

**ANTIBIOTIC PROPHYLAXIS DURING  
CLEAN ORTHOPEDIC SURGERY  
IN CHILDREN AND ADULTS**

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This optimal use guide is intended for health professionals. It is provided for information purposes only and should not replace the judgement of the clinician who performs reserved activities by an act or a regulation. The recommendations in this guide were developed using a systematic process and are supported by the scientific literature and by the knowledge and experience of Québec clinicians and experts. For further details, go to [iness.qc.ca](http://iness.qc.ca).

**GENERAL INFORMATION**

- ▶ Antibiotic prophylaxis prescribed and administered properly in terms of the indication, the choice of antibiotic, the dose, the timing of administration and the duration is one of the most effective measures for preventing surgical site infections.
- ▶ The clinical recommendations in this guide apply to clean orthopedic surgery in children and adults.

**INDICATIONS FOR ANTIBIOTIC PROPHYLAXIS**

TYPES OF SURGERY	ANTIBIOTIC PROPHYLAXIS
<ul style="list-style-type: none"> <li>• Orthopedic surgery involving the implantation of a joint prosthesis or an internal fixation device (e.g., a nail, plate or screw)</li> <li>• Spine surgery with or without instrumentation</li> </ul>	Recommended
<ul style="list-style-type: none"> <li>• Orthopedic surgery without the implantation of a joint prosthesis or an internal fixation device (e.g., bone surgery with no implants [except spine surgery]) and soft tissue surgery using absorbable sutures)</li> <li>• Orthopedic surgery with temporary implants, such as Kirschner wires</li> </ul>	Not recommended

**CHOICE OF ANTIBIOTIC**

GENERAL CASES	SPECIAL CASES		
	MRSA carriers	Allergy to a penicillin antibiotic <sup>2</sup>	
		History of severe or non-severe reaction	History of very severe reaction
Cefazolin	Vancomycin + cefazolin <sup>1</sup>	Cefazolin <sup>3</sup>	Vancomycin

1. Vancomycin is used to prevent MRSA surgical site infections in carriers. Adding cefazolin would provide better protection against MSSA than vancomycin used alone (data with a low level of evidence).
2. See the additional information and the decision algorithm on the pages below.
3. Safe or cautious administration of cefazolin, depending on the conditions indicated in the algorithm.

MRSA: methicillin-resistant *Staphylococcus aureus*;  
MSSA: methicillin-susceptible *Staphylococcus aureus*.

Consult the updates of this guide at [iness.qc.ca](http://iness.qc.ca)

## DOSAGE AND ADMINISTRATION

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		CEFAZOLIN	VANCOMYCIN	
DOSAGE	Adult	1 preoperative dose:		
		2 g if weight < 120 kg 3 g if weight ≥ 120 kg	15 mg/kg (maximum: 2 g)	
DOSAGE	Pediatric	1 preoperative dose:		
		50 mg/kg (maximum: 2 g)	15 mg/kg (maximum: 1.5 g)	
ADMINISTRATION	Route	IV bolus over 3 to 5 minutes <b>or</b> IV infusion over 15 to 30 minutes	Perfusion IV	
			<b>Dose</b>	<b>Duration of infusion</b>
			≤ 1 g	60 minutes or more
			> 1 g and ≤ 1.5 g	90 minutes or more
ADMINISTRATION	Optimal time <sup>1</sup>	Start and complete administration within 60 minutes before surgical incision	Start and complete administration within 120 minutes before surgical incision	
		<i>Record the time at which the administration of the preoperative dose was started</i>		
DOSE REPETITION	During surgery	1 additional dose in the following cases:		
		Significant intraoperative blood loss (> 1.5 liters in an adult or > 25 ml/kg in a child) <b>or</b> duration of the operation > the length of time indicated below (in relation to the start of the administration of the preoperative dose)		
		3 to 4 hours if CrCl > 50 ml/min 8 hours if CrCl 20 to 50 ml/min Not applicable if CrCl < 20 ml/min	Not applicable	
DOSE REPETITION	After surgery	An additional dose is not recommended after incision closure, regardless of the type of surgery (even in the presence of a drain)		

1. Because of the lack of sufficient scientific evidence, no recommendation could be made regarding the optimal time for administering antibiotic prophylaxis in relation to tourniquet inflation.

CrCl: creatinine clearance.


Consult the updates of this guide at [inesss.qc.ca](http://inesss.qc.ca)

## NASAL DECOLONIZATION OF *STAPHYLOCOCCUS AUREUS*

	MUPIROCIN
POPULATION	The decolonization of nasal <i>S. aureus</i> carriage with 2% mupirocin ointment may be considered in confirmed adult carriers as an additional measure for reducing the rate of <i>S. aureus</i> surgical site infections
DOSING REGIMEN	Nasal application BID for 5 days, including at least 1 preoperative application <sup>1</sup>

1. The dosing regimen studied most often. However, the most appropriate frequency and duration and the optimal time to initiate administration in relation to the day of the operation cannot be determined from the available scientific data.

## HISTORY OF ALLERGIC REACTION TO PENICILLINS

CONFIRMED ALLERGIES TO PENICILLINS		CROSS-ALLERGIES WITH CEFAZOLIN
In 100 people reporting a history of allergy to penicillins, a diagnosis of allergy will be confirmed in:		In 100 people with a confirmed allergy to penicillins, a cross-reaction with cefazolin might be observed in:
ADULTS	CHILDREN	
Fewer than 10	Fewer than 6 Reactions mostly observed in children: non-severe delayed cutaneous eruptions	
<b>Carefully assess the patient's allergy status during the preoperative visit before considering an antibiotic other than cefazolin</b>		
Click <a href="#">here</a>  to view the algorithm for help in choosing an antibiotic prophylaxis.		

CI: confidence interval.

## REFERENCES

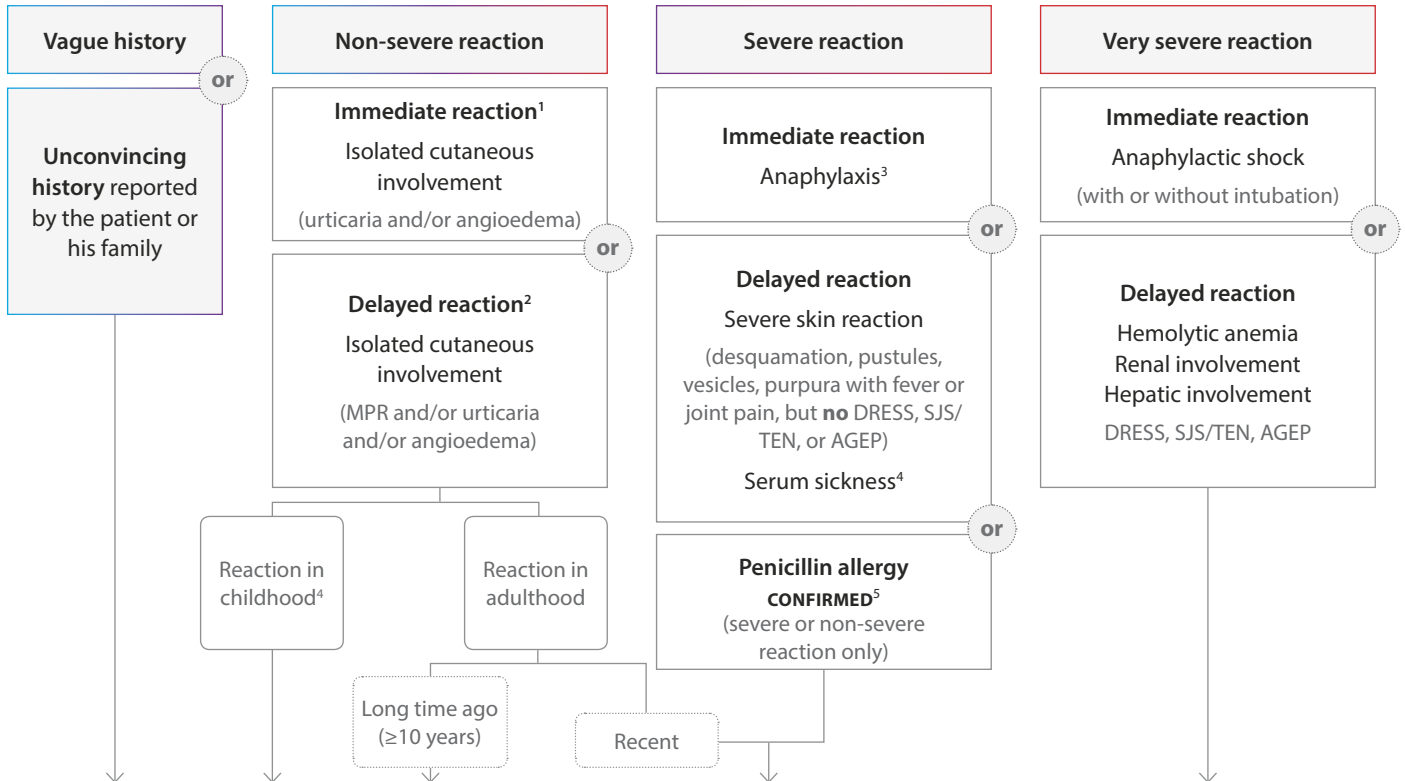
To consult the references, go to the following report:

[Antibioprophylaxie lors des chirurgies orthopédiques propres chez l'enfant et l'adulte](#)

# ANTIBIOTIC PROPHYLAXIS DURING CLEAN ORTHOPEDIC SURGERY IN CHILDREN AND ADULTS

## EVERITY OF PREVIOUS ALLERGIC REACTION TO PENICILLIN ANTIBIOTICS

DETERMINE THE SEVERITY OF THE REACTION



### THE FOLLOWING CAN BE PRESCRIBED SAFELY

Cefazolin

1. Immediate reaction (type I, or IgE-mediated): usually occurs within 1 hour after taking the **first dose** of an antibiotic.
2. Delayed reaction (type II, III or IV): may occur at any time from 1 hour after administration of a drug.
3. Anaphylaxis without shock or intubation: requires an extra level of vigilance.
4. Delayed skin reactions and serum sickness-like reactions that occur in children on antibiotics are generally nonallergic and may be of viral origin.
5. Without recommendations for other beta-lactams.
6. All beta-lactams: penicillins, cephalosporins and carbapenems.

For further information, consult [the interactive tool](#) and [the decision support tool](#).

**AGEP** : acute generalized exanthematous pustulosis;  
**DRESS** : drug reaction with eosinophilia and systemic symptoms;  
**MPR** : maculopapular rash;  
**SJS** : Stevens–Johnson syndrome;  
**TEN** : toxic epidermal necrolysis.

### PRESCRIBE THE FOLLOWING WITH CAUTION

Cefazolin

The 1<sup>st</sup> dose should **always** be administered under medical supervision.

#### If history of:

- **Immediate** reactions, a drug provocation test should be performed;
- **Delayed** reactions, the patient or his family should be advised of the risk of possible recurrence within days of using the antibiotic.

### AVOID PRESCRIBING

Beta-lactam<sup>6</sup>

**Privilege another class of antibiotic.**  
 If strong indication of a beta-lactam, obtain a consultation with specialized services.

### PRESCRIBE THE FOLLOWING

Vancomycin

DECISION-MAKING IN THE CHOICE OF ANTIBIOTIC AND CRITERIA FOR ADMINISTRATION