

**CENTER FOR DRUG EVALUATION AND  
RESEARCH**

*APPLICATION NUMBER:*

**22-393**

**PROPRIETARY NAME REVIEW(S)**



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

Date: November 4, 2009

To: Robert Justice, MD, Director  
Division of Oncology Drug Products

Through: Kellie Taylor, PharmD, Team Leader  
Carol Holquist, RPh, Director  
Division of Medication Error Prevention and Analysis (DMEPA)

From: Cathy A. Miller, MPH, BSN., Safety Evaluator  
Division of Medication Error Prevention and Analysis (DMEPA)

Subject: Proprietary Name Review

Drug Name(s): Istodax (Romidepsin) for Injection  
10 mg per vial

Application Type/Number: NDA 022393

Applicant: Gloucester Pharmaceuticals, Inc.

OSE RCM #: 2009-735

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## **1 INTRODUCTION**

This re-assessment of the proposed proprietary name, Istodax, is written in response to the anticipated approval of this NDA within 90 days from the date of this review. The Division of Medication Error Prevention and Analysis (DMEPA) found the proposed proprietary name, Istodax, acceptable in OSE Review #2009-258, dated April 16, 2009. The Division of Oncology Drug Products did not have any concerns with the proposed name, Istodax, and the Division of Drug Marketing, Advertising and Communication (DDMAC) found the name acceptable from a promotional perspective on February 20, 2009.

## **2 METHODS AND RESULTS**

For the proposed proprietary name, DMEPA staff search a standard set of databases and information sources (see section 4) to identify names with orthographic and/or phonetic similarity to the proposed name that have been approved since the previous proprietary name review. We used the same search criteria previously used in OSE Review #2009-258 and since none of the proposed product characteristics were altered we did not re-evaluate previous names of concern. Additionally, DMEPA searches the United States Adopted Names (USAN) stem list to determine if the name contains any USAN stems as of the last USAN updates. DMEPA bases the overall risk assessment on the findings of a Failure Mode and Effects Analysis (FMEA) of the proposed proprietary name, and focuses on the avoidance of medication errors.

The searches of the databases referenced in Section 4 did not yield any new names thought to look or sound similar to Istodax and represent a potential source of drug name confusion.

DMEPA staff did not identify any United States Adopted Names (USAN) stems in the proposed proprietary name, Istodax, as of October 30, 2009.

## **3 CONCLUSIONS AND RECOMMENDATIONS**

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

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

#### 4 REFERENCES

1. OSE review # 2009-258, Proprietary Name Review of Istodax, Cathy A. Miller, Safety Evaluator.

2. *Drugs@FDA* (<http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm>)

Drugs@FDA contains most of the drug products approved since 1939. The majority of labels, approval letters, reviews, and other information are available for drug products approved from 1998 to the present.

Drugs@FDA contains official information about FDA approved brand name, generic drugs, therapeutic biological products, prescription and over-the-counter human drugs and discontinued drugs and “Chemical Type 6” approvals.

3. *USAN Stems* (<http://www.ama-assn.org/ama/pub/category/4782.html>)

USAN Stems List contains all the recognized USAN stems.

4. *CDER Proposed Names List*

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

Application Type/Number	Submission Type/Number	Submitter Name	Product Name
NDA-22393	ORIG-1	GLOUCESTER PHARMACEUTICA LS INC	ROMIDEPSIN FOR INFUSION

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/s/  
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11/04/2009

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11/04/2009



**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: April 16, 2009

To: Robert Justice, M.D. Director  
Division of Oncology Drug Products

Through: Kellie Taylor, Pharm.D., Team Leader  
Denise Toyer, Pharm.D., Deputy Director  
Carol Holquist, RPh, Director  
Division of Medication Error Prevention and Analysis  
(DMEPA)

From: Cathy A. Miller, M.P.H., B.S.N. Safety Evaluator  
Division of Medication Error Prevention and Analysis  
(DMEPA)

Subject: Proprietary Name Review

Drug Name(s): Istodax (Romidepsin) for Injection  
10 mg

Application Type/Number: NDA 22-393

Applicant/Applicant: Gloucester Pharmaceuticals, Inc.

OSE RCM #: 2009-258

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

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## EXECUTIVE SUMMARY

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

However, if any of the proposed product characteristics as stated in this review are altered prior to approval of the product, DMEPA rescinds this Risk Assessment finding and recommends that the name be resubmitted for review. In the event that our Risk Assessment finding is rescinded, the evaluation of the name on resubmission is independent of the previous Risk Assessment, and as such, the conclusions on re-review of the name are subject to change.

In addition, the proposed name must be reevaluated 90 days before approval of the NDA, even if the proposed product characteristics as stated in this review are not altered.

## 1 BACKGROUND

### 1.1 INTRODUCTION

This review is in response to a request from Gloucester Pharmaceuticals, Inc. on February 4, 2009, for the proprietary name review of the proposed name, Istodax, for the potential name confusion with other proprietary or established drug names in the usual practice settings. The Applicant has submitted an external name study evaluation in support of the proposed proprietary name, Istodax. This analysis was conducted by \_\_\_\_\_ On February 18, 2009, the Applicant also submitted draft container labels and carton labeling, which will be reviewed in a separate DMEPA review.

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### 1.2 PRODUCT INFORMATION

Istodax (Romidepsin) for injection, is indicated for the treatment of cutaneous T-cell Lymphoma (CTCL), including relief of pruritus, in patients who have received at least one prior systemic therapy. The dose for Istodax administration is 14 mg/m<sup>2</sup> administered intravenously after reconstitution over a four hour period on days one, eight and fifteen of a 28-day cycle. Cycles should be repeated every 28 days provided that the patient continues to benefit from and tolerates the drug. If a patient is intolerant to therapy, dose reduction to 10 mg/m<sup>2</sup> and further reduction to 8 mg/m<sup>2</sup> can be considered.

Istodax is supplied as a single-use dual pack containing one vial of sterile lyophilized powder (10 mg Romidepsin and 20 mg Povidone bulking agent per vial), and is one diluent vial containing 2 mL of reconstitution solution composed of 80 % propylene glycol, USP, and 20 % dehydrated alcohol, USP. Istodax should be reconstituted with 2 mL of the diluent and swirled until there are no visible particles. The resulting Istodax concentration is 5 mg/mL. The appropriate Istodax amount should be extracted from the vial to deliver the desired dose and diluted in 500 mL of 0.9 % Sodium Chloride injection, USP for infusion over a four hour period. The diluted solution is stable for at least 24 hours when stored at room temperature however, it should be administered as soon after dilution as possible.

## 2 METHODS AND MATERIALS

This section describes the methods and materials used by the Division of Medication Error Prevention and Analysis (DMEPA) when conducting a proprietary name risk assessment (See 2.1 Proprietary Name Risk Assessment). The primary objective for the assessment is to identify and remedy potential sources of medication error prior to drug approval. 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.<sup>1</sup>

### 2.1 PROPRIETARY NAME RISK ASSESSMENT

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.

For the proposed proprietary name, DMEPA staff searched a standard set of databases and information sources to identify names with orthographic and phonetic similarity (See 2.1.1 for details) and held a Center for Drug Evaluation and Research (CDER) Expert Panel discussion to gather professional opinions on the safety of the proposed proprietary name (See 2.1.1.2). DMEPA staff also conducts internal FDA prescription analysis studies. When provided, external prescription analysis studies results are considered and incorporated 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 (See 2.1.2 for details). The overall risk assessment is based on the findings of a Failure Mode and Effects Analysis (FMEA) of the proprietary name, and is focused on the avoidance of medication errors.

FMEA is a systematic tool for evaluating a process and identifying where and how it might fail.<sup>2</sup> FMEA is used 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

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

<sup>2</sup> Institute for Healthcare Improvement (IHI). Failure Modes and Effects Analysis. Boston. IHI:2004.

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.<sup>3</sup>

### **2.1.1 Search Criteria**

The DMEPA staff considers the spelling of the name, pronunciation of the name when spoken, and appearance of the name when scripted as outlined in Appendix A.

For this review, particular consideration was given to drug names beginning with the letter ‘I’ 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.<sup>4,5</sup>

To identify drug names that may look similar to Istodax, the DMEPA staff also considers the orthographic appearance of the name on lined and unlined orders. Specific attributes taken into consideration include the length of the name (seven letters), upstrokes (upper case letter ‘I’, lower case letters ‘t’ and ‘d’), cross strokes and (lower case letters ‘t’ and ‘x’). Additionally, several letters in Istodax may be vulnerable to ambiguity when scripted, including the capital letter ‘I’ may appear as capital letters ‘A’, ‘F’, ‘L’, ‘E’, ‘t’, ‘J’ or ‘S’; lower case ‘s’ may look like lower case ‘r’ or ‘n’; lower case ‘t’ may look like lower case ‘l’; lower case letter ‘o’ may look like lower case letters ‘a’ or ‘u’; lower case letter ‘d’ may appear as lower case letters ‘t’ or ‘a’; lower case ‘a’ may appear as lower case letter ‘o’ or ‘u’; and lower case ‘x’ may appear as lower case ‘r’ or ‘n’. As a result, the DMEPA staff also considers these alternate appearances when identifying drug names that may look similar to Istodax.

When searching to identify potential names that may sound similar to Istodax, the DMEPA staff search for names with similar number of syllables (three), stresses (IS-to-dax or Is-to-DAX), and placement of vowel and consonant sounds. Additionally, the DMEPA staff considers that pronunciation of parts of the name can vary such as ‘Is’ can sound like ‘Ice’, ‘to’ can sound like ‘ta’ and ‘dax’ can sound like ‘dak’. The Applicant’s intended pronunciation of the proprietary name is ‘ISS-toe-dax’. Moreover, names are often mispronounced and/or spoken with regional accents and dialects, so other potential pronunciations of the name are considered.

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<sup>3</sup> Institute of Medicine. Preventing Medication Errors. The National Academies Press: Washington DC. 2006.

<sup>4</sup> Institute for Safe Medication Practices. Confused Drug name List (1996-2006). Available at <http://www.ismp.org/Tools/confuseddrugnames.pdf>

<sup>5</sup> Kondrack, G and Dorr, B. Automatic Identification of Confusable Drug Names. Artificial Intelligence in Medicine (2005)

The DMEPA staff also considers the product characteristics associated with the proposed drug throughout the identification of similar drug names because the product characteristics of the proposed drug ultimately determine the use of the product in the clinical practice setting. For this review, the following information was provided about the proposed product to the medication error staff: proposed proprietary name, Istodax, the established name (Romidepsiden), proposed indication of use (treatment of cutaneous T-cell lymphoma {CTCL}, including relief of pruritus, in patients who have received at least one prior systemic therapy), strength (10 mg/vial), dose (14 mg/m<sup>2</sup>), frequency of administration (days one, eight and fifteen of 28-day cycle), route (intravenous), and dosage form (lyophilized powder for injection). Appendix A provides a more detailed listing of the product characteristics the medication error staff generally takes into consideration.

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, these broader safety implications of the name are considered and evaluated 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.

#### **2.1.1.1 Database and Information Sources**

The proposed proprietary name was provided to the DMEPA staff to conduct a search 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 2.1.1. A standard description of the databases used in the searches is provided in Section 7. To complement the process, the medication error staff used 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 reviewed the USAN stem list to determine if any USAN stems are present within the proprietary name. The individual findings of multiple safety evaluators were then pooled and presented to the CDER Expert Panel.

#### **2.1.1.2 CDER Expert Panel Discussion**

An Expert Panel Discussion is held by DMEPA 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). Potential concerns regarding drug marketing and promotion related to the proposed names are also discussed.

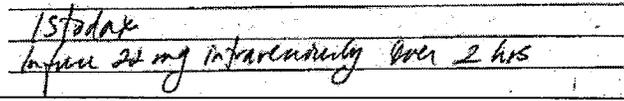
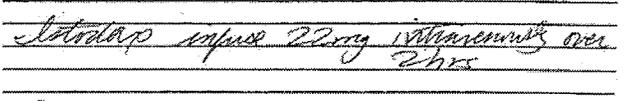
The pooled results of the DMEPA staff were presented to the Expert Panel for consideration. Based on the clinical and professional experiences of the Expert Panel members, the Panel may recommend the addition of names, additional searches by the Safety Evaluator to supplement the pooled results, or general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

**2.1.2 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 a total of 123 (one hundred twenty-three) healthcare professionals (pharmacists, physicians, and nurses), and attempts to simulate the prescription ordering process. The results are used by the Safety Evaluator to identify any 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 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.

**Figure 1. Istodax Study (conducted on March 16, 2009)**

HANDWRITTEN REQUISITION MEDICATION ORDER	VERBAL PRESCRIPTION
<p>Inpatient Medication Order #1:</p>  <p><i>Istodax</i> <i>Infuse 22 mg intravenously over 2 hrs</i></p>	<p>Istodax Infuse 22 mg intravenously over two hours</p>
<p>Inpatient Medication Order #2:</p>  <p><i>Istodax</i> <i>Infuse 22mg intravenously over 2 hrs</i></p>	

### ***2.1.3 External Proprietary Name Risk Assessment***

For this product, the Applicant submitted an external evaluation of the proposed proprietary name conducted by \_\_\_\_\_ The Division of Medication Error Prevention and Analysis conducts an independent analysis and evaluation of the data provided, and responds to the overall findings of the assessment. When the external proprietary name risk assessment identifies potentially confusing names that were not captured in DMEPA's database searches or in the Expert Panel Discussion, these names are included in the Safety Evaluator's Risk Assessment and analyzed independently by the Safety Evaluator to determine if the potentially confusing name could lead to medication errors in usual practice settings.

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After the Safety Evaluator has determined the overall risk assessment of the proposed name, the Safety Evaluator compares the findings of their overall risk assessment with the findings of the proprietary name risk assessment submitted by the Applicant. The Safety Evaluator then determines whether the Division's risk assessment concurs or differs with the findings. When the proprietary name risk assessments differ, the DMEPA provides a detailed explanation of these differences.

### ***2.1.4 Comments from the Office of New Drug Division of Oncology Drug Products***

DMEPA requests the regulatory division in the Office of New Drugs responsible for the 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. Any comments or concerns are addressed in the safety evaluator's assessment.

The 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 regulatory division is requested to concur/not concur with DMEPA's final decision.

### ***2.1.5 Safety Evaluator Risk Assessment of the Proposed Proprietary Name***

Based on the criteria set forth in Section 2.1, the Safety Evaluator Risk Assessment applies his/her individual expertise gained from evaluating medication errors reported to FDA to conduct 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.<sup>6</sup> 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 as a result of the 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.

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<sup>6</sup> Institute for Healthcare Improvement (IHI). Failure Modes and Effects Analysis. Boston. IHI:2004.

In order to perform an FMEA of the proposed name, the Safety Evaluator must analyze the use of the product at all points in the medication use system. Because the proposed product is not yet marketed, the Safety Evaluator anticipates the use of the product in the usual practice settings by considering the clinical and product characteristics listed in Appendix A. 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 evaluation, and studies, and identifies potential failure modes by asking:

*“Is the name Istodax 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 Istodax 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 possess similarity that would cause confusion at any point in the medication use system, then the name is eliminated from further review.

In the second stage of the Risk Assessment, all potential failure modes are evaluated 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 name is eliminated 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 that an alternate proprietary name be used. In rare instances, the FMEA findings may provide other risk-reduction strategies; for example, product reformulation to avoid an overlap in strength or an alternate modifier designation may be recommended as a means of reducing the risk of medication errors resulting from drug name confusion.

DMEPA will object to the use of proposed proprietary name when the one or more of the following conditions are identified in the Safety Evaluator’s Risk Assessment:

1. 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)].
2. 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)].

3. FMEA identifies potential for confusion between the proposed proprietary name and other proprietary or established drug names, and demonstrates that medication errors are likely to result from the drug name confusion under the conditions of usual clinical practice.
4. The proposed proprietary name contains an USAN (United States Adopted Names) stem, particularly in a manner that is contradictory to the USAN Council's definition.
5. 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.

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 is awarded approval first has the right to the use the name, while DMEPA will recommend that the second product to reach approval seek an alternative name.

If none of these criteria are met, then DMEPA will not object to the use of the proprietary name. If any of these criteria are met, then DMEPA will object to the use of the proposed proprietary 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 1 through 5 are supported either by FDA regulation or by external healthcare authorities, including the Institute of Medicine (IOM), World Health Organization (WHO), Joint Commission on Accreditation of Hospitals (JCOAH), and the Institute for Safe Medication Practices (ISMP), who have examined medication errors resulting from look- or sound-alike drug names and called for regulatory authorities to address the issue prior to approval.

Furthermore, 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, can be identified and remedied prior to approval to avoid patient harm.

Additionally, post-marketing experience has demonstrated that medication errors resulting from drug name confusion are notoriously difficult to remedy post-approval. Educational and other post-approval efforts are low-leverage strategies that have proven to have limited effectiveness at alleviating medication errors involving drug name confusion. Higher-leverage strategies, such as drug name changes, have been undertaken 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 the 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 FMEA process is used 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.

### 3 RESULTS

#### 3.1 PROPRIETARY NAME RISK ASSESSMENT

##### 3.1.1 Database and Information Sources

The searches yielded a total of 15 names as having some similarity to the name Istodax.

Eleven of the names were thought to look like Istodax. These include Efudex, Etodolac, Faslodex, ——— Infanrix, Intestinex, ——— Iscador, Isocal, Istalol and Levadex. Three of the names were thought to sound like Istodax. These include Histadec, Histadex and Inomax. One name was thought to look and sound similar to Istodax, Istamax.

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Additionally, DMEPA staff did not identify any United States Adopted Names (USAN) stems in the proposed proprietary name, as of February 18, 2009.

##### 3.1.2 Expert Panel Discussion

The Expert Panel reviewed the pool of names identified by DMEPA staff on February 19, 2009 (See Section 3.1.1. above) and noted no additional names thought to have orthographic or phonetic similarity to Istodax.

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

##### 3.1.3 FDA Prescription Analysis Studies

A total of 18 practitioners responded to the FDA Prescription Analysis Studies. One respondent interpreted the proposed name as Histadex in the verbal study. Fifteen of the participants interpreted the name correctly as Istodax, all of which were in the written studies. See Appendix B for the complete listing of interpretations from the verbal and written prescription studies.

##### 3.1.4 External Proprietary Name Assessment

The Applicant's external study conducted by [REDACTED] identified a total of 54 names. Six of these names were identified by DMEPA and thus, the remaining 48 names were evaluated further. These names include Aristo-Pak, Aristospan, Biscolax, Casodex, Cedax, Estroject, Fosamax, Histade, Histade MX, Histatab, Histex, Histex IE, Histor-D, Imdur, Imitrex, Introlan, Iodal, Iodex, Ionax, Iotrolan, Ipodate, Isolan, Isopap, Isoptin, Isordil, Isosorbide, Isotretinoin, Isovex, Ketonex-1, Ketonex-2, Liotrix, Procaine, Pseudatex, PseudoMax, Statobex, Stomal, Stomax, Stopain, Stri-Dex, Stulex, Sudatex, Sudex, Testex, Testoderm, Testoject, Vistaril, Vistide and West-Decon.

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### ***3.1.5 Comments from the Division***

In response to the OSE February 19, 2009 e-mail, the Division of Oncology Drug Products did not forward any comments and or concerns on the proposed proprietary name at the initial phase of the name review.

DMEPA notified the Division of Oncology Drug Products via e-mail that we had no objections to the proposed proprietary name, Istodax on March 16, 2009. Per e-mail correspondence from the Division of Oncology Drug Products on March 19, 2009, the Division indicated they concur with our assessment of the proposed proprietary name, Istodax.

### ***3.1.6 Safety Evaluator Risk Assessment***

Independent searches by the primary Safety Evaluator resulted in three additional names which were thought to look similar to Istodax and represent a potential source of drug name confusion. These include Altabax, Lotemax and Zostavax. As such, a total of sixty-six names were analyzed to determine if the drug names could be confused with Istodax and if the drug name confusion would likely result in a medication error.

Eight names lacked orthographic and/or phonetic similarity and were not evaluated further (see Appendix C).

Failure mode and effect analysis (FMEA) was then applied to determine if the potential name could potentially be confused with any of the remaining 58 names and lead to medication errors. Special consideration was given to names that were identified in the FDA Prescription Studies. This analysis determined that the name similarity between Istodax and the identified names was unlikely to result in medication errors with any of the 58 names identified for the reasons presented in Appendices D through L.

## **4 DISCUSSION**

### **4.1 PROPRIETARY NAME RISK ASSESSMENT**

Sixty-six names were identified as having some similarity to the proposed name, Istodax. The FMEA indicates that the proposed name is not likely to result in name confusion that could lead to medication errors. This finding was consistent with and supported by the independent risk assessment of the proprietary name submitted by the Applicant.

## **5 CONCLUSIONS AND RECOMMENDATIONS**

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

However, if any of the proposed product characteristics as stated in this review are altered prior to approval of the product, DMEPA rescinds this Risk Assessment finding and the name must be resubmitted for review. In the event that our Risk Assessment finding is rescinded, the evaluation of the name on resubmission is independent of the previous Risk Assessment, and as such, the conclusions on re-review of the name are subject to change. If the approval of this

application is delayed beyond 90 days from the signature date of this review, the proposed name must be resubmitted for evaluation.

## **5.1 COMMENTS TO THE DIVISION**

We would appreciate feedback on the final outcome of this review. We are willing to meet with the Division for further discussion, if needed. Please copy DMEPA on any communication to the Applicant with regard to this review. If you have further questions or need clarifications, please contact Sandra Griffith, OSE Project Manger, at 301-796-2245.

## **5.2 COMMENTS TO THE APPLICANT**

### **5.2.1 Proprietary Name**

We have completed our review of the proposed proprietary name, Istodax, and have concluded that it is acceptable. A request for proprietary name review for Istodax must be submitted once the NDA is submitted. Istodax will also be re-reviewed 90 days prior to approval of the NDA. If any of the proposed product characteristics are altered prior to approval of the marketing application, the proprietary name must be resubmitted for review.

## **6 REFERENCES**

### **1. *Micromedex Integrated Index* (<http://csi.micromedex.com>)**

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

### **2. *Phonetic and Orthographic Computer Analysis (POCA)***

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

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

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

### **4. *AMF Decision Support System [DSS]***

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

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

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

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

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

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

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

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

USPTO provides information regarding patent and trademarks.

9. **Clinical Pharmacology Online** ([www.clinicalpharmacology-ip.com](http://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](http://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](http://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](http://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, Rudolph's Pediatrics, Basic Clinical Pharmacology, and Dictionary of Medical Acronyms Abbreviations.

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

USAN Stems List contains all the recognized USAN stems.

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

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

**15. Lexi-Comp ([www.lexi.com](http://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:**

The medication error staff 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 spelled names may have greater likelihood to sound similar to one another when spoken or look similar to one another when scripted. The medication error 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 medication error 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), along with other orthographic attributes that determine the overall appearance of the drug name when scripted (see Table 1 below for details). In addition, the medication error staff compares the pronunciation of the proposed proprietary name with the pronunciation of other drug names because verbal communication of medication names is common in clinical settings. If provided, DMEPA will consider the Applicant’s intended pronunciation of the proprietary name. However, DMEPA also considers a variety of pronunciations that could occur in the English language because the Applicant has little control over how the name will be spoken in clinical practice.

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

<b>Type of similarity</b>	<b>Considerations when searching the databases</b>		
	<i>Potential causes of drug name similarity</i>	<i>Attributes examined to identify similar drug names</i>	<i>Potential Effects</i>
	Similar spelling	Identical prefix Identical infix Identical suffix Length of the name Overlapping product	<ul style="list-style-type: none"> <li>Names may appear similar in print or electronic media and lead to drug name confusion in printed or electronic communication</li> <li>Names may look similar when scripted and lead to drug name confusion in written communication</li> </ul>

Look-alike	Orthographic similarity	characteristics Similar spelling Length of the name Upstrokes Downstrokes Cross-strokes Dotted letters Ambiguity introduced by scripting letters Overlapping product characteristics	<ul style="list-style-type: none"> <li>Names may look similar when scripted, and lead to drug name confusion in written communication</li> </ul>
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	<ul style="list-style-type: none"> <li>Names may sound similar when pronounced and lead to drug name confusion in verbal communication</li> </ul>

**Appendix B: FDA Prescription Study for Istodax**

Inpatient Medication Order	Outpatient Medication Order	Voice Prescription
Istodax	Istodax	Histadex
Istodax	Istodax	Tistidex,
Istodax	Istodax	Disvadask
Istodax	Istodax	
Istodax	Istodax	
Istodax	Istodax	
	Istodax	
	Istodax	
	Istodax	

**Appendix C: Drug names lacking convincing look or sound-alike similarities to Istodax**

Proprietary Name	Similarity to Istodax
Aristo-Pak	/
Aristospan	/
Estroject	/
Etodolac	Look-Alike
Isotretinoin	/
Procaine	/
_____	/
West-Decon	/

b(4)

**Appendix D: Drug name(s) with no product information found in commonly used resources and databases**

Proprietary Name	Similarity to Istodax
Histor-D	/
Isovex	/

b(4)

**Appendix E: Name found to be a Veterinary Drug Product**

Proprietary Name	Similarity to Istodax	Comments
Stomax	_____	Nutritional supplement for dogs and cats

b(4)

**Appendix F: Names Identified that were found not to be drug products**

Proprietary Name	Similarity to Istodax	Comments
Iscador	Look-Alike	Viscum Album is a mistletoe plant

**Appendix G:** Drug names only marketed in other countries

Proprietary Name	Similarity to Istodax	Country
Histadex	Sound-Alike	Israel
Istamax	Look-Alike and Sound-Alike	Greece

**Appendix H:** Drug names discontinued or withdrawn with no generic products available

Proprietary Name	Similarity to Istodax	Status
Histade	/	Brand Histade and all generic Pseudoephedrine Hydrochloride/Chlorpheniramine Maleate in 2005
Iodal		Brand Iodal and all generic Phenylephrine Hydrochloride, Hydrocodone and Chlorpehniramine discontinued
Iotrolan		Discontinued in 1999; no other brand or generics available
Ipodate		Discontinued in 1962; no other brand or generics available
Isopap		Acetaminophen, Butalbital and Caffeine products discontinued in 1998
Liotrix		Withdrawn by the Agency in 1993; no generics available
Testex		All nine generic Testosterone Propionate products withdrawn by the Agency between 1986 through 2002

**b(4)**

**Appendix I:** Drug names with no numerical overlap in strength and dose

Product name with potential for confusion	Similarity to Proposed Proprietary Name	Strength	Usual Dose (if applicable)
<b>Istodax (Romidepsin) Lyophilized Powder for Injection</b>		<b>10 mg/vial</b>	<b>14 mg/m<sup>2</sup> intravenously over four hours on days one, eight and fifteen of a twenty-eight day cycle.</b>
Cedax (Ceftubuten Dihydrate)	_____	400 mg capsules 90 mg/5 mL Oral Suspension	Adults: 400 mg per day for ten days Pediatric: 90 mg/kg once daily for ten days
Efudex (Fluorouracil)	Look-Alike	2 % and 5 % Topical Solution 5 % Topical Cream	Apply cream or solution twice daily sufficient to cover affected lesion
Histade-MX (Pseudoephedrine Hydrochloride, Methscopolamine Nitrate and Chlorpheniramine Maleate)	_____	120 mg/4 mg/8 mg tablets	Take one to two tablets daily
_____ (Iclaprim Mesylate) Injection  *Proposed proprietary name reviewed by DMEPA	Look-Alike	_____	/
*Imdur (Isosorbide Mononitrate) Tablets	_____	/	/
*Testoderm (Testosterone) Transdermal Patch and Gel	_____	/	/

b(4)

Vistaril (Hydroxyzine)	_____	25 mg and 50 mg oral capsules 25 mg/5 mL oral suspension solution 25 mg/mL and 50 mg/mL solution for injection	25 mg to 50 mg up to four times daily
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b(4)

\*Brand discontinued but generics available

**Appendix J:** Drug names with numeric overlap in strength but with other differentiating product characteristics

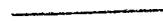
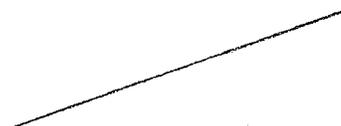
Product name with potential for confusion	Strength	Usual Dose (if applicable)	Differentiating Product Characteristics
Istodax (Romidepsin) Lypholized Powder for Injection	10 mg/vial	14 mg/m <sup>2</sup> intravenously over four hours on days one, eight and fifteen of a twenty- eight day cycle.	Route of administration is intravenous Dosage form is lypholized powder for injection One Strength available Dose written as 'X' milligrams (mg) on prescription orders
Altabax (Retapamulin) 1 % Ointment	10 mg/gm Topical Ointment	Apply to affected area twice daily for five days	Route of administration is topical Dosage form is topical cream Dose written 'apply to affected area' on prescription
*Biscolax (Bisacodyl) Rectal Suppository  *Brand discontinued but generics available	10 mg	10 mg once daily rectally	Route of administration is rectal Dosage form is rectal suppository Dose written "insert one" rectally on prescription
Fosamax (Alendronate Sodium)	5 mg, 10 mg, 35 mg, 40 mg and 70 mg Tablets  70 mg/75 mL oral solution	70 mg once weekly or 10 mg once daily for postmenopausal osteoporosis  35 mg once weekly or 5 mg once daily for prevention of postmenopausal	Route of administration is oral Dosage form is oral tablet or oral solution Multiple strengths available

		osteoporosis 40 mg once daily for six months for Paget's Disease	
Inomax (Nitric Oxide)	100 PPM and 800 PM Inhalation Gas	20 PPM recommended dose; maintain treatment for fourteen days; may reduce to 5 PPM as tolerated	Route of administration is inhalation Dosage form is inhalation gas Two strengths available Dose would be written as either 5 PPM or 20 PPM
*Isoptin (Verapamil Hydrochloride)  *Brand discontinued but generics available	40 mg, 80 mg and 120 mg tablets  100 mg, 120 mg, 180 mg, 200 mg, 240 mg and 300 mg Extended-release capsules and tablets  2.5 mg/mL Injection	Tablets: Dose individualized by titration from 40 mg to 120 mg three times daily for angina; 240 mg to 320 mg daily in two or three divided doses for arrhythmias; 80 mg three times daily for essential hypertension Extended-Release: Dose individualized by titration from 100 mg to 400 mg once daily at bedtime. Usual dose 200 mg given once daily at bedtime	Route of administration is oral and intravenous Dosage forms are oral tablet, extended-release tablets, extended-release capsules and solution for injection Multiple strengths available Varying usual dose depending on clinical indication
Isordil (Isosorbide Dinitrate)	5 mg, 10 mg, 20 mg, 30 mg, 40 mg Tablets	Initial dose of 5 mg to 20 mg twice daily; for maintenance therapy give 10 mg to 40 mg two to three times daily.	Route of administration is oral Dosage form is tablet Multiple strengths available
Isosorbide	5 mg, 10 mg, 20 mg, 30 mg, 40 mg Tablets  40 mg Extended-release	Tablet: Initial dose of 5 mg to 20 mg twice daily; for maintenance therapy give 10 mg to 40 mg two to three times daily.	Route of administration is oral Dosage form is tablet Multiple strengths available

		Extended-release: 40 mg once daily	
Stri-Dex	0.5 %, 1 %, and 2 % Topical Pad	Apply to affected area daily	Route of administration is topical Dosage form is topical pad Multiple strengths available

**Appendix K:** Drug products available single strength but with other differentiating product characteristics

<b>Product name with potential for confusion</b>	<b>Strength</b>	<b>Usual Dose (if applicable)</b>	<b>Differentiating Product Characteristics</b>
<b>Istodax (Romidepsin) Lypholized Powder for Injection</b>	<b>10 mg/vial</b>	<b>14 mg/m<sup>2</sup> intravenously over four hours on days one, eight and fifteen of a twenty-eight day cycle.</b>	<b>Route of administration is intravenous Dosage form is lypholized powder for injection Dose written as 'X' milligrams (mg) on prescription orders</b>
Histadec (Phenylephrine Hydrochloride and Chlorpheniramine Maleate)	12.5 mg Phenylephrine Hydrochloride and 4 mg Chlorpheniramine Maleate/5 mL Oral Syrup	5 mL to 30 mL daily	Route of administration is oral Dosage form is oral syrup Dose written in milliliters (mL), cubic centimeters (cc) or teaspoonfuls (tsp) on prescription orders
Histatab (Chlorpheniramine Maleate, Pseudoephedrine Hydrochloride and Methscopolamine) Tablets	8mg Chlorpheniramine Maleate; 60 mg Pseudoephedrine Hydrochloride; 1.25 mg Methscopolamine Tablets	Two tablets per day	Route of administration is oral Dosage form is tablet Dose would be written as “take two tablets” on prescription orders
Histex (Chlorpheniramine and Pseudoephedrine) tablets	8 mg Chlorpheniramine Maleate and 60 mg Pseudoephedrine Hydrochloride	Take two tablets daily	Route of administration is oral Dosage form is tablet Dose would be written “take two tablets” on prescription orders

Ionax (Salicylic Acid) Topical	6 % Salicylic Acid Topical Cream, Foam and Lotion	Cream and Lotion: Apply to affected area once daily at bedtime. Foam: Apply to affected area once at bedtime; hydrate area for five minutes; occlude area after application	Route of administration is oral Dosage form is topical cream Dose would be written "apply to affected area" on prescription orders
Intestinex (Lactobacillus Acidophilus) Capsules	Lactobacillus Acidophilus Capsules	Take one capsule with milk, fruit juice or water.	Route of administration is oral Dosage form is capsule Dose would be written "take one capsule" on prescription orders
Introlan	Nutritional Supplement	Take once daily	Route of administration is oral Dosage form is liquid
 (Proposed proprietary name under review – not yet approved product)			
Iodex (Povidone Iodine) Ointment	4.7 % Topical Ointment	Apply to affected area as directed daily	Route of administration is topical Dosage form is topical ointment Dose would be written "apply to affected area" on prescription orders
Isocal (Nutritional Supplement)	Lactose-free Isotonic Liquid containing protein 13 %, fat 37 % and carbohydrate 50 % in 250 mL or 945/mL bag oral liquid	Dose varies by patient nutritional needs	Route of administration is oral Dosage form is liquid solution Dose would be written "drink 'X' mL orally" on prescription orders
Isolan (Nutritional Supplement)	Protein 40 g, Fat 36 g, Carbohydrates 144 g, Sodium 690 g, Potassium 1.17 g/L oral liquid	Dose varies by patient nutritional needs	Route of administration is oral Dosage form is liquid Dose would be written "drink 'X' mL orally" on prescription orders

b(4)

Istalol (Timolol Maleate)	0.5 % Ophthalmic Solution	One drop to affected eye(s) a day in the morning.	Route of administration is topical Dosage form is ophthalmic solution Dose would be written "apply one drop to affected eye" on prescription orders
Ketonex-1 (Amino Acid Modified Nutrient) Powder	Amino Acid Modified Nutrient Supplement Powder with Iron containing L-Carnitine 100 mg/100 gm and Taurine 40 mg/100 gm	Administer orally daily as prescribed depending on nutrient needs.	Route of administration is oral Dosage form is powder for oral solution Dose would be written "drink 'X' mL orally" on prescription orders
Ketonex-2 (Amino Acid Modified Nutrient) Powder	Amino Acid Modified Nutrient Supplement Powder with Iron containing L-Carnitine 200 mg/100 gm and Taurine 40 mg/100 gm	Administer orally daily as prescribed depending on nutrient needs.	Route of administration is oral Dosage form is powder for oral solution Dose would be written "drink 'X' mL orally" on prescription orders
**Levodex (Dihydroergotamine Mesylate) Inhaler (Proposed proprietary name – not yet approved product)	_____	_____	_____
Lotemax (Loterprednol Etabonate) Ophthalmic Drops	0.5 % Ophthalmic Drops	Apply one to two drops into conjunctival sac of affected eye(s) four times daily.	Route of administration is topical Dosage form is Ophthalmic drops Dose would be written "one to two drops" on prescription orders
Pseudatex (Guaifenesin and Pseudoephedrine)	Guaifenesin 1200 mg and Pseudoephedrine 90 mg Tablets	One to two tablets twice daily	Route of administration is oral Dosage form is tablet Dose would be written "take one to two tablets" on prescription orders.
Pseudomax (Guaifenesin and Pseudoephedrine)	Guaifenesin 700 mg and Pseudoephedrine	One to two tablets tablet every twelve hours	Route of administration is oral Dosage form is tablet

b(4)

	80 mg Tablets		Dose would be written "take one to two tablets" on prescription orders.
*Statobex (Phendimetrazine Tartrate)	35 mg Tablet	Take one tablet twice or three times daily one hour before meals.	Route of administration is topical Dosage form is Topical Pad Multiple strengths available Dose would be written "take one tablet" on prescription order
Stopain (Menthol)	8 % Spray	Spray on affected area for pain as needed one to four times daily.	Route of administration is topical Dosage form is topical spray Dose would be written "spray on affected area" on prescription orders
Stulex (Docusate Sodium) Discontinued but generics available	250 mg Tablets	Take one tablet once daily	Route of administration is oral Dosage form is oral tablet Dose would be written "take one tablet" on prescription orders
Sudatex (Pseudoephedrine and Guaifenesin) Tablets	60 mg Pseudoephedrine 580 mg Guaifenesin	Take one to two tablets four times daily	Route of administration is oral Dosage form is tablet Dose would be written "take one to two tablets" on prescription orders
Sudex (Phenylephrine and Guaifenesin) Tablets	20 mg Phenylephrine and 600 mg Guaifenesin	Take two tablets daily every twelve hours	Route of administration is oral Dosage form is tablet Dose would be written "take two tablets" on prescription orders

**Appendix L: Look-Alike names with potential for confusion**

Failure Mode: Name confusion	Causes (could be multiple)	Effect
Istodax (Romidepsin) Lypholized Powder for Injection	10 mg/vial Reconstituted with 2 mL diluent for concentration of 5mg/mL	14 mg/m <sup>2</sup> intravenously over four hours on days one, eight and fifteen of a twenty-eight day cycle.
Casodex (Bicalutamide) 50 mg tablet	Orthographic similarities include 's' is similarly placed in both names and both names end similarly 'dex' versus 'dax'.	<p>Orthographic differences in the names, usual dose and route of administration minimize the likelihood of medication error in the usual practice setting.</p> <p><i>Rationale:</i></p> <p>The first letter 'C' in Casodex looks different than the first letter 'I' in Istodax. The lengths of the two names vary with eight letters in Casodex versus seven letters in Istodax.</p> <p>Although the likelihood exists that there may be a dose overlap between Casodex and Istodax, in order for this to occur, the patient would have to have a BSA of approximately 3.5 which is highly unlikely given average adult BSAs range from 1.6 to 1.9. Additionally, the route of administration (oral versus intravenous infusion) would accompany prescription orders and would further differentiate the two names.</p>
Faslodex (Fulvestrant) Injection 250 mg/5 mL Solution for Injection	Orthographic similarities: 'slo' can look like 'sto' and are similarly placed; 'ex' can look like 'ax' and are similarly placed.	<p>Orthographic differences in the names, the usual dose and the route of administration minimize the likelihood of medication error in the usual practice setting.</p> <p><i>Rationale:</i></p> <p>Istodax has seven letters while Faslodex has eight, making the name appear longer when scripted. Additionally, a letter (a) separates the 'F' from the 'sl', differentiating the names look from the 'Ist' in Istodax.</p> <p>The recommended dose for Faslodex is 250 mg (given via intramuscularly). Istodax dosing would vary according to the patient's body surface area however, the patient would have to have a BSA of approximately 18 to achieve an overlapping dose, which is highly unlikely and minimize the likelihood of dose overlap that would cause drug name confusion. Additionally, the route of administration (intramuscular versus intravenous infusion) would be included in physician orders and would further differentiate the two drug names.</p>
Histex IE (Carbinoxamine) 10 mg sustained-release capsule	Orthographic similarities include 'Hist' can look like 'Ist' and both names end similarly in 'ex' versus 'ax'.	Orthographic differences in the names and dosage form minimize the likelihood of medication error in the usual practice setting.

		<p><i>Rationale:</i></p> <p>The modifier ‘IE’ differentiates Histex IE from Istodax. Additionally, the upstroke ‘d’ Istodax is not present in the same letter position in Histex IE.</p> <p>The usual dose for Histex IE is 10 mg to 20 mg every twelve hours and therefore, it is possible dose overlap could exist for Istodax in a patient with a BSA of approximately ~1.4. However, prescription orders would include the route of administration (oral versus intravenous infusion) and would likely include the frequency (every twelve hours versus every 28 day cycle) which would differentiate the two names.</p>
<p>Imitrex (Sumatriptan) Nasal Spray (Sumatriptan Succinate) Oral Tablet and Injection</p> <p>5 mg/mL and 20 mg/mL Nasal Spray</p> <p>25 mg, 50 mg and 100 mg tablet</p> <p>4 mg/0.5 mL single dose prefilled syringe and 6 mg/0.5 mL single dose prefilled syringe</p>	<p>Orthographic similarities include ‘Im’ can look like ‘Is’, the ‘t’ is similarly placed in both names and both names end similarly with ‘ex’ versus ‘ax’.</p>	<p>Variations in usual dose and route of administration minimize the likelihood of medication error in the usual practice setting.</p> <p><i>Rationale:</i></p> <p>Imitrex is available in three varying dosage forms however both Imitrex and Istodax overlap in solution for injection dosage form. However, the usual dose for Imitrex is either 4 mg or 6 mg and is given subcutaneously, while the usual dose of Istodax, based on an average body surface area of 1.6 to 1.9 would range from approximately 22.4 mg to 26.6 mg and is infused intravenously. Dose and route of administration would be included in physician orders, providing differentiation between the two names.</p>
<p>Infanrix (Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed) Injection</p> <p>0.5 mL/vial Suspension for Injection</p>	<p>Orthographic similarities include: Both names begin with the letter ‘I’ and end with the letter ‘x’. The second letter ‘n’ in Infanrix can look like the second letter ‘s’ in Istodax. The third letter ‘f’ in Infanrix can also look like the third letter ‘t’ in Istodax.</p>	<p>The route of administration, dosage form and usual dose minimize the likelihood of medication error in the usual practice setting.</p> <p><i>Rationale:</i></p> <p>Infanrix is given via intramuscular injection while Istodax is administered via intravenous infusion over a four hour period. Additionally, the dosage form is Istodax is lyophilized powder requiring reconstitution with a diluent, mixing with 0.9 % Sodium Chloride while Infanrix is a solution for injection available in a glass vial, withdrawn and given via intramuscularly.</p> <p>The recommended dose for Infanrix is 0.5 mL given intramuscularly while Istodax 14 mg/m<sup>2</sup>, therefore physician orders would include the unit of measure ‘mL’ for Infanrix versus ‘mg/m<sup>2</sup>’ or ‘mg’ if the dose per meters square was already calculated.</p> <p>Additionally, the populations vary as Infanrix is a vaccine typically given to children in the primary immunization course for ages less than seven years old while Istodax is for use in adult patient populations.</p>
<p>Testoject (Testosterone Cypionate) Injection</p>	<p>Orthographic similarities include: ‘T’ can look like ‘I’ and the letters ‘sto’ are</p>	<p>Orthographic differences in the names, usual dose and route of administration minimize the likelihood of</p>

	similarly placed in both names.	<p>medication error in the usual practice setting.</p> <p><i>Rationale:</i></p> <p>Testoject has nine letters while Istodax only has seven which differentiates the lengths of the two names. Additionally, the downstroke ‘j’ in Testoject is not present in Istodax, further differentiating the two names.</p> <p>The usual dose of Testoject is 100 mg or 200 mg while the average meters squared dose of Istodax (ranging from 1.6 to 1.9) would range from 22.4 mg to 26.6 mg, thereby differentiating the two products on physician orders. Additionally, the route of administration for Istodax is intravenous infusion versus intramuscular injection for Testoject, further differentiating the two products on physician orders.</p>
Vistide (Cidofovir) Injection 75 mg/mL Solution for Injection	Orthographic similarities include: Both names have the letters ‘st’ and ‘d’ similarly placed.	<p>Orthographic differences in the names minimize the likelihood of medication error in the usual practice setting.</p> <p><i>Rationale:</i></p> <p>The capital letter ‘V’ in Vistide appears different than the capital letter ‘I’ in Istodax. The endings of the word look different ‘de’ versus ‘dax’ which make the overall appearance of the words look different. Additionally, there are two dotted ‘i’s in Vistide not present in Istodax, further differentiating the two words.</p>
Zostavax (Live Zoster Vaccine) Lyophilized Powder for Injection	Orthographic similarities include: Both names have similar letters placements of ‘sta’ in Zostavax and ‘sto’ in Istodax. Both words ending with the letters ‘ax’.	<p>Orthographic differences in the names, usual recommended dose and route of administration minimize the likelihood of medication error in the usual practice setting.</p> <p><i>Rationale:</i></p> <p>Istodax has seven letters while Zostavax has eight letters, making it appear longer when scripted. The beginnings of the two names look different with the ‘Zo’ in Zostavax appearing differently than ‘Is’ in Istodax. Additionally, the ‘dax’ in Istodax has a different shape than ‘vax’ in Zostavax due to the upstroke ‘d’, further differentiating the two words when scripted.</p> <p>The recommended dose for Zostavax is 0.65 mL while the recommended dose for Istodax is 14 mg/m<sup>2</sup> providing differentiation on prescribing orders.</p>

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/s/  
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