Formation of Atopic Dermatitis in Young Children. *Glob Pediatr Health*. 2021 Jun 6;8:2333794X211022916. <https://doi.org/10.1177/2333794X211022916>. eCollection 2021. PMID: 34164570
 - Saudi WM, Swelam MM, El-Barbary RAH, et al. Vitamin D receptor (VDR) gene polymorphism in Egyptian vitiligo patients. *J Cosmet Dermatol*. 2021 Mar;20(3):980-986. <https://doi.org/10.1111/jocd.13606>. Epub 2020 Jul 25. PMID: 32648639
 - Sawicki K, Czajka M, Matysiak-Kucharek M, et al. Chlorpyrifos alters expression of enzymes involved in vitamin D(3) synthesis in skin cells. *Pestic Biochem Physiol*. 2021 May;174:104812. <https://doi.org/10.1016/j.pestbp.2021.104812>. Epub 2021 Feb 27. PMID: 33838712
 - Seetan K, Al-Zubi M. Vitamin D level and tinea capitis, is there an association? *J Mycol Med*. 2021 Jun;31(2):101112. <https://doi.org/10.1016/j.mycmed.2021.101112>. Epub 2021 Jan 11. PMID: 33476988
 - Shalaby ME, Hasan MS, Elshorbagy MS, et al. Diagnostic and therapeutic implications of vitamin D deficiency in patients with warts: A case-controlled study. *J Cosmet Dermatol*. 2021 Apr 15. <https://doi.org/10.1111/jocd.14156>. Online ahead of print. PMID: 33860625
 - Singh A, Dorjay K, Sinha S, et al. The interplay of vitamin D and body mass index in acne patients vs. controls. *J Cosmet Dermatol*. 2021 Mar 2. <https://doi.org/10.1111/jocd.14034>. Online ahead of print. PMID: 33655695
 - Smith K, Hewlings S. Correlation between vitamin D levels and hard-to-heal wounds: a systematic review. *J Wound Care*. 2021 Jun 1;30(Suppl 6):S4-S10. <https://doi.org/10.12968/jowc.2021.30.Sup6.S4>. PMID: 34120468
 - Thompson KG, Kim N. Dietary supplements in dermatology: A review of the evidence for zinc, biotin, vitamin D, nicotinamide, and Polypodium. *J Am Acad Dermatol*. 2021 Apr;84(4):1042-1050. <https://doi.org/10.1016/j.jaad.2020.04.123>. Epub 2020 Apr 29. PMID: 32360756 Review
 - Vandikas MS, Landin-Wilhelmsen K, Holmäng A, et al. High levels of serum vitamin D-binding protein in patients with psoriasis: A case-control study and effects of ultraviolet B phototherapy. *J Steroid Biochem Mol Biol*. 2021 Jul;211:105895. <https://doi.org/10.1016/j.jsbmb.2021.105895>. Epub 2021 Apr 2. PMID: 33819632
 - Varikasuvu SR, Aloori S, Varshney S, et al. Decreased circulatory levels of Vitamin D in Vitiligo: a meta-analysis. *An Bras Dermatol*. 2021 May-Jun;96(3):284-294. <https://doi.org/10.1016/j.abd.2020.10.002>. Epub 2021 Mar 24. PMID: 33863565
 - Wang M, Zhou Y, Yan Y. Vitamin D status and efficacy of vitamin D supplementation in acne patients: A systematic review and meta-analysis. *J Cosmet Dermatol*. 2021 Mar 10. <https://doi.org/10.1111/jocd.14057>. Online ahead of print. PMID: 33690970 Review
- ## EPIDEMIOLOGY
- Akinlawon OJ, Lai CQ, Noel SE, et al. Risk Factors Associated with Vitamin D Status among Older Puerto Rican Adults. *J Nutr*. 2021 Apr 8;151(4):999-1007. <https://doi.org/10.1093/jn/nxaa426>. PMID: 33693857
 - Al-Daghri NM, Hussain SD, Ansari MGA, et al. Decreasing prevalence of vitamin D deficiency in the central region of Saudi Arabia (2008-2017). *Steroid Biochem Mol Biol*. 2021 May 15;212:105920. <https://doi.org/10.1016/j.jsbmb.2021.105920>. Online ahead of print. PMID: 34004334
 - Avdeeva VA, Suplotova IA, Pigarova EA, et al. [Vitamin D deficiency in Russia: the first results of a registered, non-interventional study of the frequency of vitamin D deficiency and insufficiency in various geographic regions of the country]. *Probl Endokrinol (Mosk)*. 2021 Apr 5;67(2):84-92. <https://doi.org/10.14341/probl12736>. PMID: 34004105 Russian
 - Benhamou J, Schindler C, Rutishauser J. Prevalence of vitamin D deficiency in an inpatient population in the Swiss Canton of Basel-Country. *Swiss Med Wkly*. 2021 Mar 11;151:w20470. <https://doi.org/10.4414/smw.2021.20470>. eCollection 2021 Mar 1. PMID: 33714209
 - Borecka O, Farrar MD, Osman JE, et al. Older Adults Who Spend More Time Outdoors in Summer and Have Higher Dietary Vitamin D Than Younger Adults Can Present at Least as High Vitamin D Status: A Pilot Study. *Int J Environ Res Public Health*. 2021 Mar 24;18(7):3364. <https://doi.org/10.3390/ijerph18073364>. PMID: 33805086
 - Chávez-Courtois M, Godínez-Martínez E, Muñoz-Manrique C, et al. Vitamin D Status and Its Determinants in Mexican Pregnant Women from a Rural and an Urban Area: A Comparative Study. *Int J Environ Res Public Health*. 2021 Apr 26;18(9):4571. <https://doi.org/10.3390/ijerph18094571>. PMID: 33925817
 - Chen Z, Lv X, Hu W, et al. Vitamin D Status and Its Influence on the Health of Preschool Children in Hangzhou. *Front Public Health*. 2021 May 17;9:675403. <https://doi.org/10.3389/fpubh.2021.675403>. eCollection 2021. PMID: 34079788
 - Contreras-Manzano A, Mejía-Rodríguez F, Villalpando S, et al. Vitamin D status in Mexican women at reproductive age, Ensanat 2018-19. *Salud Publica Mex*. 2021 May 3;63(3 May-Jun):394-400. <https://doi.org/10.26919/saludpublicamex.2021.001>

- doi.org/10.21149/12161. PMID: 34098607
- Costanzo PR, Suárez SM, Kozak AE, et al. Seasonal Variations in Sex Steroids in a Young Male Population and Their Relationship with Plasma Levels of Vitamin D. *World J Mens Health.* 2021 Jun 9. <https://doi.org/10.5534/wjmh.200156>. Online ahead of print. PMID: 34169681
 - Díaz-López A, Paz-Graniel I, Alonso-Sanz R, et al. Vitamin D deficiency in primary health care users at risk in Spain. *Nutr Hosp.* 2021 Apr 19. <https://doi.org/10.20960/nh.03565>. Online ahead of print. PMID: 33866793
 - Divanoglou N, Komninou D, Stea EA, et al. Association of Vitamin D Receptor Gene Polymorphisms with Serum Vitamin D Levels in a Greek Rural Population (Velestino Study). *Lifestyle Genom.* 2021 Jun 17:1-10. <https://doi.org/10.1159/000514338>. Online ahead of print. PMID: 34139712
 - Drali O, Arab M, Lamjadani N, et al. Vitamin D status in preschool children in Algeria. *Arch Pediatr.* 2021 Apr;28(3):215-221. <https://doi.org/10.1016/j.arcped.2020.12.013>. Epub 2021 Mar 9. PMID: 33707102
 - Dudley B, Ostrowski M, Ciausu V, et al. Revisiting vitamin D status and supplementation for in-patients with intellectual and developmental disability in the North of England, UK. *BJPsych Bull.* 2021 May 18;1-7. <https://doi.org/10.1192/bj.b.2021.55>. Online ahead of print. PMID: 34002690
 - Farzin LR, Dastgiri S. Familial Aggregation in Vitamin D Deficiency Disorder. *Cureus.* 2021 Apr 25;13(4):e14685. <https://doi.org/10.7759/cureus.14685>. PMID: 34055530
 - García-Dorta A, Medina-Vega L, Villacampa-Jiménez JJ, et al. Baseline Levels of Vitamin D in a Healthy Population from a Region with High Solar Irradiation. *Nutrients.* 2021 May 13;13(5):1647. <https://doi.org/10.3390/nu13051647>. PMID: 34068177
 - Gerges MES, Amin GEA, Andraous F, et al. Vitamin D level in a sample of Egyptian females of childbearing age attending a family medicine center. *Int J Clin Pract.* 2021 Apr;75(4):e13738. <https://doi.org/10.1111/ijcp.13738>. Epub 2020 Nov 3. PMID: 32991001
 - Horton-French K, Dunlop E, Lucas RM, et al. Prevalence and predictors of vitamin D deficiency in a nationally representative sample of Australian adolescents and young adults. *Eur J Clin Nutr.* 2021 Mar 1:1-10. <https://doi.org/10.1038/s41430-021-00880-y>. Online ahead of print. PMID: 33649524
 - Hutchings N, Babalyan V, Heijboer AC, et al. Vitamin D status in Armenian women: a stratified cross-sectional cluster analysis. *Eur J Clin Nutr.* 2021 May 13. <https://doi.org/10.1038/s41430-021-00934-1>. Online ahead of print. PMID: 33986494
 - Ikonen H, Lumme J, Seppälä J, et al. The determinants and longitudinal changes in vitamin D status in middle-age: a Northern Finland Birth Cohort 1966 study. *Eur J Nutr.* 2021 Jun 17. <https://doi.org/10.1007/s00394-021-02606-z>. Online ahead of print. PMID: 34137914
 - Karras SN, Koufakis T, Dimakopoulos G, et al. Vitamin D equilibrium affects sex-specific changes in lipid concentrations during Christian Orthodox fasting. *J Steroid Biochem Mol Biol.* 2021 Jul;211:105903. <https://doi.org/10.1016/j.jsbmb.2021.105903>. Epub 2021 Apr 30. PMID: 33933575
 - Leão IMCSM, Rodrigues BC, Dias PTP, et al. Vitamin D status and prevalence of hypovitaminosis D in different genders throughout life stages: A Brazilian cross-sectional study. *Clinics (Sao Paulo).* 2021 Apr 9;76:e2571. <https://doi.org/10.6061/clinics/2021/e2571>. eCollection 2021. PMID: 33852654
 - Lin L, Ou Q, Lin L, et al. Low prevalence of vitamin D deficiency in adult residents in Hainan, the tropical island province of China. *Ann Palliat Med.* 2021 May;10(5):5580-5589. <https://doi.org/10.21037/apm-21-1033>. PMID: 34107706
 - Lin S, Jiang L, Zhang Y, et al. Socioeconomic status and vitamin D deficiency among women of childbearing age: a population-based, case-control study in rural northern China. *BMJ Open.* 2021 Mar 22;11(3):e042227. <https://doi.org/10.1136/bmjopen-2020-042227>. PMID: 33753436
 - Milovanovic JR, Milovanovic OZ, Tomic Lucic A, et al. The significant role of dietary intake of vitamin D in non-menopausal women health. *Women Health.* 2021 May-Jun;61(5):420-430. <https://doi.org/10.1080/03630242.2021.1917480>. Epub 2021 Apr 29. PMID: 33926369
 - Mogire RM, Morovat A, Muriuki JM, et al. Prevalence and predictors of vitamin D deficiency in young African children. *BMC Med.* 2021 May 20;19(1):115. <https://doi.org/10.1186/s12916-021-01985-8>. PMID: 34011341
 - Ncayiyana JR, Martinez I, Goddard E, et al. Prevalence and Correlates of Vitamin D Deficiency among Young South African Infants: A Birth Cohort Study. *Nutrients.* 2021 Apr 29;13(5):1500. <https://doi.org/10.3390/nu13051500>. PMID: 33946851
 - Odhaib SA, Alibrahim NT, Zaboon IA, et al. Vitamin D Metabolic Profiles in Pre-menopausal Women Wearing Niqab and Hijab in Sunny Basrah. *Cureus.* 2021 May 8;13(5):e14909. <https://doi.org/10.7759/cureus.14909>. PMID: 34113519
 - Said NA, Kamenwa RW, Limbe MS, et al. Prevalence of vitamin D deficiency in exclusively breastfed infants at a tertiary healthcare facility in Nairobi, Kenya. *Arch Endocrinol Metab.* 2021 May 18;64(6):726-734. <https://doi.org/10.20945/2359-3997000000281>. PMID: 34033282
 - Salman S, Khouzami M, Harb M, et al. Prevalence and Predictors of Vitamin D Inadequacy: A Sample of 2,547 Patients in a Mediterranean Country. *Cureus.* 2021 May 7;13(5):e14881. <https://doi.org/10.7759/cureus.14881>. PMID: 34104607
 - Shamsi U, Azam I, Shamsi A, et al. Frequency and determinants of vitamin D deficiency among premenopausal and postmenopausal women in Karachi Pakistan. *BMC Womens Health.* 2021 May 10;21(1):194. <https://doi.org/10.1186/s12905-021-01339-9>. PMID: 33971882
 - Stojanović E, Radovanović D, Hew-Butler T, et al. Vitamin D in Basketball Players: Current Evidence and Future Directions. *Sports Health.* 2021 Jun 4:19417381211019343. <https://doi.org/10.1177/19417381211019343>. Online ahead of print. PMID: 34085865
 - Surve S, Begum S, Chauhan S, et al. Determinants of Vitamin D Deficiency Among Under-five Children in Urban Slums of Mumbai, India. *Indian Pediatr.* 2021 May

- 28:S097475591600338. Online ahead of print. PMID: 34047721
- Sutherland JP, Zhou A, Leach MJ, et al. Differences and determinants of vitamin D deficiency among UK biobank participants: A cross-ethnic and socioeconomic study. *Clin Nutr.* 2021 May;40(5):3436-3447. <https://doi.org/10.1016/j.clnu.2020.11.019>. Epub 2020 Nov 25. PMID: 33309415
 - Switkowski KM, Camargo CA, Rivas-Shiman SL, et al. Early-Life Factors Are Associated with Vitamin D Status in Early and Mid-Childhood and May Differ between White and Black Children. *J Nutr.* 2021 May 11;151(5):1256-1268. <https://doi.org/10.1093/jn/nxaa456>. PMID: 33693813
 - Valtueña J, Aparicio-Ugarriza R, Medina D, et al. Vitamin D Status in Spanish Elite Team Sport Players. *Nutrients.* 2021 Apr 15;13(4):1311. <https://doi.org/10.3390/nu13041311>. PMID: 33921150
 - Vasudevan B, Karunakaran U, Antony A, et al. Vitamin D status and associated factors among peri menopausal women in two selected districts of Kerala. *Indian J Public Health.* 2021 Apr-Jun;65(2):166-171. https://doi.org/10.4103/ijph.IJPH_760_20. PMID: 34135186
 - Veselka B, Brickley MB, Waters-Rist AL. A joint medico-historical and paleopathological perspective on vitamin D deficiency prevalence in post-Medieval Netherlands. *Int J Paleopathol.* 2021 Mar;32:41-49. <https://doi.org/10.1016/j.ijpp.2020.10.010>. Epub 2020 Dec 1. PMID: 33276206
 - Wilson-Barnes SL, Hunt JEA, Mendis J, et al. The relationship between vitamin D status, intake and exercise performance in UK University-level athletes and healthy inactive controls. *PLoS One.* 2021 Apr 2;16(4):e0249671. <https://doi.org/10.1371/journal.pone.0249671>. eCollection 2021. PMID: 33798240
 - Won JW, Jung SK, Jung IA, et al. Seasonal Changes in Vitamin D Levels of Healthy Children in Mid-Latitude, Asian Urban Area. *Pediatr Gastroenterol Hepatol Nutr.* 2021 Mar;24(2):207-217. <https://doi.org/10.5223/pghn.2021.24.2.207>. Epub 2021 Mar 4. PMID: 33833976
- stress and their relationships in professional soccer players. *J Sports Med Phys Fitness.* 2021 Jun 1. <https://doi.org/10.23736/S0022-4707.21.12094-8>. Online ahead of print. PMID: 34080814
- Amiri M, Raeisi-Dehkordi H, Vorland CJ, et al. Double-counting of effect sizes and inappropriate exclusion of studies in "The influence of vitamin D supplementation on IGF-1 levels in humans: A systematic review and meta-analysis". *Ageing Res Rev.* 2021 Mar;66:101236. <https://doi.org/10.1016/j.arr.2020.101236>. Epub 2020 Dec 15. PMID: 33338606
 - Arıman A, Merder E, Çulha MG, et al. Relation of glycated hemoglobin and vitamin D deficiency with erectile dysfunction in patients with type 2 diabetes mellitus. *Andrologia.* 2021 Apr 27:e14076. <https://doi.org/10.1111/and.14076>. Online ahead of print. PMID: 33905126
 - Ashcroft SP, Fletcher G, Philp AM, et al. Diet-induced vitamin D deficiency reduces skeletal muscle mitochondrial respiration. *J Endocrinol.* 2021 May;249(2):113-124. <https://doi.org/10.1530/JOE-20-0233>. PMID: 33862598
 - Bakhamsi S, Imtiaz F, Ramzan K, et al. 25-Hydroxylase vitamin D deficiency in 27 Saudi Arabian subjects: a clinical and molecular report on CYP2R1 mutations. *Endocr Connect.* 2021 Jun 1:EC-21-0102.R1. <https://doi.org/10.1530/EC-21-0102>. Online ahead of print. PMID: 34137732
 - Barrea L, Frias-Toral E, Pugliese G, et al. Vitamin D in obesity and obesity-related diseases: an overview. *Minerva Endocrinol (Torino).* 2021 Jun;46(2):177-192. <https://doi.org/10.23736/S0391-1977.20.03299X>. Epub 2020 Nov 19. PMID: 33213116
 - Bazshahi E, Pourreza S, Ghanbari M, et al. Association of Vitamin D status with Visceral Adiposity Index and Lipid Accumulation Product Index among a Group of Iranian People. *Clin Nutr Res.* 2021 Apr 26;10(2):150-160. <https://doi.org/10.7762/cnr.2021.10.2.150>. eCollection 2021 Apr. PMID: 33987141
 - Buchmann N, Eckstein N, Spira D, et al. Vitamin D insufficiency is associated with metabolic syndrome independent of insulin resistance and obesity in young adults - The Berlin Aging Study II. *Diabetes Metab Res Rev.* 2021 Apr 22:e3457. <https://doi.org/10.1002/dmrr.3457>. Online ahead of print. PMID: 33886146
 - Buscemi S, Buscemi C, Corleo D, et al. Obesity and Circulating Levels of Vitamin D before and after Weight Loss Induced by a Very Low-Calorie Ketogenic Diet. *Nutrients.* 2021 May 27;13(6):1829. <https://doi.org/10.3390/nu13061829>. PMID: 34071985
 - Chen X, Chu C, Doebis C, et al. Sex Dependent Association of Vitamin D with Insulin Resistance. *J Clin Endocrinol Metab.* 2021 Apr 1:dgab213. <https://doi.org/10.1210/clinem/dgab213>. Online ahead of print. PMID: 33791798
 - Choi EHE, Qeadan F, Alkhalili E, et al. Pre-operative vitamin D deficiency is associated with increased risk of postoperative hypocalcemia after total thyroidectomy. *J Investig Med.* 2021 Mar 31;jim-2020-001644. <https://doi.org/10.1136/jim-2020-001644>. Online ahead of print. PMID: 33789986
 - Chou SH, Murata EM, Yu C, et al. Effects of Vitamin D3 Supplementation on Body Composition in the VITamin D and Omega-3 Trial (VITAL). *J Clin Endocrinol Metab.* 2021 Apr 23;106(5):1377-1388. <https://doi.org/10.1210/clinem/dgaa981>. PMID: 33513226
 - Cordeiro MM, Biscaia PB, Brunoski J, et al. Vitamin D supplementation decreases visceral adiposity and normalizes leptinemia and circulating TNF-alpha levels in western dietfed obese rats. *Life Sci.* 2021 Aug 1;278:119550. <https://doi.org/10.1016/j.lfs.2021.119550>. Epub 2021 Apr 29. PMID: 33932442
 - D'Amelio P. Vitamin D Deficiency and Risk of Metabolic Syndrome in Aging Men. *World J Mens Health.* 2021 Apr;39(2):291-301. <https://doi.org/10.5534/wjmh.200189>. Epub 2021 Jan 26. PMID: 33663024
 - D'Andrea S, Martorella A, Coccia F, et al. Relationship of Vitamin D status with testosterone levels: a systematic review and meta-analysis. *Endocrine.* 2021 Apr;72(1):49-61. <https://doi.org/10.1007/s12020-020-02482-3>. Epub 2020 Sep 3. PMID: 32880851
 - Dalan R. Letter to the Editor from Dalan: "Vitamin D Supplementation for Prevention of Type 2 Diabetes Mellitus: To D or Not to D?". *J Clin Endocrinol Metab.* 2021 Mar

ENDOCRINOLOGY

- Abate M, Di Carlo L, Cocco G, et al. Testosterone, cortisol, vitamin D and oxydative

- 25;106(4):e1922-e1923. <https://doi.org/10.1210/clinem/dgaa967>. PMID: 33432973
- Dashti F, Mousavi SM, Larijani B, et al. The effects of vitamin D supplementation on inflammatory biomarkers in patients with abnormal glucose homeostasis: A systematic review and meta-analysis of randomized controlled trials. *Pharmacol Res.* 2021 Jun 11;170:105727. <https://doi.org/10.1016/j.phrs.2021.105727>. Online ahead of print. PMID: 34126229 Review
 - Davidson MB. Intratrial Exposure to Vitamin D and New-Onset Diabetes Among Adults With Prediabetes: A Secondary Analysis From the Vitamin D and Type 2 Diabetes (D2d) Study. *Diabetes Care* 2020;43:2916-2922. *Diabetes Care*. 2021 May;44(5):e105. <https://doi.org/10.2337/dc20-3130>. PMID: 33972322
 - Dawson-Hughes B, Nelson J, Pittas AG. Intratrial Exposure to Vitamin D and New-Onset Diabetes Among Adults With Prediabetes: A Secondary Analysis From the Vitamin D and Type 2 Diabetes (D2d) Study. *Diabetes Care* 2020;43:2916-2922. *Diabetes Care*. 2021 May;44(5):e106. <https://doi.org/10.2337/dc21-0006>. PMID: 33972323
 - Ding F, Nie X, Li X, et al. Data mining: Biological and temporal factors associated with blood parathyroid hormone, vitamin D, and calcium concentrations in the Southwestern Chinese population. *Clin Biochem.* 2021 Apr;90:50-57. <https://doi.org/10.1016/j.clinbiochem.2021.01.014>. Epub 2021 Feb 2. PMID: 33539806
 - Dos Santos EM, de Lima DSC, Padilha BM, et al. Vitamin D in the Preoperative and Postoperative Periods of Bariatric Surgery. *Obes Surg.* 2021 Jun;31(6):2723-2728. <https://doi.org/10.1007/s11695-021-05329-6>. Epub 2021 Mar 16. PMID: 33725295
 - Ebadi SA, Sharifi L, Rashidi E, et al. Supplementation with vitamin D and insulin homeostasis in healthy overweight and obese adults: A randomized clinical trial. *Obes Res Clin Pract.* 2021 May-Jun;15(3):256-261. <https://doi.org/10.1016/j.orcp.2021.03.004>. Epub 2021 Mar 18. PMID: 33744225
 - Ehrampoush E, Mirzay Razzaz J, Arjmand H, et al. The association of vitamin D levels and insulin resistance. *Clin Nutr ESPEN.* 2021 Apr;42:325-332. <https://doi.org/10.1016/j.clnesp.2021.01.012>. Epub 2021 Feb 3. PMID: 33745601
 - El-Sawaf ES, Saleh S, Abdallah DM, et al. Vitamin D and rosuvastatin obliterate peripheral neuropathy in a type-2 diabetes model through modulating Notch1, Wnt10alpha, TGF-beta and NRF-1 crosstalk. *Life Sci.* 2021 Aug 15;279:119697. <https://doi.org/10.1016/j.lfs.2021.119697>. Epub 2021 Jun 5. PMID: 34102194
 - Faienza MF, Brunetti G, Grugni G, et al. The genetic background and vitamin D supplementation can affect irisin levels in Prader-Willi syndrome. *J Endocrinol Invest.* 2021 Mar 3. <https://doi.org/10.1007/s40618-021-01533-4>. Online ahead of print. PMID: 33656700
 - Fang F, Chai Y, Wei H, et al. Vitamin D deficiency is associated with thyroid autoimmunity: results from an epidemiological survey in Tianjin, China. *Endocrine.* 2021 Mar 23. <https://doi.org/10.1007/s12020-021-02688-z>. Online ahead of print. PMID: 33759075
 - Fassula AS, Gonzalez-Chica D, Giehl MC, et al. Moderator role of vitamin D concentrations on the association between metabolic syndrome and C-reactive protein among adults. *Arch Endocrinol Metab.* 2021 May 18;64(6):695-703. <https://doi.org/10.20945/2359-3997000000272>. PMID: 34033278
 - Gasmi A, Björklund G, Peana M, et al. Phosphocalcic metabolism and the role of vitamin D, vitamin K2, and nattokinase supplementation. *Crit Rev Food Sci Nutr.* 2021 May 8:1-17. <https://doi.org/10.1080/10408398.2021.1910481>. Online ahead of print. PMID: 33966563
 - Gu X, Zhang D, Gao Z, et al. Correlations of polymorphisms of vitamin d receptor genes apai and bsmi with diabetic retinopathy. *Panminerva Med.* 2021 May 28. <https://doi.org/10.23736/S0031-0808.21.04365-2>. Online ahead of print. PMID: 34047520
 - Gudlaugsdottir BL, Engilbertsdottir S, Franzson L, et al. [Vitamin D status before and after metabolic and bariatric surgery at Landspítali]. *Laeknabladid.* 2021 Mar;107(3):137-143. <https://doi.org/10.17992/lbl.2021.03.627>. PMID: 33625380
 - Guesmi A, Zouaoui M, Haouat E, et al. Association of Vitamin D Receptor Gene Polymorphisms With the Evolution of MODY Diabetes: Study in Tunisian Patients. *Biol Res Nurs.* 2021 Apr 8;10998004211004770. <https://doi.org/10.1177/10998004211004770>. Online ahead of print. PMID: 33827288
 - Hajhashemy Z, Shahdadian F, Moslemi E, et al. Serum vitamin D levels in relation to metabolic syndrome: A systematic review and dose-response meta-analysis of epidemiologic studies. *Obes Rev.* 2021 Jul;22(7):e13223. <https://doi.org/10.1111/obr.13223>. Epub 2021 Apr 7. PMID: 33829636 Review
 - Hanna HWZ, Rizzo C, Abdel Halim RM, et al. Vitamin D status in Hashimoto's thyroiditis and its association with vitamin D receptor genetic variants. *J Steroid Biochem Mol Biol.* 2021 May 17;212:105922. <https://doi.org/10.1016/j.jsbmb.2021.105922>. Online ahead of print. PMID: 34015387
 - Hao Q, Qin Y, Zhao W, et al. A Prospective Study of Vitamin D Supplement in Thyroidectomy Patients Based on Relative Decline of Parathyroid Hormone. *Front Pharmacol.* 2021 Mar 8;12:626614. <https://doi.org/10.3389/fphar.2021.626614>. eCollection 2021. PMID: 33762946
 - Jin T, Lu W, Gong X, et al. Association of vitamin D receptor polymorphisms with metabolic syndrome-related components: A cross-sectional study. *J Clin Lab Anal.* 2021 May 19:e23829. <https://doi.org/10.1002/jcla.23829>. Online ahead of print. PMID: 34008880
 - Kamiński M, Urska A, Rogowicz-Frontczak A, et al. Insulin Resistance in Adults with Type 1 Diabetes is Associated with Lower Vitamin D Serum Concentration. *Exp Clin Endocrinol Diabetes.* 2021 May;129(5):396-402. <https://doi.org/10.1055/a-0895-5166>. Epub 2019 May 2. PMID: 31049899
 - Karampela I, Sakellou A, Vallianou N, et al. Vitamin D and Obesity: Current Evidence and Controversies. *Curr Obes Rep.* 2021 Jun;10(2):162-180. <https://doi.org/10.1007/s13679-021-00433-1>. Epub 2021 Apr 1. PMID: 33792853 Review

- Kawashima I, Tsukahara T, Kawai R, et al. The impact of vitamin D supplementation on body fat mass in elite male collegiate athletes. *Nutr Metab (Lond)*. 2021 May 21;18(1):51. <https://doi.org/10.1186/s12986-021-00578-9>. PMID: 34020679
- Keller A, Thorsteinsdottir F, Stougaard M, et al. Vitamin D concentrations from neonatal dried blood spots and the risk of early-onset type 2 diabetes in the Danish D-tect case-cohort study. *Diabetologia*. 2021 Jul;64(7):1572-1582. <https://doi.org/10.1007/s00125-021-05450-2>. Epub 2021 May 24. PMID: 34028586
- Khatiwada AS, Harris AS. Use of pre-operative calcium and vitamin D supplementation to prevent postoperative hypocalcemia in patients undergoing thyroidectomy: a systematic review. *J Laryngol Otol*. 2021 Jun 14:1-6. <https://doi.org/10.1017/S0022215121001523>. Online ahead of print. PMID: 34120662
- Kord-Varkaneh H, Rinaldi G, Hekmatdoost A, et al. Reply to "Double-counting of effect sizes and inappropriate exclusion of studies in "The influence of vitamin D supplementation on IGF-1 levels in humans: A systematic review and meta-analysis". *Ageing Res Rev*. 2021 Mar;66:101239. <https://doi.org/10.1016/j.arr.2020.101239>. Epub 2020 Dec 17. PMID: 33346153
- Krysiak R, Kowalcze K, Okopień B. The impact of exogenous vitamin D on thyroid autoimmunity in euthyroid men with autoimmune thyroiditis and early-onset androgenic alopecia. *Pharmacol Rep*. 2021 Jun 9. <https://doi.org/10.1007/s43440-021-00295-3>. Online ahead of print. PMID: 34106452
- Krysiak R, Kowalcze K, Okopień B. Vitamin D status determines the impact of metformin on circulating prolactin levels in premenopausal women. *J Clin Pharm Ther*. 2021 Jun 2. <https://doi.org/10.1111/jcpt.13447>. Online ahead of print. PMID: 34076286
- Küchler EC, Reis CLB, Marañón-Vásquez G, et al. Parathyroid Hormone Gene and Genes Involved in the Maintenance of Vitamin D Levels Association with Mandibular Retrognathism. *J Pers Med*. 2021 May 2;11(5):369. <https://doi.org/10.3390/jpm11050369>. PMID: 34063310
- Kumari S, Singh K, Kumari S, et al. Association of Vitamin D and Reproductive Hormones With Semen Parameters in Infertile Men. *Cureus*. 2021 Apr 15;13(4):e14511. <https://doi.org/10.7759/cureus.14511>. PMID: 34007762
- Lee K, Kim J. Serum vitamin D status and metabolic syndrome: a systematic review and dose-response meta-analysis. *Nutr Res Pract*. 2021 Jun;15(3):329-345. <https://doi.org/10.4162/nrp.2021.15.3.329>. Epub 2020 Dec 29. PMID: 34093974
- Li Z, Wang F, Jia Y, et al. The Relationship Between Hemoglobin Glycation Variation Index and Vitamin D in Type 2 Diabetes Mellitus. *Diabetes Metab Syndr Obes*. 2021 Apr 30;14:1937-1948. <https://doi.org/10.2147/DMSO.S310672>. eCollection 2021. PMID: 33958883
- Liang Y, Yu H, Ke X, et al. Vitamin D deficiency worsens maternal diabetes induced neurodevelopmental disorder by potentiating hyperglycemia-mediated epigenetic changes. *Ann N Y Acad Sci*. 2021 May;1491(1):74-88. <https://doi.org/10.1111/nyas.14535>. Epub 2020 Dec 10. PMID: 33305416
- Lim H, Lee H, Lim Y. Effect of vitamin D(3) supplementation on hepatic lipid dysregulation associated with autophagy regulatory AMPK/Akt-mTOR signaling in type 2 diabetic mice. *Exp Biol Med (Maywood)*. 2021 May;246(10):1139-1147. <https://doi.org/10.1177/1535370220987524>. Epub 2021 Feb 4. PMID: 33541129
- Ludvigsson J, Sumnik Z, Pelikanova T, et al. Intralymphatic Glutamic Acid Decarboxylase With Vitamin D Supplementation in Recent-Onset Type 1 Diabetes: A Double-Blind, Randomized, Placebo-Controlled Phase IIb Trial. *Diabetes Care*. 2021 May 21;dc210318. <https://doi.org/10.2337/dc21-0318>. Online ahead of print. PMID: 34021020
- Maghsoumi-Norouzabad L, Zare Javid A, et al. Evaluation of the effect of vitamin D supplementation on spermatogram, seminal and serum levels of oxidative stress indices in asthenospermia infertile men: a study protocol for a triple-blind, randomized controlled trial. *Nutr J*. 2021 Jun 2;20(1):49. <https://doi.org/10.1186/s12937-021-00711-7>. PMID: 34078367
- Manousaki D, Harroud A, Mitchell RE, et al. Correction: Vitamin D levels and risk of type 1 diabetes: A Mendelian randomization study. *PLoS Med*. 2021 Apr 29;18(4):e1003624. <https://doi.org/10.1371/journal.pmed.1003624>. eCollection 2021 Apr. PMID: 33914743
- Marziou A, Aubert B, Couturier C, et al. Combined Beneficial Effect of Voluntary Physical Exercise and Vitamin D Supplementation in Diet-induced Obese C57BL/6J Mice. *Med Sci Sports Exerc*. 2021 Mar 25. <https://doi.org/10.1249/MSS.0000000000002664>. Online ahead of print. PMID: 33787528
- Melguizo-Rodríguez L, Costela-Ruiz VJ, García-Recio E, et al. Role of Vitamin D in the Metabolic Syndrome. *Nutrients*. 2021 Mar 3;13(3):830. <https://doi.org/10.3390/nu13030830>. PMID: 33802330
- Mena-Bravo A, Calderón-Santiago M, Lope V, et al. Vitamin D(3) levels in women and factors contributing to explain metabolic variations. *J Steroid Biochem Mol Biol*. 2021 Jul;211:105884. <https://doi.org/10.1016/j.jsbmb.2021.105884>. Epub 2021 Mar 26. PMID: 33775819
- Miller EG, Nowson CA, Dunstan DW, et al. Effects of whey protein plus vitamin D supplementation combined with progressive resistance training on glycaemic control, body composition, muscle function and cardiometabolic risk factors in middle-aged and older overweight/obese adults with type 2 diabetes: A 24-week randomized controlled trial. *Diabetes Obes Metab*. 2021 Apr;23(4):938-949. <https://doi.org/10.1111/dom.14299>. Epub 2021 Jan 19. PMID: 33369020
- Minieri M, Leoni BD, Bellincampi L, et al. Serum iPTH range in a reference population: From an integrated approach to vitamin D prevalence impact evaluation. *Clin Chim Acta*. 2021 Jun 8;521:1-8. <https://doi.org/10.1016/j.cca.2021.06.004>. Online ahead of print. PMID: 34111419
- Mohammadi S, Hajhashemy Z, Saneei P. Serum vitamin D levels in relation to type-2 diabetes and prediabetes in adults: a systematic review and dose-response meta-analysis of epidemiologic studies. *Crit Rev Food Sci Nutr*. 2021 Jun 2;1-21. <https://doi.org/10.1080/10408398.2021.1926220>. Online ahead of print. PMID: 34076544
- Niculescu DA, Deacu LG, Caragheorgheopol A, et al. Combined Effects of Vitamin D Status, Renal Function and Age on Serum Parathyroid Hormone Levels. *Front Endocrinol (Lausanne)*. 2021 Apr 30;12:657991.

- <https://doi.org/10.3389/fendo.2021.657991>. eCollection 2021. PMID: 33995282
- Nikooyeh B, Neyestani TR. Can vitamin D be considered an adiponectin secretagogue? A systematic review and meta-analysis. *J Steroid Biochem Mol Biol.* 2021 Jun;3:212:105925. <https://doi.org/10.1016/j.jsbmb.2021.105925>. Online ahead of print. PMID: 34089834
 - Nikooyeh B, Shariatzadeh N, Rismanchi M, et al. Daily intake of yogurt drink fortified either with vitamin D alone or in combination with added calcium causes a thyroid-independent increase of resting metabolic rate in adults with type 2 diabetes: a randomized double blind clinical trial. *Appl Physiol Nutr Metab.* 2021 Jun 2. <https://doi.org/10.1139/apnm-2021-0248>. Online ahead of print. PMID: 34077684
 - Nimitphong H, Guo WV, Holick MF, et al. Vitamin D Inhibits Adipokine Production and Inflammatory Signaling Through the Vitamin D Receptor in Human Adipocytes. *Obesity (Silver Spring).* 2021 Mar;29(3):562-568. <https://doi.org/10.1002/oby.23109>. PMID: 33624437
 - Nimitphong H, Saetung S, Chailurkit LO, et al. Vitamin D supplementation is associated with serum uric acid concentration in patients with prediabetes and hyperuricemia. *J Clin Transl Endocrinol.* 2021 Apr 2;24:100255. <https://doi.org/10.1016/j.jcte.2021.100255>. eCollection 2021 Mar. PMID: 33898272
 - Park CY, Han SN. The Role of Vitamin D in Adipose Tissue Biology: Adipocyte Differentiation, Energy Metabolism, and Inflammation. *J Lipid Atheroscler.* 2021 May;10(2):130-144. <https://doi.org/10.12997/jla.2021.10.2.130>. Epub 2021 Mar 16. PMID: 34095008
 - Penna-Martinez M, Meyer G, Wolff AB, et al. Vitamin D status and pathway genes in five European autoimmune Addison's disease cohorts. *Eur J Endocrinol.* 2021 Mar;184(3):373-381. <https://doi.org/10.1530/EJE-20-0956>. PMID: 33444227
 - Pinheiro MM, Pinheiro FMM, Diniz SN, et al. Combination of vitamin D and dipeptidyl peptidase-4 inhibitors (VIDPP-4i) as an immunomodulation therapy for autoimmune diabetes. *Int Immunopharmacol.* 2021 Jun;95:107518. <https://doi.org/10.1016/j.intimp.2021.107518>.
 - Epib 2021 Mar 20. PMID: 33756226 Review
 - Pittas AG, Jorde R, Kawahara T, et al. Response to Letter to the Editor from Dalan: "Vitamin D Supplementation for Prevention of Type 2 Diabetes Mellitus: To D or Not to D?". *J Clin Endocrinol Metab.* 2021 Mar 25;106(4):e1928-e1929. <https://doi.org/10.1210/clinem/dgaa971>. PMID: 33377909
 - Pramono A, Jocken JWE, Adriaens ME, et al. The association between vitamin D receptor polymorphisms and tissue-specific insulin resistance in human obesity. *Int J Obes (Lond).* 2021 Apr;45(4):818-827. <https://doi.org/10.1038/s41366-021-00744-2>. Epub 2021 Jan 20. PMID: 33473175
 - Rafiq S, Jeppesen PB. Insulin Resistance Is Inversely Associated with the Status of Vitamin D in Both Diabetic and Non-Diabetic Populations. *Nutrients.* 2021 May 21;13(6):1742. <https://doi.org/10.3390/nu13061742>. PMID: 34063822
 - Ren Z, Zhao A, Wang Y, et al. Association of serum 25-hydroxy vitamin D with obesity-related indices in Chinese adults: A cross-sectional study. *Food Sci Nutr.* 2021 Feb 26;9(4):2260-2268. <https://doi.org/10.1002/fsn3.2201>. eCollection 2021 Apr. PMID: 33841842
 - Salehpour A, Shidfar F, Hedayati M, et al. Molecular mechanisms of vitamin D plus Bisphenol A effects on adipogenesis in human adipose-derived mesenchymal stem cells. *Diabetol Metab Syndr.* 2021 Apr 9;13(1):41. <https://doi.org/10.1186/s13098-021-00661-4>. PMID: 33836827
 - Salem TM, Abdelmonem E, Fayad A. Hashimoto's thyroiditis, iron, and vitamin D deficiency among Egyptian female patients: associations and possible causalities. *Hormones (Athens).* 2021 May 26. <https://doi.org/10.1007/s42000-021-00297-z>. Online ahead of print. PMID: 34037970
 - Salih YA, Rasool MT, Ahmed IH, et al. Impact of vitamin D level on glycemic control in diabetes mellitus type 2 in Duhok. *Ann Med Surg (Lond).* 2021 Mar 5;64:102208. <https://doi.org/10.1016/j.amsu.2021.102208>. ECollection 2021 Apr. PMID: 33786167
 - Selvarajan S, Srinivasan A, Surendran D, et al. Association of genetic polymorphisms in vitamin D receptor (Apal, Taql and FokI) with vitamin D and glycemic status in type 2 diabetes patients from Southern India. *Drug Metab Pers Ther.* 2021 Mar 17. <https://doi.org/10.1515/dmpt-2020-0178>. Online ahead of print. PMID: 33735953
 - Setayesh L, Casazza K, Moradi N, et al. Association of vitamin D-binding protein and vitamin D(3) with insulin and homeostatic model assessment (HOMAIR) in overweight and obese females. *BMC Res Notes.* 2021 May 19;14(1):193. <https://doi.org/10.1186/s13104-021-05608-6>. PMID: 34011380
 - Sharma K, Zajc I, Žiberna L. Dietary vitamin D equilibrium in serum ameliorates direct bilirubin associated diabetes mellitus. *Chem Biol Interact.* 2021 Mar 1;337:109399. <https://doi.org/10.1016/j.cbi.2021.109399>. Epub 2021 Jan 24. PMID: 33503443 Review
 - Singh G, Irshaidat F, Lau C, et al. Advancing the Understanding of Vitamin D Status in Post-Thyroidectomy Hypocalcemia. *Int J Endocrinol.* 2021 Apr 1;2021:5598319. <https://doi.org/10.1155/2021/5598319>. eCollection 2021. PMID: 33868401
 - Smith LM, Gallagher JC. Reference range for 24-h urine calcium, calcium/creatinine ratio, and correlations with calcium absorption and serum vitamin D metabolites in normal women. *Osteoporos Int.* 2021 Mar;32(3):539-547. <https://doi.org/10.1007/s00198-020-05615-6>. Epub 2020 Sep 4. PMID: 32886188
 - Somigliana E, Sarais V, Reschini M, et al. Single oral dose of vitamin D(3) supplementation prior to in vitro fertilization and embryo transfer in normal weight women: the SUNDRO randomized controlled trial. *Am J Obstet Gynecol.* 2021 Apr 21:S0002-9378(21)00464-6. <https://doi.org/10.1016/j.ajog.2021.04.234>. Online ahead of print. PMID: 33894153
 - Sun HL, Long SR, Fu SX, et al. Association between Vitamin D Levels and the Risk of Metabolic Syndrome in a Rural Chinese Population. *Biomed Environ Sci.* 2021 Apr 20;34(4):330-333. <https://doi.org/10.3967/bes2021.043>. PMID: 33894814
 - Taneja K, Patel S, Kaur A. Association of Vitamin D with Thyroid Status in a Tertiary Care Hospital in North India. *Clin Lab.* 2021 Jun 1;67(6). <https://doi.org/10.1016/j.clinlab.2021.04.001>

org/10.7754/Clin.Lab.2020.201042. PMID: 34107621

- Tangjittipokin W, Umjai P, Khemaprasit K, Vitamin D pathway gene polymorphisms, vitamin D level, and cytokines in children with type 1 diabetes. *Charoentawornpanich P, Chanprasert C, Teerawattanapong N, Narkdontri T, Santiprabhob J. Gene.* 2021 Jul 30;791:145691. <https://doi.org/10.1016/j.gene.2021.145691>. Epub 2021 May 5. PMID: 33961971
- Torres Dominguez EA, Meza Peñafiel A, Gómez Pedraza A, et al. Molecular mechanisms from insulin-mimetic effect of vitamin D: treatment alternative in Type 2 diabetes mellitus. *Food Funct.* 2021 Jun 24. <https://doi.org/10.1039/d0fo03230a>. Online ahead of print. PMID: 34165135 Review
- Tran Huu TT, Tran HD, Tran TN, et al. Relationship Between Vitamin D Status and the Relevant Parameters of Glucose in Patients with Type 2 Diabetes. *Diabetes Metab Syndr Obes.* 2021 Jun 3;14:2489-2494. <https://doi.org/10.2147/DMSO.S314416>. eCollection 2021. PMID: 34113140
- Vaitsi KD, Anagnostis P, Veneti S, et al. Preoperative Vitamin D Deficiency is a Risk Factor for Postthyroidectomy Hypoparathyroidism: A Systematic Review and Meta-Analysis of Observational Studies. *J Clin Endocrinol Metab.* 2021 Mar 25;106(4):1209-1224. <https://doi.org/10.1210/clinem/dgab039>. PMID: 33484571
- Valle MS, Russo C, Malaguarnera L. Protective role of vitamin D against oxidative stress in diabetic retinopathy. *Diabetes Metab Res Rev.* 2021 Mar 8. <https://doi.org/10.1002/dmrr.3447>. Online ahead of print. PMID: 33760363
- Vigna L, Lonati C, Tirelli AS, et al. Effects of Vitamin D Supplementation on Outcome of Low-Calorie Diet in Workers Presenting Obesity or Overweight: A Retrospective Observational Study. *J Am Coll Nutr.* 2021 Jun 14;1:1-9. <https://doi.org/10.1080/07315724.2021.1902879>. Online ahead of print. PMID: 34125662
- Viloria K, Hewison M, Hodson DJ. Vitamin D binding protein/GC-globulin: a novel regulator of alpha cell function and glucagon secretion. *J Physiol.* 2021 Mar 15. <https://doi.org/10.1113/JP280890>. Online ahead of print. PMID: 33719063

• Volonakis S, Koika V, Tzavelas G, et al. Adequate vitamin D supplementation does not ameliorate bone loss following long limb-biliopancreatic diversion in morbidly obese women. *Hormones (Athens).* 2021 Jun;20(2):315-321. <https://doi.org/10.1007/s42000-020-00254-2>. Epub 2020 Nov 5. PMID: 33155141

• Vondra K, Hampl R. Vitamin D and new insights into pathophysiology of type 2 diabetes. *Horm Mol Biol Clin Investig.* 2021 Mar 1. <https://doi.org/10.1515/hmbci-2020-0055>. Online ahead of print. PMID: 33655734

• Wang B, Wan H, Cheng J, et al. Blood lead, vitamin D status, and albuminuria in patients with type 2 diabetes. *Environ Pollut.* 2021 May 1;276:116653. <https://doi.org/10.1016/j.envpol.2021.116653>. Epub 2021 Feb 5. PMID: 33607353

• Wang MM, Wang Y, Chen ZJ, et al. [Research Progress of the Effects of Vitamin D Supplementation on Glycemic Control and Adverse Maternal-neonatal Outcomes in Gestational Diabetes Mellitus Patients]. *Zhongguo Yi Xue Ke Xue Yuan Xue Bao.* 2021 Apr 28;43(2):253-258. <https://doi.org/10.3881/j.issn.1000-503X.13177>. PMID: 33966706

• Zanatta AP, Gonçalves R, Ourique da Silva F, et al. Estradiol and 1alpha,25(OH)₂ vitamin D(3) share plasma membrane downstream signal transduction through calcium influx and genomic activation in immature rat testis. *Theriogenology.* 2021 May 30;172:36-46. <https://doi.org/10.1016/j.theriogenology.2021.05.030>. Online ahead of print. PMID: 34091204

• Zhang H, Cui Y, Dong R, et al. Vitamin D is associated with blood lead exposure through bone turnover in type 2 diabetes patients. *Endocr Connect.* 2021 Apr;10(4):378-386. <https://doi.org/10.1530/EC-21-0006>. PMID: 33666568

• Zhang J, Feng M, Pan L, et al. Effects of vitamin D deficiency on the improvement of metabolic disorders in obese mice after vertical sleeve gastrectomy. *Sci Rep.* 2021 Mar 16;11(1):6036. <https://doi.org/10.1038/s41598-021-85531-9>. PMID: 33727603

• Zhao H, Tang Y, Zheng C, et al. Vitamin D Status is Independently Associated with Insulin Resistance in Patients with Type 2 Diabetes Mellitus. *Risk Manag Healthc Policy.* 2021 Apr 7;14:1393-1399. <https://doi.org/10.2147/RMHP.S299963>. eCollection 2021. PMID: 33854388

GASTROENTEROLOGY

- Abdel Hafez H, Madani H, Abdel Alem S, et al. Is Serum-Ascites Vitamin D Gradient a Valid Marker for Diagnosing Spontaneous Bacterial Peritonitis in Patients with Cirrhotic Ascites? *Lab Med.* 2021 May 3;lmab019. <https://doi.org/10.1093/labmed/lmab019>. Online ahead of print. PMID: 33939819
- Al-Ghamdi HA, Al Fayez FF, Bima AI, et al. Study of Cellular Senescence and Vitamin D Deficiency in Nonalcoholic Fatty Liver Disease and The Potential Protective Effect of Vitamin D Supplementation. *J Clin Exp Hepatol.* 2021 Mar-Apr;11(2):219-226. <https://doi.org/10.1016/j.jceh.2020.07.003>. Epub 2020 Jul 18. PMID: 33746447
- Albas S, Koc EM, Nemli SA, et al. Vitamin D Levels and Vitamin D Receptor (VDR) Gene Polymorphisms in Inactive Hepatitis B Virus Carriers. *J Coll Physicians Surg Pak.* 2021 Apr;30(4):393-398. <https://doi.org/10.29271/jcpsp.2021.04.393>. PMID: 33866723
- Bendix M, Dige A, Jørgensen SP, et al. Seven Weeks of High-Dose Vitamin D Treatment Reduces the Need for Infliximab Dose-Escalation and Decreases Inflammatory Markers in Crohn's Disease during One-Year Follow-Up. *Nutrients.* 2021 Mar 26;13(4):1083. <https://doi.org/10.3390/nu13041083>. PMID: 33810258
- Bourbour F, Kabir A, Pazouki A, et al. Trends in Serum Vitamin D Levels within 12 Months after One Anastomosis Gastric Bypass (OAGB). *Obes Surg.* 2021 Apr 21. <https://doi.org/10.1007/s11695-021-05434-6>. Online ahead of print. PMID: 33881740
- Chatterjee I, Zhang Y, Zhang J, et al. Overexpression of Vitamin D Receptor in Intestinal Epithelia Protects Against Colitis via Upregulating Tight Junction Protein Claudin 15. *J Crohns Colitis.* 2021 Mar 5;jjab044. <https://doi.org/10.1093/ecco-jcc/jjab044>. Online ahead of print. PMID: 33690841
- Dai C, Jiang M. Influence of Severe Vitamin D Deficiency on the Clinical Course of Inflammatory Bowel Disease. *Dig Dis Sci.* 2021 Mar;66(3):919-920. <https://doi.org/10.1007/s10620-020-06630-w>

- org/10.1007/s10620-020-06313-3. Epub 2020 Jun 11. PMID: 32529518
- Duus KS, Moos C, Frederiksen P, et al. Prenatal and Early Life Exposure to the Danish Mandatory Vitamin D Fortification Policy Might Prevent Inflammatory Bowel Disease Later in Life: A Societal Experiment. *Nutrients*. 2021 Apr 19; 13(4):1367. <https://doi.org/10.3390/nu13041367>. PMID: 33921832
 - Fletcher J, Bedson E, Brown M, et al. Protocol for an open-label feasibility study for a randomised controlled trial of vitamin D supplementation in Crohn's Disease patients with vitamin D deficiency: D-CODE Feasibility study. *Pilot Feasibility Stud*. 2021 Mar 20;7(1):79. <https://doi.org/10.1186/s40814-021-00813-3>. PMID: 33743801
 - Gabr SA, Alghadir AH. Handgrip Strength and Vitamin D as Predictors of Liver Fibrosis and Malnutrition in Chronic Hepatitis C Patients. *Dis Markers*. 2021 Apr 2;2021:6665893. <https://doi.org/10.1155/2021/6665893>. eCollection 2021. PMID: 33884041
 - Gonzalez-Sanchez E, El Mourabit H, Jager M, et al. Cholangiopathy aggravation is caused by VDR ablation and alleviated by VDR-independent vitamin D signaling in ABCB4 knockout mice. *Biochim Biophys Acta Mol Basis Dis*. 2021 Apr 1;1867(4):166067. <https://doi.org/10.1016/j.bbadi.2020.166067>. Epub 2021 Jan 6. PMID: 33418034
 - Grover I, Gunjan D, Singh N, et al. Effect of Vitamin D Supplementation on Vitamin D Level and Bone Mineral Density in Patients With Cirrhosis: A Randomized Clinical Trial. *Am J Gastroenterol*. 2021 Apr 29. <https://doi.org/10.14309/ajg.0000000000001272>. Online ahead of print. PMID: 33927126
 - Guan Y, Hao Y, Guan Y, et al. Effects of vitamin D supplementation on blood markers in ulcerative colitis patients: a systematic review and meta-analysis. *Eur J Nutr*. 2021 Jun 1. <https://doi.org/10.1007/s00394-021-02603-2>. Online ahead of print. PMID: 34075433 Review
 - Hizarcioglu-Gulsen H, Kaplan JL, Moran CJ, et al. The Impact of Vitamin D on Response to Anti-tumor Necrosis Factor-alpha Therapy in Children With Inflammatory Bowel Disease. *J Pediatr Gastroenterol Nutr*. 2021 May 1;72(5):e125-e131. <https://doi.org/10.1097/>
 - MPG.0000000000003064. PMID: 33847289
 - Kosinsky RL, Zerche M, Kutschat AP, et al. RNF20 and RNF40 regulate vitamin D receptor-dependent signaling in inflammatory bowel disease. *Cell Death Differ*. 2021 Jun 4. <https://doi.org/10.1038/s41418-021-00808-w>. Online ahead of print. PMID: 34088983
 - Li C, Chen Y, Zhu H, et al. Corrigendum to: Inhibition of Histone Deacetylation by MS-275 Alleviates Colitis by Activating the Vitamin D Receptor. *J Crohns Colitis*. 2021 May 4;15(5):874. <https://doi.org/10.1093/ecco-jcc/jiaa209>. PMID: 33125476
 - Li C, Zhang R, Ma C, et al. Food-Grade Titanium Dioxide Particles Decreased the Bioaccessibility of Vitamin D(3) in the Simulated Human Gastrointestinal Tract. *J Agric Food Chem*. 2021 Mar 10;69(9):2855-2863. <https://doi.org/10.1021/acs.jafc.0c06644>. Epub 2021 Feb 24. PMID: 33625220
 - Li X, Gan X, Gong J, et al. Association between vitamin D receptor polymorphisms and acute pancreatitis: A protocol for systematic review and meta analysis. *Medicine (Baltimore)*. 2021 Apr 23;100(16):e25508. <https://doi.org/10.1097/MD.00000000000025508>. PMID: 33879686
 - Linsalata M, Riezzo G, Orlando A, et al. The Relationship between Low Serum Vitamin D Levels and Altered Intestinal Barrier Function in Patients with IBS Diarrhoea Undergoing a Long-Term Low-FODMAP Diet: Novel Observations from a Clinical Trial. *Nutrients*. 2021 Mar 21;13(3):1011. <https://doi.org/10.3390/nu13031011>. PMID: 33801020
 - Liu Y, Meng F, Wang S, et al. Vitamin D(3) mitigates lipopolysaccharide-induced oxidative stress, tight junction damage and intestinal inflammatory response in yellow catfish, *Peleobagrus fulvidraco*. *Comp Biochem Physiol C Toxicol Pharmacol*. 2021 May;243:108982. <https://doi.org/10.1016/j.cbpc.2021.108982>. Epub 2021 Jan 23. PMID: 33497802
 - Lu R, Zhang YG, Xia Y, et al. Paneth Cell Alertness to Pathogens Maintained by Vitamin D Receptors. *Gastroenterology*. 2021 Mar;160(4):1269-1283. <https://doi.org/10.1053/j.gastro.2020.11.015>. Epub 2020 Nov 18. PMID: 33217447
 - Magsi I, Hussain Keerio S, Kumar C, et al. Response of Helicobacter Pylori Eradication Treatment in Patients With Normal and Below-Normal Serum Vitamin D Levels. *Cureus*. 2021 Apr 30;13(4):e14777. <https://doi.org/10.7759/cureus.14777>. PMID: 34094742
 - Männistö V, Jääskeläinen T, Färkkilä M, et al. Low serum vitamin D level associated with incident advanced liver disease in the general population - a prospective study. *Scand J Gastroenterol*. 2021 Mar;56(3):299-303. <https://doi.org/10.1080/00365521.2021.1873412>. Epub 2021 Jan 21. PMID: 33478287
 - Martucci G, Volpes R, Panarello G, et al. Vitamin D levels in liver transplantation recipients and early postoperative outcomes: Prospective observational DLiverX study. *Clin Nutr*. 2021 Apr;40(4):2355-2363. <https://doi.org/10.1016/j.clnu.2020.10.027>. Epub 2020 Oct 24. PMID: 33158589
 - McGillis L, Bronte-Tinkew DM, Dang F, et al. Vitamin D deficiency enhances expression of autophagy-regulating miR-142-3p in mouse and 'involved' IBD patient intestinal tissues. *Am J Physiol Gastrointest Liver Physiol*. 2021 Jun 23. <https://doi.org/10.1152/ajpgi.00398.2020>. Online ahead of print. PMID: 34159811
 - Miura K, Oshima T, Ito C, et al. Vitamin D receptor is overexpressed in the duodenum of patients with irritable bowel syndrome. *J Gastroenterol Hepatol*. 2021 Apr;36(4):951-958. <https://doi.org/10.1111/jgh.15225>. Epub 2020 Sep 3. PMID: 32839988
 - Okubo T, Atsukawa M, Tsubota A, et al. Effect of Vitamin D Supplementation on Skeletal Muscle Volume and Strength in Patients with Decompensated Liver Cirrhosis Undergoing Branched Chain Amino Acids Supplementation: A Prospective, Randomized, Controlled Pilot Trial. *Nutrients*. 2021 May 30;13(6):1874. <https://doi.org/10.3390/nu13061874>. PMID: 34070910
 - Palmese F, Del Toro R, Di Marzio G, et al. Sarcopenia and Vitamin D Deficiency in Patients with Crohn's Disease: Pathological Conditions That Should Be Linked Together. *Nutrients*. 2021 Apr 20;13(4):1378. <https://doi.org/10.3390/nu13041378>. PMID: 33923948

- Qiu F, Zhang Z, Yang L, et al. Combined effect of vitamin C and vitamin D(3) on intestinal epithelial barrier by regulating Notch signaling pathway. *Nutr Metab (Lond)*. 2021 May 8;18(1):49. <https://doi.org/10.1186/s12986-021-00576-x>. PMID: 33964955
- Rondaij T, Kozjek NR, Popović P, et al. Vitamin D deficiency in patients with chronic intestinal failure on home parenteral nutrition. *Clin Nutr ESPEN*. 2021 Apr;42:258-261. <https://doi.org/10.1016/j.clnesp.2021.01.026>. Epub 2021 Mar 5. PMID: 33745589
- Sittipo P, Kim HK, Han J, et al. Vitamin D(3) suppresses intestinal epithelial stemness via ER stress induction in intestinal organoids. *Stem Cell Res Ther*. 2021 May 13;12(1):285. <https://doi.org/10.1186/s13287-021-02361-2>. PMID: 33985576
- Wan B, Gao Y, Zheng Y, et al. Association between serum 25-hydroxy vitamin D level and metabolic associated fatty liver disease (MAFLD)-a population-based study. *Endocr J*. 2021 Mar 4. <https://doi.org/10.1507/endocrj.EJ20-0758>. Online ahead of print. PMID: 33658438
- Wang Q, Shi X, Wang J, et al. Low serum vitamin D concentrations are associated with obese but not lean NAFLD: a cross-sectional study. *Nutr J*. 2021 Apr 1;20(1):30. <https://doi.org/10.1186/s12937-021-00690-9>. PMID: 33794916
- Wang YQ, Geng XP, Wang MW, et al. Vitamin D deficiency exacerbates hepatic oxidative stress and inflammation during acetaminophen-induced acute liver injury in mice. *Int Immunopharmacol*. 2021 May 2;97:107716. <https://doi.org/10.1016/j.intimp.2021.107716>. Online ahead of print. PMID: 33951559
- Weissman S, Aziz M, Chandran J, et al. Vitamin D-Induced Acute Pancreatitis. *Am J Ther*. 2021 Apr 8. <https://doi.org/10.1097/MJT.0000000000001369>. Online ahead of print. PMID: 33852480
- Wen Y, Jiang MZ. [Role of vitamin D in pediatric irritable bowel syndrome]. *Zhongguo Dang Dai Er Ke Za Zhi*. 2021 Mar;23(3):310-314. <https://doi.org/10.7499/j.issn.1008-8830.2012080>. PMID: 33691928
- Wu Z, Broad J, Sluyter J, et al. Effect of monthly vitamin D on diverticular disease hospitalization: Post-hoc analysis of a randomized controlled trial. *Clin Nutr*. 2021 Mar;40(3):839-843. <https://doi.org/10.1016/j.clnu.2020.08.030>. Epub 2020 Aug 31. PMID: 32919816
- Xie J, Fan Y, Jia R, et al. Yes-associated protein regulates the hepatoprotective effect of vitamin D receptor activation through promoting adaptive bile duct remodeling in cholestatic mice. *J Pathol*. 2021 Jun 22. <https://doi.org/10.1002/path.5750>. Online ahead of print. PMID: 34156701
- Xue G, Gao R, Liu Z, et al. Vitamin D/VDR signaling inhibits colitis by suppressing HIF-1alpha activation in colonic epithelial cells. *Am J Physiol Gastrointest Liver Physiol*. 2021 May 1;320(5):G837-G846. <https://doi.org/10.1152/ajpgi.00061.2021>. Epub 2021 Mar 24. PMID: 33759562
- Yaghoobi H, Ghanavati F, Seyedian SS, et al. The efficacy of calcitriol treatment in non-alcoholic fatty liver patients with different genotypes of vitamin D receptor FokI polymorphism. *BMC Pharmacol Toxicol*. 2021 Apr 7;22(1):18. <https://doi.org/10.1186/s40360-021-00485-y>. PMID: 33827700
- Yu M, Wu H, Wang J, et al. Vitamin D receptor inhibits EMT via regulation of epithelial mitochondrial function in intestinal fibrosis. *J Biol Chem*. 2021 Mar 10;296:100531. <https://doi.org/10.1016/j.jbc.2021.100531>. Online ahead of print. PMID: 33713706
- Zeng H, Safratowich BD, Liu Z, et al. Adequacy of calcium and vitamin D reduces inflammation, beta-catenin signaling, and dysbiotic *Parasutterella* bacteria in the colon of C57BL/6 mice fed a western-style diet. *J Nutr Biochem*. 2021 Jun;92:108613. <https://doi.org/10.1016/j.jnutbio.2021.108613>. Epub 2021 Mar 8. PMID: 33705950
- Zhai LL, Tang ZG. Effect of Vitamin D Supplementation on Vitamin D Level and Bone Mineral Density in Patients With Cirrhosis: Several Confounding Factors. *Am J Gastroenterol*. 2021 Jun 23. <https://doi.org/10.14309/ajg.0000000000001362>. Online ahead of print. PMID: 34158465
- Zhang X, Shang X, Jin S, et al. Vitamin D ameliorates high-fat-diet-induced hepatic injury via inhibiting pyroptosis and alters gut microbiota in rats. *Arch Biochem Biophys*. 2021 Jul 15;705:108894. <https://doi.org/10.1016/j.abb.2021.108894>. Epub 2021 May 6. PMID: 33965368
- Zielińska A, Sobolewska-Włodarczyk A, Wiśniewska-Jarosińska M, et al. The 25(OH)D3, but Not 1,25(OH)2D3 Levels Are Elevated in IBD Patients Regardless of Vitamin D Supplementation and Do Not Associate with Pain Severity or Frequency. *Pharmaceuticals (Basel)*. 2021 Mar 22;14(3):284. <https://doi.org/10.3390/ph14030284>. PMID: 33809912

HEMATOLOGY

- Ahmad Fuzi SF, Mushtaq S. Response to invited commentary: Vitamin D(3) supplementation for 8 weeks leads to improved haematological status following the consumption of an iron-fortified breakfast cereal: a double-blind randomised controlled trial in iron-deficient women. *Br J Nutr*. 2021 Mar 14;125(5):598-600. <https://doi.org/10.1017/S0007114520001683>. Epub 2020 May 14. PMID: 32406343
- Arabi SM, Ranjbar G, Bahrami LS, et al. Correction to: The effect of vitamin D supplementation on hemoglobin concentration: a systematic review and meta-analysis. *Nutr J*. 2021 Mar 5;20(1):21. <https://doi.org/10.1186/s12937-021-00679-4>. PMID: 33663525
- Arabi SM, Ranjbar G, Bahrami LS, et al. Reply to: Meta-analysis of vitamin D supplementation and hemoglobin concentration: methodological faults obscure the interpretation of the data. *Nutr J*. 2021 Apr 8;20(1):34. <https://doi.org/10.1186/s12937-021-00682-9>. PMID: 33832491
- Arabi SM, Ranjbar G, Bahrami LS, et al. Reply to: vitamin D supplementation and hemoglobin: dosing matters in prevention/treatment of anemia. *Nutr J*. 2021 Apr 8;20(1):33. <https://doi.org/10.1186/s12937-021-00683-8>. PMID: 33832484
- Bajwa RPS, Taylor K, Hoyt A, et al. Vitamin D has no impact on outcomes after HSCT in children-A retrospective study. *Pediatr Transplant*. 2021 Jun;25(4):e14008. <https://doi.org/10.1111/petr.14008>. Epub 2021 Mar 18. PMID: 33734544
- Bhandari R, Teh JB, Herrera C, et al. Prevalence and risk factors for vitamin D deficiency in long-term childhood cancer survivors. *Pediatr Blood Cancer*. 2021 Jul;68(7):e29048. <https://doi.org/10.1002/pbc.29048>

- org/10.1002/pbc.29048. Epub 2021 Apr 6. PMID: 33822476
- Bodea J, Beebe K, Campbell C, et al. Stoss therapy is safe for treatment of vitamin D deficiency in pediatric patients undergoing HSCT. *Bone Marrow Transplant.* 2021 Apr 19. <https://doi.org/10.1038/s41409-021-01294-x>. Online ahead of print. PMID: 33875811
 - Donati B, Ferrari A, Ruffini A, et al. Gene expression profile unveils diverse biological effect of serum vitamin D in Hodgkin's and diffuse large B-cell lymphoma. *Hematol Oncol.* 2021 Apr;39(2):205-214. <https://doi.org/10.1002/hon.2827>. Epub 2020 Dec 13. PMID: 33215701
 - El-Serafi A, He R, Zheng W, et al. Vitamin D levels and busulphan kinetics in patients undergoing hematopoietic stem cell transplantation, a multicenter study. *Bone Marrow Transplant.* 2021 Apr;56(4):807-817. <https://doi.org/10.1038/s41409-020-01091-y>. Epub 2020 Oct 21. PMID: 33087877
 - Innao V, Allegra A, Ginaldi L, et al. Reviewing the Significance of Vitamin D Substitution in Monoclonal Gammopathies. *Int J Mol Sci.* 2021 May 6;22(9):4922. <https://doi.org/10.3390/ijms22094922>. PMID: 34066482
 - Luebbering N, Abdullah S, Lounder D, et al. Endothelial injury, F-actin and vitamin-D binding protein after hematopoietic stem cell transplant and association with clinical outcomes. *Haematologica.* 2021 May 1;106(5):1321-1329. <https://doi.org/10.3324/haematol.2019.233478>. PMID: 32241849
 - Napolitano LM. Vitamin D supplementation and hemoglobin: dosing matters in prevention/treatment of anemia. *NutrJ.* 2021 Mar 19;20(1):23. <https://doi.org/10.1186/s12937-021-00680-x>. PMID: 33740996 Free PMC article
 - Papanikolaou IC, Afthinos A, Patsiris S, et al. Fatigue and Vitamin D in Sarcoidosis: A Prospective Non-Interventional Study. *Am J Med Sci.* 2021 Apr;361(4):553-555. <https://doi.org/10.1016/j.ams.2020.10.001>. Epub 2020 Oct 5. PMID: 33190856
 - Qin JQ, Yin H, Wu JZ, et al. 25-Hydroxy vitamin D deficiency predicts inferior prognosis in Hodgkin lymphoma. *Leuk Res.* 2021 Jun;105:106580. <https://doi.org/10.1016/j.leukres.2021.106580>. Epub 2021 Mar 29. PMID: 33836479
 - Sana S, Kayani MA. Role of Vitamin D deficiency and mRNA expression of VDR and RXR in haematological cancers. *Mol Biol Rep.* 2021 Jun 6. <https://doi.org/10.1007/s11033-021-06463-1>. Online ahead of print. PMID: 34091780
 - Sherief LM, Beshir M, Raafat N, et al. Genetic polymorphism of vitamin D receptors and plasminogen activator inhibitor-1 and osteonecrosis risk in childhood acute lymphoblastic leukemia. *Mol Genet Genomic Med.* 2021 May 27:e1700. <https://doi.org/10.1002/mgg3.1700>. Online ahead of print. PMID: 34042331
 - Speeckaert MM, Delanghe JR. Vitamin D binding protein and endothelial injury after hematopoietic stem cell transplantation: an actin scavenger with a lipid-bound character. *Haematologica.* 2021 Mar 1;106(3):923. <https://doi.org/10.3324/haematol.2020.256131>. PMID: 33645946
 - Thapa SS, Sandhu J, Sah BP. An uncommon cause of severe hypercalcemia: Vitamin D supplementation in Sarcoidosis. *Am J Med.* 2021 May 28:S0002-9343(21)00354-5. <https://doi.org/10.1016/j.amjmed.2021.04.037>. Online ahead of print. PMID: 34058157
 - Velissari A, Lakiotaki E, Nikolaou V, et al. Genetic polymorphisms in immunity related genes and the Vitamin D receptor gene and risk of Cutaneous T-cell Lymphoma in Greek population. *J Eur Acad Dermatol Venereol.* 2021 Jun 26. <https://doi.org/10.1111/jdv.17482>. Online ahead of print. PMID: 34173274
 - Zimorovat A, Mohammadi-Sartang M, Barati-Boldaji R, et al. Meta-analysis of vitamin D supplementation and hemoglobin concentration: methodological faults obscure the interpretation of the data. *Nutr J.* 2021 Mar 19;20(1):22. <https://doi.org/10.1186/s12937-021-00681-w>. PMID: 33740966
- ## IMMUNOLOGY
- Piloya TW, Bakeera-Kitaka S, Kisitu GP, et al. Vitamin D status and associated factors among HIV-infected children and adolescents on antiretroviral therapy in Kampala, Uganda. *PLoS One.* 2021 Jun 24;16(6):e0253689. <https://doi.org/10.1371/journal.pone.0253689>. eCollection 2021. PMID: 34166428
 - Acen EL, Biraro IA, Worodria W, et al. Impact of vitamin D status and cathelicidin antimicrobial peptide on adults with active pulmonary TB globally: A systematic review and meta-analysis. *PLoS One.* 2021 Jun 11;16(6):e0252762. <https://doi.org/10.1371/journal.pone.0252762>. eCollection 2021. PMID: 34115790
 - Al-Jaberi FAH, Kongsbak-Wismann M, Aguayo-Orozco A, et al. Impaired Vitamin D Signaling in T Cells From a Family With Hereditary Vitamin D Resistant Rickets. *Front Immunol.* 2021 May 19;12:684015. <https://doi.org/10.3389/fimmu.2021.684015>. eCollection 2021. PMID: 34093587
 - Al-Zoubi MS, Otoum O, Alsmadi M, et al. Elevated BMI is considerably associated with IDD rather than polymorphic variations in interleukin-1 and vitamin D receptor genes: A case-control study. *J Med Biochem.* 2021 Mar 12;40(2):129-137. <https://doi.org/10.5937/jomb-0-26367>. PMID: 33776562
 - Bergandi L, Apprato G, Silvagno F. Vitamin D and Beta-Glucans Synergically Stimulate Human Macrophage Activity. *Int J Mol Sci.* 2021 May 4;22(9):4869. <https://doi.org/10.3390/ijms22094869>. PMID: 34064458
 - Bhardwaj B, Singh J. Efficacy of Vitamin D Supplementation in Allergic Rhinitis. *Indian J Otolaryngol Head Neck Surg.* 2021 Jun;73(2):152-159. <https://doi.org/10.1007/s12070-020-01907-9>. Epub 2020 Jun 24. PMID: 34150589
 - Briceno Noriega D, Savelkoul HFJ. Vitamin D and Allergy Susceptibility during Gestation and Early Life. *Nutrients.* 2021 Mar 21;13(3):1015. <https://doi.org/10.3390/nu13031015>. PMID: 33801051
 - Chen PJ, Nakano T, Lai CY, et al. Daily full spectrum light exposure prevents food allergy-like allergic diarrhea by modulating vitamin D(3) and microbiota composition. *NPJ Biofilms Microbiomes.* 2021 May 6;7(1):41. <https://doi.org/10.1038/s41522-021-00213-8>. PMID: 33958592
 - Dennison CL, de Oliveira LB, Fraga LAO, et al. Mycobacterium leprae-helminth co-infections and vitamin D deficiency as potential risk factors for leprosy: A case-control

- study in south-eastern Brazil. *Int J Infect Dis.* 2021 Apr;105:261-266. <https://doi.org/10.1016/j.ijid.2021.02.048>. Epub 2021 Feb 13. PMID: 33592342
- Douros K, Loukou I, Tsabouri S. More data are needed about vitamin D supplements in pregnancy and infancy including any impact on allergies. *Acta Paediatr.* 2021 Mar;110(3):753-754. <https://doi.org/10.1111/apa.15592>. Epub 2020 Oct 6. PMID: 32979876
 - Eigenmann P. Comments on vitamin D in asthma, milk allergy diagnosis, and stem cell transplantation in chronic granulomatous disease. *Pediatr Allergy Immunol.* 2021 Apr;32(3):401-404. <https://doi.org/10.1111/pai.13468>. PMID: 33792989
 - Fang X, Xie Q, Zhang X. Serum vitamin D level in mice with allergic rhinitis is correlated with inflammatory factors. *Am J Transl Res.* 2021 Apr 15;13(4):3351-3356. eCollection 2021. PMID: 34017509
 - Garand M, Toufiq M, Singh P, et al. Immunomodulatory Effects of Vitamin D Supplementation in a Deficient Population. *Int J Mol Sci.* 2021 May 10;22(9):5041. <https://doi.org/10.3390/ijms22095041>. PMID: 34068701
 - Gatera VA, Lesmana R, Musfiroh I, et al. Vitamin D Inhibits Lipopolysaccharide (LPS)-Induced Inflammation in A549 Cells by Downregulating Inflammatory Cytokines. *Med Sci Monit Basic Res.* 2021 Jun 9;27:e931481. PMID: 34103463
 - Gozeler MS, Sakat MS, Kilic K, et al. Are Vitamin D Levels Associated With Risk of Deep Neck Infection? *Ear Nose Throat J.* 2021 Mar;100(3):NP161-NP163. <https://doi.org/10.1177/0145561319865498>. Epub 2019 Sep 24. PMID: 31550931
 - Guimarães de Matos G, Barroso de Figueiredo AM, Diniz Gonçalves PH, et al. Paracoccidioidesbrasiliensis induces IL-32 and is controlled by IL-15/IL-32/vitamin D pathway in vitro. *Microb Pathog.* 2021 May;154:104864. <https://doi.org/10.1016/j.micpath.2021.104864>. Epub 2021 Mar 23. PMID: 33771629
 - Heine G, Francuzik W, Doelle-Bierke S, et al. Immunomodulation of high-dose vitamin D supplementation during allergen-specific immunotherapy. *Allergy.* 2021 Mar;76(3):930-933. <https://doi.org/10.1111/all.14541>. Epub 2020 Sep 25. PMID: 32750735
 - Jain SK, Micinski D, Parsanathan R. L-Cysteine Stimulates the Effect of Vitamin D on Inhibition of Oxidative Stress, IL-8, and MCP-1 Secretion in High Glucose Treated Monocytes. *J Am Coll Nutr.* 2021 May-Jun;40(4):327-332. <https://doi.org/10.1080/07315724.2020.1850371>. Epub 2021 Feb 17. PMID: 33596158
 - Lemke D, Klement RJ, Schweiger F, et al. Vitamin D Resistance as a Possible Cause of Autoimmune Diseases: A Hypothesis Confirmed by a Therapeutic High-Dose Vitamin D Protocol. *Front Immunol.* 2021 Apr 7;12:655739. <https://doi.org/10.3389/fimmu.2021.655739>. eCollection 2021. PMID: 33897704
 - Li B, Wang M, Zhou L, et al. Association between serum vitamin D and chronic rhinosinusitis: a meta-analysis. *Braz J Otorhinolaryngol.* 2021 Mar-Apr;87(2):178-187. <https://doi.org/10.1016/j.bjorl.2019.08.007>. Epub 2019 Oct 3. PMID: 31653607
 - Lian P, Bai Y, Li J, et al. Vitamin D receptor and 1alpha-hydroxylase are highly expressed in lungs of mice infected with H9N2 avian influenza viruses. *J Steroid Biochem Mol Biol.* 2021 Jul;211:105907. <https://doi.org/10.1016/j.jsbmb.2021.105907>. Epub 2021 May 10. PMID: 33965570
 - Lithgow H, Florida-James G, Ross M, et al. Exercise acutely increases vitamin D receptor expression in T lymphocytes in vitamin D-deficient men, independent of age. *Exp Physiol.* 2021 Apr 6. <https://doi.org/10.1113/EP089480>. Online ahead of print. PMID: 33823058
 - Meca AD, Stefanescu S, Bogdan M, et al. Crosstalk between vitamin D axis, inflammation and host immunity mechanisms: A prospective study. *Exp Ther Med.* 2021 Jun;21(6):608. <https://doi.org/10.3892/etm.2021.10040>. Epub 2021 Apr 14. PMID: 33936265
 - Mumena CH, Mudhihiri MH, Sasi R, et al. The relevance of vitamin D in the oral health of HIV infected patients. *J Steroid Biochem Mol Biol.* 2021 Jul;211:105905. <https://doi.org/10.1016/j.jsbmb.2021.105905>. Epub 2021 May 4. PMID: 33962013
 - Murdaca G, Gerosa A, Paladin F, et al. Vitamin D and Microbiota: Is There a Link with Allergies? *Int J Mol Sci.* 2021 Apr 22;22(8):4288. <https://doi.org/10.3390/ijms22084288>. PMID: 33924232
 - Neeland MR, Tursi AR, Perrett KP, et al. Vitamin D insufficiency is associated with reduced regulatory T cell frequency in food-allergic infants. *Pediatr Allergy Immunol.* 2021 May;32(4):771-775. <https://doi.org/10.1111/pai.13439>. Epub 2021 Jan 13. PMID: 33351974
 - Nowak S, Wang H, Schmidt B, et al. Vitamin D and iron status in children with food allergy. *Ann Allergy Asthma Immunol.* 2021 Jul;127(1):57-63. <https://doi.org/10.1016/j.anai.2021.02.027>. Epub 2021 Mar 8. PMID: 33705915
 - Osmani F, Azarkar G. Fitting logistic regression models to assess vitamin D deficiency with clinical parameters in chronic hepatitis B patients. *Infect Dis Model.* 2021 Mar 24;6:612-617. <https://doi.org/10.1016/j.idm.2021.03.008>. eCollection 2021. PMID: 33898881
 - Paz JLP, Silvestre MDPSCA, Moura LS, et al. Association of the polymorphism of the vitamin D receptor gene (VDR) with the risk of leprosy in the Brazilian Amazon. *Biosci Rep.* 2021 Jun 18;BSR20204102. <https://doi.org/10.1042/BSR20204102>. Online ahead of print. PMID: 34143211
 - Richter WJ, Sun Y, Psoter KJ, et al. Vitamin D Deficiency Is Associated with Increased Nontuberculous Mycobacteria Risk in Cystic Fibrosis. *Ann Am Thorac Soc.* 2021 May;18(5):913-916. <https://doi.org/10.1513/AnnalsATS.202003-216RL>. PMID: 33202142
 - Segovia-Ortí R, Barceló Bennasar A, De Sotto-Esteban D, et al. Association between vitamin D status and allergen sensitization in pediatric subjects in the Balearic Islands. *Pediatr Allergy Immunol.* 2021 Apr 3. <https://doi.org/10.1111/pai.13513>. Online ahead of print. PMID: 33811785
 - Small AG, Harvey S, Kaur J, et al. Vitamin D upregulates the macrophage complement receptor immunoglobulin in innate immunity to microbial pathogens. *Commun Biol.* 2021 Mar 25;4(1):401. <https://doi.org/10.1038/s42003-021-01943-3>. PMID: 33767430
 - Starchl C, Scherkl M, Amrein K. Celiac Disease and the Thyroid: Highlighting the Roles of Vitamin D and Iron. *Nutrients.* 2021 May 21;13(6):1755. <https://doi.org/10.3390/nutrients13061755>

- org/10.3390/nu13061755. PMID: 34064075 doi.org/10.3389/fgene.2021.677780. eCollection 2021. PMID: 34168679
- Thakur P, Potluri P. Association of serum vitamin D with Chronic RhinoSinusitis in adults residing at high altitudes. *Eur Arch Otorhinolaryngol.* 2021 Apr;278(4):1067-1074. <https://doi.org/10.1007/s00405-020-06368-y>. Epub 2020 Sep 18. PMID: 32945930
 - Wani BA, Shehjar F, Shah S, et al. Role of genetic variants of Vitamin D receptor, Toll-like receptor 2 and Toll-like receptor 4 in extrapulmonary tuberculosis. *Microb Pathog.* 2021 Jul;156:104911. <https://doi.org/10.1016/j.micpath.2021.104911>. Epub 2021 May 13. PMID: 33991642
 - Warwick T, Schulz MH, Günther S, et al. A hierarchical regulatory network analysis of the vitamin D induced transcriptome reveals novel regulators and complete VDR dependency in monocytes. *Sci Rep.* 2021 Mar 22;11(1):6518. <https://doi.org/10.1038/s41598-021-86032-5>. PMID: 33753848
 - Wu Z, Camargo CA, Sluyter J, et al. Effect of monthly vitamin D supplementation on antibiotic prescribing in older adults: a post hoc analysis of a randomized controlled trial. *Am J Clin Nutr.* 2021 Mar 19:nqab015. <https://doi.org/10.1093/ajcn/nqab015>. Online ahead of print. PMID: 33742207
 - Youssry S, Hussein A, Associate MM. The immunoregulatory axis (Programmed death-1 / Programmed death ligand-1) on CD4+ T cells in lupus nephritis: association with vitamin D and chemokine C-X-C motif ligand 12. *Microbiol Immunol.* 2021 Jun 3. <https://doi.org/10.1111/1348-0421.12923>. Online ahead of print. PMID: 34081342
 - Yu X, Liu B, Zhang N, et al. Immune Response: A Missed Opportunity Between Vitamin D and Radiotherapy. *Front Cell Dev Biol.* 2021 Apr 13;9:646981. <https://doi.org/10.3389/fcell.2021.646981>. eCollection 2021. PMID: 33928081
 - Aka S, Kilercik M, Arapoglu M, et al. The Hepcidin and 25-OH-Vitamin D Levels in Obese Children as a Potential Mediator of the Iron Status. *Clin Lab.* 2021 May 1;67(5). <https://doi.org/10.7754/Clin.Lab.2020.200813>. PMID: 33978363
 - Albrecht K, Lotz J, Frommer L, et al. A rapid point-of-care assay accurately measures vitamin D. *J Endocrinol Invest.* 2021 Apr 22. <https://doi.org/10.1007/s40618-021-01575-8>. Online ahead of print. PMID: 33890251
 - Alshabrawy AK, Bergamin A, Sharma DK, et al. LC-MS/MS analysis of vitamin D(3) metabolites in human serum using a salting-out based liquid-liquid extraction and DAPTAD derivatization. *J Chromatogr B Analyt Technol Biomed Life Sci.* 2021 Mar 12;1173:122654. <https://doi.org/10.1016/j.jchromb.2021.122654>. Online ahead of print. PMID: 33819798
 - Batman A, Saygili ES, Yildiz D, et al. Risk of hypercalcemia in patients with very high serum 25-OH vitamin D levels. *Int J Clin Pract.* 2021 Mar 24:e14181. <https://doi.org/10.1111/ijcp.14181>. Online ahead of print. PMID: 33759301
 - Biberoglu S, Cakmak F, Ozkan S, et al. Vitamin D Poisoning; Hypercalcemia in a Case with Richter Transformation. *Acta Biomed.* 2021 Apr 30;92(S1):e2021146. <https://doi.org/10.23750/abm.v92iS1.9923>. PMID: 33944830
 - Bikle DD. Vitamin D regulation of and by long non coding RNAs. *Mol Cell Endocrinol.* 2021 Jul 15;532:111317. <https://doi.org/10.1016/j.mce.2021.111317>. Epub 2021 May 17. PMID: 34015414
 - Binks MJ, Bleakley AS, Rathnayake G, et al. Can dried blood spots be used to accurately measure vitamin D metabolites? *Clin Chim Acta.* 2021 Jul;518:70-77. <https://doi.org/10.1016/j.cca.2021.03.003>. Epub 2021 Mar 10. PMID: 33713691
 - Bolland MJ, Avenell A, Smith K, et al. Vitamin D supplementation and testing in the UK: costly but ineffective? *BMJ.* 2021 Mar 2;372:n484. <https://doi.org/10.1136/bmj.n484>. PMID: 33653683
 - Chauhan D, Yadav AK, Solanki PR. Carbon cloth-based immunosensor for detection of 25-hydroxy vitamin D(3). *Mikrochim Acta.* 2021 Apr 1;188(4):145. <https://doi.org/10.1007/s00604-021-04751-y>. PMID: 33792779
 - da Silva TBV, de Oliveira A, Moreira TFM, et al. Analytical validation of an ultraviolet-visible procedure for determining vitamin D(3) in vitamin D(3)-loaded microparticles and toxicogenetic studies for incorporation into food. *Food Chem.* 2021 Oct 30;360:129979. <https://doi.org/10.1016/j.foodchem.2021.129979>. Epub 2021 May 3. PMID: 33984561
 - Dille MJ, Baydin T, Kristiansen KA, et al. The impact of emulsion droplet size on in vitro lipolysis rate and in vivo plasma uptake kinetics of triglycerides and vitamin D(3) in rats. *Food Funct.* 2021 Apr 7;12(7):3219-3232. <https://doi.org/10.1039/d0fo03386c>. Epub 2021 Mar 22. PMID: 33877246
 - Fang X, Qu J, Huan S, et al. Associations of urine metals and metal mixtures during pregnancy with cord serum vitamin D Levels: A prospective cohort study with repeated measurements of maternal urinary metal concentrations. *Environ Int.* 2021 May 27;155:106660. <https://doi.org/10.1016/j.envint.2021.106660>. Online ahead of print. PMID: 34052726
 - Han YY, Hsu SH, Su TC. Association between Vitamin D Deficiency and High Serum Levels of Small Dense LDL in Middle-Aged Adults. *Biomedicines.* 2021 Apr 24;9(5):464. <https://doi.org/10.3390/biomedicines9050464>. PMID: 33923190
 - Huang J, Zhao Q, Li J, et al. Correlation between neonatal hyperbilirubinemia and vitamin D levels: A meta-analysis. *PLoS One.* 2021 May 27;16(5):e0251584. <https://doi.org/10.1371/journal.pone.0251584>. eCollection 2021. PMID: 34043645
 - Huang Z, You T. Personalise vitamin D(3) using physiologically based pharmacokinetic modelling. *CPT Pharmacometrics Syst Pharmacol.* 2021 May 7. <https://doi.org/10.1002/psp4.12640>. Online ahead of print. PMID: 33960722
 - John AS, Morris H, Richardson A, et al. Vitamin D testing: Impact of changes to testing guidelines on detection of patients at risk of vitamin D deficiency. *Ann Clin Biochem.* 2021 May;58(3):196-202. <https://doi.org/10.1177/0004563220987589>. Epub 2021 Jan 14. PMID: 33356446

LABORATORY

- Alharazy S, Naseer MI, Alissa E, et al. Whole-Exome Sequencing for Identification of Genetic Variants Involved in Vitamin D Metabolic Pathways in Families With Vitamin D Deficiency in Saudi Arabia. *Front Genet.* 2021 Jun 8;12:677780. <https://doi.org/10.3389/fgene.2021.677780>

- Karacan Küçükali G, Gülbahar Ö, Özalkak S, et al. Is Bioavailable Vitamin D Better Than Total Vitamin D to Evaluate Vitamin D Status in Obese Children? *J Clin Res Pediatr Endocrinol.* 2021 May 20. <https://doi.org/10.4274/jcrpe.galenos.2021.2020.0230>. Online ahead of print. PMID: 34013709
- Kaufmann M, Schlingmann KP, Berezin L, et al. Differential diagnosis of vitamin D-related hypercalcemia using serum vitamin D metabolite profiling. *J Bone Miner Res.* 2021 Apr 15. <https://doi.org/10.1002/jbm.4306>. Online ahead of print. PMID: 33856702
- Kaur A, Rana S, Bharti A, et al. Voltammetric detection of vitamin D employing Au-MoS(2) hybrid as immunosensing platform. *Mikrochim Acta.* 2021 Jun 4;188(7):222. <https://doi.org/10.1007/s00604-021-04862-6>. PMID: 34086134
- Kawagoe F, Mendoza A, Hayata Y, et al. Discovery of a Vitamin D Receptor-Silent Vitamin D Derivative That Impairs Sterol Regulatory Element-Binding Protein In Vivo. *J Med Chem.* 2021 May 13;64(9):5689-5709. <https://doi.org/10.1021/acs.jmedchem.0c02179>. Epub 2021 Apr 24. PMID: 33899473
- Kim W, Park J, Kim W, et al. Bio-inspired Ag nanowilli-based sandwich-type SERS aptasensor for ultrasensitive and selective detection of 25-hydroxy vitamin D(3). *Biosens Bioelectron.* 2021 Sep 15;188:113341. <https://doi.org/10.1016/j.bios.2021.113341>. Epub 2021 May 14. PMID: 34044348
- Kim YJ, Lê HG, Na BK, et al. Clinical utility of cerebrospinal fluid vitamin D-binding protein as a novel biomarker for the diagnosis of viral and bacterial CNS infections. *BMC Infect Dis.* 2021 Mar 5;21(1):240. <https://doi.org/10.1186/s12879-021-05924-z>. PMID: 33673834
- Kowalska E, Rola R, Wójcik M, et al. Analysis of vitamin D(3) metabolites in survivors of infantile idiopathic hypercalcemia caused by CYP24A1 mutation or SLC34A1 mutation. *J Steroid Biochem Mol Biol.* 2021 Apr;208:105824. <https://doi.org/10.1016/j.jsbmb.2021.105824>. Epub 2021 Jan 28. PMID: 33516786
- Li S, Hu L, Zhang C. Urinary vitamin D-binding protein as a marker of ovarian reserve. *Reprod Biol Endocrinol.* 2021 Jun 1;19(1):80. <https://doi.org/10.1186/s12958-021-00762-9>. PMID: 34074317
- Li YM, Feng Q, Jiang WQ, et al. Evaluation of vitamin D storage in patients with chronic kidney disease: Detection of serum vitamin D metabolites using high performance liquid chromatography-tandem mass spectrometry. *J Steroid Biochem Mol Biol.* 2021 Jun;210:105860. <https://doi.org/10.1016/j.jsbmb.2021.105860>. Epub 2021 Mar 1. PMID: 33662569
- Ložnjak Švarc P, Barnkob LL, Jakobsen J. Quantification of vitamin D(3) and 25-hydroxyvitamin D(3) in food - The impact of eluent additives and labelled internal standards on matrix effects in LC-MS/MS analysis. *Food Chem.* 2021 Mar 13;357:129588. <https://doi.org/10.1016/j.foodchem.2021.129588>. Online ahead of print. PMID: 33864998
- Makris K, Bhattoa HP, Cavalier E, et al. Recommendations on the measurement and the clinical use of vitamin D metabolites and vitamin D binding protein - A position paper from the IFCC Committee on bone metabolism. *Clin Chim Acta.* 2021 Jun;517:171-197. <https://doi.org/10.1016/j.cca.2021.03.002>. Epub 2021 Mar 10. PMID: 33713690 Review
- Mulrooney SL, O'Neill GJ, Brougham DF, et al. Improving vitamin D(3) stability to environmental and processing stresses using mixed micelles. *Food Chem.* 2021 May 15;362:130114. <https://doi.org/10.1016/j.foodchem.2021.130114>. Online ahead of print. PMID: 34087708
- Mulrooney SL, O'Neill GJ, Brougham DF, et al. Vitamin D(3) bioaccessibility: Influence of fatty acid chain length, salt concentration and 1alpha-phosphatidylcholine concentration on mixed micelle formation and delivery of vitamin D(3). *Food Chem.* 2021 May 15;344:128722. <https://doi.org/10.1016/j.foodchem.2020.128722>. Epub 2020 Nov 25. PMID: 33277128
- Nakamura S, Saito R, Yamamoto S, et al. Proposal of novel inhibitors for vitamin-D receptor: Molecular docking, molecular mechanics and ab initio molecular orbital simulations. *Biophys Chem.* 2021 Mar;270:106540. <https://doi.org/10.1016/j.bpc.2020.106540>. Epub 2021 Jan 1. PMID: 33418104
- Nybo M, Frækilde PN, Andersen-Ranberg K. Measurement of vitamin D in dried blood spots stored under different temperature conditions. *Ann Clin Biochem.* 2021 May 4;45:632211013870. <https://doi.org/10.1177/00045632211013870>. Online ahead of print. PMID: 33874736
- Oczkowicz M, Szymczyk B, Świątkiewicz M, et al. Analysis of the effect of vitamin D supplementation and sex on Vdr, Cyp2r1 and Cyp27b1 gene expression in Wistar rats' tissues. *J Steroid Biochem Mol Biol.* 2021 May 15;212:105918. <https://doi.org/10.1016/j.jsbmb.2021.105918>. Online ahead of print. PMID: 34004333
- Rahman A, Al-Sabah R, Jallad R, et al. Association of blood lead level with vitamin D binding protein, total and free 25-hydroxyvitamin D levels in middle-school children. *Br J Nutr.* 2021 Jun 3;1-11. <https://doi.org/10.1017/S0007114521001823>. Online ahead of print. PMID: 34078483
- Sari DK, Sari LM, Laksmi LI, et al. The Moderate Correlation Between 25(OH)D Serum and Saliva in Healthy People with Low Vitamin D Intake. *Int J Gen Med.* 2021 Mar 11;14:841-850. <https://doi.org/10.2147/IJGM.S302912>. eCollection 2021. PMID: 33737828
- Schmitz LM, Kinner A, Althoff K, et al. Investigation of Vitamin D(2) and Vitamin D(3) Hydroxylation by Kutzneria albida. *Chembiochem.* 2021 Mar 1. <https://doi.org/10.1002/cbic.202100027>. Online ahead of print. PMID: 33647186
- Schorr P, Kovačević B, Volmer DA. Overestimation of 3alpha- over 3beta-25-Hydroxyvitamin D(3) Levels in Serum: A Mechanistic Rationale for the Different Mass Spectral Properties of the Vitamin D Epimers. *J Am Soc Mass Spectrom.* 2021 Apr 7;32(4):1116-1125. <https://doi.org/10.1021/jasms.1c00054>. Epub 2021 Mar 29. PMID: 33780622
- Shah I, Mansour M, Jobe S, et al. A Non-Invasive Hair Test to Determine Vitamin D(3) Levels. *Molecules.* 2021 May 28;26(11):3269. <https://doi.org/10.3390/molecules26113269>. PMID: 34071612
- Singh P, Raizada N. Vitamin D toxicity and hypercalcaemia. *Indian J Anaesth.* 2021 Mar;65(3):272. https://doi.org/10.4103/ija.IJA_1355_20. Epub 2021 Mar 13. PMID: 33776129

- Sohn JT. Toxic Dose of Vitamin D-Induced Hypercalcemia. *Am J Ther*. 2021 May 26. <https://doi.org/10.1097/MJT.0000000000001392>. Online ahead of print. PMID: 34050047
- Surve S, Begum S, Joshi B, et al. Significance of Vitamin D Binding Protein in Assessing Vitamin D Status Among Under-Five Children. *Indian J Clin Biochem*. 2021 Apr;36(2):167-174. <https://doi.org/10.1007/s12291-020-00873-x>. Epub 2020 Feb 1. PMID: 33867707
- Szabo R, Petrișor C, Trancă S. Vitamin D and iron levels correlate weakly with hepcidin levels in postoperative patients with digestive neoplasms undergoing open abdominal surgery. *Eur Rev Med Pharmacol Sci*. 2021 May;25(9):3530-3535. https://doi.org/10.26355/eurrev_202105_25835. PMID: 34002827
- Tosoni A, Cossari A, Paratore M, et al. Delta-Procalcitonin and Vitamin D Can Predict Mortality of Internal Medicine Patients with Microbiological Identified Sepsis. *Medicina (Kaunas)*. 2021 Apr 1;57(4):331. <https://doi.org/10.3390/medicina57040331>. PMID: 33915819
- Ueno T, Takahashi S, Nakamura T, et al. Evaluation system for cell-permeable CY-P3A4 inhibitory activity using 1alpha,25-dihydroxy-vitamin D(3)-induced intestinal cell lines. *Xenobiotica*. 2021 Jul;51(7):771-777. <https://doi.org/10.1080/00498254.2021.1925375>. Epub 2021 May 17. PMID: 33947307
- Wise SA, Camara JE, Sempos CT, et al. Vitamin D Standardization Program (VDSP) intralaboratory study for the assessment of 25-hydroxyvitamin D assay variability and bias. *J Steroid Biochem Mol Biol*. 2021 May 16;212:105917. <https://doi.org/10.1016/j.jsbmb.2021.105917>. Online ahead of print. PMID: 34010687
- Wsoo MA, Razak SIA, Bohari SPM, et al. Vitamin D(3)-loaded electrospun cellulose acetate/polycaprolactone nanofibers: Characterization, in-vitro drug release and cytotoxicity studies. *Int J Biol Macromol*. 2021 Jun 30;181:82-98. <https://doi.org/10.1016/j.ijbiomac.2021.03.108>. Epub 2021 Mar 23. PMID: 33771547
- Zeng S, Chu C, Doebis C, et al. Reference values for free 25-hydroxy-vitamin D based on established total 25-hydroxy-vitamin D reference values. *J Steroid Biochem Mol Biol*. 2021 Jun;210:105877. <https://doi.org/10.1016/j.jsbmb.2021.105877>. Epub 2021 Mar 16. PMID: 33741448
- Bilak Ş, Çevik MÖ, Erdoğan İH, et al. Expression of Vitamin D Receptor and Vitamin D Receptor Gene Polymorphisms (BsmI, FokI, and TaqI) in Patients with Pterygium. *Arq Bras Oftalmol*. 2021 May-Jun;84(3):241-248. <https://doi.org/10.5935/0004-2749.20210032>. PMID: 33567021
- Bilak Ş, Yılmaz S, Bilgin B. Comparison of vitamin D levels between patients with pterygium and healthy subjects. *Int Ophthalmol*. 2021 Apr 21. <https://doi.org/10.1007/s10792-021-01868-0>. Online ahead of print. PMID: 33881669
- Burnett-Bowie SM, Cappola AR. The USPSTF 2021 Recommendations on Screening for Asymptomatic Vitamin D Deficiency in Adults: The Challenge for Clinicians Continues. *JAMA*. 2021 Apr 13;325(14):1401-1402. <https://doi.org/10.1001/jama.2021.2227>. PMID: 33847724
- Çağlar A, Tuğçe Çağlar H. Vitamin D intoxication due to misuse: 5-year experience. *Arch Pediatr*. 2021 Apr;28(3):222-225. <https://doi.org/10.1016/j.arcped.2020.12.009>. Epub 2021 Jan 19. PMID: 33483193
- Cammer AL, Whiting SJ. The challenge of achieving vitamin D adequacy for residents living in long-term care. *Public Health Nutr*. 2021 May 28:1-4. <https://doi.org/10.1017/S136898002100238X>. Online ahead of print. PMID: 34047269
- Cashman KD, Kiely ME, Andersen R, et al. Individual participant data (IPD)-level meta-analysis of randomised controlled trials with vitamin D-fortified foods to estimate Dietary Reference Values for vitamin D. *Eur J Nutr*. 2021 Mar;60(2):939-959. <https://doi.org/10.1007/s00394-020-02298-x>. Epub 2020 Jun 15. PMID: 32556447
- Chauhan K, Shahrokhi M, Huecker MR. Vitamin D. 2021 Apr 19. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. PMID: 28722941 Free Books & Documents. Review
- Cheng YW, Hung CC, Kao TW, et al. Beneficial relevance of vitamin D concentration and urine flow rate. *Clin Nutr*. 2021 Apr;40(4):2121-2127. <https://doi.org/10.1016/j.clnu.2020.09.036>. Epub 2020 Oct 1. PMID: 33039156

- Clements DN, Ryan JM, Handel IG, et al. Relationship between vitamin D status and clinical outcomes in dogs with a cranial cruciate ligament rupture. *Res Vet Sci.* 2021 May;136:385-389. <https://doi.org/10.1016/j.rvsc.2021.03.019>. Epub 2021 Mar 25. PMID: 33799168
- Cohen Y, Margier M, Lesmes U, et al. Mechanisms of absorption of vitamin D(3) delivered in protein nanoparticles in the absence and presence of fat. *Food Funct.* 2021 Jun 7;12(11):4935-4946. <https://doi.org/10.1039/d0fo02206c>. Epub 2021 Apr 13. PMID: 34100469
- Corrigendum to: "Safety of High-Dose Vitamin D Supplementation: Secondary Analysis of a Randomized Controlled Trial". *J Clin Endocrinol Metab.* 2021 Mar 25;106(4):e1932. <https://doi.org/10.1210/clinem/dgaa886>. PMID: 33440004
- Daldal H, Gokmen Salici A, et al. Ocular Findings Among Patients With Vitamin D Deficiency. *Cureus.* 2021 May 21;13(5):e15159. <https://doi.org/10.7759/cureus.15159>. PMID: 34168925
- Demir A, Güder S. The effects of vitamin B12, vitamin D, ferritin level, neutrophil/monocyte ratio and some blood parameters on genital warts presence, the number of lesions, and recurrence rates. *Andrologia.* 2021 May;53(4):e14006. <https://doi.org/10.1111/and.14006>. Epub 2021 Feb 7. PMID: 33550671
- Dominguez IJ, Farruggia M, Veronese N, et al. Vitamin D Sources, Metabolism, and Deficiency: Available Compounds and Guidelines for Its Treatment. *Metabolites.* 2021 Apr 20;11(4):255. <https://doi.org/10.3390/metabolite11040255>. PMID: 33924215
- Dunlop E, James AP, Cunningham J, et al. Vitamin D composition of Australian foods. *Food Chem.* 2021 Oct 1;358:129836. <https://doi.org/10.1016/j.foodchem.2021.129836>. Epub 2021 Apr 20. PMID: 33933982
- Dunlop E, Kiely ME, James AP, et al. Vitamin D Food Fortification and Biofortification Increases Serum 25-Hydroxyvitamin D Concentrations in Adults and Children: An Updated and Extended Systematic Review and Meta-Analysis of Randomized Controlled Trials. *J Nutr.* 2021 Jun 10:nxab180. <https://doi.org/10.1093/jn/nxab180>. Online ahead of print. PMID: 34113994
- EFSA Panel on Nutrition, Novel Foods and Food Allergens (NDA), Turck D, Castenmiller J, et al. Safety of Vitamin D(2) mushroom powder (*Agaricus bisporus*) as a Novel food pursuant to Regulation (EU) 2015/2283. *EFSA J.* 2021 Apr 8;19(4):e06516. <https://doi.org/10.2903/j.efsa.2021.6516>. eCollection 2021 Apr. PMID: 33854579
- Ellison DL, Moran HR. Vitamin D: Vitamin or Hormone? *Nurs Clin North Am.* 2021 Mar;56(1):47-57. <https://doi.org/10.1016/j.cnur.2020.10.004>. Epub 2020 Dec 28. PMID: 33549285 Review
- Elmoury MM, Abbas AS. The role of low levels of vitamin D as a cofactor in the relapse of benign paroxysmal positional vertigo (BPPV). *Am J Otolaryngol.* 2021 Jun 19;42(6):103134. <https://doi.org/10.1016/j.amjoto.2021.103134>. Online ahead of print. PMID: 34166965
- Ferreira A, Silva N, Furtado MJ, et al. Serum vitamin D and age-related macular degeneration: Systematic review and meta-analysis. *Surv Ophthalmol.* 2021 Mar-Apr;66(2):183-197. <https://doi.org/10.1016/j.survophthal.2020.07.003>. Epub 2020 Aug 5. PMID: 32768420 Review
- Ghiasi F, Eskandari MH, Golmakani MT, et al. Build-Up of a 3D Organogel Network within the Bilayer Shell of Nanoliposomes. A Novel Delivery System for Vitamin D(3): Preparation, Characterization, and Physicochemical Stability. *J Agric Food Chem.* 2021 Mar 3;69(8):2585-2594. <https://doi.org/10.1021/acs.jafc.0c06680>. Epub 2021 Feb 22. PMID: 33617257
- Gupta AA, Kheur S, Badhe RV, et al. Assessing the potential use of chitosan scaffolds for the sustained localized delivery of vitamin D. *Saudi J Biol Sci.* 2021 Apr;28(4):2210-2215. <https://doi.org/10.1016/j.sjbs.2021.01.008>. Epub 2021 Jan 20. PMID: 33911937
- Hernandez M, Recalde S, González-Zamora J, et al. Anti-Inflammatory and Anti-Oxidative Synergistic Effect of Vitamin D and Nutritional Complex on Retinal Pigment Epithelial and Endothelial Cell Lines against Age-Related Macular Degeneration. *Nutrients.* 2021 Apr 23;13(5):1423. <https://doi.org/10.3390/nutrients13051423>. PMID: 33922669
- Ho B, Ellison J, Edwards N, et al. Prevalence of vitamin D analogue toxicity in dogs. *Clin Exp Dermatol.* 2021 Apr;46(3):577-578. <https://doi.org/10.1111/ced.14499>. Epub 2020 Nov 27. PMID: 33151582
- Hui Q, Zhao X, Lu P, et al. Molecular distribution and localization of extracellular calcium-sensing receptor (CaSR) and vitamin D receptor (VDR) at three different laying stages in laying hens (*Gallus gallus domesticus*). *Poul Sci.* 2021 May;100(5):101060. <https://doi.org/10.1016/j.psj.2021.101060>. Epub 2021 Feb 18. PMID: 33752067
- Huynh B, Shah P, Sii F, et al. Low systemic vitamin D as a potential risk factor in primary open-angle glaucoma: a review of current evidence. *Br J Ophthalmol.* 2021 May;105(5):595-601. <https://doi.org/10.1136/bjophthalmol-2020-316331>. Epub 2020 Jun 30. PMID: 32606080 Review
- Jacob J, Mangelschots E, Michez M, et al. Cross-Sectional Study on Vitamin D, Zinc Oxide and Fatty Acid Status in a Population with a Moderate to High Risk of AMD Identified by the STARS() Questionnaire. *Ophthalmol Ther.* 2021 Jun;10(2):299-311. <https://doi.org/10.1007/s40123-021-00335-4>. Epub 2021 Feb 23. PMID: 33620690
- Jafari A, Sheikholeslami-Vatani D, Khosravkhsh F, et al. Synergistic Effects of Exercise Training and Vitamin D Supplementation on Mitochondrial Function of Cardiac Tissue, Antioxidant Capacity, and Tumor Growth in Breast Cancer in Bearing-4T1 Mice. *Front Physiol.* 2021 Apr 13;12:640237. <https://doi.org/10.3389/fphys.2021.640237>. eCollection 2021. PMID: 33927639
- Jin J. Screening for Vitamin D Deficiency in Adults. *JAMA.* 2021 Apr 13;325(14):1480. <https://doi.org/10.1001/jama.2021.4606>. PMID: 33847716
- Kahwati LC, LeBlanc E, Weber RP, et al. Screening for Vitamin D Deficiency in Adults: An Evidence Review for the U.S. Preventive Services Task Force. Rockville (MD): Agency for Healthcare Research and Quality (US); 2021 Apr. Report No.: 20-05270-EF-1. PMID: 33900706

- Kahwati LC, LeBlanc E, Weber RP, et al. Screening for Vitamin D Deficiency in Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*. 2021 Apr 13;325(14):1443-1463. <https://doi.org/10.1001/jama.2020.26498>. PMID: 33847712
- Kotwan J, Kühn J, Baur AC, et al. Oral Intake of Lumisterol Affects the Metabolism of Vitamin D. *Mol Nutr Food Res*. 2021 Jun 1:e2001165. <https://doi.org/10.1002/mnfr.202001165>. Online ahead of print. PMID: 34061442
- Kui A, Buduru S, Labunet A, et al. Vitamin D and Temporomandibular Disorders: What Do We Know So Far? *Nutrients*. 2021 Apr 14;13(4):1286. <https://doi.org/10.3390/nu13041286>. PMID: 33919716
- Lasanta G, Villaverde C, Mouríño A, et al. Gaikwad S, González CM, Vilariño D, et al. Lithocholic acid-based design of noncalcemic vitamin D receptor agonists. *Bioorg Chem*. 2021 Jun;111:104878. <https://doi.org/10.1016/j.bioorg.2021.104878>. Epub 2021 Mar 30. PMID: 33853023
- Lee MR, Han SJ, Kim HE, et al. Relationship between Vitamin D Deficiency and Periodontitis in Korean Adults Aged 60 Years: Analysis of Data from the Korea National Health and Nutrition Examination Survey (2013–2014). *Int J Environ Res Public Health*. 2021 Apr 15;18(8):4181. <https://doi.org/10.3390/ijerph18084181>. PMID: 33920903
- Li J, Witonsky D, Sprague E, et al. Genomic and epigenomic active vitamin D responses in human colonic organoids. *Physiol Genomics*. 2021 Jun 1;53(6):235-248. <https://doi.org/10.1152/physiolgenomics.00150.2020>. Epub 2021 Apr 26. PMID: 33900108
- Li YF, Dong L, Wei WB. [Research progress in relationship between vitamin D and myopia and its mechanisms]. *Zhonghua Yan Ke Za Zhi*. 2021 Jun 11;57(6):470-476. <https://doi.org/10.3760/cma.j.cn112142-20201120-00766>. PMID: 34098698
- Lim KH, Jang J, Park J. Prevalence and clinical impact of vitamin D deficiency in critically ill Korean patients with traumatic injuries: a single-center, prospective, observational study. *Acute Crit Care*. 2021 May;36(2):92-98. <https://doi.org/10.4266/acc.2020.00801>. Epub 2021 Apr 29. PMID: 33910318
- Lira Dos Santos EJ, Chavez MB, Tan MH, et al. Effects of Active Vitamin D or FGF23 Antibody on Hyp Mice Dentoalveolar Tissues. *J Dent Res*. 2021 Apr 27;220345211011041. <https://doi.org/10.1177/00220345211011041>. Online ahead of print. PMID: 33906518
- Liu S, Wang X, Bu X, et al. Influences of dietary vitamin D(3) on growth, antioxidant capacity, immunity and molting of Chinese mitten crab (*Eriocheir sinensis*) larvae. *J Steroid Biochem Mol Biol*. 2021 Jun;210:105862. <https://doi.org/10.1016/j.jsbmb.2021.105862>. Epub 2021 Mar 3. PMID: 33675950
- Lu X, Chen Z, Watsky MA. Effects of 1,25 and 24,25 Vitamin D on Corneal Fibroblast VDR and Vitamin D Metabolizing and Catabolizing Enzymes. *Curr Eye Res*. 2021 Mar 3:1-12. <https://doi.org/10.1080/02713683.2021.1884726>. Online ahead of print. PMID: 33535006
- Máčová L, Bičková M. Vitamin D: Current Challenges between the Laboratory and Clinical Practice. *Nutrients*. 2021 May 21;13(6):1758. <https://doi.org/10.3390/nu13061758>. PMID: 34064098
- Mandell EW. Vitamin D Deficiency in Development: How Much is Enough, and How Much is Too Much? *Am J Respir Cell Mol Biol*. 2021 Jun 17. <https://doi.org/10.1165/rcmb.2021-0218ED>. Online ahead of print. PMID: 34139137
- Marley A, Grant MC, Babraj J. Weekly Vitamin D(3) supplementation improves aerobic performance in combat sport athletes. *Eur J Sport Sci*. 2021 Mar;21(3):379-387. <https://doi.org/10.1080/17461391.2020.1744736>. Epub 2020 Mar 31. PMID: 32188366
- Michos ED, Kalyani RR, Segal JB. Why USPSTF Still Finds Insufficient Evidence to Support Screening for Vitamin D Deficiency. *JAMA Netw Open*. 2021 Apr 1;4(4):e213627. <https://doi.org/10.1001/jamanetworkopen.2021.3627>. PMID: 33847756
- Mieszkowski J, Borkowska A, Stankiewicz B, et al. Single High-Dose Vitamin D Supplementation as an Approach for Reducing Ultramarathon-Induced Inflammation: A Double-Blind Randomized Controlled Trial. *Nutrients*. 2021 Apr 13;13(4):1280. <https://doi.org/10.3390/nu13041280>. PMID: 33924645
- Okoshi MP, Cortez RM, Pagan IU, et al. Supplementation of Vitamin D. *Arq Bras Cardiol*. 2021 May;116(5):979-980. <https://doi.org/10.36660/abc.20210181>. PMID: 34008825
- Olczak-Kowalczyk D, Kaczmarek U, Gozdowski D, et al. Association of parental-reported vitamin D supplementation with dental caries of 3-year-old children in Poland: a cross-sectional study. *Clin Oral Investig*. 2021 Apr 8. <https://doi.org/10.1007/s00784-021-03914-8>. Online ahead of print. PMID: 33834312
- Oliveira DL, Dokkedal-Silva V, Fernandes GL, et al. Sleep duration as an independent factor associated with vitamin D levels in the EPISONO cohort. *J Clin Sleep Med*. 2021 Jun 21. <https://doi.org/10.5664/jcsm.9452>. Online ahead of print. PMID: 34170232
- Pérez-Castrillón JL, Dueñas-Laita A, Brandi ML, et al. Calcifediol is superior to cholecalciferol in improving vitamin D status in postmenopausal women: a randomized trial. *J Bone Miner Res*. 2021 Jun 8. <https://doi.org/10.1002/jbmr.4387>. Online ahead of print. PMID: 34101900
- Preston AM, Makowski AJ, Martinez MI. Vitamin D Content in Milk of the Rhesus Monkey. *P R Health Sci J*. 2021 Mar;40(1):50-52. PMID: 33876919
- Robbins RN, Serra M, Ranjit N, et al. Efficacy of various prescribed vitamin D supplementation regimens on 25-hydroxyvitamin D serum levels in long-term care. *Public Health Nutr*. 2021 Apr 13:1-8. <https://doi.org/10.1017/S1368980021001609>. Online ahead of print. PMID: 33845929
- Rosen CJ. From gut to blood: the travels and travails of vitamin D supplementation. *Am J Clin Nutr*. 2021 May 19:nqab125. <https://doi.org/10.1093/ajcn/nqab125>. Online ahead of print. PMID: 34008840
- Rotstein I, Katz J. Prevalence of periapical abscesses in vitamin D deficient patients. *Am J Dent*. 2021 Jun;34(3):163-165. PMID: 34143587
- Ruggiero CE, Backus RC. Effects of Vitamin D(2) and 25-Hydroxyvitamin D(2)

- Supplementation on Plasma Vitamin D Epimeric Metabolites in Adult Cats. *Front Vet Sci.* 2021 Jun 7;8:654629. <https://doi.org/10.3389/fvets.2021.654629>. eCollection 2021. PMID: 34164449
- Sadeghi M, Golshah A, Godiny M, et al. The Most Common Vitamin D Receptor Polymorphisms (Apal, FokI, TaqI, Bsml, and BgII) in Children with Dental Caries: A Systematic Review and Meta-Analysis. *Children (Basel).* 2021 Apr 15;8(4):302. <https://doi.org/10.3390/children8040302>. PMID: 33920959
 - Santos MB, de Carvalho CWP, Garcia-Rojas EE. Microencapsulation of vitamin D(3) by complex coacervation using carboxymethyl tara gum (*Caesalpinia spinosa*) and gelatin A. *Food Chem.* 2021 May 1;343:128529. <https://doi.org/10.1016/j.foodchem.2020.128529>. Epub 2020 Nov 3. PMID: 33191011
 - Savolainen L, Timpmann S, Mooses M, et al. Vitamin D supplementation does not enhance resistance training-induced gains in muscle strength and lean body mass in vitamin D deficient young men. *Eur J Appl Physiol.* 2021 Jul;121(7):2077-2090. <https://doi.org/10.1007/s00421-021-04674-9>. Epub 2021 Apr 5. PMID: 33821332
 - Schleicher RL, Sternberg MR, Potischman N, et al. Supplemental Vitamin D Increased Serum Total 25-Hydroxyvitamin D in the US Adult Population During 2007-2014. *J Nutr.* 2021 May 24:nxab147. <https://doi.org/10.1093/jn/nxab147>. Online ahead of print. PMID: 34036360
 - Shah BR, Xu W, Mráz J. Formulation and characterization of zein/chitosan complex particles stabilized Pickering emulsion with the encapsulation and delivery of vitamin D(3). *J Sci Food Agric.* 2021 Mar 1. <https://doi.org/10.1002/jsfa.11190>. Online ahead of print. PMID: 33647164
 - Shardell M, Cappola AR, Guralnik JM, et al. Sex-specific 25-hydroxyvitamin D threshold concentrations for functional outcomes in older adults: PROject on Optimal Vitamin D in Older adults (PROVIDO). *Am J Clin Nutr.* 2021 Apr 7:nqab025. <https://doi.org/10.1093/ajcn/nqab025>. Online ahead of print. PMID: 33826696
 - Shen H, Mei Y, Zhang K, et al. The Effect of Vitamin D Supplementation on Clinical Outcomes for Critically Ill Patients: A Systemic Review and Meta-Analysis of Randomized Clinical Trials. *Front Nutr.* 2021 May 4;8:664940. <https://doi.org/10.3389/fnut.2021.664940>. eCollection 2021. PMID: 34017850
 - Slominski AT, Kim TK, Qayyum S, et al. Vitamin D and lumisterol derivatives can act on liver X receptors (LXRs). *Sci Rep.* 2021 Apr 13;11(1):8002. <https://doi.org/10.1038/s41598-021-87061-w>. PMID: 33850196
 - Stockman J, Villaverde C, Corbee RJ. Calcium, Phosphorus, and Vitamin D in Dogs and Cats: Beyond the Bones. *Vet Clin North Am Small Anim Pract.* 2021 May;51(3):623-634. <https://doi.org/10.1016/j.cvsm.2021.01.003>. Epub 2021 Feb 27. PMID: 33653533
 - US Preventive Services Task Force, Krist AH, Davidson KW, et al. Screening for Vitamin D Deficiency in Adults: US Preventive Services Task Force Recommendation Statement. *JAMA.* 2021 Apr 13;325(14):1436-1442. <https://doi.org/10.1001/jama.2021.3069>. PMID: 33847711
 - van Ballegooijen AJ, Beulens JWJ, Kieneker LM, et al. Combined low vitamin D and K status amplifies mortality risk: a prospective study. *Eur J Nutr.* 2021 Apr;60(3):1645-1654. <https://doi.org/10.1007/s00394-020-02352-8>. Epub 2020 Aug 17. PMID: 32808059
 - Vázquez-Lorente H, Molina-López J, Herrera-Quintana L, et al. Effectiveness of eight-week zinc supplementation on vitamin D(3) status and leptin levels in a population of postmenopausal women: a double-blind randomized trial. *J Trace Elem Med Biol.* 2021 May;65:126730. <https://doi.org/10.1016/j.jtemb.2021.126730>. Epub 2021 Feb 12. PMID: 33607357
 - Vural E, Hazar L, Çağlayan M, et al. Peripapillary choroidal thickness in patients with vitamin D deficiency. *Eur J Ophthalmol.* 2021 Mar;31(2):578-583. <https://doi.org/10.1177/1120672120902025>. Epub 2020 Feb 3. PMID: 32009449
 - Wan M, Patel A, Patel JP, et al. Quality and use of unlicensed vitamin D preparations in primary care in England: Retrospective review of national prescription data and laboratory analysis. *Br J Clin Pharmacol.* 2021 Mar;87(3):1338-1346. <https://doi.org/10.1111/bcp.14521>. Epub 2020 Aug 31. PMID: 32803772
 - Waterhouse M, Baxter C, Duarte Romero B, et al. Predicting deseasonalised serum 25 hydroxy vitamin D concentrations in the D-Health Trial: An analysis using boosted regression trees. *Contemp Clin Trials.* 2021 May;104:106347. <https://doi.org/10.1016/j.cct.2021.106347>. Epub 2021 Mar 6. PMID: 33684596
 - Weir RR, Johnston M, Lowis C, et al. Vitamin D(3) content of cows' milk produced in Northern Ireland and its efficacy as a vehicle for vitamin D fortification: a UK model. *Int J Food Sci Nutr.* 2021 Jun;72(4):447-455. <https://doi.org/10.1080/09637486.2020.1837743>. Epub 2020 Oct 26. PMID: 33100087
 - Whiting SJ, Calvo MS. Vitamin D: Nutrition Information Brief. *Adv Nutr.* 2021 May 3:nmab051. <https://doi.org/10.1093/advances/nmab051>. Online ahead of print. PMID: 33942070
 - Wyse J, Mangan R, Zgaga L. Power determination in vitamin D randomised control trials and characterising factors affecting it through a novel simulation-based tool. *Sci Rep.* 2021 May 24;11(1):10804. <https://doi.org/10.1038/s41598-021-90019-7>. PMID: 34031451
 - Wyse J, Mangan R, Zgaga L. Publisher Correction: Power determination in vitamin D randomised control trials and characterising factors affecting it through a novel simulation-based tool. *Sci Rep.* 2021 Jun 22;11(1):13387. <https://doi.org/10.1038/s41598-021-92486-4>. PMID: 34158550
 - Yang P, Ma Y. Recent advances of vitamin D in immune, reproduction, performance for pig: a review. *Anim Health Res Rev.* 2021 Jun;22(1):85-95. <https://doi.org/10.1017/S1466252321000049>. Epub 2021 Jun 2. PMID: 34075873
 - Yıldız S, Tumer MK, Yigit S, et al. Relation of vitamin D and Bsml variant with temporomandibular diseases in the Turkish population. *Br J Oral Maxillofac Surg.* 2021 Jun;59(5):555-560. <https://doi.org/10.1016/j.bjoms.2020.08.101>. Epub 2020 Aug 28. PMID: 33863594
 - Zhang A, Cui Q, Wang X, et al. Effect of temperature of preheated soy protein isolate on the structure and properties of soy protein isolate heated-vitamin D(3) complex. *J Food Biochem.* 2021 Jun;45(6):e13733. <https://doi.org/10.1111/jfbc.13733>. Epub 2021 Apr 23. PMID: 33890679

- Zhou H, Zheng B, Zhang Z, et al. Fortification of Plant-Based Milk with Calcium May Reduce Vitamin D Bioaccessibility: An In Vitro Digestion Study. *J Agric Food Chem.* 2021 Apr; 14;69(14):4223-4233. <https://doi.org/10.1021/acs.jafc.1c01525>. Epub 2021 Mar 31. PMID: 33787251
- Žmitek K, Krusič S, Pravst I. An Approach to Investigate Content-Related Quality of Nutraceuticals Used by Slovenian Consumers: A Case Study with Folate and Vitamin D Supplements. *Foods.* 2021 Apr 13;10(4):845. <https://doi.org/10.3390/foods10040845>. PMID: 33924488
- NEPHROLOGY**
- Arapović A, Vukojević K, Glavina Durdov M, et al. Expression of renal vitamin D receptors and metabolizing enzymes in IgA nephropathy. *Acta Histochem.* 2021 Jun 8;123(5):151740. <https://doi.org/10.1016/j.acthis.2021.151740>. Online ahead of print. PMID: 34111685
- Bataille S, Pedinielli N, Carreno E, et al. VITADIAL "Does correction of 25 OH-VITAMin D with cholecalciferol supplementation increase muscle strength in hemoDIALysis patients?": study protocol for a randomized controlled trial. *Trials.* 2021 May 25;22(1):364. <https://doi.org/10.1186/s13063-021-05302-9>. PMID: 34034786
- Charoenngam N, Sriussadaporn S. Vitamin D and parathyroid hormone status in community-dwelling elderly patients with mild-to-moderate kidney impairment. *Int Urol Nephrol.* 2021 May;53(5):973-983. <https://doi.org/10.1007/s11255-020-02695-5>. Epub 2021 Jan 9. PMID: 33420892
- Christodoulou M, Aspray TJ, Schoenmakers I. Vitamin D Supplementation for Patients with Chronic Kidney Disease: A Systematic Review and Meta-analyses of Trials Investigating the Response to Supplementation and an Overview of Guidelines. *Calcif Tissue Int.* 2021 Apr 25. <https://doi.org/10.1007/s00223-021-00844-1>. Online ahead of print. PMID: 33895867
- Cianciolo G, Cappuccilli M, Tondolo F, et al. Vitamin D Effects on Bone Homeostasis and Cardiovascular System in Patients with Chronic Kidney Disease and Renal Transplant Recipients. *Nutrients.* 2021 Apr 25;13(5):1453. <https://doi.org/10.3390/nu13051453>. PMID: 33922902
- Dos Santos MS, Canale D, Bernardo DRD, et al. The Restoration of Vitamin D Levels Slows the Progression of Renal Ischemic Injury in Rats Previously Deficient in Vitamin D. *Front Med (Lausanne).* 2021 Apr 1;8:625647. <https://doi.org/10.3389/fmed.2021.625647>. eCollection 2021. PMID: 33869246
- Eskandarifar A, Roshani D, Tabarkhun A, et al. Assessment of Serum Level of Vitamin D in Infants with Nephrolithiasis. *Iran J Kidney Dis.* 2021 Mar;1(2):116-120. PMID: 33764322
- Galassi A, Ciceri P, Porata G, et al. Current treatment options for secondary hyperparathyroidism in patients with stage 3 to 4 chronic kidney disease and vitamin D deficiency. *Expert Opin Drug Saf.* 2021 Jun 9;1-17. <https://doi.org/10.1080/14740338.2021.1931117>. Online ahead of print. PMID: 33993809
- Graidis S, Papavramidis TS, Papaioannou M. Vitamin D and Acute Kidney Injury: A Two-Way Causality Relation and a Predictive, Prognostic, and Therapeutic Role of Vitamin D. *Front Nutr.* 2021 Mar 4;7:630951. <https://doi.org/10.3389/fnut.2020.630951>. eCollection 2020. PMID: 33748167
- He J, Du J, Yi B, et al. MicroRNA-122 contributes to lipopolysaccharide-induced acute kidney injury via down-regulating the vitamin D receptor in the kidney. *Eur J Clin Invest.* 2021 Mar 29:e13547. <https://doi.org/10.1111/eci.13547>. Online ahead of print. PMID: 33782973
- Karimi E, Bitarafan S, Mousavi SM, et al. The effect of vitamin D supplementation on fibroblast growth factor-23 in patients with chronic kidney disease: A systematic review and meta-analysis. *Phytother Res.* 2021 Apr 30. <https://doi.org/10.1002/ptr.7139>. Online ahead of print. PMID: 33928687
- Korucu B, Tükün A, Helvacı Ö, et al. Vitamin D receptor polymorphisms and bone health after kidney transplantation. *Turk J Med Sci.* 2021 Apr 30;51(2):802-812. <https://doi.org/10.3906/sag-1911-156>. PMID: 33306336
- Mirzakhani M, Mohammadkhani S, Hekmatirad S, et al. The association between vitamin D and acute rejection in human kidney transplantation: A systematic review and meta-analysis study. *Transpl Immunol.* 2021 Aug;67:101410. <https://doi.org/10.1016/j.trim.2021.101410>. Epub 2021 May 19. PMID: 34020044
- Nazzal ZA, Hamdan Z, Natour N, et al. Prevalence of Vitamin D Deficiency among Hemodialysis Patients in Palestine: A Cross-Sectional Study. *Int J Nephrol.* 2021 Mar 12;2021:6684276. <https://doi.org/10.1155/2021/6684276>. eCollection 2021. PMID: 33791129
- Obi Y, Ichimaru N, Sakaguchi Y, et al. Correcting anemia and native vitamin D supplementation in kidney transplant recipients: a multicenter, 2 × 2 factorial, open-label, randomized clinical trial. *Transpl Int.* 2021 Apr 22. <https://doi.org/10.1111/tri.13885>. Online ahead of print. PMID: 33884674
- Özgür Y. Relationship between Vitamin D Deficiency, Albuminuria, Peripheral Artery Disease and 5-year Mortality in Chronic Kidney Disease. *J Coll Physicians Surg Pak.* 2021 Jun;30(6):644-650. <https://doi.org/10.29271/jcpsp.2021.06.644>. PMID: 34102774
- Pasaoglu OT, Senelmis A, Helvacı O, et al. FGF23, alpha-Klotho and vitamin D mediated calcium-phosphate metabolism in haemodialysis patients. *J Med Biochem.* 2021 Mar 12;40(2):160-166. <https://doi.org/10.5937/jomb-027408>. PMID: 33776565
- Quach K, Abdelmasih M, Chen PX, et al. Vitamin D Levels and the Risk of Post-transplant Diabetes Mellitus After Kidney Transplantation. *Prog Transplant.* 2021 Jun;31(2):133-141. <https://doi.org/10.1177/15269248211002796>. Epub 2021 Apr 1. PMID: 33789542
- Rahimi Z, Abdolvand N, Sepehri MM, et al. The association of vitamin-D level with catheter-related-thrombosis in hemodialysis patients: A data mining model. *J Vasc Access.* 2021 Mar 14;11297298211001157. <https://doi.org/10.1177/11297298211001157>. Online ahead of print. PMID: 33719687
- Ramadan SM, Abdelrahman HM, Al Azizi NM, et al. Vitamin D and left ventricular dysfunction in pediatric dialysis patients; a tissue doppler study. *Minerva Pediatr (Torino).* 2021 Jun 7. <https://doi.org/10.23736/S2724-5276.21.06301-1>. Online ahead of print. PMID: 34098711

- Song Z, Xiao C, Jia X, et al. Vitamin D/VDR Protects Against Diabetic Kidney Disease by Restoring Podocytes Autophagy. *Diabetes Metab Syndr Obes*. 2021 Apr 16;14:1681-1693. <https://doi.org/10.2147/DMSO.S303018>. eCollection 2021. PMID: 33889003
- Sürmeli Döven S, Erdogan S. Vitamin D deficiency as a risk factor for renal scarring in recurrent urinary tract infections. *Pediatr Int*. 2021 Mar;63(3):295-299. <https://doi.org/10.1111/ped.14397>. Epub 2021 Mar 13. PMID: 33118657
- Takedani K, Notsu M, Koike S, et al. Osteomalacia caused by atypical renal tubular acidosis with vitamin D deficiency: a case report. *CEN Case Rep*. 2021 May;10(2):294-300. <https://doi.org/10.1007/s13730-020-00561-y>. Epub 2021 Jan 4. PMID: 33398781
- Tuey SM, Atilano-Roque A, Charkoftaki G, et al. Influence of vitamin D treatment on functional expression of drug disposition pathways in human kidney proximal tubule cells during simulated uremia. *Xenobiotica*. 2021 Jun;51(6):657-667. <https://doi.org/10.1080/00498254.2021.1909783>. Epub 2021 Apr 18. PMID: 33870862
- Ulrich C, Trojanowicz B, Fiedler R, et al. Serum Testosterone Levels Are Not Modified by Vitamin D Supplementation in Dialysis Patients and Healthy Subjects. *Nephron*. 2021 Jun 9:1-5. <https://doi.org/10.1159/000516636>. Online ahead of print. PMID: 34107473
- Vogt BP, Caramori JCT. Vitamin D and skeletal muscle: A narrative review focusing on chronic kidney disease and dialysis. *Hemodial Int*. 2021 Mar 10. <https://doi.org/10.1111/hdi.12916>. Online ahead of print. PMID: 33694274 Review
- Wang F, Hu R, Zhang J, et al. High-dose vitamin D3 ameliorates renal fibrosis by vitamin D receptor activation and inhibiting TGF-beta1/Smad3 signaling pathway in 5/6 nephrectomized rats. *Eur J Pharmacol*. 2021 Jun 17;174271. <https://doi.org/10.1016/j.ejphar.2021.174271>. Online ahead of print. PMID: 34147475
- Watson EL, Wilkinson TJ, O'Sullivan TF, et al. Association between vitamin D deficiency and exercise capacity in patients with CKD, a cross-sectional analysis. *J Steroid Biochem Mol Biol*. 2021 Jun;210:105861. <https://doi.org/10.1016/j.jsbmb.2021.105861>. Epub 2021 Mar 3. PMID: 33675951
- Yang Y, Lei Y, Liang Y, et al. Vitamin D protects glomerular mesangial cells from high glucose-induced injury by repressing JAK/STAT signaling. *Int Urol Nephrol*. 2021 Jun;53(6):1247-1254. <https://doi.org/10.1007/s11255-020-02728-z>. Epub 2021 May 3. PMID: 33942213
- Yuan P, Wang T, Li H, et al. Systematic Review and Meta-Analysis of the Association between Vitamin D Status and Lower Urinary Tract Symptoms. *J Urol*. 2021 Jun;205(6):1584-1594. <https://doi.org/10.1097/JU.0000000000001441>. Epub 2020 Nov 18. PMID: 33207134
- Zhang ZH, Luo B, Xu S, et al. Long-term vitamin D deficiency promotes renal fibrosis and functional impairment in middle-aged male mice. *Br J Nutr*. 2021 Apr 28;125(8):841-850. <https://doi.org/10.1017/S0007114520003232>. Epub 2020 Aug 19. PMID: 32812524
- Zununi Vahed S, Ahmadian E, Foroughi P, et al. Vitamin D Receptor and Vitamin D Binding Protein Gene Polymorphisms Are Associated with Renal Allograft Outcome. *Nutrients*. 2021 Mar 27;13(4):1101. <https://doi.org/10.3390/nu13041101>. PMID: 33801744
- [No authors listed] Correction for Alam et al., Upregulation of reduced folate carrier by vitamin D enhances brain folate uptake in mice lacking folate receptor alpha. *Proc Natl Acad Sci U S A*. 2021 Mar 2;118(9):e2101687118. <https://doi.org/10.1073/pnas.2101687118>. PMID: 33619114
- [No authors listed] An Alternative to Vitamin D Supplementation to Prevent Fractures in Patients With MS. *Neurology*. 2021 Apr 27;96(17):828. <https://doi.org/10.1212/WNL.00000000000011856>. PMID: 33903216
- Abbatemarco JR, Fox RJ, Li H, et al. Vitamin D Levels and Visual System Measurements in Progressive Multiple Sclerosis: A Cross-sectional Study. *Int J MS Care*. 2021 Mar-Apr;23(2):53-58. <https://doi.org/10.7224/1537-2073.2020-005>. Epub 2020 Apr 28. PMID: 33880080
- Adams LE, Moss HG, Lowe DW, et al. NAC and Vitamin D Restore CNS Glutathione in Endotoxin-Sensitized Neonatal Hypoxic-Ischemic Rats. *Antioxidants (Basel)*. 2021 Mar 20;10(3):489. <https://doi.org/10.3390/antiox10030489>. PMID: 33804757
- Akdag T, Uca AU, Altas M, et al. Level of kisspeptin-10 in patients with multiple sclerosis and the association between third ventricle diameter size and vitamin D level. *Physiol Int*. 2021 Jun 16;2021.00179. <https://doi.org/10.1556/2060.2021.00179>. Online ahead of print. PMID: 34138749
- Amirinejad R, Shirvani-Farsani Z, Naghavi Gargari B, et al. Vitamin D changes expression of DNA repair genes in the patients with multiple sclerosis. *Gene*. 2021 May 20;781:145488. <https://doi.org/10.1016/j.gene.2021.145488>. Epub 2021 Feb 13. PMID: 33588040 Clinical Trial
- Bakhshaei M, Moradi S, Mohebi M, et al. Association Between Serum Vitamin D Level and Meniere's Disease. *Otolaryngol Head Neck Surg*. 2021 Mar 23;1945998211000395. <https://doi.org/10.1177/01945998211000395>. Online ahead of print. PMID: 33755501
- Bayat M, Kohlmeier KA, Haghani M, et al. Co-treatment of vitamin D supplementation with enriched environment improves synaptic plasticity and spatial learning and memory in aged rats. *Psychopharmacology (Berl)*. 2021 May 15. <https://doi.org/10.1007/s00213-021-05853-4>. Online ahead of print. PMID: 33991198
- Beydoun MA, Shaked D, Hossain S, et al. Corrigendum: Vitamin D, Folate, and Cobalamin Serum Concentrations Are Related to Brain Volume and White Matter Integrity in Urban Adults. *Front Aging Neurosci*. 2021 Apr 19;13:660049. <https://doi.org/10.3389/fnagi.2021.660049>. eCollection 2021. PMID: 33953664
- Bivona G, Lo Sasso B, Gambino CM, et al. The Role of Vitamin D as a Biomarker in Alzheimer's Disease. *Brain Sci*. 2021 Mar 6;11(3):334. <https://doi.org/10.3390/brainsci11030334>. PMID: 33800891
- Boltjes R, Knippenberg S, Gerlach O, et al. Vitamin D supplementation in multiple sclerosis: an expert opinion based on the review of current evidence. *Expert Rev Neurother*. 2021 Jun;21(6):715-725. <https://doi.org/10.1080/13696513.2021.629022>

- g/10.1080/14737175.2021.1935878. Epub 2021 Jun 4. PMID: 34058936 doi.org/10.1007/s00415-020-10312-9. Epub 2020 Nov 21. PMID: 33219423 doi.org/10.1093/advances/nmab074. Online ahead of print. PMID: 34167149
- Botelho J, Leira Y, Viana J, et al. The Role of Inflammatory Diet and Vitamin D on the Link between Periodontitis and Cognitive Function: A Mediation Analysis in Older Adults. *Nutrients*. 2021 Mar 12;13(3):924. <https://doi.org/10.3390/nu13030924>. PMID: 33809193
 - Brüttig C, Stangl GI, Staeghe MS. Vitamin D, Epstein-Barr virus, and endogenous retroviruses in multiple sclerosis - facts and hypotheses. *J Integr Neurosci*. 2021 Mar 30;20(1):233-238. <https://doi.org/10.31083/j.jin.2021.01.392>. PMID: 33834708
 - Choudhary A, Kumar A, Sharma R, et al. Optimal Vitamin D Level Ameliorates Neurological Outcome and Quality of Life after Traumatic Brain Injury: A Clinical Perspective. *Int J Neurosci*. 2021 Apr 30;1-12. <https://doi.org/10.1080/00207454.2021.1924706>. Online ahead of print. PMID: 33930999
 - Cunha IA, Saraiva AM, Lopes P, et al. Vitamin D deficiency in a Portuguese epilepsy cohort: who is at risk and how to treat. *Epileptic Disord*. 2021 Apr 1;23(2):291-298. <https://doi.org/10.1684/epd.2021.1268>. PMID: 33875410
 - Goldschagg N, Teupser D, Feil K, et al. No evidence for a specific vitamin D deficit in benign paroxysmal positional vertigo. *Eur J Neurol*. 2021 Jun 16. <https://doi.org/10.1111/ene.14980>. Online ahead of print. PMID: 34133827
 - Gwasikoti N, Bhalla K, Kaushik JS, et al. Vitamin D, Bone Mineral Density and Serum IGF-1 Level in Non-ambulatory Children with Cerebral Palsy. *Indian Pediatr*. 2021 Apr 17;S097475591600312. Online ahead of print. PMID: 33864451
 - Jiménez Jiménez FJ, Amo G, Alonso-Navarro H, et al. Correction to: Serum vitamin D, vitamin D receptor and binding protein genes polymorphisms in restless legs syndrome. *J Neurol*. 2021 Apr;268(4):1473. <https://doi.org/10.1007/s00415-021-10422-y>. PMID: 33606072
 - Jiménez Jiménez FJ, Amo G, Alonso-Navarro H, et al. Serum vitamin D, vitamin D receptor and binding protein genes polymorphisms in restless legs syndrome. *J Neurol*. 2021 Apr;268(4):1461-1472. <https://doi.org/10.1007/s00415-021-18737-6>. Epub 2021 Jan 18. PMID: 33406925
 - Justo ME, Aldecoa M, Cela E, et al. Low Vitamin D Serum Levels in a Cohort of Myasthenia Gravis Patients in Argentina. *Photochem Photobiol*. 2021 Apr 18. <https://doi.org/10.1111/php.13432>. Online ahead of print. PMID: 33866582
 - Law SPL, Gatt PN, Schibeci SD, et al. Expression of CYP24A1 and other multiple sclerosis risk genes in peripheral blood indicates response to vitamin D in homeostatic and inflammatory conditions. *Genes Immun*. 2021 Jun 23. <https://doi.org/10.1038/s41435-021-00144-6>. Online ahead of print. PMID: 34163021
 - Le Roy C, Barja S, Sepúlveda C, et al. Vitamin D and iron deficiencies in children and adolescents with cerebral palsy. *Neurologia (Engl Ed)*. 2021 Mar;36(2):112-118. <https://doi.org/10.1016/j.nrl.2017.11.005>. Epub 2018 Jan 17. PMID: 29342407
 - Lee C, Seo H, Yoon SY, et al. Clinical significance of vitamin D in idiopathic normal pressure hydrocephalus. *Acta Neurochir (Wien)*. 2021 Jul;163(7):1969-1977. <https://doi.org/10.1007/s00701-021-04849-5>. Epub 2021 Apr 21. PMID: 33881606
 - Lefèvre-Arbogast S, Dhana K, Aggarwal NT, et al. Vitamin D Intake and Brain Cortical Thickness in Community-Dwelling Overweight Older Adults: A Cross-Sectional Study. *J Nutr*. 2021 Jun 10:nxab168. <https://doi.org/10.1093/jn/nxab168>. Online ahead of print. PMID: 34113981
 - Lincoln MR, Schneider R, Oh J. Vitamin D as disease-modifying therapy for multiple sclerosis? *Expert Rev Clin Immunol*. 2021 Apr 15;1-3. <https://doi.org/10.1080/1744666X.2021.1915772>. Online ahead of print. PMID: 33836645
 - Liu H, He Y, Beck J, et al. Defining vitamin D receptor expression in the brain using a novel VDR(Cre) mouse. *J Comp Neurol*. 2021 Jun;529(9):2362-2375. <https://doi.org/10.1002/cne.25100>. Epub 2021 Jan 7. PMID: 33368246
 - Liu N, Zhang T, Ma L, et al. Vitamin D Receptor Gene Polymorphisms and Risk of Alzheimer Disease and Mild Cognitive Impairment: A Systematic Review and Meta-Analysis. *Adv Nutr*. 2021 Jun 24:nmab074. <https://doi.org/10.1093/advances/nmab074>. Online ahead of print. PMID: 34167149
 - Maghbooli Z, Omidifar A, Varzandi T, et al. Reduction in circulating vitamin D binding protein in patients with multiple sclerosis. *BMC Neurol*. 2021 Apr 20;21(1):168. <https://doi.org/10.1186/s12883-021-02200-0>. PMID: 33879066
 - Mansoor F, Kumar V, Kumar S, et al. Association Between Serum Vitamin D Levels and Frequency of Relapses in Patients With Multiple Sclerosis. *Cureus*. 2021 Apr 9;13(4):e14383. <https://doi.org/10.7759/cureus.14383>. PMID: 33987049
 - Mansouri F, Ghanbari H, Marefat N, et al. Protective effects of vitamin D on learning and memory deficit induced by scopolamine in male rats: the roles of brain-derived neurotrophic factor and oxidative stress. *Naunyn Schmiedebergs Arch Pharmacol*. 2021 Jul;394(7):1451-1466. <https://doi.org/10.1007/s00210-021-02062-w>. Epub 2021 Mar 2. PMID: 33649977
 - Murdaca G, Banchero S, Tonacci A, et al. Vitamin D and Folate as Predictors of MMSE in Alzheimer's Disease: A Machine Learning Analysis. *Diagnostics (Basel)*. 2021 May 24;11(6):940. <https://doi.org/10.3390/diagnostics11060940>. PMID: 34073931
 - Niino M, Fukazawa T, Miyazaki Y, et al. Seasonal fluctuations in serum levels of vitamin D in Japanese patients with multiple sclerosis. *J Neuroimmunol*. 2021 Jun 2;357:577624. <https://doi.org/10.1016/j.jneuroim.2021.577624>. Online ahead of print. PMID: 34098399
 - Pan Y, Zhang Y, Liu N, et al. Vitamin D Attenuates Alzheimer-like Pathology Induced by Okadaic Acid. *ACS Chem Neurosci*. 2021 Apr 21;12(8):1343-1350. <https://doi.org/10.1021/acschemneuro.0c00812>. Epub 2021 Apr 5. PMID: 33818056
 - Panza F, La Montagna M, Lampignano L, et al. Vitamin D in the development and progression of alzheimer's disease: implications for clinical management. *Expert Rev Neurother*. 2021 Mar;21(3):287-301. <https://doi.org/10.1080/14737175.2021.1873768>. Epub 2021 Jan 18. PMID: 33406925
 - Paprocki J, Sutkowy P, Piechocki J, et al. Association between Vitamin D Supplements,

- Oxidative Stress Biomarkers, and Hyperbaric Therapy in Patients with Sudden Sensorineural Hearing Loss. *Oxid Med Cell Longev*. 2021 Mar 10;2021:8895323. <https://doi.org/10.1155/2021/8895323>. eCollection 2021. PMID: 33777323
- Peterson Hiller A. Response to the retraction of papers by Yoshihiro Sato - a review of vitamin D and Parkinson's disease. *Maturitas*. 2021 Jun;148:54. <https://doi.org/10.1016/j.maturitas.2021.03.010>. Epub 2021 Mar 24. PMID: 33838971
 - Rad RE, Zarbakhsh M, Sarabi S. The Relationship of Vitamin D Deficiency with Severity and Outcome of Acute Stroke. *Rom J Intern Med*. 2021 Apr 13. <https://doi.org/10.2478/rjim-2021-0013>. Online ahead of print. PMID: 33855844
 - Rebecchi V, Gallo D, Princiotta Cariddi L, et al. Vitamin D, Chronic Migraine, and Extracranial Pain: Is There a Link? Data From an Observational Study. *Front Neurol*. 2021 May 13;12:651750. <https://doi.org/10.3389/fneur.2021.651750>. eCollection 2021. PMID: 34054696
 - Rist PM, Buring JE, Cook NR, et al. Effect of Vitamin D and/or Marine n-3 Fatty Acid Supplementation on Changes in Migraine Frequency and Severity. *Am J Med*. 2021 Jun; 134(6):756-762.e5. <https://doi.org/10.1016/j.amjmed.2020.11.023>. Epub 2021 Jan 12. PMID: 33444588 Clinical Trial
 - Rist PM, Buring JE, Cook NR, et al. Effect of vitamin D and/or omega-3 fatty acid supplementation on stroke outcomes: A randomized trial. *Eur J Neurol*. 2021 Mar;28(3):809-815. <https://doi.org/10.1111/ene.14623>. Epub 2020 Nov 24. PMID: 33131164
 - Sarsithithum K, Wisupagan T, Kiatthanabumrung S, et al. The Association Between Serum Vitamin D Levels and Benign Paroxysmal Positional Vertigo. *Ear Nose Throat J*. 2021 Apr 18;1455613211008561. <https://doi.org/10.1177/01455613211008561>. Online ahead of print. PMID: 33866868
 - Schramm S, Schliephake I, Himpfen H, et al. Vitamin D and white matter hyperintensities: results of the population-based Heinz Nixdorf Recall Study and 1000BRAINS. *Eur J Neurol*. 2021 Jun;28(6):1849-1858. <https://doi.org/10.1111/ene.14810>. Epub 2021 Mar 31. PMID: 33686727
 - Scrimgeour AG, Condlin ML, Loban A, et al. Omega-3 Fatty Acids and Vitamin D Decrease Plasma TTau, GFAP, and UCH-L1 in Experimental Traumatic Brain Injury. *Front Nutr*. 2021 Jun 4;8:685220. <https://doi.org/10.3389/fnut.2021.685220>. eCollection 2021. PMID: 34150829
 - Simpson-Yap S, Jelinek P, Weiland T, et al. Self-reported use of vitamin D supplements is associated with higher physical quality of life scores in multiple sclerosis. *Mult Scler Relat Disord*. 2021 Apr;49:102760. <https://doi.org/10.1016/j.msard.2021.102760>. Epub 2021 Jan 16. PMID: 33545666
 - Smolders J, Hiller A, Camu W. Editorial: Vitamin D in Neurological Diseases: From Pathophysiology to Therapy. *Front Neurol*. 2021 Mar 9;12:614900. <https://doi.org/10.3389/fneur.2021.614900>. eCollection 2021. PMID: 33767657
 - Song P, Zhao X, Xu Y, et al. Morphological Effect of Vitamin D Deficiency on Globular Substances in Mice. *Otol Neurotol*. 2021 Jun 11. <https://doi.org/10.1097/MAO.0000000000003229>. Online ahead of print. PMID: 34121084
 - Sun D, Tian F. Letter to the editor: Associations of vitamin D deficiency with MRI markers of brain health in a community sample. *Clin Nutr*. 2021 May;40(5):2543. <https://doi.org/10.1016/j.clnu.2021.04.005>. Epub 2021 Apr 16. PMID: 33932801
 - Teymoori-Rad M, Sahraian MA, Mokhtari-zad T, et al. Illuminating the in vitro effects of Epstein-Barr virus and vitamin D on immune response in multiple sclerosis patients. *J Neurovirol*. 2021 Apr;27(2):260-271. <https://doi.org/10.1007/s13365-021-00951-7>. Epub 2021 Mar 5. PMID: 33666884
 - Utkan Karasu A, Karataş GK. Effect of Vitamin D Supplementation on Lower Extremity Motor Function and Ambulation in Stroke Patients. *Turk J Med Sci*. 2021 Mar 12. <https://doi.org/10.3906/sag-2010-287>. Online ahead of print. PMID: 33705638
 - Vather-Wu N, Krasowski MD, Mathews KD, et al. Vitamin D Level Stability in Dystrophinopathy Patients on Vitamin D Supplementation. *J Neuromuscul Dis*. 2021 Apr 1. <https://doi.org/10.3233/JND-200625>. Online ahead of print. PMID: 33814459
 - Waliullah S, Kumar D, Kumar D, et al. Prevalence of Vitamin D Deficiency in a Young Adult With Acute Spinal Cord Injury. *Cureus*. 2021 Mar 9;13(3):e13791. <https://doi.org/10.7759/cureus.13791>. PMID: 33842165
 - Wei S, Yuan X, Fan F, et al. The relationship between the level of vitamin D and ruptured intracranial aneurysms. *Sci Rep*. 2021 Jun 4;11(1):11881. <https://doi.org/10.1038/s41598-021-90760-z>. PMID: 34088910
 - Wesnes K, Myhr KM, Riise T, et al. Low vitamin D, but not tobacco use or high BMI, is associated with long-term disability progression in multiple sclerosis. *Mult Scler Relat Disord*. 2021 May;50:102801. <https://doi.org/10.1016/j.msard.2021.102801>. Epub 2021 Jan 28. PMID: 33636616
 - Xiaohua G, Dongdong L, Xiaoting N, et al. Severe Vitamin D Deficiency Is Associated With Increased Expression of Inflammatory Cytokines in Painful Diabetic Peripheral Neuropathy. *Front Nutr*. 2021 Mar 10;8:612068. <https://doi.org/10.3389/fnut.2021.612068>. eCollection 2021. PMID: 33777989
 - Yadav H, Irugu D, Ramakrishnan L, et al. An evaluation of serum Otolin-1 & Vitamin-D in benign paroxysmal positional vertigo. *J Vestib Res*. 2021 Mar 6. <https://doi.org/10.3233/VES-201601>. Online ahead of print. PMID: 33720865
 - Yammie K, Abi Kharma J, Kaypektian T, et al. Is diabetic neuropathy associated with vitamin D status? A meta-analysis. *Br J Nutr*. 2021 May 24;1-35. <https://doi.org/10.1017/S0007114521001707>. Online ahead of print. PMID: 34024290
 - Yang Z, Li J, Zhu Z, et al. Effect of vitamin D supplementation on benign paroxysmal positional vertigo recurrence: A meta-analysis. *Sci Prog*. 2021 Apr-Jun;104(2):368504211024569. <https://doi.org/10.1177/00368504211024569>. PMID: 34128742
 - Yousuf S, Atif F, Espinosa-Garcia C, et al. Stroke-Induced Peripheral Immune Dysfunction in Vitamin D-Deficient Conditions: Modulation by Progesterone and Vitamin D. *Mol Neurobiol*. 2021 Mar;58(3):950-963. <https://doi.org/10.1007/s12035-020-02129-4>. Epub 2020 Oct 16. PMID: 33063282

- Zelzer S, Hofer E, Meinitzer A, et al. Association of vitamin D metabolites with cognitive function and brain atrophy in elderly individuals - the Austrian stroke prevention study. *Aging (Albany NY)*. 2021 Apr 7;13(7):9455-9467. <https://doi.org/10.18632/aging.202930>. Epub 2021 Apr 7. PMID: 33825696
- OBSTETRICS GYNECOLOGY**
- Al-Bayyari N, Al-Domi H, Zayed F, et al. Androgens and hirsutism score of overweight women with polycystic ovary syndrome improved after vitamin D treatment: A randomized placebo controlled clinical trial. *Clin Nutr*. 2021 Mar;40(3):870-878. <https://doi.org/10.1016/j.clnu.2020.09.024>. Epub 2020 Sep 24. PMID: 33010974
- Alhomaid RM, Mulhern MS, Strain J, et al. Maternal obesity and baseline vitamin D insufficiency alter the response to vitamin D supplementation: a double-blind, randomized trial in pregnant women. *Am J Clin Nutr*. 2021 May 8:nqab112. <https://doi.org/10.1093/ajcn/nqab112>. Online ahead of print. PMID: 33964855
- Alkhalfaf Z, Kim K, Kuhr DL, et al. Markers of vitamin D metabolism and premenstrual symptoms in healthy women with regular cycles. *Hum Reprod*. 2021 Jun 18;36(7):1808-1820. <https://doi.org/10.1093/humrep/deab089>. PMID: 33864070
- Almidani E, Barkoumi A, Elsaiedawi W, et al. Maternal Vitamin D Levels and Its Correlation With Low Birth Weight in Neonates: A Tertiary Care Hospital Experience in Saudi Arabia. *Cureus*. 2021 Apr 16;13(4):e14528. <https://doi.org/10.7759/cureus.14528>. PMID: 34012736
- Aramesh S, Alifarja T, Jannesar R, et al. Does vitamin D supplementation improve ovarian reserve in women with diminished ovarian reserve and vitamin D deficiency: a before-and-after intervention study. *BMC Endocr Disord*. 2021 Jun 21;21(1):126. <https://doi.org/10.1186/s12902-021-00786-7>. PMID: 34154571
- Atasayan K, Yoldemir T. The effect of PCOS status on atherosclerosis markers and cardiovascular disease risk factors in young women with vitamin D deficiency. *Gynecol Endocrinol*. 2021 Mar;37(3):225-229. <https://doi.org/10.1080/09513590.2020.1826428>. Epub 2020 Sep 30. PMID: 32996333
- Azhar A, Haider G, Naseem Z, et al. Morphological changes in the experimental model of polycystic ovary syndrome and effects of vitamin D treatment. *J Obstet Gynaecol Res*. 2021 Mar;47(3):1164-1171. <https://doi.org/10.1111/jog.14671>. Epub 2021 Jan 25. PMID: 33496002
- Benaim C, Carrilho TRB, Farias DR, et al. Vitamin D during pregnancy and its association with birth outcomes: a Brazilian cohort study. *Eur J Clin Nutr*. 2021 Mar;75(3):489-500. <https://doi.org/10.1038/s41430-020-00733-0>. Epub 2020 Sep 2. PMID: 32879447
- Bergløv A, Moseholm E, Katzenstein TL, et al. Prevalence and association with birth outcomes of low Vitamin D levels among pregnant women living with HIV. AIDS. 2021 Mar 31. <https://doi.org/10.1097/QAD.0000000000002899>. Online ahead of print. PMID: 33813556
- Bindayel IA. Low Vitamin D Level in Saudi Women With Polycystic Ovary Syndrome. *Front Nutr*. 2021 Apr 12;8:611351. <https://doi.org/10.3389/fnut.2021.611351>. eCollection 2021. PMID: 33912581
- Brustad N, Greve JH, Mirzakhani H, et al. High-dose vitamin D during pregnancy and pathway gene polymorphisms in prevention of offspring persistent wheeze. *Pediatr Allergy Immunol*. 2021 May;32(4):679-689. <https://doi.org/10.1111/pai.13453>. Epub 2021 Feb 20. PMID: 33453076
- Butler AE, Dargham SR, Abouseif A, et al. Vitamin D deficiency effects on cardiovascular parameters in women with polycystic ovary syndrome: A retrospective, cross-sectional study. *J Steroid Biochem Mol Biol*. 2021 Jul;211:105892. <https://doi.org/10.1016/j.jsbmb.2021.105892>. Epub 2021 Mar 27. PMID: 33785436
- Cai S, Li J, Zeng S, et al. Impact of vitamin D on human embryo implantation-a prospective cohort study in women undergoing fresh embryo transfer. *Fertil Steril*. 2021 Mar;115(3):655-664. <https://doi.org/10.1016/j.fertnstert.2020.09.005>. Epub 2020 Oct 8. PMID: 33039126
- Cao Y, Jia X, Huang Y, et al. Vitamin D stimulates miR-26b-5p to inhibit placental COX-2 expression in preeclampsia. *Sci Rep*. 2021 May 27;11(1):11168. <https://doi.org/10.1038/s41598-021-90605-9>. PMID: 34045549
- Chu C, Tsuprykov O, Chen X, et al. Relationship Between Vitamin D and Hormones Important for Human Fertility in Reproductive-Aged Women. *Front Endocrinol (Lausanne)*. 2021 Apr 14;12:666687. <https://doi.org/10.3389/fendo.2021.666687>. eCollection 2021. PMID: 33935976
- Das B, Singhal SR, Ghalaut VS. Evaluating the association between maternal vitamin D deficiency and preeclampsia among Indian gravidas. *Eur J Obstet Gynecol Reprod Biol*. 2021 Jun;261:103-109. <https://doi.org/10.1016/j.ejogrb.2021.04.014>. Epub 2021 Apr 15. PMID: 33915489
- Davari Tanha F, Feizabad E, Vasheghani Farahani M, et al. The Effect of Vitamin D Deficiency on Overgrowth of Uterine Fibroids: A Blinded Randomized Clinical Trial. *Int J Fertil Steril*. 2021 Apr;15(2):95-100. <https://doi.org/10.22074/IJFS.2020.134567>. Epub 2021 Mar 11. PMID: 33687161
- Diogenes MEL, Bezerra FF, Donangelo CM. Reduction in Bone Loss from 5 to 20 Weeks Postpartum in Adolescents Supplemented with Calcium Plus Vitamin D during Pregnancy Is Not Sustained at 1 Year Postpartum: Follow-up Study of a Randomized Controlled Trial. *J Nutr*. 2021 Mar 11;151(3):548-555. <https://doi.org/10.1093/jn/nxaa418>. PMID: 33561253 Clinical Trial
- Doryanizadeh L, Morshed-Behbahani B, Parsanezhad ME, et al. Calcitriol Effect on Outcomes of in Vitro Fertilization in Infertile Women with Vitamin D Deficiency: A Double-Blind Randomized Clinical Trial. *Z Geburtshilfe Neonatol*. 2021 Jun;225(3):226-231. <https://doi.org/10.1055/a-1206-1064>. Epub 2020 Sep 14. PMID: 32927487
- Dutra LV, Souza FIS, Konstantyner T. EFFECTS OF VITAMIN D SUPPLEMENTATION DURING PREGNANCY ON NEWBORNS AND INFANTS: AN INTEGRATIVE REVIEW. *Rev Paul Pediatr*. 2021 May 5;39:e2020087. <https://doi.org/10.1590/1984-0462/2021/39/2020087>. eCollection 2021. PMID: 33978135
- Eraslan Sahin M, Sahin E, Madendag Y, et al. Umbilical cord N-terminal procollagen of type I collagen (P1NP) and beta C-terminal telopeptide (betaCTX) levels in term pregnancies with vitamin D deficiency. *Gynecol Endocrinol*. 2021 Mar;37(3):211-215. <https://doi.org/10.1080/09513590>

- 590.2020.1830967. Epub 2020 Oct 9. PMID: 33034225
- Fang K, He Y, Mu M, et al. Maternal vitamin D deficiency during pregnancy and low birth weight: a systematic review and meta-analysis. *J Matern Fetal Neonatal Med.* 2021 Apr;34(7):1167-1173. <https://doi.org/10.1080/14767058.2019.1623780>. Epub 2019 Jul 8. PMID: 31122092
 - Fondjo IA, Tashie W, Owiredu WKBA, et al. High prevalence of vitamin D deficiency among normotensive and hypertensive pregnant women in Ghana. *BMC Pregnancy Childbirth.* 2021 Apr 26;21(1):331. <https://doi.org/10.1186/s12884-021-03802-9>. PMID: 33902494
 - Gunasegaran P, Tahmina S, Daniel M, et al. Role of vitamin D-calcium supplementation on metabolic profile and oxidative stress in gestational diabetes mellitus: A randomized controlled trial. *J Obstet Gynaecol Res.* 2021 Mar;47(3):1016-1022. <https://doi.org/10.1111/jog.14629>. Epub 2020 Dec 28. PMID: 33372392 Clinical Trial
 - Hajikolaei MRH, Nouri M, Amirabadi SH, et al. Effect of antepartum vitamin D(3) (cholecalciferol) and postpartum oral calcium administration on serum total calcium concentration in Holstein cows fed an acidogenic diet in late gestation. *Res Vet Sci.* 2021 May;136:239-246. <https://doi.org/10.1016/j.rvsc.2021.02.017>. Epub 2021 Feb 20. PMID: 33706075
 - Helal BAF, Ismail GM, Nassar SE, et al. Effect of vitamin D on experimental model of polycystic ovary syndrome in female rats. *Life Sci.* 2021 Apr 27;119558. <https://doi.org/10.1016/j.lfs.2021.119558>. Online ahead of print. PMID: 33930367
 - Hsu CC, Huang YC, Syu SH, et al. Serum vitamin D levels in females with urinary incontinence: a meta-analysis of observational trials. *Int Urogynecol J.* 2021 Jun 16. <https://doi.org/10.1007/s00192-021-04886-9>. Online ahead of print. PMID: 34132863
 - Huang S, Fu J, Zhao R, et al. The effect of combined supplementation with vitamin D and omega-3 fatty acids on blood glucose and blood lipid levels in patients with gestational diabetes. *Ann Palliat Med.* 2021 May;10(5):5652-5658. <https://doi.org/10.21037/apm-21-1018>. PMID: 34107720
 - Islam MS, Akhtar MM, Segars JH. Vitamin D deficiency and uterine fibroids: an opportunity for treatment or prevention? *Fertil Steril.* 2021 May;115(5):1175-1176. <https://doi.org/10.1016/j.fertnstert.2021.02.040>. Epub 2021 Mar 18. PMID: 33743958
 - Jafari M, Khodaverdi S, Sadri M, et al. Association Between Vitamin D Receptor (VDR) and Vitamin D Binding Protein (VDBP) Genes Polymorphisms to Endometriosis Susceptibility in Iranian Women. *Reprod Sci.* 2021 May 4. <https://doi.org/10.1007/s43032-021-00598-z>. Online ahead of print. PMID: 33948927
 - Kalyanaraman R, Pal L. A Narrative Review of Current Understanding of the Pathophysiology of Polycystic Ovary Syndrome: Focus on Plausible Relevance of Vitamin D. *Int J Mol Sci.* 2021 May 5;22(9):4905. <https://doi.org/10.3390/ijms22094905>. PMID: 34063169
 - Karacan Küçükali G, Keskin M, Savaş Erdeve S, et al. Perinatal outcomes of high-dose vitamin D administration in the last trimester. *Turk J Obstet Gynecol.* 2021 Jun 2;18(2):159-162. <https://doi.org/10.4274/tjod.galenos.2021.90023>. PMID: 34083750
 - Kiely ME, McCarthy EK, Hennessy Á, Iron, iodine and vitamin D deficiencies during pregnancy: epidemiology, risk factors and developmental impacts. *Proc Nutr Soc.* 2021 May 14:1-13. <https://doi.org/10.1017/S0029665121001944>. Online ahead of print. PMID: 33988109
 - Klimczak AM, Fransasiak JM. Vitamin D in human reproduction: some answers and many more questions. *Fertil Steril.* 2021 Mar;115(3):590-591. <https://doi.org/10.1016/j.fertnstert.2020.12.027>. Epub 2021 Jan 28. PMID: 33516577
 - Li X, Yu J, Wen L, et al. Vitamin D status in women with dichorionic twin pregnancies and their neonates: a pilot study in China. *BMC Pregnancy Childbirth.* 2021 Apr 8;21(1):279. <https://doi.org/10.1186/s12884-021-03707-7>. PMID: 33832462
 - Li Y, Wang J, Yang J, et al. The correlation between vitamin D, glucose homeostasis and androgen level among polycystic ovary syndrome patients: a cross-sectional study. *Gynecol Endocrinol.* 2021 Mar;37(3):235-239. <https://doi.org/10.1080/09513590.2020.1810228>. Epub 2021 Feb 12. PMID: 33576294
 - Lian RH, Qi PA, Yuan T, et al. Systematic review and meta-analysis of vitamin D deficiency in different pregnancy on preterm birth: Deficiency in middle pregnancy might be at risk. *Medicine (Baltimore).* 2021 Jun 18;100(24):e26303. <https://doi.org/10.1097/MD.00000000000026303>. PMID: 34128867
 - Liao WL, Yang WC, Shaw HM, et al. Adherence to Nutritional Supplementation Determines Postoperative Vitamin D Status, but Not Levels of Bone Resorption Marker, in Sleeve-Gastrectomy Patients. *Obes Surg.* 2021 May 25. <https://doi.org/10.1007/s11695-021-05484-w>. Online ahead of print. PMID: 34033013
 - Lima MSO, da Silva BB, de Medeiros ML, et al. Evaluation of vitamin D receptor expression in uterine leiomyoma and nonneoplastic myometrial tissue: a cross-sectional controlled study. *Reprod Biol Endocrinol.* 2021 May 5;19(1):67. <https://doi.org/10.1186/s12958-021-00752-x>. PMID: 33952298
 - Lorenzon F, Gregorio T, Niebisch F, et al. Maternal vitamin D administration attenuates metabolic disturbances induced by prenatal exposure to dexamethasone in a sex-dependent manner. *J Steroid Biochem Mol Biol.* 2021 Jun 18;212:105941. <https://doi.org/10.1016/j.jsbmb.2021.105941>. Online ahead of print. PMID: 34147644
 - Lumme JE, Savukoski SM, Suvanto ETJ, et al. Early-onset climacterium is not associated with impaired vitamin D status: a population-based study. *Menopause.* 2021 May 3. <https://doi.org/10.1097/GME.0000000000001781>. Online ahead of print. PMID: 33950031
 - Magnusdottir KS, Tryggvadottir EA, Magnusdottir OK, et al. Vitamin D status and association with gestational diabetes mellitus in a pregnant cohort in Iceland. *Food Nutr Res.* 2021 Mar 23;65. <https://doi.org/10.29219/fnr.v65.5574>. eCollection 2021. PMID: 33841065
 - Matias ML, Romao-Veiga M, Ribeiro VR, et al. Progesterone and vitamin D downregulate the activation of the NLRP1/NLRP3 inflammasomes and TLR4-MyD88-NF-κB pathway in monocytes from pregnant women with preeclampsia. *J Reprod Immunol.* 2021 Apr;144:103286. <https://doi.org/10.1016/j.jri.2021.103286>. Epub 2021 Feb 5. PMID: 33578174

- Milajerdi A, Abbasi F, Mousavi SM, et al. Maternal vitamin D status and risk of gestational diabetes mellitus: A systematic review and meta-analysis of prospective cohort studies. *Clin Nutr.* 2021 May;40(5):2576-2586. <https://doi.org/10.1016/j.clnu.2021.03.037>. Epub 2021 Apr 2. PMID: 33933723
- Miriello D, Galanti F, Cignini P, et al. Uterine fibroids treatment: do we have new valid alternative? Experiencing the combination of vitamin D plus epigallocatechin gallate in childbearing age affected women. *Eur Rev Med Pharmacol Sci.* 2021 Apr;25(7):2843-2851. https://doi.org/10.26355/eurrev_202104_25537. PMID: 33877649
- Moin ASM, Sathyapalan T, Butler AE, et al. Vitamin D association with coagulation factors in polycystic ovary syndrome is dependent upon body mass index. *J Transl Med.* 2021 Jun 2;19(1):239. <https://doi.org/10.1186/s12967-021-02897-0>. PMID: 34078378
- Moon RJ, Curtis EM, Woolford SJ, et al. The importance of maternal pregnancy vitamin D for offspring bone health: learnings from the MAVIDOS trial. *Ther Adv Musculoskelet Dis.* 2021 Apr 8;13:1759720X211006979. <https://doi.org/10.1177/1759720X211006979>. eCollection 2021. PMID: 33889216
- Mosavat M, Arabiat D, Smyth A, et al. Second-trimester maternal serum vitamin D and pregnancy outcome: The Western Australian Raine cohort study. *Diabetes Res Clin Pract.* 2021 May;175:108779. <https://doi.org/10.1016/j.diabres.2021.108779>. Epub 2021 Mar 22. PMID: 33766698
- Nunes PR, Gomes VJ, Sandrim VC, et al. Effects of vitamin D-induced supernatant of placental explants from preeclamptic women on oxidative stress and nitric oxide bioavailability in human umbilical vein endothelial cells. *Braz J Med Biol Res.* 2021 May 24;54(8):e11073. <https://doi.org/10.1590/1414-431X2020e11073>. eCollection 2021. PMID: 34037098
- Pazhohan A, Danaei-Mehrabad S, Mohammad-Rezaei Z, et al. The modulating effects of vitamin D on the activity of beta-catenin in the endometrium of women with endometriosis: a randomized exploratory trial. *Gynecol Endocrinol.* 2021 Mar;37(3):278-282. <https://doi.org/10.1080/0951> 3590.2020.1858780. Epub 2020 Dec 11. PMID: 33305626
- Percival MA, Pasco JA, Hosking SM, et al. Gestational Folate and Offspring Bone Health; The Vitamin D in Pregnancy Study. *Calcif Tissue Int.* 2021 May;108(5):605-609. <https://doi.org/10.1007/s00223-020-00795-z>. Epub 2021 Jan 2. PMID: 33386479
- Pi Y, Tian X, Ma J, et al. Vitamin D alleviates hypoxia/reoxygenation-induced injury of human trophoblast HTR-8 cells by activating autophagy. *Placenta.* 2021 May 30;111:10-18. <https://doi.org/10.1016/j.placenta.2021.05.008>. Online ahead of print. PMID: 34126416
- Purdue-Smithe AC, Kim K, Nobles C, et al. The role of maternal preconception vitamin D status in human offspring sex ratio. *Nat Commun.* 2021 May 13;12(1):2789. <https://doi.org/10.1038/s41467-021-23083-2>. PMID: 33986298
- Rahnemai FA, Gholamrezaei A, Afra-khteh M, et al. Vitamin D supplementation for primary dysmenorrhea: a double-blind, randomized, placebo-controlled trial. *Obstet Gynecol Sci.* 2021 May 18. <https://doi.org/10.5468 ogs.20316>. Online ahead of print. PMID: 34010550
- Reddy JC, Barche A, Andrade SJ, et al. Vitamin D Levels in Neonates With and Without Seizures: A Single Center Cross-Sectional Study. *Indian Pediatr.* 2021 May 20;S097475591600330. Online ahead of print. PMID: 34016803
- Refaat B, El-Boshy M. Effects of supra-physiological vitamin D(3) (cholecalciferol) supplement on normal adult rat ovarian functions. *Histochem Cell Biol.* 2021 Jun;155(6):655-668. <https://doi.org/10.1007/s00418-021-01975-0>. Epub 2021 Feb 27. PMID: 33641022
- Rostami M, Simbar M, Amiri M, et al. The optimal cut-off point of vitamin D for pregnancy outcomes using a generalized additive model. *Clin Nutr.* 2021 Apr;40(4):2145-2153. <https://doi.org/10.1016/j.clnu.2020.09.039>. Epub 2020 Oct 2. PMID: 33039154
- Ryan BA, Kovacs CS. Maternal and fetal vitamin D and their roles in mineral homeostasis and fetal bone development. *J Endocrinol Invest.* 2021 Apr;44(4):643-659. <https://doi.org/10.1007/s40618-020-00986-5>
- Savard C, Bielecki A, Plante AS, et al. Longitudinal Assessment of Vitamin D Status across Trimesters of Pregnancy. *J Nutr.* 2021 Apr 8:nxab060. <https://doi.org/10.1093/jn/nxab060>. Online ahead of print. PMID: 33830266
- Skowro ska P, Kunicki M, Pastuszek E, et al. Vitamin D and anti-Mullerian hormone concentration in human follicular fluid individually aspirated from all patient follicles. *Gynecol Endocrinol.* 2021 May 28:1-5. <https://doi.org/10.1080/09513590.2021.1933934>. Online ahead of print. PMID: 34044669
- Stenhouse C, Halloran KM, Newton MG, et al. Novel Mineral Regulatory Pathways in Ovine Pregnancy: II. Calcium Binding Proteins, Calcium Transporters, and Vitamin D Signaling. *Biol Reprod.* 2021 Apr 5:ioab063. <https://doi.org/10.1093/biolre/ioab063>. Online ahead of print. PMID: 33822885
- Sun H, Shi Y, Shang Y, et al. MicroRNA-378d inhibits Glut4 by targeting Rbhn1 in vitamin D deficient ovarian granulosa cells. *Mol Med Rep.* 2021 May;23(5):369. <https://doi.org/10.3892/mmr.2021.12008>. Epub 2021 Mar 24. PMID: 33760197
- Vaughan CP, Markland AD, Huang AJ, et al. Vitamin D Intake and Progression of Urinary Incontinence in Women. *Urology.* 2021 Apr;150:213-218. <https://doi.org/10.1016/j.urology.2020.04.090>. Epub 2020 May 7. PMID: 32387293
- Vestergaard AL, Justesen S, Volqvartz T, et al. Vitamin D insufficiency among Danish pregnant women-Prevalence and association with adverse obstetric outcomes and placental vitamin D metabolism. *Acta Obstet Gynecol Scand.* 2021 Mar;100(3):480-488. <https://doi.org/10.1111/aogs.14019>. Epub 2021 Jan 12. PMID: 33030742
- Wang L, Wen X, Lv S, et al. Effects of vitamin D supplementation on metabolic parameters of women with polycystic ovary syndrome: a meta-analysis of randomized controlled trials. *Gynecol Endocrinol.* 2021 May;37(5):446-455. <https://doi.org/10.1080/09513590.2020.1813272>. Epub 2020 Sep 10. PMID: 32909865
- Wang M, Chen Z, Hu Y, et al. The effects of vitamin D supplementation on glycemic control and maternal-neonatal

- outcomes in women with established gestational diabetes mellitus: A systematic review and meta-analysis. *Clin Nutr.* 2021 May;40(5):3148-3157. <https://doi.org/10.1016/j.clnu.2020.12.016>. Epub 2020 Dec 21. PMID: 33386179
- Wang X, Jiao X, Tian Y, et al. Associations between maternal vitamin D status during three trimesters and cord blood 25(OH) D concentrations in newborns: a prospective Shanghai birth cohort study. *Eur J Nutr.* 2021 Mar 4. <https://doi.org/10.1007/s00394-021-02528-w>. Online ahead of print. PMID: 33661376
 - Weiler HA, Brooks SPJ, Sarafin K, et al. Early prenatal use of a multivitamin diminishes the risk for inadequate vitamin D status in pregnant women: results from the Maternal-Infant Research on Environmental Chemicals (MIREC) cohort study. *Am J Clin Nutr.* 2021 Jun 3:nqab172. <https://doi.org/10.1093/ajcn/nqab172>. Online ahead of print. PMID: 34081131
 - Wu J, Shao B, Xin X, et al. Association of vitamin D pathway gene polymorphisms with vitamin D level during pregnancy was modified by season and vitamin D supplement. *Clin Nutr.* 2021 May;40(5):3650-3660. <https://doi.org/10.1016/j.clnu.2020.12.029>. Epub 2020 Dec 29. PMID: 33423808
 - Xu F, Li F, Li L, et al. Vitamin D as a risk factor for the presence of asymptomatic uterine fibroids in premenopausal Han Chinese women. *Fertil Steril.* 2021 May;115(5):1288-1293. <https://doi.org/10.1016/j.fertnstert.2020.12.001>. Epub 2021 Feb 12. PMID: 33589134
 - Xu F, Wolf S, Green O, et al. Vitamin D in follicular development and oocyte maturation. *Reproduction.* 2021 May 5;161(6):R129-R137. <https://doi.org/10.1530/REP-20-0608>. PMID: 33835047 Review
 - Yang C, Jing W, Ge S, et al. Vitamin D status and vitamin D deficiency risk factors among pregnancy of Shanghai in China. *BMC Pregnancy Childbirth.* 2021 Jun 18;21(1):431. <https://doi.org/10.1186/s12884-021-03889-0>. PMID: 34144704
 - Zhang J, Xing C, Zhao H, et al. The effectiveness of coenzyme Q10, vitamin E, inositol, and vitamin D in improving the endocrine and metabolic profiles in women with polycystic ovary syndrome: a network Meta-analysis. *Gynecol Endocrinol.* 2021 May 14:1-9. <https://doi.org/10.1080/09513590.2021.1926975>. Online ahead of print. PMID: 33988478
 - Zhao H, Wei X, Yang X. A novel update on vitamin D in recurrent pregnancy loss (Review). *Mol Med Rep.* 2021 May;23(5):382. <https://doi.org/10.3892/mmr.2021.12021>. Epub 2021 Mar 24. PMID: 33760145
 - Zhao L, Chen R, Nong B, et al. High prevalence of vitamin D deficiency in Shenzhen pregnant women. *J Matern Fetal Neonatal Med.* 2021 Apr 19:1-8. <https://doi.org/10.1080/14767058.2021.1910667>. Online ahead of print. PMID: 33874834
 - Zhao X, Hu Y, Wang R, et al. [Relationship between rs7041 polymorphism of GC gene and serum vitamin D status in Chinese women of childbearing age]. Wei Sheng Yan Jiu. 2021 Mar;50(2):192-209. <https://doi.org/10.19813/j.cnki.weishengyanjiu.2021.02.005>. PMID: 33985623 Chinese
- ## ONCOLOGY
- Abbasnezhad A, Falahi E, Ghavamzadeh S, et al. Association between deficient levels of circulating vitamin D, dietary intake of vitamin D, calcium and retinol, and risk of colorectal cancer in an Iranian population: A case control study. *Asia Pac J Clin Oncol.* 2021 Apr 14. <https://doi.org/10.1111/ajco.13524>. Online ahead of print. PMID: 33852772
 - Abrahamsson H, Meltzer S, Hagen VN, et al. Sex disparities in vitamin D status and the impact on systemic inflammation and survival in rectal cancer. *BMC Cancer.* 2021 May 11;21(1):535. <https://doi.org/10.1186/s12885-021-08260-2>. PMID: 33975557
 - Adelani IB, Rotimi OA, Maduagwu EN, et al. Vitamin D: Possible Therapeutic Roles in Hepatocellular Carcinoma. *Front Oncol.* 2021 May 25;11:642653. <https://doi.org/10.3389/fonc.2021.642653>. eCollection 2021. PMID: 34113565
 - Afshan FU, Masood A, Nissar B, et al. Promoter hypermethylation regulates vitamin D receptor (VDR) expression in colorectal cancer-A study from Kashmir valley. *Cancer Genet.* 2021 Apr;252-253:96-106. <https://doi.org/10.1016/j.cancergen.2021.01.002>. Epub 2021 Jan 13. PMID: 33486463
 - Aristarco V, Johansson H, Gandini S, et al. Association of Vitamin D Receptor and Vitamin D-Binding Protein Polymorphisms with Familial Breast Cancer Prognosis in a Mono-Institutional Cohort. *Nutrients.* 2021 Apr 6;13(4):1208. <https://doi.org/10.3390/nu13041208>. PMID: 33917614
 - Aslam A, Ahmad J, Baghdadi MA, et al. Chemopreventive effects of vitamin D(3) and its analogue, paricalcitol, in combination with 5-fluorouracil against colorectal cancer: The role of calcium signalling molecules. *Biochim Biophys Acta Mol Basis Dis.* 2021 Mar 1;1867(3):166040. <https://doi.org/10.1016/j.bbadi.2020.166040>. Epub 2020 Dec 16. PMID: 33338596
 - Bilani N, Elson L, Szuchan C, et al. Newly-identified Pathways Relating Vitamin D to Carcinogenesis: A Review. *In Vivo.* 2021 May-Jun;35(3):1345-1354. <https://doi.org/10.21873/invivo.12387>. Epub 2021 Apr 28. PMID: 33910812 Review
 - Boakye D, Jansen L, Schöttker B, et al. The association of vitamin D with survival in colorectal cancer patients depends on antioxidant capacity. *Am J Clin Nutr.* 2021 Jun 1;113(6):1458-1467. <https://doi.org/10.1093/ajcn/nqaa405>. PMID: 33740035
 - Brenner H, Kuznia S, Laetsch C, et al. Prevention of Advanced Cancer by Vitamin D(3) Supplementation: Interaction by Body Mass Index Revisited. *Nutrients.* 2021 Apr 22;13(5):1408. <https://doi.org/10.3390/nu13051408>. PMID: 33922032
 - Bu L, Huang F, Li M, et al. Identification of Vitamin D-related gene signature to predict colorectal cancer prognosis. *PeerJ.* 2021 May 13;9:e11430. <https://doi.org/10.7717/peerj.11430>. eCollection 2021. PMID: 34035992
 - Campbell RA, Li J, Malone L, et al. Correlative Analysis of Vitamin D and Omega-3 Fatty Acid Intake in Men on Active Surveillance for Prostate Cancer. *Urology.* 2021 Jun 15:S0090-4295(21)00525-2. <https://doi.org/10.1016/j.urology.2021.04.050>. Online ahead of print. PMID: 34144071
 - Campolina-Silva GH, Barata MC, Werneck-Gomes H, et al. Altered expression of the vitamin D metabolizing enzymes CYP27B1 and CYP24A1 under

- the context of prostate aging and pathologies. *J Steroid Biochem Mol Biol.* 2021 May;209:105832. <https://doi.org/10.1016/j.jsbmb.2021.105832>. Epub 2021 Feb 14. PMID: 33596463
- Chatterjee R, Fuss P, Vickery EM, et al. Vitamin D supplementation for prevention of cancer: the D2d cancer outcomes (D2dCA) ancillary study. *J Clin Endocrinol Metab.* 2021 Mar 8:dgab153. <https://doi.org/10.1210/clinem/dgab153>. Online ahead of print. PMID: 33693713
 - Dieckmann KP, Andura O, Pichlmeier U, et al. Revised manuscript R2, clean version are serum levels of 25-hydroxy vitamin D reduced following orchiectomy in testicular cancer patients? *Basic Clin Androl.* 2021 Jun 10;31(1):14. <https://doi.org/10.1186/s12610-021-00132-w>. PMID: 34107893
 - Ergul E, Simsek T, Uren N, et al. Haplotype Analysis of Vitamin D Receptor (VDR) Gene in Breast Cancer Patients. *Clin Lab.* 2021 Jun 1;67(6). <https://doi.org/10.7754/Clin.Lab.2020.200931>. PMID: 34107637
 - Fernandez-Lazaro CI, Romanos-Nanclares A, Sánchez-Bayona R, et al. Dietary calcium, vitamin D, and breast cancer risk in women: findings from the SUN cohort. *Eur J Nutr.* 2021 Apr 5. <https://doi.org/10.1007/s00394-021-02549-5>. Online ahead of print. PMID: 33818633
 - Ferronato MJ, Nadal Serrano M, Arenas Lahuerta EJ, et al. Vitamin D analogues exhibit antineoplastic activity in breast cancer patient-derived xenograft cells. *J Steroid Biochem Mol Biol.* 2021 Apr;208:105735. <https://doi.org/10.1016/j.jsbmb.2020.105735>. Epub 2020 Aug 9. PMID: 32784045
 - Filip-Psurska B, Psurski M, Anisiewicz A, et al. Vitamin D Compounds PRI-2191 and PRI-2205 Enhance Anastrozole Activity in Human Breast Cancer Models. *Int J Mol Sci.* 2021 Mar 9;22(5):2781. <https://doi.org/10.3390/ijms22052781>. PMID: 33803480
 - Fraga M, Yáñez M, Sherman M, et al. Immunomodulation of T Helper Cells by Tumor Microenvironment in Oral Cancer Is Associated With CCR8 Expression and Rapid Membrane Vitamin D Signaling Pathway. *Front Immunol.* 2021 May 7;12:643298. [https://doi.org/10.3389/fim-mu.2021.643298](https://doi.org/10.3389/fim- mu.2021.643298). eCollection 2021. PMID: 34025655
 - Fu Y, Katsaros D, Biglia N, et al. Vitamin D receptor upregulates lncRNA TOPORS-AS1 which inhibits the Wnt/beta-catenin pathway and associates with favorable prognosis of ovarian cancer. *Sci Rep.* 2021 Apr 5;11(1):7484. <https://doi.org/10.1038/s41598-021-86923-7>. PMID: 33820921
 - Hektoen HH, Robsahm TE, Stenehjem JS, et al. Vitamin D and Vitamin D-binding protein and risk of bladder cancer: A nested case-control study in the Norwegian Janus Serum Bank Cohort. *Cancer Med.* 2021 Jun;10(12):4107-4116. <https://doi.org/10.1002/cam4.3960>. Epub 2021 Jun 3. PMID: 34080787
 - Hellwege JN, Zhu X, Huang X, et al. Blunted PTH response to vitamin D insufficiency/deficiency and colorectal neoplasia risk. *Clin Nutr.* 2021 May;40(5):3305-3313. <https://doi.org/10.1016/j.clnu.2020.10.057>. Epub 2020 Nov 6. PMID: 33190990
 - Hernández-Alonso P, Canudas S, Bougnam H, et al. Dietary vitamin D intake and colorectal cancer risk: a longitudinal approach within the PREDIMED study. *Eur J Nutr.* 2021 May 28. <https://doi.org/10.1007/s00394-021-02585-1>. Online ahead of print. PMID: 34050394
 - Hossain S, Liu Z, Wood RJ. Association between histone deacetylase activity and vitamin D-dependent gene expressions in relation to sulforaphane in human colorectal cancer cells. *J Sci Food Agric.* 2021 Mar 30;101(5):1833-1843. <https://doi.org/10.1002/jsfa.10797>. Epub 2020 Oct 26. PMID: 32964464
 - Jackmann N, Gustafsson J, Harila-Saari A, et al. Prevalence of and factors influencing vitamin D deficiency in paediatric patients diagnosed with cancer at northern latitudes. *Acta Paediatr.* 2021 Jul;110(7):2252-2258. <https://doi.org/10.1111/apa.15788>. Epub 2021 Mar 18. PMID: 33528842
 - Jianhai T, Jian L, Long Z, et al. Vitamin D receptor gene polymorphisms and its interactions with environmental factors on renal cell carcinoma risk. *Genes Environ.* 2021 May 18;43(1):19. <https://doi.org/10.1186/s41021-021-00185-3>. PMID: 34006324
 - Kapała A, Szlendak M, Grochowska E. Cross-sectional observational study - Investigation of vitamin D concentration in Caucasian cancer patients. what is the adequate dose of vitamin D for these patients? *Clin Nutr.* 2021 Apr 22;40(6):3852-3858. <https://doi.org/10.1016/j.clnu.2021.04.026>. Online ahead of print. PMID: 34130032
 - Kazemian E, Davoodi SH, Akbari ME, et al. Vitamin D Receptor (VDR) Allelic Variants Correlating with Response to Vitamin D3 Supplementation in Breast Cancer Survivors. *Nutr Cancer.* 2021 May 25:1-14. <https://doi.org/10.1080/01635581.2020.1869790>. Online ahead of print. PMID: 34032540
 - Klasson C, Helle-Frankling M, Sandberg C, et al. Vitamin D and Fatigue in Palliative Cancer: A Cross-Sectional Study of Sex Difference in Baseline Data from the Palliative D Cohort. *J Palliat Med.* 2021 Mar;24(3):433-437. <https://doi.org/10.1089/jpm.2020.0283>. Epub 2020 Sep 16. PMID: 32936046
 - Li Y, Cook KL, Yu W, et al. Inhibition of Antiestrogen-Promoted Pro-Survival Autophagy and Tamoxifen Resistance in Breast Cancer through Vitamin D Receptor. *Nutrients.* 2021 May 19;13(5):1715. <https://doi.org/10.3390/nu13051715>. PMID: 34069442
 - Li Z, Shi J, Wang Z, et al. [Nutrient Status of Vitamin D among Cancer Patients]. *Zhongguo Fei Ai Za Zhi.* 2021 May 20;24(5):345-350. <https://doi.org/10.3779/j.issn.1009-3419.2021.101.10>. PMID: 34034458
 - Li Z, Wu L, Zhang J, et al. Effect of Vitamin D Supplementation on Risk of Breast Cancer: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Front Nutr.* 2021 Apr 1;8:655727. <https://doi.org/10.3389/fnut.2021.655727>. eCollection 2021. PMID: 33869269
 - Lin J, Chen X, Sun M, et al. Upregulation of microRNA-181a-5p increases the sensitivity of HS578T breast cancer cells to cisplatin by inducing vitamin D receptor-mediated cell autophagy. *Oncol Lett.* 2021 Apr;21(4):247. <https://doi.org/10.3892/ol.2021.12508>. Epub 2021 Feb 3. PMID: 33664811
 - Lin W, Zou H, Mo J, et al. Micro1278 Leads to Tumor Growth Arrest, Enhanced Sensitivity to Oxaliplatin and Vitamin D and Inhibits Metastasis via KIF5B, CYP24A1, and BTG2, Respectively. *Front Oncol.*

- 2021 Mar 11;11:637878. <https://doi.org/10.3389/fonc.2021.637878>. eCollection 2021. PMID: 33791222
- Liu N, Li X, Fu Y, et al. Inhibition of lung cancer by vitamin D depends on downregulation of histidine-rich calcium-binding protein. *J Adv Res.* 2020 Aug 27;29:13-22. <https://doi.org/10.1016/j.jare.2020.08.013>. eCollection 2021 Mar. PMID: 33842001
 - Maureen Sheean P, Robinson P, Bartolotta MB, et al. Associations Between Cholecalciferol Supplementation and Self-Reported Symptoms Among Women With Metastatic Breast Cancer and Vitamin D Deficiency: A Pilot Study. *Oncol Nurs Forum.* 2021 May 1;48(3):352-360. <https://doi.org/10.1188/21.ONF.352-360>. PMID: 33856003
 - McCray T, Pacheco JV, Loitz CC, et al. Erratum: Vitamin D sufficiency enhances differentiation of patient-derived prostate epithelial organoids. *iScience.* 2021 Jun 5;24(6):102640. <https://doi.org/10.1016/j.isci.2021.102640>. eCollection 2021 Jun 25. PMID: 34142065
 - Mehaoudi RI, Adane S, Sadouki M, et al. Association of vitamin D deficiency and insulin resistance with breast cancer in premenopausal Algerian women: A cross-sectional study. *Ann Endocrinol (Paris).* 2021 Jun 21:S0003-4266(21)00076-7. <https://doi.org/10.1016/j.ando.2021.05.002>. Online ahead of print. PMID: 34166649
 - Mull B, Davis R, Munir I, et al. Differential expression of Vitamin D binding protein in thyroid cancer health disparities. *Oncotarget.* 2021 Mar 30;12(7):596-607. <https://doi.org/10.18632/oncotarget.27920>. eCollection 2021 Mar 30. PMID: 33868582
 - Nair-Shalliker V, Smith DP, Gebski V, et al. High-dose vitamin D supplementation to prevent prostate cancer progression in localised cases with low-to-intermediate risk of progression on active surveillance (ProsD): protocol of a phase II randomised controlled trial. *BMJ Open.* 2021 Mar 2;11(3):e044055. <https://doi.org/10.1136/bmjopen-2020-044055>. PMID: 33653757
 - Printz C. Supplemental Vitamin D may reduce advanced cancer risk. *Cancer.* 2021 Apr 1;127(7):993. <https://doi.org/10.1002/cncr.33521>. PMID: 33836107
 - Qadir J, Majid S, Khan MS, et al. Association of Vitamin D receptor gene variations with Gastric cancer risk in Kashmiri population. *Mol Biol Rep.* 2021 Apr;48(4):3313-3325. <https://doi.org/10.1007/s11033-021-06376-z>. Epub 2021 May 3. PMID: 33942233
 - Rehman M, Mahboob T, Shahid SM. Possible association of Vitamin D receptor, caudal-related homeobox 2 polymorphism with the risk of cancer. *Int J Health Sci (Qassim).* 2021 Mar-Apr;15(2):9-13. PMID: 33708039
 - Sánchez-Céspedes R, Fernández-Martínez MD, Raya Al, et al. Vitamin D receptor (VDR) expression in different molecular subtypes of canine mammary carcinoma. *BMC Vet Res.* 2021 May 25;17(1):197. <https://doi.org/10.1186/s12917-021-02901-1>. PMID: 34034728
 - Schepisi G, Gianni C, Bleve S, et al. Vitamin D Deficiency in Testicular Cancer Survivors: A Systematic Review. *Int J Mol Sci.* 2021 May 13;22(10):5145. <https://doi.org/10.3390/ijms22105145>. PMID: 34067977
 - Sheeley MP, Andolino C, Kiesel VA, et al. Vitamin D regulation of energy metabolism in cancer. *Br J Pharmacol.* 2021 Mar 2. <https://doi.org/10.1111/bph.15424>. Online ahead of print. PMID: 33651382
 - Staquicini FI, Hajitou A, Driessen WH, et al. Targeting a cell surface vitamin D receptor on tumor-associated macrophages in triple-negative breast cancer. *eLife.* 2021 Jun 1;10:e65145. <https://doi.org/10.7554/eLife.65145>. PMID: 34060472
 - Stroomborg HV, Vojdeman FJ, Madsen CM, et al. Vitamin D levels and the risk of prostate cancer and prostate cancer mortality. *Acta Oncol.* 2021 Mar;60(3):316-322. <https://doi.org/10.1080/0284186X.2020.1837391>. Epub 2020 Oct 24. PMID: 33103532
 - van Atteveldt JE, Verhagen IE, van den Heuvel-Eibrink MM, et al. Vitamin D supplementation for children with cancer: A systematic review and consensus recommendations. *Cancer Med.* 2021 Jun 8. <https://doi.org/10.1002/cam4.4013>. Online ahead of print. PMID: 34100559
 - Vermandere K, Bostick RM, Tran HQ, et al. Effects of Supplemental Calcium and Vitamin D on Circulating Biomarkers of Gut Barrier Function in Patients with Colon Adenoma: A Randomized Clinical Trial. *Cancer Prev Res (Phila).* 2021 Mar;14(3):393-402. <https://doi.org/10.1158/1940-6207.CAPR-20-0461>. Epub 2020 Nov 23. PMID: 33229339
 - Vitti-Ruela BV, Dokkedal-Silva V, Hachul H, et al. Melatonin and vitamin D: complementary therapeutic strategies for breast cancer. *Support Care Cancer.* 2021 Jul;29(7):3433-3434. <https://doi.org/10.1007/s00520-021-06115-x>. Epub 2021 Mar 6. PMID: 33677716
 - Voutsadakis IA. Vitamin D baseline levels at diagnosis of breast cancer: A systematic review and meta-analysis. *Hematol Oncol Stem Cell Ther.* 2021 Mar;14(1):16-26. <https://doi.org/10.1016/j.hemonc.2020.08.005>. Epub 2020 Sep 26. PMID: 33002425
 - Wei D, Wang L, Zuo X, et al. Vitamin D: Promises on the Horizon and Challenges Ahead for Fighting Pancreatic Cancer. *Cancers (Basel).* 2021 May 31;13(11):2716. <https://doi.org/10.3390/cancers13112716>. PMID: 34072725
 - Wen J, Li J, Liang X, et al. Association of Polymorphisms in Vitamin D-Metabolizing Enzymes DHCR7 and CYP2R1 with Cancer Susceptibility: A Systematic Review and Meta-Analysis. *Dis Markers.* 2021 May 22;2021:6615001. <https://doi.org/10.1155/2021/6615001>. eCollection 2021. PMID: 34093899
 - Wood ME, Liu H, Storrick E, et al. The influence of vitamin D on mammographic density: results from CALGB 70806 (Alliance) a randomized clinical trial. *Cancer Prev Res (Phila).* 2021 Apr 13:canprevres.0581.2020. <https://doi.org/10.1158/1940-6207.CAPR-20-0581>. Online ahead of print. PMID: 33849913
 - Xu J, Chen K, Zhao F, et al. Association between vitamin D/calcium intake and 25-hydroxyvitamin D and risk of ovarian cancer: a dose-response relationship meta-analysis. *Eur J Clin Nutr.* 2021 Mar;75(3):417-429. <https://doi.org/10.1038/s41430-020-00724-1>. Epub 2020 Aug 19. PMID: 32814859
 - Yi Z, Wang L, Tu X. Effect of Vitamin D Deficiency on Liver Cancer Risk: A Systematic Review and Meta-Analysis. *Asian Pac J Cancer Prev.* 2021 Apr 1;22(4):991-

997. <https://doi.org/10.31557/APJCP.2021.22.4.991>. PMID: 33906289
- Zanetta P, Squarzanti DF, Sorrentino R, et al. Oral microbiota and vitamin D impact on oropharyngeal squamous cell carcinogenesis: a narrative literature review. *Crit Rev Microbiol.* 2021 Mar;47(2):224-239. <https://doi.org/10.1080/1040841X.2021.1872487>. Epub 2021 Jan 21. PMID: 33476522 Review
 - Zendehdel A, Ansari M, Khatami F, et al. The effect of vitamin D supplementation on the progression of benign prostatic hyperplasia: A randomized controlled trial. *Clin Nutr.* 2021 May;40(5):3325-3331. <https://doi.org/10.1016/j.clnu.2020.11.005>. Epub 2020 Nov 7. PMID: 33213976
 - Zhang X, Fang YJ, Feng XL, et al. Interactions Between Vitamin D and Calcium Intake, Vitamin D Receptor Genetic Polymorphisms, and Colorectal Cancer Risk. *Dig Dis Sci.* 2021 Jun;66(6):1895-1905. <https://doi.org/10.1007/s10620-020-06455-4>. Epub 2020 Jul 5. PMID: 32627088
 - Zhou J, Ge X, Fan X, et al. Associations of vitamin D status with colorectal cancer risk and survival. *Int J Cancer.* 2021 Aug 1;149(3):606-614. <https://doi.org/10.1002/ijc.33580>. Epub 2021 Apr 9. PMID: 33783821
- PEDIATRICS**
- Chen YS, Mirzakhani H, Lu M, et al. The association of prenatal vitamin D sufficiency with aeroallergen sensitization and allergic rhinitis in early childhood. *J Allergy Clin Immunol Pract.* 2021 Jun 21:S2213-2198(21)00674-7. <https://doi.org/10.1016/j.jaip.2021.06.009>. Online ahead of print. PMID: 34166843
 - Alves AGP, Cruvinel BAC, Godoi LS, et al. Vitamin D is not associated with body composition and metabolic profile among Brazilian children with 25-hydroxyvitamin D 75 nmol/L: A cross-sectional study. *Nutr Metab Cardiovasc Dis.* 2021 Apr 9;31(4):1293-1298. <https://doi.org/10.1016/j.numecd.2020.11.029>. Epub 2020 Dec 5. PMID: 33549443
 - Alves AGP, Cruvinel BAC, Schincaglia RM, et al. Vitamin D supplementation reduces serum lipids of children with hypertriacylglycerolemia: A randomized, triple-masked, placebo-controlled crossover trial. *Nutrition.* 2021 Apr 28;89:111296. <https://doi.org/10.1016/j.nut.2021.111296>. Online ahead of print. PMID: 34116394
 - Arman S. What are the effects of vitamin D supplementation for term breastfed infants to prevent vitamin D deficiency and improve bone health? - A Cochrane Review summary with commentary. *J Musculoskelet Neural Interact.* 2021 Jun 1;21(2):193-195. PMID: 34059564
 - Artman A, Huang A, Bowker R, et al. Evaluation of vitamin D protocol in the neonatal intensive care unit at Rush University Medical Center. *JPEN J Parenter Enteral Nutr.* 2021 Jun 14. <https://doi.org/10.1002/jpen.2138>. Online ahead of print. PMID: 34125972
 - Awasthi N, Awasthi S, Pandey S, et al. Association of vitamin D receptor gene polymorphisms in North Indian children with asthma: a case-control study. *Int J Mol Epidemiol Genet.* 2021 Apr 15;12(2):24-34. eCollection 2021. PMID: 34093968
 - Barceló A, Morell-García D, Ribot C, et al. Vitamin D as a biomarker of health in snoring children: a familial aggregation study. *Pediatr Res.* 2021 Jun 8. <https://doi.org/10.1038/s41390-021-01612-5>. Online ahead of print. PMID: 34103676
 - Bhat JA, Sheikh SA, Ara R. Correlation of 25-hydroxy vitamin D level with neonatal hyperbilirubinemia in term healthy newborn: A prospective hospital-based observation study. *Int J Pediatr Adolesc Med.* 2021 Mar;8(1):5-9. <https://doi.org/10.1016/j.ijpm.2019.10.001>. Epub 2019 Oct 22. PMID: 33718570
 - Bozkurt HB, Çelik M. Investigation of the serum vitamin D level in infants followed up with the diagnosis of laryngomalacia: a case-control study. *Eur Arch Otorhinolaryngol.* 2021 Mar;278(3):733-739. <https://doi.org/10.1007/s00405-020-06412-x>. Epub 2020 Oct 7. PMID: 33026500
 - Çelik N, Doğan HO, Zararsız G. Different threshold levels of circulating total and free 25-hydroxyvitamin D for the diagnosis of vitamin D deficiency in obese adolescents. *Eur J Pediatr.* 2021 Jun 11. <https://doi.org/10.1007/s00431-021-04137-5>. Online ahead of print. PMID: 34117551
 - Chou HD, Yao TC, Huang YS, et al. Myopia in school-aged children with preterm birth: the roles of time spent outdoors and serum vitamin D. *Br J Ophthalmol.* 2021 Apr;105(4):468-472. <https://doi.org/10.1136/bjophthalmol-2019-315663>. Epub 2020 Jun 19. PMID: 32561534
 - Chung M, Ruan M, Cara KC, et al. Vitamin D and Calcium in Children 0-36 Months: A Scoping Review of Health Outcomes. *J Am Coll Nutr.* 2021 May-Jun;40(4):367-396. <https://doi.org/10.1080/07315724.2020.1774822>. Epub 2020 Jul 14. PMID: 32662755
 - Clark P, Montiel-Ojeda D, Chico-Barba LG, et al. Vitamin D concentration and its association with parathyroid hormone in children and adolescents. *Bol Med Hosp Infant Mex.* 2021 Jun 9. <https://doi.org/10.24875/BMHIM.20000243>. Online ahead of print. PMID: 34107534
 - Cui P, Ge L, Li J. Study on the Improvement of Behavioral and Cognitive Dysfunction of Children with OSAS by Vitamin D. *Biomed Res Int.* 2021 May 7;2021:5536689. <https://doi.org/10.1155/2021/5536689>. eCollection 2021. PMID: 34055979
 - Fiamenghi VI, Mello ED. Vitamin D deficiency in children and adolescents with obesity: a meta-analysis. *J Pediatr (Rio J).* 2021 May-Jun;97(3):273-279. <https://doi.org/10.1016/j.jped.2020.08.006>. Epub 2020 Oct 3. PMID: 33022267
 - Flores ME, Rivera-Pasquel M, Valdez-Sánchez A, et al. Vitamin D status in Mexican children 1 to 11 years of age: an update from the Ensanut 2018-19. *Salud Publica Mex.* 2021 May 3;63(3 May-Jun):382-393. <https://doi.org/10.21149/12156>. PMID: 34098608
 - Francis EC, Charron E, Li M, et al. Third trimester maternal vitamin D and early childhood socioemotional development. *Paediatr Perinat Epidemiol.* 2021 May;35(3):350-358. <https://doi.org/10.1111/ppe.12736>. Epub 2020 Dec 8. PMID: 33295049
 - Ge H, Liu W, Li H, et al. The association of vitamin D and vitamin E levels at birth with bronchopulmonary dysplasia in preterm infants. *Pediatr Pulmonol.* 2021 Jul;56(7):2108-2113. <https://doi.org/10.1002/ppul.25414>. Epub 2021 Apr 20. PMID: 33878218
 - Gąbska D, Kołota A, Lachowicz K, et al. The Influence of Vitamin D Intake and Status on Mental Health in Children. *Frontiers in Endocrinology.* 2021;12:661111. <https://doi.org/10.3389/fendo.2021.661111>. PMID: 34117551

dren: A Systematic Review. *Nutrients*. 2021 Mar 16;13(3):952. <https://doi.org/10.3390/nu13030952>. PMID: 33809478

- Hauta-Alus HH, Holmlund-Suila EM, Kajantie E, et al. The Effects of Vitamin D Supplementation During Infancy on Growth During the First 2 Years of Life. *J Clin Endocrinol Metab*. 2021 Mar 8;106(3):e1140-e1155. <https://doi.org/10.1210/clinem/dgaa943>. PMID: 33347567
- He M, Cao T, Wang J, et al. Vitamin D deficiency relation to sepsis, paediatric risk of mortality III score, need for ventilation support, length of hospital stay, and duration of mechanical ventilation in critically ill children: A meta-analysis. *Int J Clin Pract*. 2021 Apr;75(4):e13908. <https://doi.org/10.1111/ijcp.13908>. Epub 2020 Dec 20. PMID: 3280208
- Hemmingway A, Fisher D, Berkery T, et al. Adherence to the infant vitamin D supplementation policy in Ireland. *Eur J Nutr*. 2021 Apr;60(3):1337-1345. <https://doi.org/10.1007/s00394-020-02334-w>. Epub 2020 Jul 17. PMID: 32681322
- Karakaş NM. The prevalence of low serum levels of Vitamin D, Vitamin B12, folate and ferritin in adolescents: Single center experience. *Sci Prog*. 2021 Apr-Jun;104(2):368504211007667. <https://doi.org/10.1177/00368504211007667>. PMID: 33821692
- Koren Y, Lubetzky R, Mandel D, et al. Anemia, Hepcidin, and Vitamin D in Healthy Preterm Infants: A Pilot Study. *Am J Perinatol*. 2021 May 3. <https://doi.org/10.1055/s-0041-1729556>. Online ahead of print. PMID: 33940646
- Lepus CA, Samela K, Emerick KM, et al. Vitamin D status in children with intestinal failure who have achieved enteral autonomy. *Nutr Clin Pract*. 2021 Jun 23. <https://doi.org/10.1002/ncp.10685>. Online ahead of print
- Li W, Zhou J, Liu S, et al. The correlation between neonatal vitamin D levels and the risk of childhood asthma attacks. *Transl Pediatr*. 2021 Apr;10(4):914-920. <https://doi.org/10.21037/tp-21-92>. PMID: 34012840
- Li X, Yu Q, Qin F, et al. Serum Vitamin D Level and the Risk of Urinary Tract Infection in Children: A Systematic Review and Meta-Analysis. *Front Public Health*. 2021 Mar 19;9:637529. <https://doi.org/10.3389/fpubh.2021.637529>. eCollection 2021. PMID: 33816422
- Malden S, Gillespie J, Hughes A, et al. Obesity in young children and its relationship with diagnosis of asthma, vitamin D deficiency, iron deficiency, specific allergies and flatfootedness: A systematic review and meta-analysis. *Obes Rev*. 2021 Mar;22(3):e13129. <https://doi.org/10.1111/obr.13129>. Epub 2020 Aug 18. PMID: 32808447
- Mimouni FB, Mendlovic J. Vitamin D requirements in infancy: an updated systematic review. *Curr Opin Clin Nutr Metab Care*. 2021 May 1;24(3):259-264. <https://doi.org/10.1097/MCO.0000000000000748>. PMID: 33741755
- Miyagaki S, Yamaguchi M, Ota T, et al. Alfacalcidol improves the growth velocity in children with vitamin D deficiency/insufficiency: A single center retrospective cohort study. *PLoS One*. 2021 Mar 8;16(3):e0247886. <https://doi.org/10.1371/journal.pone.0247886>. eCollection 2021. PMID: 33684119
- Moschonis G, Androutsos O, Hulshof T, et al. Risk evaluation of vitamin D insufficiency or deficiency in children using simple scores: The Healthy Growth Study. *Nutr Res*. 2021 Apr;88:19-27. <https://doi.org/10.1016/j.nutres.2020.12.021>. Epub 2020 Dec 26. PMID: 33743321
- Muntean C, Săsărăan M. Vitamin D Status and Its Role in First-Time and Recurrent Urinary Tract Infections in Children: A Case-Control Study. *Children (Basel)*. 2021 May 20;8(5):419. <https://doi.org/10.3390/children8050419>. PMID: 34065169
- Nalbantoglu Ö, Acar S, Arslan G, et al. Investigating the Efficiency of Vitamin D administration with Buccal Spray in the Treatment of Vitamin D Deficiency in Children and Adolescents. *J Clin Res Pediatr Endocrinol*. 2021 Jun 10. <https://doi.org/10.4274/jcrpe.galenos.2021.2021.0047>. Online ahead of print. PMID: 34109778
- Namakin K, Hosseini M, Zardast M, et al. Vitamin D Effect on Ultrasonography and Laboratory Indices and Biochemical Indicators in the Blood: an Interventional Study on 12 to 18-Year-Old Children with Fatty Liver. *Pediatr Gastroenterol Hepatol Nutr*. 2021 Mar;24(2):187-196. <https://doi.org/10.5223/pghn.2021.24.2.187>. Epub 2021 Mar 4. PMID: 33833974
- Nassar MF, Emam EK, Allam MF. Is There a Benefit of Vitamin D Supplementation in Deficient Children and Adolescents Suffering from Obesity? A Meta-Analysis. *Glob Pediatr Health*. 2021 May 27;8:2333794X211018352. <https://doi.org/10.1177/2333794X211018352>. eCollection 2021. PMID: 34104694
- Navarro CLA, Grgic O, Trajanoska K, et al. Associations Between Prenatal, Perinatal, and Early Childhood Vitamin D Status and Risk of Dental Caries at 6 Years. *J Nutr*. 2021 May 12:nxab075. <https://doi.org/10.1093/jn/nxab075>. Online ahead of print. PMID: 33982112
- Önal ZE, Tekin A, Gürbüz T, et al. Vitamin D status in pubertal children. *Minerva Pediatr (Torino)*. 2021 Apr;73(2):173-179. <https://doi.org/10.23736/S2724-5276.16.04334-X>. PMID: 33880905
- Pruszkowska-Przybylska P, Sitek A, Rosset I, et al. Associations between second to fourth digit ratio, cortisol, vitamin D, and body composition among Polish children. *Sci Rep*. 2021 Mar 29;11(1):7029. <https://doi.org/10.1038/s41598-021-86521-7>. PMID: 33782473
- Rosser FJ, Han YY, Forno E, et al. Effect of vitamin D supplementation on lung function in children with asthma and low vitamin D levels. *J Allergy Clin Immunol*. 2021 Jun 9:S0091-6749(21)00902-7. <https://doi.org/10.1016/j.jaci.2021.05.037>. Online ahead of print. PMID: 34118248
- Rutigliano I, De Filippo G, De Giovanni D, et al. Is sunlight enough for sufficient vitamin D status in children and adolescents? A survey in a sunny region of southern Italy. *Nutrition*. 2021 Apr;84:111101. <https://doi.org/10.1016/j.nut.2020.111101>. Epub 2020 Dec 5. PMID: 33476996
- Saneifard H, Shakiba M, Sheikhy A, et al. Vitamin D Deficiency in Children and Adolescents: Role of Puberty and Obesity on Vitamin D Status. *Nutr Metab Insights*. 2021 May 26;14:11786388211018726. <https://doi.org/10.1177/11786388211018726>. eCollection 2021. PMID: 34103940
- Seymen-Karabulut G, Günlemez A, Gökalp AS, et al. Vitamin D Deficiency Prevalence in

- Late Neonatal Hypocalcemia: A Multicenter Study. *J Clin Res Pediatr Endocrinol.* 2021 May 20. <https://doi.org/10.4274/jcrpe.galenos.2021.2020.0169>. Online ahead of print. PMID: 34013710
- Simpson CA, Zhang JH, Vanderschueren D, et al. 25-OHD response to vitamin D supplementation in children: effect of dose but not GC haplotype. *Eur J Endocrinol.* 2021 Jun 1;EJE-21-0349.R1. <https://doi.org/10.1530/EJE-21-0349>. Online ahead of print. PMID: 34128826
 - Simunovic M, Supe-Domic D, Karin Z, et al. The Relationship of Vitamin D Status, Adherence to the Mediterranean Diet, and Physical Activity in Obese Children and Adolescents. *J Med Food.* 2021 Apr;24(4):385-393. <https://doi.org/10.1089/jmf.2020.0032>. Epub 2020 Aug 12. PMID: 32783677
 - Song C, Sun H, Wang B, et al. Association Between Vitamin D Status and Undernutrition Indices in Children: A Systematic Review and Meta-Analysis of Observational Studies. *Front Pediatr.* 2021 Jun 4;9:665749. <https://doi.org/10.3389/fped.2021.665749>. eCollection 2021. PMID: 34150687
 - Tayde A, Mittal M, Khadgawat R, et al. Response to single oral dose vitamin D in obese vs non-obese vitamin D-deficient children. *Eur J Pediatr.* 2021 Apr;180(4):1043-1050. <https://doi.org/10.1007/s00431-020-03831-0>. Epub 2020 Oct 12. PMID: 33047160
 - Tung KTS, Wong RS, Tsang HW, et al. An Assessment of Risk Factors for Insufficient Levels of Vitamin D during Early Infancy. *Nutrients.* 2021 Mar 25;13(4):1068. <https://doi.org/10.3390/nu13041068>. PMID: 33806056
 - Uday S, Naseem S, Large J, et al. Failure of national antenatal vitamin D supplementation programme puts dark skinned infants at highest risk: A newborn bloodspot screening study. *Clin Nutr.* 2021 May;40(5):3542-3551. <https://doi.org/10.1016/j.clnu.2020.12.008>. Epub 2020 Dec 11. PMID: 33358424
 - Usman M, Woloshynowych M, Britto JC, et al. Obesity, oxidative DNA damage and vitamin D as predictors of genomic instability in children and adolescents. *Int J Obes (Lond).* 2021 Jun 22. <https://doi.org/10.1038/s41366-021-00879-2>. Online ahead of print. PMID: 34158611
 - Wang Y, Jiang L. Role of vitamin D-vitamin D receptor signaling on hyperoxia-induced bronchopulmonary dysplasia in neonatal rats. *Pediatr Pulmonol.* 2021 Jul;56(7):2335-2344. <https://doi.org/10.1002/ppul.25418>. Epub 2021 Apr 20. PMID: 33878208
 - Wen X, Gu Y. Preliminary validation of serotransferrin and vitamin D binding protein in the gingival crevicular fluid as candidate biomarkers for pubertal growth peak in subjects with Class I and Class II malocclusion. *Am J Orthod Dentofacial Orthop.* 2021 Apr;159(4):415-425.e1. <https://doi.org/10.1016/j.ajodo.2020.01.025>. Epub 2021 Feb 3. PMID: 33549368
 - Xavier TA, Madalena IR, da Silva RAB, et al. Vitamin D deficiency is a risk factor for delayed tooth eruption associated with persistent primary tooth. *Acta Odontol Scand.* 2021 May 4:1-6. <https://doi.org/10.1080/00016357.2021.1918762>. Online ahead of print. PMID: 33944665
 - Yuksel M, Demir B, Mizikoglu Ö, et al. Course of vitamin D levels before and after liver transplantation in pediatric patients. *Pediatr Transplant.* 2021 Jun 2:e14049. <https://doi.org/10.1111/petr.14049>. Online ahead of print. PMID: 34076935
 - Zhang X, Luo K, He X, et al. Association of vitamin D status at birth with pulmonary disease morbidity in very preterm infants. *Pediatr Pulmonol.* 2021 May;56(5):1215-1220. <https://doi.org/10.1002/ppul.25233>. Epub 2020 Dec 23. PMID: 33331677
 - Zhao Y, Qin R, Hong H, et al. Vitamin D status and its dietary and lifestyle factors in children during the first 5 years of life: A cross-sectional multicentre Jiangsu bone study. *J Hum Nutr Diet.* 2021 Mar 10. <https://doi.org/10.1111/jhn.12883>. Online ahead of print. PMID: 33751685
- ## PNEUMOLOGY
- Ayyildiz F, Yildiran H, Afandiyeva N, et al. THE EFFECTS OF VITAMIN D SUPPLEMENTATION ON PROGNOSIS IN PATIENTS WITH MILD OBSTRUCTIVE SLEEP APNEA SYNDROME. *Turk J Med Sci.* 2021 Jun 27. <https://doi.org/10.3906/sag-2101-83>. Online ahead of print. PMID: 34174792
 - Ahmad S, Arora S, Khan S, et al. Vitamin D and its therapeutic relevance in pulmonary diseases. *J Nutr Biochem.* 2021 Apr;90:108571. <https://doi.org/10.1016/j.jnutbio.2020.108571>. Epub 2020 Dec 31. PMID: 33388351 Review
 - Ahn KM, Kim SS, Lee SY, et al. Vitamin D deficiency and lung function decline in healthy individuals: A large longitudinal observation study. *Respir Med.* 2021 Jun;182:106395. <https://doi.org/10.1016/j.rmed.2021.106395>. Epub 2021 Apr 20. PMID: 33894439
 - Alkhatabeh MJ, Almomani HS, Abdul-Razzak KK, et al. Association of asthma with low serum vitamin D and its related musculoskeletal and psychological symptoms in adults: a case-control study. *NPJ Prim Care Respir Med.* 2021 May 14;31(1):27. <https://doi.org/10.1038/s41533-021-00239-7>. PMID: 33990605
 - Allen RJ. Vitamin D and bacterial pneumonias: the question of causality. *Thorax.* 2021 May;76(5):426-427. <https://doi.org/10.1136/thoraxjnlg-2020-216375>. Epub 2021 Mar 2. PMID: 33653935
 - Alvi S, Syed JG, Nusrat B, et al. Frequency of Vitamin D Deficiency in Patients of Asthma. *Cureus.* 2021 May 3;13(5):e14828. <https://doi.org/10.7759/cureus.14828>. PMID: 34104581
 - Andújar-Espinosa R, Aparicio-Vicente M, Ruiz-López FJ, et al. Influence of vitamin D supplementation on the quality of life of asthma patients: Findings from ACVID randomised clinical trial. *Respir Med.* 2021 May 31;185:106484. <https://doi.org/10.1016/j.rmed.2021.106484>. Online ahead of print. PMID: 34089969
 - Bhatt SP, Guleria R. Polymorphisms in vitamin D receptor and parathyroid hormone genes in the development and progression of obstructive sleep apnea in Asian Indians. *Nutrition.* 2021 Mar 7;89:111237. <https://doi.org/10.1016/j.nut.2021.111237>. Online ahead of print. PMID: 33895557
 - Bindayel IA. Effect of age and body mass index on vitamin D level in children with asthma in Riyadh. *Sci Rep.* 2021 Jun 1;11(1):11522. <https://doi.org/10.1038/s41598-021-91108-3>. PMID: 34075181
 - Bouloukaki I, Tsiligianni I, Mermigkis C, et al. Vitamin D deficiency in patients evaluated for obstructive sleep apnea: is it associated with disease severity? *Sleep Breath.* 2021 Jun;25(2):1109-1117. <https://doi.org/10.1007/s00542-021-01480-0>

- org/10.1007/s11325-020-02142-w. Epub 2020 Jul 10. PMID: 32648186
- Burkes RM, Couper DJ, Barjaktarevic IZ, et al. Age-Dependent Associations Between 25-Hydroxy Vitamin D Levels and COPD Symptoms: Analysis of SPIROMICS. *Chronic Obstr Pulm Dis.* 2021 Apr;27(2):277-291. <https://doi.org/10.15326/jcopdf.2020.0180>. PMID: 33829714
 - Çolak Y, Nordestgaard BG, Afzal S. Low vitamin D and risk of bacterial pneumonias: Mendelian randomisation studies in two population-based cohorts. *Thorax.* 2021 May;76(5):468-478. <https://doi.org/10.1136/thoraxjnlg-2020-215288>. Epub 2020 Oct 27. PMID: 33109689
 - Derbyshire EJ, Calder PC. Respiratory Tract Infections and Antibiotic Resistance: A Protective Role for Vitamin D? *Front Nutr.* 2021 Mar 25;8:652469. <https://doi.org/10.3389/fnut.2021.652469>. eCollection 2021. PMID: 33842525
 - Garg D, Bhalla K, Nanda S, et al. Vitamin D status in children with community acquired pneumonia and its association with severity: a hospital-based study. *Minerva Pediatr (Torino).* 2021 Apr 12. <https://doi.org/10.23736/S2724-5276.21.06036-9>. Online ahead of print. PMID: 33845559
 - Golan-Tripto I, Loewenthal N, Tal A, et al. Vitamin D deficiency in children with acute bronchiolitis: a prospective cross-sectional case-control study. *BMC Pediatr.* 2021 Apr 30;21(1):211. <https://doi.org/10.1186/s12887-021-02666-4>. PMID: 33931018
 - Han H, Chung SI, Park HJ, et al. Obesity-induced Vitamin D Deficiency Contributes to Lung Fibrosis and Airway Hyperresponsiveness. *Am J Respir Cell Mol Biol.* 2021 Mar;64(3):357-367. <https://doi.org/10.1165/rcmb.2020-0086OC>. PMID: 33296297
 - Ito Y, Tsuda H, Imai K, et al. Vitamin D improves pulmonary function in a rat model for congenital diaphragmatic hernia. *Arch Biochem Biophys.* 2021 Mar 30;700:108769. <https://doi.org/10.1016/j.abb.2021.108769>. Epub 2021 Jan 20. PMID: 33484710
 - Jat KR, Goel N, Gupta N, et al. Efficacy of vitamin D supplementation in asthmatic children with vitamin D deficiency: A randomized controlled trial (ESDAC trial). *Pediatr Allergy Immunol.* 2021 Apr;32(3):479-488. <https://doi.org/10.1111/pai.13415>. Epub 2020 Dec 4. PMID: 33207014
 - Jolliffe DA, Camargo CA Jr, Sluyter JD, et al. Vitamin D supplementation to prevent acute respiratory infections: a systematic review and meta-analysis of aggregate data from randomised controlled trials. *Lancet Diabetes Endocrinol.* 2021 May;9(5):276-292. [https://doi.org/10.1016/S2213-8587\(21\)00051-6](https://doi.org/10.1016/S2213-8587(21)00051-6). Epub 2021 Mar 30. PMID: 33798465
 - Knihtilä HM, Kelly RS, Brustad N, et al. Maternal 17q21 genotype influences prenatal vitamin D effects on offspring asthma/recurrent wheeze. *Eur Respir J.* 2021 Mar 2:2002012. <https://doi.org/10.1183/13993003.02012-2020>. Online ahead of print. PMID: 33653805
 - Labib JR, Ibrahim SK, Ismail MM, et al. Vitamin D supplementation and improvement of pneumonic children at a tertiary pediatric hospital in Egypt: A randomized controlled trial. *Medicine (Baltimore).* 2021 Apr 2;100(13):e25011. <https://doi.org/10.1097/MD.00000000000025011>. PMID: 33787584
 - Lee J, Park HK, Kwon MJ, et al. Decreased lung function is associated with vitamin D deficiency in apparently healthy, middle aged Koreans: the Kangbuk Samsung Health Study. *Eur J Clin Nutr.* 2021 Mar;75(3):501-512. <https://doi.org/10.1038/s41430-020-00748-7>. Epub 2020 Sep 15. PMID: 32934338
 - Li J, Tiwari A, Mirzakhani H, et al. Circulating MicroRNA: Incident Asthma Prediction and Vitamin D Effect Modification. *J Pers Med.* 2021 Apr 16;11(4):307. <https://doi.org/10.3390/jpm11040307>. PMID: 33923455
 - Lips P. Vitamin D to prevent acute respiratory infections. *Lancet Diabetes Endocrinol.* 2021 May;9(5):249-251. [https://doi.org/10.1016/S2213-8587\(21\)00075-9](https://doi.org/10.1016/S2213-8587(21)00075-9). Epub 2021 Mar 30. PMID: 33798467
 - Lokesh KS, Chaya SK, Jayaraj BS, et al. Vitamin D deficiency is associated with chronic obstructive pulmonary disease and exacerbation of COPD. *Clin Respir J.* 2021 Apr;15(4):389-399. <https://doi.org/10.1111/crj.13310>. Epub 2020 Dec 2. PMID: 33217151
 - Lu M, Litonjua AA, O'Connor GT, et al. Effect of early and late prenatal vitamin D and maternal asthma status on offspring asthma or recurrent wheeze. *J Allergy Clin Immunol.* 2021 Apr;147(4):1234-1241.e3. <https://doi.org/10.1016/j.jaci.2020.06.041>. Epub 2020 Aug 19. PMID: 32822692
 - Meng F, Chen P, Guo X, et al. Correlations between Serum P2X7, Vitamin A, 25-hydroxy Vitamin D, and Mycoplasma Pneumoniae Pneumonia. *J Clin Lab Anal.* 2021 May;35(5):e23760. <https://doi.org/10.1002/jcla.23760>. Epub 2021 Mar 16. PMID: 33724522
 - Oktaria V, Danchin M, Triasih R, et al. The incidence of acute respiratory infection in Indonesian infants and association with vitamin D deficiency. *PLoS One.* 2021 Mar 23;16(3):e0248722. <https://doi.org/10.1371/journal.pone.0248722>. eCollection 2021. PMID: 33755666
 - Parameswaran P, Vaidya PC, Attri SV, et al. Vitamin D Deficiency: Prevalence and Association with Intrathoracic Tuberculosis in Indian Children. *Indian J Pediatr.* 2021 Mar;88(3):276. <https://doi.org/10.1007/s12098-020-03350-8>. Epub 2020 May 28. PMID: 32468388
 - Planté-Bordeneuve T, Berardis S, Bastin P, et al. Vitamin D intoxication in patients with cystic fibrosis: report of a single-center cohort. *Sci Rep.* 2021 Apr 8;11(1):7719. <https://doi.org/10.1038/s41598-021-87099-w>. PMID: 33833284
 - Quraishi SA, Bhan I, Matthay MA, et al. Vitamin D Status and Clinical Outcomes in Acute Respiratory Distress Syndrome: A Secondary Analysis From the Assessment of Low Tidal Volume and Elevated End-Expiratory Volume to Obviate Lung Injury (ALVE-Off) Trial. *J Intensive Care Med.* 2021 Jun 24;8850666211028139. <https://doi.org/10.1177/08850666211028139>. Online ahead of print. PMID: 34165010
 - Sakurai R, Singh H, Wang Y, et al. Effect of Perinatal Vitamin D Deficiency on Lung Mesenchymal Stem Cell Differentiation and Injury Repair Potential. *Am J Respir Cell Mol Biol.* 2021 Jun 14. <https://doi.org/10.1165/rcmb.2020-0183OC>. Online ahead of print. PMID: 34126864
 - Sanders EC, Burkes RM, Mock JR, et al. Bronchoalveolar Lavage and Plasma Cathelicidin Response to 25-Hydroxy Vitamin D Supplementation: A Pilot Study. *Chronic*

- Obstr Pulm Dis. 2021 May 21. <https://doi.org/10.15326/jcopdf.2021.0220>. Online ahead of print. PMID: 34044475
- Saraf R, Jensen BP, Camargo CA Jr, et al. Vitamin D status at birth and acute respiratory infection hospitalisation during infancy. *Paediatr Perinat Epidemiol.* 2021 Apr 1. <https://doi.org/10.1111/ppe.12755>. Online ahead of print. PMID: 33792941
 - Sarhan TS, Elrifai A. Serum level of vitamin D as a predictor for severity and outcome of pneumonia. *Clin Nutr.* 2021 Apr;40(4):2389-2393. <https://doi.org/10.1016/j.clnu.2020.10.035>. Epub 2020 Oct 23. PMID: 33158588
 - Siachpazidou DI, Kotsiou OS, Stavrou V, et al. Serum vitamin D levels in patients with obstructive sleep apnea syndrome and level changes after continuous positive airway pressure therapy. *Sleep Breath.* 2021 Jun;25(2):657-668. <https://doi.org/10.1007/s11325-020-02146-6>. Epub 2020 Aug 1. PMID: 32740855
 - Speeckaert MM, Delanghe JR. Vitamin D binding protein: A key regulator of vitamin D deficiency among patients with pneumonia. *Clin Nutr.* 2021 May;40(5):2491-2492. <https://doi.org/10.1016/j.clnu.2021.03.024>. Epub 2021 Mar 29. PMID: 33932791
 - Thakur C, Kumar J, Kumar P, et al. Vitamin-D supplementation as an adjunct to standard treatment of asthma in children: A randomized controlled trial (ViDASTA Trial). *Pediatr Pulmonol.* 2021 Jun;56(6):1427-1433. <https://doi.org/10.1002/ppul.25287>. Epub 2021 Feb 1. PMID: 33522698
 - Xiao J, He W. The immunomodulatory effects of vitamin D drops in children with recurrent respiratory tract infections. *Am J Transl Res.* 2021 Mar 15;13(3):1750-1756. eCollection 2021. PMID: 33841698
 - Yadav U, Kumar P, Rai V. Fokl polymorphism of the vitamin D receptor (VDR) gene and susceptibility to tuberculosis: Evidence through a meta-analysis. *Infect Genet Evol.* 2021 Aug;92:104871. <https://doi.org/10.1016/j.meegid.2021.104871>. Epub 2021 Apr 24. PMID: 33901685 Review
 - Yang C, Lu Y, Wan M, et al. Efficacy of High-Dose Vitamin D Supplementation as an Adjuvant Treatment on Pneumonia: Systematic Review and a Meta-Analysis of Randomized Controlled Studies. *Nutr Clin Pract.* 2021 Apr;36(2):368-384. <https://doi.org/10.1002/ncp.10585>. Epub 2020 Oct 9. PMID: 33037694 Review
 - Zhang TP, Chen SS, Zhang GY, et al. Association of vitamin D pathway genes polymorphisms with pulmonary tuberculosis susceptibility in a Chinese population. *Genes Nutr.* 2021 Apr 21;16(1):6. <https://doi.org/10.1186/s12263-021-00687-3>. PMID: 33882819
- ## PSYCHIATRY
- Bakhtiari-Dovvombaygi H, Izadi S, Zare Moghaddam M, et al. Beneficial effects of vitamin D on anxiety and depression-like behaviors induced by unpredictable chronic mild stress by suppression of brain oxidative stress and neuroinflammation in rats. *Naunyn Schmiedebergs Arch Pharmacol.* 2021 Apr;394(4):655-667. <https://doi.org/10.1007/s00210-020-02002-0>. Epub 2020 Oct 27. PMID: 33106919
 - Beydoun MA, Ng AE, Fanelli-Kuczmarski MT, Hossain S, et al. Vitamin D status and its longitudinal association with changes in patterns of sleep among middle-aged urban adults. *J Affect Disord.* 2021 Mar 1;282:858-868. <https://doi.org/10.1016/j.jad.2020.12.145>. Epub 2020 Dec 29. PMID: 33601729
 - Bond M, Moll N, Rosello A, et al. Vitamin D levels in children and adolescents with chronic tic disorders: a multicentre study. *Eur Child Adolesc Psychiatry.* 2021 Apr 13. <https://doi.org/10.1007/s00787-021-01757-y>. Online ahead of print. PMID: 33851280
 - Choy O, Raine A. Vitamin D sufficiency attenuates the effect of early social adversity on child antisocial behavior. *Psychol Med.* 2021 Mar 25:1-10. <https://doi.org/10.1017/S0033291721001069>. Online ahead of print. PMID: 33762031
 - Di Gessa G, Biddulph JP, Zaninotto P, et al. Changes in vitamin D levels and depressive symptoms in later life in England. *Sci Rep.* 2021 Apr 8;11(1):7724. <https://doi.org/10.1038/s41598-021-87432-3>. PMID: 33833363
 - Fond G, Masson M, Richieri R, et al. The Covid-19 infection: An opportunity to develop systematic vitamin D supplementation in psychiatry. *Encephale.* 2021 Mar 14:S0013-7006(21)00057-9. [https://doi.org/10.1016/j.schres.2021.03.008](https://doi.org/10.1016/j.en
Freedman R, Hunter SK, Law AJ, et al. Choline, folic acid, Vitamin D, and fetal brain development in the psychosis spectrum. <i>Schizophr Res.</i> 2021 Apr 7:S0920-9964(21)00128-6. <a href=). Online ahead of print. PMID: 33838984
 - Hemamy M, Pahlavani N, Amanollahi A, et al. Correction to: The effect of vitamin D and magnesium supplementation on the mental health status of attention-deficit hyperactive children: a randomized controlled trial. *BMC Pediatr.* 2021 May 12;21(1):230. <https://doi.org/10.1186/s12887-021-02683-3>. PMID: 33980185
 - Hemamy M, Pahlavani N, Amanollahi A, et al. The effect of vitamin D and magnesium supplementation on the mental health status of attention-deficit hyperactive children: a randomized controlled trial. *BMC Pediatr.* 2021 Apr 17;21(1):178. <https://doi.org/10.1186/s12887-021-02631-1>. PMID: 33865361
 - Kemény LV, Robinson KC, Hermann AL, et al. Vitamin D deficiency exacerbates UV/endorphin and opioid addiction. *Sci Adv.* 2021 Jun 11;7(24):eabe4577. <https://doi.org/10.1126/sciadv.abe4577>. Print 2021 Jun. PMID: 34117054
 - Lee BK, Eyles DW, Magnusson C, et al. Developmental vitamin D and autism spectrum disorders: findings from the Stockholm Youth Cohort. *Mol Psychiatry.* 2021 May;26(5):1578-1588. <https://doi.org/10.1038/s41380-019-0578-y>. Epub 2019 Nov 6. PMID: 31695167
 - Lye MS, Tor YS, Tey YY, et al. BsmI-Apal-TaqI TAC (BAI) Haplotype of Vitamin D Receptor Gene Is Associated with Increased Risk of Major Depressive Disorder. *J Mol Neurosci.* 2021 May;71(5):981-990. <https://doi.org/10.1007/s12031-020-01719-0>. Epub 2020 Oct 9. PMID: 33034825
 - Mehrdad M, Eftekhari MH, Jafari F, et al. Associations between FTO rs9939609 polymorphism, serum vitamin D, mental health, and eating behaviors in overweight adults. *Nutr Neurosci.* 2021 May 3:1-9. <https://doi.org/10.1080/1028415X.2021.1913316>. Online ahead of print. PMID: 33939949
 - Mehrdad M, Eftekhari MH, Jafari F, et al. Does vitamin D affect the association be-

- tween FTO rs9939609 polymorphism and depression? *Expert Rev Endocrinol Metab.* 2021 Mar;16(2):87-93. <https://doi.org/10.1080/17446651.2021.1889367>. Epub 2021 Mar 23. PMID: 33756086
- Mergl R, Dogan-Sander E, Willenberg A, et al. The effect of depressive symptomatology on the association of vitamin D and sleep. *BMC Psychiatry.* 2021 Apr 6;21(1):178. <https://doi.org/10.1186/s12888-021-03176-4>. PMID: 33823823
 - Miller MC, Pan X, Eugene Arnold L, et al. Vitamin D levels in children with attention deficit hyperactivity disorder: Association with seasonal and geographical variation, supplementation, inattention severity, and theta:beta ratio. *Biol Psychol.* 2021 May;162:108099. <https://doi.org/10.1016/j.biopsych.2021.108099>. Epub 2021 Apr 26. PMID: 33915215
 - Neriman A, Hakan Y, Ozge U. The psychotropic effect of vitamin D supplementation on schizophrenia symptoms. *BMC Psychiatry.* 2021 Jun 15;21(1):309. <https://doi.org/10.1186/s12888-021-03308-w>. PMID: 34130647
 - Paduchová Z, Katreňíková B, Vaváková M, et al. The Effect of Omega-3 Fatty Acids on Thromboxane, Brain-Derived Neurotrophic Factor, Homocysteine, and Vitamin D in Depressive Children and Adolescents: Randomized Controlled Trial. *Nutrients.* 2021 Mar 27;13(4):1095. <https://doi.org/10.3390/nu13041095>. PMID: 33801688
 - Saleh IA, Almutairi FM, Alorabi WK, et al. Short- and Long-Term Effects of Vitamin D Treatment on Bacillus Calmette-Guerin-Induced Depressive-Like Behavior in Mice. *Neuropsychiatr Dis Treat.* 2021 Mar 2;17:711-720. <https://doi.org/10.2147/NDT.S291793>. eCollection 2021. PMID: 33688194
 - Scorza FA, Almeida AG, Scorza CA, et al. Bipolar Disorder: The Vitamin D Debate. *J Affect Disord.* 2021 May 1;286:338-339. <https://doi.org/10.1016/j.jad.2021.02.073>. Epub 2021 Mar 4. PMID: 33773216
 - Tan Q, Liu S, Chen D. Poor vitamin D status and the risk of maternal depression: a dose-response meta-analysis of observational studies. *Public Health Nutr.* 2021 Jun;24(8):2161-2170. <https://doi.org/10.1017/S1368980019004919>. Epub 2020 Dec 18. PMID: 33336636
 - Terock J, Hannemann A, Weihs A, et al. Alexithymia is associated with reduced vitamin D levels, but not polymorphisms of the vitamin D binding-protein gene. *Psychiatr Genet.* 2021 Jun 1. <https://doi.org/10.1097/YPG.0000000000000283>. Online ahead of print. PMID: 34074948
 - Trivedi C, Mansuri Z, Jain S. Maternal Vitamin D Level and Attention-Deficit/Hyperactivity Disorder in Offspring: Getting the Most Out of the Data. *J Am Acad Child Adolesc Psychiatry.* 2021 May 5;S0890-8567(21)00275-6. <https://doi.org/10.1016/j.jaac.2021.03.022>. Online ahead of print. PMID: 33961988
 - Zhou P, Wolraich ML, Cao AH, et al. Adjuvant effects of vitamin A and vitamin D supplementation on treatment of children with attention-deficit/hyperactivity disorder: a study protocol for a randomised, double-blinded, placebo-controlled, multicentric trial in China. *BMJ Open.* 2021 Jun 16;11(6):e050541. <https://doi.org/10.1136/bmjopen-2021-050541>. PMID: 34135055
- ## RHEUMATOLOGY
- Abdeen HAA, Rodriguez-Sanz D, Ewidea M, et al. Efficacy of Vitamin D Supplementation in Addition to Aerobic Exercise Training in Obese Women with Perceived Myalgia: A Single-Blinded Randomized Controlled Clinical Trial. *Nutrients.* 2021 May 27;13(6):1819. <https://doi.org/10.3390/nu13061819>. PMID: 34071781
 - Al-Rawaf HA, Gabr SA, Alghadir AH. Vitamin D Deficiency and Molecular Changes in Circulating MicroRNAs in Older Adults with Lower Back Pain. *Pain Res Manag.* 2021 May 17;2021:6662651. <https://doi.org/10.1155/2021/6662651>. eCollection 2021. PMID: 34055120
 - Aldana Sierra MC, Christian CW. Vitamin D, rickets and child abuse: controversies and evidence. *Pediatr Radiol.* 2021 May;51(6):1014-1022. <https://doi.org/10.1007/s00247-020-04893-w>. Epub 2021 May 17. PMID: 33999242 Review
 - Alessio N, Belardo C, Trotta MC, et al. Vitamin D Deficiency Induces Chronic Pain and Microglial Phenotypic Changes in Mice. *Int J Mol Sci.* 2021 Mar 30;22(7):3604. <https://doi.org/10.3390/ijms22073604>. PMID: 33808491
 - Amini Kadijani A, Bagherifard A, Mohammadi F, et al. Association of Serum Vitamin D with Serum Cytokine Profile in Patients with Knee Osteoarthritis. *Cartilage.* 2021 Apr 23;19:476035211010309. <https://doi.org/10.1177/19476035211010309>. Online ahead of print. PMID: 33890506
 - Ammerman BM, Ling D, Callahan LR, et al. Prevalence of Vitamin D Insufficiency and Deficiency in Young, Female Patients With Lower Extremity Musculoskeletal Complaints. *Sports Health.* 2021 Mar;13(2):173-180. <https://doi.org/10.1177/1941738120953414>. Epub 2020 Dec 10. PMID: 33301353
 - Beling A, Hresko MT, DeWitt L, et al. Vitamin D levels and pain outcomes in adolescent idiopathic scoliosis patients undergoing spine fusion. *Spine Deform.* 2021 Mar 8. <https://doi.org/10.1007/s43390-021-00313-7>. Online ahead of print. PMID: 33683641
 - Berry TM, Moustafa AA. Osteoporosis and the effect of dysregulation of the transsulfuration pathway via taurine on intracellular calcium homeostasis, vitamin D absorption and vitamin K absorption. *Clin Nutr ESPEN.* 2021 Jun;43:191-196. <https://doi.org/10.1016/j.clnesp.2021.02.023>. Epub 2021 Mar 16. PMID: 34024513
 - Blufstein A, Behm C, Kubin B, et al. Effect of vitamin D(3) on the osteogenic differentiation of human periodontal ligament stromal cells under inflammatory conditions. *J Periodontal Res.* 2021 Jun;56(3):579-588. <https://doi.org/10.1111/jre.12858>. Epub 2021 Feb 5. PMID: 33547643
 - Bolland MJ, Avenell A, Grey A. Prevalence of biochemical osteomalacia in adults undergoing vitamin D testing. *Clin Endocrinol (Oxf).* 2021 Jul;95(1):74-83. <https://doi.org/10.1111/cen.14483>. Epub 2021 Apr 25. PMID: 33866594
 - Bouillon R. Nutritional rickets: calcium or vitamin D deficiency? *Am J Clin Nutr.* 2021 Apr 19:nqab121. <https://doi.org/10.1093/ajcn/nqab121>. Online ahead of print. PMID: 33876199
 - Bouillon R. Vitamin D: good or bad for muscle strength? *J Bone Miner Res.* 2021 Jun 15. <https://doi.org/10.1002/>

- jbmr.4390. Online ahead of print. PMID: 34131947
- Brech GC, Machado-Lima A, Bastos MF, et al. Vitamin D supplementation associated with 12-weeks multimodal training in older women with low bone mineral density: A randomized double-blind placebo-controlled trial. *Exp Gerontol.* 2021 Apr;146:111211. <https://doi.org/10.1016/j.exger.2020.111211>. Epub 2021 Jan 6. PMID: 33421538 Clinical Trial
 - Burt IA, Billington EO, Rose MS, et al. Reply to Effects of High-Dose Vitamin D Supplementation on Bone Fragility. *J Bone Miner Res.* 2021 Mar;36(3):622. <https://doi.org/10.1002/jbmr.4190>. Epub 2020 Oct 23. PMID: 33095473
 - Burt IA, Billington EO, Rose MS, et al. Reply to Vitamin D Supplements: Is Bone Loss by HR-pQCT Really Negative? *J Bone Miner Res.* 2021 Jun;36(6):1206-1207. <https://doi.org/10.1002/jbmr.4247>. Epub 2021 Feb 3. PMID: 33534173
 - Castillo-Avila RG, González-Castro TB, Tovilla-Zárate CA, et al. Association Between FokI Polymorphism of Vitamin D Receptor Gene and Lumbar Spine Disc Degeneration: A Systematic Review and Meta-Analysis. *Am J Phys Med Rehabil.* 2021 May 1;100(5):492-500. <https://doi.org/10.1097/PHM.0000000000001588>. PMID: 32932361
 - Catalano A, Bellone F, Santoro D, et al. Vitamin D Boosts Alendronate Tail Effect on Bone Mineral Density in Postmenopausal Women with Osteoporosis. *Nutrients.* 2021 May 31;13(6):1878. <https://doi.org/10.3390/nu13061878>. PMID: 34072655
 - Chaffer TJ, Leduc-Gaudet JP, Moamer A, et al. Novel insights into the autonomous role played by vitamin D receptor in the regulation of skeletal muscle mass. *J Physiol.* 2021 Apr;599(7):1955-1956. <https://doi.org/10.1111/jp281211>. Epub 2021 Feb 2. PMID: 33476041
 - Chevalley T, Brandi ML, Cavalier E, et al. How can the orthopedic surgeon ensure optimal vitamin D status in patients operated for an osteoporotic fracture? *Osteoporos Int.* 2021 May 20;1-15. <https://doi.org/10.1007/s00198-021-05957-9>. Online ahead of print. PMID: 34013461
 - de Carvalho JF. Negativization of anti-nuclear, anti-dsDNA, and anti-chromatin antibodies after vitamin D supplementa-
 - tion in a lupus patient. *Clin Nutr ESPEN.* 2021 Apr;42:262-264. <https://doi.org/10.1016/j.clnesp.2021.01.025>. Epub 2021 Feb 9. PMID: 33745590
 - Deng J, Yang Y, He J, et al. Vitamin D receptor activated by vitamin D administration alleviates *Mycobacterium tuberculosis*-induced bone destruction by inhibiting NFκB-mediated aberrant osteoclastogenesis. *FASEBJ.* 2021 Jun;35(6):e21543. <https://doi.org/10.1096/fj.202100135R>. PMID: 34046950
 - Elechi HA, Oduwole A, Idris HW, et al. Vitamin D and bone mineral status of newborn-maternal pair delivering at a tertiary hospital in Nigeria. *Niger J Clin Pract.* 2021 Mar;24(3):345-354. https://doi.org/10.4103/njcp.njcp_368_20. PMID: 33723108
 - Fakhfakh R, Feki S, Elleuch A, et al. Vitamin D status and CYP27B1-1260 promoter polymorphism in Tunisian patients with systemic lupus erythematosus. *Mol Genet Genomic Med.* 2021 Mar;9(3):e1618. <https://doi.org/10.1002/mgg3.1618>. Epub 2021 Feb 17. PMID: 33594806
 - Feehan J, Degabrielle E, Tripodi N, et al. The effect of vitamin D supplementation on circulating osteoprogenitor cells: A pilot randomized controlled trial. *Exp Gerontol.* 2021 Jul 15;150:111399. <https://doi.org/10.1016/j.exger.2021.111399>. Epub 2021 May 7. PMID: 33971278
 - Feng F, Shi G, Chen H, et al. Comprehensive Interventions Including Vitamin D Effectively Reduce the Risk of Falls in Elderly Osteoporotic Patients. *Orthop Surg.* 2021 May 5. <https://doi.org/10.1111/os.13009>. Online ahead of print. PMID: 33951328
 - Fogarty MJ, Losbanos LL, Craig TA, et al. Muscle specific deletion of the vitamin-D receptor in mice is associated with diaphragm muscle weakness. *J Appl Physiol (1985).* 2021 May 20. <https://doi.org/10.1152/japplphysiol.00194.2021>. Online ahead of print. PMID: 34013750
 - Erratum to: Diet Modulates the Effects of Genetic Variants on the Vitamin D Metabolic Pathway and Bone Mineral Density in Mexican Postmenopausal Women; <https://doi.org/10.1093/jn/nxab067>. *J Nutr.* 2021 Jun 1;151(6):1675. <https://doi.org/10.1093/jn/nxab166>. PMID: 34075416 Free PMC article
 - Gkekas NK, Anagnostis P, Paraschou V, et al. The effect of vitamin D plus protein supplementation on sarcopenia: A systematic review and meta-analysis of randomized controlled trials. *Maturitas.* 2021 Mar;145:56-63. <https://doi.org/10.1016/j.maturitas.2021.01.002>. Epub 2021 Jan 12. PMID: 33541563
 - Havdahl A, Mitchell R, Paternoster L, et al. Author Correction: Investigating causality in the association between vitamin D status and self-reported tiredness. *Sci Rep.* 2021 May 7;11(1):10243. <https://doi.org/10.1038/s41598-021-89274-5>. PMID: 33963257
 - Heyer FL, de Jong J, Willems PC, et al. The Effect of Bolus Vitamin D(3) Supplementation on Distal Radius Fracture Healing: A Randomized Controlled Trial Using HR-pQCT. *J Bone Miner Res.* 2021 Apr 20. <https://doi.org/10.1002/jbmr.4311>. Online ahead of print. PMID: 33877707
 - Huhtakangas JA, Huovinen J, Laaksonen S, et al. A single intra-articular dose of vitamin D analog calcipotriol alleviates synovitis without adverse effects in rats. *PLoS One.* 2021 Apr 20;16(4):e0250352. <https://doi.org/10.1371/journal.pone.0250352>. eCollection 2021. PMID: 33878143
 - Ingstad F, Solberg LB, Nordsletten L, et al. Vitamin D status and complications, readmissions, and mortality after hip fracture. *Osteoporos Int.* 2021 May;32(5):873-881. <https://doi.org/10.1007/s00198-020-05739-9>. Epub 2020 Nov 17. PMID: 33201249
 - Jamal AB, Hasan Khan MN, Sadiq M. Intertrochanteric Hip Fractures And Vitamin D Deficiency; A Significant Association. *J Ayub Med Coll Abbottabad.* 2021 Apr-Jun;33(2):257-261. PMID: 34137541
 - Karna MJ, Korewo D, Myślińska D, et al. The Positive Impact of Vitamin D on Glucocorticoid-Dependent Skeletal Muscle Atrophy. *Nutrients.* 2021 Mar 14;13(3):936. <https://doi.org/10.3390/nu13030936>. PMID: 33799389
 - Kaygusuz SB, Alavanda C, Kirkgoz T, et al. Does Genotype-Phenotype Correlation Exist in Vitamin D-Dependent Rickets Type IA: Report of 13 New Cases and Review of the Literature. *Calcif Tissue Int.* 2021 May;108(5):576-586. <https://doi.org/10.1007/s00223-020-00784-2>. Epub 2021 Jan 2. PMID: 33386952

- Knechtle B, Jastrzębski Z, Hill L, et al. Vitamin D and Stress Fractures in Sport: Preventive and Therapeutic Measures-A Narrative Review. *Medicina (Kaunas)*. 2021 Mar 1;57(3):223. <https://doi.org/10.3390/medicina57030223>. PMID: 33804459
- Kocaer A, Sarpel T, Gökçen N, et al. Proximal muscle strength as a predictor of vitamin D insufficiency in elderly. *Turk J Phys Med Rehabil.* 2021 Mar 4;67(1):84-90. <https://doi.org/10.5606/tfrd.2021.5323>. eCollection 2021 Mar. PMID: 33948548
- Koda R, Miyazaki S, Iino N, et al. Vitamin D Deficiency-induced Osteomalacia in a Patient with Anorexia Nervosa. *Intern Med.* 2021 Jun 1;60(11):1731-1736. <https://doi.org/10.2169/internalmedicine.5911-20>. Epub 2020 Dec 29. PMID: 33390486
- Koyama S, Kubota T, Naganuma J, et al. Incidence rate of vitamin D deficiency and FGF23 levels in 12- to 13-year-old adolescents in Japan. *J Bone Miner Metab.* 2021 May;39(3):456-462. <https://doi.org/10.1007/s00774-020-01173-3>. Epub 2020 Nov 18. PMID: 33206223
- Kucuk A, Baykara RA, Tuzcu A, et al. Could Ferritin, Vitamin B(12), and Vitamin D Play a Role in the Etiopathogenesis of Fibromyalgia syndrome? *Rom J Intern Med.* 2021 Jun 17. <https://doi.org/10.2478/rjim-2021-0022>. Online ahead of print. PMID: 34142515
- Kupisz-Urbańska M, Płudowski P, Marciniowska-Suchowierska E. Vitamin D Deficiency in Older Patients-Problems of Sarcopenia, Drug Interactions, Management in Deficiency. *Nutrients.* 2021 Apr 10;13(4):1247. <https://doi.org/10.3390/nu13041247>. PMID: 33920130
- Latham CM, Brightwell CR, Keeble AR, et al. Vitamin D Promotes Skeletal Muscle Regeneration and Mitochondrial Health. *Front Physiol.* 2021 Apr 14;12:660498. <https://doi.org/10.3389/fphys.2021.660498>. eCollection 2021. PMID: 33935807
- Li S, Xi C, Li L, et al. Comparisons of different vitamin D supplementation for prevention of osteoporotic fractures: a Bayesian network meta-analysis and meta-regression of randomised controlled trials. *Int J Food Sci Nutr.* 2021 Jun;72(4):518-528. <https://doi.org/10.1080/09637486.2020.1830264>. Epub 2020 Oct 11. PMID: 33043722
- Li Y, Huang J, Wang J, et al. Lactoferrin Is a Potential Activator of the Vitamin D Receptor in Its Regulation of Osteogenic Activities in C57BL/6J Mice and MC3T3-E1 Cells. *J Nutr.* 2021 May 12:nxab105. <https://doi.org/10.1093/jn/nxab105>. Online ahead of print. PMID: 33982113
- Lin CC, Shih MH, Chen CD, et al. Effects of adequate dietary protein with whey protein, leucine, and vitamin D supplementation on sarcopenia in older adults: An open-label, parallel-Group study. *Clin Nutr.* 2021 Mar;40(3):1323-1329. <https://doi.org/10.1016/j.clnu.2020.08.017>. Epub 2020 Aug 27. PMID: 32928579
- Manolopoulos PP, Lavranos G, Mamaïs I, et al. Vitamin D and bone health status in beta thalassemia patients-systematic review. *Osteoporos Int.* 2021 Jun;32(6):1031-1040. <https://doi.org/10.1007/s00198-021-05821-w>. Epub 2021 Jan 9. PMID: 33423084 Review
- Markopoulos G, Lepetos P, Perrea DN, et al. Possible Roles of Vitamin D in Bone Grafting. *Cureus.* 2021 Apr 26;13(4):e14688. <https://doi.org/10.7759/cureus.14688>. PMID: 34055532
- Marozik P, Rudenka A, Kobets K, et al. Vitamin D Status, Bone Mineral Density, and VDR Gene Polymorphism in a Cohort of Belarusian Postmenopausal Women. *Nutrients.* 2021 Mar 4;13(3):837. <https://doi.org/10.3390/nu13030837>. PMID: 33806559
- Mazess RB. Vitamin D Supplements: Is Bone Loss by pQCT Really Negative? *J Bone Miner Res.* 2021 Jun;36(6):1204-1205. <https://doi.org/10.1002/jbmr.4246>. Epub 2021 Feb 3. PMID: 33534185
- Meshkini F, Soltani S, Clayton ZS, et al. The effect of vitamin D on fibroblast growth factor 23: a systematic review and meta-analysis of randomized controlled trials. *Eur J Clin Nutr.* 2021 Jun;75(6):988-989. <https://doi.org/10.1038/s41430-021-00903-8>. Epub 2021 Mar 26. PMID: 33772215
- Michałak F, Hnitécka S, Dominiak M, et al. Schemes for Drug-Induced Treatment of Osteonecrosis of Jaws with Particular Emphasis on the Influence of Vitamin D on Therapeutic Effects. *Pharmaceutics.* 2021 Mar 8;13(3):354. <https://doi.org/10.3390/pharmaceutics13030354>. PMID: 33800247
- Mieszkowski J, Kochanowicz A, Piskorska E, et al. Serum levels of bone formation and resorption markers in relation to vitamin D status in professional gymnastics and physically active men during upper and lower body high-intensity exercise. *J Int Soc Sports Nutr.* 2021 Apr 13;18(1):29. <https://doi.org/10.1186/s12970-021-00430-8>. PMID: 33849553
- Min C, Yoo DM, Wee JH, et al. High-Intensity Physical Activity with High Serum Vitamin D Levels is Associated with a Low Prevalence of Osteopenia and Osteoporosis: A Population-Based Study. *Osteoporos Int.* 2021 May;32(5):883-891. <https://doi.org/10.1007/s00198-020-05746-w>. Epub 2020 Nov 23. PMID: 33230576
- Mølmen KS, Hammarström D, Pedersen K, et al. Vitamin D(3) supplementation does not enhance the effects of resistance training in older adults. *J Cachexia Sarcopenia Muscle.* 2021 Jun;12(3):599-628. <https://doi.org/10.1002/jcsm.12688>. Epub 2021 Mar 31. PMID: 33788419
- Moore DM, O'Sullivan M, Kiely P, et al. Vitamin D levels in Irish children with fractures: A prospective case-control study with 5 year follow-up. *Surgeon.* 2021 Apr 24:S1479-666X(21)00067-6. <https://doi.org/10.1016/j.surge.2021.02.015>. Online ahead of print. PMID: 33903053
- Mukai M, Yamamoto T, Takeyari S, et al. Alkaline phosphatase in pediatric patients with genu varum caused by vitamin D-deficient rickets. *Endocr J.* 2021 Mar 24. <https://doi.org/10.1507/endocrj.EJ20-0622>. Online ahead of print. PMID: 33762518
- Murad MH. Letter to the Editor from Murad: "The Effect of Vitamin D on Falls: A Systematic Review and Meta-Analysis". *J Clin Endocrinol Metab.* 2021 Mar 8;106(3):e1495. <https://doi.org/10.1210/clinem/dgaa928>. PMID: 33319221
- Okan F, Zincir H, Deveci K. The Effect of Sun Light Exposure to the Level of Vitamin D in Elderly People Living in Nursing Home. *J Clin Densitom.* 2021 Mar 17:S1094-6950(21)00024-X. <https://doi.org/10.1016/j.jocd.2021.03.006>. Online ahead of print. PMID: 33888407
- Ozden A, Doneray H, Turkyilmaz A. Two novel CYP2R1 mutations in a family with vitamin D-dependent rickets type 1b. *Endocrine.* 2021 Jun;72(3):852-864. <https://doi.org/10.1007/s12020-021-02670-9>. Epub 2021 Mar 13. PMID: 33715104

- Ozden A, Doneray H. The genetics and clinical manifestations of patients with vitamin D dependent rickets type 1A. *J Pediatr Endocrinol Metab.* 2021 Apr;134(6):781-789. <https://doi.org/10.1515/jpem-2020-0691>. Print 2021 Jun 25. PMID: 33823104
- Palmer ND, Lu L, Register TC, et al. Genome-wide association study of vitamin D concentrations and bone mineral density in the African American-Diabetes Heart Study. *PLoS One.* 2021 May 20;16(5):e0251423. <https://doi.org/10.1371/journal.pone.0251423>. eCollection 2021. PMID: 34014961
- Panda AK, Padhi S. Comment on: Vitamin D receptor gene polymorphisms and osteoarthritis: a meta-analysis. *Rheumatology (Oxford).* 2021 Jun 18;60(6):e215. <https://doi.org/10.1093/rheumatology/keab063>. PMID: 33493318
- Park H, Park CY. Risk of Osteoarthritis is Positively Associated with Vitamin D Status, but Not Bone Mineral Density, in Older Adults in the United States. *J Am Coll Nutr.* 2021 May 25;1:9. <https://doi.org/10.1080/07315724.2020.1787907>. Online ahead of print. PMID: 34032559
- Pierce JL, Perrien DS. Do Interactions of Vitamin D(3) and BMP Signaling Hold Implications in the Pathogenesis of Fibrodysplasia Ossificans Progressiva? *Curr Osteoporos Rep.* 2021 Apr 14. <https://doi.org/10.1007/s11914-021-00673-z>. Online ahead of print. PMID: 33851285 Review
- Punceviciene E, Gaizevska J, Sabaliauskaitė R, et al. Vitamin D and VDR Gene Polymorphisms' Association with Rheumatoid Arthritis in Lithuanian Population. *Medicina (Kaunas).* 2021 Apr 3;57(4):346. <https://doi.org/10.3390/medicina57040346>. PMID: 33916688
- Qi G, Yu K, Feng Y, et al. 1alpha,25-dihydroxyvitamin D3 promotes early osteogenic differentiation of PDLSCs and a 12-year follow-up case of early-onset vitamin D deficiency periodontitis. *J Steroid Biochem Mol Biol.* 2021 Apr;208:105805. <https://doi.org/10.1016/j.jsbmb.2020.105805>. Epub 2021 Jan 21. PMID: 33486080
- Ramasamy B, Magne F, Tripathy SK, et al. Association of Gut Microbiome and Vitamin D Deficiency in Knee Osteoarthritis Patients: A Pilot Study. *Nutrients.* 2021 Apr 13;13(4):1272. <https://doi.org/10.3390/nu13041272>. PMID: 33924396
- Raptis K, Makris K, Trovas G, et al. Does Vitamin D affects changes in volumetric bone mineral density and architecture in postmenopausal women after conservatively treated distal radius fractures? *J Musculoskeletal Neuronal Interact.* 2021 Mar 1;21(1):93-103. PMID: 33657759
- Rivera-Paredes B, Quezada-Sánchez AD, Denova-Gutiérrez E, et al. Diet Modulates the Effects of Genetic Variants on the Vitamin D Metabolic Pathway and Bone Mineral Density in Mexican Postmenopausal Women. *J Nutr.* 2021 Apr 13:nxab067. <https://doi.org/10.1093/jn/nxab067>. Online ahead of print. PMID: 33847345
- Romeu Montenegro K, Amarante Pufal M, Newsholme P. Vitamin D Supplementation and Impact on Skeletal Muscle Function in Cell and Animal Models and an Aging Population: What Do We Know So Far? *Nutrients.* 2021 Mar 28;13(4):1110. <https://doi.org/10.3390/nu13041110>. PMID: 33800650
- Schneider L, Hax V, Monticielo O, et al. Dualities of the vitamin D in systemic sclerosis: a systematic literature review. *Adv Rheumatol.* 2021 Jun 9;61(1):34. <https://doi.org/10.1186/s42358-021-00192-6>. PMID: 34108054
- Shokri HM, Mohamed KO, Fahmy NA, et al. Vitamin D receptor gene polymorphism in patients with osteomalacic myopathy in Egypt. *Neurol Sci.* 2021 Mar;42(3):1031-1037. <https://doi.org/10.1007/s10072-020-04622-z>. Epub 2020 Jul 26. PMID: 32715368
- Siddiqui AA, Kumar J, Adeel M, et al. Prevalence of vitamin D deficiency in children presenting with supracondylar fractures of humerus. *Int J Clin Pract.* 2021 May;75(5):e14056. <https://doi.org/10.1111/ijcp.14056>. Epub 2021 Feb 10. PMID: 33525057
- Sim DS, Tay K, Howe TS, et al. Preoperative severe vitamin D deficiency is a significant independent risk factor for poorer functional outcome and quality of life 6 months after surgery for fragility hip fractures. *Osteoporos Int.* 2021 May 7. <https://doi.org/10.1007/s00198-021-05970-y>. Online ahead of print. PMID: 33959793
- Sirufo MM, Ginaldi L, De Martinis M. The IL-33/ST2 axis and vitamin D as a possible emerging therapeutic target in osteoarthritis. *Rheumatology (Oxford).* 2021 Mar 22:keab292. <https://doi.org/10.1093/rheumatology/keab292>. Online ahead of print. PMID: 33752232
- Sisi SZH, Azarbayjani MA, Vafaeenabadi M, et al. The effect of regular resistance exercise, vitamin D, and calcium supplements on the gastrocnemius muscle in rats in the postmenopausal period: An experimental study. *Int J Reprod Biomed.* 2021 Mar 21;19(3):283-292. <https://doi.org/10.18502/ijrm.v19i3.8576>. eCollection 2021 Mar. PMID: 33842825
- Song K, Kwon A, Chae HW, et al. Vitamin D status is associated with bone mineral density in adolescents: Findings from the Korea National Health and Nutrition Examination Survey. *Nutr Res.* 2021 Mar;87:13-21. <https://doi.org/10.1016/j.nutres.2020.12.011>. Epub 2020 Dec 8. PMID: 33596507
- Song Y, Liu SF, Wu Z, et al. Effects of preoperative serum vitamin D levels on early clinical function outcomes and the moderate-to-severe pain prevalence in postmenopausal women after primary total knee arthroplasty. *Menopause.* 2021 May 3. <https://doi.org/10.1097/GME.0000000000001789>. Online ahead of print. PMID: 33950032
- Starczak Y, Reinke DC, Barratt KR, et al. Vitamin D receptor expression in mature osteoclasts reduces bone loss due to low dietary calcium intake in male mice. *J Steroid Biochem Mol Biol.* 2021 Jun;210:105857. <https://doi.org/10.1016/j.jsbmb.2021.105857>. Epub 2021 Feb 26. PMID: 33647520
- Sudjaritruk T, Bunupuradah T, Aurpibul L, et al. Impact of vitamin D and calcium supplementation on bone mineral density and bone metabolism among Thai adolescents with perinatally acquired HIV infection: A randomized clinical trial. *Clin Infect Dis.* 2021 Jun 14:ciab547. <https://doi.org/10.1093/cid/ciab547>. Online ahead of print. PMID: 34125899
- Sugiyama T. Effects of High-Dose Vitamin D Supplementation on Bone Fragility. *J Bone Miner Res.* 2021 Mar;36(3):621. <https://doi.org/10.1002/jbmr.4194>. Epub 2020 Nov 2. PMID: 33136304
- Szymczak-Tomczak A, Kaczmarek-Ryś M, Hryhorowicz S, et al. Vitamin D, Vitamin D Receptor (VDR) Gene Polymorphisms (Apal and FokI), and Bone

- Mineral Density in Patients With Inflammatory Bowel Disease. *J Clin Densitom.* 2021 Apr-Jun;24(2):233-242. <https://doi.org/10.1016/j.jocd.2020.10.009>. Epub 2020 Oct 24. PMID: 33172802
- Tanjeko AT, Serré J, Wüst RCI, et al. The combination of smoking with vitamin D deficiency impairs skeletal muscle fiber hypertrophy in response to overload in mice. *J Appl Physiol (1985).* 2021 Jun 3. <https://doi.org/10.1152/japplphysiol.00733.2020>. Online ahead of print. PMID: 34080919
 - Thompson M, Aitken D, Balogun S, et al. Population vitamin D stores are increasing in Tasmania and this is associated with less BMD loss over 10 years. *J Clin Endocrinol Metab.* 2021 Mar 30:dgab197. <https://doi.org/10.1210/clinem/dgab197>. Online ahead of print. PMID: 33782704
 - Thorpe DL, Beeson WL, Knutsen R, et al. Dietary patterns and hip fracture in the Adventist Health Study 2: combined vitamin D and calcium supplementation mitigate increased hip fracture risk among vegans. *Am J Clin Nutr.* 2021 May 8:nqab095. <https://doi.org/10.1093/ajcn/nqab095>. Online ahead of print. PMID: 33964850
 - Tiosano D, Abrams SA, Weisman Y. Lessons Learned from Hereditary 1,25-Dihydroxyvitamin D-Resistant Rickets Patients on Vitamin D Functions. *J Nutr.* 2021 Mar 11;151(3):473-481. <https://doi.org/10.1093/jn/nxaa380>. PMID: 33438017 Review
 - Tu L, Zheng S, Cicuttini F, et al. Effects of Vitamin D Supplementation on Disabling Foot Pain in Patients With Symptomatic Knee Osteoarthritis. *Arthritis Care Res (Hoboken).* 2021 Jun;73(6):781-787. <https://doi.org/10.1002/acr.24371>. PMID: 32623812
 - Varkal MA, Gulenc B, Yildiz I, et al. Vitamin D level, body mass index and fracture risk in children: vitamin D deficiency and fracture risk. *J Pediatr Orthop B.* 2021 Mar 18. <https://doi.org/10.1097/BPB.0000000000000867>. Online ahead of print. PMID: 33741834
 - Vij N, Ranade AS, Gupte S, et al. Tension-Sided Femoral Neck Stress Fracture in an Adolescent with Vitamin D Deficiency and Osteomalacia: A Case Report. *JBJS Case Connect.* 2021 Jun 15;11(2). <https://doi.org/10.2106/JBJS.CC.20.00787>. PMID: 34129537
 - Wanigatunga AA, Sternberg AL, Blackford AL, et al. The effects of vitamin D supplementation on types of falls. *J Am Geriatr Soc.* 2021 Jun 12. <https://doi.org/10.1111/jgs.17290>. Online ahead of print. PMID: 34118059
 - XueJ, Song Y, Liu H, et al. Vitamin D receptor gene polymorphisms and risk of intervertebral disc degeneration: An updated meta-analysis based on 23 studies. *Medicine (Baltimore).* 2021 May 21;100(20):e25922. <https://doi.org/10.1097/MD.000000000025922>. PMID: 34011063
 - Ye Q, Wang G, Huang Y, et al. Mycophenolic Acid Exposure Optimization Based on Vitamin D Status in Children with Systemic Lupus Erythematosus: A Single-Center Retrospective Study. *Rheumatol Ther.* 2021 Jun 17. <https://doi.org/10.1007/s40744-021-00324-w>. Online ahead of print. PMID: 34142344
 - Yu Y, Liu D, Feng D, et al. Association between Vitamin D and Knee Osteoarthritis: A PRISMA-Compliant Meta-analysis. *Z Orthop Unfall.* 2021 Jun;159(3):281-287. <https://doi.org/10.1055/a-1098-8815>. Epub 2020 Mar 9. PMID: 32150754 English
 - Zhao ZX, He Y, Peng LH, et al. Does vitamin D improve symptomatic and structural outcomes in knee osteoarthritis? A systematic review and meta-analysis. *Aging Clin Exp Res.* 2021 Mar 30. <https://doi.org/10.1007/s40520-020-01778-8>. Online ahead of print. PMID: 33783714 Review
 - Zheng C, Li H, Rong S, et al. Vitamin D level and fractures in children and adolescents: a systematic review and meta-analysis. *J Bone Miner Metab.* 2021 Jun 11. <https://doi.org/10.1007/s00774-021-01238-x>. Online ahead of print. PMID: 34115219
 - Zittermann A, Berthold HK, Pilz S. The effect of vitamin D on fibroblast growth factor 23: a systematic review and meta-analysis of randomized controlled trials. *Eur J Clin Nutr.* 2021 Jun;75(6):980-987. <https://doi.org/10.1038/s41430-020-00725-0>. Epub 2020 Aug 27. PMID: 32855522 Review.