Online Supplement

Original Research

A Multimodal Intervention to Improve Guideline-Based Screening for Alpha-1 Antitrypsin Deficiency in a Community Health Setting

Andrew A. Wilson, MD[1] Celia Bora, DNP[2] Catherine Silva, MD[2] Julie L. White, MS, CHCP[1] Natalie Sanfratello, MPH, CHCP[1] Jaime Symowicz, PhD[3] Cristen Querey, MS[3] Donna Gabriel, PhD, MS[3]

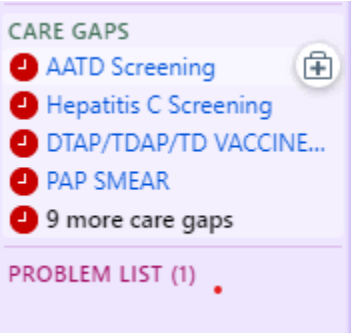
[1]Boston University Chobanian & Avedisian School of Medicine, Boston, Massachusetts, United States

[2]East Boston Neighborhood Health Center, Boston, Massachusetts, United States

[3]Med-IQ, Baltimore, Maryland, United States

SUPPLEMENTARY FIGURES

Figure S1: Care Gap Alert in Epic Indicating That a Patient is Overdue for AATD Screening



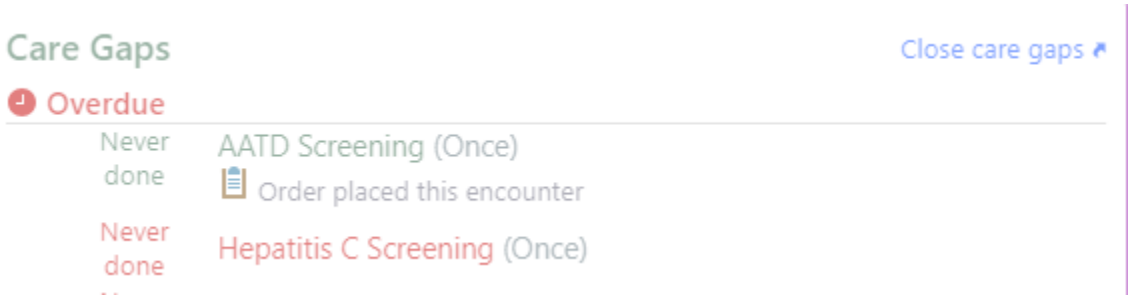


Figure S2: Care Gap SmartSet to Order AAT Test in Epic

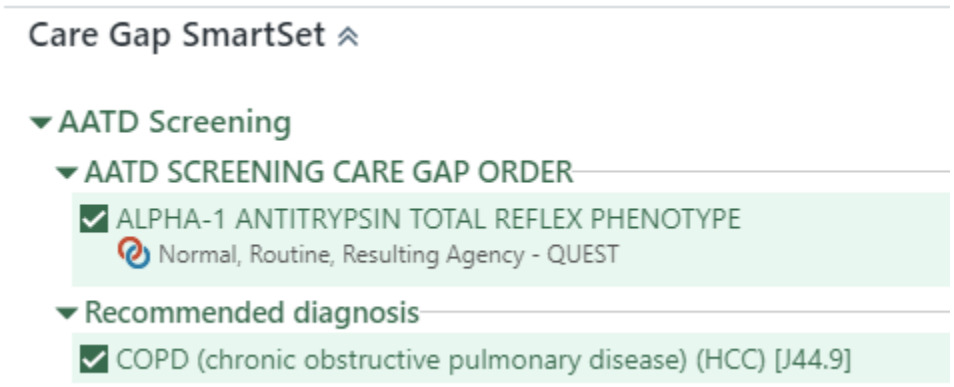


Figure S3: AAT Total Test Results Shown in Epic

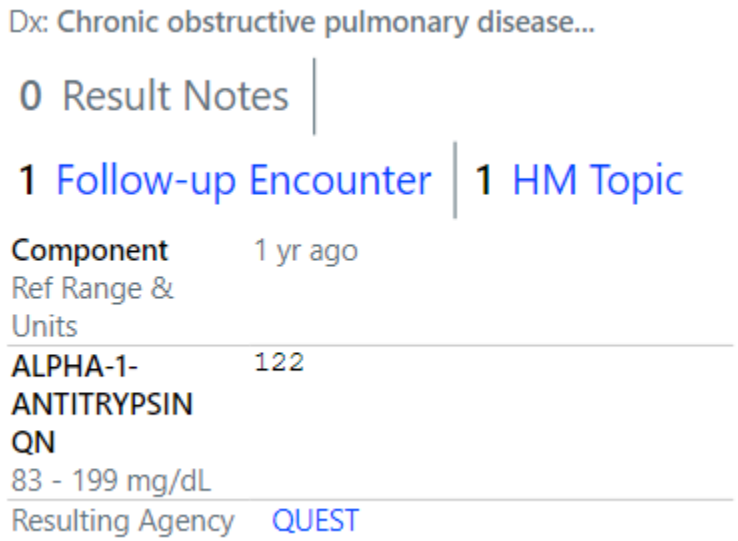
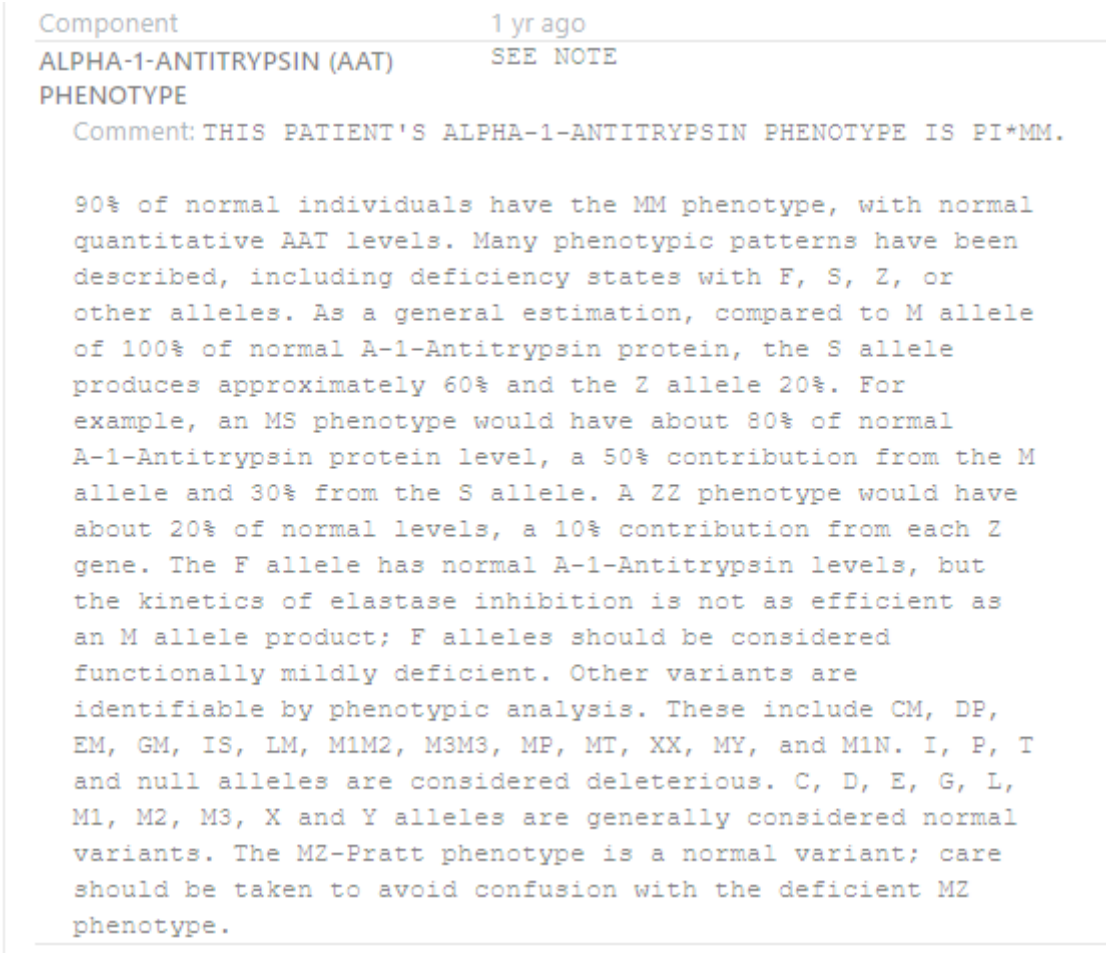


Figure S4: AAT Phenotype Narrative Results Shown in Epic

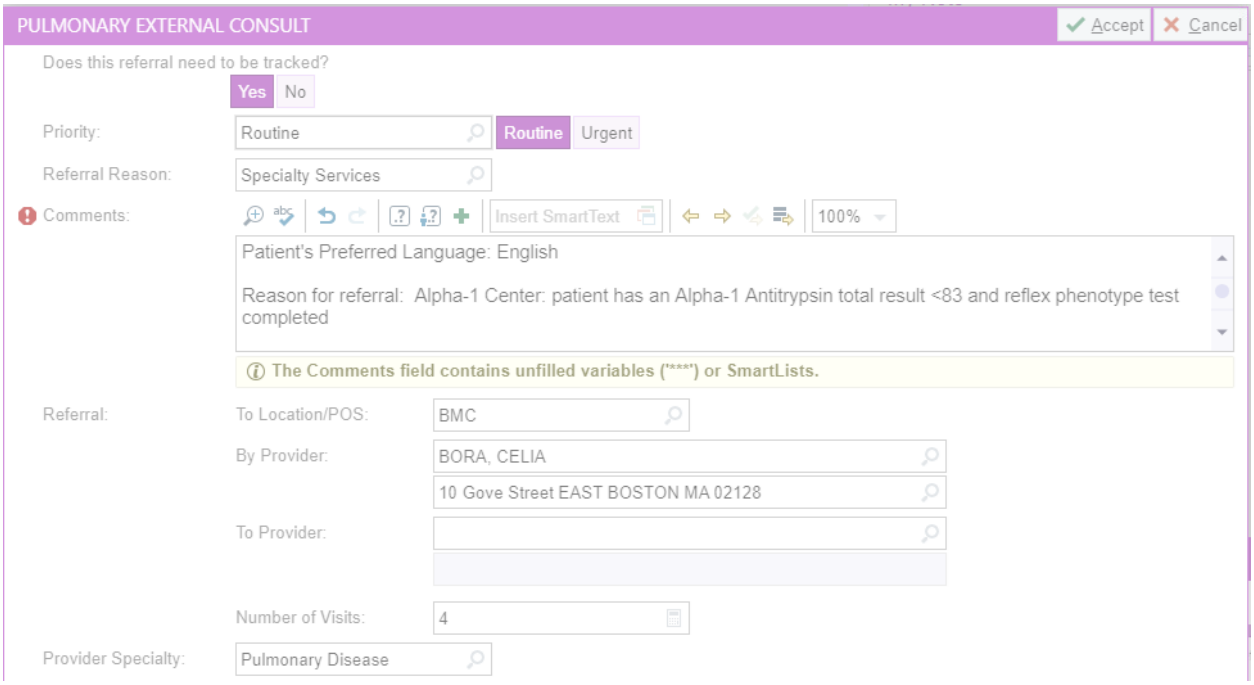


Component	1 yr ago
ALPHA-1-ANTITRYPSIN (AAT) PHENOTYPE	SEE NOTE

Comment: THIS PATIENT'S ALPHA-1-ANTITRYPSIN PHENOTYPE IS PI*MM.

90% of normal individuals have the MM phenotype, with normal quantitative AAT levels. Many phenotypic patterns have been described, including deficiency states with F, S, Z, or other alleles. As a general estimation, compared to M allele of 100% of normal A-1-Antitrypsin protein, the S allele produces approximately 60% and the Z allele 20%. For example, an MS phenotype would have about 80% of normal A-1-Antitrypsin protein level, a 50% contribution from the M allele and 30% from the S allele. A ZZ phenotype would have about 20% of normal levels, a 10% contribution from each Z gene. The F allele has normal A-1-Antitrypsin levels, but the kinetics of elastase inhibition is not as efficient as an M allele product; F alleles should be considered functionally mildly deficient. Other variants are identifiable by phenotypic analysis. These include CM, DP, EM, GM, IS, LM, M1M2, M3M3, MP, MT, XX, MY, and M1N. I, P, T and null alleles are considered deleterious. C, D, E, G, L, M1, M2, M3, X and Y alleles are generally considered normal variants. The MZ-Pratt phenotype is a normal variant; care should be taken to avoid confusion with the deficient MZ phenotype.

Figure S5: Referral to Alpha-1 Center Provided in Epic



SUPPLEMENTARY TABLES

Supplementary Table S1

Supplementary Table S1: **Number of Participating Providers Per Grand Rounds Session**

Number of participating providers • First session • Second session • Third session	 29 (17.8%) 22 (13.5%) 23 (14.1%)
Average number of sessions attended per provider	1.63

Table S1 legend: A total of 163 medical providers who were able to activate AATD screening (defined as MD/DO, NP, or PA) were invited to attend the grand rounds sessions. A total of 49 unique computer terminals, each linked to a medical provider, logged in to at least one session. Some terminals are located in clinical practice locations where multiple clinicians can and do share a single terminal, preventing the ability to precisely identify the number of attendees at each session.

Supplementary Table S2: Baseline Survey Questions Administered Before the First Educational Session

1. Have you ever seen a patient with alpha-1 antitrypsin deficiency (AATD) at your center? A. Yes B. No C. Unsure (please explain): _____
2. How often do you screen your patients with COPD for AATD? A. Always B. Frequently C. Usually D. Sometimes E. Never F. Not applicable to my practice
3. Please describe any additional barriers to AATD screening that you experience.

Supplementary Table S3: Post-Activity Survey Questions Administered After the Third Educational Session

1. Have you ever seen a patient with alpha-1 antitrypsin deficiency (AATD) at your center? A. Yes B. No C. Unsure (please explain): _____
2. Have you ordered a test for AATD since the first grand rounds presentation in July 2022? A. Yes B. No C. Not applicable; I have not seen a patient with chronic obstructive pulmonary disease (COPD) yet D. Not applicable to my practice
3. Have you seen any abnormal AAT results since the first grand rounds presentation in July 2022? A. Yes—high levels B. Yes—low/deficient levels C. No D. Not applicable; I have not ordered a test for AATD yet E. Not applicable to my practice
4. Have you made a referral to the Boston Medical Center Alpha-1 Center since the first grand rounds presentation in July 2022? A. Yes B. No C. Not applicable; I have not ordered a test for AATD yet D. Not applicable to my practice
5. Please describe any additional barriers to AATD screening that you have experienced.
6. What part of this education on AATD did you find most useful for your practice?