

Penicillin Allergy De-Labeling at Seattle Children's Hospital: A Pilot Project on an Inpatient Unit

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Speaker Disclosures

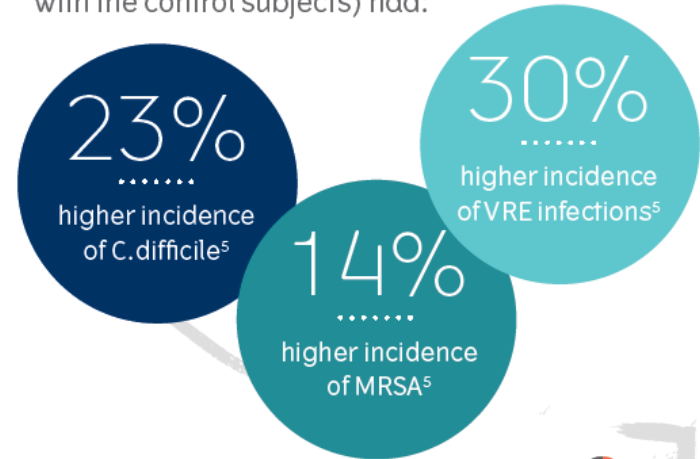
I have no actual or potential conflict of interest in relation to this presentation.



Know the Facts

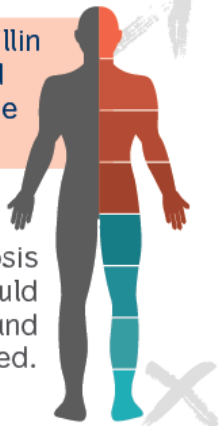
About Proper Antibiotic Selection

Patients claiming a penicillin allergy (compared with the control subjects) had:



3X Patients labeled penicillin allergic have a threefold increased risk of adverse events (ADE).⁷

Carrying an inaccurate diagnosis of penicillin "allergy" could adversely affect the quantity and quality of health care used.

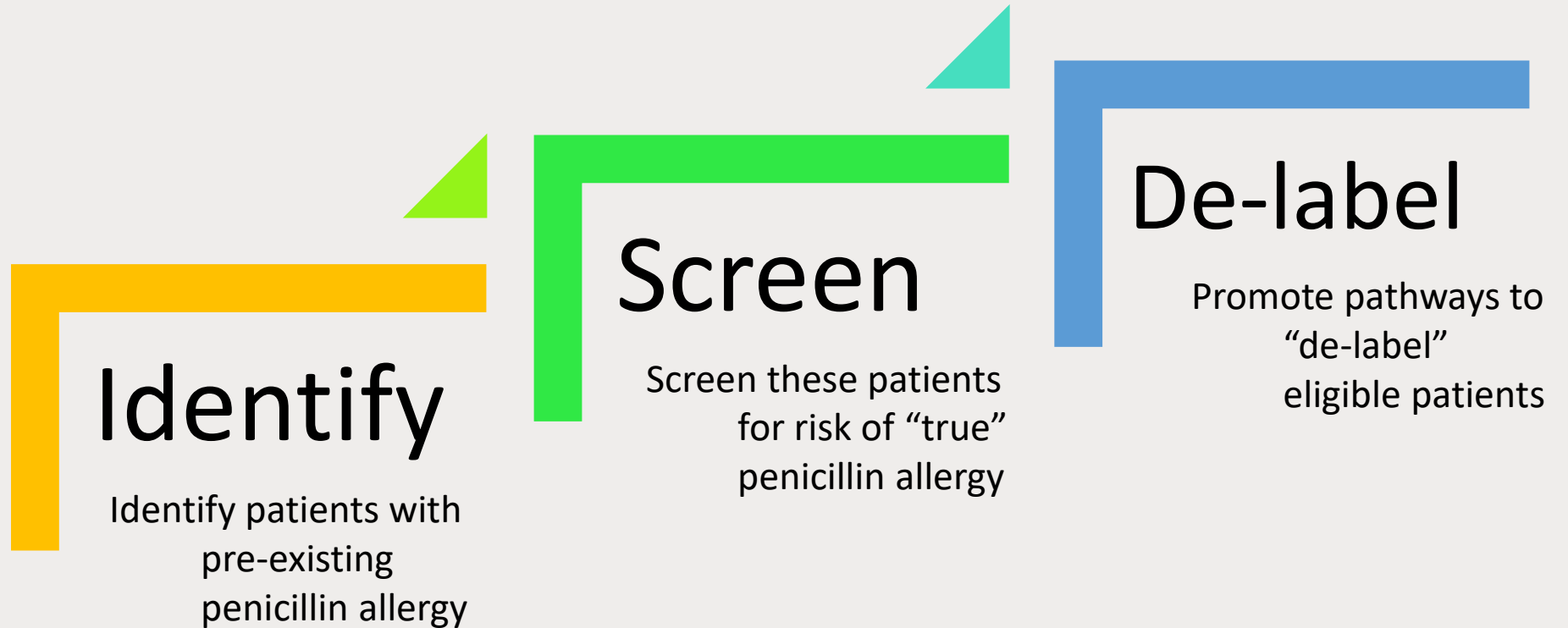


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Incorrect PCN Allergy Label= Bad

- >95% patients who report PCN allergies have no reaction on challenge
- 80% with allergy grow out of them after 10 years

Goals for a Pilot at Seattle Children's



Intervention, Simplified

Nurses: Complete an electronic Screening Questionnaire



MD/DO/APPs:

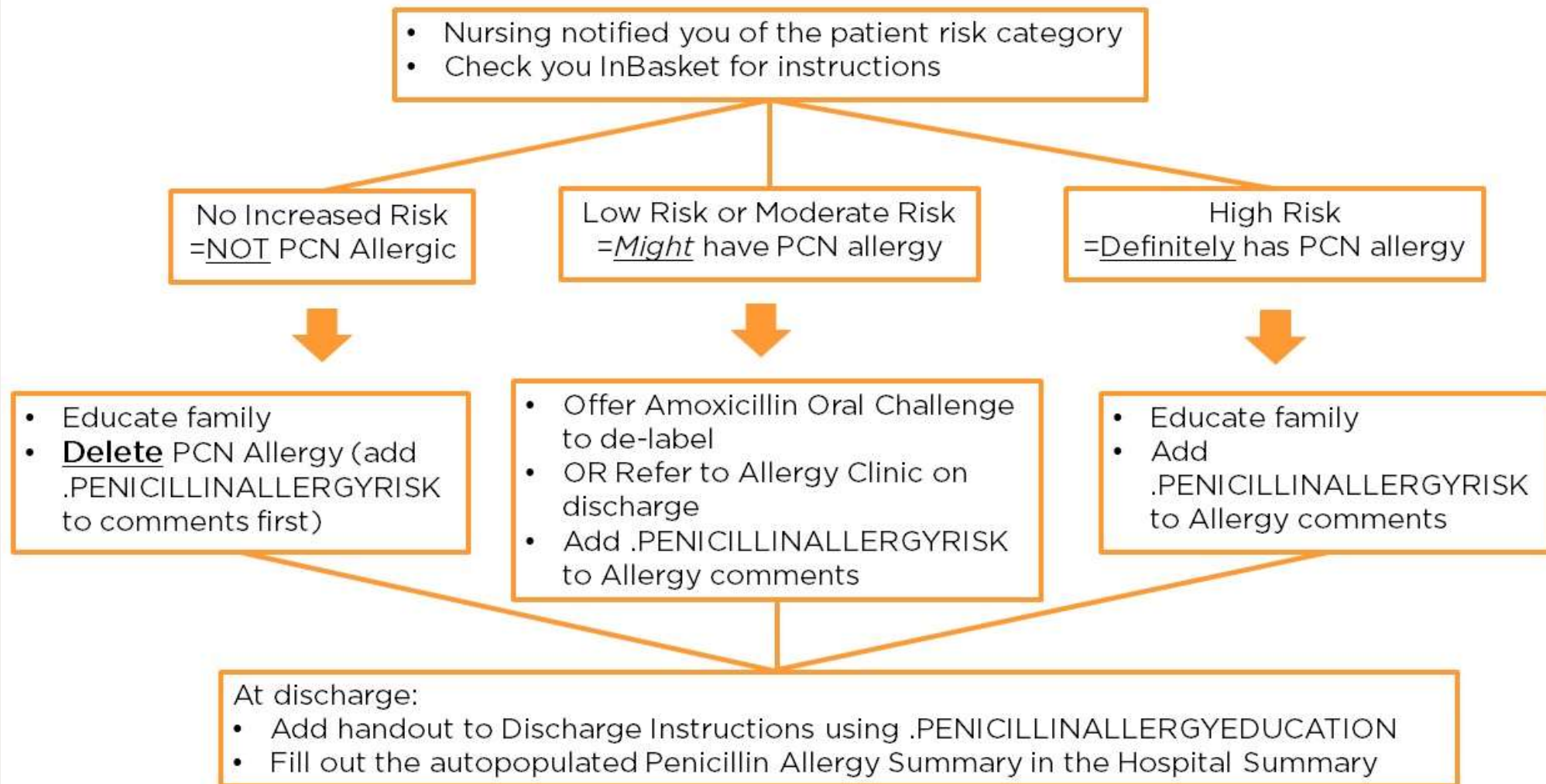
- Delete or Modify the Allergy
- Offer some patients an Oral Amox Challenge
- Tell the family



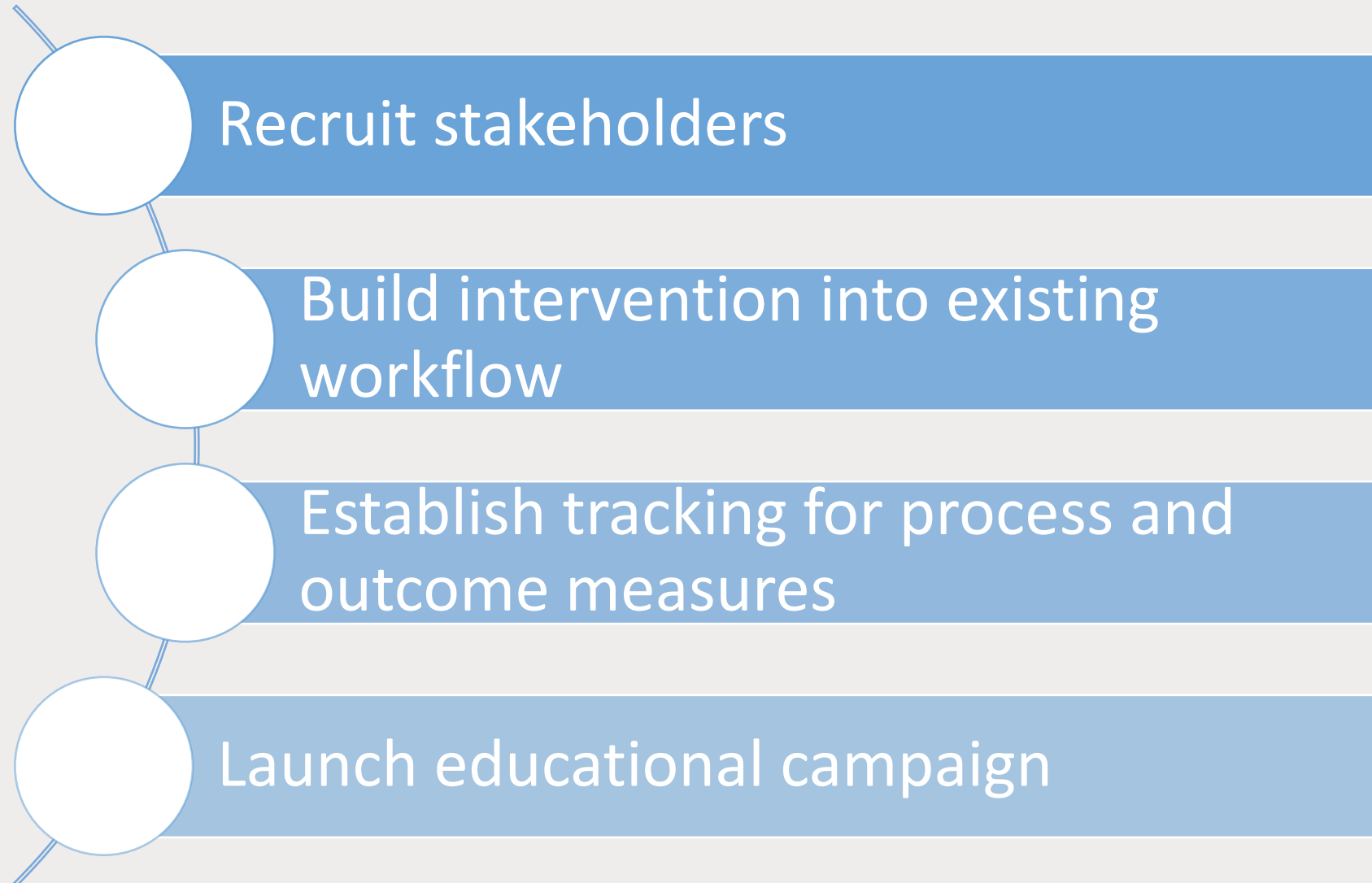
Nurse Role

- PCN allergic patient admitted to Med R4
- Nurse asks Allergy Screening Questions during admission process
- Allergy Screening Questionnaire risk-stratifies patient
- Nurse informs provider of patient risk category

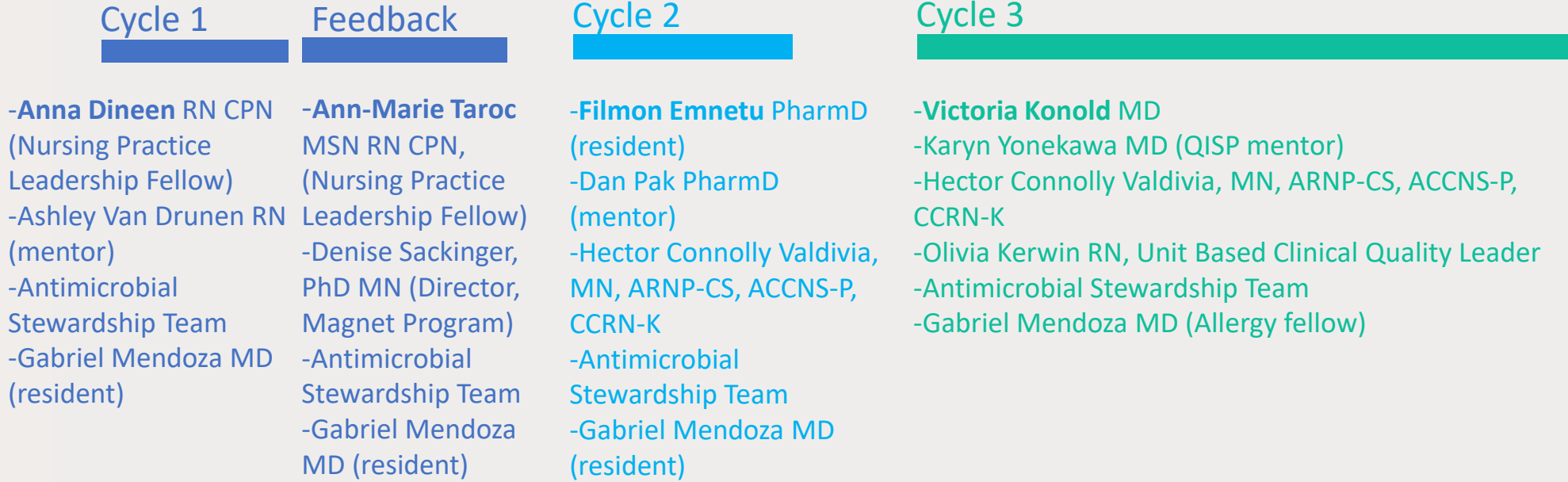
Resident/APP Role in Penicillin Allergy De-Labeling Project



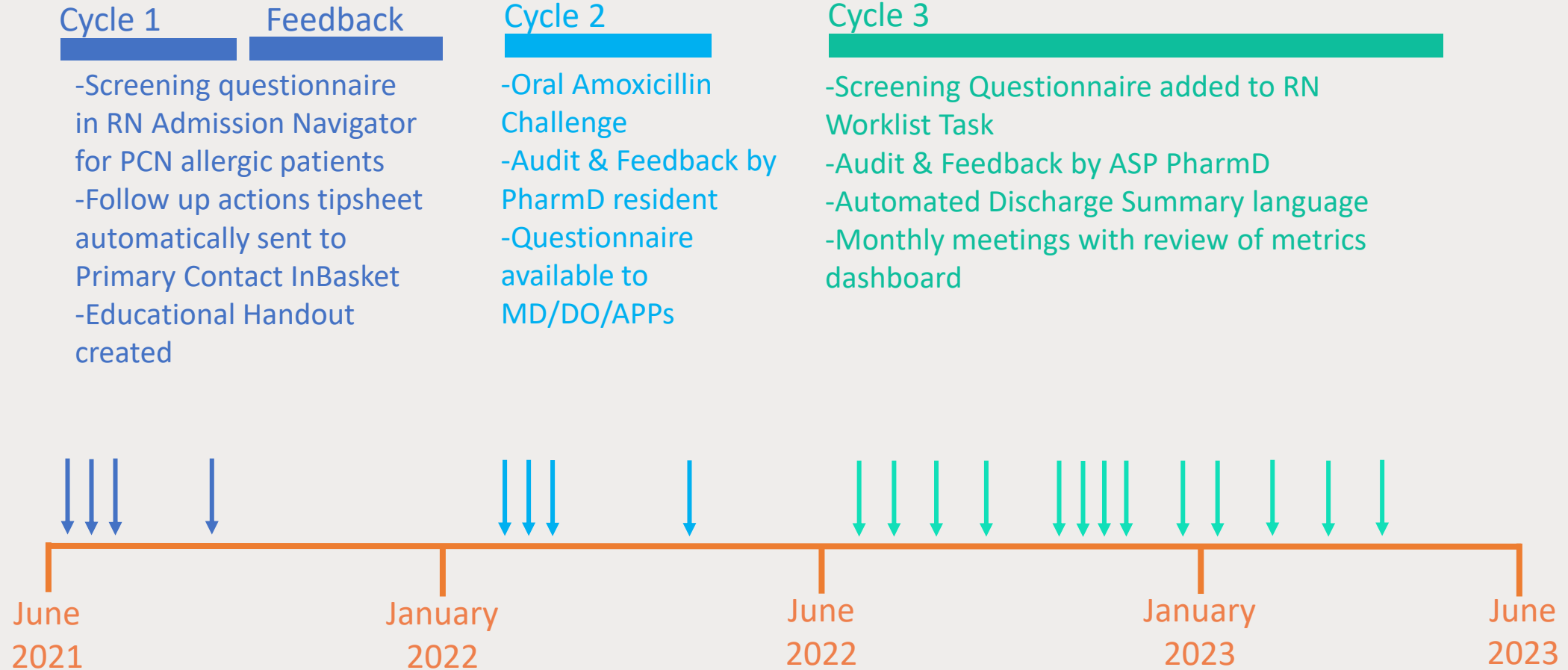
Implementation Steps



3 PDSA Cycles - Stakeholders



3 PDSA Cycles - Interventions



Questionnaire automatically appears in Admission Navigator for PCN allergic patients

Penicillin Allergy Screening

Why is the patient currently avoiding penicillin?

My child had a reaction to penicillin or a penicillin related antibiotic

Someone in my child's family is allergic to penicillin's

I don't remember

Other reason (Please explain)

What was the name of the medicine the patient received?

Penicillin

How soon after starting the medication did the symptoms start?

Within 30 minutes of taking the first dose

More than 30 minutes but less than 24 hours after

Greater than 24 hours after the first dose

Greater than 7 days after the first dose

How was the medication reaction treated?

How was the reaction treated?

It gradually went away without any intervention or treatment

It went away with an oral antihistamine (Benadryl)

Epinephrine Administration

Did the patient have to receive medical care from any of the following?

Pediatrician's Office

Allergist's Office

Urgent Care or Emergency Room

Overnight Hospitalization

Which of the following symptoms did the patient have to the medication:

Rash or hives alone (no other allergic symptoms)

Nausea, vomiting or diarrhea alone (no other allergic symptoms)

Lesions or ulcers involving the lips, mouth or eyes

Peeling of the skin

"Stevens's Johnson Syndromes (SJS)" or "toxic Epidermal Necrolysis (TEN)"

Involvement of the kidney or liver

"Drug Rash with eosinophilia and systemic symptoms (DRESS)"

Anemia or low blood counts

Joint pains/swelling and fevers or "Serum sickness"

Immediate respiratory symptoms (such as wheezing, cough, trouble breathing)

Immediate swelling of the lips or tongue

Blood pressure changes

Anaphylaxis

Other (Please explain)

Has the patient had Penicillin or a Penicillin-related antibiotic since the initial reaction?

No Yes

If yes to question above, did the patient tolerate this later exposure to penicillin's without difficulty?

Yes No



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EHR Automatically Calculates Risk

- Recommended RN actions appear in Best Practice Advisory
- Follow up actions automatically sent to Primary Contact InBasket

This patient is at **Low Risk** for penicillin allergy. Please follow these instructions:

Providers serving as the Primary Contact:

1. Modify the patient's allergy by selecting the penicillin to which they are allergic
 - Type this SmartPhrase into Comments: **.PENICILLINALLERGYRISK**
 - Choose 'Low Risk' from the drop-down list, then click Accept to save
2. Check your InBasket for next steps (in-house Amoxicillin Challenge or referral to outpatient Allergy)

Others: Notify the Primary Contact via Secure Chat or page that (1) patient's Allergy Risk Screening Questionnaire has been completed and (2) the primary contact will receive instructions in their InBasket with next steps. You can also modify the allergy record as described above.

[↗ Update Allergies](#)

The following actions have been applied: _____

✓ Sent: This advisory has been sent to the primary contact's In Basket.

! Acknowledge Reason _____

Next steps reviewed



SmartPhrase Created to Communicate Risk

Allergies/Contraindications

Add a new agent Full Search

Reaction

Severity

Reaction Type

Noted

Valid Until

Allergies

Amoxicillin

Agent: Amoxicillin

Reactions:

Severity:

Noted: 6/9/2021

Reaction Type:

Comments:

.PCNALLERGYRISK in Comments

This patient was screened by the Penicillin Allergy Risk Questionnaire developed by the Antimicrobial Stewardship Team. Their penicillin allergy risk is determined to be: No increased risk. Per protocol, this patient's penicillin allergy record should be deleted at this time.

- No increased risk. Per protocol, this patient's penicillin allergy record will be deleted.
- Low risk. This patient should avoid penicillins for now until more information becomes available.
- Moderate risk. This patient should avoid penicillins for now until more information becomes available.
- High risk. This patient should always avoid penicillins.

ing: 229



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Oral Amoxicillin Challenge Process Formalized

Worked with P&T, Pharmacy on
Penicillin Allergy Challenge Order Set

Not the right time?



- Refer to UW Allergy or Northwest Allergy for outpatient penicillin allergy testing and challenge
- Had meeting with local NW Allergy leader and UW AI liaison on this
- Called out insurance difference on handout

Medication Desensitization / Penicillin Allergy Challenge / Graded Challenge ✓

Clinician communication
Until discontinued, Starting today at 1544, Until Specified
Desensitization: Monitor vital signs every 15 minutes during desensitization. Notify provider if patient experiences a reaction-stop the infusion and give rescue medications as indicated. Notify provider at end of desensitization to document in Allergies per policy. Amoxicillin challenge: Stay with the patient for the first 15 minutes after oral dose of amoxicillin and perform another assessment at the end of the first 15 minutes. If stable, obtain vitals at 30 minutes. Notify provider if patient experiences a reaction and give rescue medications as indicated. Notify provider at end of oral challenge to document in Allergies per policy. Graded Challenge: Monitors patient for 30 minutes for clinical signs or symptoms of a Type I hypersensitivity reaction for each step of the graded challenge. Notify provider if patient experiences a reaction-stop the infusion and give rescue medications as indicated. Notify provider at end of graded challenge to document in Allergies per policy.

Premedications - for Desensitization ONLY

Medication Desensitization Provider Entry

Penicillin Allergy Challenge

amoxicillin 400 mg/5 mL oral suspension (\$) 45 mg/kg, Oral, Once, for penicillin allergy challenge

amoxicillin chewable tablet (\$) 45 mg/kg, Oral, Once, for penicillin allergy challenge

amoxicillin capsule (\$) 45 mg/kg, Oral, Once, for penicillin allergy challenge

amoxicillin tablet (\$) 45 mg/kg, Oral, Once, for penicillin allergy challenge

Graded Challenge Provider Entry

Anaphylaxis for Inpatient

Oxygen Therapy
Routine

EPINEPHrine injection 0.13 mg (\$\$)
0.13 mg (0.01 mg/kg × 13 kg), Intramuscular, Once PRN, anaphylaxis, Starting today at 1543, For 1 dose
First line.



Patient and PCP Education

- SmartPhrase with patient education handout created for use in Discharge Instructions
- Results of the Allergy Screening Questionnaire autopopulate into Hospital Summary Note Template-> Discharge Summary for PCP communication



Did you know that

Penicillin is the **most commonly reported drug allergy**



However, **nine out of 10 patients** reporting a penicillin allergy are not truly allergic

10
Most patients lose their penicillin allergy after 10 years*



Broad-spectrum antibiotics may cause **treatment-resistant superbugs, like MRSA and C-Diff**

When patients are penicillin allergy tested

98%

of hospitalized patients with a history of penicillin allergy would have a negative allergy test result*

Healthcare providers can prescribe **less expensive, less toxic, and more appropriate antibiotics**

What is my child's penicillin allergy risk category?

Your child's penicillin allergy risk category was determined by an evidence-based screening questionnaire administered by your nurse during this hospital stay.

For more information, see here: <https://www.cdc.gov/antibiotic-use/clinicians/penicillin-allergy.html>

(Provider Instructions: Please indicate which risk category your patient is by checking box)

No Increased Risk

Check here if applicable

- You do not have a penicillin allergy
- You can safely take penicillins such as: amoxicillin, amoxicillin-clavulanate, ampicillin etc.)
- Please inform your Primary Care Provider or Pediatrician that you were screened and found not to have a penicillin allergy

Low Risk

Check here if applicable

- It's unclear if you have a true penicillin allergy
- Avoid penicillins for now (such as: amoxicillin, amoxicillin-clavulanate, ampicillin etc.)
- See an outpatient allergy specialist (see below) to evaluate if you should get tested for penicillin allergy

Moderate Risk

Check here if applicable

- It's unclear if you have a true penicillin allergy
- Avoid penicillins for now (such as: amoxicillin, amoxicillin-clavulanate, ampicillin etc.)
- See an outpatient allergy specialist (see below) to evaluate if you should get tested for penicillin allergy

High Risk

Check here if applicable

- You definitely have a penicillin allergy
- You should always avoid penicillins (such as: amoxicillin, amoxicillin-clavulanate, ampicillin etc.)

Educational Campaign

Pharmacy:

SBAR emails, ASP pharmD at monthly team pharmacist meeting, pharmacy resident at work in progress meetings



Nursing:

Clinical Nurse Specialists and Nurse Educators at huddles, UBCs, charge nurse meeting, nursing research meeting, Nursing Grand Rounds



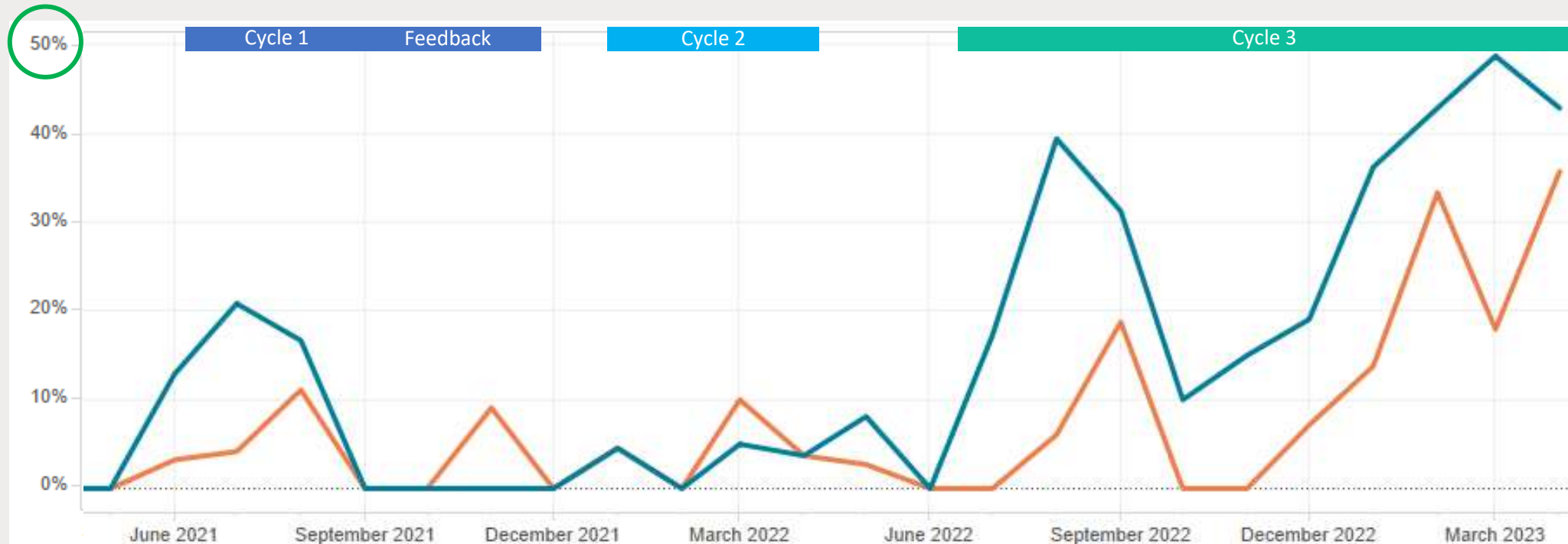
Physicians, Housestaff and APPs:

Hospitalist division meeting, Infectious Disease division meeting, Housestaff business meeting, intern orientation, APP fellow orientation, in-person rounding on floor, monthly email to senior residents rotating on intervention unit



Tracking Measures in Tableau Dashboard

Post-Intervention Screening Completion Rate and Allergy Commentary Rate by Month (MedR4 Unit)

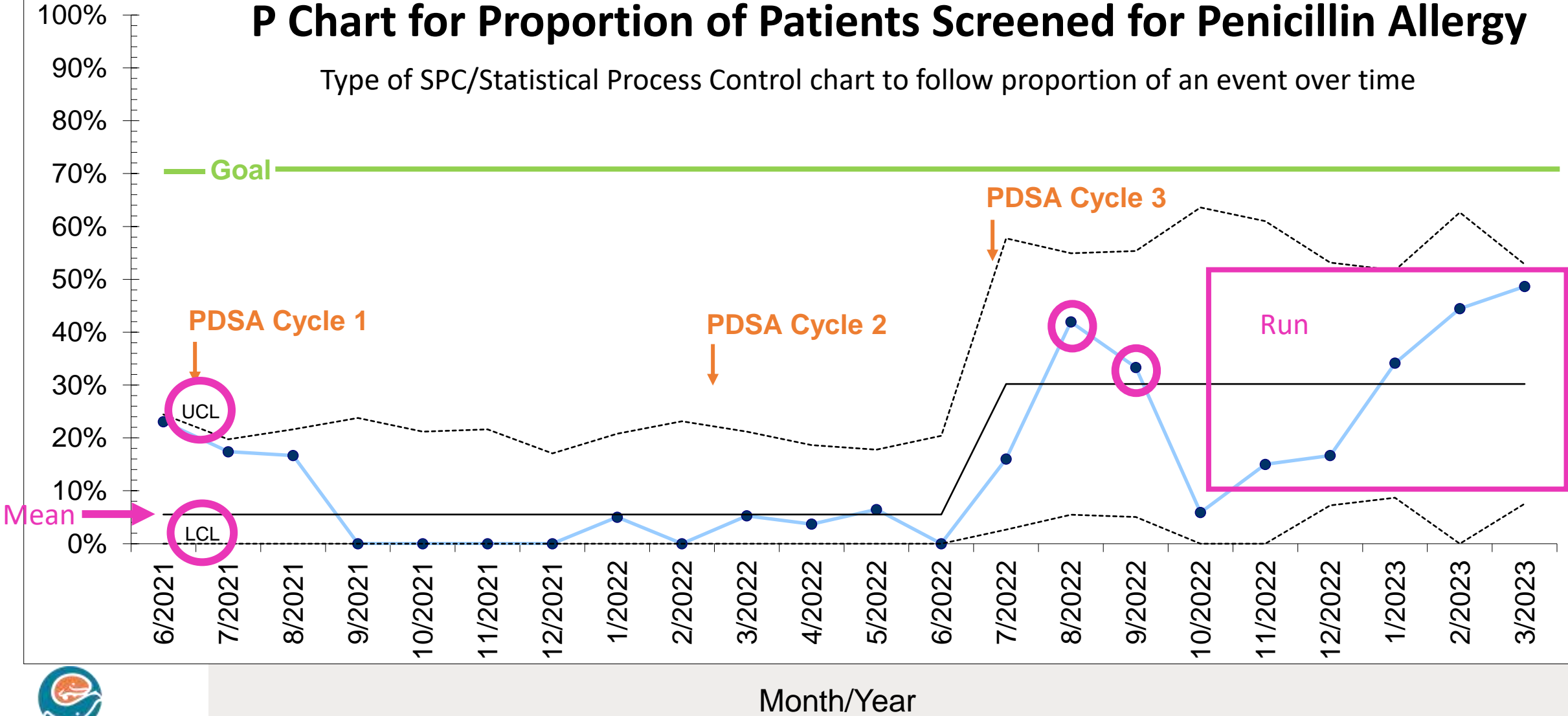


Looking at same results in a P Chart

P Chart for Proportion of Patients Screened for Penicillin Allergy

Type of SPC/Statistical Process Control chart to follow proportion of an event over time

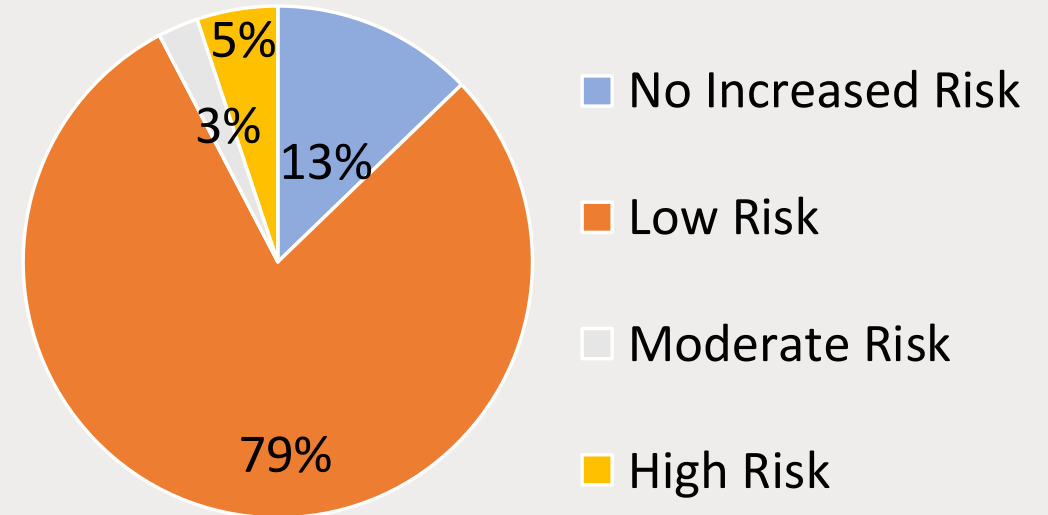
Screening Completion Rate



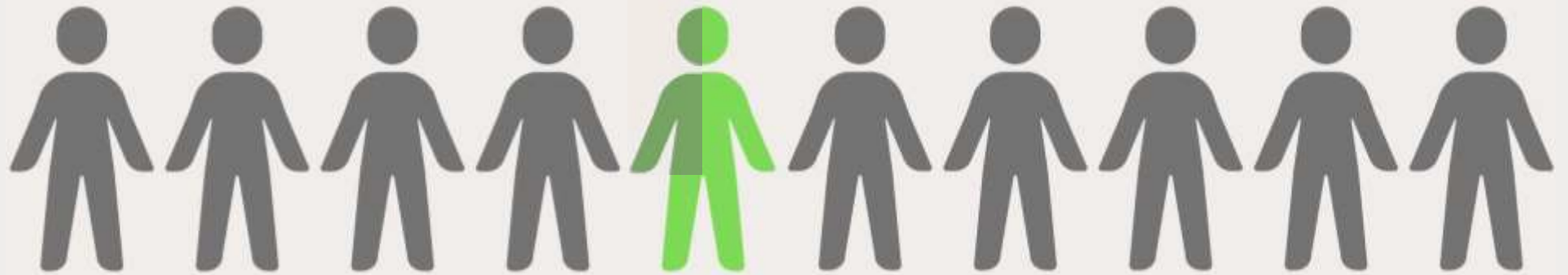
Results

- 20% (78/384) of eligible patients were screened during the pilot

Risk Level for
Screened Patients



Results



- **11%** (42/384) of patients eligible for screening had an allergy removed
 - 5 official PO Amox Challenges
- **26%** (11/42) of patients with an allergy removed were re-labeled or incompletely de-labeled initially





Lessons Learned

- Consider what resources you have
 - Nursing based strategy helpful when little Allergy or ASP resources
 - Electronic screening questionnaire required significant informatics resources
- Build strong relationships with nursing, pharmacy, housestaff and informatics
- Leverage research requirements
- Broaden educational campaign to include MAs, outpatient RNs, PMDs, patients
- Be intentional about what success means to you



Ongoing and Future Work

Poster presented at APA QI/PAS conference

Manuscript drafting in process

Sept 2023: Expanded to new inpatient unit

~Dec 2023: Expand to oncology inpatient units

Future: Target re-labeling and ED or outpatient expansion





Thank you!

Bedside RNs on MedR4

Anna Dineen RN CPN

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Ashley Van Drunen RN

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Hector Connolly Valdivia, MN, ARNP-CS, ACCNS-P,
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Derry McDonald PharmD (ASP)

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Gabriel Mendoza MD

Lori Rutman MD (QISP)

Karyn Yonekawa MD (QISP)

Scott Monke (Informatics)

Saaliha Nawaz (Informatics)

Brendan Bettinger (Analytics)

Bryan Strub (BEAR)



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Questions?

Thanks!



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Feel free to email me at Victoria.Konold@seattlechildrens.org

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- [Evaluation and Diagnosis of Penicillin Allergy for Healthcare Professionals | Antibiotic Use | CDC](#)
- [IS IT REALLY A PENICILLIN ALLERGY? \(cdc.gov\)](#)
- [Penicillin Allergy Center | AAAAI Education Center](#)

