

Antimicrobial Stewardship Strategy:

Systematic antibiotic allergy verification

Clarification and clear documentation of allergy status to help optimize the selection of antimicrobials.



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Level: **B**

Difficulty Level: **2**

Program Stage:

- Early
- ✓ Intermediate
- Advanced

For more information on these criteria and how they were developed, please see the [Antimicrobial Stewardship Strategy Criteria Reference Guide](#).

Description

This is an overview and not intended to be an all-inclusive summary. As a general principle, patients must be monitored by the health care team after changes to therapy resulting from recommendations made by the antimicrobial stewardship team.

Allergic reactions to antimicrobials are often overreported by patients, since many reactions are actually adverse effects and not true allergies. As well, the incidence of cross-reactivity between antimicrobials (e.g., among the beta-lactam agents) is often overestimated by health care providers and overstated in older references.

Both situations may result in the avoidance of safer, less costly and/or more effective antimicrobials (e.g., the use of vancomycin instead of a beta-lactam for a beta-lactam susceptible organism).

Systematic allergy assessment with appropriate documentation and interpretation for all patients—or targeting those prescribed antimicrobial agents—could help optimize the selection of antimicrobial agents and/or avoid broad-spectrum or more toxic alternatives. This may be performed by the antimicrobial stewardship team, clinical or decentralized pharmacists, or by clinicians (including dispensary pharmacists) as needed.

It is important that once an allergy is clarified or refuted, the patient's record is updated accordingly. The patient and/or patient's family should also be informed about how to clearly report a true allergy versus an adverse effect in future encounters with health care providers.

A more advanced service includes pharmacist- or physician-managed penicillin skin testing programs to verify IgE-mediated penicillin allergy in patients for whom a penicillin agent is indicated and who have an unclear history of severe reaction.

Advantages

- Promotes use of narrower-spectrum/more effective agents (e.g., alternate beta-lactam instead of fluoroquinolone for patients with a penicillin allergy) or agents with better efficacy and/or lower toxicity (e.g., cefazolin instead of vancomycin for penicillin allergy).
- Numerous references are available to provide guidance about allergy history-taking, documentation and interpretation, and assessment of incidence and risks of cross-allergenicity among beta-lactam agents.
- Improving assessment and prescribing in penicillin-allergic patients is a focus of the Association of Medical Microbiology and Infectious Disease Canada/Choosing Wisely Canada program recommendations.¹

Disadvantages

- Detailed, systematic-history taking may be time-consuming.
- Significant resources and expertise required for formal skin-testing programs.

Requirements

- Staff familiar with the required procedures.

Associated Metrics

- Number of patients with allergies assessed.
- Number of interventions related to allergy clarification and documentation.
- Clinical significance of interventions (advanced).

References

1. Choosing Wisely Canada/Association of Medical Microbiology and Infectious Disease Canada. Five things physicians and patients should question [Internet]. Toronto, ON: Choosing Wisely Canada; 2015 [updated 2015 Sep 4; cited 2015 Oct 30]. Available from: <http://www.choosingwiselycanada.org/recommendations/medical-microbiology-and-infectious-disease/>

Additional Useful References

Select articles to provide supplemental information and insight into the strategy described and/or examples of how the strategy was applied; not a comprehensive reference list. URLs are provided when materials are freely available on the Internet.

- Hippert LD, Halapy H. Assessing penicillin allergies with a structured assessment form. Can J Hosp Pharm. 2000; 53:184–92. Available from: <http://www.cjhp-online.ca/cshp/index.php/cjhp/article/view/728/863> or

An example of a penicillin allergy assessment form is provided.

- Khan DA, Solensky R. Drug Allergy. J Allergy Clin Immunol. 2010;125(2 Suppl 2):S126–37.

Discusses how to manage allergies to many drug classes, including beta-lactams and sulfonamides.

- Allergic cross-reactivity among beta-lactam antibiotics: an update. Pharm Lett. 2009;25(4):250415.

Discusses true rate of cross-sensitivity and contains protocols for graded challenges to establish tolerance.

- Seitz CS, Bröcker EB, Trautmann A. Diagnostic testing in suspected fluoroquinolone hypersensitivity. Clin Exp Allergy. 2009 Nov;39(11):1738–45. Epub 2009 Sep 3.

Used protocol of increasing oral doses to establish tolerance to quinolones from different generations.

- Unger NR, Gauthier TP, Cheung LW. Penicillin skin testing: potential implications for antimicrobial stewardship. Pharmacotherapy. 2013;33(8):856–67.

- Trubiano J, Phillips E. Antimicrobial stewardship's new weapon? A review of antibiotic allergy and pathways to “de-labeling”. Curr Opin Infect Dis. 2013;26(6):526–37. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3862073/>

Samples/Examples

- [Example 1: Sunnybrook Health Sciences Centre - Algorithm for Assessment of Patients Labeled “Allergic” to a Beta-lactam Antibiotic](#)
- [Example 2: Providence Health Care, BC - Penicillin Allergy De-labelling Program Form](#)
- [Example 3: Providence Health Care, BC - Penicillin Allergy Algorithm for Surgical Patients](#)

These documents have been generously shared by various health care institutions to help others develop and build their antimicrobial stewardship programs. We recommend crediting an institution when adopting a specific tool/form/pathway in its original form.

Examples that contain clinical or therapeutic recommendations may not necessarily be consistent with published guidelines, or be appropriate or directly applicable to other institutions. All examples should be considered in the context of the institution's population, setting and local antibiogram.

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Links with Other Strategies

- [Prescriber education](#)
- [Surgical antibiotic prophylaxis optimization](#)

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For further information

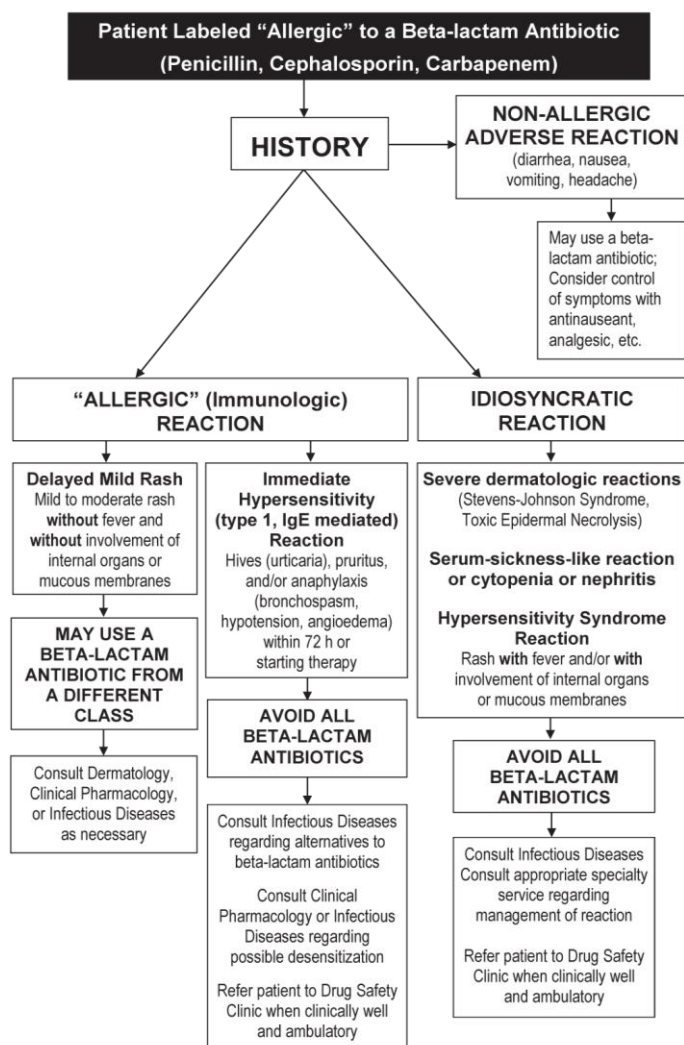
[Antimicrobial Stewardship Program](#), Infection Prevention and Control, Public Health Ontario.

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Example 1: Sunnybrook Health Sciences Centre - Algorithm for Assessment of Patients Labeled “Allergic” to a Beta-lactam Antibiotic



Sunnybrook Antimicrobial Handbook 2013

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Example 2: Providence Health Care, BC - Penicillin Allergy De-labelling Program Form



Providence Health Care Penicillin Allergy De-Labeling Program

Initial Assessment

Date:

Attach patient label here

List of antibiotics patient receiving concurrently:

List of antibiotic allergies in PHC Information System:

List of antibiotic allergies in PharmaNet:

1) Who told you that you have a penicillin allergy?
(more than one may apply)

- ☐ Parents or relatives
- ☐ Physician
- ☐ Nurse
- ☐ Pharmacist
- ☐ I don't know
- ☐ No one told me
- ☐ I know I have an allergy

2) Have you ever had a penicillin skin test?

- ☐ Yes → Go to #3
- ☐ No → Go to #4

3) If yes to 2, the penicillin skin test result was:

- ☐ Positive
- ☐ Negative
- ☐ I don't know

4) When did you last receive penicillin?

- ☐ Never
- ☐ >10 years ago
- ☐ 1-10 years ago
- ☐ Days to months ago
- ☐ I don't know

5) When was your last allergic reaction to penicillin?

- ☐ Never
- ☐ >10 years ago
- ☐ 1-10 years ago
- ☐ Days to months ago
- ☐ I don't know

6) What was the nature of your reaction to penicillin?

- | | |
|--|--|
| <input type="checkbox"/> Rash | <input type="checkbox"/> Fatigue |
| <input type="checkbox"/> Anaphylactic reaction
(BP problems, difficulty
breathing, tongue/lip
swelling) | <input type="checkbox"/> Dizziness |
| <input type="checkbox"/> Feeling jittery | <input type="checkbox"/> Nausea/vomiting |
| <input type="checkbox"/> Tingling | <input type="checkbox"/> Diarrhea |
| <input type="checkbox"/> Other (describe): | <input type="checkbox"/> Heartburn/abdominal
discomfort |
| | <input type="checkbox"/> Chest
pain/palpitations |

7) How quickly did the reaction develop after the penicillin was taken?

- ☐ Minutes to hours
- ☐ Hours to days
- ☐ More than 1 week
- ☐ I don't know

8) Have you ever been diagnosed with Stevens Johnson Syndrome or Toxic Epidermal Necrolysis related to penicillin? (Prompt for clarification: skin peels off; involvement of mouth, anus, eyes; requires hospitalization or ICU stay)

- ☐ Yes
- ☐ No
- ☐ I don't know

Total duration of interview: ____ (min)

Record of Decision (complete after discussing with Dr.)

☐ Removed allergy from PHC record and PharmaNet → Filled out forms and provided patient with wallet card

☐ Confirmed allergy on history → Documented clearly in SCM and provided patient with wallet card

☐ Referred to allergist for inpatient assessment → Completed fax cover sheet

☐ Referred to allergist for outpatient assessment → Completed fax cover sheet

☐ Patient was deemed not reliable for follow-up

☐ Patient refused further assessment

☐ Patient was discharged prior to outpatient follow up being arranged

Last Revised: December 2, 2015

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Example 2: Providence Health Care, BC - Penicillin Allergy De-labelling Program Form (continued)



Providence Health Care Penicillin Allergy De-Labeling Program

Outcome

Date of allergist visit: _____

1) Allergist who completed assessment:

☐
☐
☐

2) Result of penicillin allergy skin testing:

- ☐ Negative
☐ Positive
☐ Not done

3) Result of penicillin V 300 mg oral challenge:

- ☐ No reaction
☐ Positive reaction (specify):
☐ Not done

4) Final assessment:

- ☐ Patient was allergic to penicillin
☐ Patient was not allergic to penicillin

Update to Patient Record

1) Allergy status in PHC medical record changed?

- ☐ Caution sheet updated
☐ Order written in prescriber's order's ("please see updated caution sheet")
☐ Note written in interdisciplinary progress
☐ Allergy status on SCM changed to "patient was penicillin skin test negative and tolerated oral challenge on _____ (date)"

2) Form to request removal of penicillin allergy completed and faxed to PharmaNet?

- ☐ Yes
☐ Not applicable (allergy not on PharmaNet)

3) Patient counselled and provided with documentation (wallet card):

- ☐ Yes
☐ No (specify reason):

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Example 3: Providence Health Care, BC - Penicillin Allergy Algorithm for Surgical Patients

Suspected Penicillin Allergy in Patients Undergoing Surgery

This algorithm is meant to help surgeons, anesthesiologists, nurses, and pharmacists clarify reported penicillin allergy in the context of peri-operative antibiotic prophylaxis.

KEY MESSAGES

- Cephalosporins may be prescribed to patients with reported penicillin allergy if physicians use the clinical decision support algorithm below.
- If the reaction to penicillin occurred more than 10 years ago, the likelihood of a reaction to cephalosporin is low due to diminished IgE levels.¹
- Only 10% of all patients who report a penicillin allergy are diagnosed as skin-test positive.² Of those who are skin-test positive, there is only a 2% cross-reactivity rate with cephalosporins for patients who have a true penicillin allergy³ (i.e. 0.2% of all patients reporting allergy).
- Overall there is less than a 1 in 100,000 risk of anaphylaxis with a cephalosporin in patients reporting a penicillin allergy.¹

ASSESS THE TYPE OF REACTION TO PENICILLIN

Stevens Johnson Syndrome
OR
Toxic Epidermal Necrolysis

Do NOT administer beta-lactam.
Consider alternative antibiotic.
For vancomycin please make note on OR booking form.

Anaphylaxis within past 10 years (dyspnea, facial swelling, shock, immediate hives)

Referral to allergist for preoperative testing.
Do NOT administer beta-lactam.
Consider alternative antibiotic.
For vancomycin please make note on OR booking form.

Anaphylaxis more than 10 years ago

Proceed with administering cephalosporin in a monitored perioperative setting. Consider referral to allergist for preoperative testing.
Consider physician supervision for first dose depending on clinical history.

Unknown reaction
OR
Patient unable to recall

Non-severe reaction:
• Delayed rash (more than 24 hrs from taking drug)
• Itching
• GI intolerance

Proceed with administering cephalosporin in a monitored peri-operative setting.
Consider physician supervision for first dose depending on clinical history.

References

(1) Sullivan, et al. Skin testing to detect penicillin allergy; Journal of Allergy and Clinical Immunology, Vol 68, 1981. (2) Solensky, et al. Drug allergy: an updated practice primer; Annals of Allergy, Asthma & Immunology, Vol 105, Oct 2010 (3) Apter, et al. Is there cross-reactivity between penicillins and cephalosporins?; The American Journal of Medicine, Vol 119, April 2006



Approved by the Antimicrobial Stewardship Subcommittee
Approved by the PHC P&T Committee 2014



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