



NDA 020184/S-019

**SUPPLEMENT APPROVAL**

Xoma (US) LLC  
Attention: Cheryl A. Madsen  
Director, Regulatory Affairs and Compliance  
2910 Seventh Street  
Berkeley, CA 94710

Dear Ms. Madsen:

Please refer to your Supplemental New Drug Application (sNDA) dated March 19, 2012 and received March 20, 2012 submitted under section 505(b)(1) of the Federal Food, Drug, and Cosmetic Act (FDCA) for Aceon (perindopril erbumine) 2 mg, 4 mg, and 8 mg Tablets.

This "Prior Approval" supplemental new drug application provides for labeling revised as follows:

1. In **HIGHLIGHTS**, the boxed warning was changed:

<p style="text-align: center;"><b>WARNING: FETAL TOXICITY</b></p> <p style="text-align: center;"><i>See full prescribing information for complete boxed warning.</i></p> <ul style="list-style-type: none"><li>• <b>When pregnancy is detected, discontinue ACEON as soon as possible (5.4)</b></li><li>• <b>Drugs that act directly on the renin-angiotensin system can cause injury and death to the developing fetus (5.4)</b></li></ul>
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2. In **FULL PRESCRIBING INFORMATION**, the boxed warning was changed:

<p style="text-align: center;"><b>WARNING: FETAL TOXICITY</b></p> <ul style="list-style-type: none"><li>• <b>When pregnancy is detected, discontinue ACEON as soon as possible. (5.4)</b></li><li>• <b>Drugs that act directly on the renin-angiotensin system can cause injury and death to the developing fetus. (5.4)</b></li></ul>
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3. Under **WARNINGS AND PRECAUTIONS**, the section was changed from:

**5.4 Fetal/Neonatal Morbidity and Mortality**

ACE inhibitors can cause fetal and neonatal morbidity and death when administered to pregnant women. Several dozen cases have been reported in the world literature. When pregnancy is detected, ACE inhibitors should be discontinued as soon as possible.

The use of ACE inhibitors during the second and third trimesters of pregnancy has been associated with fetal and neonatal injury, including hypotension, neonatal skull hypoplasia, anuria, reversible or irreversible renal failure and death. Oligohydramnios has also been reported, presumably resulting from decreased fetal renal function; oligohydramnios in this setting has been associated with fetal limb contractures, craniofacial deformation and hypoplastic lung development. Prematurity, intrauterine growth retardation, patent ductus arteriosus, and other structural cardiac malformations, as well as neurologic malformations, have been reported following exposure to ACE inhibitors during the first trimester of pregnancy.

When patients become pregnant, healthcare providers should make every effort to discontinue the use of ACEON as soon as possible. Rarely (probably less often than once in every thousand pregnancies), no alternative to ACE inhibitors will be found. In these rare cases, the mothers should be apprised of the potential hazards to their fetuses, and serial ultrasound examinations should be performed to assess the intra-amniotic environment.

If oligohydramnios is observed, ACEON® (perindopril erbumine) should be discontinued unless it is considered life-saving for the mother. Contraction stress testing (CST), a non-stress test (NST) or biophysical profiling (BPP) may be appropriate, depending upon the week of pregnancy. Patients and healthcare providers should be aware, however, that oligohydramnios may not appear until after the fetus has sustained irreversible injury. Infants with histories of *in utero* exposure to ACE inhibitors should be closely observed for hypotension, oliguria and hyperkalemia. If oliguria occurs, attention should be directed toward support of blood pressure and renal perfusion. Exchange transfusion or dialysis may be required as a means of reversing hypotension and/or substituting for disordered renal function. Perindopril, which crosses the placenta, can theoretically be removed from the neonatal circulation by these means, but limited experience has not shown that such removal is central to the treatment of these infants.

To:

## **5.4 Fetal toxicity**

### **Pregnancy Category D**

Use of drugs that act on the renin-angiotensin system during the second and third trimesters of pregnancy reduces fetal renal function and increases fetal and neonatal morbidity and death. Resulting oligohydramnios can be associated with fetal lung hypoplasia and skeletal deformations. Potential neonatal adverse effects include skull hypoplasia, anuria, hypotension, renal failure, and death. When pregnancy is detected discontinue ACEON as soon as possible [*see Use in specific Populations (8.1)*].

4. Under **USE IN SPECIFIC POPULATIONS**, the section was changed from:

#### **8.1 Pregnancy**

Pregnancy Category D [*see Boxed Warning and Warnings and Precautions (5.4)*]. Radioactivity was detectable in fetuses after administration of <sup>14</sup>C-perindopril to pregnant rats.

To:

#### **8.1 Pregnancy**

Pregnancy Category D [*see [Boxed Warning](#) and Warnings and Precautions (5.4)*].

Use of drugs that act on the renin-angiotensin system during the second and third trimesters of pregnancy reduces fetal renal function and increases fetal and neonatal morbidity and death. Resulting oligohydramnios can be associated with fetal lung hypoplasia and skeletal deformations. Potential neonatal adverse effects include skull hypoplasia, anuria, hypotension, renal failure, and death. When pregnancy is detected, discontinue ACEON as soon as possible. These adverse outcomes are usually associated with use of these drugs in the second and third trimester of pregnancy. Most epidemiologic studies examining fetal abnormalities after exposure to antihypertensive use in the first trimester have not distinguished drugs affecting the renin-angiotensin system from other antihypertensive agents. Appropriate management of maternal hypertension during pregnancy is important to optimize outcomes for both mother and fetus.

In the unusual case that there is no appropriate alternative to therapy with drugs affecting the renin-angiotensin system for a particular patient, apprise the mother of the potential risk to the fetus. Perform serial ultrasound examinations to assess the intra-amniotic environment. If oligohydramnios is observed, discontinue ACEON, unless it is considered lifesaving for the mother. Fetal testing may be appropriate, based on the week of pregnancy. Patients and physicians should be aware, however, that oligohydramnios may not appear until after the fetus has sustained irreversible injury. Closely observe infants with histories of in utero

exposure to ACEON for hypotension, oliguria, and hyperkalemia. [*see Use in Specific Populations(8.4)*]

Radioactivity was detectable in fetuses after administration of 14C-perindopril to pregnant rats.

5. Under **USE IN SPECIFIC POPULATIONS/Pediatric Use**, the section was changed from:

**8.4 Pediatric Use**

Safety and effectiveness of ACEON in pediatric patients have not been established.

To:

Neonates with a history of in utero exposure to ACEON:

If oliguria or hypotension occurs, direct attention toward support of blood pressure and renal perfusion. Exchange transfusions or dialysis may be required as a means of reversing hypotension and/or substituting for disordered renal function. Perindopril, which crosses the placenta, can theoretically be removed from the neonatal circulation by these means, but limited experience has not shown that such removal is central to the treatment of these infants.

Safety and effectiveness of ACEON in pediatric patients have not been established.

6. Under **PATIENT COUNSELING INFORMATION**, the section was changed from:

Inform female patients of childbearing age that use of drugs, such as ACEON, that act on the renin-angiotensin system during pregnancy may cause serious problems in the fetus and infant. Patients taking ACEON® (perindopril erbumine) who are or plan to become pregnant should immediately notify their healthcare provider.

Tell patients to report immediately signs or symptoms suggesting angioedema (swelling of face, extremities, eyes, lips, tongue, hoarseness or difficulty in swallowing or breathing) and to take no more drug before consulting a healthcare provider.

Tell patients to report promptly any indication of infection (*e.g.*, sore throat, fever) which could be a sign of neutropenia.

To:

Female patients of childbearing age should be told about the consequences of exposure to ACEON during pregnancy. Discuss treatment options with women

planning to become pregnant. Patients should be asked to report pregnancies to their physicians as soon as possible.

Tell patients to report promptly any indication of infection (*e.g.*, sore throat, fever) which could be a sign of neutropenia.

7. The revision date and version number were updated.

There are no other changes from the last approved package insert.

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

### **CONTENT OF LABELING**

As soon as possible, but no later than 14 days from the date of this letter, submit the content of labeling [21 CFR 314.50(l)] in structured product labeling (SPL) format using the FDA automated drug registration and listing system (eLIST), as described at <http://www.fda.gov/ForIndustry/DataStandards/StructuredProductLabeling/default.htm>. Content of labeling must be identical to the enclosed labeling (text for the package insert), with the addition of any labeling changes in pending “Changes Being Effectuated” (CBE) supplements, as well as annual reportable changes not included in the enclosed labeling.

Information on submitting SPL files using eLIST may be found in the guidance for industry titled “SPL Standard for Content of Labeling Technical Qs and As” at <http://www.fda.gov/downloads/DrugsGuidanceComplianceRegulatoryInformation/Guidances/UCM072392.pdf>.

The SPL will be accessible from publicly available labeling repositories. Also within 14 days, amend all pending supplemental applications for this NDA, including CBE supplements for which FDA has not yet issued an action letter, with the content of labeling [21 CFR 314.50(l)(1)(i)] in MS Word format, that includes the changes approved in this supplemental application, as well as annual reportable changes and annotate each change. To facilitate review of your submission, provide a highlighted or marked-up copy that shows all changes, as well as a clean Microsoft Word version. The marked-up copy should provide appropriate annotations, including supplement number(s) and annual report date(s).

### **PROMOTIONAL MATERIALS**

You may request advisory comments on proposed introductory advertising and promotional labeling. To do so, submit the following, in triplicate, (1) a cover letter requesting advisory comments, (2) the proposed materials in draft or mock-up form with annotated references, and (3) the package insert(s) to:

Food and Drug Administration  
Center for Drug Evaluation and Research

Division of Drug Marketing, Advertising, and Communications  
5901-B Ammendale Road  
Beltsville, MD 20705-1266

You must submit final promotional materials and package insert(s), accompanied by a Form FDA 2253, at the time of initial dissemination or publication [21 CFR 314.81(b)(3)(i)]. Form FDA 2253 is available at <http://www.fda.gov/opacom/morechoices/fdaforms/cder.html>; instructions are provided on page 2 of the form. For more information about submission of promotional materials to the Division of Drug Marketing, Advertising, and Communications (DDMAC), see <http://www.fda.gov/AboutFDA/CentersOffices/CDER/ucm090142.htm>.

All promotional materials that include representations about your drug product must be promptly revised to be consistent with the labeling changes approved in this supplement, including any new safety information [21 CFR 314.70(a)(4)]. The revisions in your promotional materials should include prominent disclosure of the important new safety information that appears in the revised package labeling. Within 7 days of receipt of this letter, submit your statement of intent to comply with 21 CFR 314.70(a)(4) to the address above or by fax to 301-847-8444.

### **REPORTING REQUIREMENTS**

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:

Lori Anne Wachter, RN, BSN  
Regulatory Project Manager for Safety  
(301) 796-3975

Sincerely,

*{See appended electronic signature page}*

Mary Ross Southworth, Pharm.D.  
Deputy Director for Safety  
Division of Cardiovascular and Renal Products  
Office of Drug Evaluation 1  
Center for Drug Evaluation and Research

ENCLOSURE:  
Content of Labeling

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**This is a representation of an electronic record that was signed electronically and this page is the manifestation of the electronic signature.**  
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/s/  
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MARY R SOUTHWORTH  
04/11/2012