
North Dakota Medicaid Pharmacy Program Quarterly News

Published Quarterly by Health Information Designs, LLC

Welcome to the “North Dakota Medicaid Pharmacy Program Quarterly News,” a pharmacy newsletter presented by the North Dakota Department of Human Services and published by Health Information Designs, LLC. This newsletter is published as part of a continuing effort to keep the Medicaid provider community informed of important changes in the North Dakota Medicaid Pharmacy Program.

The North Dakota Department of Human Services has contracted with Health Information Designs, LLC (HID) to review and process prior authorizations (PAs) for medications. For a current list of medications requiring a PA, as well as the necessary forms and criteria, visit www.hidndmedicaid.com, or call HID at (866) 773-0695 to have this information faxed. An important feature on this website is the NDC Drug Lookup. This allows you to determine if a specific NDC is covered (effective date), reimbursement amount, MAC pricing, copay information, and any limitations (prior authorization or quantity limits).

This newsletter provides information regarding the anticholinergic cognitive burden (ACB). Also included is examples of drugs with ACB scores.

The North Dakota Medicaid Pharmacy Program team appreciates your comments and suggestions regarding this newsletter. To suggest topics for inclusion, or to make comments, please contact Health Information Designs, LLC at (334) 502-3262, call toll free at 1-800-225-6998, or e-mail us at info@hidinc.com.



Helpful Numbers

PA Help Desk	866-773-0695
To fax PAs	866-254-0761
To report adverse reactions	800-FDA-1088

Inside this issue:	Page
Welcome	1
Helpful Numbers	1
The Anticholinergic Cognitive Burden	2
ACB Scale	3
Health Information Designs, LLC	4

Visit HID's North Dakota Department of Human Services Prior Authorization Webpage, www.hidndmedicaid.com.

The Anticholinergic Cognitive Burden (ACB) Scale

Medications with anticholinergic activity negatively affect the cognitive performance of older adults. These medications are frequently prescribed to the older population for treating common disease states such as depression, hypertension, Parkinson's disease, vertigo, asthma, cardiovascular disease, incontinence, psychotic symptoms and behavioral problems. Studies report that 20-50% of the 36 million US patients greater than 65 years of age take at least one anticholinergic medication.

Adverse effects of anticholinergic drugs can sometimes be misinterpreted as consequences of aging and lead to the addition of more prescription drugs to relieve the adverse effects caused initially by the anticholinergic medication. With a growing prevalence of cognitive impairment in the older adult population, as well as increase in the number of medications prescribed, clinicians should be aware of the potential effect that anticholinergics have on the development of adverse effects including cognitive dysfunction.

Anticholinergic toxicity is a common problem in the elderly. It has many effects ranging from dry mouth, constipation, and visual impairments to confusion, delirium, and severe cognitive decline. The central nervous system of older patients can be especially sensitive to anticholinergic adverse effects due to age related changes in the body: a decrease in cholinergic neurons and/or receptors in the brain, a more permeable blood brain barrier, a reduction in hepatic metabolism or renal excretion of anticholinergic drugs. An important clinical issue pointed out in recent studies is the large number of older patients who are exposed to multiple drugs with low anticholinergic activity and the concern that the cumulative burden of these medications over the course of many years may be associated with cognitive decline and increased mortality.

Cognitive impairment in older patients can include disorders that range from mild cognitive impairment (MCI) and delirium to dementia. Dementia is an acquired syndrome of progressive decline in memory and at least one other cognitive domain such as language, visuospatial or executive function, to an extent that is sufficient to interfere with social or occupational functioning in an alert person. Delirium is an acute disturbance of consciousness with reduced ability to focus, sustain or shift attention that occurs over a short period of time and tends to fluctuate over the course of the day. MCI is defined as the presence of cognitive deficit with the absence of delirium that is not affecting the individual's functional performance.

Campbell et al conducted a clinical literature review of the cognitive impact of anticholinergics and found, in the majority of studies reviewed, a positive association between the use of anticholinergic drugs and acute delirium and/or MCI. The authors noted that this adverse effect may not occur exclusively from a single agent with strong anticholinergic effects, but from a possible accumulation of multiple medications with anticholinergic effects and may not be related to the doses of individual medications. Decreasing the anticholinergic burden of a polymedicine profile improves cognition. Since toxicity is often the result of the anticholinergic burden of multiple prescriptions, the management of older patients should aim to reduce the use of all medications with anticholinergic side effects.

Throughout the studies evaluated in the review conducted by Campbell et al, there were minimal changes in global measurements of cognitive function in the patients receiving anticholinergic medications, however, other qualitative problems were identified apart from global measurement tools (deficits in processing speed, psychomotor performance, concentration/attention, problem solving, and language skills). The authors state that the significance of this comparison is that in a clinical setting many practitioners rely on global measures to evaluate cognitive performance and therefore may not accurately identify a decline in cognitive function when evaluating exposure to anticholinergics.

Boustani et al developed the Anticholinergic Cognitive Burden (ACB) scale to address the shortfall in using global measures to evaluate the negative effects of anticholinergic medications. The Anticholinergic Cognitive Burden (ACB) scale is a practical tool used to identify the severity of anticholinergic effects on cognition of prescribed and over-the-counter medications. This tool provides clinicians with a simple score that estimates the cumulative anticholinergic cognitive activity resulting from the total medications taken. Anticholinergic medications identified by Boustani et al are categorized into three classes: mild, moderate, and severe cognitive anticholinergic negative effects. Drugs with possible anticholinergic effects (*in vitro* assays) were given a score of 1. Drugs with established and clinically relevant cognitive anticholinergic effects were given a score of either 2 or 3, based on the drug blood

brain barrier permeability and its association with the development of delirium. All other drugs with no anticholinergic effects can be considered as having a score of zero. The total added score of different drugs taken by the patient determines the accumulative anticholinergic cognitive burden.

In their review, Boustani et al describe how to utilize the results of the ACB scale. In cases where an older adult receiving a drug with an ACB scale of 2 or 3; or in cases where a patient total ACB score is above 3, prescribers should consider the following; switching to an alternative medication with less anticholinergic cognitive effects, holding the medication during hospitalization or acute illness (due to an increase in the permeability of the blood-brain barrier), discontinuing the drug if there is no absolute need, and/or monitoring the patient's cognitive performance regularly while receiving the anticholinergic drug.

When assessing a patient for their anticholinergic burden, clinicians should take a full medication history (including over the counter medications), use a simple scale to measure the anticholinergic burden, and avoid prescribing multiple anticholinergic medications. Medications with anticholinergic activity negatively affect the cognitive performance of older adults and recognizing the anticholinergic activity of certain medications can improve cognition.

Drugs with ACB Score of 1	
Generic Name	Brand Name
Alverine	Spasmonal™
Alprazolam	Xanax™
Atenolol	Tenormin™
Bupropion	Wellbutrin™, Zyban™
Captopril	Capoten™
Chlorthalidone	Diuril™, Hygroton™
Cimetidine	Tagamet™
Clorazepate	Tranxene™
Codeine	Contin™
Colchicine	Colcrys™
Diazepam	Valium™
Digoxin	Lanoxin™
Dipyridamole	Persantine™
Disopyramide	Norpace™
Fentanyl	Duragesic™, Actiq™
Furosemide	Lasix™
Fluvoxamine	Luvox™
Haloperidol	Haldol™
Hydralazine	Apresoline™
Hydrocortisone	Cortef™, Cortaid™
Isosorbide	Isordil™, Ismo™
Loperamide	Imodium™, others
Metoprolol	Lopressor™, Toprol™
Morphine	MS Contin™, Avinza™
Nifedipine	Procardia™, Adalat™
Prednisone	Deltasone™, Sterapred™
Quinidine	Quinaglute™
Ramitidine	Zantac™
Risperidone	Risperdal™
Theophylline	Theodur™, Uniphyll™
Trazodone	Desyrel™
Triamterene	Dyrenium™
Warfarin	Coumadin™

Drugs with ACB Score of 2	
Generic Name	Brand Name
Amantadine	Symmetrel™
Belladonna	Multiple
Carbamazepine	Tegretol™
Cyclobenzaprine	Flexeril™
Cyproheptadine	Periactin™
Loxapine	Loxitane™
Meperidine	Demerol™
Methotrimeprazine	Levoprome™
Molindone	Moban™
Oxcarbazepine	Trileptal™
Pimozide	Orap™

Drugs with ACB Score of 3	
Generic Name	Brand Name
Amitriptyline	Elavil™
Amoxapine	Asendin™
Atropine	Sal-Tropine™
Benzotropine	Cogentin™
Brompheniramine	Dimetapp™
Carbinoxamine	Histex™, Carbihist™
Chlorpheniramine	Chlor-Trimeton™
Chlorpromazine	Thorazine™
Clemastine	Tavist™
Clomipramine	Anafranil™
Clozapine	Clozaril™
Darifenacin	Enablex™
Desipramine	Norpramin™
Dicyclomine	Bentyl™
Dimenhydrinate	Dramamine™, others
Diphenhydramine	Benadryl™, others
Doxepin	Sinequan™
Flavoxate	Urispas™
Hydroxyzine	Atarax™, Vistaril™
Hyoscyamine	Anaspaz™, Levsin™
Imipramine	Toframil™
Mecizine	Antivert™
Methocarbamol	Robaxin™
Nortriptyline	Pamelor™
Olanzapine	Zyprexa™
Orphenadrine	Norflex™
Oxybutynin	Ditropan™
Paroxetine	Paxil™
Perphenazine	Trilafon™
Promethazine	Phenergan™
Propantheline	Pro-Banthine™
Quetiapine	Seroquel™
Scopolamine	Transderm Scop™
Thioridazine	Mellaril™
Tolterodine	Detrol™
Trifluoperazine	Stelazine™
Trihexyphenidyl	Artane™
Trimipramine	Surmontil™

References

- Campbell N, Boustani M, Limbil T, et al. The cognitive impact of anticholinergics: a clinical review. *Clin Intervent in Aging*. 2009; 4: 225-233.
- Vanaja VK, Theth MJ. Chronic anticholinergic toxicity: identification and management in older patients. *Geriatrics*. 2002;358: 36-37.
- Roe C, Anderson M, Sprick B. Use of anticholinergic medications by older adults with dementia. *J Am Geriatr Soc*. 2002; 50: 836-842.
- Fox C, Richardson K, Maidment I, et al. Anticholinergic medication use and cognitive impairment in the older population: the Medical Research Council Cognitive Function and Ageing Study. *J Am Geriatr Soc*. 2011; 59(9): 1477-1485.
- Kersten H, Mollen E, Tolo IK, et al. Cognitive effects of reducing anticholinergic drug burden in a frail elderly population: a randomized controlled trial. *J Gerontol*. 2013; 68(3):271-78.
- Fox C, Richardson K, Maidment ID, et al. Anticholinergic medication use and cognitive impairment in the older population: the medical research council cognitive function and ageing study. *JAGS* 2011; 59:1477-83.
- Tune LE. Anticholinergic effects of medications in elderly patients. *J Clin Psychiatry*. 2001;62(21):11-14.
- Smithard DG, Fox C, Maidment ID, et al. Do anticholinergic drugs contribute to functional and cognitive decline? *Aging Health*. 2012; 8(1): 57-60.
- Boustani MA, Campbell NL, Mungler S, et al. Impact of anticholinergics on the aging brain: a review and practical application. *Aging Health* 2008;4:311-320.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (4th Edition)*. American Psychiatric Association, Washington, DC: USA (1994).
- Boustani M, Buttar A. Delirium. In: *Primary Care Geriatrics, a Case-Based Approach*, 5th ed, ch 16. Philadelphia: Mosby; 2007: 210-218.
- Boustani M, Ham RJ. Alzheimer disease and other dementias. In: *Ham RJ, Shone PD, Warshaw GA, et al. Primary Care Geriatrics: A Case Based Approach*, 5th ed, ch 16. Philadelphia: Mosby; 2007:219-236.
- Cavanaugh RM, Lund BC, Perry PJ, et al. The Anticholinergic Drug Scale as a measure of drug-related anticholinergic burden: Association with serum anticholinergic activity. *J Clin Pharmacol*. 2006;46:1481-1486.
- Campbell NL, Boustani MA, Lane KA, et al. Use of anticholinergics and the risk of cognitive impairment in an African American population. *Neurology*. 2010;75(2):152-59.
- Tune LE. Anticholinergic effects of medication in elderly patients. *J Clin Psychiatry*. 2001;62 (suppl 2):11-14.
- Boustani M, Schubert C, Sennour Y. The challenge of supporting care for dementia in primary care. *Clin Interv Aging*. 2007; 2(4):631-636.
- Boustani M, Peterson B, Hanson L, et al. Screening for dementia in primary care: a summary of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med*. 2003; 138(11): 927-937.



Health Information Designs, LLC is the most experienced and qualified provider of drug utilization review and pharmacy support services in the country. We specialize in helping our clients promote clinically appropriate and cost-effective prescribing, dispensing, and utilization of prescription drugs.

Health Information Designs, LLC was founded in 1976 with a mission to improve patient care and contain costs for state Medicaid agencies by providing drug utilization review (DUR) services. In 1997, HID was acquired by HDI Solutions and subsequently has experienced strong and steady growth as a premium healthcare analytics and pharmacy support services provider. HID is the industry leader in providing comprehensive prescription drug monitoring programs. Currently, HID works with clients in 30 states, including 16 Medicaid agencies, 22 Boards of Pharmacy and state health agencies, and several private healthcare benefit management organizations. The work performed by HID has a daily impact on the healthcare of more than 115 million Americans.

**HEALTH
INFORMATION DESIGNS**

391 Industry Drive
Auburn, AL 36832
Tel: 800-748-0130
Fax: 800-748-0116

PRST STD
U.S. Postage