Phonetic Orthographic Computer Analysis (POCA) System

Presented by
R. F. Shangraw, Jr., Ph.D.
Project Performance Corporation

Presented to
40th Annual Conference of the Drug Information Association
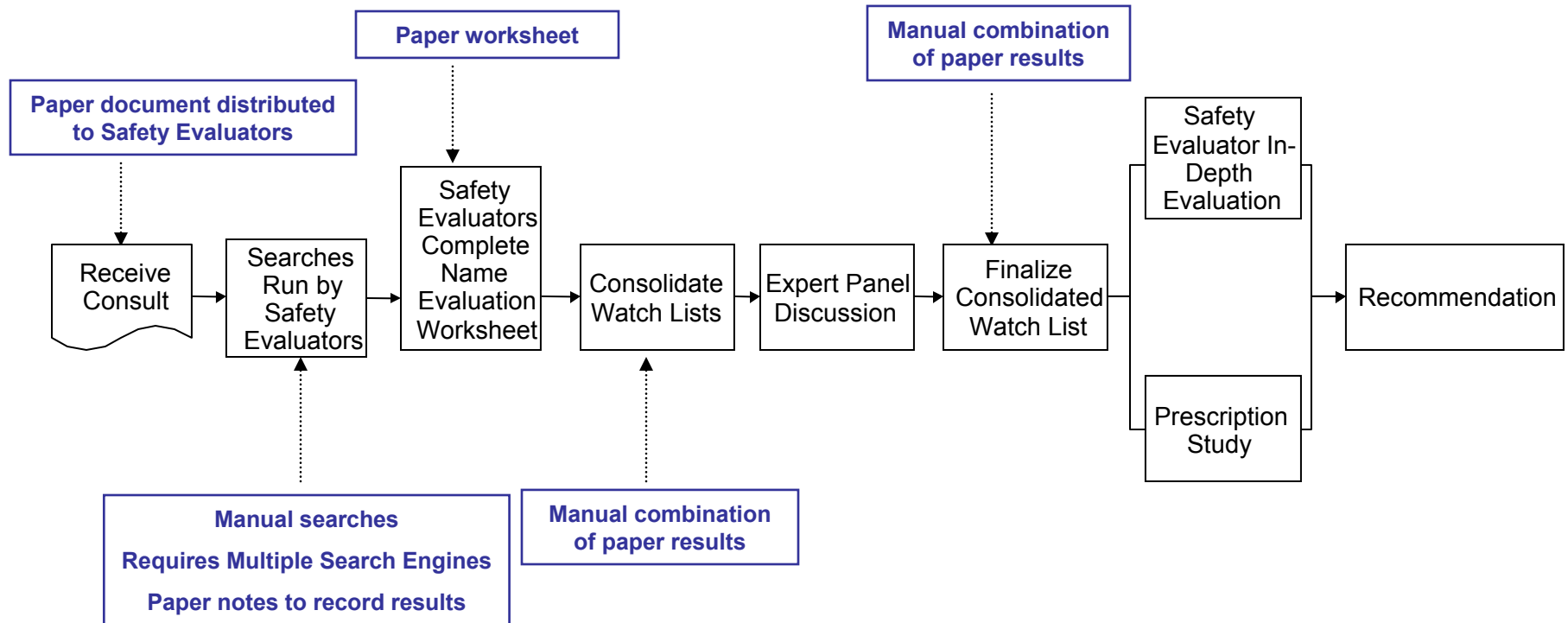Washington, D.C.
June 16, 2004

- Overall System Design

- The Medical Repository

- Algorithm Testing

- System Demonstration

www.ppc.com

simplifying the complex

- # Accessibility
  - – Web-based
  - – Varying levels of permission for varied tasks
  - – Ease of use

- # Efficient Use of Expert Time
  - – Decrease paper production
  - – Increase analysis time while decreasing search time

- # Scientifically-Based Analysis
  - – Reliability of Algorithms
  - – Predictive Validity of Algorithms
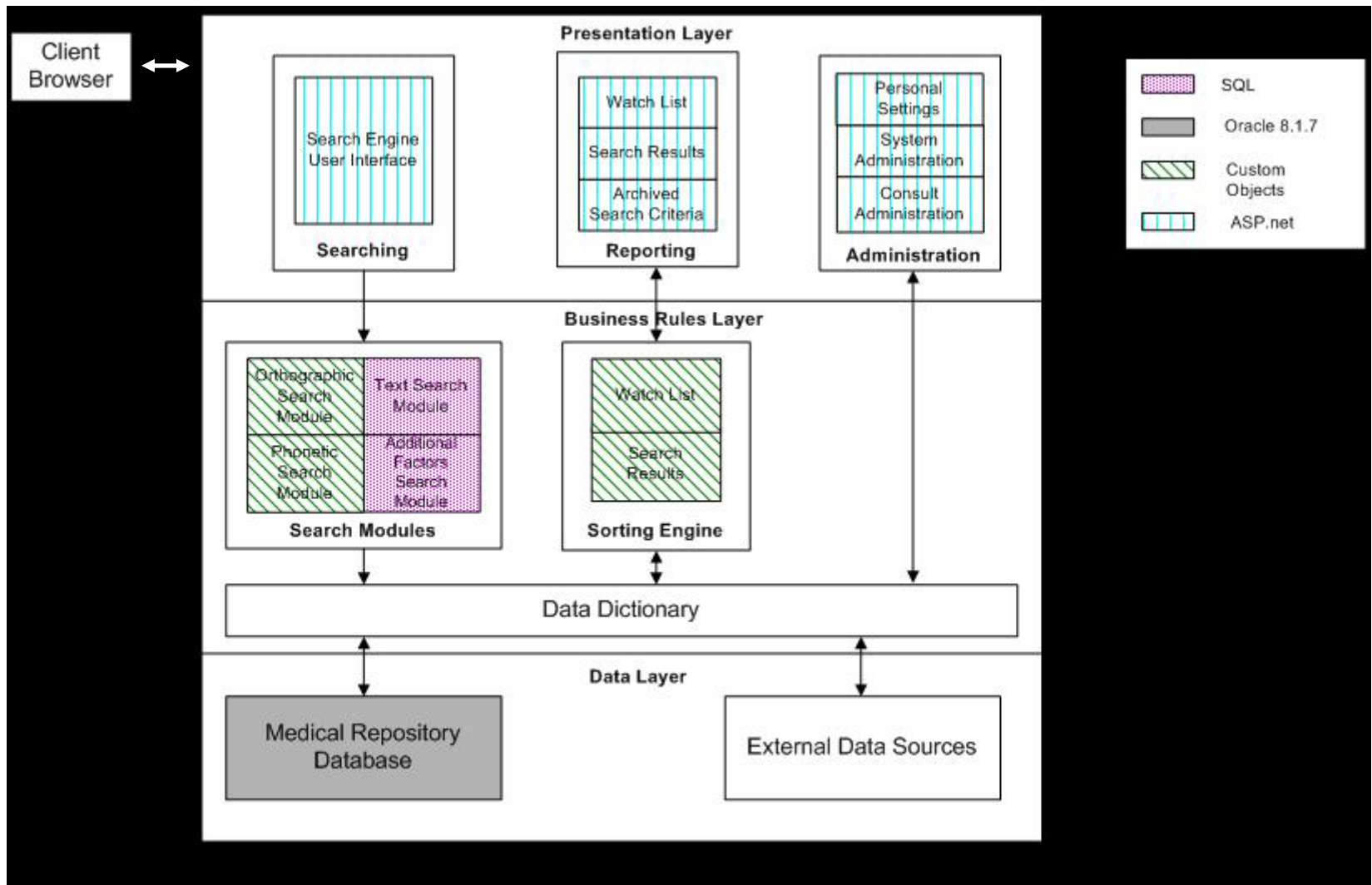
www.ppc.com

simplifying the complex

- Pilot System Development Funded by the U.S. Food and Drug Administration (FDA)
- Development Team
  - Project Performance Corporation
  - Bonnie Dorr, University of Maryland
  - Greg Kondrak, University of Alberta
- Pilot System Under Evaluation by FDA

Before Computer Analysis:

POCA System Architecture

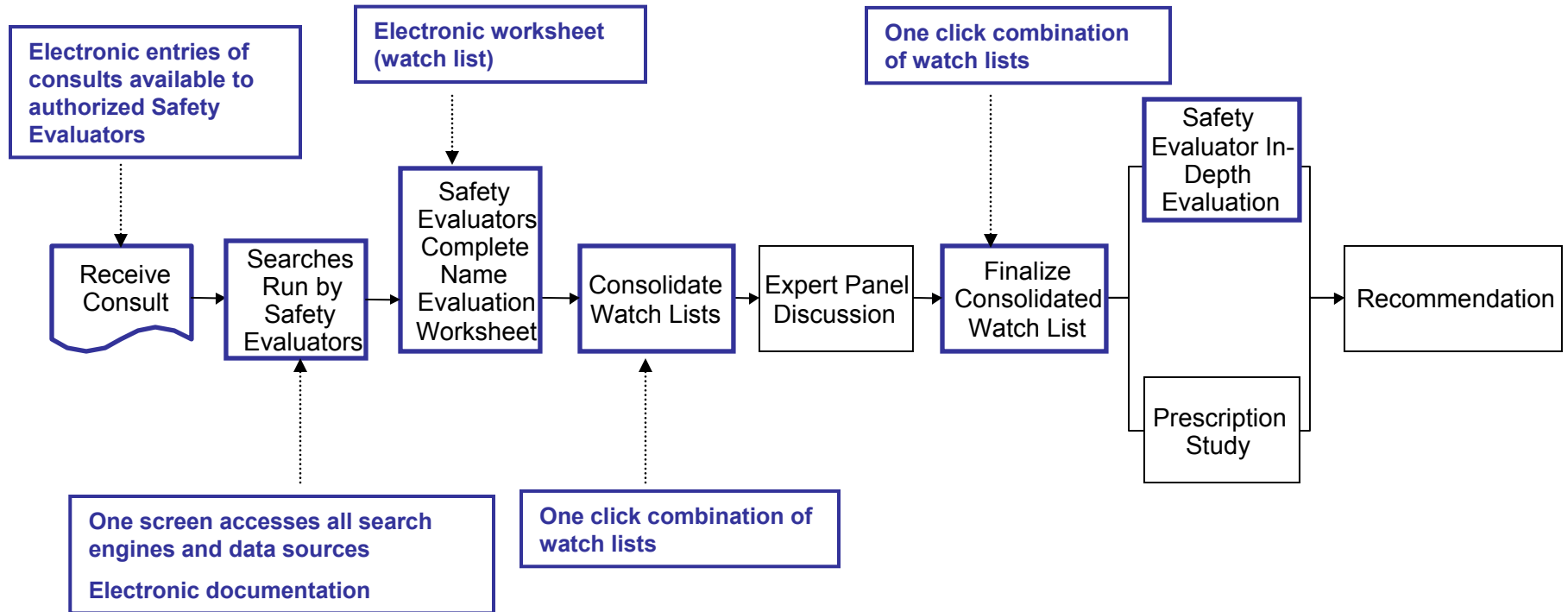

Client Browser

Presentation Layer

- Search Engine User Interface — **Searching**
- Watch List / Search Results / Archived Search Criteria — **Reporting**
- Personal Settings / System Administration / Consult Administration — **Administration**

Business Rules Layer

- Orthographic Search Module / Text Search Module / Phonetic Search Module / Additional Factors Search Module — **Search Modules**
- Watch List / Search Results — **Sorting Engine**

Data Dictionary

Data Layer

- Medical Repository Database
- External Data Sources

Legend:
- SQL
- Oracle 8.1.7
- Custom Objects
- ASP.net

With Computer Analysis:

Electronic entries of consults available to authorized Safety Evaluators

Electronic worksheet (watch list)

One click combination of watch lists

Receive Consult → Searches Run by Safety Evaluators → Safety Evaluators Complete Name Evaluation Worksheet → Consolidate Watch Lists → Expert Panel Discussion → Finalize Consolidated Watch List → Safety Evaluator In-Depth Evaluation / Prescription Study → Recommendation

One screen accesses all search engines and data sources

Electronic documentation

One click combination of watch lists

www.ppc.com

simplifying the complex

- Oracle Database
- Features
  - Populated with FDA Corporate Database
    - Approved and Unapproved Proprietary Names
    - Ability to Include Additional Factors Such As Drug Strengths, Dosing Intervals, Dosage Forms and Routes of Administration. Feature Not Yet Implemented.
  - Ability to Manually Update the Repository
  - Ability to Import Data with Database Tools
- Next Steps
  - Biologics
  - Supplements and Herbals
  - Medical Terminology

Recall and Precision

- Recall – The percentage of relevant names retrieved by the search

- Precision – The percentage of retrieved names relevant to the search

Recall – $\dfrac{A \bigcap B}{A}$

Precision – $\dfrac{A \bigcap B}{B}$

A = Gold Standard

B = Retrieved Names
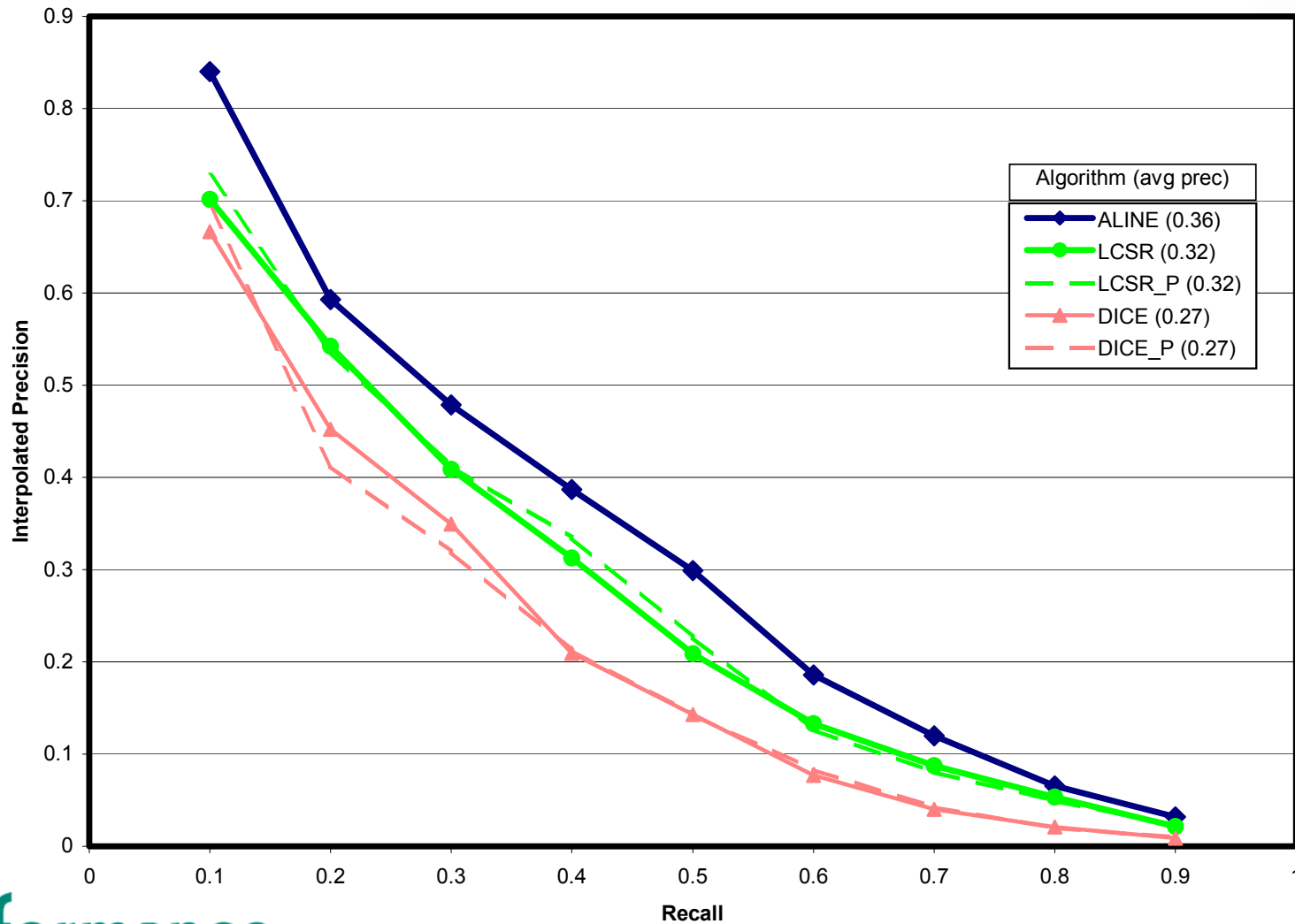
- <u>FDA Requirement</u>: Empirical comparisons of the system's ability to identify at least 75% of the potentially confusing names that have been identified by all the FDA safety evaluators during the 100 most recently completed reviews.

- <u>Project Outcome</u>: The pilot system identified 92.5% of the names identified by the FDA safety evaluators during the 100 most recently completed reviews.

www.ppc.com

simplifying the complex

FDA Automated Method of
Minimizing Medication Errors Due to
Similar Proprietary and Established Names

User ID:

Password:

Login

Reset Password | Change Password | Request Account

Disclaimer
This is a Federal computer system and is the property of the United States Government. It is for authorized use only. Users (authorized or unauthorized) have no explicit or implicit expectation of privacy.

Any or all use of this system and all files on this system may be intercepted, monitored, recorded, copied, audited, inspected, and disclosed to authorized site, Food and Drug Administration, and law enforcement personnel, as well as authorized officials of other agencies, both domestic and foreign. By using this system, the user consents to such interception, monitoring, recording, copying, auditing, inspection, and disclosure at the discretion of authorized site or Food and Drug Administration personnel.

Unauthorized or improper use of this system may result in administrative disciplinary action and civil and criminal penalties. By continuing to use this system you indicate your awareness of and consent to these terms and conditions of use. LOG OUT IMMEDIATELY if you do not agree to the conditions stated in this warning.

FDA

Search Database

Retrieve Archived Search

Quick Search

Search Text: Claritin

Search Type: ☑ Orthographic
                ☑ Phonetic
                ☐ Text*
                * % For wildcard searching
                _ For single character searching

                (Reset)   (Submit)

Switch to advanced search view

File   Edit   View   Favorites   Tools   Help

FDA

New Search

Search Results
Search Term: *Claritin*

[Add to Watch List]

Orthographic & Phonetic Matches greater then 65%

☐	Name of Concern	Match Percentage ▼
☐	CLARITIN	100
☐	CLARITIN-D	87
☐		74
☐		72
☐		71
☐		70
☐		68
☐		68
☐		68
☐		68
☐		67
☐		66
☐		66

Phonetic Matches greater then 65%

☐	Name of Concern	Match Percentage ▼
☐	CLARITIN	100

Done   🌐 Internet

		67
☐		66
☐		66

Phonetic Matches greater then 65%

☐	Name of Concern	Match Percentage ▾
☐	CLARITIN	100
☐	CLARITIN-D	85
☐		78
☐		74
☐		72
☐		71
☐		69
☐		69
☐		69
☐		69
☐		68
☐		68
☐		67
☐		67
☐		67
		Page 1 [2]

Orthographic Matches greater then 65%

☐	Name of Concern	Match Percentage ▾
☐	CLARITIN	100
☐	CLARITIN-D	89
☐		

File   Edit   View   Favorites   Tools   Help

FDA

New Search

Search Results
Search Term: *Claritin*

[Add to Watch List]

Orthographic & Phonetic Matches greater then 65%

☐	**Name of Concern**	**Match Percentage** ▼
☐	CLARITIN	100
☐	CLARITIN-D	87
☐		74
☐		72
☐		71
☐		70
☐		68
☐		68
☐		68
☐		68
☐		67
☐		66
☐		66

Phonetic Matches greater then 65%

■	**Name of Concern**	**Match Percentage** ▼
☐	CLARITIN	100

Product Details For CLARITIN - Microsoft Internet Explorer

Product Details for CLARITIN

Dosage Form:	
Drug Strength:	1MG/1ML
Route of Administration:	ORAL
Active Ingredient:	LORATADINE
Drug Strength:	10MG
Dosage Form:	TABLET

Done   Internet

File   Edit   View   Favorites   Tools   Help

FDA

Enter your search critieria to find an archived search.

Username:

Start Date:

End Date:

Search Module:

Search Term:

Search

Done   Internet