



NDA 19-384/S-052

Merck & Co., Inc.
Attention: Mr. Peter Kusma
Manager, Regulatory Affairs
P.O. Box 1000, UG2CD-48
North Wales, PA 19454-1099

Dear Mr. Kuzma:

Please refer to your supplemental new drug application (NDA) dated, August 6, 2008 and received August 6, 2008, submitted under section 505(b) of the Federal Food, Drug, and Cosmetic Act (FDCA) for NOROXIN[®] (norfloxacin) Tablets.

We acknowledge receipt of your submissions dated: September 5, September 25, and October 2, 2008.

Reference is also made to the FDA letter dated July 7, 2008 notifying you, under Section 505(o)(4) of the FDCA, of new safety information that we believe should be included in the labeling for fluoroquinolone antimicrobial drugs. This information pertained to the risk of tendon-related adverse events with the use of fluoroquinolones.

Your supplemental new drug application provides for revisions to the labeling for NOROXIN (norfloxacin) consistent with our July 7, 2008 letter and August 25, September 17, and October 2, 2008 correspondences.

This supplemental new drug application provides for the following changes to product labeling (additions are noted by underline and deletions are noted by ~~strikethrough~~):

1. A **Boxed Warning** with bolded font and enclosed in a black box was added to the beginning of the labeling as follows:

<p><u>WARNING:</u> <u>Fluoroquinolones, including NOROXIN[®], are associated with an increased risk of tendinitis and tendon rupture in all ages. This risk is further increased in older patients usually over 60 years of age, in patients taking corticosteroid drugs, and in patients with kidney, heart or lung transplants (See WARNINGS).</u></p>

2. The **WARNINGS/Tendon Effects** subsection of the labeling was renamed "**Tendinopathy and Tendon Rupture**", moved to the first paragraph of the **WARNINGS** section, and updated as follows:

Tendinopathy and Tendon Rupture: Fluoroquinolones, including NOROXIN, are associated with an increased risk of tendinitis and tendon rupture in all ages. This adverse reaction most frequently involves the Achilles tendon, and rupture of the Achilles tendon may require surgical repair. Tendinitis and tendon rupture in the rotator cuff (the shoulder), the hand, the biceps, the thumb, and other tendon sites have also been reported. The risk of developing fluoroquinolone-associated tendinitis and tendon rupture is further increased in older patients usually over 60 years of age, in patients taking corticosteroid drugs, and in patients with kidney, heart or lung transplants. Factors, in addition to age and corticosteroid use, that may independently increase the risk of tendon rupture include strenuous physical activity, renal failure, and previous tendon disorders such as rheumatoid arthritis. Tendinitis and tendon rupture have also occurred in patients taking fluoroquinolones who do not have the above risk factors. Tendon rupture can occur during or after completion of therapy; cases occurring up to several months after completion of therapy have been reported. NOROXIN should be discontinued if the patient experiences pain, swelling, inflammation or rupture of a tendon. Patients should be advised to rest at the first sign of tendinitis or tendon rupture, and to contact their healthcare provider regarding changing to a non-quinolone antimicrobial drug.

~~**Tendon Effects:** Ruptures of the shoulder, hand, Achilles tendon or other tendons that required surgical repair or resulted in prolonged disability have been reported in patients receiving quinolones, including norfloxacin. Post-marketing surveillance reports indicate that this risk may be increased in patients receiving concomitant corticosteroids, especially the elderly. Norfloxacin should be discontinued if the patient experiences pain, inflammation, or rupture of a tendon. Patients should rest and refrain from exercise until the diagnosis of tendonitis or tendon rupture has been excluded. Tendon rupture can occur during or after therapy with quinolones, including norfloxacin.~~

3. The information on tendon adverse reactions in the **PRECAUTIONS/ Information for Patients** subsection of the labeling was moved to the first bullet of the subsection and updated as follows:

- to contact their healthcare provider if they experience pain, swelling, or inflammation of a tendon, or weakness or inability to use one of their joints; rest and refrain from exercise; and discontinue NOROXIN treatment. The risk of severe tendon disorders with fluoroquinolones is higher in older patients usually over 60 years of age, in patients taking corticosteroid drugs, and in patients with kidney, heart or lung transplants.

~~-to discontinue treatment and inform their physician if they experience pain, inflammation, or rupture of a tendon, and to rest and refrain from exercise. The risk of serious tendon disorders with quinolones is higher in those over 65 years of age and those on corticosteroids.~~

4. The information on tendon adverse events in the **PRECAUTIONS/Geriatric Use** subsection of the labeling was moved to the first paragraph of the subsection and updated as follows:

Geriatric patients are at increased risk for developing severe tendon disorders including tendon rupture when being treated with a fluoroquinolone such as NOROXIN. This risk is further increased in patients receiving concomitant corticosteroid therapy. Tendinitis or tendon rupture can involve the Achilles, hand, shoulder, or other tendon sites and can occur during or after completion of therapy; cases occurring up to several months after fluoroquinolone treatment have been reported. Caution should be used when prescribing NOROXIN to elderly patients especially those on corticosteroids. Patients should be informed of this potential side effect and advised to discontinue NOROXIN and contact their healthcare provider if any symptoms of tendinitis or tendon rupture occur (See **Boxed Warning, WARNINGS, and ADVERSE REACTIONS/Post-Marketing Adverse Event Reports**).

~~Patients over 65 years of age are at increased risk for developing severe tendon disorders including tendon rupture when being treated with a fluoroquinolone such as NOROXIN. This risk is further increased in patients receiving concomitant corticosteroid therapy. Tendon rupture can usually involve the Achilles, hand or shoulder tendons and can occur during therapy or up to a few months post completion of therapy. Caution should be used when prescribing NOROXIN to elderly patients especially those on corticosteroids. Patients should be informed of this potential side effect and advised to discontinue therapy and inform their physicians if any tendon symptoms occur.~~

5. The Patient Package Insert was replaced with a Medication Guide, and the complete Medication Guide is located at the end of the Package Insert

We have completed our review of this supplemental application. This application is approved, effective on the date of this letter, for use as recommended in the agreed-upon labeling text.

CONTENT OF LABELING

As soon as possible, but no later than 14 days from the date of this letter, please submit the content of labeling [21 CFR 314.50(l)] in structured product labeling (SPL) format as described at <http://www.fda.gov/oc/datacouncil/spl.html> that is identical to the enclosed labeling (text for the package insert, text for the patient package insert). Upon receipt, we will transmit that version to the National Library of Medicine for public dissemination. For administrative purposes, please designate this submission, “**SPL for approved supplement NDA 19-384/S-052.**”

In addition, within 21 days of the date of this letter, amend any pending applications for this NDA with content of labeling in structured product labeling (SPL) format to include the changes approved in these applications.

Marketing the product with FPL that is not identical to the approved labeling text and in the required format may render the product misbranded and an unapproved new drug.

We request that the revised labeling approved today be available on your website within 10 days of receipt of this letter and that the revised labeling be reflected in the next printing of the labeling. While you may use labeling already printed as of the date of this letter until January 3, 2009, after that date we request that the revised labeling accompany any newly shipped product.

Failure to make these changes promptly could make your product misbranded under Sections 201(n) and 502(a) of FDCA.

Please note that you must comply with the Medication Guide Regulations as specified in 21 CFR 208. In particular, the carton and container labels must comply with 21 CFR 208.24 (a)(2)(d). Please submit proposed labels for review within 30 days of receipt of this letter.

LETTERS TO HEALTH CARE PROFESSIONALS

If you issue a letter communicating important information about this drug product (i.e., a “Dear Health Care Professional” letter), we request that you submit a copy of the letter to this NDA and a copy to the following address:

MEDWATCH
Food and Drug Administration
5515 Security Lane
HFD-001, Suite 5100
Rockville, MD 20852

We remind you that you must comply with reporting requirements for an approved NDA (21 CFR 314.80 and 314.81).

If you have any questions, please call Kristen Miller, Pharm.D., Safety Regulatory Project Manager, at (301) 796-1600.

Sincerely,

{See appended electronic signature page}

Renata Albrecht, M.D.
Director
Division of Special Pathogen and Transplant Products
Office of Antimicrobial Products
Center for Drug Evaluation and Research

Enclosure (Final Product Labeling, including Medication Guide)

**This is a representation of an electronic record that was signed electronically and
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/s/

Renata Albrecht
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