Oregon Health & Science University
School of Medicine

Scholarly Projects Final Report

Title *(Must match poster title; include key words in the title to improve electronic search capabilities.)*

E-Consult Pathway for Evaluating Penicillin and Sulfonamide Antibiotic Allergies in Prospective Hematologic Transplant Patients

Student Investigator's Name

Julia Liu

Date of Submission *(mm/dd/yyyy)*

03/24/2026

Graduation Year

2026

Project Course *(Indicate whether the project was conducted in the Scholarly Projects Curriculum; Physician Scientist Experience; Combined Degree Program [MD/MPH, MD/PhD]; or other course.)*

Scholarly Projects

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Scholarly Project Final Report

Concentration Lead's Name

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Project/Research Question

What are the outcomes from establishing a drug allergy electronic consult pathway for prospective hematology/oncology transplant patients with penicillin and sulfa antibiotic allergies?

Type of Project *(Best description of your project; e.g., research study, quality improvement project, engineering project, etc.)*

Clinical workflow

Key words *(4-10 words describing key aspects of your project)*

Drug allergy, electronic consults, cell therapy, bone marrow transplant, CAR-T, penicillin, sulfa

Meeting Presentations

If your project was presented at a meeting besides the OHSU Capstone, please provide the meeting(s) name, location, date, and presentation format below (poster vs. podium presentation or other).

ACAAI: Orlando, FL, November 8, 2025, Poster presentation.

Publications *(Abstract, article, other)*

If your project was published, please provide reference(s) below in JAMA style.

N/A

Submission to Archive

Final reports will be archived in a central library to benefit other students and colleagues. Describe any restrictions below (e.g., hold until publication of article on a specific date).

N/A

Scholarly Project Final Report

Next Steps

What are possible next steps that would build upon the results of this project? Could any data or tools resulting from the project have the potential to be used to answer new research questions by future medical students?

The next steps for the project would include continuing data collection and streamlining workflows. The team will also need to follow patient outcomes for those who have not yet scheduled allergy testing. We also have enough data for publication.

Please follow the link below and complete the archival process for your Project in addition to submitting your final report.

https://ohsu.ca1.qualtrics.com/jfe/form/SV_3ls2z8V0goKiHZP

Student's Signature/Date *(Electronic signatures on this form are acceptable.)*
This report describes work that I conducted in the Scholarly Projects Curriculum or alternative academic program at the OHSU School of Medicine. By typing my signature below, I attest to its authenticity and originality and agree to submit it to the Archive.

 Recoverable Signature

X Julia Liu

Student's full name

Signed by: c1279cf8-f320-4fdd-b03f-6aca8e7c9589

Mentor's Approval *(Signature/date)*

X

Mentor Name

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Report*: Information in the report should be consistent with the poster, but could include additional material. Insert text in the following sections targeting 1500-3000 words overall; include key figures and tables. Use Calibri 11-point font, single spaced and 1-inch margin; follow JAMA style conventions as detailed in the full instructions.*

Introduction *(≥250 words)*

Electronic consults (e-consults) allow for asynchronous specialist evaluation without a dedicated clinic visit, presenting a promising pathway for streamlining specialist care.[1,2] To utilize e-consults, referring providers complete the required questions, the specialist reviews the responses and chart history, and recommendations are routed back to the primary team. Within allergy and immunology (A/I), drug allergy evaluation is a common reason for consultation.[2,3] Although many patients carry chart-reported allergies to penicillin or sulfa antibiotics, most do not have a true IgE-mediated allergy.[4] Erroneous chart allergies can lead to avoidance of first-line antibiotics, increased use of broad-spectrum antibiotics, and increased risk of antibiotic resistance.[4,5]

Drug allergy evaluation is important among cell-therapy patients, who become immunocompromised and may require therapeutic or prophylactic antibiotics during their transplant course. Given the urgency in these patients' treatment timelines, expedited specialist evaluation is necessary. However, many allergy clinics have long wait times that are incompatible with patients' treatment timelines.[6] Our institution established an e-consult pathway between our hematology/oncology (heme/onc) and A/I departments to evaluate penicillin and sulfa antibiotic allergies among hematopoietic stem cell transplant (HSCT) and chimeric antigen receptor T-cell (CAR-T) patients. Our goals are to evaluate overall e-consult usage, e-consult recommendations, drug de-labeling outcomes, and subsequent use of first-line antibiotics.

Methods *(≥250 words)*

Cell-therapy focused nurse navigators identified incoming patients with a listed penicillin or sulfonamide antibiotic allergy referred for bone marrow transplant (BMT) or CAR-T therapy at our institution. Then, they placed orders for e-consults, which were sent to our study team. The study team contacted patients to complete the e-consult questions. Responses were routed to the allergy MD, who notified patients of results. Drug allergies could then be de-labeled without further intervention or recommended for evaluation with drug challenge. If indicated, patients were recommended to schedule allergy testing outpatient. If patients were unable to complete allergy testing while outpatient, testing could be completed by an inpatient pharmacist during patients' hospital admissions. Patients with Kaiser insurance were ineligible for our study. Data was collected for all e-consults completed between 9/23/2024 and 12/11/2025.

Data was collected via chart review and stored on a secure Excel spreadsheet. Demographic info included patient age, sex, race, primary diagnosis, transplant type (BMT, CAR-T), and drug allergy in the chart. Primary outcomes included initial e-consult recommendations (skin testing and challenge, challenge only, de-labeling without testing, testing contraindicated), individual allergy testing outcomes, and number of drug allergies de-labeled. Secondary outcomes include average time spent by allergy MD completing each e-consult, days between e-consult placement and allergy MD completing the e-consult, whether the patient first-line antibiotic after de-labeling without adverse events, and whether patients were re-labeled.

Results *(≥500 words)*

During the study period, e-consults were placed for 47 eligible patients. Among 39 patients, 45 total drug allergies were evaluated via e-consults, with most patients having a chart-reported penicillin allergy only (22; 56.4%), followed by sulfa antibiotic allergy only (11; 28.2%). Six patients had both penicillin and sulfa antibiotic allergies listed on their chart (15.4%). The majority of participants identified as male (21; 53.9%), followed by female (17; 43.6%), then other (1; 2.6%). The racial demographics of the participants were White (31; 79.5%), Declined to Answer (4; 10.3%), Asian (2; 5.1%), Black (1; 2.6%), and American Indian/Alaskan Native (1; 2.6%). Ages of participants ranged from <50 (5, 16.7%), 50-59 (3; 10.0%), 60-69 (8; 26.7%), 70-79 (12; 40.0%), >80 (2; 6.7%). The most common diagnoses for transplant were multiple myeloma (11; 30.8%), diffuse large B cell lymphoma (DLBCL) (6; 18.0%), acute myeloid leukemia (AML) (4; 10.3%), aplastic anemia (2; 7.7%), and Hodgkin lymphoma (2; 7.7%). All other diagnoses had one patient with the listed diagnosis. Finally, HSCT was the most common cell-therapy type (23; 59.0%) followed by CAR-T therapy (16; 41.0%)

Of the 45 total drug allergies, four (8.9%) were directly de-labeled without direct challenge. One patient (2.2%) had a reaction history where testing was contraindicated, and the allergy was subsequently kept on the chart. Further testing was recommended for 40 drug allergies, including 23 penicillin allergies (51.1%) and 17 sulfa antibiotic allergies (37.8%). Allergy testing was deferred for four patients due to patient death or changing goals of care.

As of 1/21/2025, allergy testing was completed for 14 total drug allergies among 13 patients (nine penicillin, three Sulfa antibiotic, and one patient with both allergies). The majority of patients were tested in an outpatient setting (9; 69.2%), and four (30.8%) patients were tested inpatient. 100% of challenged allergies were de-labeled without adverse reaction. Six patients (15.4%) subsequently received penicillin or Sulfa antibiotics after de-labeling as part of their treatment plan, without adverse reaction. No patients to date have been re-labeled.

There was an average of 10.3 days elapsed between the time between e-consult ordering and completion by an allergy physician. Each e-consult took an average of 6.8 minutes to complete. For patients that completed allergy testing, there was an average of 42.3 days between the e-consult completion date and allergy testing date.

Discussion *(≥500 words)*

Drug allergy evaluations are a common reason for referral to A/I, and e-consults can increase access to timely specialist recommendations. One institution found that drug allergy evaluation made up 36% of all inpatient consults, with another institution reporting that penicillin allergy evaluation made up 67% of their total inpatient e-consults.[3,7] Due to high demand for allergy care, there are often long wait times for in-person evaluation, with one institution reporting a median wait time for 178 days for outpatient visits.[6] This extended timeline can pose a challenge for patients with urgent needs, including those who are planning to undergo HSCT or CAR-T. E-consults can bypass the need for in-person evaluation, streamlining care for patients.[1]

Our project established a formal e-consult pathway between our institution's heme/onc and A/I departments to evaluate chart-reported penicillin and sulfa antibiotic allergies among prospective cell therapy patients. During our study period, we evaluated 45 drug allergies among 39 patients. Four drug

allergies were directly de-labeled based off e-consult question responses and chart review. Allergy testing was recommended for 40 additional drug allergies. All challenged drug allergies were de-labeled without adverse reaction, which is consistent with the low rates of true anaphylaxis among penicillin and sulfa antibiotic allergies reported in the literature.[4] Six out of 17 de-labeled patients received penicillin or sulfa antibiotics after de-labeling, demonstrating how this pathway facilitates antibiotic stewardship.

E-consults also have faster turnaround times than traditional office visits, with an average time of 10.3 days between e-consult orders and completion by an allergy physician. Other institutions have reported even faster median turnaround times of 1-22 hours, as compared to the six to nine month wait time for new patient appointments at our institution.[2,3] E-consults are also completed in less time than new patient visits, with an average of 6.8 minutes spent on each e-consult compared to the 60 minutes allocated for new patient in-clinic visits. Some institutions report similar completion times, with a median of 11-15 minutes spent on each e-consult.[2,3] At one institution, overall wait times for in-person allergy consults were decreased by 1.5 days, demonstrating how e-consults can speed up allergist workflows.[2] Overall, e-consults can expedite care for patients by bypassing in-person visit wait times, providing quicker response times, and reducing overall time spent for evaluating each allergy.

The next steps for this project include continuing data collection for new e-consults, following up on patient allergy testing results and clinical outcomes, refining clinical pathways, and evaluating patient experience with e-consults. Within qualitative interview studies, the patient perception of e-consult benefits include expedited access to care, decreased travel burden, and strengthened role of primary care providers (PCPs).[8] However, some patients were concerned that they could not directly ask questions to the specialists. Among primary care providers, most studies report high PCP satisfaction with e-consults, with one study finding that 97% of requesting providers reported an “excellent” or “good” impression of e-consults.[3,8] However, PCPs also reported increased workload without additional time or compensation for patients served through e-consults.[8] There is limited data on e-consult usage and experiences for drug allergy evaluation among the heme/onc patient population. Further research is needed to determine how clinical workflows can best support cell-therapy patients, referring providers in heme/onc, and allergists.

Conclusions *(2-3 summary sentences)*

E-consults are an effective tool to streamline drug allergy evaluation in patients with time-sensitive needs, including patients with hematologic malignancies preparing for BMT and CAR-T therapy. Benefits of drug allergy de-labeling within hematologic transplant patents include option to use first-line antibiotics.

References *(JAMA style format)*

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