



ASHP DDI Software Survey

Executive Summary

Background and Rationale

In 1990, the Omnibus Budget Reconciliation Act (OBRA'90) required that pharmacists, in support of state Medicaid patients, perform a prospective drug use review (DUR), provide patient counseling, and maintain the patient's medication record. In response to these requirements, DUR software applications were integrated into pharmacy computer systems to provide a mechanism to perform and document prospective DUR in conjunction with every prescription processed in inpatient and outpatient pharmacy settings. Use of DUR software has led to significant improvements in patient care, including improved accessibility to, and currency of, evidence-based drug information. However, clinicians have voiced concern about the development and use of some aspects of these programs, particularly software used to identify and manage potential drug-drug interactions (DDI).

During their 2008 meeting, the ASHP Council on Therapeutics (COT) voted to establish, in conjunction with the ASHP Section of Pharmacy Informatics and Technology, a multidisciplinary group or meeting that includes representatives of professional associations, drug information publishers, and software companies to develop consistent standards for the development and inclusion of drug interaction information in clinical decision-support systems. Members of the Council and the Section Advisory Group (SAG) on Ambulatory Care Informatics conducted a member survey to assess process, benefits, and barriers to the use of DDI software with the goal of identifying areas for improvement. The SAG and COT work group will develop a commentary for the *American Journal of Health-System Pharmacists (AJHP)* with recommendations covering standardization, functionality, and best practices.

Methodology

- The survey was administered via the online survey instrument, Qualtrics (www.qualtrics.com).
- The survey invitation was sent via e-mail to 16, 574 pharmacists identified as members of the ASHP Section of Clinical Specialists and Scientists, ASHP Section of Pharmacy Managers, or the ASHP Section of Pharmacy Informatics and Technology. All types and sizes of hospitals in the United States were included in the sample.
- The survey was launched October 6, 2009 and closed November 9, 2009. (One e-mail reminder was sent to nonresponders).
- A total of 1,745 pharmacists responded to the survey, yielding a response rate of 11 %.
- The margin of error is $\pm 2\%$ at 95% confidence interval (higher when data is disaggregated).

Key Findings

- Alert fatigue was identified as a common problem with current DDI software programs. 51 % of survey respondents strongly believed that there are too many insignificant alerts, which have the potential to cause clinicians to override or ignore alerts. Only 18 % of respondents stated that the alerts provided were extremely clinically significant. However, only 14% of respondents believed it was difficult to override alerts for potentially lethal drug combinations.
- Perceived accuracy of the severity classification was identified as the greatest concern with respondents' current DDI software. Sixty-two percent of respondents believed that many alerts are classified too severely, while 36 % believed some alerts are inappropriate classified as less severe or not significant.
- Other limitations of current DDI software included inability to customize alerts (39 %), poor quality of information provided (37 %), and inability to limit who receives alerts (15 %).
- Nearly half (48 %) of respondents reported that non-pharmacist health care professionals, such as physicians and physician extenders, do not receive electronic DDI alerts; 20 % of respondents stated that their facility had turned off some alerts for physicians.
- 63 % of respondents reported that nursing staff are not alerted to DDIs during the medication administration process.
- 42 % of respondents indicated that their DDI software has a process for modifying alerts; 23 % reported that their DDI system does not have this capability, and 35% of respondents were uncertain if the software could be modified.
- 25 % of respondents reported that their practice site had changed the pre-programmed severity level for some DDI alerts.
- 69 % of respondents stated that their DDI system does not have hard stops—a mechanism that prevents users from entering orders or proceeding when a DDI is likely to cause patient harm.
- When asked if the information provided with a DDI alert was adequate to support making a clinical decision, 44 % responded that the amount of information was adequate, whereas 30 % rated this information as less than adequate (combined rating of 1 or 2 on a scale of 1 to 5, with 1 being not enough information and 5 being too much information).
- Only 40 % of respondents' DDI software programs allow users to create alerts for non-formulary drugs. Non-formulary drugs may not be included as part of the information system's drug database.
- 37 % of facilities have a continuous quality improvement or quality assurance process to assess drug interaction alerts that are frequently overridden. 43 % of facilities do not have a formal process for this review; 20 % of respondents were uncertain if such a process exists at their practice site.
- 80 % of facilities do not provide formal education to pharmacists or other clinicians on how to evaluate and respond to DDI alerts.

Additional Findings

- Limitations in the evidence base used to develop DDI software was identified as a significant contributor to problems with DDI severity classification, including variation among ratings provided by different software for the same interaction.
- Almost half of the respondents (43 %) indicated that their DDI software continues to provide alerts for therapies that have been discontinued or changed to inactive. The time frame for delivery of these alerts varied significantly from several half lives of an interacting drug to several days after the drug had been discontinued. The optimal time frame for continuing alerts is often unclear and not documented in the literature. Many respondents indicated that they were uncertain of the time frame for which these alerts continue following drug discontinuation.
- Continuous quality improvement processes were generally performed by the clinical staff, medication safety officers, chief medical information officers, or a medication management team. The frequency of this assessment varied from daily to annually. The majority of survey respondents reported that information from these assessments and recommendations to change or eliminate alerts are approved by the Pharmacy & Therapeutics Committee.
- Respondents noted unique situations in which DDI software fails to detect DDI, including for drugs given via nasogastric tube and when the drug's NDC number is not current in the IT system.

Recommendations for Improvement

Survey participants were asked to identify the most important issue that ASHP and other stakeholders should focus on in order to improve DDI software. The most common responses are reported below.



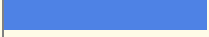


- Standardizing alerts, including severity classification and clinical significance (230 responses)
- Addressing alert fatigue and insignificant alerts (114 responses)
- Enhancing the quality of information provided with alerts, including providing recommendations for monitoring or alternative therapies (81 responses)
- Improving DDI software user interface and programming, including presentation of alerts, documentation of overrides, improved hard stops, and timeliness of updates (70 responses)
- Improving the ability to customize the software (58 responses)
- Developing best practices for managing potential DDI (including implementation and use of DDI software) and providing education (47 responses)

ASHP gratefully acknowledges Jesse Huxtable, Pharm.D. for her assistance in developing and analyzing the survey and writing the executive summary.

DDI Survey Results

Last Modified: 02/24/2010

1. Which of the following technologies are used at your practice setting or provided by your company? (please check all that apply)

Answer		Response	%
Pharmacy Information System - computerized pharmacy order management system that allows pharmacist to electronically enter or edit medication orders		1,391	86%
Electronic Health Record (EHR) - electronic record of patient health information, including: patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports		1,024	63%
Computerized Provider Order Entry (CPOE) - an application that allows prescribers to use a computer to directly enter medical orders electronically in inpatient and ambulatory settings		690	43%
Electronic Prescribing (e-prescribing) - prescribers can electronically send an accurate prescription directly to the pharmacy from the point-of-care		431	27%
Not applicable		75	5%

Statistic	Value
Min Value	1
Max Value	5
Total Responses	1,621

2. Does your drug interaction program alert other health care professionals (i.e., physicians/physician extenders)?

Answer	Response	%
Yes	686	42%
No	779	48%
Unsure	156	10%
Total	1,621	100%

3. Do you feel that there are there too many alerts for drug-drug interactions (DDI) in your electronic system?

Question	Not Enough Alerts1	2	3	4	Too Many Alerts5	Responses
	3%	5%	27%	37%	27%	1,626

4. Please rate your level of agreement with the following statement?

Question	Strongly Disagree 1	2	3	4	Strongly Agree 5	Responses
There are too many insignificant alerts causing overriding or ignoring of alerts.	1%	9%	4%	34%	51%	978
Alert fatigue is a phenomenon that describes our drug-drug interaction system alerts.	1%	9%	8%	37%	45%	973

5. On average, how would you rate the clinical importance of the DDI alerts in your electronic system?

Question	Not Very Important 1	2	3	4	Extremely Important 5	Responses
	2%	15%	33%	32%	18%	1,491

6. When a DDI alert is presented, do you feel that the amount of information provided is adequate to make a reasonable clinical decision?

Question	Not Enough Information 1	2	3	4	Too Much Information 5	Responses
	8%	22%	44%	23%	3%	1,495

7. How often do you consult additional resources (e.g., Hansten and Horn's Manual of Adverse Drug Interactions) to resolve a DDI alert?

Question	Never 1	2	3	4	Frequently 5	Responses
	9%	27%	25%	25%	13%	1,496

8. Are the alerts that are generated by your DDI software regularly reviewed?

Answer	Response	%
Yes	412	27%
No	452	30%
Unsure	644	43%
Total	1,508	100%

9. Does your institution have a method for Continuous Quality Improvement (CQI) or Quality Assurance (QA) for drug interactions that are frequently ignored or overridden?

Answer	Response	%
Yes	153	37%
No	175	43%
Unsure	83	20%
Total	411	100%

10. Please describe your institutions CQI process for drug interactions that are ignored or overridden.

Text Response

We have systematically reviewed high level alerts that were ignored to determine if they are legitimate or should be downgraded.

Monthly report generated listing all DDIs that are overridden. Report reviewed by pharmacy; data & recommendations presented to P&T for action.

Override report reviewed

Our system monitors frequency of alerts to identify "problems." Those are reviewed by our system pharmacy directors regularly. We also have an end user feedback mechanism that assists in identifying additions. For new formulary items, we review the data provided by our vendor prior to activating the alerts.

Clinical pharmacy specialist provides monthly report from our automated intervention reporting software.

Generate a report delineating the over-ride reasons

Reviewed at multidisciplinary team meeting and also at CPOE physician meeting. Recommendations on changing or eliminating the alert are brought to P&T for final approval.

Ongoing process: DDI alerts are limited to severe interactions (i.e., life-threatening) in which the verifying pharmacist will contact the prescriber. If the alert should not have been overridden, a prevented medication error is entered. Currently conducting a comprehensive evaluation of this process.

Evaluate biannually and reevaluate the severity of the alert and decide if it should be a filtered alert.

They are reviewed in report

We just started this process with our new system. A pharmacy advisory group will quarterly review the overrides

Clinical pharmacist and physician on the committee review the alerts

Documentation in the profile is performed.

Clinical staff review the previous day's overridden interactions on a daily basis and alert physicians if changes are needed.

The clinical pharmacist who is responsible for reviewing this data will talk with all pharmacy team members involved in the situation. She then takes the information to our pharmacy quality team and we decide how to move forward to prevent the same situation again.

Currently DIs are not part of our CQI process

Reviewed by Pharmacy Clinical Council for relevance and may result in a different alert being presented to end user if relevance is high enough to make that necessary.

We are supposed to read all interactions that are flagged by our pharmacy computer system, but when we get busy, we don't read all the interactions.

A computerized report is generated from the system and reviewed at the local P & T level with summary reports being forwarded to the central office P & T. Outcomes are used to develop continuing

education interventions to elevate the standard of practice within our 18 facilities. We also use the CE outcomes with the system to track overall change in practice.

A medication safety committee reviews and makes recommendations for change.

Evaluate the usefulness of that alert.

Interactions with amiodarone when amiodarone is profiled as a prn to be as a prn to be started for V-tach.

Monitor overrides to see if there are specific users always overriding and counsel those users

Formal Alert Review Process. Clinicians are encouraged to suggest alerts be modified. Requests for alert changes are reviewed by Medication Safety Officer, Chief Medical Information Officer, and other staff when applicable (e.g., nursing, laboratory etc.). Modifications in alerts are implemented based on patient safety implications and benefit/risk assessment. Alert modifications that involve medications are reviewed by the Pharmacy and Therapeutics Committee, and the alert modification decision is reconsidered if any concerns are identified.

Pharmacy administration reviews reasons for override on a monthly basis. Since I am not directly involved, I cannot describe the exact process.

Data collected and reviewed by pharmacy IS with pharmacists.

Group meets monthly to review top drugs and then make recommendations to P&T and/or medication safety committees

The VA categorizes only 2 levels of alert, critical and severe. For Critical alerts the monitor is concurrent. An override reason must be given or the alert cannot be overridden. If the physician overrides a critical interaction the pharmacy will call if the reason is not valid. Reports of overridden alerts are done monthly. For Severe interactions there is no override function since the level of evidence is less and the judgment is the providers.

Stats reviewed by P&T subcommittee and modifications recommended to P&T for system changes.

No overridden

Interactions that are ignored/overridden are routinely reviewed by the clinical staff for pharmacist feedback or reassessment to inactivate

It is a reactive system, if a DDI is reported, it is investigated.

Staff education and reminders

Data generated off reporting is analyzed for white noise, and we strive to increase the percentage of times that an action is taken as a function of the total number of alerts fired. Feedback is solicited and acted upon after discussion of clinical significance versus amount of white noise generated.

Alert override reports are reviewed by a pharmacist (ME); we look for ways to emphasize the most important report and remove insignificant alerts

Significant overrides are listed each week and evaluated with the pharmacist doing the override. Patterns are trended

Examine list of overrides monthly to identify those that may need customization

Assist our customers in evaluating to optimize alerts (vendor)

Reports are reviewed and action taken.

The incidence of specific DDIs is evaluated; there is an established process to demote and promote DDIs among different alerting levels.

Regular reports are generated and reviewed on a yearly basis

DUR saved, notes by pharmacist and doctor contacts, and if interaction overridden, or if medicine changed. all info electronically attached to Rx.

Recently, a DDI regarding olanzapine and lorazepam was brought to the attention of our pharmacy clinical manager. Our system does not have a means to differentiate between oral and IM olanzapine, so the alert was being triggered all too frequently. This was brought before P&T to adjust the alert settings.

tracking in DDIs, alerted person. action taken. analyzed to determine if DDI should be presented to clinician, suppressed, or if education is needed

We use a third party vendor, [vendor name redacted] to track and document pharmacist interventions. This includes actions taken on drug/drug interactions.

Issues are randomly brought up to the system Info Systems pharmacists. Subsequently, the issues are brought up to a regularly scheduled meeting of clinical pharmacists (in the health system)

Pharmacist must state what they did with the DDI notice and their [response] can be tracked.

We review the interventions monthly that are not accepted by the providers. If they are associated with patient harm they get reported to the respective departments (Medicine, Surg, OB, etc.)

Pharmacy manager reviews the report and discusses concerns with the pharmacist or technician involved.

A report is generated monthly of all the DDI that are acknowledged and overridden and reviewed by the Chief Medical Informatics Officer and Medication Management committee for Informatics.

Selected review of interactions which have proved problematic....by clinical educator. Attempts to have number of alerts reduced have been unsuccessful as software company is unresponsive

The report is generated and queued to the Clinical Coordinator and the Quality Systems reviewer and they report to the clinical practice committee and the PBM which two prong contacts to specific prescribers who may be bypassing the system or areas where the DDI is oversensitive

Duplicate Therapy. Refill Too Soon.

COLLATION OF TYPES OF DDI WARNINGS THAT ARE OVERLOOKED; TRENDS REPORTED TO QUALITY DEPARTMENT AND TO P&T FOR REVIEW AND POSSIBLE ACTIONS.

After alert overrides are reviewed/audited either further education or a DUE is done to resolve the issue.

Regularly review and change severity if interaction not necessary.

We submit them to an electronic database, where they are logged electronically for us.

FMLA

Report can be generated of overrides. Clinical pharmacist will review

Monitoring of override reports and reasons provided for overrides for further investigation and/or modifications.

It will capture the users' initials and record.

Clinical staff reviews

This will happen if there is a problem or an ADE associated with an overridden alert.

We review the most frequently firing alerts to determine if the level of severity is warranted. Based on a

thorough review, we take the changes to our system P&T for approval.

None

Monitored on a daily basis

QI team of pharmacists that do daily reviews and educate/alert when needed.

We review and then decide if the alert makes sense. If it does not, we deactivate it.

Before 2009 we had a manual ADR reporting form which usually was a problem for healthcare professionals to report major DDIs to pharmacy but, because of a quality improvement project, we converted the manual form to an online form that can be accessed easily and therefore actual data is collected and preventive strategies have been made especially regarding the updating of DDIs that are life threatening

There is a multi-disciplinary committee that reviews frequent alerts for appropriateness.

They are reviewed quarterly and presented to P&T. Committee decides to keep or remove alert from CPOE system.

Pharmacy staff meetings are used to discuss this. We have a staff member that is also in the Health Information section and works on the programs. Problems that come up are handled by him. Either adding or deleting information.

We generate a report monthly that is reviewed by the pharmacy manager at each institution. The override is reviewed with the pharmacist to determine if it was appropriate and steps are taken for discipline at that point if the override was not appropriate.

The software pharmacist collates requests every month, brings them to P&T and advises regarding removal of the warning.

Overrides populate an analytics tool in near real time. The tool facilitates granular examination of override data in minutes.

Discussed monthly at Medication Safety Meeting.

Our Pharm IS group reviews these on a monthly basis

If the interaction is determined to be minor or not clinically significant a pop-up box is put in place for a override

INSUFFICIENT INFORMATION TO ANSWER

Verbal authorizations via prescriber after discussion.

Not involved in the CQI process but I know home office clinical pharmacists are assigned to review and update and our system can measure when certain edits are overridden

Quarterly review of overrides to determine trending and opportunities for change.

Our IS pharmacist can monitor the overrides, and we can suppress "noisy interactions" that are not clinically significant.

pdma

Report printed. Persons involved counseled. DDI corrected

Limited

Reviewed as root-cause-analysis & other mechanisms

Output from the system is generated and analyzed. That information is presented to P&T with recommendations.

Reports
Unsure
Decision Support Subcommittee reviews numbers & types of alerts overridden.
Disasters result in punitive actions, reality is ignored, the software is a laughable dysfunctional mess and it is only a matter of time before a patient suffers serious harm.
Monthly report generated for DDI that are overridden and EMR team pharmacist reviews to make recommendations of configuration changes to overridden alerts.
Random review, attention brought to pharmacist
REPORT IS GENERATED, REVIEWED BY DIRECTOR, DISCUSSED AMONGST STAFF, PRESENTED PERIODICALLY AT P & T COMMITTEE
A medication use evaluation and adverse drug reactions are reviewed and discussed by the Director of Drug Information and MUE/ADR directors. Issues are then discussed with Hospital Administration.
They are evaluated for appropriateness and assessed for severity. Then a determination [is made as to] whether they should fire in the future or not.
We have a medication safety committee that reviews these and reports the results up to corporate. The managers provide feedback to the individuals that make mistakes.
Clinical review committee composed of various professionals with ongoing review of system information.
I know of none

Statistic	Value
Total Responses	100

11. Does your system assign a severity class to DDI identified?

Answer	Response	%
Yes	1,220	81%
No	159	11%
Unsure	118	8%
Total	1,497	100%

12. Does your drug interaction program stratify DDI based on significance?

Answer	Response	%
Yes	892	74%
No	139	12%
Unsure	171	14%
Total	1,202	100%



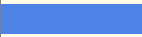

13. Is there a method to modify alerts generated by your DDI software?

Answer	Response	%
Yes	617	42%
No	347	23%
Unsure	513	35%
Total	1,477	100%

14. Does your DDI system detect interactions with therapy that has been discontinued or is inactive?

Answer	Response	%
Yes	637	43%
No	568	38%
Unsure	282	19%
Total	1,487	100%

15. Once a medication has been discontinued or is inactive, how long does your electronic system continue to monitor for interactions with current therapy?

Answer		Response	%
Less than 24 hours		106	17%
Greater than 24 hours		203	33%
It varies based on the discontinued or inactive medication; The system continues to screen for a pre-determined time period that is specific to the medication.		187	30%
Other (please specify)		123	20%
Total		619	100%

Other (please specify)
Do not know
24 hours
2 half-lives
Not sure
We can specify this
Not sure
Never noticed
Unsure
24 hours
Unknown
Unsure
24 hour hours or we set up rules for some meds for R.Ph. to check inactive profile
Unsure
Unsure
I'm not sure
Unsure
Unsure
I don't know.
It varies, but I'm not sure if it varies in the exact way described above
Unknown
7 days
Unsure [of] timeframe
If the medication is not discontinued specifically it continues to include it during the screening
Don't know
24 hours
Customized setting of 24 hours
System reset at 0300 hrs, so varies with the time the med is DC'd
24 hr
All active medications - inpatient and outpatient - are evaluated by our DDI software, which can be time consuming. When a patient was on a host of medications as an outpatient that have been discontinued while inpatient, the software evaluates the outpatient medications that are still technically active for outpatient use.
Don't know
3 months
User defined
Not sure

Not sure
Unknown
Several months - up to 18
Not sure
As long as the inactive medication is left in the patient's record
Unsure
Unsure of parameters
Depends on formulary service vendor like [vendor name redacted]
The parameter can be turned off and on and the time frame can be controlled by the setting in the software.
2 half-lives
Unsure
Until medication is deleted from the system
Setting is determined at local level but must be ≥ 24 hours
Unsure
Not sure
Depends on the drug
As long as the drug is in the patient profile.
Unsure
Not sure
?
Unsure
It continues forever
Our system allows the time frame to be set by the hospital (in days). Currently we have it set to 1 day.
90 days
Not sure
Monitors DDI with outpatient meds (which may or may not be current) - not d/c'd inpatient meds
72 hrs
Allows global setting based on hours; does not currently allow for variation by drug; known issue, deficiency with system
Outpatient, 1 year; inpatient, 30 days
Exactly 24 hrs or indefinitely for home meds
Customizable
Unsure
Unknown
Ours currently screens against the "home med" list, which is not clinically significant in an inpatient setting

Not sure
Unsure
Unsure
Not really sure
24 hours for DC, unlimited for inactive/home meds during hospitalization
Don't know
Seems to be the third option, but I am not certain
24 hrs
Don't know
Unsure
Unsure
Unsure
Administrator can set the length of time to check
Based on half-life values
Set by system 1 or more days
It does not monitor for discontinued inpatient meds, but it monitors against the home med profile indefinitely.
Not sure
Not sure how it is set
If it is listed as an active home med it continues to screen even if not ordered as an inpatient.
Don't know
Unsure
48 hours
We can specify. We currently have it set to only review active medications.
Unknown
Unsure
Unsure
Unsure
Unsure, but not forever
Unsure
Unsure
Unsure
Unsure
Unsure
Not sure
Unknown

16. Please rate your level of agreement with the following statement.

Question	Strongly Disagree 1	2	3	4	Strongly Agree 5	Responses
"It is difficult to override alerts for potentially lethal drug combinations."	36%	29%	20%	9%	5%	1,459

17. Does your DDI system have “hard stops” that is, a stop that prevents users from entering orders or proceeding for known DDI combinations that are highly likely to cause harm to the patient?

Answer	Response	%
Yes	249	17%
No	1,023	69%
Unsure	207	14%
Total	1,479	100%

18. Does your DDI system require that you enter a reason for an override?

Answer	Response	%
Yes	183	74%
No	65	26%
Total	248	100%

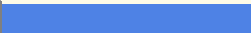



19. Is the response (the reason for the override) a:

Answer	Response	%
Drop-down list	54	30%
Free text entry	31	17%
Both, a drop-down list and a free text entry	93	52%
Other (please specify)	1	1%
Total	179	100%

Other (please specify)

pneumonic list

20. What action must occur to proceed?

Answer		Response	%
Pharmacist and/or physician review		126	53%
Pharmacist and/or physician documentation		46	19%
Both, pharmacist and/or physician review and documentation		56	23%
Other (please specify)		12	5%
Total		240	100%

Other (please specify)

Pharmacist notification to MD for him/her to review for continuation of order

R.Ph. review with notification of RN or physician

Pharmacist judgment with/or without physician contact

Tailorable on our system; could block action or allow with comment or allow with no interaction between ordering provider and system

Significant interactions require Clinical Intervention electronic entry

Depends on alert level

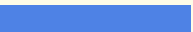


Nothing

Nothing

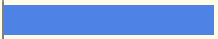

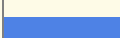



Pharmacist review

Level 1 can't be overridden; level 2 may be overridden by prescriber without review

21. Does your DDI system create alerts for non-formulary medications?

Answer		Response	%
Yes		572	40%
No		650	46%
Unsure		201	14%
Total		1,423	100%

22. Which of the following customization processes have you employed in your DDI software? (please check all that apply)

Answer		Response	%
Turn off some of the alerts		602	44%
Turn off some of the alerts for physicians while leaving them on for pharmacists		269	20%
Changed the severity level of some alerts after reviewing them		339	25%
Used a resource, other than the software vendor, to customize the alerts		196	14%
Unsure		534	39%
Other		80	6%

Other
No customization
Added policies to require additional health practitioner review
Only see severe alerts
Turn off profiles requiring mandatory view
Have not done so
Can only stratify by severity, if customize anything, the upkeep is astronomical
None
Severity code is all or none
I don't turn anything off, I do however disregard some of the "junk" that surfaces which everyone knows about and is minor in nature
We are trying to get more information from [vendor name redacted] to evaluate the DDI alerts we get
N/A
Modified after Central Office Pharmacy & Therapeutics Committee review.
Nothing
Can't customize
None
VA does its own evidence-based customization
Nothing
We have always documented
System has no alerts
No customization
Reset significance level for alters
Create redundant processes for most critical alerts
Not able to intervene in the system
Use software vendor to customize alerts
System won't allow for customization
None
Individualize
None
Hopefully being reviewed and refined.
Used pop-ups for some information
None
May be others I don't know about
This is controlled corporately, which continues to ignore pharmacist requests
Overrides

Pharmacist discrepancy
Select level of severity to alert (only available on Rx system)
Create ingredient alerts such as enoxaparin + bupivacaine
FYI: We do not have CPOE yet
Turn off hard stop (all or none)
Nothing
None
No access
Using the severity level to determine what alerts to display and require reason for the override to be entered.
Cannot change
Indicated that for some classes of meds not to fire for duplicate therapy (i.e., laxatives, stool softeners, etc.)
Very little customization allowed
"In-house"
None of these
Not modifiable
None
[Drug information publisher name redacted]
Alerts are hardcoded, cannot change
No customization
We have had to choose to shut off needed alerts to turn off those we did not need.
None
NONE
We can't customize
Our IS Team builds/customizes many drug alerts in our pharmacist order entry system
Unsure of others
CREATED ALERTS
[Turn] off for RNs
Cannot turn off specific alerts. If we turn off alert for a drug, all alerts associated with that drug are turned off
Set level of alert
Unsure
Change the presentation of the alert
Turned off all alerts in EMR and left them turned on in the pharmacy system which is separate from the EMR
No one responsible & capable

Only display severe alerts, not intermediate

Expert panel reviews multiple sources and creates list of DDI for enterprise

CUSTOMIZED OUR PROCESS REGARDING THE ALERT, NOT THE SOFTWARE

Further customization not possible since function controlled by large sister hospital where it is not a priority

None

Reporting to the programming company

Statistic	Value
Min Value	1
Max Value	6
Total Responses	1,366

23. Are nurses electronically alerted to DDI during the medication administration process?

Answer	Response	%
Yes	219	15%
No	910	63%
Unsure	313	22%
Total	1,442	100%

24. Does your institution have a formal education program for any of the health care professionals (including pharmacists) on how to evaluate and respond to a drug interaction?

Answer	Response	%
Yes	125	9%
No	1,145	80%
Unsure	165	11%
Total	1,435	100%

25. Please provide your opinion to the following question.

Question	Impossible 1	2	3	4	Highly Possible 5	Responses
Do you think it is possible to get different software vendors to agree on a standard database for DDI?	9%	32%	33%	20%	7%	1,434

26. Which of the following do you consider to be the greatest problems or concerns with your current DDI software? (please check all that apply)

Answer	Response	%
Too many alerts that you consider to be classified "too severely"	863	62%
Poor quality of information on DDI that is presented	522	37%
Inability to customize alerts	547	39%
Inability to limit who receives alerts (i.e., pharmacist, physician, some subset of physicians)	204	15%
Too many alerts that you consider to be classified "too lightly"	506	36%
Other (please specify)	142	10%

Other (please specify)

I really cannot comment

The ease of "blowing" past a severe alert

Same system alert shows for DDI, allergies, and duplicate therapy- ugghhh

Too many alerts, period.

Time consuming to customize alerts

Crossover of other alerts like therapeutic duplications that increase alert fatigue and affect the effectiveness of the system

Route of administration removes drug from alerts - if NGT, no alerts

Alert fatigue with minimal number of alerts activated

Labor intensive to customize & maintain

Only focus on the drugs for severity. Do not take patient factors into account.

Ability to require documentation on highest severity or chosen severities

Our future system does not have a robust program. It requires a lot of customization in order to provide the information needed.

Vendor alert classification guided by ill informed risk reduction strategy

Alerts for clinically insignificant interactions but these are mostly drug-food I think

Vendors afraid of law suits

Pharmacists are not utilizing the tool

No hard stops for DDI with severe potential for harm

Do not use software currently

Limitations within the current CPOE system

Need more liver enzyme interactions and for them to be more definitive in nature if possible. Need more information upfront on IV incompatibility. DDI needs to be based on drug name, not NDC, b/c when an NDC is expired and your database has not had a chance to catch up to that, you miss the DDI on your system. DDI system currently will not let you enter the DDI UNTIL you have resolved it fully. Show me a facility that can do that and I will be impressed. I need to get DDIs entered and have a chance to get the resolution on my own time for follow up resolution later in the day.

Only high level alerts are generated. The pharmacist should receive more alerts but the prescribers don't want them.

Too easy to override

Alert fatigue

Inability to configure "hard stop" by level of DDI severity

So many alerts that they sometimes become ignored

No problems since it is a legacy system, we control the severity and the criteria for overriding messages.

Nonformulary drugs not checked

Too many "duplicate" or repetitive alerts (i.e., two alerts for one interaction - one for each drug order); alerts that are simply not warranted (false positives)

IT disconnect with users

Meaningless alerts. E.g., if entering a potassium protocol, system alerts me that all the potassiums interact.

Staff override without proper documentation

If there are more than 4 or 5 alerts, the R.Ph. must scroll down to see them all (which doesn't always happen). And the interactions are not presented until the R.Ph. has finished all of the order entry steps (it should be presented sooner)

Too many interactions for no longer active medications and interactions that are not applicable

Too many alerts, period.

CLINICALLY SIGNIFICANT DRUG-DRUG INTERACTIONS ARE NOT DISTINGUISHED FROM CLINICALLY INSIGNIFICANT DRUG-DRUG INTERACTIONS

Too much information

Duplicate alerts

Poor evidence for some of the severities

System does not have DDI

None of the above

Too many alerts in general that are received by physicians in CPOE as white noise, this in turn presents a whole different level of liability if the patient has a significant DDI that was "overridden"

Too many insignificant alerts that need to be filtered

Too tedious and time consuming to customize alerts

Inaccurate alerts

Alert fatigue leads to pharmacist not responding to any alert

Doesn't catch all (e.g., QT interval prolongation)

Too many alerts leading to error fatigue

Can only reset level for a medication, not a specific interaction

The alerts are classified correctly--there are just too many or the alert doesn't apply to this patient or has been managed with dose adjustments

No hard stops

DDI software not very clinically relevant

Checks against discontinued medications

Need to be able to include smart logic with interactions

Need to suppress unlikely alerts and be able to recall based on potential reaction.

Need friendlier display. This is in development.

Alerts fire without patient-specific context

Alert fatigue with too many DDIs

Software cries wolf.

Inappropriate alerts for non-existent problems.

No consideration of patient factors before sending alert.

Software does not present the alerts in a manner that makes them easy to distinguish and evaluate with the medications in the patient's profile.

Too many insignificant alerts

Some alerts are for classes such as "analgesics" which will show interaction for ASA 81 mg daily if patient is receiving any other pain relief

too many requiring override, numbing the importance of override

Just TOO many alerts - specifically on duplication of therapy

No stratification based on severity

Alerts can be bypassed by hitting enter. No response needed.

Software is unable to distinguish alerts from being low to severe by using color, different pop ups, or anything else distinguishing and this contributes to the alert fatigue

DDIs based on NDC numbers

Physicians do not pay attention to them

Not clinically relevant information provided

Inaccuracies

System dangerous - too many people override important info because too much useless info is given

Too many alerts (> 50% of orders have alerts)

Difficulty and time needed to review and customize alerts

Too many variations in classification of DDI alerts

Computer systems are not capable. You have to understand that the majority of software vendors are business office software vendors that cater to the business office.

Warnings for drugs that have been discontinued

Interactions w/minor ingredients

Cannot alert physician or other clinical departments

Too many alerts, some minor, which seems to cause some staff to ignore alerts, without scrutinizing for major alerts.

Discontinued drugs continue to be screened forever

Too many alerts on DDIs that are not relevant clinically, but yet, no alerts exist for some very serious interactions clinically.

No time to manage this appropriately

Free text reasons commonly weak or non-existent (e.g., spacebar "return")

Not enough information on statistics of how often alert is likely to result in general population

Inability to customize alerts received at end-user level

Unsure

Alerts not linked to order entry

Staff override without review is too easy

Should be tailored to the typist. E.g., if a technician is typing, the software should spell out the issue. Interaction refill for warfarin patient received ciprofloxacin 48 days ago for 7 days. Option for tech to override based on risk.

Clinical significance vs theoretical significance

The alert is OK ... but you still need to know the patient and scenario to make an informed decision. It's not all in the DDI software.

Unsure

Inability to have alert not display in patient who is chronically on two interacting drugs (e.g., warfarin/aspirin, potassium/triamterene)

Difficult to work through alerts.

Too many alerts of little consequence

Mostly annoying and time consuming, but not usually helpful

Not enough resource time to customize DDI to be meaningful for our institution

Local issue - not advanced technologies in place

Many drug interactions that are not picked up by the software! We use [vendor name redacted], and when we tested drug interactions with MAOIs, half of those we thought significant were not flagged. I don't know how they decide what to include, so I can't educate my staff about what the software might miss. The vendors are absolutely resistant to adding interactions we identify as missing. They often omit drugs that are in an interacting class, not identifying additive effects (e.g., multiple serotonergics), etc.

Statistic	Value
Min Value	1
Max Value	6
Total Responses	1,403

27. Relative to DDI, what is the most important issue that the ASHP informatics group should be working on?

Text Response

I thought it very difficult to agree on a database, but this standard would be important.

Determining how many alerts a pharmacist could reasonably handle if most alerts required some action (i.e., how many alerts are too many...assuming they are mostly good).

Remove the "bench top" DDI alerts and leave the clinical DDIs

Establishing a consistent method for categorizing clinically significant DDIs and their frequency.

Making sure information is updated. Many interactions are from the 1970s. Need standard definitions of Contraindicated, Severe, etc. Many are designated severe level 3 or severe level 1. What does this mean??

Developing a clinically significant list of drug-drug interactions that should be universally included in all systems based on severity. Have a valid way of turning off some of the alerts without increasing liability. Ability to turn off DDI alerts to drugs that have been discontinued unless clinically possible

Prioritization according to significance of the alert. If this could be linked to a message that is transmitted to physician pager or ???, then increased value would be achieved. This may be a non-issue with CPOE, but then alert monotony will be a great issue.

Recommending or stating what a pharmacist should do when receiving the alert.

Classification of DDI levels based upon evidence.

Resolve two issues and you are well on your way to success.....OCPs and antibiotics and the whole issue surrounding serotonin syndrome (tramadol/fluoxetine/sumatriptan)

Too many insignificant alerts causing alert fatigue.

Helping to identify alert significance and determine who should receive alerts at different levels of severity--nurse, providers, R.Ph.

Include other information to help decision-making on potential impact of DDI and ways to minimize (without avoiding all together)

A way to filter out reported but not clinically relevant DDI

Recommendations for CPOE- how much is too much? Should R.Ph. and prescribers see the same level of warnings?

The ability to review interactions and discuss them with the provider ([drug information publisher name redacted], etc.) if you have further concern about an interaction.

A national "standard" for minimum information (offending drugs, relevant labs, times of administration, etc.). Thanks.

Standard database of DDIs. As all DDIs are not absolute contraindications - a severity system based on contraindications rather than a severity number scale would be best. Absolute contraindication (why); possible/probably = caution in specific patients (define); minor/modest caution - monitor appropriately (define). QA the process - build into package software periodic automatic reporting of DDI lists - overrides, prescription ordered/administered to patient, interventions, and status of DDI - evaluation process, updated literature contraindications.

Evidence-based standardization of alert severity.

Encourage IT vendors to develop standardized systems to categorize DDI better.

Key in on clinically relevant DDIs - not interactions with saline as our system does

Reporting capabilities

Standardizing severity of DDIs

Creating a standardized approach to DDI across the different software companies. The information presented must make sense to clinicians not programmers.

Provider order entry

Ensuring that only meaningful interactions are flagged. This means two strategies. First, you need to be able to modify the alerts. Second, you will need to eliminate unimportant alerts and add interactions that are most important.

Can't suppress previous pharmacist reviewed drug interactions from the EMAR

This is a great survey, but there are nuances to it that are difficult to tease out. For example, if the CPOE system provides the alert and there is an interfaced pharmacy information system, is the information conveyed to the pharmacy system? Does the pharmacy system also have its own alerts and can these be modified and/or turned off? What does or should a pharmacist do when receiving information that an alert has been bypassed by a prescriber? What are the documentation standards of practice for prescribers who get an alert? How labor intensive is it to modify manufacturer-supplied DDI alerts and what is the resultant liability to the institution? Even the providers of content don't stand behind their own alert systems (note, all have a warranty disclaimer disavowing them of responsibility should the data be incorrect). This is a tough subject as you know!

Software should be required to be flexible. While our system is flexible, and we make decisions specific to our needs, I've heard about others that struggle with the task. I wonder if this issue should be treated the same way smart pump settings are handled...vendors guide but don't specify.

Severity level in relationship to actual patient drug profile, not a presumed or universal interaction on all possible drugs. Severity level with detailed information based on literature search and source references. Detailed management guidelines based on DDI.

Require alerts to fire at order entry in a true "CPOE" (physician enters) rather than wait to alert only the pharmacist at verification of the physician entered order.

There is a major problem when drugs are administered through feeding tubes. Alerts are turned off, because interaction software does not recognize route of administration. There are no alerts for do not crush, or do not give in jejunum. CPOE systems for many drugs will not recognize the feeding tube route, so orders must be expressed verbally outside system. The order reads PO, but the patient only has a feeding tube, because the system does not have NGT route available for that dose

Allergies

Hard stops for highly significant DDI.

Convincing leaders and directors that it is ok to customize the alerts and turn some up and turn some down without taking on additional liability for the organization

Enhance the quality of information provided with the alerts.

Advancing the dialogue towards standardization of alerts and developing guidelines for organizations to set-up their alerts based on best practices. In addition, developing educational programs for how best to evaluate and respond to alerts.

Standard nomenclature and classification of DDI across the board.

There needs to be away to find drug interactions due to issues with route. E.g., patient on fentanyl epidural interacts and patient is prescribed a heparin drip. No current drug interaction exists to alert pharmacy of this!

Standardization

Serious interactions, not crap like additive sedation. Geez I know already that promethazine and lorazepam will cause additive sedation!!

Uniformity - that is all we need there is NO reason this should be different anywhere health care is provided. Same with frequencies and routes. Pharmacy should stand-up and own this!

Work with [vendor names redacted] and other vendors to provide clinically meaningful alerts rather than nuisance alerts

Encourage DDI compendium concordance. Maybe use [drug information publisher name redacted].

Not sure

Finding best way to present alerts, such that avoid [alert] fatigue and also avoid likelihood that important alert is missed.

I believe that work on a compatible DDI system that all vendors could use/interface with would be a tremendous gift.

Feedback from users to the software vendors to consider upgrading or downgrading alerts. Feedback is typically ignored, with a generic warning that any changes that we make are not supported by the vendor and they will not be held liable if there are clinical consequences.

A more uniform means of classifying the most significant DDIs to make those stand out from less significant DDIs. Perhaps there is a role for a group like ISMP that could become a clearinghouse and rater of DDIs for incorporation by the various software vendors.

Standardization and pharmacist education

Improved methods of information to identify severe, life threatening interactions vs those alerts which may indicate intolerance, etc.

Information regarding likelihood of interaction including risk factors

We use [vendor name redacted] for our interaction data, I think. We are able to set the alert significance level, but are unable to modify the alert (tylenol and food)? I would like to be able to change the level of an alert (from a 7 to a 5 or the reverse). If technology does not allow - we need available to all a decision tree to work through the interaction, determine significance, and documentation guidelines that meet liability requirements.

Providing only clinically relevant DDIs.

Standardization of DDIs and a definitive severity coding system

Get vendors to standardize drug naming and interactions

Too many alerts for interactions actually used therapeutically or for other common interactions of low significance(e.g., warfarin & aspirin 81 mg) that it possibly creates a tendency toward "alert blindness" simply for the volume of insignificant alerts.

To standardize the severity definitions. To promote the need for customized filtering by profession

Discussion with both database providers and pharmacy system providers to develop the ability, on the part of the end user, to customize levels and, to a lesser extent, content of alerts to meet the need of

each individual practice site.

Adverse reaction

Being concise regarding info provided.

Ability to change or customize alerts within an institute/system

Customizable severity stratification could reduce alert fatigue

The alerts should also provide suggestions for alternative therapy

Probably QT interval prolongation. We are a cardiac facility and have been caught on this one many times. It's a long list! Also, when you have pop-up after pop-up, one begins to ignore the screens. Maybe different colors for different areas, e.g. similar drug type, allergy, DDI.

Use clinical significance and get rid of "class" alerts

I am not sure how many different sources are available but if there are multiple sources, then standardization is important.

Not sure

Standardization of definitions and presentation

Fear of lawsuit using information needs attention

Standardizing alerts w/ severity scale which is user friendly

Standardize the level of alerts and documentation of evidence

One of questions (looking at our current CPOE system for DDI) may be whether there is any food-drug or other interaction that may be of interest to tag in addition to DDI - this may not be important factor. Inpatient, there is limited complementary or alternative medicine used, and resources can be checked on these. Challenges may be on the timeliness of the updates and customization for new labeling changes.

Separating out clinically significant interactions that are supported by the medical literature.

1. Liver enzyme system DDI information with definitive statements to evaluate.
2. DDI systems that can be customized to adapt to new information as it breaks in the field and clinically important. Why should we wait???
3. DDI systems that don't expect full resolution of a potential DDI before letting you document your process.
4. DDI systems that capture the amount of time taken to perform this function that link this to FTE needs in a department.
5. DDI interactive systems with "point of care systems" that can stop administration of any drug that may potentially cause harm.

A standard DDI process/text/nomenclature - too many variations available now - a high alert in one system may be a medium/low in another

ON a system to actually block the entry of a drug that has a severe interaction with a drug the patient is already receiving.

Working to be sure pharmacists receive needed alerts with good background information. If possible, of course standardization would be great.

Clinically significant DDIs

Eliminating "minor" interactions to eliminate alert fatigue that may lead to a missed "serious" interaction.

Clinical significance in reporting a DDI to avoid too many alerts which should be standardized across healthcare.

Standardize severity and give direction to software companies.

Ensuring that there is not just a yes or no option. Rather there should be an option from a drop-down menu, and if none of the above classify then select "other" and a free-text box to follow.

How long a drug-drug interaction remains clinically relevant after a given medication or medications have been discontinued.

Education. Suggest more succinct verbiage in initial pop-up with links to more information PRN. I also am not in agreement with pharmacists seeing different alerts than MDs. Urge pharmacy and P&T to take ownership of streamlining alerts... do not let IS folks dictate this due to complaints of alert fatigue.

Standardization of DDI software. Ease of customization.

Multiple drug interactions; solubility issues for IVs; flag contraindicated drug combinations relative to just precautions; how to resolve issues (e.g., monitor drug levels). Most of the interactions in our hospital system are important only for unmonitored outpatients. For example, in our hospital, we do daily PT/INRs and adjust accordingly, so a lot of the warfarin interactions are not very relevant.

Agree with the wish for vendors to agree. Our system has more reports and options for quality improvement data that we have not been able to take the time to evaluate.

Providing concise explanation of DDI and alert fatigue, too many low severity alerts can cause more severe alerts to get lost in the process

Standardize a friendly process that everyone (pharmacists and physicians) can use throughout the country.

Guidelines on how to best evaluate and respond to an interaction. Create a better method of stratifying interactions that is practical and could be applied to the real world. Hopefully vendors could pick up on this.

How to minimize alerts to those that are truly actionable. Of those that are actionable it would help to categorize viable responses to alerts. For example, if the drugs should never be given concurrently, what length of time is required for discontinuation of one and the start of the new therapy. If it is 'okay' to give the two drugs together, but additional monitoring is needed the type and frequency of monitoring should be defined. A clear process for communicating this information to other caregivers should also be outlined.

Standardizing DDI databases and severity levels; Clinical oversight and input on which DDIs are relevant - act as editors; promoting standardized education on how to interpret DDIs.

Creating a system that requires the pharmacist to contact the ordering physician for override based on level of severity. E.g., a life threatening DDI would require the physician to electronically override the DDI before the order becomes active or would allow the physician to authorize a discontinuation of the order.

A way to adjust alerting based upon patient-specific or population-specific data. For example, some minor to moderate DDIs might be appropriate in some populations or patients.

Harmonization of vendor products... (then world peace!)

Software standardization and customizability

It is my personal opinion that HARD STOPS are inherently dangerous in themselves. There is always an exception to the rule, and override mechanisms (however intentionally cumbersome they need to be) are appropriate.

Make sure that the data base covers cyp issues as part of the package.

Standardization of what and detailed information of the drug-drug interaction that is meaningful for the providers and pharmacists.

Standardize classification of alerts

Statistic	Value
Total Responses	599

28. What is your primary position? (please mark the one that best describes your role)

Answer	Response	%
Director of pharmacy	245	17%
Associate or assistant director of pharmacy	75	5%
Clinical coordinator	157	11%
Other supervisory position	34	2%
Staff pharmacist	185	13%
Clinical pharmacist – generalist	178	12%
Clinical pharmacist – specialist	189	13%
Medication safety coordinator	30	2%
Informatics/technology specialist	116	8%
Faculty	62	4%
Student	41	3%
Resident	77	5%
Technician	9	1%
Other primary position	47	3%
Total	1,445	100%

Other primary position

Systems Analyst

Drug Information Director

Critical Care

Army pharmacy Consultant

Info systems

Pharmacy Consultant

Manager, Director Trainee

Project Manager, Pharmacist

Anticoagulation coordinator

VP Pharmacy Services

Part-time staff pharmacist and full-time PhD student

Informatics

Supply chain pharmacist

Quality Outcome

Researcher

Corporate Manager Informatics & Technology

STAFF/CLINICAL PHARMACIST

VP Clinical

Analyst for software vendor

Director of Pharmacy Practice

Clinical Research Specialist

Pharmacy educator

Pharmacist - Clinical Apps Specialist

Medication Use Evaluation Coordinator

Fellow

Retired

Vendor consultant

Operations Manager

Administrator over pharmacy

Software developer specializing in pharmacy applications, and electronic medication administration records.

Clinical toxicologist

Retired pharmacist

Pharmacoeconomist

Clinical Pharmacist-Informatics

Health outcomes manager (PharmD)
Currently unemployed
Residency Director
Manager, Drug Information Service
Pharmacist Informatics Consultant
Consultant
Consultant pharmacist
"RENTAL PHARMACIST"
Pharmacist

29. What is your primary practice/work setting? (please mark one that best describes your work setting)

Answer	Response	%
Community (not for-profit) hospital	706	49%
University hospital	255	18%
For-profit hospital	117	8%
Government hospital	94	7%
Critical access hospital	27	2%
Community health clinic	21	1%
Health maintenance organization	12	1%
Medical office/clinic	12	1%
Pharmacy benefit management (PBM)	8	1%
Home infusion pharmacy	8	1%
Long-term care facility	7	0%
College or university	38	3%
Pharmaceutical industry	3	0%
Technology-based industry	14	1%
Other for-profit industry	9	1%
Community pharmacy	41	3%
Government agency	9	1%
Other practice/work setting	57	4%
Total	1,438	100%

Other for-profit industry	Other practice/work setting
Small for profit Rehab hospital 304B Community Teaching Hospital	Health care system of six different hospitals QIO
Psychiatric Hospital	NHS, UK
Rehabilitation hospital software	Not-for-profit hospital, referral only, pediatric, oncology academic medical center, not for profit
	Hospital\Community Health\ Public Health and Corrections Pharmacy
	Governmental agency operating 18 inpatient facilities.
	Management company, corporate HQ
	hospice
	Consulting - Hospital
	Part-time community chain pharmacy and full-time University
	DRUG INFORMATION CENTER
	Clinical pharmacists position at an integrated pharmacy clinic
	MTM service within primary care provider office
	Not-for-profit healthcare system
	Oncology clinic in a teaching hospital
	Not for-profit corporate IT support
	Integrated health system
	Corporate For Profit Hospitals
	Pediatric specialty hospital
	Comprehensive cancer care center
	Primary Care Clinic
	State mail order psychiatric pharmacy
	Association/Academia
	Ambulatory Oncology
	System office
	Physician office practice
	Community, teaching (not for-profit) hospital
	Long-Term Acute Care Setting
	Government MR/DD LTC
	Cancer center (ambulatory)
	Consulting
	IT Services for IDN

	Corrections
	Information System Pharmacist
	Physician office
	Military Ambulatory Clinic
	Retail
	Poison center
	Tech program
	Specialized diabetes pharmacy
	Regional medical center
	Retired
	Group purchasing organization
	Surgery Satellite
	Cancer hospital & clinics
	State psychiatric hospital
	Formerly correctional facility
	Rehabilitation Hospital
	TRIBAL FACILITY
	Health provider network
	Walgreens