Development and Evaluation of a Nurse Practitioner-Directed Vitamin D Screening and Supplementation Protocol During Medicare Annual Wellness Examinations in a Rural Primary Care Practice

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Problem/Purpose

Problem:
- Vitamin D deficiency is the most common micronutrient deficiency globally, affecting an estimated 1 billion people worldwide

- Vitamin D deficiency occurs most frequently in people over the age of 65

- In 2019, 61% of Americans over the age of 65 were vitamin D deficient

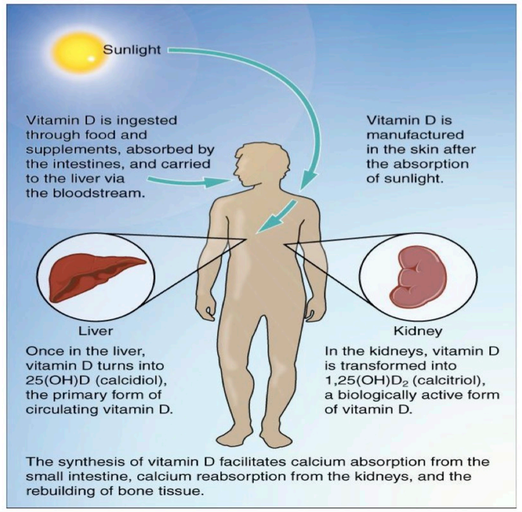
Purpose:
- To screen at-risk adults aged 65+ for vitamin D deficiency annually at Medicare annual wellness visits (MAWV)

- To supplement those deficient in vitamin D systematically

PICOT/Methods

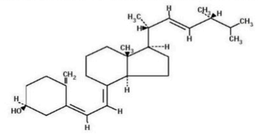
PICOT:
In an adult primary care practice, how does the addition of an EMR prompt adding serum 25-hydroxyvitamin D for use during geriatric adult (age 65+) annual wellness exams compared to current practice with no EMR prompt influence the number of patients screened for vitamin D deficiency over a 90-day period?

Methods:
A serum 25-hydroxyvitamin D level was added via electronic medical record (EMR) prompt to an existing annual fasting lab order set at the MAWV



Review of Literature

Chronic Illnesses Associated with Vitamin D Deficiency



Musculoskeletal Disorders:
- Rickett's (classic vitamin D deficiency)

- Impaired calcium absorption and bone metabolism

- Osteopenia progressing to osteoporosis

- Increased fracture risk

- Muscle weakness increasing risk for falls

Cardiovascular Disease:
- Hypertension

- Hyperlipidemia

- Impaired glucose metabolism

- Increased risk for cardiovascular events

Respiratory Illness:
- Increased frequency of viral URIs

- Increased incidence community acquired pneumonia

- Increased severity of symptoms associated with respiratory illness

COVID-19:
- Low vitamin D levels associated with increased severity and duration of COVID-19 symptoms

- Low vitamin D levels carry higher hospitalization rates

- Low vitamin D levels associated with increased need for mechanical ventilation

- COVID-19 patients deficient in vitamin D have higher mortality rates

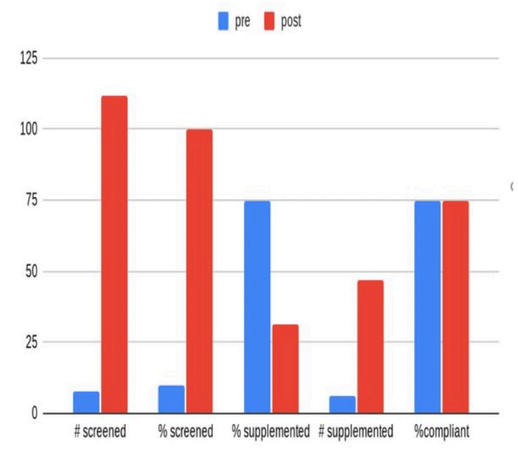
Cancer:
- Vitamin D adequacy associated with decreased metastatic cancers in non-obese patients

- Vitamin D deficiency associated lower cancer mortality rates in non-obese patients

- These risk reductions were noted in data analysis of the VITAL study in 2019

Results

Vitamin D Screening and Supplementation Pre- and Post-intervention



- Compliance rates for vitamin D screening were similar pre-implementation (6 of 8) and post-implementation (112 of 149) at 75%

- 10% (n=8) of patients were offered screening pre-implementation vs. 100% (n=149) post-implementation (**+90%**)

- 8 patients were screened pre-implementation vs. 112 patients post-implementation (**+1,400%**)

- 6 patients were supplemented pre-implementation vs. 47 patients post-implementation (**+783%**)

- Average BMI of project participants was 31.5

- Average age of project participants was 71.5

- Nearly all project participants were caucasian

- 54% of the project participants identified as male

- Serum vitamin D level pre-intervention (n=8) mean was 28.6 mg/dL with a standard deviation of 12.06 (range 19-49 mg/dL)

- Serum vitamin D level post-intervention (n=112) mean was 37.0 with a standard deviation of 17.01 (range 7-97 mg/dL)

Limitations

Seasonal Variance:
- More need for vitamin D supplementation during cold weather months

- Increased need for surveillance of vitamin D levels during cold weather months

Geographical Variance:
- Less need for supplementation in tropical climates

- Increased need for surveillance of vitamin D status the further from the equator one resides

Racial/Ethnic Variance:
- Fairly homogenous (Caucasian) population

- Further screening in predominantly black, Asian, and Hispanic communities is needed in the future

Implications for APRN Practice/Conclusions

Implications for APRN Practice:
- DNP-prepared APRNs are leaders that can spearhead preventive health QI projects

- DNP-prepared APRNs are in a unique position to teach the importance of health promotion activities like vitamin D screening

- The nursing model of health care delivery embraces the prioritization of health promotion and partnering with patients to reach health-related goals, as demonstrated by this vitamin D screening project

Conclusions:
- Systematic vitamin D surveillance program benefits vulnerable elderly patients

- Vitamin D screening and supplementation can help mitigate chronic illness associated with vitamin D deficiency

- EMR prompt can decrease burden/workload for primary care providers

Contact information

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