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Vitamin D Deficiency in Patients With Symptoms of Depression

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Nebraska Medicine

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Vitamin D Deficiency in Patients With Symptoms of Depression

Abstract

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#38. Lead Me to Lead Screening: Improving Lead Screening Rates at Urban, High-Risk Family Medicine Clinic

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Mentor: Hannah Christiansen

Program: Family Medicine

Type: Original Research

Background: Several clinics within the Nebraska Medicine health system are located within the nation's largest residential lead superfund site, and therefore have higher risk of lead toxicity than the general population. This includes both our urban family medicine clinic and other non-resident primary care clinics.

Methods: We looked at completed lead screening rates for children within the health system aged 1-7 years old, as our county health department recommends screening annually for all children up to the age of seven. A previous project improved the screening process by allowing for collection of capillary and venous blood samples in the clinic space, resulting in a higher percentage of patients screened (34.5% pre-implementation v. 59.8% post-implementation, $p < 0.001$). However, unfortunately 40% of eligible children did not receive appropriate

screening, so this study looks at outreach via phone call, EMR patient messaging, and letters via mail to improve screening rates. It also expanded from our residency clinic to other health system clinics within the superfund site.

Results: Pending

Conclusion: Pending

#39. AI for A Eye: Implementing Point-Of-Care Artificial Intelligence Retinal Screening in a Resident Clinic

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Mentor: Hannah Christiansen

Program: Family Medicine

Type: Original Research

Background: The American Diabetes Association recommends that patients with diabetes mellitus undergo screening for diabetic retinopathy every 1-2 years, as it is the most frequent cause of new blindness among adults in developed countries. Unfortunately, screening for retinopathy remains far below target and often underperforms other diabetic screening recommendations. This is especially true for patients with diabetics and low socioeconomic status or who are racial/ethnic minorities

- patients served in our urban residency clinic. Previous initiatives to improve screening rates have included: electronic medical record flags, pre-visit planning, nurse-led quality measure gap lists, same-day walk-in retinal imaging in a different building on campus, and analysts querying outside records for previously completed screening. Despite these efforts, our clinic screening rate has consistently remained below target, around 56%. This is lower than our health system average.

Methods: We implemented the Eyenuk artificial intelligence technology on 12/11/23 to take a point-of-care retinal photo and analyze it for diabetic retinopathy for patients due or overdue for diabetic retinopathy screening.

Results: Within the first 3 weeks of use, clinic screening rates increased to 59% (44 additional screenings documented).

Conclusion: We predict that this model will significantly improve diabetic retinopathy screening rates, especially in our underserved residency clinic. We also detail lessons learned in implementation of Eyenuk, including effects on workflow, patient throughput in clinic, and return-on-investment. Finally, we discuss how exposure to this technology benefits residents planning to move to a rural practice after graduation who may be considering implementing the technology.

#40. Effect of Advanced Patient Scheduling on Patient- And Resident-Continuity

Michael Schulte¹, Hannah Christiansen¹

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Mentor: Hannah Christiansen

Program: Family Medicine

Type: Original Research

Background: Physician-patient continuity is an important element of effective healthcare, and therefore, continuity clinics are a central aspect of residency training. Continuity has been shown to build patient trust, and decrease utilization of healthcare and emergency departments (ED), healthcare costs, preventable hospitalizations, medical procedures, and duration of work disability for low back pain. New Association of Graduate Medical Education (ACGME) family

medicine residency program requirements as of 2023 include guidelines regarding continuity of care with specific targets for patient and resident-sided continuity. The objective of this study was to determine if opening resident clinic schedules 6 months ahead would improve continuity of care.

Methods: The primary outcome measured was patient-sided and resident-sided continuity over 6 months following intervention. ED utilization before and after intervention was also measured as a secondary outcome.

Results: We expect that by allowing patients to schedule follow-up appointments up to 6 months out, we may improve both

patient-facing and resident-facing continuity. We are uncertain if it will result in decreased utilization of urgent care visits, emergency room visits, or hospitalization rates. We also wonder if patient satisfaction with scheduling will improve, specifically in response to the Press-Ganey question "ease of scheduling your appointment."

Conclusion: New ACGME guidelines require accurate reporting of both patient-and resident-sided continuity with targets for different levels of training. We describe our approach to tracking resident-sided and patient-sided continuity. An intervention of advanced scheduling is feasible for numerous programs, and may provide improved continuity rates.

#41. Paternity Matters: Does Paternal Involvement Have an Effect on Prenatal Care?

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Mentor: Peter Schindler

Program: Family Medicine

Type: Original Research

Background: Although there is much data on a father's involvement and a child's health and development, there is, to date, a paucity of research that examines whether paternal involvement has an effect on prenatal care.

Methods: A retrospective analysis of a data set of all pregnancies (n=744) from one Federally Qualified Health Center in 2022

was done. The data set included the patient's number of total prenatal visits, gestational age (GA) at first OB visit, as well as a "yes or no" question regarding paternal involvement.

Results: There was a statistically significant difference in the number of prenatal visits between those couples who had paternal involvement (mean number of visits=11.3, SD=3.7) and those who did not have paternal involvement (mean=9.5, SD=3.8)(p<0.001). There is also a statistically significant difference in the average GA at the first OB visit between those who had paternal involvement

(mean GA at first OB visit = 103.34 days, SD 61.3) and those who did not have paternal involvement (mean=136.16 days, SD=72.3) (p<0.001).

Conclusion: Paternal involvement is shown to have a strongly positive relationship to frequency of obstetric care, earlier presentation for obstetric care, as well as a significant relationship to the number of pregnancies. More outcomes are yet to be studied, but the findings in this research suggest partner support to be associated with positive maternal health behaviors during pregnancy.

#42. Risk of Coronary Artery Calcification Due to Sarcopenia: A Meta-Analysis

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Program: Family Medicine

Mentor: Nosheen Hafeez

Type: Systematic Review/Meta-Analysis

Background: Sarcopenia is thought to adversely affect cardiovascular system. We sought to explore its impact on coronary arteries.

Methods: A comprehensive search of literature was done from inception upto Jan 5, 2024 to identify studies investigating the association between sarcopenia and coronary artery calcification. Six eligible studies were included in the analysis. Pooled data were

analyzed to estimate the risk of coronary artery calcification in sarcopenia patients using hazard ratios (HR) and their corresponding 95% confidence intervals (CI). A sensitivity analysis was performed to evaluate the impact of individual studies on the overall findings.

Results: The pooled data of the six eligible studies demonstrated a high level of heterogeneity among the included studies (I² (I-square statistic) =92%). Sarcopenia was found to be significantly associated with an increased risk of coronary artery calcification, with an overall HR of 1.78 (95% CI 1.20 to 2.64, p = 0.004). However, sensitivity analysis

indicated that one study potentially influenced the observed heterogeneity. Upon removing this study, the heterogeneity decreased to <5%, and the pooled results for the remaining five studies showed an HR of 2.12 (95% CI 1.96 to 2.30, p < 0.01), which was consistent with the primary analysis.

Conclusion: Sarcopenia is associated with a higher risk of coronary artery calcification. The study is limited by biases of individual studies and heterogeneity. Subsequent sensitivity analysis confirmed the primary findings. Further research is needed to better understand the underlying mechanisms and potential interventions.

#43. Vitamin D Deficiency in Patients With Symptoms of Depression

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Mentor: Leslie Veskrna

Program: Clarkson Family Medicine

Type: Systematic Review/Meta-Analysis

Background: Vitamin D deficiency (VDD) is found in many patients with depression, which has been shown in numerous studies. Current guidelines on screening asymptomatic VDD are not defined due to inadequate evidence. In this review, we attempted to identify correlations between VDD and components of the 9-item criteria (PHQ-9) of depression screening/diagnosis in adults,

to guide decisions on vitamin D screening in clinical depression.

Methods: We performed a literature search using EMBASE. A total of 425 articles were identified that contain concepts of depression and at least one other component of PHQ-9 as well as their correlation with VDD.

Results: Forty-nine studies showed a positive correlation between VDD and sleep disorders (n=402313 subjects), 13 of which were about sleep apnea (n=7143 subjects). 9 studies showed a positive correlation between VDD and fatigue (n=3150 subjects) but in

the context of comorbidities such as cancer and multiple sclerosis. Nine articles report evidence of a correlation between VDD and suicidal behaviors (n=1490 subjects). Although multiple studies indicate that VDD is related to cognitive dysfunction, only 1 study mentioned a correlation between VDD and psychomotor speed decline in urban adults. There were no articles identified that reported correlation between VDD and "pleasure in doing things", "appetite changes", "low self-esteem", "concentration", despite paraphrases and synonyms were being used in the search.

Conclusion: VDD is correlated to depression, with the vast majority of the evidence in sleep disorder, fatigue, and suicidal behaviors.

Screening VDD in patients' PHQ-9 positive for the above items may provide higher positive predictive value.

#44. Establishing the Problem: Identifying Barriers to Workflow Among Internal Medicine Resident Physicians Within the VA Medical Center

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Mentor: Evan Symons

Program: Internal Medicine

Type: Original Research

Background: Workflow inefficiencies, particularly those related to the electronic health record 'CPRS', have been a major focus in feedback from Internal Medicine (IM) resident physicians working at the Omaha Veterans' Affairs (VA) facility. We surveyed current IM resident physicians to elucidate which factors have been especially cumbersome to daily workflow at the Omaha VA facility.

Methods: We drafted a list of CPRS components and institutional variables, which were then formulated into a Likert-style questionnaire. Participants were asked to gauge how frequently they had difficulty using each item. Additionally, participants ranked their level of agreement with statements regarding daily tasks essential to medical practice. These questions were distributed to current IM residents using Microsoft Forms. A public link was used to preserve anonymity.

Results: A total of 21 responses were obtained (91 participants total, 23% response rate) which is comparable to established survey response rates. Locating intake and

output data is challenging for most respondents (50% responding 'constant issues'; 35% responding issues occur 'frequently'). Difficulty logging onto a workstation was experienced 'occasionally' or greater in 90% of survey participants. (**Figure 1**) By comparison, patient list selection, reviewing notes, and forwarding pagers cause less frequent impediments.

Conclusion: A majority of IM resident physicians experience disruptions to daily workflow by potentially modifiable factors at the Omaha VA facility. Interventions to mitigate these factors can be prioritized based on the percentage of residents affected and the relative event frequency.

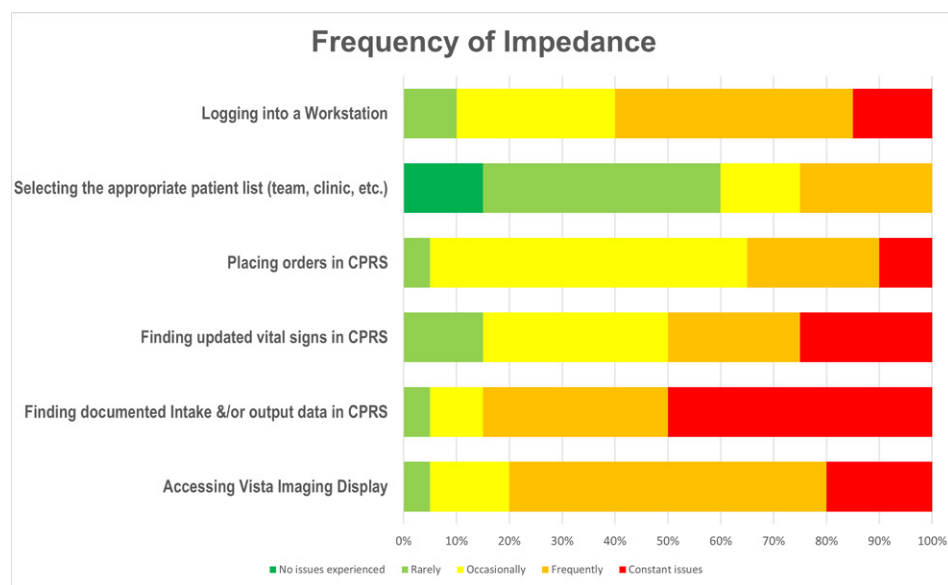


Figure 1. Participant responses to the prompt: "Please estimate how often you have experienced difficulty when using each of the following items."

#45. Prosthetic Valve Endocarditis With *Cardiobacterium Hominis*: A Case Report

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Mentor: Jonathan H. Ryder

Program: Internal Medicine

Type: Case Report

Background: *Cardiobacterium hominis* (*C. hominis*) is an uncommon cause of infective endocarditis and often presents sub-acutely with fevers, cardiac murmurs, or embolic phenomena. We present a rare case of *C. hominis* infective prosthetic valve endocarditis that presented with new onset atrial flutter and systemic emboli.

Case: A 38-year-old male presented to the emergency department with palpitations, shortness of breath, and chest tightness and was found to be in atrial flutter. He underwent a transesophageal echocardiogram guided cardioversion and was incidentally found to have a one-centimeter echodensity on the ventricular side of his prosthetic aortic valve (**Figure 1**). He had a prior history of native valve endocarditis secondary to methicillin-susceptible *Staphylococcus aureus* related to injection drug use necessitating aortic and tricuspid valve replacements. He had refrained from injection drug use since prior to his

last episode of endocarditis. He did not have any common signs or symptoms associated with endocarditis, such as fevers, chills, or new murmurs. Blood cultures eventually grew *C. hominis*, and he was successfully treated with 7 weeks of ceftriaxone prior to a re-do sternotomy with mechanical aortic and bioprosthetic tricuspid valve replacements.

Conclusion: *Cardiobacterium hominis* is a rare but important to recognize cause of infective endocarditis with an indolent presentation that often leads to delayed diagnoses. Clinicians should have a high index