Attachment 3: DUR Project-Anticholinergic Burden

Background

The DUR Board recommended that we pursue a retrospective targeted intervention centered around the use of multiple anticholinergic drugs and the cumulative anticholinergic burden this could place on patients.

Numerous drugs with anticholinergic properties available by prescription and OTC are prescribed to the Medicaid and SeniorCare population. The side effects of these drugs are well documented and include constipation, urinary retention, glaucoma, dry mouth and eyes as well as heat intolerance and cardiac arrhythmias. At high doses, these drugs can cause memory impairment, delirium or other CNS symptoms. Side effects may be even more pronounced in the elderly.[1] The use of multiple drugs with anticholinergic effects may increase the likelihood and severity of the side effects.

The DUR Board directed APS staff to provide preliminary information on patients with significant anticholinergic burden and propose a potential targeted intervention. APS prepared a preliminary analysis on drugs with anticholinergic side effects. The original list of drugs was developed from the side effect table from First DataBank for drugs with anticholinergic side effects, e.g., dry mouth, urinary retention, etc. This list was reviewed by APS staff pharmacists to prepare an initial list of drugs for extraction. The initial extraction produced a list of recipients on one or more anticholnergic drugs in a single month for both fee-for service (FFS) and SeniorCare recipients. A table of these results is shown.

Table 1-Number of patients receiving an anticholinergic drug

FFS MEDICAID				**SENIORCARE**		
Number of Rxs/month	Pt count	Cumulative %		Number of Rxs/month	Pt count	Cumulative %
15	3	0.01%		12	1	0.01%
14	1	0.02%		11	1	0.01%
13	1	0.02%		10	2	0.03%
12	6	0.05%		9	2	0.04%
11	3	0.06%		8	7	0.09%
10	7	0.09%		7	7	0.15%
9	11	0.14%		6	27	0.34%
8	27	0.26%		5	41	0.64%
7	34	0.40%		4	161	1.81%
6	83	0.76%		3	552	5.82%
5	180	1.54%		2	2373	23.08%
4	497	3.69%		1	10581	100.00%
3	1206	8.91%				
2	4105	26.66%				
1	16954	100.00%				
Total Patients	23118				13755	

[1] Mulsant BH et al. "Serum Anticholinergic Activity in a Community-Based Sample of Older Adults: Relationship with Cognitive Performance" *Arch Gen Psychiatry.* 2003;60:198-203

The drugs with potential anticholinergic side effects differed between the FFS and SeniorCare populations. The top 25 drugs ranked by percent of occurrence in the extract is shown in Table 2.

Table 2-Top 25 Anticholinergic Drugs Ranked by Percentage

FFS MEDICAID				**SENIORCARE**		
DRUGNAME	Count RXs	% of RXs		DRUGNAME	Count RXs	% of RXs
LORATADINE	6298	18.99%		OXYBUTYNIN	2171	11.73%
TRAZODONE	2473	7.46%		RANITIDINE	2117	11.44%
RANITIDINE	1951	5.88%		AMITRIPTYLINE	1585	8.57%
CYCLOBENZAPRINE	1935	5.84%		MIRTAZAPINE	1533	8.28%
CARBAMAZEPINE	1691	5.10%		TRAZODONE	1088	5.88%
DIPHENHYDRAMINE	1387	4.18%		TIOTROPIUM - INHALATION	1049	5.67%
AMITRIPTYLINE	1373	4.14%		MECLIZINE	693	3.75%
OLANZAPINE	1358	4.10%		SOLIFENACIN	628	3.39%
CETIRIZINE	1040	3.14%		IPRATROPIUM	594	3.21%
BENZTROPINE	984	2.97%		FAMOTIDINE	581	3.14%
MIRTAZAPINE	954	2.88%		CYCLOBENZAPRINE	465	2.51%
OXYBUTYNIN	926	2.79%		NORTRIPTYLINE	423	2.29%
BENZONATATE	710	2.14%		TOLTERODINE	422	2.28%
CLOZAPINE	677	2.04%		HYDROXYZINE	352	1.90%
HYDROXYZINE	638	1.92%		CARBAMAZEPINE	348	1.88%
PROMETHAZINE	560	1.69%		HYOSCYAMINE	344	1.86%
HALOPERIDOL	509	1.54%		L-HYOSCYAMINE	344	1.86%
IPRATROPIUM	497	1.50%		OLANZAPINE	333	1.80%
VARENICLINE	469	1.41%		DIPHENOXYLATE ATROPINE	307	1.66%
NICOTINE	434	1.31%		DOXEPIN	292	1.58%
MECLIZINE	408	1.23%		PROCHLORPERAZINE	274	1.48%
FEXOFENADINE	407	1.23%		BENZONATATE	272	1.47%
PROCHLORPERAZINE	406	1.22%		CETIRIZINE	266	1.44%
NORTRIPTYLINE	403	1.22%		FEXOFENADINE	237	1.28%
TIZANIDINE	390	1.18%		IMIPRAMINE	225	1.22%

Intervention Design

The preliminary results were presented to the DUR Board for review and discussion. Items discussed included whether drugs should be weighted equally, and what target to develop for the intervention. A recent article described a drug measurement scale to estimate the anticholinergic burden of multiple drugs with anticholinergic activity[2]. The Board recommended using the methodology from the article to apply weights to the anticholinergic drugs. The Board recommended that an intervention should be sent to prescribers with patients with an anticholinergic burden of six or greater and who also had at least 7 anticholiergic drugs prescribed by them in the month. An extract for the intervention was prepared from the August 2007 pharmacy claims for both Medicaid FFS and for SeniorCare. The intervention was mailed the last week in September.

An intervention letter with a response sheet and a patient profile were developed for the intervention. A copy of the letter and response sheet is attached as Appendix 1. Analysis of the claims extract identified 128 prescribers with 437 patients for the intervention. An additional 1303 patients had an anticholinergic burden of 6 or greater but the prescriber had not written more than 6 prescriptions, meaning that most of these cases involved a single prescriber and a single patient. In addition to the letter and response sheet, the prescriber received an individual profile for each patient included in the intervention. The profile contained all the drugs contributing to the patient's anticholinergic burden.

Evaluation

Claims were extracted for all patients with an anticholinergic burden greater 6 in the original analysis. The 437 patients in the intervention were evaluated for anticholinergic burden using the same methodology used to select patients for the intervention. In addition, the 1303 patients with anticholinergic burdens of 6 or greater were evaluated and serve as a cohort for the analysis. Patients with no eligibility in December were eliminated from both evaluations.

Table 3 shows the results of the intervention.

Table 3-Anticholinergic burden change post intervention

Intervention				Cohort		
Burden	Number	%		Burden	Number	%
Increased	52	12.1%		Increased	88	7.1%
No change	123	28.7%		No change	339	27.2%
Decreased	253	59.1%		Decreased	820	65.8%
Total	428			Total	1247	

An additional analysis compared the values of the anticholinergic burden in each group and is shown in Table 4.

[2] Carnahan RM et al. "The Anticholinergic Drug Scale as a Measure of Drug-Related Anticholinergic Burden: Associations with Serum Anticholinergic Activity" *J Clin. Pharmacol.* 2006; 46: 1481-1486

Table 4-Average Anticholinergic Burden

Intervention	Average Burden		Cohort	Average Burden
Pre	10.49		Pre	7.42
Post	6.95		Post	4.08
Change	3.53		Change	3.34

Discussion

When compared to the cohort group, it appears that the intervention was not effective in changing the anticholinergic burden in patients identified with an anticholinergic burden of 6 or greater.