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
Office of Medication Error Prevention and Risk Management

Proprietary Name Review

Date:	December 6, 2011
Reviewer	Denise V. Baugh, PharmD, BCPS Division of Medication Error Prevention and Analysis
Team Leader	Lubna Merchant, PharmD, M.S. Division of Medication Error Prevention and Analysis
Division Director	Carol Holquist, R.Ph. Division of Medication Error Prevention and Analysis
Drug Name and Strength	Mitosol (Mitomycin for Solution) 0.2 mg per vial
Application Type/Number:	NDA 022572
Applicant	Mobius Therapeutics, LLC
OSE RCM #:	2011-3728

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

CONTENTS

1 INTRODUCTION

This review evaluates the proposed proprietary name, Mitosol, from a safety and promotional perspective. The sources and methods used to evaluate the proposed name are outlined in the reference section and Appendix A respectively.

1.1 REGULATORY HISTORY

DMEPA reviewed the proposed name, Mitosol, previously (OSE # 2010-1948 dated November 22, 2010) and found it to be acceptable.

1.2 PRODUCT INFORMATION

The following product information is provided in the September 30, 2011 proprietary name submission.

- Established Name: Mitomycin for Solution
- Indication of Use: treatment of refractory glaucoma by topical application
- Route of administration: topical, ophthalmic
- Dosage form: vial of Mitosol which contains 0.2 mg of lyophilized Mitomycin
- Dose: (b) (4)
- How Supplied: Three Mitosol Kits for Ophthalmic Use are in one carton. (b) (4)
- Storage: store kits at (b) (4) 15°C to 30°C (59°F – 86°F)
- Container and Closure systems: Items for use during surgery are packaged in (b) (4) trays with (b) (4) lidding

2 RESULTS

The following sections provide the information obtained and considered in the evaluation of the proposed proprietary name.

2.1 PROMOTIONAL ASSESSMENT

The Office of Prescription Drug Promotion (OPDP) determined the proposed name is acceptable from a promotional perspective. DMEPA and the Division of Transplant and Ophthalmology Products (DTOP) concurred with the findings of OPDP's promotional assessment of the proposed name.

2.2 SAFETY ASSESSMENT

The following aspects of the name were considered in the overall evaluation.

2.2.1 United States Adopted Names (USAN)

On November 12, 2011 the United States Adopted Name (USAN) stem search identified that a USAN stem is not present in the proposed proprietary name.

2.2.2 Components of the Proposed Proprietary Name

This proprietary name is comprised of a single word that does not contain any components (i.e. a modifier, route of administration, dosage form, etc.) that is misleading or can contribute to medication error.

2.2.4 FDA Name Simulation Studies

Forty practitioners participated in DMEPA's prescription studies. The interpretations did not overlap with or appear or sound similar to any currently marketed products. Twenty-nine (n = 29) of the forty participants (72.5%) interpreted the name correctly as "Mitosol" with correct interpretation occurring in all three studies. The remaining written responses misinterpreted the drug name. The letter 'M' was misinterpreted as the letter 'U' or 'H'. In the verbal studies, most of the responses were misspelled phonetic variations of the proposed name. See Appendix C for the complete listing of interpretations from the verbal and written prescription studies.

1.2.5 Comments from Other Review Disciplines

In response to the OSE, October 25, 2011 e-mail, the Division of Transplant and Opthalmology Products (DTOP) noted that the name "Mitosol" is similar to the name, "Optisol". This name was evaluated in our previous review (OSE 2010-1948 dated November 22, 2010) and will not be evaluated further since its product characteristics have not changed.

2.2.6 Failure Mode and Effects Analysis of Similar Names

Appendix B lists possible orthographic and phonetic misinterpretations of the letters appearing in the proposed proprietary name, Mitosol. Table 1 lists the names with

orthographic, phonetic, or spelling similarity to the proposed proprietary name, Mitosol, as identified by the primary reviewer, the Expert Panel Discussion (EPD), and other review disciplines.

Table 1: Collective List of Potentially Similar Names (DMEPA, EPD, Other Disciplines, FDA Name Simulation Studies, and Primary Reviewer Search)

Look Similar					
Name	***Source***	***Name***	***Source***	***Name***	***Source***
Medrol	FDA	Maxitrol	FDA	Midamor	FDA
Vaprisol	FDA	Mitolactol	FDA	Mitotane	FDA
Mebaral	FDA	Metsal AR	FDA	Mefoxin	FDA
Welchol	FDA	Metoral	FDA	Malarone	FDA
Natrecor	FDA	Mitomycin	FDA	Metrodin	FDA
Nitro-Bid	FDA	Mithracin	FDA	Mellaril	FDA
Nitro-Dur	FDA	Miltonin	FDA	Moducal	FDA
Nitrostat	FDA	Miltown	FDA	Nulecit	FDA
Maxair	FDA	Milophene	FDA	Velivet	FDA
Nitrol	FDA	Velcade	FDA	[redacted]	[redacted]
Natazia	Primary Reviewer	Natroba	Primary Reviewer	[redacted]	[redacted]
Sound Similar					
Metastron	FDA	[redacted]	[redacted]	[redacted]	[redacted]
Look and Sound Similar					
Microsul	FDA	Nizoral	FDA	Metozolv ODT	FDA
Mucosil	FDA	Mintezol	FDA	Metolazone	FDA
Miochol	FDA	Mitotrol	FDA	Midol	FDA
Mitrazol	FDA	Mitosol***	FDA	Vitazol	FDA
Nadolol	FDA	(b) (4)	FDA	Vitafol	FDA

Our analysis of the forty-seven names contained in Table 1 considered the information obtained in the previous sections along with their product characteristics. Eight (Vaprisol, Maxitrol, Nitrol, Medrol, Microsul, Nadolol, Nizoral, and Vitafol) of the 47 names were

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previously reviewed (OSE Review # 2010-1948 dated November 22, 2010). As the product characteristics for Mitosol have not changed, we did not re-evaluate these names in this review. Thus, we determined thirty-nine names will not pose a risk for confusion as described in Appendices D through E.

2.2.7 Communication of DMEPA's Final Decision to Other Disciplines

DMEPA communicated our findings to the Division of Special Pathogens and Transplant Products (DSPTP) via e-mail on December 5, 2011. At that time we also requested additional information or concerns that could inform our review. Per e-mail correspondence from the Division of Special Pathogens and Transplant Products (DSPTP) on December 6, 2011, they stated no additional concerns with the proposed proprietary name, Mitosol.

3 CONCLUSIONS

The proposed proprietary name is acceptable from both a promotional and safety perspective.

If you have further questions or need clarifications, please contact Karen Townsend, OSE project manager, at 301-796-5413.

3.1 COMMENTS TO THE APPLICANT

We have completed our review of the proposed proprietary name, Mitosol, and have concluded that this name is acceptable. However, if any of the proposed product characteristics as stated in your September 30, 2011 submission are altered, DMEPA rescinds this finding and the name must be resubmitted for review. Additionally, this proprietary name must be re-evaluated 90 days prior to the approval of the application. The conclusions upon re-review are subject to change.

4 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. This database also lists the orphan drugs.

4. ***FDA Document Archiving, Reporting & Regulatory Tracking System [DARRTS]***

   DARRTS is a government database used to organize Applicant and Sponsor submissions as well as to store and organize assignments, reviews, and communications from the 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. ***U.S. Patent and Trademark Office (***http://www.uspto.gov***)***

   USPTO provides information regarding patent and trademarks.

8. ***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.

9. ***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.

10. ***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.

11. ***Access Medicine*** *(www.accessmedicine.com)*

    Access Medicine® from McGraw-Hill contains full-text information from approximately 60 titles; it includes tables and references. Among the titles are: Harrison's Principles of Internal Medicine, Basic & Clinical Pharmacology, and Goodman and Gilman's The Pharmacologic Basis of Therapeutics.

12. ***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.

13. ***Red Book Pharmacy's Fundamental Reference***

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

14. ***Lexi-Comp (www.lexi.com)***

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

15. ***Medical Abbreviations Book***

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

16. ***CVS/Pharmacy (www.CVS.com)***

    This database contains commonly used over the counter products not usually identified in other databases.

17. ***Walgreens (www.walgreens.com)***

    This database contains commonly used over the counter products not usually identified in other databases.

18. Rx List (www.rxlist.com)

RxList is an online medical resource dedicated to offering detailed and current pharmaceutical information on brand and generic drugs.

19. Dogpile (www.dogpile.com)

Dogpile is a Metasearch engine that searches multiple search engines including Google, Yahoo! and Bing, and returns the most relevant results to the search.

APPENDICES

Appendix A

FDA's Proprietary Name Risk Assessment considers the promotional and safety aspects of a proposed proprietary name. The promotional review of the proposed name is conducted by OPDP. OPDP evaluates proposed proprietary names to determine if they are overly fanciful, so as to misleadingly imply unique effectiveness or composition, as well as to assess whether they contribute to overstatement of product efficacy, minimization of risk, broadening of product indications, or making of unsubstantiated superiority claims. OPDP provides their opinion to DMEPA for consideration in the overall acceptability of the proposed proprietary name.

The safety assessment is conducted by DMEPA. DMEPA staff search a standard set of databases and information sources to identify names that are similar in pronunciation, spelling, and orthographically similar when scripted to the proposed proprietary name. Additionally, we consider inclusion of USAN stems or other characteristics that when incorporated into a proprietary name may cause or contribute to medication errors (i.e., dosing interval, dosage form/route of administration, medical or product name abbreviations, names that include or suggest the composition of the drug product, etc.). 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. [1]

Following the preliminary screening of the proposed proprietary name, DMEPA gathers to discuss their professional opinions on the safety of the proposed proprietary name. This meeting is commonly referred to the Center for Drug Evaluation and Research (CDER) Expert Panel discussion. DMEPA also considers other aspects of the name that may be misleading from a safety perspective. DMEPA staff conducts a prescription simulation studies using FDA health care professionals. When provided, DMEPA considers external proprietary name studies conducted by or for the Applicant/Sponsor and incorporates the findings of these studies into the overall risk assessment.

The DMEPA primary reviewer assigned to evaluate the proposed proprietary name is responsible for considering the collective findings, and provides an overall risk assessment of the proposed proprietary name. DMEPA bases the overall risk assessment on the findings of a Failure Mode and Effects Analysis (FMEA) of the proprietary name and misleading nature of the proposed proprietary name with a focus on the avoidance of medication errors.

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. DMEPA considers the product characteristics associated with the proposed product 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.

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[1] National Coordinating Council for Medication Error Reporting and Prevention. http://www nccmerp.org/aboutMedErrors html. Last accessed 10/11/2007.

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. DMEPA considers how these product characteristics may or may not be present in communicating a product name throughout the medication use system. Because drug name confusion can occur at any point in the medication use process, DMEPA 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.[2] The product characteristics considered for this review appears in Appendix B1 of this review.

The DMEPA considers the spelling of the name, pronunciation of the name when spoken, and appearance of the name when scripted. DMEPA compares the proposed proprietary name with the proprietary and established name of existing and proposed drug products and names currently under review at the FDA. DMEPA 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. DMEPA examines the phonetic similarity using patterns of speech. If provided, DMEPA will consider the Sponsor's intended pronunciation of the proprietary name. However, DMEPA also considers a variety of pronunciations that could occur in the English language because the Sponsor has little control over how the name will be spoken in clinical practice. The orthographic appearance of the proposed name is evaluated using a number of different handwriting samples. DMEPA applies expertise gained from root-cause analysis of postmarketing 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).

[2] 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/Similar shape 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, DMEPA 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 searches 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. A standard description of the databases used in the searches is provided in the reference section of this review. To complement the process, the DMEPA uses 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, DMEPA reviews 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. DMEPA also evaluates if there are characteristics included in the composition that may render the name unacceptable from a safety perspective (abbreviation, dosing interval, etc.).

2. Expert Panel Discussion

DMEPA gathers gather CDER professional opinions on the safety of the proposed product and discussed the proposed proprietary name (Expert Panel Discussion). The Expert Panel is composed of Division of Medication Errors Prevention (DMEPA) staff and representatives from the Division of Drug Marketing, Advertising, and Communications (OPDP). We also consider input from other review disciplines (OND, ONDQA/OBP). 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 database and information searches to the Expert Panel for consideration. Based on the clinical and professional experiences of the Expert Panel members, the Panel may recommend additional 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 Simulation 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 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 record their interpretations of the orders which are recorded electronically.

4. Comments from Other Review Disciplines

DMEPA requests the Office of New Drugs (OND) and/or Office of Generic Drugs (OGD), ONDQA or OBP for their comments or concerns with the proposed proprietary name, ask for 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 OPDP's decision on the name. The primary Safety Evaluator addresses any comments or concerns in the safety evaluator's assessment.

The OND/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 provide any further information that might inform DMEPA's final decision on the proposed name.

Additionally, other review disciplines opinions such as ONDQA or OBP may be considered depending on the proposed proprietary name.

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, considers all aspects of the name that may be misleading or confusing, conducts a Failure Mode and Effects Analysis, and provides an overall decision on acceptability dependent on their 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.[3] 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 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

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

characteristics listed in Appendix B1 of this review. 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? And Are there any components of the name that may function as a source of error beyond sound/look-alike"***

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 or because of some other component of the name. 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.

Moreover, 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 Overall Risk Assessment:

a. OPDP finds the proposed proprietary name misleading from a promotional perspective, and the Review Division concurs with OPDP'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 but involve a naming characteristic that when incorporated into a proprietary name, may be confusing, misleading, cause or contribute to medication errors.

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 generally recommends that the Sponsor select an alternative proprietary name and submit the alternate name to the Agency for 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 Sponsor 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/Sponsor. However, the safety concerns set forth in criteria a through e above 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, confusing, or misleading 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 preventable source of medication error that, in many instances, the Agency and/or Sponsor 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. Sponsors have undertaken higher-leverage strategies, such as drug name changes, in the

past but at great financial cost to the Sponsor 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 Sponsors' 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.

Appendix B: Letters with Possible Orthographic or Phonetic Misinterpretation

Letters in Name, Mitosol	Scripted May Appear as	Spoken May Be Interpreted as
Capital 'M'	N, V, W, H, U	n
lower case 'i'	a, i, e, o	any vowel, y
lower case 't'	i, l, b, f	d
lower case 'o'	a, e, u	any vowel
lower case 's'	n, r	z
lower case 'l'	i, b, h	el, ll
combination letters 'ol'	d	aul, awl, all

Appendix C: Prescription Simulation Samples and Results

Figure 1. Mitosol Prescription Study (Conducted on November 2, 2011)

Handwritten Requisition Medication Order	Verbal Prescription
Medication Order: Mitosol #1 to OR	"Mitosol - One to OR"
Outpatient Prescription: Mitosol #1 UAR	

FDA Prescription Simulation Responses.

INPATIENT	STRENGTH	VOICE	STRENGTH	OUTPATIENT	STRENGTH
HISTOSOL		MICTASOL		MITOSOL	
MITOSOL		MITASOL		MITOSOL	
MITOSOL	none	MITASOL	na	MITOSOL	
MITOSOL	none	MITASOL	1	MITOSOL	
MITOSOL		MITASOL	1 to OR	MITOSOL	
MITOSOL	None given	MITASOL	1	MITOSOL	
MITOSOL		MITASOL	none	MITOSOL	
MITOSOL		MITOSAL	1 to OR	MITOSOL	
MITOSOL		MITOSOL		MITOSOL EYE DROPS	
MITOSOL		MITOSOL		UNITOSOL	
MITOSOL	#1	MYCTOTHOL			
MITOSOL	none given	MYTOSOL			
MITOSOL	None	MYTOSOL	one		
MITOSOL		MYTOSOL			
MITOSOL					
MITOSOL #1					

Appendix D: Proprietary names not likely to be confused or not used in usual practice settings for the reasons described.

Proprietary Name	Active Ingredient	Similarity to Mitosol	Failure preventions
Mithracin	Plicamycin	Look	NDA 050109 was withdrawn by Commissioner on June 18, 2009 (effective date in the Federal Register notice). There are no therapeutic equivalents or generic products available (Source: DARRTS).
Milontin	Phensuximide	Look	NDA 008855 was withdrawn effective August 5, 1996 (FR) [Source: DARRTS]). There are no therapeutic equivalents or generic products available.
Metastron	Strontium Chloride Sr 89	Sound	Lack of convincing phonetic similarities
Mitolactol	Mitolactol/ Dibromodulcitol	Look	Oral orphan drug product (IND 035246) for treatment of brain tumor/uterine cancer; product characteristics not found in commonly used drug databases (e.g., Redbook, Clinical Pharmacology, Facts & Comparisons online, Drugs@FDA, and Micromedex)
Metsal AR	Magnesium Salicylate	Look	Drug product available in Australia; product characteristics unknown (Source: Lexicomp)
Metoral	Topical Triamcinolone	Look	Drug product available in Malaysia and Thailand; product characteristics are unknown (Source: Lexicomp)
Moducal	Nutritional Supplement for enteral feeding	Look	Not a drug. Product is unlikely to be confused with Mitosol because of differing product characteristics and the use of separate pathways in the traditional medication use system (e.g., distribution, storage, and prescribing).
Mitotrol	Nutritional Supplement	Look and Sound	Not a drug; Product is unlikely to be confused with Mitosol because of differing product characteristics and the use of separate pathways in the traditional medication use system (e.g., distribution, storage, and prescribing). (Source: SAEGIS)
Mitosol	Mitomycin	Look and	Name is the subject of this review

		Sound	(Sources: SAEGIS, USPTO)

(b) (4)

[redacted]

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

Appendix E: Risk of medication errors due to product confusion minimized by dissimilarity of the names and/ or use in clinical practice for the reasons described.

Proposed name: Mitosol (Mitomycin for Solution)	**Strength(s): 0.2 mg/vial**	**Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye**
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Vaprisol (Conivaptan) Injection 20 mg/100 mL Usual dose: 20 mg intravenous over 30 minutes, then 20 mg as continuous intravenous infusion for 24 hours (up to 3 days)	Orthographic similarity stems from the similar appearance of their first letters ('V' vs. 'M') in some handwriting styles and the fact that these names share the last three letters of their names ('-sol'). Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The marketed name, Vaprisol, includes a down stroke ('p') in the third position whereas this location is occupied by an up stroke ('t') in the proposed name, Mitosol. Additionally, the letters preceding the suffix, 'sol' in both of these names ('-ri-' vs. '-o-') do not look similar when written and Vaprisol appears longer in length. These differences may distinguish this name pair. It is likely that the dosing regimen (dose and infusion rate) for Vaprisol would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) (each containing 0.2 mg) would be required and how frequently they must be applied.
Welchol (Colesevelam) oral powder for suspension, oral tablet 3.75 grams of powder/packet, 625 mg oral tablet Usual dose: 1,875 mg orally twice daily or 3,750 mg orally once daily	Orthographic similarity stems from the similar appearance of their first letters ('W' vs. 'M') when written and the fact that both names include an up stroke in the third position ('l' vs. 't') and end with the same two letters ('-ol'). Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The added up stroke ('h') in the marketed name, Welchol, gives this name a different shape from the proposed name, Mitosol, and may help to differentiate between this name pair. It is likely that the dosing regimen (dose and frequency of administration) for Welchol would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) (each containing 0.2 mg) would be required and how frequently they must be applied.

Proposed name: Mitosol (Mitomycin for Solution)	Strength(s): 0.2 mg/vial	Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Natrecor (Nesiritide) Intravenous Powder for Solution 1.5 mg Usual dose: 2 mcg/kg intravenous bolus, then 0.01 mg/kg/minute by continuous infusion (up to 0.03 mg/kg/minute)	Orthographic similarity stems from the similar appearance of their first letters ('N' vs. 'M') in some handwriting styles and the fact that they share the same letter in the third position ('t'). Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The proposed name, Mitosol, includes an up stroke ('l') at the end of its name which gives it a different shape from the marketed name, Natrecor. Additionally, the letters in the fourth through sixth positions within these names ('-rec-' vs. '-oso-') look different when written. These differences may distinguish this name pair. It is likely that the dosing regimen (dose and infusion rate) for Natrecor would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.
Nitro-Bid (Nitroglycerin) Transdermal Ointment 2% Usual dose: 0.5 inches to 2 inches topically in the morning and repeat the dose 6 hours later	Orthographic similarity stems from the similar appearance of their first letters ('N' vs. 'M') in some handwriting styles and the fact that they share the same two letters in the second and third positions ('-it-'). Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The marketed name, Nitro-Bid, includes an up stroke ('b') in the sixth position giving this name a different shape from the proposed name, Mitosol. Additionally, Nitro-Bid appears longer in length when scripted. These differences may help distinguish between this name pair. It is likely that the dosing regimen (dose and frequency of administration) for Nitro-Bid would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.

Proposed name: Mitosol (Mitomycin for Solution)	**Strength(s): 0.2 mg/vial**	**Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye**
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Nitro-Dur (Nitroglycerin) Transdermal Patch 0.1 mg/hr, 0.2 mg/hr, 0.3 mg/hr, 0.4 mg/hr, 0.6 mg/hr, 0.8 mg/hr Usual dose: Apply one patch (0.2 mg to 0.4 mg/hr) topically in the morning (and remove in the evening)	Orthographic similarity stems from the similar appearance of their first letters ('N' vs. 'M') in some handwriting styles and the fact that they share the same two letters in the second and third positions ('-it-').	The marketed name, Nitro-Dur, includes an up stroke ('d') in the sixth position giving this name a different shape from the proposed name, Mitosol. Additionally, Nitro-Dur appears longer in length when scripted. These differences may help distinguish between this name pair. Since Nitro-Dur is available in multiple strengths, this information needs to be provided by the prescriber to dispense/administer the product as intended
Nitrostat (Niroglycerin) Tablet 0.3 mg, 0.4 mg, 0.6 mg Usual dose: One tablet sublingually upon the first sign of a heart attack; repeat every 5 minutes as needed up to 3 doses; call MD if no relief	Orthographic similarity stems from the similar appearance of their first letters ('N' vs. 'M') and their last letters ('t' vs. 'l') and the fact that they share the same two letters in the second and third positions ('-it-').	The marketed name, Nitrostat, includes an up stroke ('t') in the seventh position giving this name a different shape from the proposed name, Mitosol. Additionally, Nitrostat appears longer in length when scripted. These differences may help distinguish between this name pair. Since Nitrostat is available in multiple strengths, this information needs to be provided by the prescriber to dispense/administer the product as intended.

Proposed name: Mitosol (Mitomycin for Solution)	**Strength(s): 0.2 mg/vial**	**Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye**
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Maxair (Pirbuterol Acetate) Autohaler 0.2 mg/inhalation Usual dose : Two puffs every 4 to 6 hours as needed (up to 12 puffs per day)	Orthographic similarity stems from sharing the same first letter ('M') and having a cross stroke in the third positions ('x' vs. 't'). Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The letters following the cross stroke in the marketed name, Maxair ('-air') do not look similar to the letters following the cross stroke in the proposed name, Mitosol ('-osol'). This difference will likely distinguish this name pair.
Mitomycin Powder for Solution (established name for Mutamycin which has been discontinued) 5 mg, 20 mg, 40 mg Usual dose: 10 mg/m^2 to 12 mg/m^2 as intravenous bolus on Day #1 and 5-Floururacil 1000 mg/m^2 per day as continuous IV infusion on days #1 through #4	Orthographic similarity stems from sharing the same first four letters ('Mito-') in their names. Overlap in numerical strength exists (20 mg vs. 0.2 mg).	The marketed name, Mitomycin includes a down stroke ('y') and appears longer in length when scripted. This difference is likely to differentiate Mitomycin from the proposed name, Mitosol. It is likely that the dosing regimen (dose, route and frequency of administration) for Mitomycin would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.

Proposed name: Mitosol (Mitomycin for Solution)	**Strength(s): 0.2 mg/vial**	**Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye**
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Miltown (Meprobamate) Tablets (Brand is no longer marketed, but generic products exist in the marketplace) 200 mg, 400 mg, 600 mg Usual dose: 1200 mg to 1600 mg orally in 3 to 4 divided doses	Orthographic similarity stems from sharing the same first two letters ('Mi').	The marketed name, Miltown, includes two sequential up strokes ('-lt-') which gives this name a different shape from the proposed name, Mitosol, where the two up strokes are separated by several letters ('-oso-'). This difference will likely help to distinguish between this name pair. Since Miltown is available in multiple strengths, this information must be stated prior to dispensing/administering the medication. It is likely that the dosing regimen (dose and frequency of administration) for Miltown would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.
Milophene (Clomiphene) Tablets (Brand is no longer marketed, but generic products exist in the marketplace). 50 mg Usual dose: 50 mg orally daily x 5 days	Orthographic similarity stems from sharing the same first two letters ('Mi'). Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The marketed name, Milophene, includes a down stroke ('p') immediately followed by an up stroke ('h') whereas the proposed name, Mitosol, has a terminal up stroke ('l') giving these names comparatively different shapes. Additionally, Milophene is longer in length when scripted. These differences will likely distinguish these names from each other.

Proposed name: Mitosol (Mitomycin for Solution)	**Strength(s): 0.2 mg/vial**	**Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye**
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Midamor (Amiloride) Tablet 5 mg Usual dose: 5 mg to 20 mg orally daily	Orthographic similarity stems from sharing the first two letters ('Mi') of their names and the fact that they have an up stroke in the third position ('d' vs. 't'). Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The proposed name, Mitosol, includes an up stroke ('l') at the end of its name which gives it a different shape from the marketed name, Midamor. Additionally, the last four letters of Mitosol ('-osol') do not look like the last four letters of Midamor ('-amor') when written. These differences may distinguish this name pair.
Mitotane Tablet 500 mg Usual dose: 2 grams to 16 grams orally daily (in 3 to 4 divided doses)	Orthographic similarity stems from sharing the first four letters ('Mito-') of their names. Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The second up stroke in the marketed name, Mitotane, is in the fifth position, whereas the proposed name, Mitosol has its second up stroke at the end of its name giving these names different shapes. This difference may distinguish this name pair from each other.

Proposed name: Mitosol (Mitomycin for Solution)	**Strength(s): 0.2 mg/vial**	**Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye**
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Mefoxin (Cefoxitin) Injection 1 gram/50 mL, 2 grams/50 mL Usual dose: 1 gram to 2 grams intravenously every 4 hours to every 8 hours	Orthographic similarity stems from sharing their first letter ('M') and the fact that an up stroke is in the third position ('f' vs. 't') of these names.	The proposed name, Mitosol, has an up stroke ('l') in the last position of its name giving it a different shape from that of the marketed name, Mefoxin. Additionally, the letters in the fifth through seven positions of these names do not look similar when scripted ('xin' vs. 'sol'). These differences may help to distinguish between this name pair. It is likely that the dosing regimen (dose and frequency of administration) for Mefoxin would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.
Malarone (Atovaquone and Proguanil) Tablet 250 mg/100 mg Usual dose: One to four tablets orally daily for 1 to 3 days	Orthographic similarity stems from sharing the same first letters ('M') and having an up stroke in the third position within their names ('l' vs. 't'). Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The letters following the first up stroke in the proposed name, Mitosol and the marketed name, Malarone, do not look similar when scripted ('-osol' vs. '-arone'). Additionally, Malarone is longer in length. These differences will likely help to distinguish this name pair. It is possible that the dosing regimen (dose and frequency of administration) for Malarone would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.

Proposed name: Mitosol (Mitomycin for Solution)	**Strength(s): 0.2 mg/vial**	**Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye**
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Metrodin (Urofollitropin) Injection (Brand name no longer exists but generics are available) 75 IU/amp, 150 IU/amp Usual dose : 150 units/day subcutaneous or intramuscular for the first 5 days of treatment in patients who have received gonadotropin-releasing hormone agonist.	Orthographic similarity stems from sharing the same first and third letters ('M' and 't').	The second up stroke appears in the fifth position in the marketed name, Metrodin, whereas it is the last letter in the proposed name, Mitosol, giving these names different shapes. This difference may help to distinguish between this name pair.
Mellaril (Thioridazine) Tablet, Oral Concentrate 10 mg, 15 mg, 25 mg, 50 mg, 100 mg, 150 mg, 200 mg; 30 mg/mL, 100 mg/mL Usual dose: 50 mg to 100 mg orally three times daily (up to 800 mg/day)	Orthographic similarity stems from sharing the same first and last letters ('M' and 'l').	The marketed name, Mellaril has two consecutive up strokes ('ll') in the third and fourth position whereas the proposed name, Mitosol, includes a single up stroke ('t') in the third position. This difference gives these names different shapes and may help to distinguish between them. Since Mellaril is available in multiple strengths, this information must be stated prior to dispensing/administering the medication.

Proposed name: Mitosol (Mitomycin for Solution)	**Strength(s): 0.2 mg/vial**	**Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye**
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Nulecit (Sodium Ferric Gluconate Complex) Intravenous Solution 62.5 mg/5 mL Usual dose: 25 mg to 125 mg intravenous over 1 hour with each hemodialysis (up to 1 gram)	Orthographic similarity stems from the similar appearance of their first letters ('M' vs. 'N') and the fact that they have up strokes in the same positions within their names ('l' vs. 't') and 't' vs. 'l'). Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The combination of letters in the fourth through sixth position in the marketed name, Nulecit, is orthographically different from the combination of letters in the same position within the proposed name, Mitosol ('-eci-' vs. '-oso-'). This difference may help to distinguish this name pair. It is likely that the dosing regimen (dose and frequency of administration) for Nulecit would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.
Velivet (Desogestrel and Ethinyl Estradiol) Tablet 7 Tablets containing 0.1 mg desogestrel and 0.025 mg ethinyl estradoil, 7 tablets containing 0.125 mg desogestrel and 0.025 mg ethinyl estradiol, and 7 tablets containing 0.15 mg and 0.025 mg ethinyl estradiol with 7 inert tablets Usual dose: One tablet orally daily	Orthographic similarity stems from the similar appearance of their first, third and last letters ('V' vs. 'M', 'l' vs. 't', and 't' vs. 'l') in some handwriting styles. Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The combination of letters in the fourth through sixth position in the marketed name, Velivet, is orthographically different from the combination of letters in the same position within the proposed name, Mitosol ('-ive-' vs. '-oso-'). This difference may help to distinguish this name pair.

Proposed name: Mitosol (Mitomycin for Solution)	Strength(s): 0.2 mg/vial	Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Velcade (Bortezomib) for Injection 3.5 mg Usual dose: 1.3 mg/m^2 intravenous bolus twice weekly for 2 weeks or twice weekly on days 1, 4, 8, 11, 22, 25, 29, and 32	Orthographic similarity stems from the similar appearance of their first and third letters ('V' vs. 'M' and 'l' vs. 't') in some handwriting styles. Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The fourth through seventh letters in the marketed name, Velcade ('cade') do not look orthographically similar to the letters in the same position within the proposed name, Mitosol ('osol'). This difference may distinguish this name pair from each other. It is likely that the dosing regimen (dose and frequency of administration) for Velcade would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.
Mucosil (Acetylcysteine) Solution 10 %, 20 % Usual dose: For acetaminophen overdose: ORAL: 140 mg/kg orally one time, then 70 mg/kg orally every 4 hours for 17 doses. INTRAVENOUS: 300 mg/kg given as a continuous intravenous infusion over 21 hours. Preparation varies depending upon patient weight.	Orthographic similarity stems from sharing the same letters in the first, fourth, fifth, and seventh positions ('M', 'l', 'o', 's', and 'l') and having the same length. Phonetic similarity stems from both names having three syllables. Additionally, four of their seven letters appear in the same location within their names which supports similar pronunciations of their first letter, last letter and the letter combination '-os-' which appears in their infix.	The proposed name, Mitosol, includes an up stroke ('t') in the third position which gives this name a different shape from the marketed name, Mucosil. Phonetically, the second letter in Mucosil, 'u' has a long sound (as 'you') and is distinguishable from the second letter in Mitosol, 'i' (pronounced similar to 'eye'). Additionally, the letters in the sixth position ('i' vs. 'o') are similarly distinguishable as they have a short sound and use different aspects of the mouth to pronounce. For example, the letters 'il' (in Mucosil) sound like 'ill' and the letters 'ol' (in Mitosol) sound similar to the word 'all'. These orthographic and phonetic differences may help to distinguish this name pair. It is likely that the dosing regimen (dose and frequency of administration) for Mucosil would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.

Proposed name: Mitosol (Mitomycin for Solution)	Strength(s): 0.2 mg/vial	Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Mitrazol (Miconazole Nitrate) Vaginal cream, 2% Vaginal Suppository, 100 mg, 200 mg Usual dose: Cream: one applicator daily for 7 days Vaginal Supp: 100 mg (or 200 mg) per vagina at bedtime for 7 days (or 3 days)	Orthographic similarity stems from sharing the first three letters ('Mit-') and the last two letters ('-ol') of their names. Phonetic similarity stems from both names having three syllables and sharing the same first three letters and last two letters which support similar pronunciations of their prefix and suffix.	The infix of the marketed name, Mitrazol ('raz') does not look or sound similar to that of the proposed name, Mitosol ('os') when written or spoken. These orthographic and phonetic differences may help to differentiate between this name pair. It is likely that the dosing regimen (weight-based dose and frequency of administration) for Mitrazol would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.
Mintezol (Thiabendazole) Per DARRTS, NDA 016096 and NDA 016097 were discontinued from domestic sales effective October 31, 2008 and March 31, 2003 respectively. However, Annual Reports are still being submitted to the Agency and therefore, re-introduction into the US market remains a possibility. Tablet : 500 mg (NDA 016096) Oral Suspension : 500 mg/5 mL (NDA 016097)	Orthographic similarity stems from sharing the same first two and last two letters ('Mi' and 'ol') and having a single cross-stroke ('t') within their names. Phonetic similarity stems from both names having three syllables and sharing the same last two letters ('ol') which supports similar pronunciations of their suffixes. Additionally, the letter 's' (in Mitosol) sounds similar to the letter 'z' (in Mintezol). Both products are single strength and therefore, this information would not have to be stated	The marketed name, Mintezol, includes the letter 'n' just prior to the cross stroke ('t') which lengthens its prefix and differentiates it from the proposed name, Mitosol. Additionally, the letter 'I' in Mintezol has a short sound versus the long sound (as in 'eye') of the 'i' in Mitosol. It is likely that the dosing regimen (weight-based dose and frequency of administration) for Mintezol would be stated, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.

Usual dose : The dose is determined by the patient's weight and should be given twice daily up to a maximum of 3 grams	prior to dispensing/administering the drugs.	

Proposed name: Mitosol (Mitomycin for Solution)	Strength(s): 0.2 mg/vial	Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Natroba (Spinosad) Topical Suspension 0.9% Usual dose: Apply just enough product to cover dry scalp and hair; rinse off with warm water after 10 minutes; if needed, may repeat after 7 days	Orthographic similarity stems from the similar appearance of their first letters ('N' vs. 'M') in some handwriting styles and the fact that these names share the same letter ('t') in the third position. Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The fourth through seventh letters in the proposed name, Mitosol ('-osol') do not look similar to the letters in the same position of the marketed name, Natroba ('-roba'). This difference may help to distinguish between this name pair.
Metozolv ODT (Metoclopramide) Tablet, orally distintegrating 5 mg, 10 mg Usual dose: 5 mg to 15 mg orally four times daily (30 minutes before meals and at bedtime)	Orthographic similarity stems from sharing the same letters in the first, third, fourth, sixth and seventh positions within their names ('M', 't', 'o', 'o', and 'l'). Phonetic similarity stems from both names having three syllables and sharing the same letters in the first, third, fourth, sixth and seventh positions within their names ('M', 't', 'o', 'o', and 'l') which supports their sound alike characteristics.	The terminal letter ('v') of the marketed name, Metozolv, makes this name appear longer than the proposed name, Mitosol. The ''I' in the proposed name, Mitosol, (which sounds like 'eye') does not sound like the 'e' in Metozolv which has a short sound. These differences may help distinguish between this name pair. It is likely that the dosing regimen (dose and frequency of administration) for Metozolv would be explicitly stated on a prescription/medication order, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.

Proposed name: Mitosol (Mitomycin for Solution)	Strength(s): 0.2 mg/vial	Usual dose: Saturate the [redacted] (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Metolazone Tablet 2.5 mg, 5 mg, 10 mg Usual dose: 5 mg to 20 mg orally daily	Orthographic similarity stems from sharing the same first ('M'), third ('t'), and fourth ('o') letters within their names. Additionally, both names have two up strokes ('t' and 'l'). Phonetic similarity stems from sharing the same first ('M'), third ('t'), and fourth ('o') letters within their names which supports similar sounding first and second syllables.	The marketed name, Metolazone, has five letters following its second up stroke ('l') making this name longer in length than Mitosol. Additionally, Metolazone, has four syllables whereas the proposed name, Mitosol, has three. These orthographic and phonetic differences may help to distinguish this name pair. It is likely that the dosing regimen (dose and frequency of administration) for Metolazone would be explicitly stated on a prescription/medication order, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated [redacted] (b) (4) would be required and how frequently they must be applied.
Midol (Ibuprofen) Tablet 200 mg Usual dose: 200 mg orally every 4 to 6 hours (not to exceed 1200 mg per day)	Orthographic similarity stems from sharing four letters ('M', 'i', 'o', and 'l') and having two up strokes ('d' vs. 't' and 'l') in the same or similar positions. Phonetic similarity stems from sharing four letters ('M', 'i', 'o', and 'l') in the same or similar positions which supports their similar sound-alike qualities. Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering	The proposed name, Mitosol, has four letters ('-osol') which immediately follow the first up stroke ('t') giving this name a longer appearance than that of the marketed name, Midol. Additionally, Mitosol has three syllables whereas Midol has two. These orthographic and phonetic differences may help distinguish between this name pair.

	the drugs.	

Proposed name: Mitosol (Mitomycin for Solution)	Strength(s): 0.2 mg/vial	Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Vitazol (Metronidazole) Intravenous (IV): 500 mg/100 mL Topical Cream/Lotion: 0.75% Topical Gel/Jelly: 0.75%, 1 % Vaginal Gel/Jelly: 0.75% Capsule: 375 mg Tablet: 250 mg, 500 mg, and (extended-release) 750 mg Usual dose: Intravenous: 15 mg/kg IV over 1 hour, then 7.5 mg/kg every 6 hours Vaginal Gel/Jelly: One applicator intra-vaginally once or twice daily for 5 to 7 days Topical Cream/Gel/Lotion/Jelly: Apply thin film topically to affected area twice daily	Orthographic similarity stems from the similar appearance of their first letters ('V' vs. 'M') when scripted and the fact that both names share the same second ('i'), third ('t') and last two letters ('-ol'). Additionally, they are of similar length. Phonetic similarity stems from the fact that these names have three syllables and they share the same second, ('i'), third ('t') and last two letters ('-ol'). Additionally, the 's' in Mitosol sounds similar to the 'z' in Vitazol. These similarities support the sound-alike qualities of this name pair.	It is likely that the dosing regimen (dose, route of administration, and frequency of administration) for Vitazol would be explicitly stated on a prescription/medication order given the multiple numbers of dosage forms and strengths available, but such information would not be given for Mitosol since it cannot be known in advance of the procedure how many saturated (b) (4) would be required and how frequently they must be applied.
Miochol (Acetylcholine Chloride) Ophthalmic Solution	Orthographic similarity stems from sharing the first two letters ('Mi')	The third through fifth letters in the marketed name, Miochol ('-och-') do not look like the third through fifth letters in the proposed name, Mitosol ('-tos-').

20 mg/vial Usual dose: To induce rapid miosis, instill into the anterior chamber before or after securing one or more sutures. In most cases, 0.5 to 2 mL produces satisfactory miosis.	and the last two letters (‘ol’). Additionally, both names are the same length. Phonetic similarity stems from sharing the first two letters (‘Mi’) and the last two letters (‘ol’) which supports similar pronunciations of this name pair. Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs. Both drug products are used in the same patient population.	Additionally, the first up strokes within the names (‘h’ in Miochol and ‘t’ in Mitosol) appear in different positions within the names giving this name pair different shapes. Phonetically, the infixes do not sound alike when spoken. There is a clear transition to the infix for the proposed name, Mitosol because of the hard ‘t’ sound whereas the transition is softer when the marketed name, Miochol is spoken. These orthographic and phonetic differences may help to distinguish between these names.

Proposed name: Mitosol (Mitomycin for Solution)	**Strength(s): 0.2 mg/vial**	**Usual dose: Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye**
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	**Causes (could be multiple)**	**Prevention of Failure Mode**
Natazia (Dienogest and Estradiol Valerate) Tablet Two tablets contain 3 mg Estradiol Valerate Five tablets contain 2 mg Estradiol Valerate and 2 mg Dienogest Seventeen tablets contain 2 mg 2 mg Estradiol Valerate and 3 mg Dienogest Two tablets contain 1 mg Estradiol Valerate Two white inert tablets Usual dose: One tablet orally daily	Orthographic similarity stems from the similar appearance of their first letters ('N' vs. 'M') in some handwriting styles and the fact that these names share the same letter ('t') in the third position. Both products are single strength and therefore, this information would not have to be stated prior to dispensing/administering the drugs.	The proposed proprietary name, Mitosol, includes a second up stroke ('l') in its name giving this name a different shape from the marketed name, Natazia. Additionally, the last three letters of these names do not look similar when written ('-zia' vs. '-sol'). These differences may help to distinguish between this name pair.

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/s/

DENISE V BAUGH
12/06/2011

LUBNA A MERCHANT
12/06/2011

CAROL A HOLQUIST
12/06/2011

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:	November 22, 2010
Application Type/Number:	NDA 022572
Through:	Melina Griffis RPh, Team Leader Denise Toyer, PharmD, Deputy Director Division of Medication Error Prevention and Analysis
From:	Lubna Merchant, MS, PharmD., Safety Evaluator Division of Medication Error Prevention and Analysis
Subject:	Proprietary Name Review
Drug Name(s):	Mitosol (Mitomycin) for Ophthalmic solution, 0.2 mg per Vial
Applicant:	Mobius Therapeutics, LLC
OSE RCM #:	2010-1948

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

CONTENTS

EXECUTIVE SUMMARY

This review summarizes the analysis of the proposed proprietary name, Mitosol (Mitomycin), for Ophthalmic Solution. 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 Mitosol 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 Mobius Therapeutics dated October 22, 2010 for an assessment of the proposed proprietary name, Mitosol, regarding potential name confusion with other proprietary or established drug names in the usual practice settings. The proposed labels and labeling will be reviewed separately in OSE review # 2010-1589.

1.2 PRODUCT INFORMATION

Mitosol (Mitomycin) is an antibiotic derived from *Streptomyces caespitosis* that has antimetabolytic properties. Mitosol is indicated for the treatment of refractory glaucoma as an adjunct to ab externo glaucoma surgery by topical application to the exposed site of a filtering bleb during trabeculectomy surgery to prolong the closing of the surgically created fistula. Mitosol is intended for topical application to the surgical site of glaucoma filtration surgery. (b) (4) provided within the Mitosol Kit should be fully saturated with the entire reconstituted vial. The saturated (b) (4) should be equally applied to the treatment area, and remain on the treatment area for two minutes, then removed and disposed appropriately. Mitosol will be available as 0.2 mg/vial supplied in a kit which contains the following: (b) (4)

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, 2.2, and 2.3 identify specific information associated with the methodology for the proposed proprietary name, Mitosol.

2.1 SEARCH CRITERIA

For this review, particular consideration was given to drug names beginning with the letter 'M' 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 Mitosol, the DMEPA safety evaluators also considers the orthographic appearance of the name on lined and unlined orders. Specific attributes taken into consideration include the length of the name (seven letters), upstrokes (three, letters 'M,' 't,' and 'l'), down strokes (none), cross strokes (one, letter 't'), and dotted letters (one, letter 'i'). Additionally, several letters in Mitosol 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 Mitosol.

When searching to identify potential names that may sound similar to Mitosol, the DMEPA staff search for names with similar number of syllables (three), stresses (Mi-to-sol), and placement of vowel and consonant sounds. (See Appendix B). The Applicant's intended pronunciation (mī-tō-sŏl) was also taken into consideration. Moreover, names are often mispronounced and/or spoken with regional accents and dialects, so other potential pronunciations of the name are considered.

2.2 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 and verbal prescription was communicated during the FDA prescription studies.

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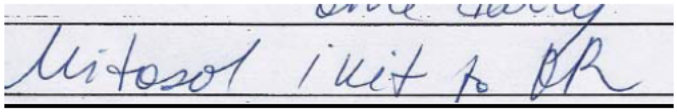
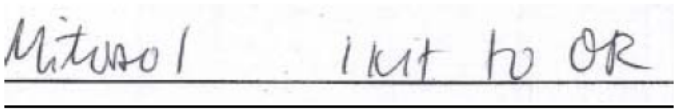
[1] Institute for Safe Medication Practices. Confused Drug name List (1996-2006). Available at http://www.ismp.org/Tools/confuseddrugnames.pdf

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

Figure 1. Mitosol Study (conducted on September 23, 2010)

HANDWRITTEN REQUISITION MEDICATION ORDER	VERBAL PRESCRIPTION
Inpatient prescription 1: 	Mitosol 1 kit to OR
Inpatient prescription 2: 	

3. RESULTS

3.1 Database and Information Sources

The searches yielded a total of 17 names as having some similarity to the name Mitosol. Fifteen of the names were thought to look like Mitosol. These include Vitafol, Nizoral, Maxitrol, Metrogel, Mexitil, Miglitol, Motofen, Mozobil, Nadolol, Visicol, Nitrol, Minotal, Medrol, Mitocyn, and Mitrazol. One name were thought to sound like Mitosol: Miconazole. The remaining name: Metozolv ODT was thought to look and sound similar to Mitosol.

Additionally, DMEPA staff did not identify any United States Adopted Names (USAN) stems in the proposed proprietary name, as of September 21, 2010.

3.2 Expert Panel Discussion

The Expert Panel reviewed the pool of names identified by DMEPA staff (See Section 3.1 above) and noted one additional name thought to have phonetic similarity to Mitosol: Mytussin.

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 Prescription Analysis Studies

A total of 23 practitioners responded, with none of the responses overlapping with any existing drug names. Twelve (n=12) of the participants interpreted the name correctly as "Mitosol," with correct interpretation occurring in both written studies. The remaining written responses misinterpreted the drug name. The letter 'M' was misinterpreted as the letter 'U'. In the verbal studies, most of the responses were misspelled phonetic variations of the proposed name.

See Appendix C for the complete listing of interpretations from the verbal and written prescription studies.

3.5 COMMENTS FROM THE DIVISION OF ANTI-INFECTIVE AND OPHTHALMOLOGY PRODUCTS (DAIOP)

3.5.1 INITIAL PHASE OF REVIEW

In response to the OSE, September 21, 2010 e-mail, Division of Anti-infective and Ophthalmology Products (DAIOP) noted that the name "Mitosol" is similar to the name "Optisol." Optisol is further evaluated in this review.

3.5.2 Midpoint of Review

DMEPA notified the Division of Division of Anti-infective and Ophthalmology Products (DAIOP) Products via e-mail that we had no concerns with the proposed proprietary name, Mitosol, on October 26, 2010. Per e-mail correspondence from the DAIOP on October 26, 2010, they indicated the Division had no additional issues with the proposed proprietary name, Mitosol.

3.6 SAFETY EVALUATOR RISK ASSESSMENT

Independent searches by the primary Safety Evaluator resulted in identification of eight additional names which were thought to look or sound similar to Mitosol represent a potential source of drug name confusion. The names identified to have look-alike similarities are Microsul, Acetasol, Mintezol, Mebaral, Viburcol, Velosef, Mitosol and Antizol.

Thus, we evaluated a total of twenty seven names: eight identified by the primary safety evaluator, 17 identified in section 3.1, 1 identified in section 3.2 above and 1 identified in section 3.5.1.

4. DISCUSSION

Mitosol is the proposed proprietary name for Mitomycin for Ophthalmic Solution. This proposed name was evaluated from a safety and promotional perspective based on the product characteristics provided by the Mobius. We sought input from pertinent disciplines involved with the review of this application and considered it accordingly.

4.1 PROMOTIONAL ASSESSMENT

DDMAC found the proposed proprietary name acceptable from a promotional perspective, and did not offer any additional comments relating to the proposed name. DMEPA and the Division of Anti-infective and Ophthalmology Products (DAIOP) concurred with the findings of DDMAC's promotional assessment of the proposed name.

4.2 SAFETY ASSESSMENT

Twenty seven names were identified as having potential similarity to the proposed proprietary name, Mitosol. No other aspects of the name were considered to pose potential confusion with the name. Nine of the twenty seven names did not undergo Failure Mode and Effect Analysis (FMEA) for the following reasons: four names were either OTC, nutrients or product not identified as a drug and not dispensed pursuant to a prescription, three names were of discontinued products, one name with limited

information and one proposed proprietary names withdrawn by the Applicant (see Appendices D-G).

Failure modes and effects analysis (FMEA) was applied to determine if the proposed proprietary name could potentially be confused with the remaining 18 names and lead to medication errors. This analysis determined that the name similarity between Mitosol and all of the identified names was unlikely to result in medication error for the reasons presented in Appendices H.

5. CONCLUSIONS AND RECOMMENDATIONS

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

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.

If you have further questions or need clarifications, please contact Brantley Dorch, project manager, at 301-796-0150.

6. COMMENTS TO THE APPLICANT

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

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

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.

7. 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. FDA Document Archiving, Reporting & Regulatory Tracking System [DARRTS]

DARRTS is a government database used to organize Applicant and Applicant submissions as well as to store and organize assignments, reviews, and communications from the 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/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.

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 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.

[3] National Coordinating Council for Medication Error Reporting and Prevention. http://www.nccmerp.org/aboutMedErrors html. Last accessed 10/11/2007.

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

[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.

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.

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 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.

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

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).

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.

Appendix B: Letters with possible orthographic or phonetic misinterpretation

Letters in Name, Beyaz	Scripted may appear as	Spoken may be interpreted as
Capital 'M'	N, V	n
lower case 'i'	a, i, e, o	any vowel
lower case 't'	I, l, b, F	D
lower case 'o'	a, e, o, u	any vowel
lower case 's'	n, r	z
lower case 'l'	I, b, h	el

Appendix C: FDA Prescription Study Responses

Inpatient Medication Order-1	Voice Prescription	Inpatient Medication Order-2
Mitosol	Mitosol	Mitusol
Mitosol	Mytosol	Mitosol
Mitosol	Mitosol	Mitosol
Uitosol	Mitosol	Mitosol
Uitosol	Mitosol	Mitasol
Mitosol	Mitosol	
Uitosol	Mitosol	
Uitosol		
Ilitosol		
Mitosol		
Mitosol		

Appendix D: OTC, nutritional supplement or product not identified as drug.

Proprietary Name	Similarity to Mitosol	Reason
Viburcol	Look	Homeopathic Preparation
Vitafol	Look	Oral Multivitamin Drops
Optisol	Look	Corneal storage medium used for donor tissue preservation in corneal transplantation
Mitosol	Look	International trade name for Adhesive

Appendix E: Discontinued products with no available generics.

Proprietary Name	Similarity to Mitosol	Status
Microsul (Sulfamethiozole) Tablets	Look	Discontinued products with no available generics
Velosef (Cephradine) Capsules and Oral Suspension	Look	Discontinued products with no available generics
Mintezol (Thiabendazole) Tablets and Oral Suspension	Look	Discontinued products with no available generics

Appendix F: Names with limited information

Proprietary Name	Similarity to Mitosol	Status
Minotal (Acetaminophen and Butabarbital) Tablets	Look	Name found in Micromedex. No other information could be obtained from any other pharmaceutical databases. Usage data indicates that the product in not prescribed under the name

Appendix G: Proposed proprietary names

Proprietary Name	Similarity to Mitosol	Status
(b) (4)	(b) (4)	This was the previous name proposed by the Applicant for Mitomycin Ophthalmic solution. Name was withdrawn by applicant and the new proposed proprietary name for this product is Mitosol.

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

Appendix H : Products with orthographic, phonetic and/or multiple differentiating product characteristics minimize the risk for medication errors.

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the [(b) (4)] with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Nitrol (Nitroglycerin) Topical Ointment	Look alike	Single strength 2 %	One application of 0.5 inches to 2 inches (7.5 mg to 30 mg) applied Topically upon rising in the morning and again 6 hours later to a 36-square-inch area of truncal skin	Differences in product characteristics minimize the likelihood of medication error in the usual practice setting. Route of Administration: *Ophthalmic vs. topical* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. one application of 0.5 inches to 2 inches* Dosage Form: *Ophthalmic solution vs. topical ointment* Frequency: *Once during surgery vs. two times daily(6 hours apart)*
Acetasol (Glacial Acetic Acid) Otic drops	Look alike	Single strength 2%	Instill 3-5 drops every 4-6 hours as needed	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *The prefix 'ace' appears different from 'mi' when scripted* Route of Administration: *Ophthalmic vs. otic* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. 3-5 drops* Frequency: *Once during surgery vs. every 4-6 hours*

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Mebaral (Mephobarbital) Tablets	Look alike	32 mg 50 mg 100 mg	Adults: 32 mg-150 mg given 2-4 times daily Children: 6-12 mg/kg/day in 2-4 divided doses	Differences in product characteristics minimize the likelihood of medication error in the usual practice setting. Route of Administration: *Ophthalmic vs. oral* Dose: (b) (4) *saturated with the entire reconstituted (0.2 mg) vial vs. 32 mg to 150 mg or 6-12 mg/kg/day* Dosage Form: *Ophthalmic solution vs. tablets* Frequency: *Once during surgery vs. 2-4 times daily* Strength: *0.2 mg/vial vs. 32 mg, 50 mg and 100 mg or 6-12 mg/kg/day*
Medrol (Methyl-prednisolone) Tablets	Look alike	2 mg 4 mg 8 mg 16 mg 32 mg	4 mg to 60 mg given once daily to four times daily	Differences in product characteristics minimize the likelihood of medication error in the usual practice setting. Route of Administration: *Ophthalmic vs. oral* Dose: (b) (4) *saturated with the entire reconstituted (0.2 mg) vial vs. 4 mg to 60 mg* Dosage Form: *Ophthalmic solution vs. tablets* Strength: *0.2 mg/vial vs. 2 mg, 4 mg, 8 mg, 16 mg and 32 mg* Frequency: *Once during surgery vs. 1-4 times daily*

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the [(b) (4)] with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Antizol (Fomepizole) Injection Solution	Look alike	Single strength 1 gm/mL	Loading dose: 15 mg/kg followed by doses of 10 mg/kg every 12 hours for 4 doses, then 15 mg/kg every 12 hours thereafter until ethylene glycol levels have been reduced <20 mg/dL and patient is asymptomatic with normal pH.	Differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Route of Administration: *Ophthalmic vs. intravenous infusion* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. 10-15 mg/kg*
Nizoral (Ketoconazole) Tablets and Shampoo	Look Alike	Tablets: 200 mg Shampoo: 2%	Shampoo: One application applied to scalp once Tablets: 200 mg to 400 mg once daily	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *Mitosol has an additional upstroke 't' in the name which is absent in Nizoral* Route of Administration: *Ophthalmic vs. oral or topical* Dosage Form: *Ophthalmic solution vs. tablets or shampoo* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. 1 application or 200 mg to 400 mg*

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the [(b) (4)] with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Maxitrol (Neomycin, Polymyxin B, and Dexamethasone) Ophthalmic Ointment and Suspension	Look alike	Ophthalmic ointment: 3.5 mg/10000 units/0.1% per gm Ophthalmic suspension: 3.5 mg/10000 units/0.1% per mL	Ointment: Place a small amount (~1/2") in the affected eye 3-4 times/day Suspension: Instill 1-2 drops into affected eye(s) every 3-4 hours.	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *The upstroke 't' is in different positions in the two names.* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. 1 application or 1-2 drops* Frequency: *Once during surgery vs. every 3-4 hours or 3-4 times daily*
Metrogel (Metronidazole) Topical and Vaginal gel	Look alike	Topical gel: 1% Vaginal gel 0.75 %	Vaginal: One applicatorful intravaginally once or twice daily Topical: Apply thin film to affected area once daily	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *Metrogel has a downstroke 'g' in the name which is absent in Mitosol.* Route of Administration: *Ophthalmic vs. vaginal or topical* Dosage Form: *Ophthalmic solution vs. topical or vaginal gel* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. 1 application or 1 applicatorful* Frequency: *Once during surgery vs. once or twice daily*

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Mexitil (Mexiletine) Tablets	Look alike	150 mg 200 mg 250 mg	200 mg to 300 mg every 8 hours	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *The upstroke 't' is in different positions in the two names.* Route of Administration: *Ophthalmic vs. oral* Dosage Form: *Ophthalmic solution vs. tablets* Dose: (b) (4) *saturated with the entire reconstituted (0.2 mg) vial vs. 200 mg to 300 mg* Strength: *0.2 mg/vial vs. 150 mg, 200 mg and 250 mg* Frequency: *Once during surgery vs. every 8 hours*

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Miglitol Tablets	Look alike	25 mg 50 mg 100 mg	25 mg to 100 mg three times daily	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *Miglitol has an additional upstroke 'l' and a downstroke 'g' in the name which is absent in Mitosol* Route of Administration: *Ophthalmic vs. oral* Dosage Form: *Ophthalmic solution vs. tablets* Frequency: *Once during surgery vs. three times daily* Strength: *0.2 mg/vial vs. 150 mg, 200 mg and 250 mg* Dose: (b) (4) *saturated with the entire reconstituted (0.2 mg) vial vs. 25 mg to 100 mg*

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the [(b) (4)] with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Motofen (Difenoxin and Atropine) Tablets	Look alike	Single strength 1mg/0.025 mg	One to two tablets every 3-4 hours	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *Mitosol has an additional upstroke 'l' at the end of the name giving it a different shape than Mitosol* Route of Administration: *Ophthalmic vs. oral* Dosage Form: *Ophthalmic solution vs. tablets* Frequency: *Once during surgery vs. every 3-4 hours* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. one to two tablets*
Mozobil (Plerixafor) Injection Solution	Look alike	Single strength 20 mg/mL	Normal dose: 0.24 mg/kg (maximum dose of 40 mg/day) Dose adjustment: 0.16 mg/kg (maximum dose of 27 mg/day)	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *The first upstroke (b vs. t) is in different positions in the two names.* Route of Administration: *Ophthalmic vs. subcutaneous injection* Frequency: *Once during surgery vs. once daily* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. 0.24 mg/kg and 0.16 mg/kg*

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Nadolol Tablets	Look alike	20 mg 40 mg 80 mg	40 mg to 320 mg once daily	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *Nadolol has an additional upstroke 'l' in the name which is absent in Mitosol* Route of Administration: *Ophthalmic vs. oral* Dosage Form: *Ophthalmic solution vs. tablets* Frequency: *Once during surgery vs. once daily* Strength: *0.2 mg/vial vs. 20 mg, 40 mg, and 80 mg* Dose: (b) (4) *saturated with the entire reconstituted (0.2 mg) vial vs. 40 to 320 mg*

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the [(b) (4)] with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Visicol (Monobasic sodium phosphate monohydrate and dibasic sodium phosphate anhydrous) Tablets	Look alike	Single strength 1.102 gm/ 0.398 gm	40 tablets once prior to colonoscopy taken as follows: Evening before colonoscopy: 3 tablets every 15 minutes for 6 doses, then 2 additional tablets in 15 minutes (total of 20 tablets) 3-5 hours prior to colonoscopy: 3 tablets every 15 minutes for 6 doses, then 2 additional tablets in 15 minutes (total of 20 tablets)	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *Mitosol has an additional upstroke 't' in the name which is absent in Visicol* Route of Administration: *Ophthalmic vs. oral* Dosage Form: *Ophthalmic solution vs. tablets* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. 40 tablets*
Miconazole	Sound alike	Kit: 400 mg Buccal Tablet: 50 mg Topical Cream: 2 % Topical Ointment: 2 % Vaginal Cream: 2 % Vaginal Suppository: 100 mg 200 mg	Vaginally : one applicatorful or one suppository vaginally once daily Topically: one application twice daily Oral: 50 mg buccally once daily	Phonetic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Phonetic: *Miconazole has an additional syllable 'na' in the name which is absent in Mitosol* Route of Administration: *Ophthalmic vs. vaginal, topical or buccal* Dosage Form: *Ophthalmic solution vs. cream, tablets, ointment and suppositories* Frequency: *Once during surgery vs. one to two times daily* Dose: [(b) (4)] *saturated with the entire reconstituted (0.2 mg) vial vs. one application or 1 tablet (50 mg)*

Product name with potential for confusion	Similarity to Mitosol	Strength	Usual Dosage and Administration	Name confusion is prevented by the combination of stated product characteristics, orthographic, and/or phonetic differences as described.
Mitosol (Mitomycin) for Ophthalmic Solution	**N/A**	**Single strength 0.2 mg/vial**	**Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye.**	**N/A**
Mytussin	Sound alike	Single strength 100 mg/5 mL	5 mL to 10 mL every 4 hours as needed	Phonetic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Phonetic: *The last syllable in the two names (sol vs. sin) sound different when pronounced* Route of Administration: *Ophthalmic vs. oral* Frequency: *Once during surgery vs. every 4 hours* Dose: (b) (4) *saturated with the entire reconstituted (0.2 mg) vial vs. 5 mL to 10 mL*
Metozolv ODT	Look and sound alike	5 mg 10 mg	10 to 15 mg four times daily	Orthographic differences in the names, in conjunction with differences in product characteristics, minimize the likelihood of medication error in the usual practice setting. Orthographic: *The addition of the modifier ODT lengthen the name Metozolv ODT.* Route of Administration: *Ophthalmic vs. oral* Dosage Form: *Ophthalmic solution vs. tablets* Frequency: *Once during surgery vs. four times daily* Strength: *0.2 mg/vial vs. 5 mg and 10 mg* Dose: (b) (4) *saturated with the entire reconstituted (0.2 mg) vial vs. 10 mg to 15 mg*

Appendix K: Risk of medication errors due to product confusion minimized by dissimilarity of the names or specified product characteristics

Proposed name: **Mitosol (Mitomycin) for Ophthalmic Solution**	**Strength:** **0.2 mg/vial**	**Usual Dose:** **Saturate the (b) (4) with the entire reconstituted vial and apply topically to the surgical site in the eye.**
Failure Mode: Name confusion	**Causes**	**Prevention of Failure (name confusion) Leading to a Medication Error**
Mitrazol (Miconazole) Topical Powder Strength: 2 % Dose: One application applied topically two times daily	**Orthographic Similarities:** Both names start with identical letters 'mit' and end with similar prefixes **Phonetic Similarities:** Both names start and end with similar sounding syllables.	Differences in product characteristics minimize the likelihood of medication error in the usual practice setting. **Rationale:** The two products differ in the route of administration and dosage form. Mitosol is an ophthalmic solution applied to the eye and Mitrazol is a topical powder applied topically. Additionally the two products also differ in dose and frequency of use. Mitosol is used once during surgery with (b) (4) saturated with the reconstituted vial and Mitrazol is dosed as one application two times daily. The two products also differ in the setting of use. Mitosol is a prescription and will be used only during surgery in the OR and Mitrazol is available as an over the counter product.

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/s/

LUBNA A MERCHANT
11/23/2010

MELINA N GRIFFIS
11/23/2010

CAROL A HOLQUIST on behalf of DENISE P TOYER
12/06/2010
Signing on behalf of Denise Toyer