CENTER FOR DRUG EVALUATION AND RESEARCH

APPLICATION NUMBER:

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PROPRIETARY NAME REVIEW(S)

Department of Health and Human Services
Public Health Service
Food and Drug Administration
Center for Drug Evaluation and Research
Office of Surveillance and Epidemiology

Date:	October 27, 2010
Application Type/Number:	NDA 021463
Through:	Todd Bridges, RPh, Team Leader Denise Toyer, PharmD, Deputy Director Division of Medication Error Prevention and Analysis (DMEPA)
From:	Colleen E. Brennan, RPh, Safety Evaluator Division of Medication Error Prevention and Analysis (DMEPA)
Subject:	Proprietary Name Review
Drug Name:	Fortesta (Testosterone) Gel, 2%
Applicant:	Endo Pharmaceuticals, Inc.
OSE RCM #:	2010-1567

***** Note: This review contains proprietary and confidential information that should not be released to the public.*****

1 INTRODUCTION

This re-assessment of the proprietary name responds to a notification that NDA 021463 may be approved within 90 days. This NDA received a Complete Response on October 16, 2009. The Applicant responded to the Complete Response letter on June 30, 2010. The Division of Medication Error Prevention and Analysis (DMEPA) found the proposed proprietary name, Fortesta, acceptable in OSE Review #2009-1117, dated July 29, 2009. The Division of Reproductive and Urology Products (DRUP) did not have any concerns with the proposed name, Fortesta, and the Division of Drug Marketing, Advertising and Communications (DDMAC) found the name acceptable from a promotional perspective on June 18, 2009.

2 METHODS AND RESULTS

For the proposed proprietary name, DMEPA staff searched a standard set of databases and information sources (see section 4) to identify names with orthographic and phonetic similarity to the proposed name that have been approved since the previous OSE proprietary name review. We used the same search criteria that were used in OSE Review #2009-1117 for the proposed proprietary name, Fortesta. Since none of the proposed product characteristics were altered we did not re-evaluate previous names of concern. Additionally, DMEPA searched the United States Adopted Names (USAN) stem list to determine if the name contains any USAN stems as of the last USAN updates. DMEPA bases the overall risk assessment on the findings of a Failure Mode and Effects Analysis (FMEA) of the proposed proprietary name, and focuses on the avoidance of medication errors.

The searches of the databases yielded no new names thought to look or sound similar to Fortesta and represent a potential source of drug name confusion. DMEPA staff also did not identify any United States Adopted Names (USAN) stems in the proposed proprietary name Fortesta, as of September 10, 2010.

3 CONCLUSIONS AND RECOMMENDATIONS

The Proprietary Name Risk Assessment findings indicate that the proposed name, Fortesta, is not vulnerable to name confusion that can lead to medication errors nor is the name considered promotional. Thus, the Division of Medication Error Prevention and Analysis (DMEPA) has no objection to the proprietary name, Fortesta, for this product at this time.

DMEPA considers this a final review; however, if approval of the NDA is delayed beyond 90 days from the date of this review, the Division of Reproductive and Urology Products should notify DMEPA because the proprietary name must be re-reviewed prior to the new approval date.

4 REFERENCES

1. **OSE review #2009-1117 Proprietary Name Review of Fortesta; Abdus-Samad, Jibril**

2. **Drugs@FDA** ***(****http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm****)***
   Drugs@FDA contains most of the drug products approved since 1939. The majority of labels, approval letters, reviews, and other information are available for drug products approved from 1998 to the present. Drugs@FDA contains official information about FDA approved brand name, generic drugs, therapeutic biological products, prescription and over-the-counter human drugs and discontinued drugs and "Chemical Type 6" approvals.

3. **USAN Stems** ***(****http://www.ama-assn.org/ama/pub/about-ama/our-people/coalitions-consortiums/united-states-adopted-names-council/naming-guidelines/approved-stems.shtml****)***
   USAN Stems List contains all the recognized USAN stems.

4. **CDER Proposed Names List**
   Compiled list of proposed proprietary names submitted to the Division of Medication Error Prevention and Analysis (DMEPA) for review. The list is updated weekly and maintained by DMEPA

This is a representation of an electronic record that was signed electronically and this page is the manifestation of the electronic signature.

/s/

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10/27/2010

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11/01/2010

DENISE P TOYER
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Department of Health and Human Services
Public Health Service
Food and Drug Administration
Center for Drug Evaluation and Research
Office of Surveillance and Epidemiology

Date:	July 29, 2009
To:	Scott Monroe, MD, Director Division of Reproductive and Urologic Products (DRUP)
Through:	Todd Bridges, RPh, Team Leader Denise Toyer, PharmD, Deputy Director Carol Holquist, RPh, Director Division of Medication Error Prevention and Analysis (DMEPA)
From:	Jibril Abdus-Samad, PharmD, Safety Evaluator Division of Medication Error Prevention and Analysis (DMEPA)
Subject:	Proprietary Name Review
Drug Name(s):	Fortesta (Testosterone) Gel, 2%
Application Type/Number:	NDA 21-463
Applicant:	ProStrakan, Inc.
OSE RCM #:	2009-1117

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CONTENTS

EXECUTIVE SUMMARY

Fortesta is the proposed proprietary name for Testosterone Gel. This proposed name was evaluated from a safety and promotional perspective based on the product characteristics provided by the Applicant. We sought input from pertinent disciplines involved with the review of this application and considered it accordingly. Our evaluation did not identify concerns that would render the name unacceptable based on the product characteristics and safety profile known at the time of this review. Thus, DMEPA finds the proposed proprietary name, Fortesta, conditionally acceptable for this product. The proposed proprietary name must be re-reviewed 90 days before approval of the NDA.

Additionally, if any of the proposed product characteristics as stated in this review are altered, DMEPA rescinds this finding and the name must be resubmitted for review. The conclusions upon re-review are subject to change.

1 BACKGROUND

1.1 INTRODUCTION

This review is in response to a request from ProStrakan, Inc. dated June 3, 2009, for an assessment of the proposed proprietary name, Fortesta, regarding potential name confusion with other proprietary or established drug names in the usual practice settings. Additionally, the container label, carton and insert labeling were submitted for review and comment on April 17, 2009, however they will be evaluated under a separate review (OSE# 2009-897).

1.2 REGULATORY HISTORY

The Applicant submitted a request for assessment of the proposed proprietary name, Fortigel, on April 17, 2009. (b) (4) Subsequently, in a correspondence dated June 3, 2009, the Applicant withdrew its request to review the primary proposed proprietary name, Fortigel, and submitted a request for assessment of a secondary proposed proprietary name, Fortesta.

1.3 PRODUCT INFORMATION

Fortesta (Testosterone) gel has a proposed indication for testosterone replacement therapy in adult male hypogonadism exhibited as primary hypogonadism, hypogonadotrophic or secondary hypogonadism, (b) (4) The product will be available in 2% gel that will be administered by use of a metered pump device that delivers 0.5 g gel (10 mg of testosterone) per complete depression. The recommended starting dose of Fortesta is a total of 2 g of gel (40 mg of testosterone or 4 pumps depressions) applied topically once daily. Fortesta will be available in 60 g canisters which are stored at room temperature (25º C or 77º F).

2 METHODS AND MATERIALS

Appendix A describes the general methods and materials used by the Division of Medication Error Prevention and Analysis (DMEPA) when conducting a proprietary name risk assessment for all proprietary names. Sections 2.1 and 2.2 identify specific information associated with the methodology for the proposed proprietary name, Fortesta.

2.1 SEARCH CRITERIA

For this review, particular consideration was given to drug names beginning with the letter 'F' when searching to identify potentially similar drug names, as 75% of the confused drug names reported by the USP-ISMP Medication Error Reporting Program involve pairs beginning with the same letter.[1,2]

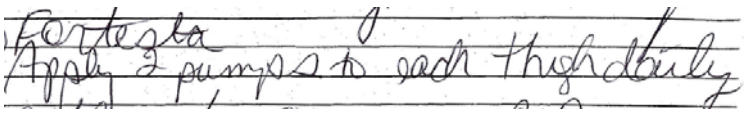
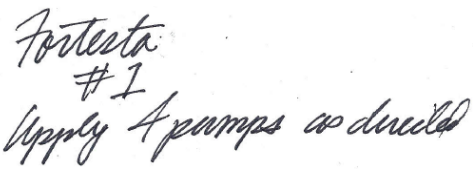
To identify drug names that may look similar to Fortesta, the DMEPA staff also considers the orthographic appearance of the name on lined and unlined orders. Specific attributes taken into consideration include the length of the name (8 letters), upstrokes (3, capital letter 'F', lowercase 't'), downstrokes (none), cross strokes (3, capital letter 'F', lowercase 't'), and dotted letters (none). Additionally, several letters in Fortesta may be vulnerable to ambiguity when scripted (See Appendix B). As a result, the DMEPA staff also considers these alternate appearances when identifying drug names that may look similar to Fortesta.

When searching to identify potential names that may sound similar to Fortesta, the DMEPA staff search for names with similar number of syllables (3), stresses (For – TES – ta), or (FOR – tes – ta), and placement of vowel and consonant sounds. Additionally, the DMEPA staff considers that pronunciation of parts of the name can vary such as '-tes-' may sound like '-tes-' or '-tis-' or '-ta' may sound like '-da' (See Appendix B). The Applicant's intended pronunciation (For – tes – ta) was also taken into consideration, as it was included in the Proprietary Name Review Request. Moreover, names are often mispronounced and/or spoken with regional accents and dialects, so other potential pronunciations of the name are considered.

2.2 FDA PRESCRIPTION ANALYSIS STUDIES

In order to evaluate the potential for misinterpretation of the proposed proprietary name in handwriting and verbal communication of the name, the following inpatient medication order, outpatient and verbal prescriptions were communicated during the FDA prescription studies.

Figure 1. Fortesta Rx Study (conducted on June 18, 2009)

Handwritten Medication Order	Verbal Prescription
Inpatient Medication Order :  Outpatient Prescription: 	Fortesta # 1 Apply 4 pumps daily as directed

[1] Institute for Safe Medication Practices. Confused Drug name List (1996-2006). Available at http://www.ismp.org/Tools/confuseddrugnames.pdf

[2] Kondrack, G and Dorr, B. Automatic Identification of Confusable Drug Names. Artificial Intelligence in Medicine (2005)

3 RESULTS

3.1 DATABASE AND INFORMATION SOURCES

The searches yielded a total of thirty-six names as having some similarity to the name Fortesta.

Thirty-three of the names were thought to look like Fortesta (Factrel, (b) (4), Farnestat, Feratab, Ferrlecit, Fertinex, Follistim AQ, Folnate, Fordex, Fortacet, Fortacil, Fortamet, Fortanest, Fortasec, Fortavit Liquid, Fortecortin, Forteo, Fortical, Forticef, Fortovase, Forzest, Fototar, Leukotac, Leustatin, Lorista, Lunesta, Tanahist-D, Testred, Titralac, Tolectin, Totect, Zilactin, and Zileuton). One name (Fortaz) was thought to sound like Fortesta. Two names (Fareston and Fentora) were thought to both look and sound like Fortesta.

Additionally, DMEPA staff did not identify any United States Adopted Names (USAN) stems in the proposed proprietary name, as of June 15, 2009.

3.2 EXPERT PANEL DISCUSSION

The Expert Panel reviewed the pool of names identified by DMEPA staff (See Section 3.1 above) and noted no additional names thought to have orthographic or phonetic similarity to Fortesta.

DDMAC had no concerns regarding the proposed name from a promotional perspective, and did not offer any additional comments relating to the proposed name.

3.3 FDA PRESCRIPTION ANALYSIS STUDIES

A total of twenty practitioners responded to the prescription analysis studies with none of the responses overlapping with an existing name. However, one practitioner stated that Fortesta could be confused with Forteo, an approved product currently marketed in the United States. Seventeen (85%) of the participants interpreted the name correctly as "Fortesta" with correct interpretations occurring in both the outpatient and inpatient written studies. In the outpatient study, all twelve responses were correct. In the inpatient study, only one response was incorrect, whereas all (2) of the verbal responses were incorrect. See Appendix C for the complete listing of interpretations from the verbal and written prescription studies.

3.4 COMMENTS FROM THE DIVISION

In response to the OSE e-mail dated June 22, 2009, the DRUP did not forward any comments and/or concerns on the proposed name at the initial phase of the name review.

DMEPA notified the DRUP via e-mail that we had no objections to the proposed proprietary name, Fortesta, on July 15, 2009. Per e-mail correspondence from the DRUP on July 15, 2009, they indicated they concur with our assessment of the proposed proprietary name, Fortesta.

3.5 SAFETY EVALUATOR RISK ASSESSMENT

Independent searches by the primary Safety Evaluator did not identify any additional names which were thought to look or sound similar to Fortesta and represent a potential source of drug name confusion.

*** This document contains proprietary and confidential information that should not be released to the public.

4 DISCUSSION

Neither DDMAC nor the review Division had concerns with the proposed name.

DMEPA identified and evaluated thirty-six names which were evaluated for their potential similarity to the proposed name, Fortesta. Seven names lacked orthographic and/or phonetic similarity and were not evaluated further (see Appendix D).

Failure mode and effect analysis (FMEA) was then applied to determine if the proposed proprietary name could potentially be confused with the remaining twenty-nine names and lead to medication errors. This analysis determined that the name similarity between Fortesta was unlikely to result in medication errors with any of the 29 products for the reasons presented in Appendices E through K.

Additionally, DMEPA did not identify any other factors that would render the name unacceptable at this time.

5 CONCLUSIONS AND RECOMMENDATIONS

The Proprietary Name Risk Assessment findings indicate that the proposed name, Fortesta, is not vulnerable to name confusion that could lead to medication errors. Thus, the Division of Medication Error Prevention and Analysis (DMEPA) has no objection to the proprietary name, Fortesta, for this product at this time.

However, if any of the proposed product characteristics as stated in this review are altered, DMEPA rescinds this Risk Assessment finding and the name must be resubmitted for review. In the event that our Risk Assessment finding is rescinded, the evaluation of the name on resubmission is independent of the previous Risk Assessment, and as such, the conclusions on re-review of the name are subject to change. The proposed name must be re-reviewed 90 days before approval of the NDA. For questions or clarifications, please contact OSE Project Manager, Maria Wasilik, at 301-796-0567.

5.1 COMMENTS TO THE APPLICANT

We have completed our review of the proposed proprietary name, Fortesta, and have concluded that it is acceptable.

Fortesta will be re-reviewed 90 days prior to approval of the NDA. If we find the name unacceptable following the re-review, we will notify you.

6 REFERENCES

1. Micromedex Integrated Index (http://csi.micromedex.com)

Micromedex contains a variety of databases covering pharmacology, therapeutics, toxicology and diagnostics.

2. Phonetic and Orthographic Computer Analysis (POCA)

POCA is a database which was created for the Division of Medication Error Prevention and Analysis, FDA. As part of the name similarity assessment, proposed names are evaluated via a phonetic/orthographic algorithm. The proposed proprietary name is converted into its phonemic representation before it runs through the phonetic algorithm. Likewise, an orthographic algorithm exists which operates in a similar fashion.

3. Drug Facts and Comparisons, online version, St. Louis, MO (http://factsandcomparisons.com)

Drug Facts and Comparisons is a compendium organized by therapeutic course; it contains monographs on prescription and OTC drugs, with charts comparing similar products.

4. AMF Decision Support System [DSS]

DSS is a government database used to track individual submissions and assignments in review divisions.

5. Division of Medication Errors Prevention and Analysis proprietary name consultation requests

This is a list of proposed and pending names that is generated by the Division of Medication Error Prevention and Analysis from the Access database/tracking system.

6. Drugs@FDA (http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm)

Drugs@FDA contains most of the drug products approved since 1939. The majority of labels, approval letters, reviews, and other information are available for drug products approved from 1998 to the present. Drugs@FDA contains official information about FDA approved brand name, generic drugs, therapeutic biological products, prescription and over-the-counter human drugs and discontinued drugs and "Chemical Type 6" approvals.

7. Electronic online version of the FDA Orange Book (http://www.fda.gov/cder/ob/default.htm)

The FDA Orange Book provides a compilation of approved drug products with therapeutic equivalence evaluations.

8. U.S. Patent and Trademark Office (http://www.uspto.gov)

USPTO provides information regarding patent and trademarks.

9. Clinical Pharmacology Online (www.clinicalpharmacology-ip.com)

Clinical Pharmacology contains full monographs for the most common drugs in clinical use, plus mini monographs covering investigational, less common, combination, nutraceutical and nutritional products. It also provides a keyword search engine.

10. Data provided by Thomson & Thomson's SAEGIS ™ Online Service, available at (www.thomson-thomson.com)

The Pharma In-Use Search database contains over 400,000 unique pharmaceutical trademarks and trade names that are used in about 50 countries worldwide. The data is provided under license by IMS HEALTH.

11. Natural Medicines Comprehensive Databases (www.naturaldatabase.com)

Natural Medicines contains up-to-date clinical data on the natural medicines, herbal medicines, and dietary supplements used in the western world.

12. Stat!Ref (www.statref.com)

Stat!Ref contains full-text information from approximately 30 texts; it includes tables and references. Among the database titles are: Handbook of Adverse Drug Interactions, Rudolphs Pediatrics, Basic Clinical Pharmacology, and Dictionary of Medical Acronyms Abbreviations.

13. USAN Stems (http://www.ama-assn.org/ama/pub/category/4782.html)

USAN Stems List contains all the recognized USAN stems.

14. Red Book Pharmacy's Fundamental Reference

Red Book contains prices and product information for prescription, over-the-counter drugs, medical devices, and accessories.

15. Lexi-Comp (www.lexi.com)

Lexi-Comp is a web-based searchable version of the Drug Information Handbook.

16. Medical Abbreviations Book

Medical Abbreviations Book contains commonly used medical abbreviations and their definitions.

APPENDICES

Appendix A:

FDA's Proprietary Name Risk Assessment considers the potential for confusion between the proposed proprietary name and the proprietary and established names of drug products existing in the marketplace and those pending IND, NDA, BLA, and ANDA products currently under review by the Center. DMEPA defines a medication error as any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. [3]

For the proposed proprietary name, DMEPA staff search a standard set of databases and information sources to identify names with orthographic and phonetic similarity and hold a Center for Drug Evaluation and Research (CDER) Expert Panel discussion to gather professional opinions on the safety of the proposed proprietary name. DMEPA staff also conducts internal CDER prescription analysis studies. When provided, DMEPA considers external prescription analysis study results and incorporate into the overall risk assessment.

The Safety Evaluator assigned to the Proprietary Name Risk Assessment is responsible for considering the collective findings, and provides an overall risk assessment of the proposed proprietary name. DMEPA bases

[3] National Coordinating Council for Medication Error Reporting and Prevention. http://www.nccmerp.org/aboutMedErrors.html. Last accessed 6/17/2009.

the overall risk assessment on the findings of a Failure Mode and Effects Analysis (FMEA) of the proprietary name, and focuses on the avoidance of medication errors.

FMEA is a systematic tool for evaluating a process and identifying where and how it might fail. [4] DMEPA uses FMEA to analyze whether the drug names identified with orthographic or phonetic similarity to the proposed proprietary name could cause confusion that subsequently leads to medication errors in the clinical setting. DMEPA uses the clinical expertise of its staff to anticipate the conditions of the clinical setting where the product is likely to be used based on the characteristics of the proposed product.

In addition, the product characteristics provide the context for the verbal and written communication of the drug names and can interact with the orthographic and phonetic attributes of the names to increase the risk of confusion when there is overlap or, in some instances, decrease the risk of confusion by helping to differentiate the products through dissimilarity. Accordingly, the DMEPA staff considers the product characteristics associated with the proposed drug throughout the risk assessment because the product characteristics of the proposed may provide a context for communication of the drug name and ultimately determine the use of the product in the *usual* clinical practice setting.

Typical product characteristics considered when identifying drug names that could potentially be confused with the proposed proprietary name include, but are not limited to; established name of the proposed product, proposed indication of use, dosage form, route of administration, strength, unit of measure, dosage units, recommended dose, typical quantity or volume, frequency of administration, product packaging, storage conditions, patient population, and prescriber population. Because drug name confusion can occur at any point in the medication use process, DMEPA staff considers the potential for confusion throughout the entire U.S. medication use process, including drug procurement, prescribing and ordering, dispensing, administration, and monitoring the impact of the medication.[5] DMEPA provides the product characteristics considered for this review in section one.

The Division of Medication Error Prevention and Analysis considers the spelling of the name, pronunciation of the name when spoken, and appearance of the name when scripted. DMEPA also compares the spelling of the proposed proprietary name with the proprietary and established name of existing and proposed drug products because similarly in spelled names may have greater likelihood to sound similar to one another when spoken or look similar to one another when scripted. DMEPA staff also examines the orthographic appearance of the proposed name using a number of different handwriting samples. Handwritten communication of drug names has a long-standing association with drug name confusion. Handwriting can cause similarly and even dissimilarly spelled drug name pairs to appear very similar to one another. The similar appearance of drug names when scripted has led to medication errors. The DMEPA staff applies expertise gained from root-cause analysis of such medication errors to identify sources of ambiguity within the name that could be introduced when scripting (e.g., "T" may look like "F," lower case 'a' looks like a lower case 'u,' etc). Additionally, other orthographic attributes that determine the overall appearance of the drug name when scripted (see Table 1 below for details). In addition, the DMEPA staff compares the pronunciation of the proposed proprietary name with the pronunciation of other drug names because verbal communication of medication names is common in clinical settings. If provided, DMEPA will consider the Applicant's intended pronunciation of the proprietary name. However, DMEPA also considers a variety of pronunciations that could occur in the English language because the Applicant has little control over how the name will be spoken in clinical practice.

[4] Institute for Healthcare Improvement (IHI). Failure Modes and Effects Analysis. Boston. IHI:2004.

[5] Institute of Medicine. Preventing Medication Errors. The National Academies Press: Washington DC. 2006.

Table 1. Criteria used to identify drug names that look- or sound-similar to a proposed proprietary name.

Type of similarity	**Considerations when searching the databases**		
	Potential causes of drug name similarity	*Attributes examined to identify similar drug names*	*Potential Effects*
Look-alike	Similar spelling	Identical prefix Identical infix Identical suffix Length of the name Overlapping product characteristics	• Names may appear similar in print or electronic media and lead to drug name confusion in printed or electronic communication • Names may look similar when scripted and lead to drug name confusion in written communication
	Orthographic similarity	Similar spelling Length of the name Upstrokes Down strokes Cross-strokes Dotted letters Ambiguity introduced by scripting letters Overlapping product characteristics	• Names may look similar when scripted, and lead to drug name confusion in written communication
Sound-alike	Phonetic similarity	Identical prefix Identical infix Identical suffix Number of syllables Stresses Placement of vowel sounds Placement of consonant sounds Overlapping product characteristics	• Names may sound similar when pronounced and lead to drug name confusion in verbal communication

Lastly, the DMEPA staff also considers the potential for the proposed proprietary name to inadvertently function as a source of error for reasons other than name confusion. Post-marketing experience has demonstrated that proprietary names (or components of the proprietary name) can be a source of error in a variety of ways. Consequently, DMEPA considers and evaluates these broader safety implications of the name throughout this assessment and the medication error staff provides additional comments related to the safety of the proposed proprietary name or product based on professional experience with medication errors.

1. Database and Information Sources

DMEPA staff conducts searches of the internet, several standard published drug product reference texts, and FDA databases to identify existing and proposed drug names that may sound-alike or look-alike to the proposed proprietary name using the criteria outlined in Section 2.1. Section 6 provides a standard description of the databases used in the searches. To complement the process, the DMEPA staff use a computerized method of identifying phonetic and orthographic similarity between medication names. The program, Phonetic and Orthographic Computer Analysis (POCA), uses complex algorithms to select a list of names from a database that have some similarity (phonetic, orthographic, or both) to the trademark being evaluated. Lastly, the DMEPA staff review the USAN stem list to determine if any USAN stems are present within the proprietary name. The individual findings of multiple safety evaluators are pooled and presented to the CDER Expert Panel.

2. CDER Expert Panel Discussion

DMEPA conducts an Expert Panel Discussion to gather CDER professional opinions on the safety of the proposed product and the proposed proprietary name. The Expert Panel is composed of Division of Medication Errors Prevention (DMEPA) staff and representatives from the Division of Drug Marketing, Advertising, and Communications (DDMAC). The Expert Panel also discusses potential concerns regarding drug marketing and promotion related to the proposed names.

The primary Safety Evaluator presents the pooled results of the DMEPA staff to the Expert Panel for consideration. Based on the clinical and professional experiences of the Expert Panel members, the Panel may recommend the addition of names, additional searches by the primary Safety Evaluator to supplement the pooled results, or general advice to consider when reviewing the proposed proprietary name.

3. FDA Prescription Analysis Studies

Three separate studies are conducted within the Centers of the FDA for the proposed proprietary name to determine the degree of confusion of the proposed proprietary name with marketed U.S. drug names (proprietary and established) due to similarity in visual appearance with handwritten prescriptions or verbal pronunciation of the drug name. The studies employ healthcare professionals (pharmacists, physicians, and nurses), and attempts to simulate the prescription ordering process. The primary Safety Evaluator uses the results to identify orthographic or phonetic vulnerability of the proposed name to be misinterpreted by healthcare practitioners.

In order to evaluate the potential for misinterpretation of the proposed proprietary name in handwriting and verbal communication of the name, inpatient medication orders and/or outpatient prescriptions are written, each consisting of a combination of marketed and unapproved drug products, including the proposed name. These orders are optically scanned and one prescription is delivered to a random sample of the 123 participating health professionals via e-mail. In addition, a verbal prescription is recorded on voice mail. The voice mail messages are then sent to a random sample of the participating health professionals for their interpretations and review. After receiving either the written or verbal prescription orders, the participants send their interpretations of the orders via e-mail to DMEPA.

4. Comments from the OND review Division or Generic drugs

DMEPA requests the Office of New Drugs (OND) or Office of Generic Drugs (OGD) Regulatory Division responsible for the application for their comments or concerns with the proposed proprietary name and any clinical issues that may impact the DMEPA review during the initial phase of the name review. Additionally, when applicable, at the same time DMEPA requests concurrence/non-concurrence with DDMAC's decision on the name. The primary Safety Evaluator addresses any comments or concerns in the safety evaluator's assessment.

The OND or OGD Regulatory Division is contacted a second time following our analysis of the proposed proprietary name. At this point, DMEPA conveys their decision to accept or reject the name. The OND or OGD Regulatory Division is requested to concur/not concur with DMEPA's final decision.

5. Safety Evaluator Risk Assessment of the Proposed Proprietary Name

The primary Safety Evaluator applies his/her individual expertise gained from evaluating medication errors reported to FDA, conducts a Failure Mode and Effects Analysis, and provides an overall risk assessment of name confusion. Failure Mode and Effects Analysis (FMEA) is a systematic tool for evaluating a process and identifying where and how it might fail.[6] When applying FMEA to assess the risk of a proposed proprietary name, DMEPA seeks to evaluate the potential for a proposed proprietary name to be confused with another

[6] Institute for Healthcare Improvement (IHI). Failure Mode and Effects Analysis. Boston. IHI:2004.

drug name because of name confusion and, thereby, cause errors to occur in the medication use system. FMEA capitalizes on the predictable and preventable nature of medication errors associated with drug name confusion. FMEA allows the Agency to identify the potential for medication errors due to orthographically or phonetically similar drug names prior to approval, where actions to overcome these issues are easier and more effective than remedies available in the post-approval phase.

In order to perform an FMEA of the proposed name, the primary Safety Evaluator must analyze the use of the product at all points in the medication use system. Because the proposed product is has not been marketed, the primary Safety Evaluator anticipates the use of the product in the usual practice settings by considering the clinical and product characteristics listed in Section one. The Safety Evaluator then analyzes the proposed proprietary name in the context of the usual practice setting and works to identify potential failure modes and the effects associated with the failure modes.

In the initial stage of the Risk Assessment, the Safety Evaluator compares the proposed proprietary name to all of the names gathered from the above searches, Expert Panel Discussion, and prescription studies, external studies, and identifies potential failure modes by asking:

> ***"Is the proposed proprietary name convincingly similar to another drug name, which may cause practitioners to become confused at any point in the usual practice setting?"***

An affirmative answer indicates a failure mode and represents a potential for the proposed proprietary name to be confused with another proprietary or established drug name because of look- or sound-alike similarity. If the answer to the question is no, the Safety Evaluator is not convinced that the names posses similarity that would cause confusion at any point in the medication use system, thus the name is eliminated from further review.

In the second stage of the Risk Assessment, the primary Safety Evaluator evaluates all potential failure modes to determine the likely *effect* of the drug name confusion, by asking:

> ***"Could the confusion of the drug names conceivably result in medication errors in the usual practice setting?"***

The answer to this question is a central component of the Safety Evaluator's overall risk assessment of the proprietary name. If the Safety Evaluator determines through FMEA that the name similarity would not ultimately be a source of medication errors in the usual practice setting, the primary Safety Evaluator eliminates the name from further analysis. However, if the Safety Evaluator determines through FMEA that the name similarity could ultimately cause medication errors in the usual practice setting, the Safety Evaluator will then recommend the use of an alternate proprietary name.

DMEPA will object to the use of proposed proprietary name when the primary Safety Evaluator identifies one or more of the following conditions in the Risk Assessment:

a. DDMAC finds the proposed proprietary name misleading from a promotional perspective, and the Review Division concurs with DDMAC's findings. The Federal Food, Drug, and Cosmetic Act provides that labeling or advertising can misbrand a product if misleading representations are made or suggested by statement, word, design, device, or any combination thereof, whether through a PROPRIETARY name or otherwise [21 U.S.C 321(n); See also 21 U.S.C. 352(a) & (n)].

b. DMEPA identifies that the proposed proprietary name is misleading because of similarity in spelling or pronunciation to another proprietary or established name of a different drug or ingredient [CFR 201.10.(C)(5)].

c. FMEA identifies the potential for confusion between the proposed proprietary name and other proprietary or established drug name(s), and demonstrates that medication errors are likely to result from the drug name confusion under the conditions of usual clinical practice.

d. The proposed proprietary name contains an USAN (United States Adopted Names) stem.

e. DMEPA identifies a potential source of medication error within the proposed proprietary name. For example, the proprietary name may be misleading or, inadvertently, introduce ambiguity and confusion that leads to errors. Such errors may not necessarily involve confusion between the proposed drug and another drug product.

If DMEPA objects to a proposed proprietary name on the basis that drug name confusion could lead to medication errors, the primary Safety Evaluator uses the FMEA process to identify strategies to reduce the risk of medication errors. DMEPA is likely to recommend that the Applicant select an alternative proprietary name and submit the alternate name to the Agency for DMEPA to review. However, in rare instances FMEA may identify plausible strategies that could reduce the risk of medication error of the currently proposed name. In that instance, DMEPA may be able to provide the Applicant with recommendations that reduce or eliminate the potential for error and, thereby, would render the proposed name acceptable.

In the event that DMEPA objects to the use of the proposed proprietary name, based upon the potential for confusion with another proposed (but not yet approved) proprietary name, DMEPA will provide a contingency objection based on the date of approval. Whichever product, the Agency approves first has the right to use the proprietary name, while DMEPA will recommend that the second product to reach approval seek an alternative name.

The threshold set for objection to the proposed proprietary name may seem low to the Applicant. However, the safety concerns set forth in criteria a through e are supported either by FDA regulation or by external healthcare authorities, including the Institute of Medicine (IOM), World Health Organization (WHO), the Joint Commission, and the Institute for Safe Medication Practices (ISMP). These organizations have examined medication errors resulting from look- or sound-alike drug names and called for regulatory authorities to address the issue prior to approval. Additionally, DMEPA contends that the threshold set for the Proprietary Name Risk Assessment is reasonable because proprietary drug name confusion is a predictable and a preventable source of medication error that, in many instances, the Agency and/or Applicant can identify and rectify prior to approval to avoid patient harm.

Furthermore, post-marketing experience has demonstrated that medication errors resulting from drug name confusion are notoriously difficult to rectify post-approval. Educational and other post-approval efforts are low-leverage strategies that have had limited effectiveness at alleviating medication errors involving drug name confusion. Applicants have undertaken higher-leverage strategies, such as drug name changes, in the past but at great financial cost to the Applicant and at the expense of the public welfare, not to mention the Agency's credibility as the authority responsible for approving the error-prone proprietary name. Moreover, even after Applicants' have changed a product's proprietary name in the post-approval phase, it is difficult to eradicate the original proprietary name from practitioners' vocabulary, and as a result, the Agency has continued to receive reports of drug name confusion long after a name change in some instances. Therefore, DMEPA believes that post-approval efforts at reducing name confusion errors should be reserved for those cases in which the potential for name confusion could not be predicted prior to approval. . (See Section 4 for limitations of the process).

Appendix B: Letters with possible orthographic or phonetic misinterpretation

Letters in Name, Fortesta	Scripted may appear as	Spoken may be interpreted as
Capital 'F'	L, T, Z	ph
lower case 'o'	a, e, or u	any vowel
lower case 'r'	v, n, c, x, or t	wr
lower case 't'	f, x, or r	d
lower case 'e'	a, i, or l	any vowel
lower case 's'	n or g	z or x
lower case 'a'	c, ci, ce, o, or u	any vowel

Appendix C: FDA Prescription Study Responses

Outpatient Prescription	Inpatient Medication Order	Voice Prescription
Fortesta	Fortesta	Testa
Fortesta	Fortesta	Fortestof
Fortesta	Foresta	
Fortesta (*could be confused with Forteo*)	Fortesta	
Fortesta	Fortesta	
Fortesta	Fortesta	
Fortesta		
Fortesta		
Fortesta		
Fortesta		
Fortesta		
Fortesta		

Appendix D: Names lacking significant orthographic or phonetic similarities

Proprietary Name	Similarity to Fortesta
Farnestat	Look
Follistim AQ	Look
Fortecortin	Look
Fortovase	Look
Zilactin	Look
Fortaz	Sound

Appendix E: Foreign proprietary names identified as similar to Fortesta

Proprietary Name	Similarity to Fortesta	Foreign Territories	Source
Fortacet (Aluminium Acetate, Chamomile, Arnica)	Look	Switzerland	Micromedex
Fortacil (Amino-acid and mineral preparation)	Look	Mexico	Micromedex
Fortanest (Midazolam)	Look	Indonesia	Lexi-Comp, Micromedex
Fortasec (Loperamide)	Look	Spain	Lexi-Comp Micromedex
Forticef (Cefaclor)	Look	Oman	Micromedex
Forzest (Tadalafil)	Look	India	Lexi-Comp, Micromedex
Lorista (Losartan)	Look	Bosnia Herzegowina, Czech Republic, Estonia, Croatia, Lithuania, Poland, Slovenia, Slovakia	Micromedex

Appendix F: Proprietary names no longer active and no generics available

Proprietary Name	Similarity to Fortesta	Status
Fordex	Look	Withdrawn by Commissioner, May 2, 1973 per DSS

Appendix G: Unapproved drug name found on Orphan Drug List, not found in other commonly used drug references.

Proprietary Name	Established Name
Leukotac	Inolimomab

Appendix H: Products with no overlap in strength or usual dose

Product name with potential for confusion	Similarity to Proposed Proprietary Name	Strength, dosage form	Usual Dose (if applicable)
Fortesta (Testosterone)		**2% gel**	**Apply 1 to 7 pumps daily as directed**
Factrel (Gonadorelin Hydrochloride)	Look	100 mg/vial, 500 mg/vial for injection	Inject 100 mg subcutaneously or intravenously once for hypogonadism test
Fertinex (Urofollitropin)	Look	75 units/vial , 150 units/vial for injection	Inject 75 units to 300 units subcutaneously daily
Fortamet (Metformin Hydrochloride)	Look	500 mg, 1000 mg extended release tablets	Take 1 to 2 tablets orally once daily

Appendix I: Single strength products with different product characteristics and usual dose

Product name with potential for confusion	Similarity to Proposed Proprietary Name	Strength	Usual Dose	Differentiating Product Characteristics
Fortesta (Testosterone)		**2% gel**	**Apply 1 to 7 pumps daily as directed**	**Dose form: gel** **Route of administration: topical** **Strength: 2%** **Frequency of administration: once daily** **Usual Practice setting: outpatient and inpatient**
Ferrlecit (Sodium Ferric Gluconate Complex)	Look	62.5 mg/ 5 mL injection	Infuse 125 mg intravenously over 1 hour	*Dose:* 125 mg *Dosage form:* injection *Route of administration:* intravenous *Frequency of administration:* every 2 to 3 days at dialysis *Usual practice setting:* inpatient or outpatient infusion center
Fortavit Liquid (Multivitamin with Iron)	Look	263 mL	Take 5 mL orally once daily	*Dose:* 5 mL *Dosage form:* liquid *Route of administration:* oral
Leustatin (Cladribine)	Look	1 mg/mL injection	Infuse 0.09 mg/kg daily by continuous intravenous infusion for 7 days	*Dose:* 0.09 mg/kg *Dosage form:* injection *Route of administration:* intravenously *Frequency of administration:* continuous infusion for 7 days *Usual practice setting:* inpatient
Tanahist-D (Chlorpheniramine Tannate, Phenylephrine Tannate)	Look	2 mg/6 mg per mL	Take 2 mL orally every 6 hours as needed	*Dose: 2 mL* *Dosage form:* suspension *Route of administration:* oral *Frequency of administration:* every 6 hours as needed

Continued Appendix I: Single strength products with different product characteristics and usual dose

Product name with potential for confusion	Similarity to Proposed Proprietary Name	Strength	Usual Dose	Differentiating Product Characteristics
Fortesta (Testosterone)		**2% gel**	**Apply 1 to 7 pumps daily as directed**	**Dose form: gel** **Route of administration: topical** **Strength: 2%** **Frequency of administration: once daily** **Usual Practice setting: outpatient and inpatient**
Titralac (Calcium Carbonate) Titralac Extra Strength (Calcium Carbonate)	Look	420 mg, 750 mg tablets	Take 2 to 3 tablets orally every 2 to 3 hours as needed for heartburn	*Dosage form:* tablet *Route of administration:* oral *Frequency of administration:* every 2 to 3 hours as need
Totect (Dexrazoxane Hydrochloride)	Look	500 mg/vial for injection	Infuse 1,000 mg/m^2 - 2000 mg/m^2 intravenously over 1 to 2 hours for 3 days	*Dose:*1,000 mg/m^2 - 2000 mg/m^2 *Dosage form:* injection *Route of administration:* intravenous *Frequency of administration:* once daily for 3 days *Usual practice setting:* inpatient or outpatient infusion
Zileuton (Zyflo CR)	Look	600 mg tablet, extended release	Take 2 tablets orally 2 times daily	*Dosage form:* tablet *Route of administration:* oral *Frequency of administration:* 2 times daily

Appendix J: Products with numerically similar or overlapping strength or dose but different product characteristics and usual dose

Product name with potential for confusion	Similarity to Proposed Proprietary Name	Strength	Usual Dose	Differentiating Product Characteristics
Fortesta (Testosterone)		**2% gel**	**Apply 1 to 7 pumps daily as directed**	**Dose form: gel** **Route of administration: topical** **Strength: 2%** **Frequency of administration: once daily** **Usual Practice setting: outpatient and inpatient**
(b) (4)				
Forteo (Teriparatide)	Look	250 mcg/mL injection	Inject **20** mcg subcutaneously daily	*Dosage form:* injection *Route of administration:* subcutaneous
Lunesta (Eszopiclone)	Look	1 mg, **2 mg**, 3 mg tablet	Take 1 tablet orally at bedtime	*Dosage form:* tablet *Route of administration:* oral *Frequency of administration:* once daily, however *bedtime*
Tolectin (Tolmetin Sodium) *no longer marketed, however generics available*	Look	**200 mg**, 600 mg tablets 400 mg capsules	Take 1 tablet or capsule orally 3 times daily	*Dosage form:* tablet or capsule *Route of administration:* oral *Frequency of administration:* 3 times daily
Fentora (Fentanyl Citrate)	Look/Sound	100 mcg, **200 mcg**, 300 mcg, 400 mcg, 600 mcg, 800 mcg	Take 1 tablet orally every 4 hours as needed for breakthrough pain as directed	*Dosage form:* buccal tablet *Route of administration:* oral *Frequency of administration:* every 4 hours as needed

*** This review contains proprietary and confidential information that should not be released to the public

Appendix K: Products with multiple overlapping product characteristics

Failure Mode: Name confusion	**Causes: (could be multiple)**	**Rationale why medications errors are unlikely to occur in usual practice setting**
Fortesta (Testosterone)	**Strength: 2% gel**	**Usual dose: Apply 1 to 7 pumps daily as directed**
Feratab (Ferrous Sulfate) 300 mg tablet Usual Dose: Take 1 tablet orally 1 to 3 times daily	Orthographic Similarity: both name share 4 letters ('F', 'r', 't', 'a') with 3 of these letters in similar or same position ('F', 'r', 't'); 2 letters may appear similar when scripted ('e' vs. 'o', 'a' vs. 'e'); and 3 upstrokes ('F', 't', 'b' vs. 'F', 't', 't') Single strength products Frequency of administration: can be ordered once daily	Orthographic differences: Fortesta has an extra crosstroke ('F', 't', 't' vs. 'F', 't'); Fortesta has an additional letter between the second and third upstrokes ('-es-' vs. '-a-') and another letter after the last upstroke ('-a'). Feratab has an additional letter between the first and second upstrokes ('-era-' vs. '-or-') Although medication orders for both medications may be ordered once daily and without a strength, a medication order for Feratab may include distinguishers such as "tablet" , "po (oral)"; whereas a medication order for Fortesta may contain distinguishers such as 'Apply', 'pump(s)' or "front and inner thighs".
Folnate (Cyanocobalamin, Folic Acid, Pyridoxine) 1 mg/2.5 mg/25 mg tablet Usual Dose: Take 1 tablet orally daily	Orthographic Similarity: both names share 3 letters in the same or similar positions ('Fo-', 't'); 3 upstrokes ('F', 'l', 't' vs. 'F', 't', 't'); 2 letters that appear similar when scripted ('a' vs. 'e' and ('e' vs. 'a') Single strength products Frequency of administration: once daily	Orthographic differences: Fortesta has an additional crosstroke ('t') and an additional letter between the first and second upstrokes ('-or-' vs. '-o-') Although medication orders for both medications may be ordered once daily and without a strength, a medication order for Folnate may include distinguishers such as "tablet" , "po (oral)"; whereas a medication order for Fortesta may contain distinguishers such as 'Apply', 'pump(s)' or "front and inner thighs".

Continued Appendix K: Products with multiple overlapping product characteristics

Failure Mode: Name confusion	**Causes: (could be multiple)**	**Rationale why medications errors are unlikely to occur in usual practice setting**
Fortesta (Testosterone)	**Strength: 2% gel**	**Usual dose: Apply 1 to 7 pumps daily as directed**
Fototar (Coal Tar) 2% cream Usual Dose: Apply to affected area 1 to 4 times daily	Orthographic similarity: Both names share 5 letters in the same or similar position ('F', 'o', 't', 't', 'a') and 3 upstrokes ('F', 't', 't') Numerical overlap: 2% Single strength products Route of administration: Topical Frequency of administration: can be ordered once daily Medication order may contain "as directed"	Orthographic differences: Fortesta has additional letters between upstrokes ('o' vs. 'or'; 'o' vs. 'es') which make the name appear longer. Fototar has an additional letter after the last 't' ('-ar' vs. '-a'). Although medication orders for both medications may contain "Apply", a medication order for Fototar may include "affected area"; whereas a medication order for Fortesta may contain distinguishers such as 'pump(s)' or "front and inner thighs".
Fortical (Calcitonin, Salmon) 200 units/actuation Usual Dose: 1 spray or pump intranasally once daily as directed	Orthographic similarity: Both names share 5 letters in the same or similar position ('Fort-', 'a'); 3 upstrokes ('F', 't', 't', vs. 'F', 't', 'l'); and 'i' may appear as 'e' when scripted. Single strength products Require actuation of a pump or spray device Medication order may contain "as directed"	Orthographic differences: additional crosstroke 't' in Fortesta and trailing 'a' change the shape. Additionally, Fortical has a dotted letter ('i'). A medication order for Fortical may contain distinguishers such as 'Nasal' or 'intranasally'; whereas a medication order for Fortesta may contain distinguishers such as 'Apply'. Furthermore, an inpatient medication order for Fortesta may also contain more specific instructions such as applying Fortesta to the front and inner thighs. These medications are gender specific (Fortical-women vs. Fortesta-men)

Continued Appendix K: Products with multiple overlapping product characteristics

Failure Mode: Name confusion	**Causes: (could be multiple)**	**Rationale why medications errors are unlikely to occur in usual practice setting**
Fortesta (Testosterone)	**Strength: 2% gel**	**Usual dose: Apply 1 to 7 pumps daily as directed**
Testred (Methyltestosterone) 10 mg capsules Usual Dose: Take 1 to 5 capsules orally daily	Orthographic similarity: Share 2 letters ('t', 'e') in similar or same position; 3 letters that may appear similar when scripted ('T' vs. 'F', 'e' vs. 'o', 's' vs. 'r'); and have 3 upstrokes ('T', 't', 'd' vs. 'F', 't', 't') Single strength products Frequency of administration: once daily	Orthographic differences: Fortesta has an additional crosstroke ('t') and an additional letter ('-a') after the last upstroke. Although medication orders for both medications may be ordered once daily and without a strength, a medication order for Testred may include distinguishers such as "capsule" or "po (oral)"; whereas a medication order for Fortesta may contain distinguishers such as 'Apply', 'pump(s)' or "front and inner thighs".
Fareston (Toremifene Citrate) 60 mg tablet Usual Dose: Take 1 tablet orally once daily	Orthographic similarity: Both names share 5 letters in the same or similar position ('F', 'r', '-est') and 2 letters may appear similar when scripted ('a' vs. 'o', 'o' vs. 'a') Phonetic similarity: Both names share 3 syllable (fa – res – ton vs. for – tes –ta); and the beginnings are similar (Far- vs. For-) Single strength products Frequency of administration: once daily	Orthographic differences: Fortesta has an additional upstroke and crosstroke ('t') in the middle of the name. Phonetic differences: the middle syllable of Fortesta has a strong 't' sound. Although medication orders for both medications may be ordered once daily and without a strength, a medication order for Fareston may include distinguishers such as "tablet" or "po (oral)"; whereas a medication order for Fortesta may contain distinguishers such as 'Apply', 'pump(s)' or "front and inner thighs".

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