



30. Simpozij HDMBLM-a

VITAMIN D U ZDRAVLJU I BOLESTI

Klinički zavod za kemiju
KBC Sestre milosrdnice, Zagreb

Program

2

| Vrijeme | Predavanje |
|--------------------|--|
| 11.30-12.00 | Vitamin D jučer, danas, sutra <i>Nora Nikolac Gabaj</i> |
| 12.00-12.20 | Mehanizam djelovanja i fiziološka uloga vitamina D <i>Adriana Unić</i> |
| 12.20-12.40 | Utjecaj predanalitičkih čimbenika na koncentraciju vitamina D <i>Marijana Miler</i> |
| 12.40-13.00 | Analitički izazovi u određivanju vitamina D <i>Tomislav Pavičić</i> |
| 13.00-14.00 | Stanka za ručak |
| 14.00-14.20 | Vitamin D u ekstravaskularnim tjelesnim tekućinama <i>Jelena Culej</i> |
| 14.20-14.40 | Vitamin D i plodnost <i>Ivan Bolanča</i> |
| 14.40-15.00 | Vitamin D u šećernoj bolesti <i>Davorka Herman Mahečić</i> |
| 15.00-15.20 | Polimorfizmi receptora vitamina D u reumatoidnim bolestima <i>Alen Vrtarić</i> |
| 15.20-15.40 | Vitamin D u bolestima pluća <i>Lara Milevoj Kopčinović</i> |

Tehnički detalji

3

Sažetci predavanja:

Biochem Med 2019;29(3):

<https://www.biochemia-medica.com/en/journal/29/3/746>



Potvrdnice:

Elektronički

Anketa:

Elektronički uz potvrđnicu

Hvala unaprijed na odgovorima! 😊

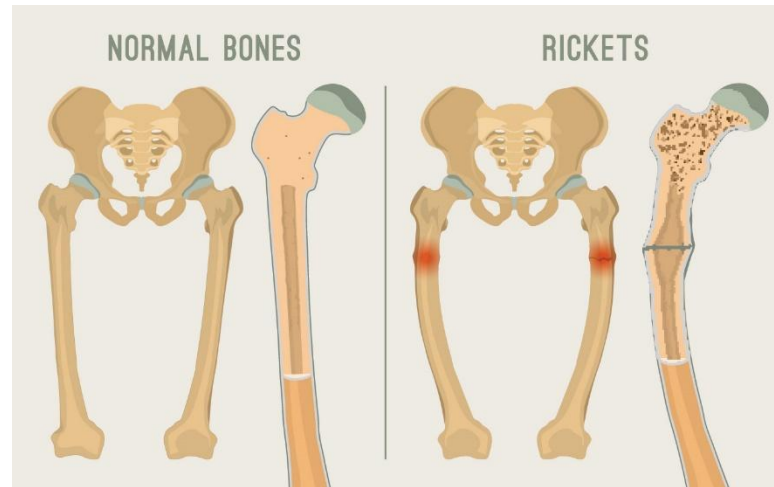
VITAMIN D JUČER, DANAS, SUTRA

Nora Nikolac Gabaj

Otkriće vitamina D

5

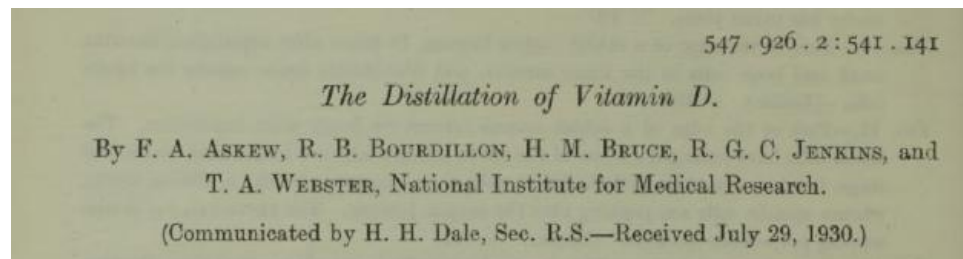
1930-ih godina



VITAMIN D



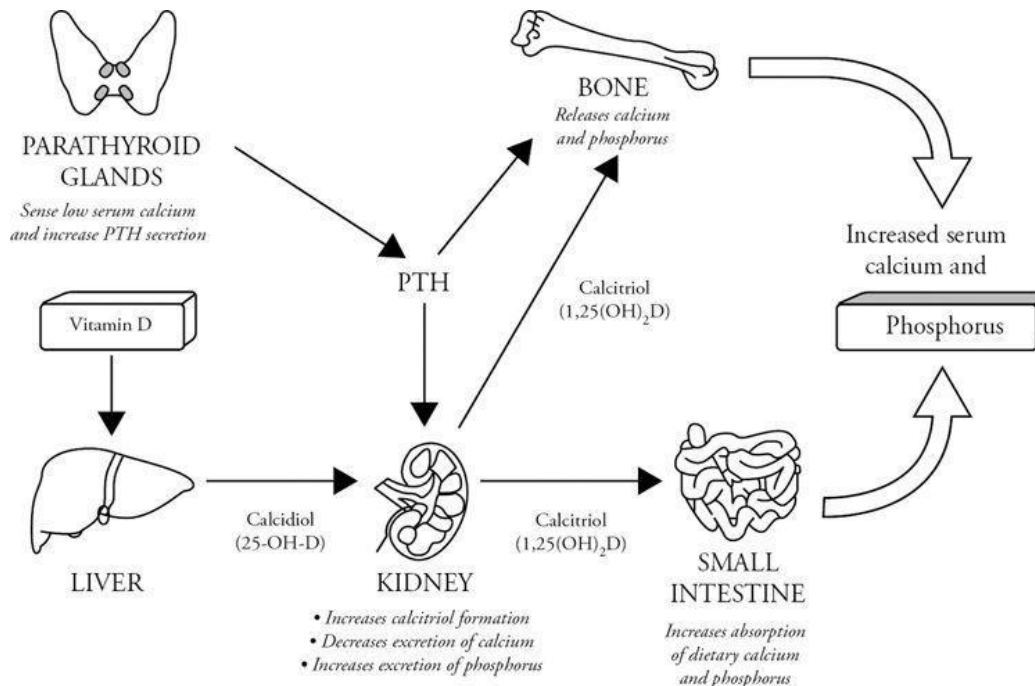
Kärkkäinen



Vitamin ili hormon?

6

- Funkcija i mehanizam djelovanja: druga polovica 20. stoljeća



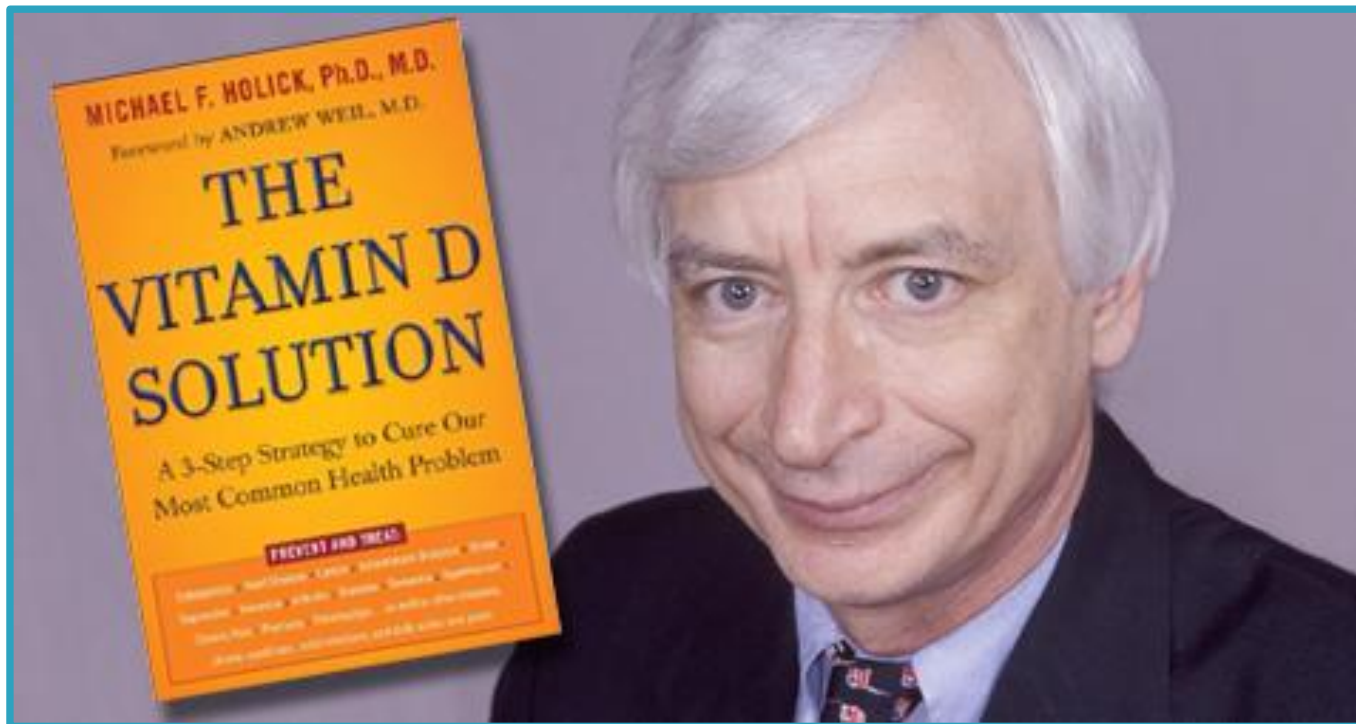
Održavanje ravnoteže
Ca i P
Regulator mišićno-
koštanog sustava

Mehanizam djelovanja i fiziološka uloga vitamina D

Adriana Unić

Što se promijenilo?

7

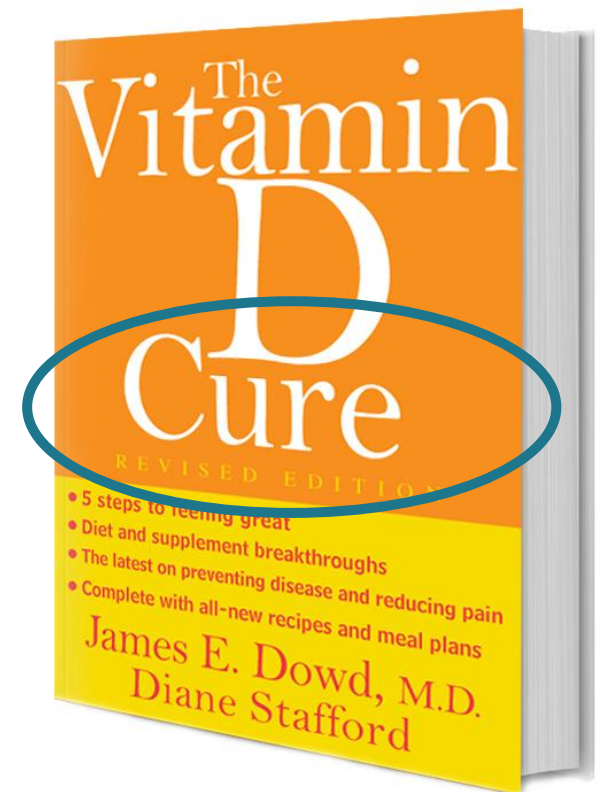
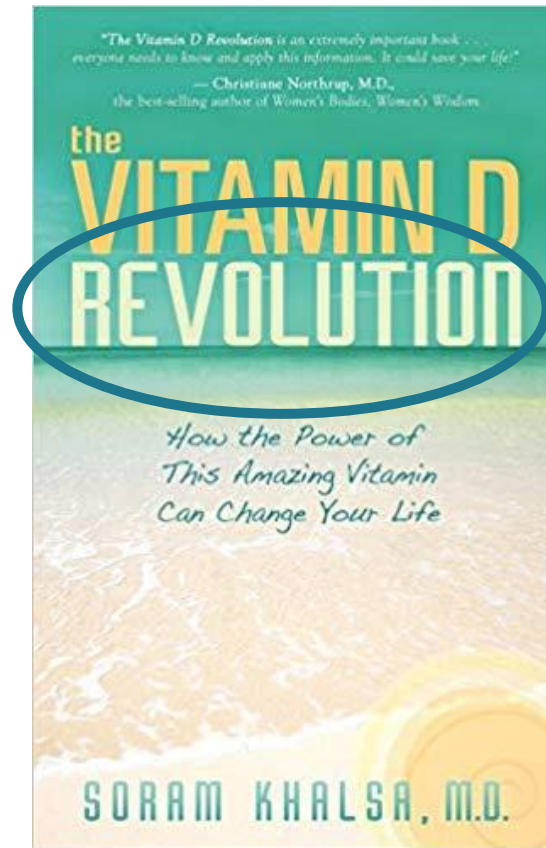
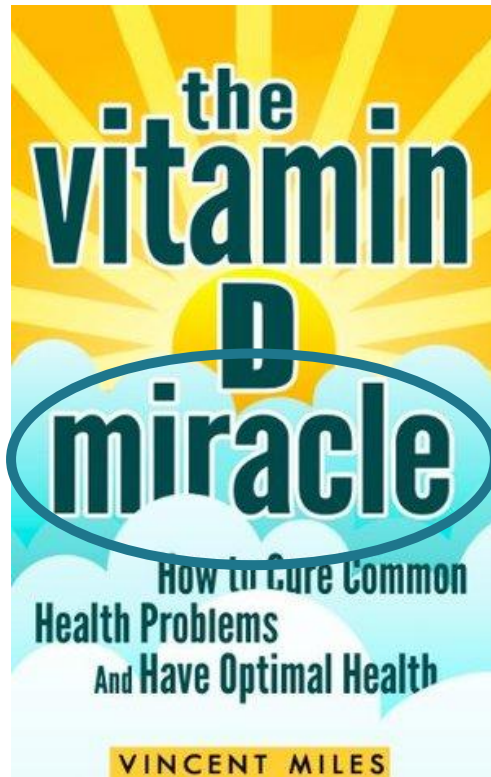


...provjerite koncentraciju vitamina D!



Nova nada?

8



Znanstvena istraživanja

9

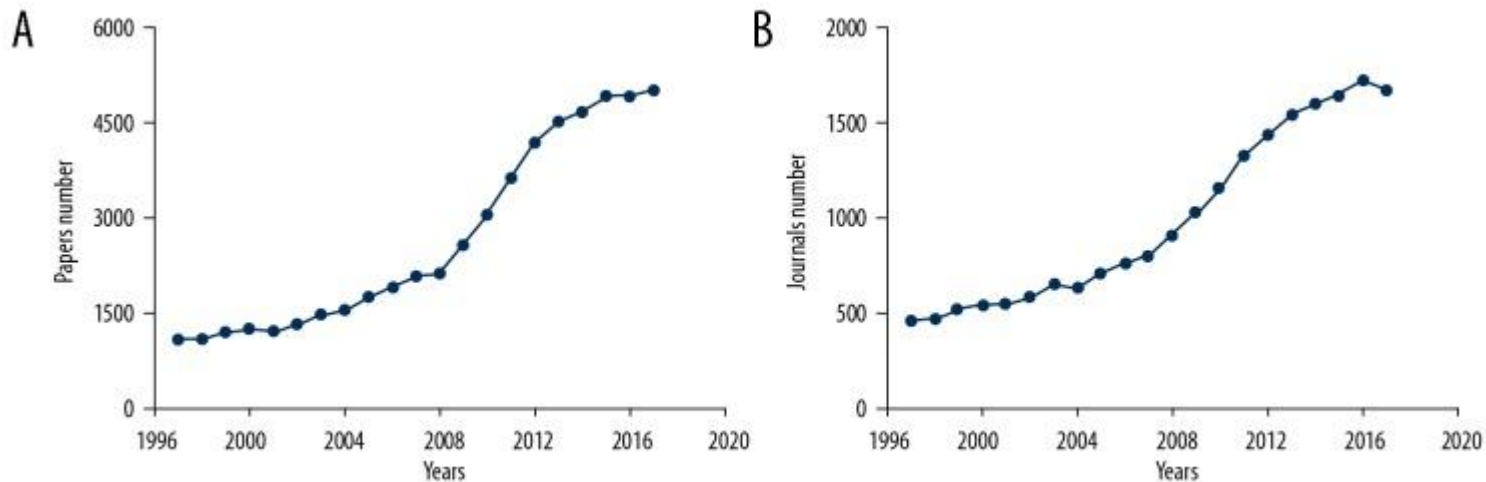


Figure 1. Changes in the number of vitamin D-related papers (A) and journals (B) from 1997 to 2017.

Yang A, Lv Q, Chen F, Wang D, Liu Y, Shi W. Identification of Recent Trends in Research on Vitamin D: A Quantitative and Co-Word Analysis. *Med Sci Monit* 2019;25:643-655. doi: 10.12659/MSM.913026.

Vitamin D u ekstravaskularnim tjelesnim tekućinama

Jelena Culej

Polimorfizmi receptora vitamina D u reumatoidnim bolestima

Alen Vrtarić

Širenje fokusa istraživanja

10

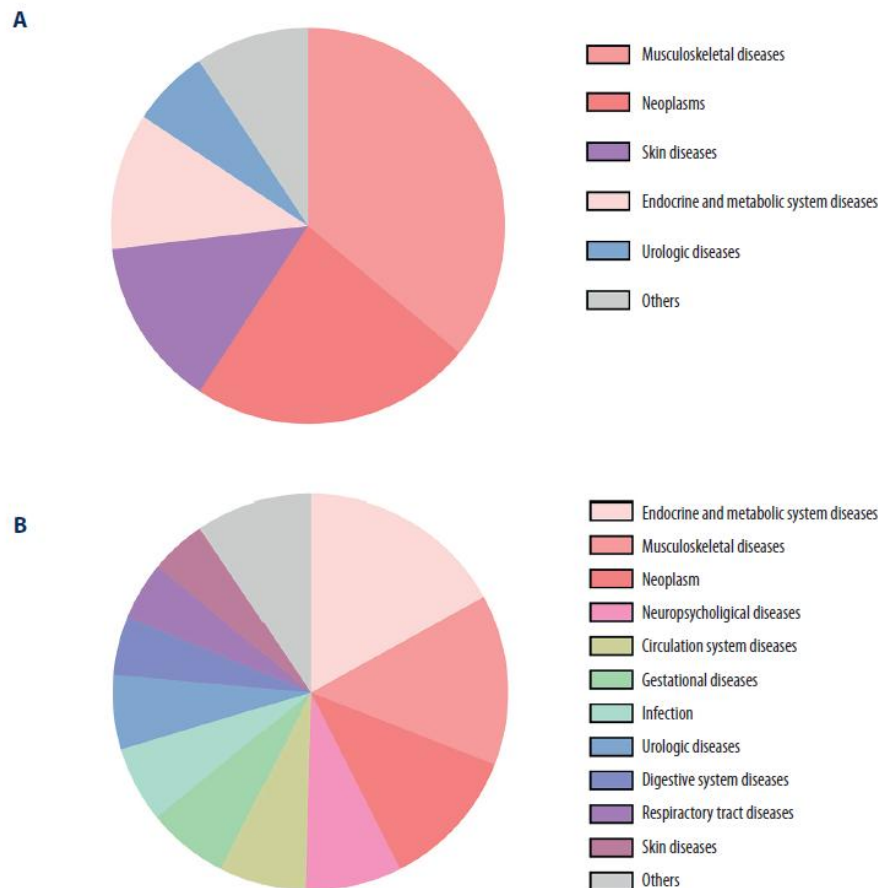


Figure 5. Vitamin D-related disease distribution from 2002 to 2005 (A) and from 2015 to 2018 (B). The numbers of publications are 707 (A) and 2351 (B), respectively.

Vitamin D i plodnost

Ivan Bolanča

**Vitamin D u šećernoj
bolesti**

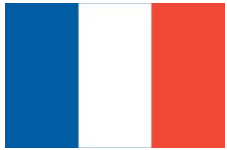
Davorka Herman Mahečić

**Vitamin D u bolestima
pluća**

Lara Milevoj Kopčinovć

Vitamin D – posljedice

11



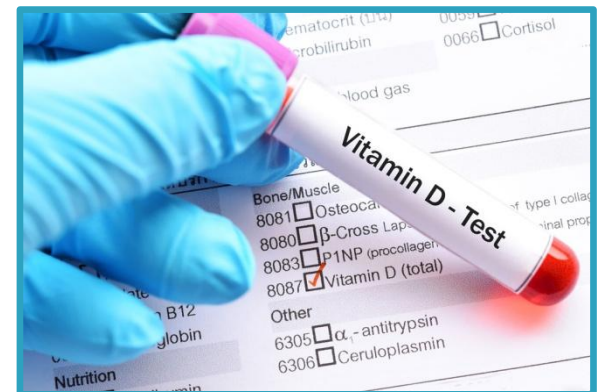
učestalost **↑10x** u zadnjih 10 god
trošak privatnih laboratorija 150 mil EUR



2016. Medicare 10 mil testova;
→ **↑ 547%** od 2007

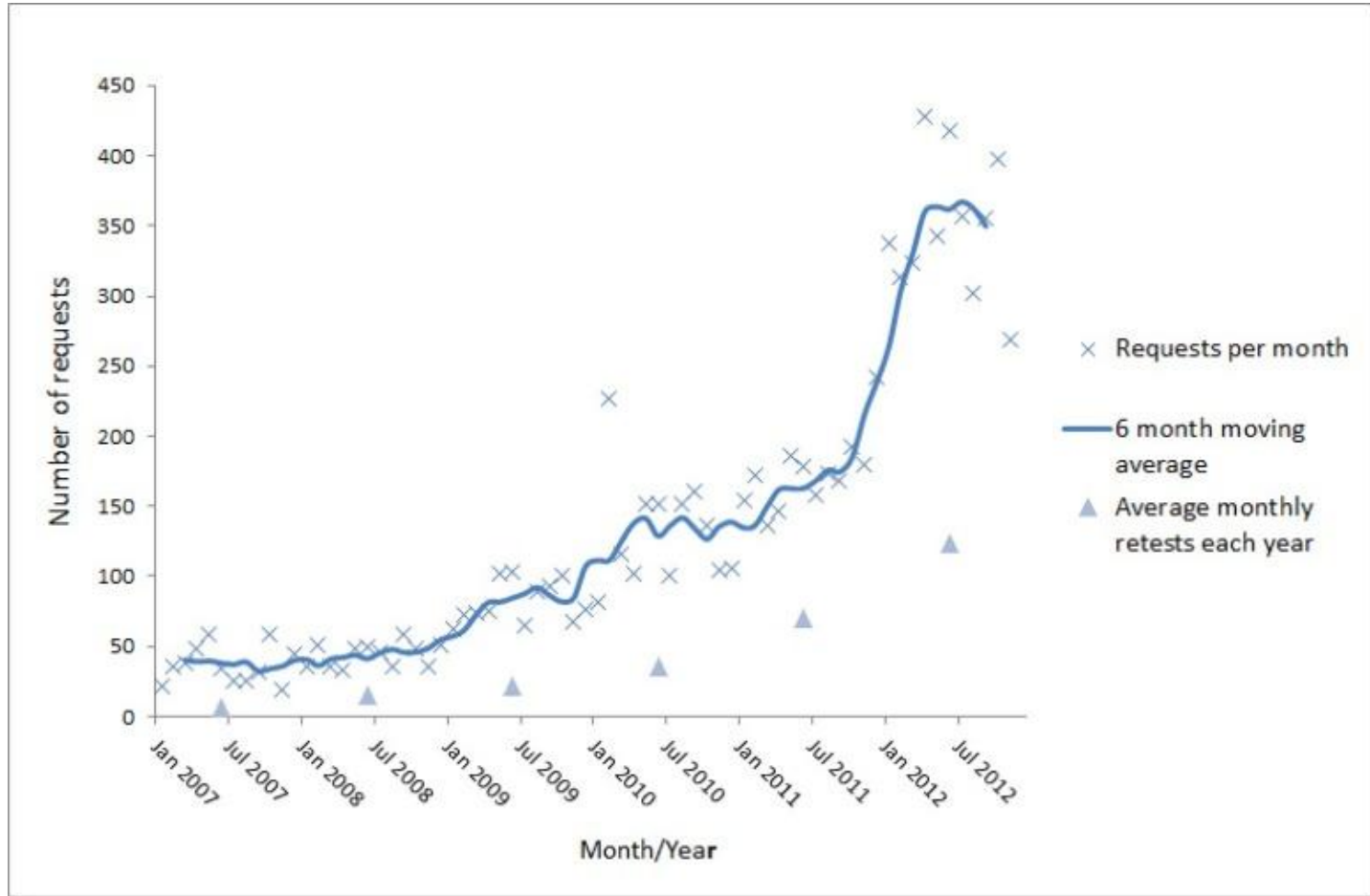
Trošak **365 mil** USD

5. test po učestalosti unutar
Medicare sustava



Porast broja zahtjeva!

12



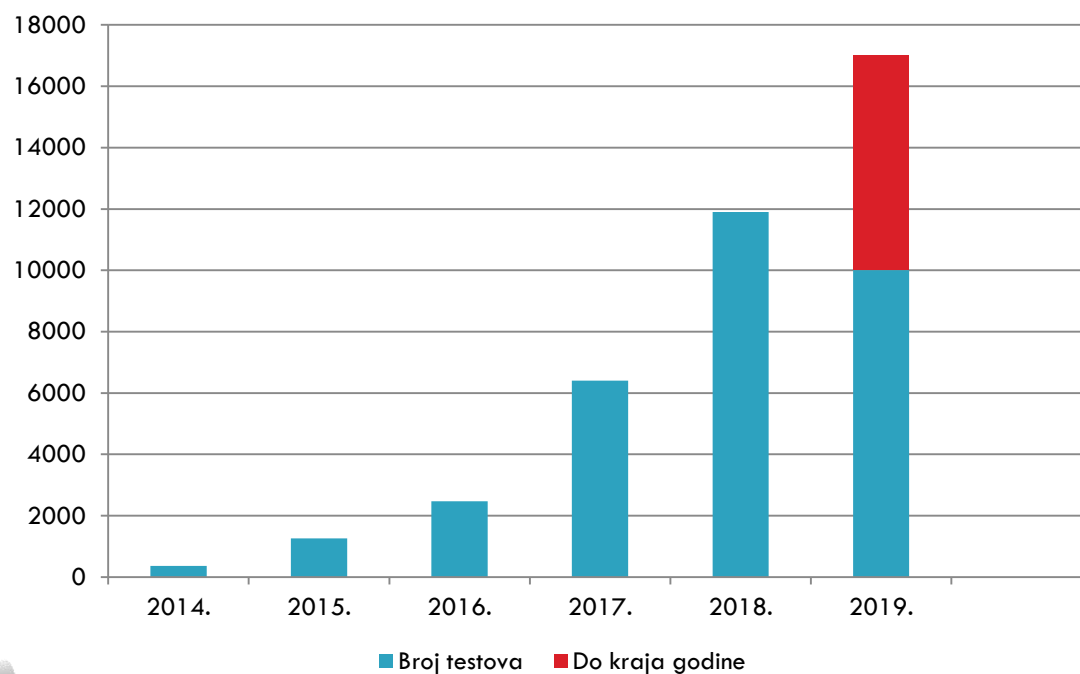
Zhao S, Gardner K, Taylor W, Marks E, Goodson N. Vitamin D assessment in primary care: changing patterns of testing. London J Prim Care (Abingdon) 2015;7:15-22.

Vitamin D u KBCSM



13

Vitamin D



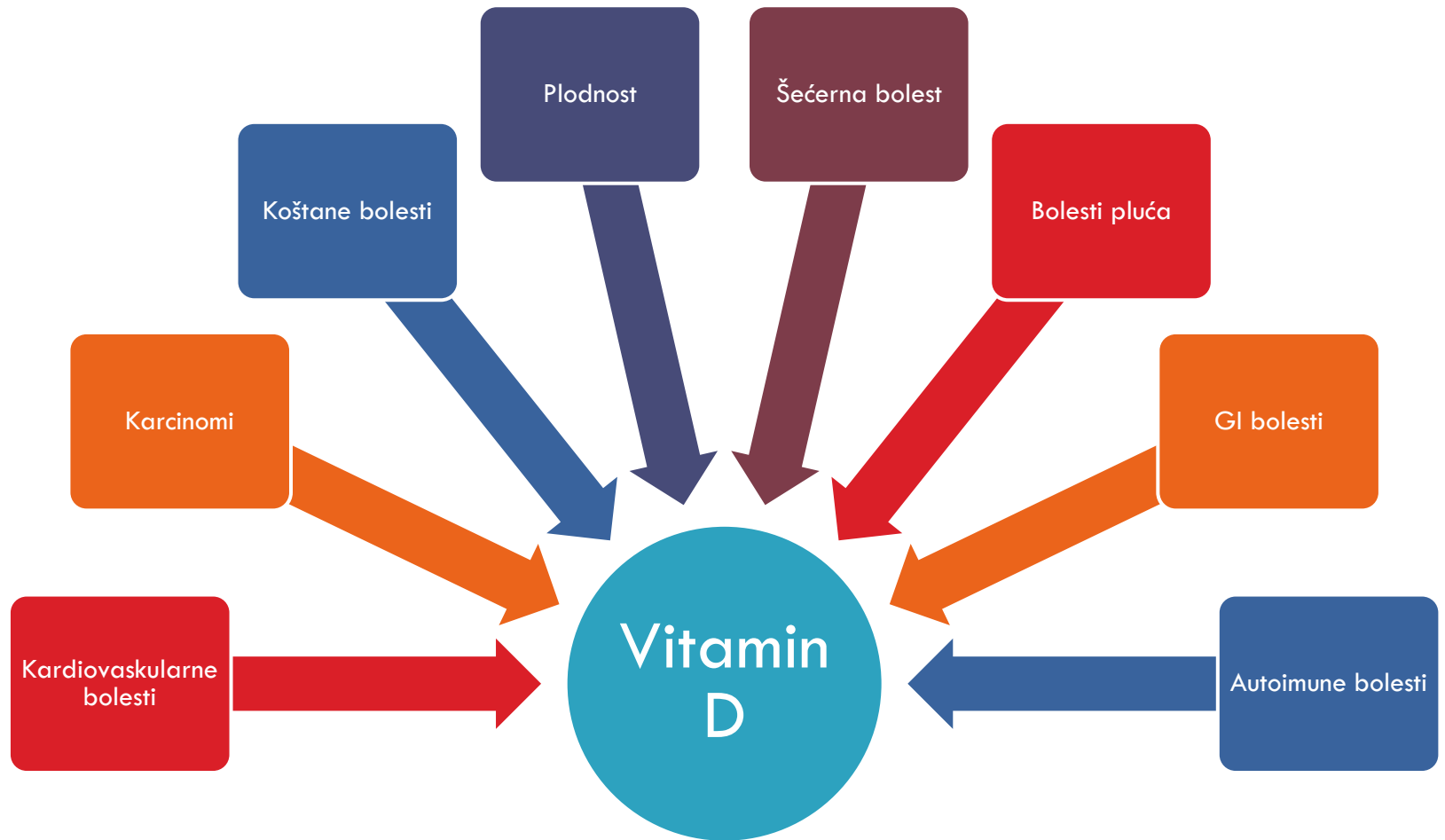
↑13x
u 4 god.

Bez naručivanja
Izrada nalaza: isti dan



Mnogostruka uloga vitamina D

14

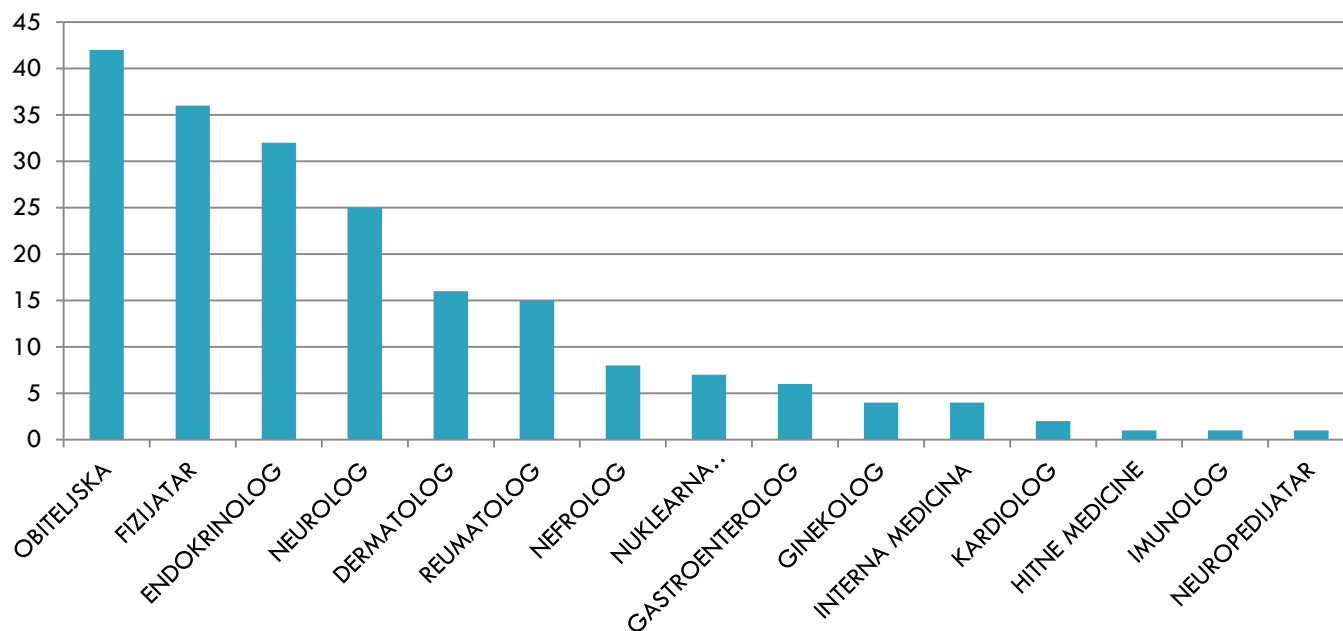


Tko je zatražio vitamin D?

15

Klinički zavod za kemiju
Siječanj – veljača 2019.
N = 200 (ambulantni pacijenti)

Specijalist



SMJERNICE ZA PREVENCIJU, PREPOZNAVANJE I LIJEČENJE NEDOSTATKA VITAMINA D U ODRASLIH*

**GUIDELINES FOR THE PREVENTION, DETECTION AND THERAPY
OF VITAMIN D DEFICIENCY IN ADULTS***

DARIJA VRANEŠIĆ BENDER, ZLATKO GILJEVIĆ, VESNA KUŠEC,
NADICA LAKTAŠIĆ ŽERJAVIĆ, MARIJA BOŠNJAK PAŠIĆ, EDUARD VRDOLJAK,
DINA LJUBAS KELEČIĆ, ŽELJKO REINER, BRANIMIR ANIĆ, ŽELJKO KRZNARIĆ**
Liječ Vjesn 2016;138:121–132

- Hrvatsko društvo za kliničku prehranu HLZ-a
- Hrvatsko reumatološko društvo HLZ-a
- Hrvatsko neurološko društvo HLZ-a
- Hrvatsko društvo za aterosklerozu HLZ-a
- Hrvatsko društvo za laboratorijsku medicinu HLZ-a
- Hrvatsko društvo za osteoporozu
- Hrvatsko onkološko društvo
- Hrvatsko društvo nutricionista i dijetetičara



Preporučene koncentracije

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| 25-OH D (nmol/L) | Interpretacija |
|---------------------|---|
| < 30 | Teški nedostatak vitamina D |
| < 50 | Nedostatak (deficit) vitamina D |
| < 75 | Manjak (insuficijencija) vitamina D |
| ≥ 75 | Aдекватna razina vitamina D |
| 100 – 125 | Potencijalno povoljni učinci kod malignih bolesti |
| > 250 | Suvišak vitamina D |
| > 375 | Intoksikacija |

Stanje u Hrvatskoj



IS IT OKAY
TO BE
STRICT?

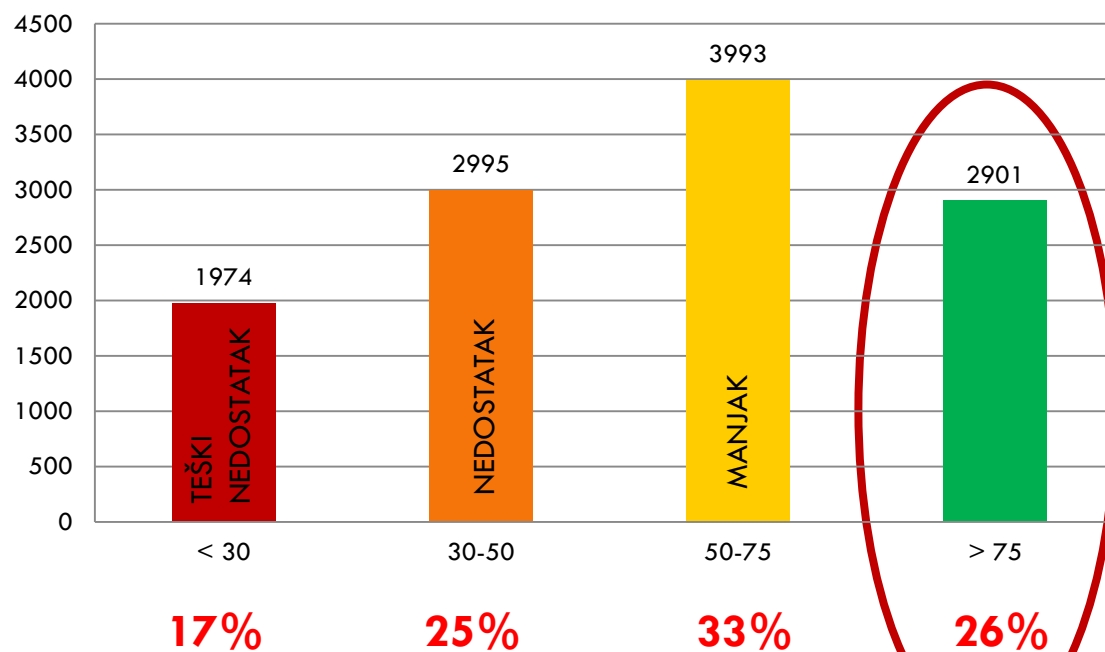
18

Klinički zavod za kemiju, KBC Sestre milosrdnice

01.01.2018. – 31.12.2018.

N = 11 863

Raspodjela koncentracija vitamina D



Je li granica prestroga?

Nadopuna uzimanja

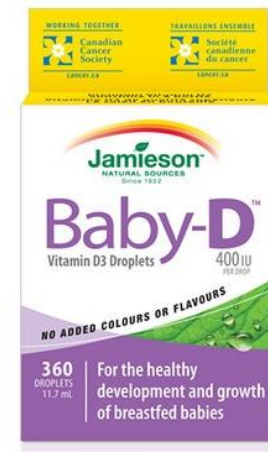
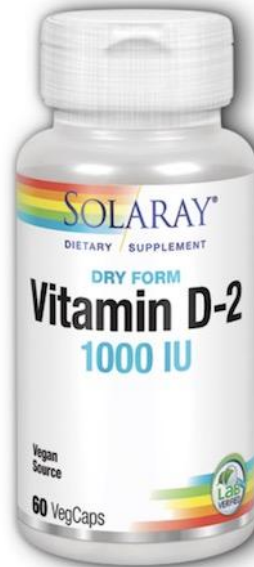
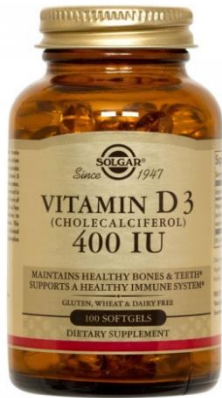
19

| | Preporučena doza Opća populacija | Preporučena doza Rizični bolesnici |
|---------------------|-------------------------------------|---------------------------------------|
| Djeca do 1. god. | 400 IU/dan | |
| Odrasli (> 18 god.) | 600 IU/dan | 1 500 – 2 000 IU/dan |
| > 70 god. | 800 IU/dan | 1 500 – 2 000 IU/dan |



Vitamin D za svakoga!

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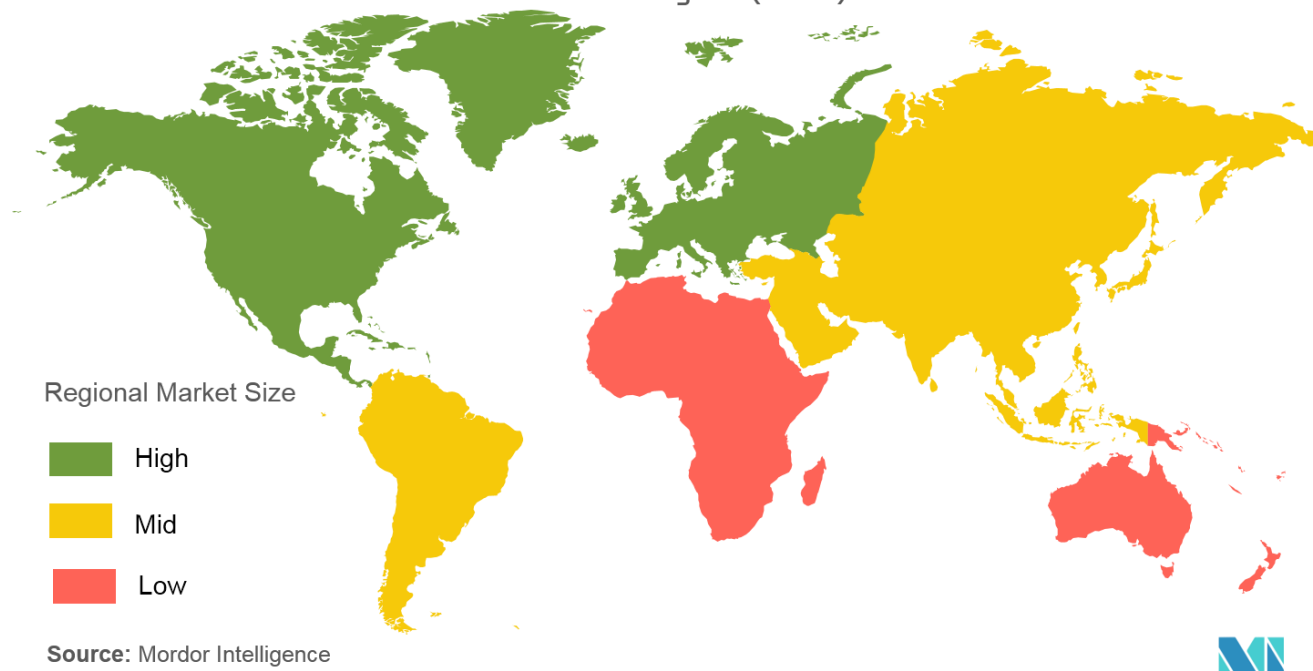


Tržište suplemenata



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Vitamin D Supplements Market: Market Size by Region (2018)



Dostupno na: <https://www.mordorintelligence.com/industry-reports/vitamin-d-supplements-market>

Prodaja suplemenata vit D: **936** mil USD (**↑9x** u zadnjih 10 godina)

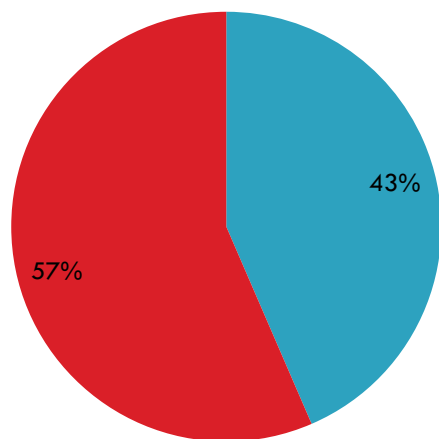
Stanje u Hrvatskoj

22

Klinički zavod za kemiju
Siječanj – veljača 2019.
N = 200 (ambulantni pacijenti)

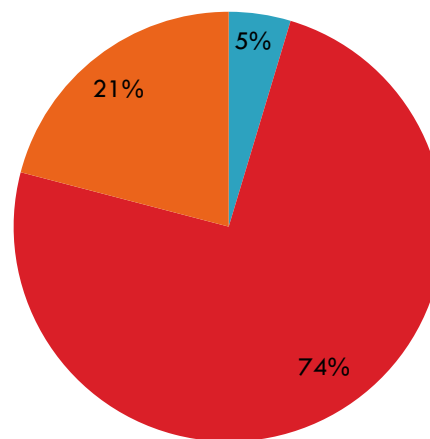
Suplementi vitamina D

■ DA ■ NE



Oblik pripravka

■ Tablete ■ Kapi ■ Ampule



Problem sa suplementima?

23

DE GRUYTER

Clin Chem Lab Med 2018; aop

Ana-Maria Simundic*, Petra Filipi, Alen Vrtaric, Marijana Miler, Nora Nikolac Gabaj, Andrea Kocsis, Sanja Avram, Najdana Gligorovic Barhanovic, Anyla Buló, Janne Cadamuro, Edmee van Dongen-Lases, Pinar Eker, Andre Vital-e-Silva, Evgenija Homsak, Mercedes Ibarz, Danica Labudovic, Mads Nybo, Hedviga Pivovarníková, Inna Shmidt, Joanna Siodmiak, Zorica Sumarac and Dalius Vitkus

Patient's knowledge and awareness about the effect of the over-the-counter (OTC) drugs and dietary supplements on laboratory test results: a survey in 18 European countries

18 x 200 ispitanika

Anketno ispitivanje

Hrvatska, Mađarska, BiH, Crna Gora, Albanija, Austrija, Nizozemska, Turska, Portugal, Slovenija, Španjolska, Makedonija, Danska, Slovačka, Rusija, Poljska, Srbija, Litva

Učestalost uzimanja

24

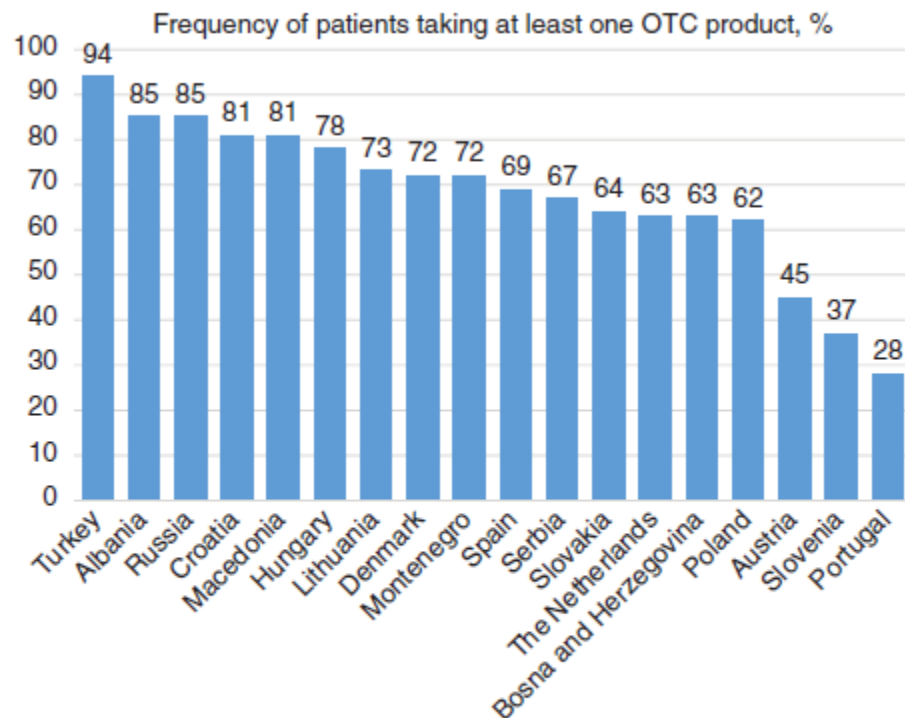


Figure 2: Distribution of countries (n=18) relative to the frequency of patients (n=3600) taking at least one OTC drug or dietary supplement.

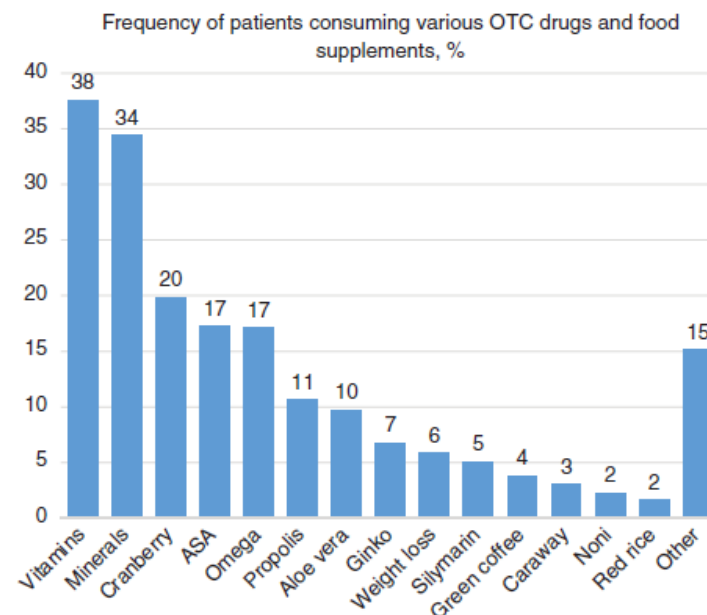
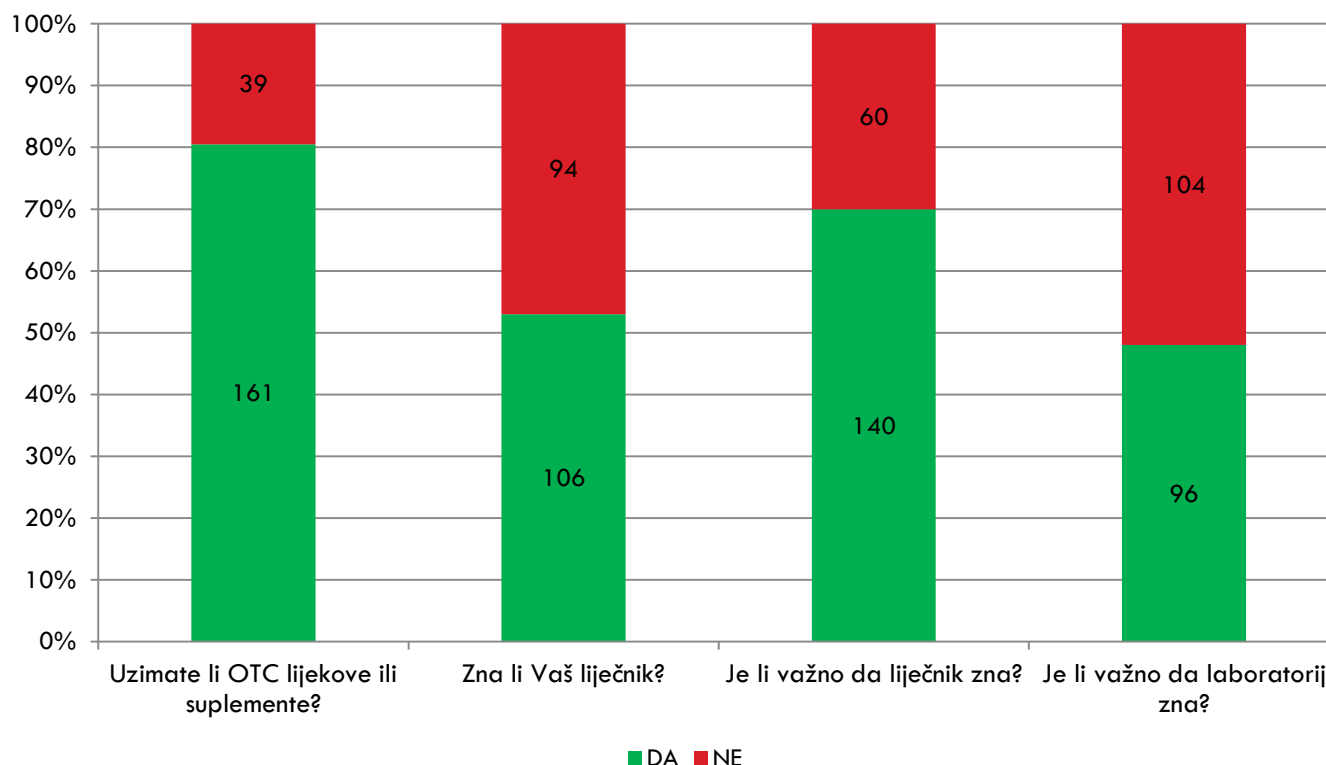


Figure 3: Frequency of consumption of OTC drugs or dietary supplements by all patients in this study (n=3600).

Simundic AM, Filipi P, Vrtaric A, Miler M, Nikolac Gabaj N, Kocsis A, et al. Patient's knowledge and awareness about the effect of the over-the-counter (OTC) drugs and dietary supplements on laboratory test results: a survey in 18 European countries. *Clin Chem Lab Med* 2018;57:183-194. doi: 10.1515/cclm-2018-0579.

Rezultati iz Hrvatske

25



Simundic AM, Filipi P, Vrtaric A, Miler M, Nikolac Gabaj N, Kocsis A, et al. Patient's knowledge and awareness about the effect of the over-the-counter (OTC) drugs and dietary supplements on laboratory test results: a survey in 18 European countries. Clin Chem Lab Med 2018;57:183-194. doi: 10.1515/cclm-2018-0579.

Predanalitički standardi

26



03-2019/v.1.

Prijevod preporuke:

Simundic AM, Böhlenius K, Cadamuro J, Church S, Cornes MP, van Dongen-Lases EC, et al; Working Group for Preanalytical Phase (WG-PRE), of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) and Latin American Working Group for Preanalytical Phase (WG-PRE-LATAM) of the Latin America Confederation of Clinical Biochemistry (COLABIOCLI). Joint EFLM-COLABIOCLI Recommendation for venous blood sampling. Clin Chem Lab Med 2018;56(12):2015-38. doi: 10.1515/ccm-2018-0602.

Zajednička preporuka EFLM-COLABIOCLI za uzorkovanje venske krvi

Zagreb, kolovoz 2019.

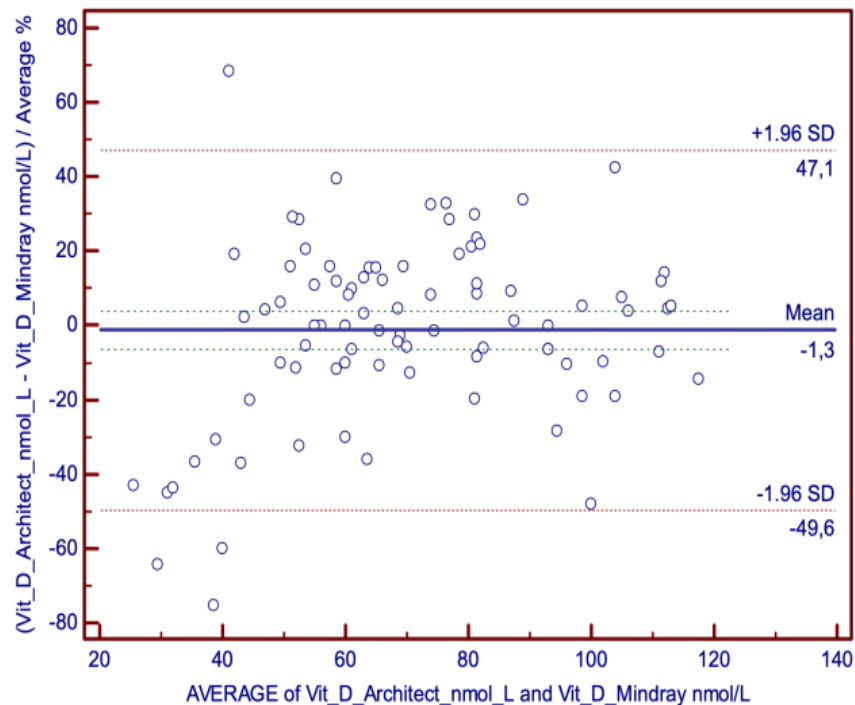
© Sva prava pridržana. Ovaj dokument je zaštićen autorskim pravima i ne smije se u cijelosti niti djelomično umnažati, pohranjivati niti prenositi, u bilo kojem obliku i na bilo koji način bez privole izdavača (HDMBLM).

Korak 2. Provjera pripreme bolesnika za uzorkovanje krvi (1B)

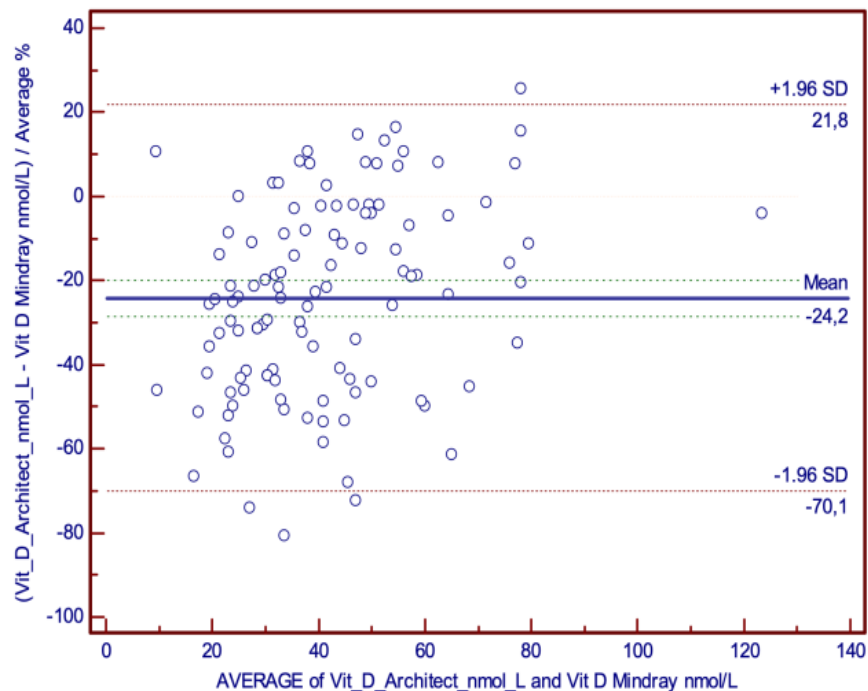
2.6 Postoje i drugi mogući čimbenici, kao što su redovita ili nedavna tjelesna aktivnost, unos hrane i lijekova, lijekovi bez recepta, dodaci prehrani i biljni pripravci, i ostali za koje se zna da utječu na koncentraciju određenih analita te treba provjeriti je li bolesnik slijedio potrebne upute prije uzimanja uzoraka krvi (23–25).

Utjecaj suplemenata na rezultate

27



Bolesnici uzimaju suplementacijsku terapiju



Bolesnici bez terapije

Vrtaric A, Pavicic T, Milevoj Kopcinovic L, Miler M, Culej J, Unic A et al. Vitamin D results for two different immunochemistry methods are not comparable in patients without vitamin D supplementation therapy. Publication in process

Djeluje li suplementacija vitaminom D?

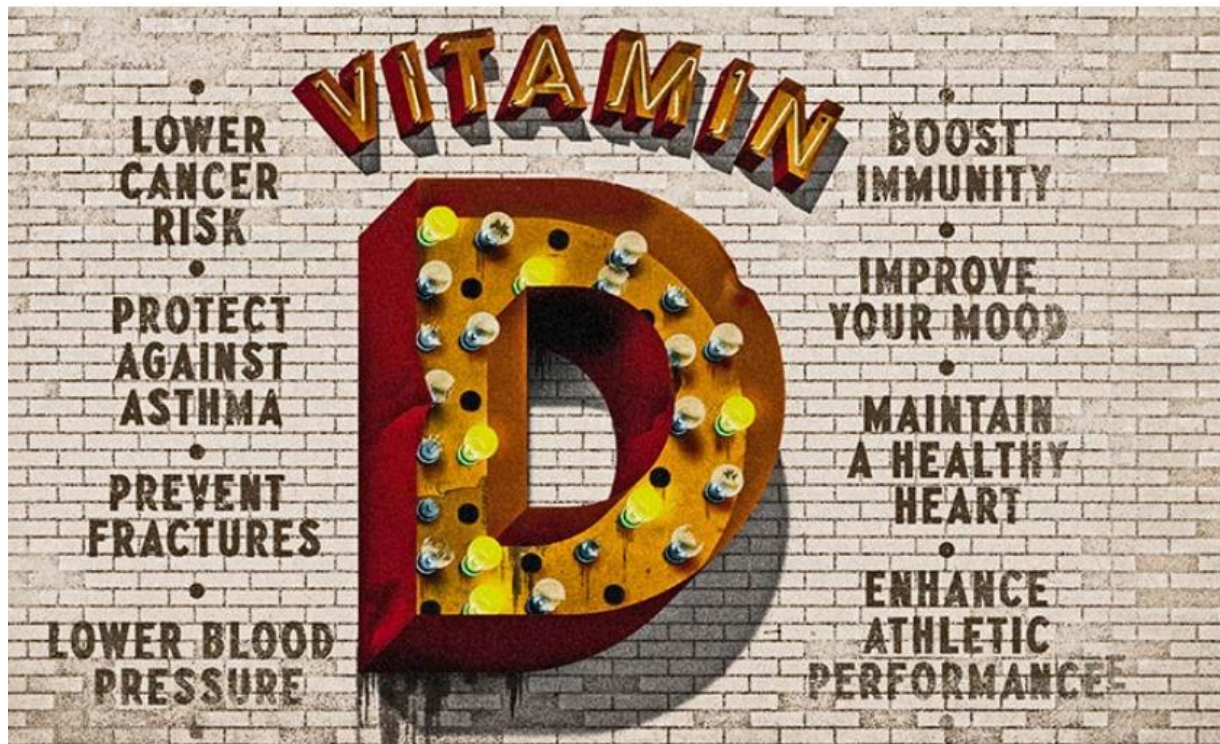
28

FEATURE

HEALTH & MEDICINE

Vitamin D supplements aren't living up to their hype

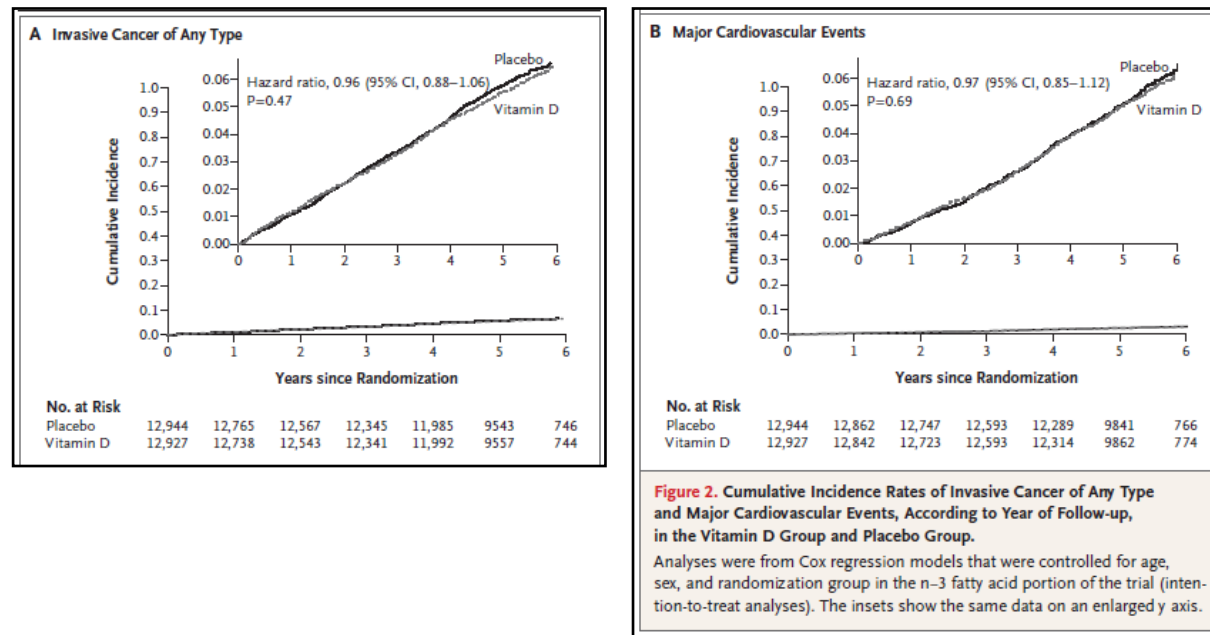
Recent studies say taking extra amounts of the nutrient may not be a boon for every body



Manson JE et al. Vitamin D Supplements and Prevention of Cancer and Cardiovascular Disease. *N Engl J Med* 2019;380(1):33-44. doi: 10.1056/NEJMoa1809944.

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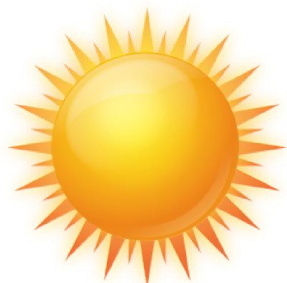
Randomizirano kontrolirano ispitivanje, N = 25871



Supplementation with vitamin D **DID NOT** result in a lower incidence of invasive cancer or cardiovascular events than placebo.

Predanalitika?

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Vitamin D

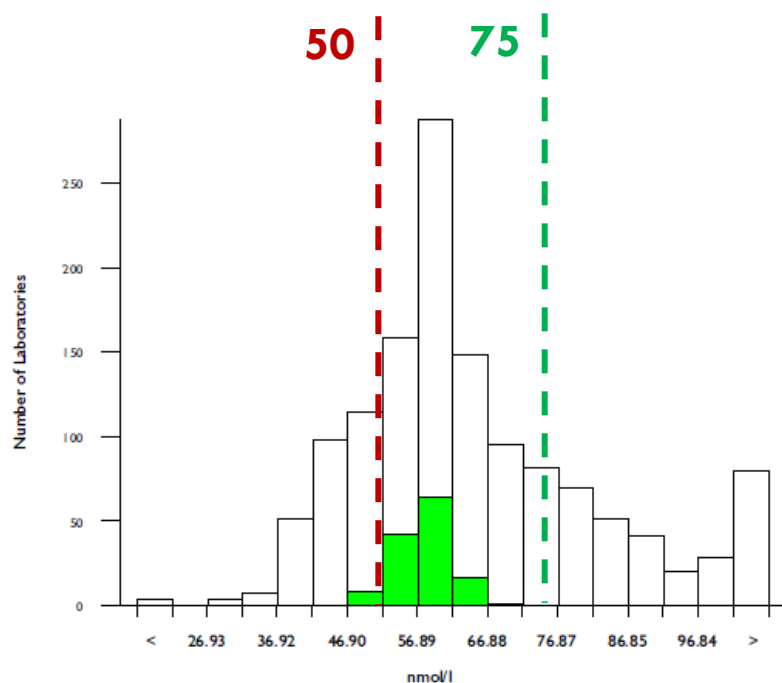


Utjecaj predanalitičkih čimbenika na koncentraciju vitamina D

Marijana Miler

Metodologija?

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| Method | N | Mean | CV% | U _m |
|---|-----|---------|------|----------------|
| Roche Vitamin D Total | 281 | 49.101 | 15.9 | 0.58 |
| Abbott Architect (3L52) | 133 | 58.220 | 5.0 | 0.31 |
| Roche Vitamin D Total II | 125 | 63.286 | 11.5 | 0.81 |
| Abbott Architect (5P02)/ Alinity (8P45) | 122 | 57.616 | 5.0 | 0.33 |
| Siemens Centaur XP/XPT/Classic | 123 | 89.899 | 12.0 | 1.22 |
| Beckman Dxl 600/800 | 107 | 71.363 | 9.5 | 0.82 |
| bioMérieux Vidas/mini Vidas/Vidas 3 | 64 | 55.811 | 9.9 | 0.86 |
| Beckman Access 25 OH Vitamin D Total | 45 | 77.648 | 14.1 | 2.04 |
| Ortho Vitros 3600/5600/ECi/XT 7600 | 40 | 117.580 | 9.0 | 2.08 |
| DiaSorin Liaison XL | 38 | 78.159 | 7.8 | 1.23 |
| DiaSorin, Liaison | 30 | 77.593 | 9.4 | 1.67 |
| Roche Vitamin D Total II e801 | 30 | 59.840 | 6.4 | 0.87 |
| SNIBE Maglumi Analyser | 20 | 58.727 | 4.9 | 0.80 |
| TOSOH | 13 | 54.722 | 10.2 | 1.94 |
| Fujirebio Lumipulse G Series | 9 | 62.234 | 7.7 | 2.01 |
| HPLC/UPLC | 8 | 64.262 | 17.6 | 4.99 |
| Siemens Atellica IM | 7 | 90.408 | 6.2 | 2.65 |
| Mindray CL Series | 5 | 54.342 | 9.3 | 2.84 |
| ELISA | 6 | 49.051 | 27.8 | 6.95 |
| IDS iSYS | 5 | 64.794 | 16.7 | 6.03 |
| Randox Evolution | 3 | 62.250 | 8.5 | 3.80 |

RIQAS MONTHLY IMMUNOCHEMISTRY CYCLE 17 SAMPLE 6

Analitički izazovi u određivanju vitamina D

Tomislav Pavičić



“For low vitamin D, I’d recommend supplements, not sunshine.”

HVALA NA PAŽNJI!