

Primary Care Assessment and Management of Aggressive Behavior toward Others for the Adult with Mental Retardation and Developmental Disabilities (MR/DD)

1. Overview

Aggression can be defined as harmful or potentially harmful, physical or verbal actions directed against other persons, self, or property. Self-focused aggression may manifest as self-injurious behavior. Aggression is a common symptom towards self (4-5%) and towards property (7%) in all persons with MR/DD. Over half (58%) of “challenging behaviors” include aggression and one-third include property damage (See Table 1). Aggression towards others can take verbal or physical forms. Physical aggression includes pushing, punching, pinching, hair pulling, biting or sexual activity. Biting is a very serious problem because human bites can produce severe infections in the wound of the victim. Challenging behaviors are more common in boys and young men (See Table 2). Most “aggressive” individuals (79%) exhibit two or more aggressive behaviors while some (19%) manifest up to five (See Table 3). Aggression is common in persons with moderate to severe mental retardation and this dangerous

Table 1
Challenging Behaviors in Adults with DD/MR* (1)

%	Behavior
9-12	Other
7	Aggression
4	SIB
4-5	Destructive

*Total Population Study
Res. In Dev Disab. 2001;22:77-93

behavior requires immediate assessment and management. Aggression can be broadly divided into three types: persistent, episodic or occasional. Persistent aggression implies serious aggressive behaviors occurring more than once per week on a regular basis. Episodic aggression implies periods with aggressive behavior dispersed between periods where no aggression is identified. Occasional aggression indicates a person who becomes hostile very few weeks to months (See Table 4). The frequency, severity and predictability of aggression dictate the immediacy of response. Occasional, non-harmful aggression, such as slapping or pinching, rarely requires pharmacological intervention but often responds to behavioral management. No specific symptoms of mental retardation are associated with higher risks of aggression, although certain genetic disorders, such as Down’s syndrome and Prader-Willi, have increased risk (13). The assessment and management of aggression in children or adolescents is not discussed in this segment.

Table 2
Challenging Behaviors in Persons with DD/MR (1)

- 10-15% - all persons
- 50% - living with family
- 2/3 – adolescent, young adults
- 2/3 – boys or men
- Most have two or more behaviors

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Table 3
Characteristics of Aggressive Behavior in Adults with DD/MR (1)

- 79% - two or more aggressive behaviors
- 19% - five or more aggressive behaviors

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Dangerous or continuous aggressive behaviors require immediate evaluation and management. Behaviors that jeopardize the safety of the patient, staff, family or other individuals may warrant hospitalization until the cause is identified and treatment reduces the level of risk. Occasional, serious aggression is rarely treated with medication unless the danger is quite high and persistent. The pharmacological treatment of episodic aggression should begin with a careful assessment. When possible, behavioral interventions are the first method of treatment for all types of aggression.

Some aggressive or dangerous behavior may produce criminal charges. Each case must be evaluated according to the circumstances and the capacity of the individual. Persons with mild retardation may enter the criminal justice system and require forensic evaluations. The presence of mental retardation does not automatically produce diminished capacity in the accused individual. The description of aggressive behavior requires careful consideration as “assaultive” behavior can produce criminal penalties.

Table 4
Classification of Severe, Impulsive or Aggressive Behavior

Type	Frequency	Probable Benefit From Medication	Probable benefit from behavioral intervention	Likely Etiology
Occasional	Every few months or less	Low	High	Environmental
Episodic	Every few months to every few weeks	Variable	High	Multiple
Persistent	Weekly	High	High	Psychiatric Medical

DDMED 2

Psychiatric emergencies can be divided into impulsive behavior, aggressive behavior or assaultive behavior (**See Table 5**). The term “assaultive” implies that the patient is physically attacking the staff or family through intentional behavior. Aggression can be verbal, physical, or sexual. Physical aggression may include resistiveness, striking out, biting, property destruction, elopement, and other such behaviors. Assaultiveness may include direct physical attacks on staff or other residents. Verbal aggressiveness includes threatening behavior or verbal hostility that may provoke confrontations. Assaultiveness requires immediate interventions to safeguard patient and staff. Pharmacological interventions may be used as the first line of treatment when the patient’s hostility threatens serious harm (**See Table 6**). Aggressiveness may also require immediate psychopharmacology; however, staff should carefully consider other options prior to use of medications, e.g., verbal de-escalation, stimulus reduction, etc. Patients with communication problems may not be able to explain causes of agitation and clinicians must exclude common psychiatric and medical disorders that can produce these behaviors (**See Table 7**). Medications are rarely necessary as the first option in verbal aggressiveness. Antipsychotics and benzodiazepines may be required to stabilize a dangerous patient but these medications rarely correct underlying causes for aggression or hostile behaviors. These medications simply sedate the patient until the staff can organize effective assessment and management of the underlying cause. Threat reduction is best accomplished by reduction of underlying causes.

Table 5

A Nomenclature System For Dangerous Behavior in Adult Persons with MR/DD

Type	Target of Behavior	Form	Risk Level
Impulsive	People, objects	Physical/verbal/sexual	Variable
Aggressive	People, objects	Physical/verbal/sexual	Variable
Assaultive	Towards people	Physical/sexual	High

Table 6
Common Dosing Ranges of Injectable Medications for Acute Agitation or Assaultiveness in the Adult MR/DD Patient
 (Dosing Range in Milligrams)

MEDICATION	FRAIL or OLD (mg)	HEALTHY (mg)	CAUTION See PDR
Haldol (haloperidol) ¹	0.5 to 2.5	1 to 5	Acute EPS
Zyprexa (olanzapine) ²	2.5 to 5	2.5 to 10	Hypotension
Geodon (ziprasidone) ³	5 to 10	10 to 20	Cardiac Toxicity
<p>¹ May give Haldol every two hours for a total of four doses in 24 hours. ² May give a total of three doses of Zyprexa per 24 hours. Second dose may follow first dose by 2 hours and the third dose may be administered four hours after the second. ³ May repeat Geodon once in 2 to 4 hours for a total of two doses in 24 hours.</p> <p>These values are suggested guidance. Each patient should be individually assessed and dosing adjusted to that individual's clinical circumstances. Consult a child psychiatrist for treatment of children and adolescents. See PDR for complete information (24).</p>			

Table 7
Common Biomedical, Psychosocial, Causes of Aggression in the Adult Patient with MR/DD

Biological	Medical	Psychological	Social
<ul style="list-style-type: none"> • Frontal Lobe Dysfunction • Psychosis • Mood Disorder • Anxiety Disorder 	<ul style="list-style-type: none"> • Rectal Impaction • Pain • Seizure Disorder • Delirium 	<ul style="list-style-type: none"> • Sociopathy • Fear • Abuse • Neglect 	<ul style="list-style-type: none"> • Environmental Stressors • Interpersonal Conflicts

2. Differential Diagnosis of Aggression

The differential diagnosis of aggression in persons with DD/MR is lengthy and depends upon the severity of mental retardation and other medical or psychiatric comorbidities (2). The differential diagnosis in a mildly retarded person is distinct from that in the profound to severely retarded individual. Aggression in the mildly retarded person may result from psychological, social, psychiatric or medical conditions (See Table 7). The diagnosis of antisocial personality disorder implies criminality and this stigmatizing diagnosis should be restricted to persons with mild or moderate mental retardation. Persons with severe mental retardation rarely possess the psychological and social capacity to warrant a diagnosis of personality disorder. Medical problems or medications can produce impulsive or hostile behavior in all groups of retarded individuals. Medical conditions such as seizure disorders may precipitate aggressive acts during the post-ictal confusion (3). Individuals with mental retardation who suffer secondary head trauma may develop impulsive, hostile or aggressive behaviors as a result of injury to the orbito-frontal cortices (9). Episodic aggression may be the consequence of post-ictal confusion following a seizure or toxicity from antiepileptic medication. Medication non-compliance for individuals receiving psychotropic or antiepileptic medications may produce a re-occurrence of symptoms.

Some medications may produce or worsen impulsive or aggressive behavior. Benzodiazepines can disinhibit and intoxicate a retarded individual. Medically induced delirium can produce aggressive or hostile behavior (4). Any patient with an abrupt onset of aggressive or hostile

behavior requires an immediate medical evaluation to exclude new health problems. Old, first generation antipsychotic medications and selective serotonin reuptake inhibitors may produce paradoxical reactions such as akathisia that precipitate aggressive behavior in the intellectually disabled person. Steroids, bronchodilators, psychostimulants, and multiple other medications can produce agitation that may manifest as impulsive or aggressive behavioral disturbances (5).

Psychiatric problems may produce aggression in the retarded individual. Depression (6), mania (7), psychosis, and severe anxiety (8) may cause sufficient distress to produce hostile or aggressive activities. Mania can produce severe hostility that occurs in a cyclical pattern. Abuse can produce PTSD that manifests as aggression.

3. Diagnostic Considerations of Aggression in Specific Patient Subgroups

A. Aggression in Persons with Mild to Moderate Retardation. Mild to moderately retarded persons may develop aggression as a consequence of psychosocial stressors to include abuse, neglect, family chaos, alteration of a residential situation, disruption of personal relationships, etc. Studies show that aggressive behavior may have many causes in this patient group.

The new onset of aggressive or hostile behavior in the younger patient with mild mental retardation may require the clinician to perform a serum and urine toxicology screen to exclude the possibility of substance-induced behavioral change (9). Cocaine, methamphetamine, hallucinogens such as LSD, and other psychostimulants such as PCP, can produce severe agitation and aggression in the retarded person. The mild to moderately retarded person who presents with the new onset of psychosis and aggression should be evaluated to exclude the possibility of a behavior produced by chronic, methamphetamine intoxication. Other street drugs, such as Ecstasy, can produce acute agitation; however, persistent behavioral changes are more common with chronic methamphetamine abuse. Canniboids may cause intoxication and transient impulsive behavior; however, persistent aggression is less common. Alcohol intoxication and alcohol withdrawal can both produce aggressive, hostile, and impulsive behavior. Intoxication can be diagnosed through a physical examination and blood alcohol level. Alcohol withdrawal can be identified through the classic symptoms of hypervigilance with autonomic instability (9).

B. Aggression in Persons with Severe to Profound Retardation. New onset aggressive behavior in the severe or profoundly retarded person is often the result of new medical or psychiatric problems (See Table 5). Patients with long-standing histories of physical aggression may have exacerbations caused by new onset stressors. Communication problems often complicate the assessment of these individuals. The new onset of aggression should trigger an evaluation to detect new, unrecognized medical problems, new psychiatric problems, non-compliance with psychotropic or antiepileptic medications and other precipitants, such as physical or sexual abuse (10), (11).

C. Aggression in Older Individuals with DD/MR. The new onset of aggression or hostility in the older patient may be produced by the new onset of dementia. Persons with mental retardation have at least the same rate of dementia over the age of 60 as other individuals and specific groups such as those with Down's syndrome are at higher risk for developing dementia in their 50's (12), (13). The worsening of function coupled with a new behavioral problem such

as aggression or hostility may signal the onset of dementia. The aggressive, demented patient needs careful diagnostic assessment and then adjustment of their daily life schedule to compensate for diminished intellectual function.

3. Assessment

Patients with multiple aggressive behaviors require a careful assessment for each behavior and specific management strategy. For instance, a person who bites, punches, and throws objects requires an assessment for each hostile act that produces an intervention to reduce the frequency of each behavior. New onset medical problems may produce delirium, pain or other conditions in all groups that provoke aggressive behavior (**See Table 7**). Severely retarded individuals may not be capable of describing discomfort and pain. A complete mental status examination is required to exclude depression, mania, psychosis, anxiety, or delirium. Clinicians should do a complete review of all medications and assess routine functions such as frequency of bowel movement, oral intake, and adaptive function (**14**). The treatment team should review the person's life circumstances to determine whether new psychosocial stressors have occurred that might provoke aggression. Common life circumstances such as change of roommate, loss of relationship, death of family member, loss of employment, or other life stressors may provoke aggression within the individual (**15**). The new-onset of sexual aggression should trigger a review to determine whether the patient was the victim of sexual abuse.

Once there is reasonable certainty that there are no medical explanations for the aggressive behaviors/symptoms, an assessment of psychiatric symptoms should be conducted. Individuals with intellectual disabilities are more likely to have behavioral manifestations of psychiatric symptoms when they occur and are less likely to be able to verbalize in a sophisticated way about what they are experiencing. Some assessment tools designed for aiding the identification of psychiatric symptoms in individuals with intellectual disabilities include the DASH-II (Diagnostic Assessment for the Severely Handicapped – II), the ADD (Assessment of Dual Diagnosis), and the REISS Screen. These instruments have taken symptoms for the various diagnostic categories in the DSM and translated them into descriptions of behaviors that have been associated with particular diagnostic categories. This kind of assessment can also help sort out which behaviors are manifestations of a psychiatric disorder and which behaviors are a result of learning. Functional behavioral assessments need to be conducted for the latter when identified.

4. Behavioral Management

Behavioral management of aggression or hostility is the most important intervention. The strategy includes risk assessment, control of precipitants, early intervention, acute management and after-event evaluation. Staff or family must be trained and organized to safely manage an aggressive patient with minimum harm to persons or damage to property. Aggression may be a symptom of comorbid mental illness or this behavior may be a distinct symptom. In either situation, behavior analytic procedures can be included with other treatment modalities for a person who has both a psychiatric diagnosis and intellectual disabilities. Behavioral specialists can determine appropriate training strategies to assist a person with intellectual disabilities to gain better coping skills for dealing with their psychiatric symptoms. Triggers for the symptoms can be identified and strategies taught to staff, family members, and the individual to prevent escalation of the behavioral symptom. Counseling can be provided, keeping in mind that discussions need to be geared toward the level of understanding of the individual. Most

counseling should take the form skill-building and include the chance for positive reinforcement during the learning process. For example, if an individual becomes angry easily due to an impulse control problem, anger management training may be successful when presented in simplistic terms, modeled by the clinician, and practiced repeatedly by the individual in more than one or two sessions. As the person learns the management techniques, positive reinforcement should be delivered to assist with the acquisition and maintenance of the skills.

Physical, mechanical or pharmacological restraints are sometimes needed to control an aggressive patient. The chronic use of physical restraints, such as helmets with face/mouth guards, is an extraordinary intervention that requires documentation that all behavioral or pharmacological interventions were exhausted prior to utilization of this restrictive intervention. Such extraordinary interventions require careful protection of patient's rights.

Borderline or mildly retarded individuals who understand the consequences of criminal behavior may require criminal sanctions. The decision to refer an assaultive person with mental retardation to law enforcement requires careful consideration by all parties involved with care. Individuals with antisocial personalities or criminal backgrounds may be best managed through the criminal justice systems. Persons with moderate or severe retardation rarely meet a standard from criminal culpability.

5. Pharmacological Therapy

A. Treatment of Chronic Aggression. Consensus guidelines identify new second or third generation antipsychotics and anticonvulsants as the pharmacological treatment of choice for chronic aggression. The treatment of aggression begins with proper evaluation to identify underlying medical or psychiatric precipitants (**See Table 7**). Specific medical problems should be corrected as rapidly as possible, e.g., otitis media, dental abscess, UTI, kidney stones, etc. Suspected pain can be treated with physical interventions such as heat or cooling, massage, routine analgesics such as Tylenol or non-steroidal anti-inflammatories; however, narcotics may be required when patients continue to manifest pain despite adequate interventions. Patients with aggression produced by terminal illness, such as cancer, require aggressive, hospice quality analgesic therapy to reduce aggression.

Antipsychotic medications can be used for aggression produced by psychosis or mania. Injectable antipsychotic medications (**See DDMED 39**) can be used to sedate an aggressive patient and these medications can improve the patient's compliance with behavioral management. Risperidone has demonstrated efficacy in reducing the frequency of aggressive episodes in autistic persons (**16**), (**17**), (**18**). Other new second generation antipsychotic medications, such as olanzapine, are probably effective (**19**). Older first generation antipsychotic medications should be avoided when possible. The published, consensus treatment guidelines for persons with MR/DD identify risperdal, olanzapine, and quetiapine as top choices (**See Table 8**), (**21**).

Table 8

Summary of Common Doses of Antipsychotic Medications Prescribed for Adult Population with MR/DD with Persistent, Severe Aggression (21), (25)

Drug	Healthy/Adult Daily Dose Range	Frail or Elderly Daily Dose Range	Major Advisory See PDR for full details
1st Generation Medications			
Chlorpromazine	25-1000mg	10-500mg	Anticholinergic Side Effects
Thioridazine	25-500mg	10-250mg	Blackbox Cardiac Warning
Haloperidol	1.0-30mg	0.5-5.0mg	High Potential for EPS/TD
Fluphenazine	1-20mg	1-5mg	High Potential for EPS/TD
2nd Generation Medications			
Clozapine	100-600mg	25-300mg	Black Box for Agranulocytosis
Risperidone	1-6mg	0.25-2.0mg	Dose-related EPS
Olanzapine	5-20mg	2.5-10mg	Sedation and Metabolic Issues
Quetiapine	25-800mg	25-200mg	Sedation and Hypotension Possible
Ziprasidone	20-160mg	20-80mg	Cardiac Warning
3rd Generation Medications			
Aripiprazole	5-30mg	5-20mg	Akathesia and/or withdrawal Dyskinesia Possible
ABBREVIATIONS: EPS – Extrapyramidal Symptoms TD- Tardive Dyskinesia These values summarize typical dose ranges for persons with MR/DD. Each patient should be carefully assessed and dosing adjusted to his or her clinical circumstances. See the PDR for a complete description of possible side effects (24).			

B. Stabilization of Acute Aggression. Short-term stabilization of the patient can be accomplished through sedation with benzodiazepines or injectable antipsychotic medications (See Table 6). Intramuscular Geodon, olanzapine or old antipsychotic medications, such as Haldol, can be used with some effect (See DDMED 39). A short course of antipsychotics can be initiated with the intent of sedating the patient while a definitive management strategy is constructed, e.g., 1 to 2 weeks. The behavioral analysis team should use this interlude to assess and manage the behavioral problem. Short half-life benzodiazepines can be used for acute sedation with the aggressive patient. Some patients become intoxicated with these gabanergic agents as their psychopharmacology is similar to alcohol (4), (9). Long-term use with these drugs is not indicated unless the patient has a generalized anxiety disorder, PTSD, or some other anxiety disorder in the anxiety family that warrants this treatment (See DDMED 3).

C. Treatment of Episodic Aggression. Episodic, severe, explosive aggressive behavior may require pharmacological interventions. Specific diagnostic criteria for intermittent and explosive disorder for the person with intellectual disability are not defined. Lithium may reduce impulsive and aggressive behavior (22). Lithium is demonstrated as effective in the 0.7 to 1.0 serum level. Most individuals will have improvement while 30% will have side effects. Anticonvulsant medications, such as carbamazepine and valproic acid, can be used to suppress chronic aggressive or impulsive behavior and these drugs should be titrated to the minimum dose required to control aggression or to the full anticonvulsant level (21), (22). A combination of antipsychotic and anticonvulsant medications or lithium can be initiated and then the

antipsychotic should be rapidly discontinued while the anticonvulsant is maintained and monitored (See Table 8).

Several different classes of medications are presently used to reduce aggressive behavior including beta blockers, clonidine, buspirone, and opioid antagonists (21). Buspirone (Buspar) has been reported as effective for irritable and impulsive behavior. Other medications have anecdotal reports of therapeutic efficacy and can be given empirical trials when other interventions fail

D. Treatment of Occasional Aggression. Low frequency aggression rarely responds to medications and drug therapy increases the risk of complications. Behavioral interventions are used for this symptom.

Table 9

Commonly Prescribed Doses of Anticonvulsant Mood Stabilizing or Anti-impulse Medications for Adults with Mental Retardation and Developmental Disabilities (21), (25)

Medication Choices	Daily Dose for Healthy/Young		Daily Dose for Frail/Elderly		Comments See PDR
	<i>Dose (mg)</i>	<i>Target Blood Level</i>	<i>Dose (mg)</i>	<i>Target Blood Level</i>	
Valproic Acid	900 to 2400mg	50 to 125 mcg/ml	750 to 1500mg	50 to 100 mcg/ml	Hepato Toxicity Low Platelets
Carbamazepine	400 to 1200mg	4 to 10 mcg/ml	200 to 800mg	2 to 8 mcg/ml	Neutropenia Hyponatremia
Lithium	300 to 1200mg	0.5 to 1.5mEq/L	150 to 600mg	0.2 to 1.0 mEq/L	Multiple Drug Interactions Narrow Therapeutic Window
Dose ranges are commonly prescribed for mood stabilization or anti-impulsive effect. All doses must be individually adjusted for the individual patient. Consult with a child psychiatrist for treatment of children or adolescents. Consult with PDR for complete information.					

6. Assessment of Therapeutic Benefit for Aggression

The goal of therapy is reduction of frequency or intensity of aggressive episodes. The therapeutic endpoint is reduction of symptoms as described by the patient and caregiver or as measured by behavioral monitoring. Mildly retarded patients can describe symptoms. The clinician must depend on behavioral symptoms to determine efficacy in severely retarded persons. Minimal behavioral monitoring depends on the features and frequency of the behavior (See Table 10).

Table 10**Methods of Assessing Therapeutic Benefit of Antipsychotic Medications**

Severity of Mental Retardation	Self-Reporting	Caregiver Reporting	Behavioral Monitoring
Mild	R	R	H
Moderate	H	R	R
Severe/Profound	U	R	R

R=Required H=Helpful, but not always required U=Unreliable

7. Conclusion

The management of aggression begins with a careful clinical history and evaluation. The assessment is based on the severity of disability and the patient's age. Most aggression is treated with behavioral interventions. Pharmacological interventions can be used in individuals with specific psychiatric diagnoses that produced the behavior, e.g., mania, or with individuals who have failed behavioral interventions by manifesting such dangerous behaviors that sedation is required. Clinicians should avoid diagnoses such as antisocial personality disorder and intermittent explosive disorder in the person with moderate or severe retardation; however, these diagnoses may be appropriate in persons with mild mental retardation.

REFERENCES:

1. Emerson E, Kiernan C, Alborz A, et al. The prevalence of challenging behaviors: a total population study. *Research in Devel. Disabilities* 2001;22:77-93.
2. Silka VR, Hauser MJ. Psychiatric assessment of the person with mental retardation. *Psychiatric Annals* 1997;27(3):162-169.
3. Ryan R, Sunada K. Medical evaluation of persons with mental retardation referred for psychiatric assessment. *General Hospital Psychiatry* 1997;19:274-280.
4. Barron J, Sandman CA. Paradoxical excitement to sedative-hypnotics in mentally retarded clients. *American Journal on Mental Deficiency* 1985;90(2):124-129.
5. Stavrakaki C, Mintsioulis G. Implications of a clinical study of anxiety disorders in persons with mental retardation. *Psychiatric Annals* 1997;27(3):182-197.
6. Meins W. Symptoms of major depression in mentally retarded adults. *Journal of Intellectual Disability Research* 1995;39(1):41-45.
7. Lowry MA, Sovner R. Severe behavior problems associated with rapid cycling bipolar disorder in two adults with profound mental retardation. *Journal of Intellectual Disability Research* 1992;36:269-281.
8. Khreim I, Mikkelsen E. Anxiety disorders in adults with mental retardation. *Psych. Annals* 1997;27(3):175-181.
9. Kaplan HI, Sadock BJ, eds. *Comprehensive Textbook of Psychiatry/V*, Baltimore: Williams & Wilkins, 1989.
10. Deb S, Thomas M, Bright C. Mental disorder in adults with intellectual disability. I: Prevalence of functional psychiatric illness among a community-based population aged between 16 and 64 years. *Journal of Intellectual Disability Research* 2001;45(6):495-505.
11. Gillberg C, Presson E, Grufman M, Themner U. Psychiatric disorders in mildly and severely mentally retarded urban children and adolescents: epidemiological aspects. *British Journal of Psychiatry* 1986;149:68-74.
12. *Mental Retardation and Developmental Disabilities: including a section on Down Syndrome*, (in) *City Health Information: New York City Department of Health and Mental Hygiene* 2003;22(4):1-7.
13. Moldavsky M, Lev D, Lerman-Sagie T. Behavioral phenotypes of genetic syndromes: a reference guide for psychiatrists. *J. Am. Acad. Child. Adolesc. Psych* 2001;40(7):749-761.
14. Kastner T, Walsh KK, Fraser M. Undiagnosed medical conditions and medication side effects presenting as behavioral/psychiatric problems in people with mental retardation. *Mental Health Aspects of Developmental Disabilities*, July/August/September 2001;4(3):101-107.

15. Ghaziuddin M. Behavioral disorder in the mentally handicapped: the role of life events. *British Journal of Psychiatry* 1998;152:683-686.
16. Cohen SA, Ihrig K, Lott RS, Kerrick JM. Risperidone for aggression and self-injurious behavior in adults with mental retardation. *Journal of Autism and Devel. Disorders* 1998;28(3):229-233.
17. Findling RL, Aman MG, Eerdeken M, et al. Long-term, open-label study of risperidone in children with severe disruptive behaviors and below-average IQ. *Am. J. Psychiatry* 2004;161:677-684.
18. Snyder R, Turgay A, Aman M, et al. Effects of risperidone on conduct and disruptive behavior disorders in children with subaverage IQ's. *J. Am. Acad. Child Adolesc Psychiatry* 2002;41(9):1026-1036.
19. Janowsky DS, Barnhill J, Davis JM. Olanzapine for self-injurious, aggressive, and disruptive behaviors in intellectually disabled adults: a retrospective, open-label, naturalistic trial. *J. Clin. Psychiatry* 2003;64:1258-1265.
20. Kalachnik JE, Hanzel TE, Harder SR, et al. Antiepileptic drug behavioral side effects in individuals with mental retardation and the use of behavioral measurement techniques. *Mental Retardation* 1995;33(6):374-382.
21. Special Issue. Expert Consensus Guidelines Series: Treatment of psychiatric and behavioral problems in mental retardation. *American Journal on Mental Retardation* 2000;105(3):165-188.
22. Craft M, Ismail IA, Krishnamurti D, et al. Lithium in the treatment of aggression in mentally handicapped patients: a double-blind trial. *British Journal of Psychiatry* 1987;150:685-689.
23. Ruedrich S, Swales TP, Fossaceda C, et al. Effect of divalproex sodium on aggression and self-injurious behavior in adults with intellectual disability: a retrospective review. *Journal of Intellectual Disability Research* 1999;43(2):105-111.
24. Physician's Desk Reference (PDR), (58th Edition). Montvale, NJ: Thompson PDR, 2004.
25. Tasman A, Kay J, Lieberman JA (Eds.), (2003). *Psychiatry therapeutics* (2nd Edition). London: Wiley.