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# Models of Pediatric Asthma Care

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with PD developed acute confusion and visual hallucinations of butterflies ascribed to PD. She was considered for discharge until a dietary history revealed that a typical meal was diet soda and white bread. Serum B1 (49 nmol/L), B6 (<5.0 nmol/L), and folate (5.4 ng/mL) were low. Confusion and hallucinations resolved three days after replacement. Case 3 This 46-year-old policeman with PD presented for a second opinion in the Comprehensive PD Clinic. He complained of trouble walking and forgetfulness thought related to his PD. B12 was low (176 pg/mL) and normalized with replacement. Symptoms resolved within eight weeks.

**Conclusion:** Common symptoms of PD including gait problems, cognitive impairment, hallucinations, and sensory disturbances can be caused by vitamin deficiencies and are easily correctable. We are currently collecting nutritional data on our PD patients for future studies. ■

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## Vitamin Deficiencies Are Extremely Common in Parkinson's Disease: A Case for Routine Screening

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**Mentor:** John M. Bertoni

**Program:** Neurological Sciences, Division of Movement Disorders

**Type:** Original Research

**Background:** In this study we assess vitamin deficiencies in Parkinson's disease (PD) and their impact on disease characteristics and common clinical assessments.

**Methods:** 118 patients from our PD clinic underwent serum testing for thiamine (B1), pyridoxine (B6), cobalamin (B12) and 25-hydroxy cholecalciferol (D3). We compared age, BMI, disease duration, United Parkinson's Disease Rating Scale (UPDRS), Mini Mental Status Examination (MMSE), levodopa equivalent daily dose (LEDD), and reported falls between those with and without vitamin deficiencies. Statistical analyses included a nonparametric Wilcoxon two-sample test and nonparametric Pearson and Spearman correlations.

**Results:** In total, 66 patients (56%) were deficient in one vitamin, and 24 in two or more (B1 = 6, B6 = 26, B12 = 44, and D3 = 24). Average UPDRS score was 35 with average disease duration of 7 years for both groups. LEDD for deficient patients was higher (712 mg) compared to the normal group (594 mg), though not statistically significant (p=0.11). There was a trend for older age in the deficient group (73 vs 69.5 years; p=0.093). Both groups had similar MMSE scores and report of falls. There were no linear correlations between vitamin levels and age, BMI, disease duration, UPDRS, MMSE, or LEDD.

**Conclusion:** Our preliminary data suggest that although vitamin deficiencies were present in 56% of our PD patients, there was not a strong correlation between serum levels and objective clinical measurements. Sample size limited statistical power and we will repeat analyses as more patients are enrolled. There are many other objective measures that can be included in future studies. ■

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## Models of Pediatric Asthma Care

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**Mentor:** Chad Abersch

**Program:** Pediatrics

**Type:** Review/Meta-analysis

**Background:** Asthma exacerbation is a leading cause of emergency department visits and one of the top indications for hospitalization in children. Not only does this burden the medical care system with accruing costs and resources, these exacerbations are highly preventable given a strong medical home and a practical model of pediatric asthma care. Our aim was to perform a systemic review of literature to evaluate the existent models of pediatric asthma care with clinical and public health outcomes.

**Methods:** The Up to Date, Cochrane Library, and PubMed databases were queried using the search terms "Models of Pediatric Asthma Care". We included all original, full-text abstracts published after 2010. We excluded abstracts pertaining to novel agents in treatment, ED/inpatient management, school-based protocols, complementary/alternative medication, environmental and epigenetic factors.

**Results:** The proposed models in literature are as follows:

1. Subgroup Analyses from the Prompting Asthma Intervention in Rochester-Uniting Parents and Providers Trial (Goldstein et all, 2018).
2. Children's Hospital Boston Community Asthma Initiative (Sommer et all, 2011).
3. Medical Home Model (Rojanasarot et all, 2018).
4. Ensemble Learning Model (Khasha R et all, 2019).
5. Practice Organization Model (Ruffner MA et all, 2018).

**Conclusion:** Asthma continues to be a major public health problem despite novel treatment agents and guideline-based management. An ideal theoretical model would include a) family educational programs/community resources, b) severity/control assessment, d)ensuring access of medication/ insurance coverage, e) addressing environmental triggers, f)frequent follow up care for susceptible children, g) addressing co-morbid conditions, and h) implementing legislative policy change. ■

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*Names in bold type indicate presenting author.


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## High-Persensitivity Pneumonitis


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**Mentor:** Daniel Hershberger

**Program:** Internal Medicine

**Type:** Case Report

**Introduction:** Hypersensitivity pneumonitis (HP) is an immune-mediated lung disease characterized by parenchymal inflammation following inhalation of an inciting antigen.

**Case Report:** A middle-aged woman was admitted with sub-acute respiratory failure. Physical exam revealed a euvolemic woman with coarse breath sounds who was requiring supplemental oxygen. She had two prior hospitalizations for similar but less severe symptoms. Her previous episodes appeared to respond to antibiotics though required her to go home on oxygen. Chest CT revealed diffuse bilateral consolidations, and a leukocytosis was present. Broad spectrum antibiotics were initiated. There was no clinical improvement at 24 hours so TMP/SMX plus corticosteroids were added to her treatment plan. She promptly improved. A hypersensitivity panel was positive for antibodies against Aspergillus species. Exposure history uncovered marijuana use that coincided with her current and prior respiratory symptoms. Hypersensitivity pneumonitis was diagnosed. She was discharged on a steroid taper and strict marijuana avoidance. At six-week follow up her symptoms had completely resolved.
**Discussion:** Environmental fungi are well-established triggers for HP. They are able to pass through lit marijuana cigarettes and pipes, particularly the spores of A. fumigatus. Knowing this we felt confident making the diagnosis of HP in our patient because of her positive hypersensitivity panel plus her history of marijuana use coinciding with her symptoms. Her symptoms resolved with corticosteroids and abstinence from marijuana.

**Conclusion:** Marijuana harbors organic antigens and should be explored as a trigger for hypersensitivity pneumonitis. ■


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## Improving the Efficiency of Same-Day Ill Calls


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**Mentor:** R. Gregory Bociek

**Program:** Internal Medicine, Division of Oncology and Hematology

**Type:** Original Research

**Background:** We sought to use quality improvement (QI) methodology to approach problems leading to burnout and workplace stress in our oncology care team.

**Methods:** Through a broad survey, we identified coordination of same-day, outpatient visits for acutely ill oncology patients as a source of excessive stress for team members across various disciplines including case managers, infusion clinic nurses, advanced practice providers, and physicians. We used the Plan-Do-Study-Act (PDSA) framework to identify a feasible, appropriate intervention to reduce case manager time required to coordinate visits with the specific aim of reducing their time by 25%. We also tracked phone calls required to arrange a visit and perceived frustration with the process. Our intervention involved transitioning from paging individual practitioners to using HIPPA-compliant group text to collaboratively coordinate care.

**Results:** After one PDSA cycle, we found case manager time required to arrange a visit had de-creased by 21%, number of calls required by 59% and frustration with the process by 41%.

**Conclusion:** While we did not meet our specific aim, we feel use of a QI approach led to an easily implemented, effective modification to streamline a previously inefficient, disruptive workflow. The use of QI methodology ensured we understood the baseline process and involved all stakeholders before implementing a change and also ensured we followed data to understand our intervention's impact on team members. Viewing sources of burnout and workplace frustration through the lens of QI may lead to more consistently high-yield interventions than traditional wellness-based, administrative approaches. ■


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