CENTER FOR DRUG EVALUATION AND RESEARCH

APPLICATION NUMBER:

022445Orig1s000

PROPRIETARY NAME REVIEW(S)

PROPRIETARY NAME REVIEW

Division of Medication Error Prevention and Analysis (DMEPA)
Office of Medication Error Prevention and Risk Management (OMEPRM)
Office of Surveillance and Epidemiology (OSE)
Center for Drug Evaluation and Research (CDER)

***** This document contains proprietary information that cannot be released to the public*****

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Date of This Review:	October 15, 2015
Application Type and Number:	NDA 22445
Product Name and Strength:	Sustol (granisetron) Prefilled Injection 10 mg/0.4 mL
Product Type:	Single
Rx or OTC:	Rx
Applicant/Sponsor Name:	Heron Therapeutics, Inc.
Panorama #:	2015- 1114787
DMEPA Primary Reviewer:	Sherly Abraham, R.Ph.
DMEPA Team Leader:	Kendra Worthy, Pharm.D.

Contents

1 INTRODUCTION

This review evaluates the proposed proprietary name, Sustol, from a safety and misbranding perspective. The sources and methods used to evaluate the Sustol are outlined in the reference section and Appendix A respectively. The Applicant did not submit an external name study for this product.

1.1 PRODUCT INFORMATION

The following product information is provided in the July 27, 2015, proprietary name submission.

Active Ingredient:	Granisetron
Indication:	Prevention of acute and delayed nausea and vomiting with initial and repeat courses of cancer chemotherapy.
Route of Admini-stration:	Subcutaneous injection
Dosage Form:	Prefilled syringe
Strength:	10 mg/0.4 mL
Dose and Frequency	10 mg in single subcutaneous injection 30 minutes prior to initiation of chemotherapy.
How Supplied:	Prefilled syringes in 1 mL glass in carton of six kits and single dose kit
Storage:	Store at 2 to 8°C (Refrigerated)

2 RESULTS

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

2.1 MISBRANDING ASSESSMENT

The Office of Prescription Drug Promotion (OPDP) determined that the Sustol would not misbrand the proposed product. DMEPA and the Division of Gastroenterology and Inborn Errors Products (DGIEP) concurred with the findings of OPDP's assessment of the Sustol.

2.2 SAFETY ASSESSMENT

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

2.2.1 United States Adopted Names (USAN) Search

There is no USAN stem present in the proprietary name[1].

2.2.2 Components of the Proposed Proprietary Name

The Applicant indicated in their submission that the proposed name, Sustol, is derived from (b) (4) two of the drug product's attributes. This proprietary name is comprised of a single that does not contain any components (i.e. a modifier, route of administration, dosage form, etc.) that are misleading or can contribute to medication error.

2.2.3. FDA Name Simulation Studies

83 practitioners participated in DMEPA's prescription studies. The responses did not overlap with any currently marketed products nor did the responses sound or look similar to any currently marketed products or any products in the pipeline. 41 participants interpreted the proposed name correctly (outpatient n=13, voice=3, inpatient n=22). Appendix B contains the results from the verbal and written prescription studies.

2.2.3 Comments from Other Review Disciplines at Initial Review

In response to the OSE, August 12, 2015 e-mail, the Division of the Division of Gastroenterology and Inborn Errors Products (DGIEP) did not forward any comments or concerns relating to the proposed proprietary name at the initial phase of the review.

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[1]USAN stem search conducted on September 16, 2015

2.2.4 Communication of DMEPA's Analysis at Midpoint of Review

DMEPA communicated our findings to the Division of Gastroenterology and Inborn Errors Products (DGIEP) via e-mail on October 12, 2015. At that time we also requested additional information or concerns that could inform our review. Per e-mail correspondence from the DGIEP on October 14, 2015, they stated no additional concerns with the proposed proprietary name, Sustol.

2.2.5 Phonetic and Orthographic Computer Analysis (POCA) Search Results

Table 1 lists the number of names with the combined orthographic and phonetic score of ≥50% retrieved from our POCA search[2] organized as highly similar, moderately similar or low similarity for further evaluation. Table 1 also includes names identified from the FDA Prescription Simulation.

Table 1. POCA Search Results	**Number of Names**
Highly similar name pair: combined match percentage score ≥70%	4
Moderately similar name pair: combined match percentage score ≥50% to ≤ 69%	183
Low similarity name pair: combined match percentage score ≤49%	0

2.2.6 Safety Analysis of Names with Potential Orthographic, Spelling, and Phonetic Similarities

Our analysis of 187 names contained in Table 1 determined all 187 names will not pose a risk for confusion as described in Appendices C through H.

[2] POCA search conducted on September 16, 2015

3.0 CONCLUSIONS

The proposed proprietary name is acceptable.

If you have further questions or need clarifications, please contact Alek Winiarski, OSE project manager, at 301-796-5295.

3.1 COMMENTS TO THE APPLICANT

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

If any of the proposed product characteristics as stated in July 27, 2015, submission are altered prior to approval of the marketing application, the name must be resubmitted for review.

3 REFERENCES

1. ***USAN Stems (http://www.ama-assn.org/ama/pub/physician-resources/medical-science/united-states-adopted-names-council/naming-guidelines/approved-stems.page)***

   USAN Stems List contains all the recognized USAN stems.

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

POCA is a system that FDA designed. As part of the name similarity assessment, POCA is used to evaluate proposed names via a phonetic and orthographic algorithm. The proposed proprietary name is converted into its phonemic representation before it runs through the phonetic algorithm. Likewise, an orthographic algorithm exists that operates in a similar fashion. POCA is publicly accessible.

Drugs@FDA

Drugs@FDA is an FDA Web site that contains most of the drug products approved in the United States 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* and *generic drugs*; *therapeutic biological products*, *prescription* and *over-the-counter* human drugs; and *discontinued drugs* (see Drugs @ FDA Glossary of Terms, available at http://www.fda.gov/Drugs/InformationOnDrugs/ucm079436.htm#ther_biological).

RxNorm

RxNorm contains the names of prescription and many OTC drugs available in the United States. RxNorm includes generic and branded:

- Clinical drugs – pharmaceutical products given to (or taken by) a patient with therapeutic or diagnostic intent
- Drug packs – packs that contain multiple drugs, or drugs designed to be administered in a specified sequence

Radiopharmaceuticals, contrast media, food, dietary supplements, and medical devices, such as bandages and crutches, are all out of scope for RxNorm (http://www.nlm.nih.gov/research/umls/rxnorm/overview.html#).

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.

APPENDICES

Appendix A

FDA's Proprietary Name Risk Assessment evaluates proposed proprietary names for misbranding and safety concerns.

1. **Misbranding Assessment**: For prescription drug products, OPDP assesses the name for misbranding concerns. . For over-the-counter (OTC) drug products, the misbranding assessment of the proposed name is conducted by DNCE. OPDP or DNCE evaluates proposed proprietary names to determine if the name is false or misleading, such as by making misrepresentations with respect to safety or efficacy. For example, a fanciful proprietary name may misbrand a product by suggesting that it has some unique effectiveness or composition when it does not (21 CFR 201.10(c) (3)). OPDP or DNCE provides their opinion to DMEPA for consideration in the overall acceptability of the proposed proprietary name.

***Table 2- Prescreening Checklist for Proposed Proprietary Name**

	Answer the questions in the checklist below. Affirmative answers to any of these questions indicate a potential area of concern that should be carefully evaluated as described in this guidance.
Y/N	**Is the proposed name obviously similar in spelling and pronunciation to other names?**
	Proprietary names should not be similar in spelling or pronunciation to proprietary names, established names, or ingredients of other products.
Y/N	**Are there medical and/or coined abbreviations in the proprietary name?**
	Proprietary names should not incorporate medical abbreviations (e.g., QD, BID, or others commonly used for prescription

	communication) or coined abbreviations that have no established meaning.
Y/N	**Are there inert or inactive ingredients referenced in the proprietary name?**
	Proprietary names should not incorporate any reference to an inert or inactive ingredient in a way that might create an impression that the ingredient's value is greater than its true functional role in the formulation (21 CFR 201.10(c)(4)).
Y/N	**Does the proprietary name include combinations of active ingredients?**
	Proprietary names of fixed combination drug products should not include or suggest the name of one or more, but not all, of its active ingredients (see 21 CFR 201.6(b)).
Y/N	**Is there a United States Adopted Name (USAN) stem in the proprietary name?**
	Proprietary names should not incorporate a USAN stem in the position that USAN designates for the stem.
Y/N	**Is this proprietary name used for another product that does not share at least one common active ingredient?**
	Drug products that do not contain at least one common active ingredient should not use the same (root) proprietary name.
Y/N	**Is this a proprietary name of a discontinued product?**
	Proprietary names should not use the proprietary name of a discontinued product if that discontinued drug product does not contain the same active ingredients.

a. Phonetic and Orthographic Computer Analysis (POCA): Following the preliminary screening of the proposed proprietary name, DMEPA staff evaluates the proposed name against potentially similar names. In order to identify names with potential similarity to the proposed proprietary name, DMEPA enters the proposed proprietary name in POCA and queries the name against the following drug reference databases, Drugs@fda, CernerRxNorm, and names in the review pipeline using a 50% threshold in POCA. DMEPA reviews the combined orthographic and phonetic matches and group the names into one of the following three categories:

- Highly similar pair: combined match percentage score ≥70%.
- Moderately similar pair: combined match percentage score ≥50% to ≤ 69%.
- Low similarity: combined match percentage score ≤49%.

Using the criteria outlined in the check list (Table 3-5) that corresponds to each of the three categories (highly similar pair, moderately similar pair, and low similarity), DMEPA evaluates the name pairs to determine the acceptability or non-acceptability of a proposed proprietary name. The intent of these checklists is to increase the transparency and predictability of the safety determination of whether a proposed name is vulnerable to confusion from a look-alike or sound-alike perspective. Each bullet below corresponds to the name similarity category cross-references the respective table that addresses criteria that DMEPA uses to determine whether a name presents a safety concern from a look-alike or sound-alike perspective.

- For highly similar names, differences in product characteristics often cannot mitigate the risk of a medication error, including product differences such as strength and dose. Thus, proposed proprietary names that have a combined score of ≥ 70 percent are at risk for a look-alike sound-alike confusion which is an area of concern (See Table 3).
- Moderately similar names with overlapping or similar strengths or doses represent an area for concern for FDA. The dosage and strength information is often located in close proximity to the drug name itself on prescriptions and medication orders, and it can be an important factor that either increases or decreases the potential for confusion between similarly named drug pairs. The ability of other product characteristics to mitigate confusion (e.g., route, frequency, dosage form, etc.) may be limited when the strength or dose overlaps. We review such names further, to determine whether sufficient differences exist to prevent confusion. (See Table 4).
- Names with low similarity that have no overlap or similarity in strength and dose are generally acceptable (See Table 5) unless there are data to suggest that the name might be vulnerable to confusion (e.g., prescription simulation study suggests that the name is likely to be misinterpreted as a marketed product). In these instances, we would reassign a low similarity name to the moderate similarity category and review according to the moderately similar name pair checklist.

b. FDA Prescription Simulation Studies: DMEPA staff also conducts a prescription simulation studies using FDA health care professionals.

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.

c. 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.

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.

Table 3. Highly Similar Name Pair Checklist (i.e., combined Orthographic and Phonetic score is ≥ 70%).

Answer the questions in the checklist below. Affirmative answers to some of these questions suggest that the pattern of orthographic or phonetic differences in the names may render the names less likely to confusion, provided that the pair does not share a common strength or dose.			
Orthographic Checklist		Phonetic Checklist	
Y/N	Do the names begin with different first letters? *Note that even when names begin with different first letters, certain letters may be confused with each other when scripted.*	**Y/N**	Do the names have different number of syllables?
Y/N	Are the lengths of the names dissimilar* when scripted? **FDA considers the length of names different if the names differ by two or more letters.*	**Y/N**	Do the names have different syllabic stresses?
Y/N	Considering variations in scripting of some letters (such as *z* and *f*), is there a different number or placement of upstroke/downstroke letters present in the names?	**Y/N**	Do the syllables have different phonologic processes, such vowel reduction, assimilation, or deletion?
Y/N	Is there different number or placement of cross-stroke or dotted letters present in the names?	**Y/N**	Across a range of dialects, are the names consistently pronounced differently?
Y/N	Do the infixes of the name appear dissimilar when scripted?		
Y/N	Do the suffixes of the names appear dissimilar when scripted?		

Table 4: Moderately Similar Name Pair Checklist (i.e., combined score is ≥50% to ≤69%).

Step 1	Review the DOSAGE AND ADMINISTRATION and HOW SUPPLIED/STORAGE AND HANDLING sections of the prescribing information (or for OTC drugs refer to the Drug Facts label) to determine if strengths and doses of the name pair overlap or are very similar. Different strengths and doses for products whose names are moderately similar may decrease the risk of confusion between the moderately similar name pairs. Name pairs that have overlapping or similar strengths or doses have a higher potential for confusion and should be evaluated further (see Step 2). Because the strength or dose could be used to express an order or prescription for a particular drug product, overlap in one or both of these components would be reason for further evaluation. For single strength products, also consider circumstances where the strength may not be expressed. For any i.e. drug products comprised of more than one active ingredient, consider whether the strength or dose may be expressed using only one of the components. To determine whether the strengths or doses are similar to your proposed product, consider the following list of factors that may increase confusion: • Alternative expressions of dose: 5 mL may be listed in the prescribing information, but the dose may be expressed in metric weight (e.g., 500 mg) or in non-metric units (e.g., 1 tsp, 1 tablet/capsule). Similarly, a strength or dose of 1000 mg may be expressed, in practice, as 1 g, or vice versa. • Trailing or deleting zeros: 10 mg is similar in appearance to 100 mg which may potentiate confusion between a name pair with moderate similarity. • Similar sounding doses: 15 mg is similar in sound to 50 mg
Step 2	Answer the questions in the checklist below. Affirmative answers to some of these questions suggest that the pattern of orthographic or phonetic differences in the names may reduce the likelihood of confusion for moderately similar names **with** overlapping or similar strengths or doses.

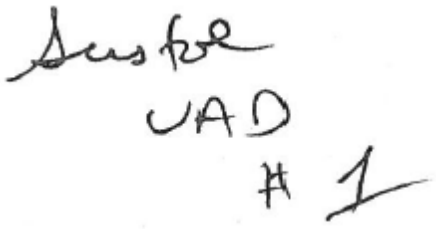
	Orthographic Checklist (Y/N to each question) • Do the names begin with different first letters? Note that even when names begin with different first letters, certain letters may be confused with each other when scripted. • Are the lengths of the names dissimilar* when scripted? *FDA considers the length of names different if the names differ by two or more letters. • Considering variations in scripting of some letters (such as *z* and *f*), is there a different number or placement of upstroke/downstroke letters present in the names? • Is there different number or placement of cross-stroke or dotted letters present in the names? • Do the infixes of the name appear dissimilar when scripted? • Do the suffixes of the names appear dissimilar when scripted?	Phonetic Checklist (Y/N to each question) • Do the names have different number of syllables? • Do the names have different syllabic stresses? • Do the syllables have different phonologic processes, such vowel reduction, assimilation, or deletion? • Across a range of dialects, are the names consistently pronounced differently?

Table 5: Low Similarity Name Pair Checklist (i.e., combined score is ≤49%).

In most circumstances, these names are viewed as sufficiently different to minimize confusion. Exceptions to this would occur in circumstances where, for example, there are data that suggest a name with low similarity is nonetheless misinterpreted as a marketed product name in a prescription simulation study. In such instances, FDA would reassign a low similarity name to the moderate similarity category and review according to the moderately similar name pair checklist.

Appendix B: Prescription Simulation Samples and Results

Figure 1. Sustol Study (Conducted on August 21, 2015)

Handwritten Requisition Medication Order	Verbal Prescription
Medication Order: 	Sustol UAD #1
Outpatient Prescription: 	

Fda Prescription Simulation Responses (<u>Aggregate 1 Rx Studies Report)</u>

244 People Received Study

83 People Responded

Study Name: Sustol

Total	**33**	**23**	**27**	
Interpretation	**Outpatient**	**Voice**	**Inpatient**	**Total**
Cystal	0	1	0	1
Gustol	0	0	1	1
Scisfoe	1	0	0	1
Scistol	1	0	0	1
Substall	0	1	0	1
Sunsol	0	0	1	1
Sursol	0	0	1	1
Susfoe	5	0	0	5
Susfol	5	0	0	5
Sustal	0	12	0	12
Sustall	0	3	0	3
Sustoe	5	0	0	5
Sustol	16	3	22	41
Sustol Inject	0	0	1	1
Sustol Injection	0	0	1	1
Sustor	0	1	0	1

Sustov	0	1	0	1
Systol	0	1	0	1

Appendix C: Highly Similar Names (e.g., combined POCA score is ≥70%)

No.	Proposed name: Sustol Established name: Granisetron Dosage form: Prefilled subcutaneous syringe Strength(s): 10 mg/0.4 mL	POCA Score (%)	Orthographic and/or phonetic differences in the names sufficient to prevent confusion Other prevention of failure mode expected to minimize the risk of confusion between these two names.
1.	Sustol	100	Proposed proprietary name subject of this review.
2.	Fe-stool	80	Name found in RxNorm. No product characteristics available in Drugs@FDA, Redbook, Facts and Comparison, CVS, Walgreens and Amazon.
3.	Fus-sol	73	Name found in RxNorm. No product characteristics available in Drugs@FDA, Redbook, Facts and Comparison, CVS, Walgreens and Amazon.
4.	Ustell	70	The prefixes and suffixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.

Appendix D: Moderately Similar Names (e.g., combined POCA score is ≥50% to ≤69%) with no overlap or numerical similarity in Strength and/or Dose

No.	Name	POCA Score (%)
1.	Sudal	64
2.	Spasdel	62
3.	Statrol	60
4.	Sectral	58
5.	Sorbitol	58
6.	Cefzil	54
7.	Inositol	54
8.	Steviol	54
9.	Spastolate	51
10.	Castor Oil	50
11.	Felbatol	50
12.	Nytol	50
13.	Restoril	50
14.	Xylitol	50

Appendix E: Moderately Similar Names (e.g., combined POCA score is ≥50% to ≤69%) with overlap or numerical similarity in Strength and/or Dose

No.	**Proposed name:** Sustol **Established name:** Granisetron **Dosage form:** Prefilled subcutaneous syringe **Strength(s):** 10 mg/0.4 mL	POCA Score (%)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
1.	Stadol	68	The prefixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.
2.	Phos-cal	66	The suffixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different.
3.	Sustiva	62	The infixes of this name pair have sufficient orthographic differences. The third syllables of this name pair sound different and Sustiva has an extra syllable.
4.	Santyl	61	The suffixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.
5.	Sulfo-Lo	59	The infixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different and Sulfo-Lo has an extra syllable.

No.	Proposed name: Sustol Established name: Granisetron Dosage form: Prefilled subcutaneous syringe Strength(s): 10 mg/0.4 mL	POCA Score (%)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
6.	Sotalol	58	The infixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different and Sotalol has an extra syllable.
7.	Suspen	58	The suffixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different.
8.	*** (b) (4)	56	The suffixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different and *** (b) (4) has an extra syllable.
9.	Tustan	56	The suffixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.
10.	Glutol	54	The prefixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.

No.	Proposed name: Sustol Established name: Granisetron Dosage form: Prefilled subcutaneous syringe Strength(s): 10 mg/0.4 mL	POCA Score (%)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
11.	Sulfacel	54	The infixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different and Sulfacel has an extra syllable.
12.	Suttar	54	The suffixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.
13.	Testopel	54	The suffixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.
14.	Testolin	53	The suffixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.
15.	Crestor	52	The suffixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.

No.	Proposed name: Sustol Established name: Granisetron Dosage form: Prefilled subcutaneous syringe Strength(s): 10 mg/0.4 mL	POCA Score (%)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
16.	*** (b) (4)	52	The infixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different and *** (b) (4) has an extra syllable.
17.	Sulfur	52	The suffixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different.
18.	Surmontil	52	The length of this name pair is dissimilar. The first syllables of this name pair sound different and Surmontil has an extra syllable.
19.	Epitol	51	The prefixes of this name pair have sufficient orthographic differences. The first syllables of this name pair sound different.
20.	Sufentanil	51	The prefixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different and sufentanil has two extra syllables.

No.	Proposed name: Sustol Established name: Granisetron Dosage form: Prefilled subcutaneous syringe Strength(s): 10 mg/0.4 mL	POCA Score (%)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
21.	Sumavel	51	The suffixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different and Sumavel has an extra syllable.
22.	Levatol	50	The prefixes of this name pair have sufficient orthographic differences. The second syllables of this name pair sound different and Levatol has an extra syllable.
23.	Sinustab	50	Sinustab is available in 325mg-30 mg vs. Sustol is available in 10 mg/0.4 mL. There is no numerical overlap in strengths. The second syllables of this name pair sound different and Sinustab has an extra syllable.

Appendix F: Low Similarity Names (e.g., combined POCA score is ≤49%)

No.	Name	POCA Score (%)
	N/A	

Appendix G: Names not likely to be confused or not used in usual practice settings for the reasons described**.**

No.	Name	POCA Score (%)	Failure preventions
1.	Fostril	66	Brand discontinued with no generic equvialent available.
2.	Surital	66	Product withdrawn from market due to safety concerns as of September 17, 2001.
3.	Sustac	66	Name found in RxNorm. No product characteristics available in common drug references.
4.	Sumbul	64	Name found in RxNorm. No product characteristics available in common drug references.
5.	Stoxil	63	Product withdrawn from market due to safety concerns as of September 17, 2001.
6.	Syncol	62	Name found in RxNorm. No product characteristics available in common drug references.
7.	Sevosol	61	Name found in RxNorm. No product characteristics available in common drug references.
8.	Soy sterol	61	Name found in RxNorm. No product characteristics available in common drug references..

No.	Name	POCA Score (%)	Failure preventions
9.	Sulpitil	61	Name found in RxNorm. No product characteristics available in common drug references..
10.	Sulster	61	Product withdrawn from market due to safety concerns.
11.	Spacol	60	Brand discontinued with no generic equvialent available.
12.	*** (b) (4)	60	This is a secondary proposed proprietary name and the name was conditionally approved under proprietary name *** (b) (4)
13.	Sustain	59	Name found in RxNorm. No product characteristics available in common drug references.
14.	Dettol	58	Name found in RxNorm. No product characteristics available in common drug references.
15.	Sustaire	58	Product withdrawn from market due to safety concerns.
16.	Sustanon	58	Name found in RxNorm. No product characteristics available in common drug references.

No.	Name	POCA Score (%)	Failure preventions
17.	Senosol	57	Name found in RxNorm. No product characteristics available in common drug references.
18.	Sympatol	57	Name found in RxNorm. No product characteristics available in common drug references.
19.	Destolit	56	Name found in RxNorm. No product characteristics available in common drug references.
20.	Sarisol	56	Product withdrawn from market due to safety concerns.
21.	Septisol	56	Product withdrawn from market due to safety concerns as of September 19, 1996.
22.	Skatole	54	Name found in RxNorm. No product characteristics available in common drug references.
23.	Sulten-10	54	Product withdrawn from market due to safety concerns.
24.	Suscard	53	Name found in RxNorm. No product characteristics available in common drug references.
25.	Celectol	52	Name found in RxNorm. No product characteristics available in common drug references.

No.	Name	POCA Score (%)	Failure preventions
26.	Maltol	52	Name found in RxNorm. No product characteristics available in common drug references.
27.	Percutol	52	Name found in RxNorm. No product characteristics available in common drug references.
28.	Sevredol	52	Name found in RxNorm. No product characteristics available in common drug references.
29.	*** (b) (4)	52	This is a secondary proposed proprietary name and the primary proposed name ** (b) (4)
30.	Silanol	52	Name found in RxNorm. No product characteristics available in common drug references.
31.	Slentrol	52	Name found in RxNorm. No product characteristics available in common drug references.
32.	Somnasol	52	Name found in RxNorm. No product characteristics available in common drug references.

No.	Name	POCA Score (%)	Failure preventions
33.	Sumtan	52	Name found in RxNorm. No product characteristics available in common drug references.
34.	Suclor	51	Name found in RxNorm. No product characteristics available in common drug references.
35.	*** (b) (4)	50	This is a secondary proposed proprietary name and the application (NDA 200740) was approved under Cystaran.
36.	Myrtol	50	Name found in RxNorm. No product characteristics available in common drug references.
37.	Salamol	50	Name found in RxNorm. No product characteristics available in common drug references.
38.	Simbadol	50	Name found in RxNorm. No product characteristics available in common drug references.
39.	Sotacor	50	Name found in RxNorm. No product characteristics available in common drug references.
40.	Sulpho-lac	50	Brand discontinued with no generic equvialent available.

No.	Name	POCA Score (%)	Failure preventions
41.	Vanatol	50	Name found in RxNorm. No product characteristics available in common drug references.

Appendix H: Names not likely to be confused due to notable spelling, orthographic and phonetic differences.

No.	Name	POCA Score (%)
1.	Fruso	66
2.	Tis-u-sol	66
3.	Pasmol	64
4.	Ponstel	64
5.	Drisdol	62
6.	Isosol	62
7.	Piptal	62
8.	Apstil	60
9.	Duzol	60
10.	Lescol	60
11.	Restall	60
12.	Taxol	60
13.	Tusal	60
14.	Feosol	59
15.	Panscol	59
16.	Dactil	58

No.	Name	POCA Score (%)
17.	Docusol	58
18.	Duosol	58
19.	Cenfol	56
20.	Centyl	56
21.	Cutemol	56
22.	Dexol	56
23.	Doxal	56
24.	Doxil	56
25.	Photocil	56
26.	Taktil	56
27.	Visicol	56
28.	Visicol	56
29.	Zestril	56
30.	Cantil	55
31.	Esozol	55
32.	Prosol	55
33.	Vosol	55
34.	Anusol	54
35.	Butisol	54
36.	Citral	54
37.	Docusil	54
38.	Dutoprol	54
39.	D-vi-sol	54
40.	Fluosol	54
41.	Fosrenol	54

No.	Name	POCA Score (%)
42.	Fosteum	54
43.	Ipstyl	54
44.	Nasosol	54
45.	Navstel	54
46.	Nufol	54
47.	Ocu-sul	54
48.	Ocu-sul 10	54
49.	Ocu-sul 15	54
50.	Ocu-sul 30	54
51.	Toprol	54
52.	Tuss tan	54
53.	Tusstat	54
54.	Fiortal	53
55.	Tussanil	53
56.	Asacol	52
57.	Calpol	52
58.	Cepacol	52
59.	Chem-sol	52
60.	Chendol	52
61.	Clostebol	52
62.	Cytomel	52
63.	Detrol	52
64.	Disal	52
65.	Disipal	52
66.	Dofsol-A	52

No.	Name	POCA Score (%)
67.	D-Tal	52
68.	Factrel	52
69.	Fortral	52
70.	Istalol	52
71.	Parsidol	52
72.	Patanol	52
73.	Physiosol	52
74.	Topicool	52
75.	Totamol	52
76.	Tusnel c	52
77.	Ventral	52
78.	Vexol	52
79.	1-butanol	51
80.	Catosal	51
81.	Cresol	51
82.	Fastin	51
83.	Kefzol	51
84.	Oscal 500	51
85.	Tindal	51
86.	Xodol	51
87.	Buprol	50
88.	Cilostazol	50
89.	Crystal b-12	50
90.	Cyndal	50
91.	Drysol	50

No.	Name	POCA Score (%)
92.	Duochol	50
93.	Durezol	50
94.	Estriol	50
95.	Fosfestrol	50
96.	Fostex	50
97.	Musril	50
98.	Opti	50
99.	Osthol	50
100.	Pletal	50
101.	Predsol	50
102.	Pulmotil	50
103.	Testro-LA	50
104.	Toradol	50
105.	Vistaril	50

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/s/

SHERLY ABRAHAM
10/15/2015

KENDRA C WORTHY
10/15/2015

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:	1/23/13
Reviewer:	Teresa McMillan, PharmD 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, RPh. Division of Medication Error Prevention and Analysis
Drug Name(s):	Sustol (Granisetron) Extended-release Injection
Strengths:	10 mg/0.4 mL
Application Type/Number:	NDA 022445
Applicant/Sponsor:	AP Pharma
OSE RCM #:	2012-2527

*** 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, Sustol, 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

This application is currently under review with the Division of Gastroenterology and Inborn Error Products (DGIEP). The proposed proprietary name, Sustol, was found acceptable in OSE Review #2009-1600, dated November 20, 2009. However, the application received a Complete Response on March 16, 2010.

On October 25, 2012, A.P. Pharma resubmitted the NDA and a request to the Agency for an assessment of the proposed proprietary name under NDA 022445.

1.2 PRODUCT INFORMATION

The following product information is provided in the October 25, 2012 proprietary name submission.

- Active Ingredient: Granisetron
- Indication of Use: moderately (b) (4) emetogenic cancer chemotherapy-prevention of acute (0-24 hr) and delayed(24-120 hr) nausea and vomiting associated with initial and repeat courses
- Route of Administration: Subcutaneous
- Dosage Form: Solution for Injection
- Strength: 10 mg/0.4 mL
- Dose and Frequency: 10 mg, 30 minutes prior to chemotherapy every 7 days
- How Supplied: A kit which contains a single (b) (4) pre-filled glass sterile syringe along with a dosing needle
- Storage: Refrigerated at 2°C to 8°C- may be removed form the refrigerator at least 60 minutes prior to use in order to ease administration and may be left at room temperature for up to 7 days. Protect from light.

2. RESULTS

The following sections provide the information obtained and considered in the overall 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 Gastroenterology and Inborn Error Products (DGIEP) concurred with the findings of OPDP's promotional assessment of the proposed name.

2.2 SAFETY ASSESSMENT

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

2.2.1 United States Adopted Names (USAN) SEARCH

The November 30, 2012 search of the United States Adopted Name (USAN) stems did not identify that a USAN stem is present in the proposed proprietary name.

2.2.2 Components of the Proposed Proprietary Name

The Applicant indicated in their submission that the proposed name, Sustol, is derived from (b) (4) two of the drug product's attributes. This is an extended-release injectable solution for subcutaneous administration. There is no modifier added to describe the extended-release characteristics of this product. Therefore, we have evaluated whether or not the proposed name requires a modifier to signal the extended-release nature of the product (see FMEA of modifier section 2.2.7). Additionally, the derivation was provided to OPDP for consideration in their review of the name for promotional concerns and OPDP found the name acceptable from a promotional perspective.

2.2.3 Medication Error Data Selection of Cases

DMEPA searched FAERS database (or other databases) for medication errors involving Granisetron which would be relevant for this review.

The search was limited from the date of our last AERS search in OSE RCM # 2010-1016 dated September 9, 2010. The January 3, 2013 search of the FDA Adverse Event Reporting System (FAERS) database used the following search terms: '*GRANISETRON*' (active ingredient), Medication Errors (HLGT), Product Packaging Issues (HLT), Product Label Issues (HLT), Product Quality Issues (NEC) (HLT).

Each report was reviewed for relevancy and duplication. Duplicates were merged into a single case. The NCC MERP Taxonomy of Medication Errors was used to code the case outcome and error root causes when provided by the reporter.

This search yielded no relevant cases.

2.2.4 FDA Name Simulation Studies

Eighty-four practitioners participated in DMEPA's prescription studies. The interpretations did not overlap with or appear or sound similar to any currently marketed products. Twenty-eight participants interpreted the name correctly as "Sustol". The remaining participants provided incorrect responses. Forty-four participants interpreted the name incorrectly as "Sustal". The remaining misinterpretations from all responses occurred with the letter 'S' being misinterpreted for the letter 'D', the letter 'u' for the letter string 're' and the letter 's' for the letter string 'ss', the letter 'o' for the letters 'a' and 'i', and the letter 'l' for the letter 'k' and the letter strings 'lk' and 'll'. See Appendix C for the complete listing of interpretations from the verbal and written prescription studies.

2.2.5 Comments from Other Review Disciplines

In response to the OSE, November 26, 2012 e-mail, the Division of Gastroenterology and Inborn Error Products (DGIEP) did not forward any comments or concerns relating to the proposed name at the initial phase of the proprietary name review.

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, Sustol. Table 1 lists the names with orthographic, phonetic, or spelling similarity to the proposed proprietary name, Sustol identified by the primary reviewer, the Expert Panel Discussion (EPD), and other review disciplines. Table 1 also includes the names identified by (b) (4) not identified by DMEPA and require further evaluation.

Table 1: Collective List of Potentially Similar Names (DMEPA, EPD, Other Disciplines, and External Name Study)

Look Similar					
Name	***Source***	***Name***	***Source***	***Name***	***Source***
Sotret	FDA	Sustex PSE	FDA	Sust-A	FDA
Geritol	FDA	Santyl	FDA	Zantac	FDA
Surfak	FDA	Noctec	FDA	Systane	FDA
Sustaire	FDA	Sidoral	FDA	Toradol	FDA
Surital	FDA	Sudal	FDA	Genedel	FDA
Gentak	FDA	Guacol	FDA	(b) (4) ***	FDA
Gantanol	FDA	Invega Sustenna	FDA	Abstral	FDA
Sancuso	FDA	Drisdol	FDA	Zestril	Both
Sural	FDA				
Look and Sound Similar					
Name	***Source***	***Name***	***Source***	***Name***	***Source***
Sosol	FDA	Stadol	FDA	Sustol	FDA
Sustiva	Both	Sular	Both	Sustac	Both
Sastid	Both	Sutent	Both	Detrol	External
Isotol	External	Istalol	External	Justor	External
Patanol	External	Sectral	External	Seroquel	External
Sorbital	External	Sotalol	External	Sulton	External
Sustacal	External	Sustain	External	Suston	External
Tegretol	External	Tussin	External	Sulfatol	FDA
Sound alike					
Taxol	FDA				

Our analysis of the 50 names contained in Table 1 considered the information obtained in the previous sections along with their product characteristics. We determined 50 names will not pose a risk for confusion as described in Appendices D through E.

2.2.7 Failure Mode and Effects Analysis of Modifier

This product is an extended-release subcutaneous injectable formulation of the currently marketed product Granisetron. As proposed, the Applicant does not include a modifier with the name to convey that Sustol is an extended-release dosage form. Additionally, there are no immediate release subcutaneous formulations of Sustol that would require this product name to be differentiated. However, we note that there are immediate release

oral (i.e. tablet and solution) and injectable (i.e. intravenous) formulations of Granisetron. The oral formulations are administered once or twice daily 1 hour prior to chemotherapy and the injectable intravenous formulation is administered 30 minutes prior to chemotherapy. Granisetron is also available in a transdermal formulation which can be administered at the same frequency of once every 7 days as the proposed product Sustol. Additionally, this transdermal formulation is also marketed under a different proprietary name, which does not include a modifier.

Thus, we evaluated if a modifier is needed for the root name Sustol or if the lack of the modifier raises any potential concerns. Typically a modifier is used to denote the formulation's extended-release property to help mitigate wrong technique and wrong frequency errors. However, the proposed product is an injectable, and cannot be crushed, chewed or manipulated in any way that is typically seen with extended release oral formulations, thus wrong technique errors with this product due to the absence of a modifier are not anticipated. Wrong frequency errors may be a concern because this product is given once every 7 days and all other Granisetron formulations with the exception of the transdermal formulation are administered on the day of chemotherapy which can vary in frequency.

However, as noted with the transdermal formulation of Granisetron, there is no precedence for the use of modifier to denote the frequency of every 7 days. The transdermal formulation is differentiated by using a different proprietary name. As noted in Section 2.2.3, no wrong frequency errors were identified amongst the Granisetron formulations.

We also considered if other extended-release injectable formulations may contain a modifier to denote that the product is extended-release. We note that the use of modifiers is inconsistent. For products that have no immediate release formulations on the market with the same proprietary name there are instances where a modifier is used, for example Invega Sustenna utilizes a modifier. However there are also instances where a modifier is not used, for example Revia, Vivitrol, Naltrexone. These formulations are differentiated from the immediate release formulations by using a different proprietary name. However, if there are other immediate release formulations marketed under the same proprietary name, we note the use of a modifier to help distinguish the different formulations (i.e. Zyprexa, Zyprexa Relprevv).

Moreover, there is no standard modifier that has been used to denote the extended-release property in an injectable formulation. Thus, in this instance, given the totality of the factors considered above, there is no compelling evidence to support the necessity of a modifier for the proposed proprietary name, Sustol, at this time. We believe the use of label and labeling statements that reinforce that Sustol is a once weekly subcutaneous extended-release injectable drug, irrespective of the inclusion of a modifier in the proprietary name is sufficient.

2.28 Communication of DMEPA's Final Decision to Other Disciplines

DMEPA communicated our findings to the Division of Gastroenterology and Inborn Error Products (DGIEP) via e-mail on December 19, 2012. At that time we also requested additional information or concerns that could inform our review. Per e-mail

correspondence from the Division of Gastroenterology and Inborn Error Products (DGIEP) on December 26, 2012, they stated no additional concerns with the proposed proprietary name, Sustol.

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 Phong Do, OSE project manager, at 301-796-4795.

3.1 COMMENTS TO THE APPLICANT

We have completed our review of the proposed proprietary name, Sustol and have concluded that this name is acceptable. However, if any of the proposed product characteristics as stated in your October 25, 2012 submission are altered, the name must be resubmitted for review.

Additionally, the proposed proprietary name must be re-reviewed 90 days prior to approval of the NDA. 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 (www.thomsonhc.com/home/dispatch)***

    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 (www.medilexicon.com)***

    Medical Abbreviations dictionary 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.

20. ***Natural Standard (http://www.naturalstandard.com)***

    Natural Standard is a resource that aggregates and synthesizes data on complementary and alternative medicine.

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

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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.

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. 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 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 Office of Prescription Drug Promotion (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 Section 1.2 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, Sustol	**Scripted May Appear as**	**Spoken May Be Interpreted as**
Capital 'S'	G, 5, L, J, D	'C', 'Z', 'X'
lower case 's'	a, n, r, G, g,	'c' , 'z', 'x'
lower case 'u'	a, ee, ei, ie, re, n, o, v, w, or y	any vowel
lower case 't'	A, f, r, x, l, b	'd'
lower case 'o'	a, c, e, or u	any vowel, 'oh'
lower case 'l'	b, e, h, i, k, t, s, A, P	
Letter Strings	**Scripted May Appear as**	**Spoken May Be Interpreted as**
ol	d	'all'

Appendix C: Prescription Simulation Samples and Results

Figure 1. Sustol (Conducted on 11/20/2012)

Handwritten Requisition Medication Order	**Verbal Prescription**
Medication Order: Sustol 10mg subcutaneously 30 min prior to chemo	Sustol Bring to clinic #1
Outpatient Prescription: Sustol Bring to clinic #1	

FDA Prescription Simulation Responses (Aggregate 1 Rx Studies Report)

Study Name: Sustol

194 People Received Study

84 People Responded

Study Name: Sustol

Total	30	27	27
INTERPRETATION	**INPATIENT**	**VOICE**	**OUTPATIENT**	**TOTAL**
DRESTOL	0	0	1	1
DUSTOL	0	0	1	1
SUSSTOL	0	1	0	1
SUSTAK	0	1	0	1
SUSTAL	29	11	4	44
SUSTALK	0	1	0	1
SUSTALL	0	4	0	4
SUSTIL	0	0	1	1
SUSTOL	1	9	18	28
SUSTRAL	0	0	1	1
SUSTROL	0	0	1	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 Sustol	Failure preventions
1	Santyl	Collagenase	Look alike	The pair has sufficient orthographic differences.
2	Noctec	Chloral Hydrate	Look alike	The pair has sufficient orthographic differences.
3	Sideral	Multivitamins with Minerals	Look alike	The pair has sufficient orthographic differences.
4	Systane	Artificial Tears	Look alike	The pair has sufficient orthographic differences.
5	Toradol	Ketorolac	Look alike	The pair has sufficient orthographic differences.
6	Gentak	Gentamicin	Look alike	The pair has sufficient orthographic differences.
7	Guacol	N/A	Look alike	The pair has sufficient orthographic differences. Additionally, no information could be found in the commonly used drug databases.
8	Genedel	Bromphenerime;	Look alike	The pair has sufficient orthographic

		dextromorphan; pseudoephedrine		differences. Additionally, no dosing information could be found in the commonly used drug databases.
9	Gantanol	Sulfamethoxazole	Look alike	The pair has sufficient orthographic differences.
10	Invega Sustenna	Paliperidone	Look alike	The pair has sufficient orthographic differences.
11	Sancuso	Granisetron	Look alike	The pair has sufficient orthographic differences.
12	(b) (4) ***	(b) (4)	Look alike	The pair has sufficient orthographic differences. Additionally, this name was found unacceptable (b) (4) This name was withdrawn by the Applicant.
13	Abstral	Fentanyl Citrate	Look alike	The pair has sufficient orthographic differences.
14	Isotol	Mannitol	Look alike	This is an international product marketed in Italy.
Proprietary Name		**Active Ingredient**	**Similarity to Sustol**	**Failure preventions**
15	Justor	N/A	Look and sound alike	This name was identified via POCA Plus in the (b) (4) external study. However, no product information could be found in any of the commonly used drug databases.
16	Patanol	Olopatadine	Look and sound alike	The pair has sufficient orthographic and phonetic differences.
17	Seroquel	Quetiapine	Look and sound alike	The pair has sufficient orthographic and phonetic differences.
18	N/A	Sorbital	Look and sound alike	The pair has sufficient orthographic and phonetic differences.
19	N/A	Sotalol	Look and sound alike	The pair has sufficient orthographic and phonetic differences.
20	Sulton	N/A	Look and sound alike	This name was identified via POCA Plus in the (b) (4) external study. However, no product information could be found in any of the commonly used drug databases.
21	Suston	N/A	Look and sound alike	This name was identified via POCA Plus by the (b) (4) external study.

				However, no product information could be found in any of the commonly used drug databases.
22	Tegretol	Carbamazepine	Look and sound alike	The pair has sufficient orthographic and phonetic differences.
23	Tussin	Guafenisin	Look and sound alike	The pair has sufficient orthographic and phonetic differences.
24	Sulfatol	Sulfacetamide;sulfur	Look and sound alike	The pair has sufficient orthographic and phonetic differences.
25	Sustac	Nitroglycerin	Look and Sound alike	This is an international name marketed in the United Kingdom.
26	Taxol	Paclitaxel	Sound alike	The pair has sufficient phonetic differences.
Proprietary Name		**Active Ingredient**	**Similarity to Sustol**	**Failure preventions**
27	Sustol	Granisetron	Look and sound alike	This name is the subject of this review.
28	Sustex PSE	Guafenesin/ Psuedoephedrine HCL	Look alike	This is a discontinued product that could only be found in RedBook and no dosing information could be found in any of the commonly used drug databases.
29	Sust-A	vitamin A	Look alike	This is a discontinued product that could only be found in RedBook and no dosing information could be found in any of the commonly used drug databases.
30	Sustaire	Theophylline	Look alike	This name has been withdrawn per Federal Register effective. However, it is unclear if is due to safety concerns.
31	Surital	Thiamylal sodium	Look alike	This name has been withdrawn per Federal Register effective. However, it is unclear if is due to safety

				concerns.
32	Sural	Ethambutol	Look alike	This is an international drug that is marketed in Czech Republic, Ethiopia, Hungary, and Slovakia.

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: Sustol (granisetron) **Dosage form(s): Extended-release Injection (Single (b) (4) syringe)** **Strength(s): 10 mg/0.4 mL** **Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days**		**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
1	Sotret (Isotretinoin) <u>Capsules</u> 10 mg, 20 mg, 30 mg, 40 mg <u>Usual Dose</u> 0.5 to 1.0 mg/kg/day given in two divided doses daily with food for 15 to 20 weeks	*<u>Similarities</u>* <u>Orthographics</u> Both names contain three upstrokes (‘S’, ‘t’, ‘t’ vs. ‘S’, ‘t’, ‘l’) in the similar positions. The letter string ‘So’ when scripted appears similar to the letter string ‘Su’. The letter string ‘et’ when scripted appears similar to the letter string ‘ol’. <u>Strength</u> 10 mg <u>Usual Dose</u> 10 mg	*<u>Differences</u>* <u>Orthographics</u> The infix ‘otr’ in the name Sotret provides differentation between the infix ‘ust’ in the name Sustol when scripted. <u>Frequency of Administration</u> Twice daily vs. once every 7 days

Proposed name: Sustol (granisetron) **Dosage form(s): Extended-release Injection (Single (b) (4) syringe)** **Strength(s): 10 mg/0.4 mL** **Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days**		**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
2	Geritol (multivitamins w/minerals) <u>Tablets or Liquid</u> <u>Usual Dose</u> Take one tablet once daily with food or take one tablespoonful once daily with food.	*<u>Similarities</u>* <u>Orthographics</u> Both names contain three upstrokes (‘G’, ‘t’, ‘t’ vs. ‘S’, ‘t’, ‘l’) in similar positions. The letter string ‘Ger’ when scripted appears similar to the letter string ‘Sus’. Both names end with the letter string ‘tol’ <u>Strength</u> Both products are available as a single strength which does not require a strength to be written on the prescription .	*<u>Differences</u>* <u>Usual Dose</u> One tablet vs. 10 mg <u>Frequency of Administration</u> Once daily vs. Once every 7 days

	Proposed name: Sustol (granisetron) Dosage form(s): Extended-release Injection (Single (b) (4) syringe) Strength(s): 10 mg/0.4 mL Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days	Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion Causes (could be multiple)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
3	Sectral (Acebutolol) Capsules 200 mg, 400 mg Usual Dose 200 mg twice daily or 400 mg-800 mg once daily. Max daily dose-1200 mg	*Similarities* Orthographics Both names contain three upstrokes (‘S’, ‘t’, ‘l’) in similar positions. The letter string ‘Sec’ when scripted appears similar to the letter string ‘Sus’. The letter string ‘tral’ when scripted appears similar to the letter string ‘tol’. Phonetics Both names begin with the ‘S’ sound. Both names contain two syllables. Both names end with the ‘al’ vs. ‘ol’ sound.	*Differences* Strength Sustol is available as a single strength which does not require a strength to be written on the prescription vs. Sectral is available in multiple strengths (i.e 200 mg, 400 mg) which would require a strength on a prescription. There is no overlap in strength. Phonetics The ‘ectr’ sound is phonetically different from the ‘ust’sound. Usual Dose 1-2 capsules vs. 10 mg Frequency of Administration Once daily vs. Once every 7 days

Proposed name: Sustol (granisetron) **Dosage form(s): Extended-release Injection (Single (b) (4) syringe)** **Strength(s): 10 mg/0.4 mL** **Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days**		**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
4	Surfak (Docusate) (discontinued with generic equivalents) <u>Softgels</u> 240 mg <u>Usual Dose</u> 240 mg PO daily; may repeat dosage for 2 to 3 days until bowel movements are normal	*<u>Similarities</u>* <u>Orthographics</u> Both names contain three upstrokes ('S', 't', 'l' vs. 'S', 'f', 'k') in the same positions. The letter string 'Sur' when scripted appears similar to the letter string 'Sus'. The letter string 'fak' when scripted appears similar to the letter string 'tol'. <u>Strength</u> Both products are available as a single strength which does not require a strength to be written on the prescription .	*<u>Differences</u>* <u>Usual Dose</u> 1 softgel vs. 10 mg <u>Frequency of Administration</u> Once daily vs. Once every 7 days

	Proposed name: Sustol (granisetron) Dosage form(s): Extended-release Injection (Single (b) (4) syringe) Strength(s): 10 mg/0.4 mL Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days	Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion Causes (could be multiple)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
5	Zantac (Ranitidine) Effervescent Tablets 25 mg Tablets 150 mg, 300 mg Oral Solution 75 mg/5 mL, 150 mg/10 mL Solution for Injection 25 mg/mL Usual Dose 75 mg-150 mg twice daily or 300 mg once daily 50 mg IV or IM every 6—8 hours	*Similarities* Orthographics The letter string 'Zan' when scripted appears similar to the letter string 'Sus'. The letter string 'to' when scripted appears similar to the letter string 'ta'.	*Differences* Orthographics The name Zantac ontains two upstrokes ('Z','t') vs. the name Sustol contains three upstrokes ('S', 't', 'l') giving them different shapes when scripted. Strength Sustol is available as a single strength which does not require a strength to be written on the prescription vs. Zantac is available in multiple strengths (i.e 150 mg, 300 mg, 25 mg/mL, 75 mg/5mL, 150 mg/ 10 mL) which would require a strength on a prescription. There is no overlap in strength. Usual Dose 1-2 tablets or vs. 10 mg Frequency of Administration Once-twice daily vs. Once every 7 days

	Proposed name: Sustol (granisetron) **Dosage form(s): Extended-release Injection (Single (b) (4) syringe)** **Strength(s): 10 mg/0.4 mL** **Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days**	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
6	Drisdol (ergocalciferol) Capsules 1.25 mg (50,000 IU) Oral Drops 8,000 IU/mL Usual Dose 12,000 IU to 500,000 IU once daily	*Similarities* Orthographics Both names contain three upstrokes ('S', 't', 'l' vs. 'D', 'd', 'l') in similar positions. The letter string 'Dris' when scripted appears similar to the letter string 'Sus'. The letter string 'dol' when scripted appears similar to the letter string 'tol'. Usual Dose (achievable) 10 mg	*Differences* Strength Sustol is available as a single strength which does not require a strength to be written on the prescription vs. Drisdol is available in multiple strengths [1.25 mg (50, 000 IU), 8,000IU/mL] which would require a strength on a prescription. Usua1 Dose 12000 IU to 5000,000 IU vs. 10 mg Frequency of Administration Once-twice daily vs. Once every 7 days

	Proposed name: Sustol (granisetron) **Dosage form(s): Extended-release Injection (Single (b) (4) syringe)** **Strength(s): 10 mg/0.4 mL** **Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days**	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
7	Sosol (Sulfisoxazole) (discontinued with no generics) <u>Tablets</u> 500 mg <u>Usual Dose</u> <u>Treatment of UTI</u>: 2 to 4 grams by mouth initially followed by a maintenance dose of 4 to 8 grams in 4 to 6 equally divided doses <u>Treatment of cystitis in females</u>: 2 grams by mouth as a single dose <u>Treatment of chlamydial conjunctivitis</u>: 500 mg by mouth 4 times per day	*<u>Similarities</u>* <u>Orthographics</u>. The letter string 'Sos' when scripted appears similar to the letter string 'Sus'. Both names end with the letter 'ol'. <u>Phonetics</u> Both names contain two syllables. Both names begin with the 'Sos' vs. 'Sus' sounds and end with the 'ol' sound. <u>Strength</u> Both are available as a single strength which does not require a strength to be written on the prescription.	*<u>Differences</u>* <u>Orthographics</u> The name Sosol ontains two upstrokes ('S','l') vs. the name Sustol contains three upstrokes ('S', 't', 'l') giving them different shapes when scripted. <u>Usual Dose</u> 1-8 tablets vs. 10 mg <u>Frequency of Administration</u> 4-6 times daily vs. Once every 7 days

	Proposed name: Sustol (granisetron) Dosage form(s): Extended-release Injection (Single (b) (4) syringe) Strength(s): 10 mg/0.4 mL Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days	Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion Causes (could be multiple)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
8	Stadol (butorphanol) Solution for Injection 2 mg/mL Nasal Spray-discontinued but generics available 10 mg/mL Usual Dose 2 mg (range, 1—4 mg) IM every 3—4 hours as needed or 1 mg (range, 0.5—2 mg) IV every 3—4 hours as needed 1 mg (1 spray) into one nostril. If this is not sufficient to relieve pain within 60—90 minutes, another 1 mg (1 spray) may be used in the other nostril. This two-dose sequence can be repeated 3—4 hours after the last dose as needed	*Similarities* Orthographics. Both names contain three upstrokes ('S', 't', 'l'). The letter string 'Sos' when scripted appears similar to the letter string 'Sus'. Both names end with the letter 'ol'. Phonetics Both names contain two syllables. Both names begin with the 'S' sound and end with the 'ol' sound. Strength 10 mg/mL vs. 10 mg/0.4 mL	*Differences* Orthographics Although both names contain three upstrokes ('S', 't', 'l'), the secont upstroke letter 't' is located in the 2nd position in the name Stadol vs. the 4th position in the name Sustol giving them different shapes when scripted. Phonetics The 'Stad" sound when enunciated sounds distinctly different from the 'Sust' sound. Usual Dose 1-4 mg or 1 spray or vs. 10 mg Frequency of Administration 3-4 hours as needed vs. Once every 7 days

	Proposed name: Sustol (granisetron) **Dosage form(s): Extended-release Injection (Single (b) (4) syringe)** **Strength(s): 10 mg/0.4 mL** **Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days**	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
9	Sustiva (Efavirenz) L&S) <u>Capsule</u> 50 mg, 200 mg <u>Tablet</u> 600 mg <u>Usual Dose</u> 200 mg-600 mg once daily	*<u>Similarities</u>* <u>Orthographics</u>. The letter string 'Sos' when scripted appears similar to the letter string 'Sus'. Both names end with the letter 'ol'. <u>Phonetics</u> Both names begin with the 'Sus' sound.	*<u>Differences</u>* <u>Orthographics</u> The name Sustiva ontains two upstrokes ('S','t') vs. the name Sustol contains three upstrokes ('S', 't', 'l') giving them different shapes when scripted. <u>Phonetics</u> Sustiva has three syllables vs. Sustol has two syllables. The 'iva" sound when enunciated sounds distinctly different from the 'ol' sound. <u>Usual Dose</u> 1-2 tablets or capsules vs. 10 mg <u>Frequency of Administration</u> Once daily vs. Once every 7 days <u>Strength</u>

			Sustol is available as a single strength which does not require a strength to be written on the prescription vs. Sustiva is available in multiple strengths (i.e 50 mg, 200 mg, 600 mg) which would require a strength on a prescription. There is no overlap in strength.

	Proposed name: Sustol (granisetron) Dosage form(s): Extended-release Injection (Single (b) (4) syringe) Strength(s): 10 mg/0.4 mL Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days	Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion Causes (could be multiple)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
10	Sular (Nisoldipine) Extended Release Tablets 8.5 mg, 17 mg, 25.5 mg, 34 mg Usual Dose 8.5—34 mg once daily	*Similarities* Orthographics. Both names begin with the letter string 'Su'. The letter string 'la' when scripted appears similar to the letter string to'. Phonetics Both names contain two syllables. Both names begin with the 'Su' sound.	Orthographics The name Sular contains two upstrokes ('S','l') vs. the name Sustol contains three upstrokes ('S', 't', 'l') giving them different shapes when scripted. Phonetics The 'lar' sound when enunciated sounds distinctly different from the 'stol' sound. ' Usual Dose 1-2 tablets vs. 10 mg Frequency of Administration Once daily vs. Once every 7 days Strength Sustol is available as a single strength which does not require a strength to be written on the prescription vs. Sular is available in multiple strengths (i.e 8.5 mg, 17 mg, 25.5 mg, 34 mg) which would require a strength on a prescription. There is no overlap in strength.

Proposed name: Sustol (granisetron) **Dosage form(s): Extended-release Injection (Single (b) (4) syringe)** **Strength(s): 10 mg/0.4 mL** **Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days**		**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
11	Sastid (sulfur;salicylic acid) (discontinued) <u>Topical soap</u> 10%;3% <u>Usual Dose</u> Use 1-3 times daily	*<u>Similarities</u>* <u>Orthographics</u> Both names contain three upstrokes ('S', 't', 'l' vs. 'S', 't', 'd') in the same positions. The letter string 'Sast' when scripted appears similar to the letter string 'Sust'. The letter string 'id' when scripted appears similar to the letter string 'ol'. <u>Phonetics</u> Both names begin with the 'Sust' vs. 'Sast' sound. Both names contain two syllables. <u>Strength</u> Both products are available as a single strength which does not require a strength to be written on the prescription.	*<u>Differences</u>* <u>Phonetics</u> The 'iva" sound when enunciated sounds distinctly different from the 'ol' sound. <u>Usual Dose</u> One application vs. 10 mg <u>Frequency of Administration</u> 1-3 times daily vs. Once every 7 days

	Proposed name: Sustol (granisetron) Dosage form(s): Extended-release Injection (Single (b) (4) syringe) Strength(s): 10 mg/0.4 mL Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days	Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion Causes (could be multiple)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
12	Sutent (Sunitinib) Capsules 12.5 mg, 25 mg, 50 mg Usual Dose 37.5 mg -87.5 mg once daily continuously. Dose increase or reduction of 12.5 mg increments. Max dose- 87.5 mg/day	*Similarities* Orthographics Both names contain three upstrokes ('S', 't', 'l' vs. 'S', 't', 't') in the same positions. Both names begin with the 'Su'letter string. Phonetics Both names begin with the 'Su' sound. Both names contain two syllables.	Orthographics The letter string 'tent' when scripted appears distinctly different from the letter string 'stol'. Phonetics The 'tent' sound when enunciated sounds distinctly different from the 'stol' sound. ' Usual Dose 1-2 capsules vs. 10 mg Frequency of Administration Once daily vs. Once every 7 days Strength Sustol is available as a single strength which does not require a strength to be written on the prescription vs. Sutent is available in multiple strengths (i.e 12.5 mg, 25 mg, 50 mg) which would require a strength on a prescription. There is no overlap in strength.

Proposed name: Sustol (granisetron) Dosage form(s): Extended-release Injection (Single (b) (4) syringe) Strength(s): 10 mg/0.4 mL Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days		Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion Causes (could be multiple)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
13	Detrol and Detrol LA (tolterodine) <u>Tablets</u> 1 mg, 2 mg, 4 mg <u>Usual Dose</u> 2 mg PO twice daily. The dose may be lowered to 1 mg PO twice daily based on individual response and tolerability or 4 mg once daily. Max dose-4 mg/day	*<u>Similarities</u>* <u>Orthographics</u> Both names contain three upstrokes ('S', 't', 'l' vs. 'D', 't', 'l') in the same positions. Both names end with the 'ol'letter string. The letter string 'De' when scripted appears similar to the letter string 'Su'. <u>Phonetics</u> Both names contain two syllables. Both names end with the 'ol'sound.	*<u>Differences</u>* <u>Phonetics</u> The 'Det' sound when enunciated sounds distinctly different from the 'Sust' sound. <u>Usual Dose</u> 1tablet vs. 10 mg <u>Frequency of Administration</u> twice daily vs. Once every 7 days <u>Strength</u> Sustol is available as a single strength which does not require a strength to be written on the prescription vs. Detrol and Detrol LA are available in multiple strengths (i.e 1 mg, 2 mg, 4 mg) which would require a strength on a prescription.

	Proposed name: Sustol (granisetron) Dosage form(s): Extended-release Injection (Single (b) (4) syringe) Strength(s): 10 mg/0.4 mL Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days	Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion Causes (could be multiple)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
14	Istalol (timolol maleate) <u>Opthalmic solution</u> 0.5% <u>Usual Dose</u> Instill 1 drop of a 0.5% solution in affected eye(s) once daily in the morning.	*<u>Similarities</u>* <u>Orthographics</u> Both names end with the 'ol'letter string. The letter 'I' when scripted appears similar to the letter string 'S'. <u>Phonetics</u> Both names end with the 'ol'sound. <u>Strength</u> Both products available as a single strength which does not require a strength to be written on the prescription.	*<u>Differences</u>* <u>Orthographics</u> The name Istalol contains three upstrokes ('I','t','l', 'l') vs. the name Sustol contains three upstrokes ('S', 't', 'l') giving them different shapes when scripted. <u>Phonetics</u> The 'Istal' sound when enunciated sounds distinctly different from the 'Sust' sound. <u>Usual Dose</u> 1drop vs. 10 mg <u>Frequency of Administration</u> once daily vs. Once every 7 days

Proposed name: Sustol (granisetron) Dosage form(s): Extended-release Injection (Single (b) (4) syringe) Strength(s): 10 mg/0.4 mL Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days		Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion Causes (could be multiple)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
15	Sustacal Nutritional supplement <u>Usual Dose</u> Use as directed by physician	*<u>Similarities</u>* <u>Orthographics</u> Both names contain three upstrokes (‘S’, ‘t’, ‘l’) in similar positions. Both names begin with the ‘Sust’letter string. The letter string ‘al’ when scripted appears similar to the letter string ‘ol’. <u>Phonetics</u> Both names begin with the ‘Sust’ sound. The ‘al’ sound when enunciated sounds similar to the ‘ol’ sound. <u>Strength</u> Both products available as a single strength which does not require a strength to be written on the prescription.	*<u>Differences</u>* <u>Orthographics</u> The letter string ‘ac’ in the name Sustacal provides differentiation between the name Sustol by elongating the name. <u>Phonetics</u> The name Sustacal has three syllables vs. Sustol has two syllables. The ‘cal’ sound at the end of the name Sustacal provides phonetic differentiation between the name Sustol. <u>Frequency of Administration</u> As directed vs. Once every 7 days

	Proposed name: Sustol (granisetron) Dosage form(s): Extended-release Injection (Single (b) (4) syringe) Strength(s): 10 mg/0.4 mL Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days	Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion Causes (could be multiple)	Prevention of Failure Mode In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names
16	Sustain (electrolyte replacement) (sodium chloride, calcium carbonate, potassium chloride) <u>Tablets</u> 170 mg;15 mg;15 mg <u>Usual Dose</u> Take 2 tablets with at least 8 oz. of water once daily.	*<u>Similarities</u>* <u>Orthographics</u> Both names begin with the 'Sust'letter string. <u>Phonetics</u> Both names begin with the 'Sust' sound. <u>Strength</u> Both are available as a single strength which does not require a strength to be written on the prescription.	*<u>Differences</u>* <u>Orthographics</u> The name Sustain contains two upstrokes ('S','t') vs. the name Sustol contains three upstrokes ('S', 't', 'l') giving them different shapes when scripted. <u>Phonetics</u> The 'ain' sound when enunciated sounds distinctly different from the 'ol' sound. <u>Usual Dose</u> 2 tablet vs. 10 mg <u>Frequency of Administration</u> Once daily vs. Once every 7 days

Proposed name: Sustol (granisetron) **Dosage form(s): Extended-release Injection (Single (b) (4) syringe)** **Strength(s): 10 mg/0.4 mL** **Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days**		**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
17	Zestril (lisniopril) Tablets 2.5 mg, 5 mg, 10 mg, 20 mg, 30 mg, 40 mg Usual Dose 2.5 mg-40 mg once daily	*Similarities* Orthographics Both names contain three upstrokes ('S', 't', 'l' vs. 'Z', 't', 'l') in similar positions. The letter string 'Zest' when scripted appears similar to the letter string 'Sust'. The letter string 'il' when scripted appears similar to the letter string 'ol'. Strength 10 mg Usual Dose 10 mg	*Differences* Frequency of Administration Once daily vs. Once every 7 days

Proposed name: Sustol (granisetron) **Dosage form(s): Extended-release Injection (Single (b) (4) syringe)** **Strength(s): 10 mg/0.4 mL** **Usual dose: 10 mg subcutaneously 30 minutes prior to chemotherapy every 7 days**		**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
18	Sudal 12 (chlorpheniramine maleate;pseudoephedrine hydrochloride) (discontinued) <u>Tablets</u> 4 mg;30 mg <u>Usual Dose</u> 1 tablet every 12 hours	*<u>Similarities</u>* <u>Orthographics</u> Both names begin with the 'Su'letter string. The letter string 'dal' when scripted appears similar to the letter string 'tol'. <u>Phonetics</u> Both names begin with the 'Su' sound and end with the 'al' vs. 'ol' sound. <u>Strength</u> Both are available as a single strength which does not require a strength to be written on the prescription.	*<u>Differences</u>* <u>Orthographics</u> The name Sudal contains two upstrokes ('S','d') vs. the name Sustol contains three upstrokes ('S', 't', 'l') giving them different shapes when scripted. <u>Phonetics</u> The 'st' sound in the name Sustol when enunciated sounds distinctly different from the 'd' sound. <u>Usual Dose</u> 1 tablet vs. 10 mg <u>Frequency of Administration</u> Every 12 hours vs. Once every 7 days

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/s/

LUBNA A MERCHANT
01/23/2013

CAROL A HOLQUIST
01/23/2013

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 20, 2009
To:	Donna Griebel, MD, Director Division of Gastroenterology Products
Through:	Todd Bridges, RPh, Team Leader Denise Toyer, PharmD, Deputy Director Carol Holquist, RPh, Director Division of Medication Error Prevention and Analysis (DMEPA)
From:	Deveonne Hamilton-Stokes, RN, BSN, Safety Evaluator Division of Medication Error Prevention and Analysis (DMEPA)
Subject:	Proprietary Name Review
Drug Name(s):	Sustol (Granisetron) Injection 10 mg/0.4 mL
Application Type/Number:	NDA 022445
Applicant:	AP Pharma, Inc.
OSE RCM #:	2009-1600

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

CONTENTS

EXECUTIVE SUMMARY

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

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

1 BACKGROUND

1.1 INTRODUCTION

This review is in response to a request from AP Pharma Pharma, Inc., dated August 28, 2009, for an assessment of the proposed proprietary names, Sustol, regarding potential name confusion with other proprietary or established drug names in the usual practice settings. Container label, carton labeling and insert labeling were also submitted, but will be reviewed under separate cover. Additionally, the Applicant submitted an external evaluation of the proposed proprietary name.

1.2 PRODUCT INFORMATION

Sustol (Granisetron) injection is indicated for the prevention of chemotherapy-induced nausea and vomiting in the acute (0-24hr) and delayed (24-120 hr) phase following emetogenic chemotherapy. The usual recommended dose is 10 mg subcutaneously 30 minutes before the start of single-day chemotherapy. A dose may be given once every 7 days and only on the day chemotherapy is given. Sustol will be available in a single (b) (4) syringe containing 10 mg of Granisetron and must be refrigerated at 2°C to 8°C (36°F to 46°F).

2 METHODS AND MATERIALS

Appendix A describes the general methods and materials used by the Division of Medication Error Prevention and Analysis (DMEPA) when conducting a proprietary name risk assessment for all proprietary names. Sections 2.1, 2.2, and 2.3 identify specific information associated with the methodology for the proposed proprietary name, Sustol.

2.1 SEARCH CRITERIA

For this review, particular consideration was given to drug names beginning with the letter 'S' 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 Sustol, 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

[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)

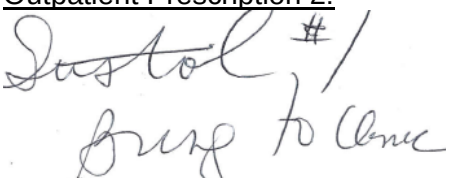
(six letters), upstrokes (3, capital letter 'S' and lowercase letters 't' and 'l'), down strokes (none), cross strokes (one, lower case letter 't'), and dotted letters (none). Additionally, several letters in Sustol may be vulnerable to ambiguity when scripted (See Appendix B). As a result, the DMEPA staff also considers these alternate appearances when identifying drug names that may look similar to Sustol.

When searching to identify potential names that may sound similar to Sustol, the DMEPA staff search for names with similar number of syllables (two), stresses (SUS-tol or sus-TOL), and placement of vowel and consonant sounds. Additionally, the DMEPA staff considers that pronunciation of parts of the name can vary such as 'S' may sound like 'Z' and 'stol' may sound like 'zol'. (See Appendix B). The Applicant's intended pronunciation (sus-Tol) was also taken into consideration, as it was included in the Proprietary Name Review Request. Moreover, names are often mispronounced and/or spoken with regional accents and dialects, so other potential pronunciations of the name are considered.

2.2 FDA PRESCRIPTION ANALYSIS STUDIES

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

Figure 1. Sustol Rx Study (conducted on September 14, 2009)

HANDWRITTEN OUTPATIENT PRECRIPTIONS	VERBAL RESCRIPTION
Inpatient Order: 	"Sustol Dispense #1 Bring to clinic"
Outpatient Prescription 2: 	

2.3 EXTERNAL PROPRIETARY NAME RISK ASSESSMENT

For this product, the Applicant submitted an independent risk assessment of the proposed proprietary name conducted by a consulting firm, (b) (4) 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 the Division of Medication Error Prevention and Analysis staff'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 names could lead to medication errors in usual practice settings.

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 DMEPA's risk assessment concurs or differs with the findings of the external risk assessment. When the proprietary name risk assessments differ, we provide a detailed explanation of these differences.

3 RESULTS

3.1 DATABASE AND INFORMATION SOURCES

The searches yielded a total of 20 names as having some similarity to the name Sustol.

Fourteen of the names were thought to look like Sustol. These include: Sustiva, Sustac, Gantanol, Zestril, Sustacal, Abstral, Sustenna, Sural, Surfak, Genedel, Guacol, Seroquel, Sorbitol and Drisdol. The two names thought to sound like Sustol are Sustaire and Taxol. The remaining names (Sotalol, Sectral, Surital and Stadol) were thought to look and sound similar to Sustol.

Additionally, DMEPA staff did not identify any United States Adopted Names (USAN) stems in the proposed proprietary name, as of November 4, 2009.

3.2 CDER EXPERT PANEL DISCUSSION

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

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

3.3 FDA PRESCRIPTION ANALYSIS STUDIES

A total of 17 practitioners responded, but none of the responses overlapped with any existing or proposed drug names. About 41% of the participants (n=7) interpreted the name correctly as "Sustol", with correct interpretation occurring in the outpatient study. The remainder of the respondents (n=10) misinterpreted the drug name. In the written prescription studies the letter 'o' was misinterpreted as 'a', 'e' and 'i' and the letter 'u' was misinterpreted as the letter 'y'. In the verbal prescription study the beginning letter, capital S, was misinterpreted as the letter 'Z', the letter 'u' was misinterpreted as the letter 'o', the second letter 's' was misinterpreted as the letter 'x', the letter 'o' was misinterpreted as the letter 'a' and the letter 'l' was misinterpreted as the letter 'v'. See Appendix C for the complete listing of interpretations from the verbal and written prescription studies.

3.4 EXTERNAL PROPRIETARY NAME ASSESSMENT

In the proposed name risk assessment submitted by the Applicant, (b) (4) identified a total of 21 drug names as having some potential for confusion with the name Sustol.

Of the 21 names, DMEPA identified the following 8 names during the database searches: Sectral, Seroquel, Sorbitol, Sotalol, Sustac, Sustacal, Sustiva and Zestril. The remaining 13 names (Detrol, Isotol, Istalol, Justor, Patanol, Sastid, Sular, Sulton, Sustain, Suston, Sutent, Tegretol and Tussin) were evaluated as part of the safety evaluator risk assessment.

3.5 COMMENTS FROM THE DIVISION

In response to the OSE email dated September 8, 2009 e-mail, the Division of Gastroenterology Products stated that they thought the proposed named looked like Sustacal, an enteral nutrition product. Sustacal was also identified in DMEPA searches and evaluated as part of the safety evaluator risk assessment.

On November 9, 2009, DMEPA notified the Division of Gastroenterology Products via e-mail that we had no objections to the proposed proprietary name, Sustol. Per e-mail correspondence from the Division of Gastroenterology Products on November 16, 2009, they indicated that they concur with our assessment of the proposed proprietary name, Sustol.

3.6 SAFETY EVALUATOR RISK ASSESSMENT

Independent searches by the primary Safety Evaluator identified six additional names (Statrol, Sosol, Sudal 12, (b) (4) ***, Sancuso and Sulfatol) which were thought to look or sound similar to Sustol and represent a potential source of drug name confusion.

4 DISCUSSION

DDMAC and the Review Division had no concerns with the proposed proprietary name, Sustol.

DMEPA identified and evaluated 39 names for their potential similarity to the proposed name, Sustol. Seven names lacked orthographic and/or phonetic similarity to Sustol, two names were foreign names, four names were not found in commonly referenced databases and the remaining three names are no longer marketed and have no generics available (see Appendices D through G). Thus these names were eliminated from further evaluation.

Failure mode and effect analysis (FMEA) was then applied to determine if the proposed proprietary name could potentially be confused with the remaining 23 names and lead to medication errors. This analysis determined that the name similarity between Sustol was unlikely to result in medication errors with any of the 23 products for the reasons presented in Appendices H through J.

Additionally, DMEPA did not identify any other factors that would render the name acceptable at this time. This finding is consistent with the independent name study.

5 CONCLUSIONS AND RECOMMENDATIONS

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

However, if any of the proposed product characteristics as stated in this review are altered, DMEPA rescinds this Risk Assessment finding and the name must be resubmitted for review. In the event that our Risk Assessment finding is rescinded, the evaluation of the name on resubmission is independent of the previous Risk Assessment, and as such, the conclusions on re-review of the name are subject to change. The proposed name must be re-reviewed 90 days before approval of the NDA. For questions or clarifications, please contact Nina Ton, OSE Project Manager, at 301-796-1648.

5.1 COMMENTS TO THE APPLICANT

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

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

REFERENCES

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

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

2. Phonetic and Orthographic Computer Analysis (POCA)

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

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

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

4. AMF Decision Support System [DSS]

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

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

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

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

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

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

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

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

USPTO provides information regarding patent and trademarks.

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

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

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

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

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

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

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

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

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

USAN Stems List contains all the recognized USAN stems.

14. Red Book Pharmacy's Fundamental Reference

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

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

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

16. Medical Abbreviations Book

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

APPENDICES

Appendix A:

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

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

The Safety Evaluator assigned to the Proprietary Name Risk Assessment is responsible for considering the collective findings, and provides an overall risk assessment of the proposed proprietary name. DMEPA bases the overall risk assessment on the findings of a Failure Mode and Effects Analysis (FMEA) of the proprietary name, and focuses on the avoidance of medication errors.

FMEA is a systematic tool for evaluating a process and identifying where and how it might fail. [4] DMEPA uses FMEA to analyze whether the drug names identified with orthographic or phonetic similarity to the

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

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

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 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.

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*

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

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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

If DMEPA objects to a proposed proprietary name on the basis that drug name confusion could lead to medication errors, the primary Safety Evaluator uses the FMEA process to identify strategies to reduce the risk of medication errors. DMEPA is likely to recommend that the Sponsor 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 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 Sponsor. 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 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. . (See Section 4 for limitations of the process).

Appendix B: Potential orthographic or phonetic misinterpretations of the letters in Sustol

Letters in Name, Sustol	Scripted may appear as	Spoken may be interpreted as
Capital 'S'	G, D,	Z
lower case 'u'	c, ce, i	any vowel
lower case 's'	c	x
lower case 't'	a, i, u	-
lower case 'o'	a,	any vowel
lower case 'l'	i or e	v

Appendix C:

FDA Prescription Study Responses

Inpatient Medication Order	Voice Prescription	Outpatient Prescription
Sustal	Sustal	Sustol
Sustel	Suxtal	Sustol
Sustal	Zostal	Sustol
Sustil	Sustal	Sustol
	Sustav	Sustol
		Sustol
		Sustol
		Systole

Appendix D: Names without convincing look-alike and/or sound-alike similarities to Sustol.

Proprietary Name	Similarity to Sustol
Taxol	Sound
Patanol	COPA
Seroquel	COPA
Sulton	COPA
Tegretol	COPA
Tussin	COPA

Appendix E: Foreign proprietary name identified as similar to Sustol.

Proprietary Name	Similarity to Sustol	Country
Sustac	COPA	United Kingdom
Isotol	COPA	Italy

Appendix F: Product with limited or no additional information found in DMEPA References 1-16

Proprietary Name	Source
Justor	COPA
Suston	COPA
Guacol	Look
Genedel	Look

Appendix G: Drug products that are discontinued and no generic equivalent is available

Proprietary Name	Similarity to Sustol	Status and Date
Gantanol	Look	Discontinued per Orange Book/Red Book
Surital	Look and Sound	Discontinued per Orange Book/Red Book
Statrol	Look and Sound	Discontinued per Orange Book/Red Book

Appendix H: Products with no numerical overlap in strength or dose.

Product name with potential for confusion	Similarity to Proposed Proprietary Name	Dosage Form/Strength	Usual Dose (if applicable)
Sustol (Granisetron)	**NA**	**Injection: 10 mg/0.4 mL syringe**	**10 mg subcutaneously given 30 minutes before the start of single-day chemotherapy.** **May be given once every 7 days, and only on the day chemotherapy is given**
Invega **Sustenna** (Paliperidone Palmitate)	Look	Injectable suspension: 39 mg, 78 mg, 117 mg, 156 mg, 234 mg	Initiation: 234 mg intramuscularly on treatment day one and 156 mg one week later Maintenance: 117 mg intramuscularly monthly
Sustacal OTC nutritional product	Look	Oral liquid	Usual dose varies based on doctor recommendation. Dose can be in cans or ounces
Sotalol Hydrochloride	Look	Injection: 150 mg/vial Tablets: 80 mg, 120 mg, 160 mg, 240 mg	**Injection:** Initiation dose of 75 mg infused over 5 hours once or twice daily based on the creatinine clearance Maintenance dose 75 mg to 160 mg one or twice daily **Tablets:** Initiation dose of 80 mg twice daily based on the creatinine clearance Maintenance dose 160 mg to 320 mg/day given in two or three divided doses
Istalol (Timolol maleate)	COPA	Ophthalmic Solution: 0.5 %	One drop of 0.5 % in the affected eye(s) once a day in the morning.
Sastid (Salicylic Acid/Sulfur)	COPA	Topical soap	Wet the skin. Work up a lather with this medication, then wash the affected areas. Rinse thoroughly and pat dry
Sancuso (Granisetron)	Look	Transdermal patch: 3.1 mg	Apply one patch at a minimum of 24 hours prior to the start of chemotherapy.
(b) (4)			

Product name with potential for confusion	Similarity to Proposed Proprietary Name	Dosage Form/Strength	Usual Dose (if applicable)
Sustol **(Granisetron)**	**NA**	**Injection: 10 mg/0.4 mL syringe**	**10 mg subcutaneously given 30 minutes before the start of single-day chemotherapy.** **May be given once every 7 days, and only on the day chemotherapy is given**
Sorbitol	Look	Irrigation solution: 3%, 3.3%, Solution (OTC): 70%	Volume of solution needed will vary with the nature and duration of the urologic procedure 5 mL to 60 mL
Drisdol (Ergocalciferol)	Look	Capsule: 50,000 IU	Vitamin D Resistant Rickets: 12,000 IU to 500,000 IU units daily Hypoparathyroidism: 50,000 to 200,000 IU units daily
Sudal 12 (Pseudoephedrine Hydrochloride/ Chlorpheniramine maleate)	Look and Sound	Tablet: 30 mg/4 mg	1-2 tablets every 12 hours
Sulfatol (Sulfacetamide Sodium/ Sulfur)	Look and Sound	Topical Suspension: 10 %/5 %	Apply a thin film to affected areas 1 to 3 times daily
Sectral (Acebutolol Hydrochloride)	Look and Sound	Capsule: 200 mg, 400 mg	Hypertension: Initial dose of 400 mg given as a single daily dose or twice daily Maintenance dose of 400 mg to 800 mg per day Ventricular Arrhythmia: 400 mg daily given as 200 mg twice a day Maintenance dose of 600 mg to 1200 mg per day
Surfak (Docusate Calcium)	Look	Capsule: 240 mg	One capsule by mouth daily for several days or until bowel movements are normal
Sular (Nisoldipine)	COPA	Tablet: 8.5 mg, 17 mg, (b) (4), 34 mg	17 mg to 34 mg once daily
(b) (4)			

Appendix I: Products with numerically similar strength, achievable dose or overlap in strength with multiple differentiating product characteristics

Product name with potential for confusion	Similarity to Product Name	Dosage Form/Strength	Usual Dose	Other Differentiating Product Characteristics
Sustol **(Granisetron)**		**Injection: 10 mg/0.4 mL syringe**	**10 mg subcutaneously given 30 minutes before the start of single-day chemotherapy.** **May be given once every 7 days, and only on the day chemotherapy is given**	
Sustiva (Efavirenz)	Look	Capsules: 50 mg, 200 mg Tablet: 600 mg	600 mg once daily, on an empty stomach If given with voriconazole, then dose is 300 mg once daily	**Dosage forms:** Injection vs. tablets/capsule **Frequency of administration:** Single dose 30 minutes before chemotherapy vs. Once daily **Route of administration:** Subcutaneously vs. Oral **Usual Dose:** 10 mg vs. 600 mg
Sustaire (Theophylline) Discontinued, generics available	Sound	Capsules: 100 mg, 125 mg, 200 mg, 250 mg, 300 mg Elixir: 80 mg/15 mL Tablets: 100 mg, 200 mg, 300 mg, 400 mg, 450 mg, 600 mg	400 mg to 1600 mg/day; Dose should be individualized on the basis of peak serum theophylline concentration measurements	**Dosage forms:** Injection vs. tablets/capsule/elixir **Frequency of administration:** Single dose 30 minutes before chemotherapy vs. Once daily **Route of administration:** Subcutaneously vs. Oral **Usual Dose:** 10 mg vs. 400 mg to 1600 mg
Stadol (Butorphanol Tartrate)	Look and Sound	Injection: 2 mg/mL Nasal Spray: 1 mg/mL	**Injection:** Treatment of Pain: 1 mg intravenously every 3 to 4 hours as needed; 2 mg intramuscularly every 3 to 4 hours as needed Preoperative Medication: 2 mg intramuscularly 60 to 90 minutes before surgery **Nasal Spray:** 1 spray in one nostril; may repeat in 60-90 minutes	**Frequency of administration:** Single dose 30 minutes before chemotherapy vs. every 3 to 4 hours as needed **Route of administration:** Subcutaneously vs. Intravenously/Intramuscularly/Intra-nasally **Usual Dose:** 10 mg vs.1 mg, 2 mg or 1 spray

Abstral*** (Fentanyl citrate)	Look	Orally Disintegrating Tablet: 100 mcg, 200 mcg, 300 mcg, 400 mcg, 600 mcg, 800 mcg	Starting dose: Dissolve 100 mcg , may repeat 100 mcg in 30 minutes if pain not resolved; must wait at least 2 hours before treating another episode of breakthrough pain	**Dosage forms:** Injection vs. tablets **Frequency of administration:** Single dose 30 minutes before chemotherapy vs. Every 2 hours as needed **Route of administration:** Subcutaneously vs. Sublingually (b) (4)
Sural (Ethambutol Hydrochloride)	Look	Tablets: 100 mg, 400 mg	Initial treatment: 15 mg/kg once every 24 hours Retreatment: 25 mg/kg once every 24 hours	**Dosage forms:** Injection vs. tablets **Frequency of administration:** Single dose 30 minutes before chemotherapy vs. Every 24 hours **Route of administration:** Subcutaneously vs. Orally **Usual Dose:** 10 mg vs.15 mg/kg or 25 mg/kg
Detrol (Tolterodine Tartrate)	COPA	Tablet: 1 mg, 2 mg	2 mg twice daily (1 mg twice daily for renal or hepatic impaired patients.	**Dosage forms:** Injection vs. tablets **Frequency of administration:** Single dose 30 minutes before chemotherapy vs. twice daily **Route of administration:** Subcutaneously vs. Orally **Usual Dose:** 10 mg vs. 2 mg
Sutent (Sunitinib Malate)	COPA	Capsules: 12.5 mg, 25 mg, 37.5 mg, 50 mg	50 mg once daily, on a schedule of 4 weeks on treatment followed by 2 weeks off; Dose increase or reduction of 12.5 mg increments is recommended based on individual safety and tolerability	**Dosage forms:** Injection vs.capsules **Frequency of administration:** Single dose 30 minutes before chemotherapy vs. once daily for 4 weeks; then off for 2 weeks **Route of administration:** Subcutaneously vs. Orally **Usual Dose:** 10 mg vs. 50 mg

Appendix J: Potential confusing name with strong orthographic and phonetic similarity or numerical overlap in strength or dose

Failure Mode: Name Confusion	Causes (could be multiple)	Rationale why medication errors are unlikely to occur in the usual practice setting
Sustol **(Granisetron)** **Injection:** **10 mg/0.4 mL syringe**		**10 mg subcutaneously given 30 minutes before the start of single-day chemotherapy.** **May be given once every 7 days, and only on the day chemotherapy is given**
(b) (4)		
Zestril (Lisinopril) Tablets: 2.5 mg, 5 mg, 10 mg, 20 mg, 30 mg, 40 mg, Hypertension: Initial dose of 10 mg: Usual dose range 20 mg to 40 mg per day administered in a single daily dose Heart Failure: 5 mg to 40 mg per day administered in a single daily dose	Orthographic similarity: Both share the middle letters 'st' and the ending letter 'l' Overlapping strength:10 mg Overlapping dose of 10 mg	Although Sustol and Zestril share an overlapping strength and dose, other differentiating product characteristics as well as orthographic differences in the name will help reduce the risk of medication errors. The product beginnings help to provide differentiation 'Su' vs. 'Ze'. Additionally, the products have differentiating characteristics such as route of administration (subcutaneously vs. oral), dosage form (injection vs. tablets), and frequency of administration (10 mg subcutaneously given 30 minutes before the start of single-day chemotherapy vs. once daily). Additionally, Zestril is available in multiple strengths and thus a strength must be specified; whereas, Sustol is available as a single strength and the strength may be omitted.

Application Type/Number	Submission Type/Number	Submitter Name	Product Name
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