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# Guide for Nitrofurantoin Product Selection

Macrochantin and Macrobid are often selected mistakenly by providers as a result of computerized order entry methods such as drop down boxes or preference lists.

This guide is intended to assist providers with product selection including indication, organism susceptibility, and dose.

The Nitrofurantoin summary compares the two available product formulations to assist in prescribing.

	Macrobid <sup>1</sup>	Macrochantin <sup>2</sup>
<b>Generic</b>	Nitrofurantoin macrocrystals plus nitrofurantoin monohydrate	Nitrofurantoin macrocrystals
<b>Susceptible Organisms (in vitro and in clinical infections)</b>	<u>Gram Positive Aerobes</u> <i>Staphylococcus saprophyticus</i> <i>Staphylococcus aureus</i> <i>Enterococci (e.g., Enterococcus faecalis)</i>	<u>Gram Negative Aerobes</u> <i>Escherichia coli</i>
<b>FDA Indications</b>	Acute uncomplicated UTI treatment	UTI prophylaxis and acute uncomplicated UTI treatment
	Nitrofurantoin concentrates in the bladder and should not be used to treat pyelonephritis.	
<b>Typical Dosing</b>	Guideline: 100 mg by mouth with food every 12 hours for 5 days <sup>3</sup> Package Insert: 100 mg by mouth with food every 12 hours for 7 days	<i>Prophylaxis:</i> 50 to 100mg by mouth with food once daily at bedtime <i>Treatment:</i> 50 to 100 mg by mouth with food four times/day for 7 days or at least 3 days after urine is sterile
<b>Dosing Frequency</b>	<i>Treatment:</i> Twice daily	<i>Prophylaxis:</i> Once daily <i>Treatment:</i> Four times daily
<b>Notes</b>	The monohydrate mixes with the gastric and intestinal fluids to create a gel that releases nitrofurantoin over time.	
<b>Mechanism of Action</b>	Nitrofurantoin is a bactericidal agent in the urine at therapeutic doses. Nitrofurantoin inhibits protein synthesis, aerobic energy metabolism, DNA synthesis, RNA synthesis and cell wall synthesis. The broad mechanism of action may contribute to the lack of acquired bacterial resistance. <sup>1,2</sup>	
<b>Drug Interactions</b>	Antacids with magnesium trisilicate (decreased rate and extent of absorption), uricosuric drugs like probenecid and sulfapyrazone (decreased renal tubular excretion; may decrease efficacy and increase side effects).	
<b>Available Dosages</b>	100mg capsules	25mg, 50mg, and 100mg capsules

Adverse events have been reported to be similar across both formulations.<sup>4</sup> Current acute uncomplicated UTI guidelines recommend the use of Macrobid.<sup>3</sup> Furadantin (Nitrofurantoin) oral suspension (25mg/5mL) is similar to Macrochantin in organism coverage and indications.<sup>5</sup> Nitrofurantoin is not active against *Proteus* species, *Serratia* species, or *Pseudomonas* species.

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## (continued)

### American Geriatrics Society 2019 Update of Beers Criteria on Nitrofurantoin

- Updated Recommendation: Avoid the use of nitrofurantoin in patients with a creatinine clearance <30mL/min (quality of evidence: low; strength of recommendation: strong).<sup>6</sup>
  - Previously, it was recommended to avoid use in patients with a creatinine clearance of <60mL/min.
  - The recommendation was updated based on retrospective trials that contradict prior evidence that showed decreased efficacy in patients with a creatinine clearance <60mL/min.<sup>7-9</sup>
- The long-term use avoidance recommendation has not changed based on the risk for irreversible pulmonary fibrosis, hepatotoxicity, and peripheral neuropathy.<sup>6</sup>

### Sources

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