Fourth Year Medical Students’ Required Written Patient Care Assignments Reflecting Awareness of Use of Vitamin D in Older Patients at Risk for Falling

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I have no conflicts of interest to disclose!
Objectives

• Understand how I became interested in vitamin D deficiency in clinical practice in a relatively sunny climate in Florida

• Discuss results of a survey of awareness of vitamin D deficiency states, supplementation, and treatment among faculty at a medical school.

• Know, using a cross section of frail older patients, using the window of our 4th year geriatrics medical students written medication review assignments, about how often our community faculty are prescribing vitamin D.

• Ask your opinion: do you think vitamin D is overused or underused?
Mission and Vision of our Medical School

• The Florida State University College of Medicine will educate and develop exemplary physicians who practice patient-centered health care, discover and advance knowledge, and are responsive to community needs, especially through service to elder, rural, minority, and underserved populations.

• The FSU College of Medicine will lead the nation in preparing compassionate physicians to deliver the highest quality 21st Century patient-centered medicine to communities of greatest need.

• Florida has the highest proportion of older persons in the US and the lowest per capita number of geriatricians. Geriatric education is mandated by law in the founding of our school.

• Among a handful of medical schools with a department of geriatrics.
Regional Campuses:
1. Daytona Beach
2. Fort Pierce
3. Orlando
4. Pensacola
5. Sarasota
6. Tallahassee

Rural Training Sites:
7. Immokalee
8. Marianna

Clinical Training Site:

Residency/Fellowships:
4. Pensacola
   Pediatrics
   Ob/Gyn
6. Tallahassee
   Internal Medicine
   Dermatology
10. Ft. Myers
    Family Medicine
### Baseline SF36 Scores, Improvement at 1 Year, and Confidence Intervals (CI)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Mean Baseline</th>
<th>Mean Improvement</th>
<th>CI</th>
<th>P-Value</th>
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<tr>
<td>Physical Function</td>
<td>48</td>
<td>5.5</td>
<td>3.1</td>
<td>&lt; .0001</td>
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<tr>
<td>Role Limits Physical</td>
<td>38</td>
<td>10.8</td>
<td>3.9</td>
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<td>Role Limits Emotional</td>
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<td>8.4</td>
<td>2.7</td>
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<tr>
<td>Energy / Fatigue</td>
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<td>5.6</td>
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<td>&lt;.0001</td>
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<tr>
<td>Emotional Function</td>
<td>68</td>
<td>3.3</td>
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<tr>
<td>Social Function</td>
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<td>6.8</td>
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<tr>
<td>Pain</td>
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<tr>
<td>General Health</td>
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<td>8.5</td>
<td>7.4</td>
<td>&lt;.00001</td>
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</table>
Fall prevention with supplemental vitamin and active forms of vitamin D: a meta-analysis of randomized controlled trials


• A dose of 700 IU -1000 IU supplemental vitamin D a day reduced falls by 19%, and by up to 26% with vitamin D3, within 2-5 months of treatment initiation.

• Vitamin D may not reduce falls at doses of less than 700 IU per day.

• In the introduction and literature review for this study it was pointed out that vitamin D has a direct beneficial effect on muscle, and improved strength and balance in several trials in older persons


Awareness of vitamin D deficiency states and recommended supplementation doses: survey of faculty and staff at a medical school

Agens JE, Galasko GT, Purandare AV, Lin J ESPEN December 2012 Volume 7, Issue 6

• Anonymous survey of faculty at Florida State College of Medicine
• 209 respondents approximately half were physicians
• 1800 faculty across six campuses across Florida, low response rate
• Geographically distributed, community based medical school model
• 3rd and 4th year student do their clinical years in physician practices
• Purpose of this survey was to determine the level of awareness of vitamin D deficiency states, physician awareness of their own vitamin D status, and recommendation of vitamin D supplementation and treatment for their patients
Survey: Vitamin D Deficiency Awareness of Conditions Associated with Low Vitamin D Levels

- Survey responders could free text up to five conditions
- Conditions were then aggregated into groups and then counted
- Those conditions noted by 15% or less of the responders included items such as falls, fractures, muscle weakness, fatigue, etc.
- As you can see in the next two slides, physicians tended to be more likely to list up to five conditions
- Approximately half the non-physicians did not list any conditions
- Physicians were significantly more likely to list osteomalacia and rickets than osteoporosis.
Figure 2. Total Number of Conditions Listed with a Maximum of Five Permitted
Figure 1. Categories of Conditions
Survey: Vitamin D Deficiency Categorical Variables of Responders

• Are you personally taking vitamin D yourself? (yes/no)
• Are you personally taking calcium? (yes/no)
• Your age?
• Sunlight exposure (less than 20 minutes a day?)
• Have you ever had your vitamin D level checked? (yes/no)
• If your vitamin D level has ever been checked, was it low? (yes/no)
• If you are a physician, what dose of vitamin D do you recommended for prevention of vitamin D deficiency? Treatment? 200 IU, 400 IU, 800 IU, 1000 IU, or greater than 1000 IU
Vitamin D survey: Key Findings

• Osteomalacia and rickets were widely recognized as associated with vitamin D deficiency. Osteoporosis as well, but significantly less so.
• Few surveyed listed fractures or falls as associated with vitamin D deficiency.
• 70% of the female physicians were taking vitamin D, 43% of males
• Only 23% of the physicians had ever had their vitamin D level checked
• Older age, less than 20 minutes of sun exposure, and taking calcium was associated with having a vitamin D level checked.
• Two thirds who knew their vitamin D level said it was low.
Figure 3. MD Recommended Daily Dose Vitamin D International Units

- Prevention
- Treatment

Response (Percentage)

<table>
<thead>
<tr>
<th>Daily Dose</th>
<th>Response</th>
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<tr>
<td>200</td>
<td>2</td>
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<tr>
<td>400</td>
<td>25</td>
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<td>800</td>
<td>31</td>
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<tr>
<td>1000</td>
<td>22</td>
</tr>
<tr>
<td>&gt;1000</td>
<td>58</td>
</tr>
<tr>
<td>Unsure</td>
<td>10</td>
</tr>
</tbody>
</table>

Percentage: 2/2; 25/2; 31/2; 22/10; 58/10; 10/16
Vitamin D survey: Additional findings

• Physicians who had their own vitamin D level checked were 4.5 times more likely to recommend greater than or equal to 800 IU per day for supplementation for their patients.
Clinicians are strongly advised to recommend vitamin D supplementation of at least 1000 IU/d with calcium to older adults residing in institutional settings to reduce the risk of fracture and falls.

There are insufficient data at this time to support a recommendation for increased vitamin D without calcium for older persons residing in the community or institutional settings.

Clinicians should review older adults vitamin D intake form all sources and discuss strategies to achieve a total vitamin D input associated with fall and fracture prevention.

Routine laboratory testing for 25(OH)D serum concentrations is not necessary.
Fourth Year Medical Students’ Required Written Patient Care Assignments on Geriatrics Clerkship

• Perform a medication review including a patient-centered analysis of general efficacy, specific risk/benefit analysis, calculation of remaining life expectancy and comparison with time to benefit for each medication, reasoning out a person-centered therapeutic plan.

• Demonstrate proficiency in detecting and describing functional impairment detailing the patient's premorbid status, the events leading to the observed functional changes and a brief description of the functional changes, exam, and proposed plans for rehabilitation. The goals of the patient must be included.

• Submit 'reflections at the end of life' using a patient summary, patient and family goals, plan of care, efficacy of existing care plan, recommendations for proposed changes, critique of the healthcare delivery system and description of any ethical issues.
Fourth Year Medical Students’ Competencies Assessed by Observation and Case Discussion

• Demonstrate to Clerkship Director or designated faculty the ability to perform fall risk assessment with correct interpretation of results, including gait assessment.

• Demonstrate to Clerkship Director or designated faculty the ability to assess for cognitive impairment using the appropriate screening tools (CAM, Minicog, MMSE or MoCA observation) with correct interpretation of results (case discussion).

• Demonstrate knowledge and understanding of the key components of a safe and comprehensive discharge/admission plan for an older adult. A case presentation to Clerkship Director that includes plans to assist the patient in maintaining or improving function including nutrition.
How frequently is vitamin D supplementation used in a cross section of a frail older population?

- Subjects: consenting medical student’s medication review assignments- one patient per student, 82 assignments about one out of four students taking the required clerkship in geriatrics
- Three consecutive academic years of data: 2013, 2014, 2015
- Patient age range 55-102 years of age, average age 81 years old
- Patients on 6-17 medications including OTC and dietary supplements
- 57% of the patients in rehabilitation settings, nursing homes, or ALFs
- Almost all patients had functional impairment
- Students are required to include all non-prescription and dietary supplements in their medication review written assignments.
Answer: Vitamin D was used in < 1 of 3 frail patients

- **2012-13**: 26% of patients on 800-2000 IU, one patient on < 800 IU and student recommended increase, and in two patients student recommended vitamin D be added.

- **2013-14**: 27% of patients, most on 400 IU with 1200mg calcium/ day; but two patients without dose specified, one on 50,000 IU noted deficient (level 22ng/ml), one patient noted deficient but not on D, and in one case the student recommended D should be added.

- **2014-15**: 30% of patients, ranging 400 IU to 2000 IU/ daily, in one case student recommended a decrease from 50,000 IU weekly to 1000- 2000 IU daily after reviewing records for deficiency, and one student recommended starting 1000 IU of D daily.
What do you think?

• In your community is vitamin D deficiency state awareness low or high?

• Do you believe vitamin D supplementation is overused or underutilized?