

General Principles Of Clinical Psychopharmacology For Adult Persons With Mental Retardation Or Developmental Disabilities (MR/DD)

1. General Principles for Prescribers

Psychopharmacology for adult and elderly persons with neuro-developmental disorders is challenging (1), (2). Psychiatric and behavioral problems are common in children and adolescents with MR/DD; however, this section does not contain material that is appropriate to this age population (3). The assessment and management of psychiatric or behavioral problems in a small child or young teenager requires the attention of a child psychiatrist and a pediatrician. Dosing schedules and medication recommendations included in this text and website www.ddmed.org are not applicable to the child and early adolescent populations. Clinicians should refer to appropriate pediatric references for advice on medication prescription and monitoring. The published medication prescription guidelines for healthy adults with MR/DD are used in these recommendations (4). Prescription for frail adults follows guidance provided for the elderly (20).

The rate of psychiatric disorders in the population with MR/DD ranges from 10% to over 30% (See **Table 1**). The rates of challenging behavior exceed 10% and many have multiple behavior problems (See **Table 2**), (5), (6), (7). Most psychotropic prescriptions are written by primary care physicians or other individuals with limited expertise in psychopharmacology for disabled individuals. Psychotropic medications are prescribed for almost one-third of some populations with up to 22% receiving antipsychotics, 5.9% receiving antidepressant medications, and 9.3% receiving antianxiety therapy among persons residing in institutions (8). The pharmacological strategy for specific syndromes such as schizophrenia, generalized anxiety, etc., in the patients with MR/DD resembles that strategy used for persons with normal intellect; however, psychopharmacology for the patient with MR/DD differs from that of normal individuals and clinicians must adjust prescribing patterns to accommodate the special needs of these populations. The patient with MR/DD has an increased risk of common side effects from medications and these individuals often manifest unusual complications from the drugs. Many patients with MR/DD receive

other drugs, such as anticonvulsants that increase the likelihood of drug-drug interactions (9). The number of comorbid medical problems depends upon the age of the patient and the clinical syndrome producing intellectual disability. The patient with MR/DD may be unable to accurately remember or describe adverse effects from the medication. The prescribing clinician

Table 1
Rates of SMI in Adult MR/DD* (5)

Diagnosis	%	Published Range
Schizophrenia	4.4	2-4.4
Mood Disorder	2.2	3.3-4.3
Anxiety	2.2	2.2-5.5
Phobia	4.4	4.4-8.2
Delusional Disorder	1	0-1.1

*Age 16 to 64 from total population
J. Int. Dis. Res. 2001;45(6):495-505

Table 2
Frequency of Challenging Behaviors in MR/DD (6)

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

Res. In Dev Disab. 2001;22:77-93

should communicate expected complications with the caregiver for observational assessment. For example, medications that produce excessive sedation, fatigue or pain cause symptoms that the patient may not be able to describe during the follow-up examination. Medication toxicity may manifest as new onset behavioral problems. For example, the prescription of a non-steroidal anti-inflammatory may produce gastric distress that results in hostility, aggression, or refusal to eat. The clinician must be aware of the unusual manifestation of common medication side effects in this special population (10), (11).

Medication non-compliance may be an obstacle to achieving therapeutic goals. Patients may refuse meds or some individuals may be unable to swallow pills. The clinician's prescription pattern must follow the specific needs and functional challenges of the patient.

Deaf patients need the assistance of a sign interpreter to allow the clinician to complete the evaluation. Blind, deaf patients present a specific challenge and the clinician must depend on staff or family with detailed understanding of the patient.

2. Use of Psychotropic Medication

Basic principles of prescription. Psychotropic medications are indicated for four broad reasons: 1) to enhance habilitative or educational function, 2) to treat specific psychiatric disorders, 3) for immediate control of dangerous behaviors, and 4) for control of severe disruptive behaviors that fail to respond to behavioral interventions. The prescription of any psychotropic medication requires identification and documentation of specific target symptoms or behaviors manifest by the patient as well as assessment of efficacy for symptom reduction.

The side-effect monitoring of any medication for the patient with MR/DD should include: 1) consideration of side-effects based on the patient's clinical condition, 2) communication of potential side-effects to the caregiver or staff, and 3) monitoring and reporting system for the side-effect that accommodates the patient's disabilities. Potential medication toxicity is always weighed against potential benefit.

The five major classes of psychotropic medication commonly used in persons with MR/DD are displayed in **Table 3**. The top choice and side effects are listed as determined by consensus recommendations are published literature (2), (3), (4), (20). The appropriate use of psychotropic medications in the MR/DD patient requires an accurate, appropriate diagnosis.

The language impaired patient may not be able to describe typical symptoms of disorders such as psychosis or depression and the prescribing clinician should have documented additional symptoms to suggest this syndrome. Psychotropic medications should not be prescribed to suppress annoying, disruptive symptoms or behaviors until a behavioral management program has been employed and this intervention is demonstrated ineffective. Disruptive or annoying behaviors should not be managed with psychotropic medications unless the consequence is sufficiently grievous to warrant the probable side effects produced by these medications (4).

Adjusting dosage based on symptom reporting. Many patients lack sufficient cognitive ability to accurately report symptoms to the prescribing physician. Some individuals are residents of group homes with minimal family contact. The physician may need to depend on reports of the family or staff. Reporting individuals should have daily interactions with the patient. Family or staff should be encouraged to document the frequency and severity of target

symptoms. Symptom reporting can be affected by unfamiliarity with the patient or personal attitudes of reporters. Reports can be inaccurate and physicians must determine rater bias prior to changing medications. Global negative reports in an adequately managed patient imply reporter bias or a new problem rather than treatment failure.

Table 3
Efficacy and Toxicity of Psychotropic Medications Commonly Prescribed
for Persons with MR/DD

Class of Medication	First Choice	Risk for Toxicity	Therapeutic Efficacy	Level of Precaution	Medication Commonly Used
I. Antipsychotics					
1. New, second generation	✓	I	G	C	Risperdal
2. Old, first generation		H	F	A	Haloperidol
II. Antidepressants					
1. Second Generation (SSRI)	✓	L	G	R	Fluoxetine
2. Third Generation		L	G	R	Venlafaxine
3. TCA		I	G	C	Nortriptyline
4. MAOI		H	G	A	Phenelzine
III. Benzodiazepines					
1. Short Half-Life	✓	I	G	C	Lorazepam
2. Long Half-Life		H	F	A	Diazepam
IV. Mood Stabilizers					
1. Antiepileptics	✓	I	G	R	Valproic acid
2. Lithium		H	G	C	
V. Hypnotics (Chronic)					
1. Non-benzodiazepines	✓	I	F	C	Zolpidem
2. Benzodiazepines		H	F	A	Temazepam
3. Antihistamines		H	P	A	diphenhydramine
4. Other		H	P	A	Chloral Hydrate
<p>Toxicity: (H)=high (I)=intermediate (L)=low Efficacy: (G)=good (F)=fair (P)=poor Precaution: R – Commonly used by all physicians. C- Use with caution. Psychiatrist should assess patient. A- Avoid when possible. Only a specialist should use this medication. Substantial Risk of Side Effects. Abbreviations: MAOI- Monoamine oxidase inhibitors TCA-tricyclic antidepressants SSRI-selective serotonin reuptake inhibitors (2), (4), (9), (33), (34)</p>					

The therapeutic endpoint is reduction of symptoms as described by the patient and caregiver or as measured by behavioral monitoring. Patients with mild mental retardation can often describe symptoms. The clinician must depend on behavioral symptoms to determine pharmacological efficacy in severely retarded persons. Minimal behavioral monitoring requires consistent measurements over several days of observation (See Table 4).

Staff or family can sometimes set unrealistic expectations for the improvement provided by psychopharmacology or reduce efforts at behavioral interventions as the patient improves with

medications. For instance, a patient with self-injurious behavior (SIB) may improve with medications and behavioral management. As the patient has fewer SIB episodes, the staff or family may reduce emphasis on behavioral management. As the SIB increases, the observers report that the medication no longer helps the patient. Alternatively, the caregiver may have unrealistic expectations for the expected results such as total eradication of the symptom. The mechanics of therapeutic monitoring based on severity of retardation are included in **Table 4**.

Table 4
Methods of Assessing Therapeutic Benefit of Psychotropic 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

Polypharmacy. Monotherapy for most psychiatric disorders is always preferred (32). Polypharmacy with all classes of medications should be avoided and used as a treatment of last resort. For instance, patients may receive two antipsychotic medications or two antidepressant medications when only one medication is required to achieve the desired effect. There is no substantial peer-reviewed clinical data to support the use of two antipsychotic medications (2), (3), (12). Polypharmacy also occurs when a patient is having an acute problem and requires additional sedation. Often, the additional medication, e.g., antipsychotics or benzodiazepines, is continued after correction of the underlying problem that produces the new psychiatric symptoms. Physicians often respond to harried staff members who demand immediate action for a disruptive or potentially dangerous behavior. These additional medications should be titrated down following stabilization of behavior or correction of precipitating medical problems. Add-on medications should be slowly tapered over days to weeks to avoid rebound or withdrawal symptoms.

Any patient receiving more than one medication from a specific class, e.g., two antidepressants, two antipsychotics, should have regular, i.e., every 6 to 12 months reassessment to confirm the necessity of the polypharmacy and trial dosage reduction strategies should be conducted unless past attempts have failed or the target symptoms are so severe that more trials would be inappropriate.

Dual Use Medication. Psychiatric problems are common in individuals with MR/DD and seizure disorders. Some anticonvulsant medications demonstrate excellent mood stabilization and acceptable toxicity (9). For example, Valproic acid and carbamazepine both have anti-impulse and mood stabilization effects, while Dilantin and Phenobarbital have minimal appreciable psychotropic benefit. Clinicians treating the triple-diagnosed patients, i.e., MR/DD, seizure disorder/mentally ill, should consider medications with dual use as both anticonvulsants and psychotropic medications. Klonopin should be used with great care in all clinical settings because of its long half-life, high toxicity, and risk for producing falls with injury along with questionable antiepileptic efficacy (13).

Regulatory Compliance. The federal regulatory guidelines for the use of psychotropic medications under Title 19 for ICF/MR's differ significantly from those used in hospitals or in

the nursing home. PRN medications for behavioral control are not allowed on a routine basis in federally funded programs and the use of psychotropic medications is severely scrutinized. Nursing home patients require compliance with federal survey standards defined in F329 to F333 of the federal survey guide. Patients in nursing homes require: 1) specific diagnoses, e.g., schizophrenia, bipolar disorder, 2) clear documentation of the need for the drugs, e.g., behaviors severe or dangerous enough to warrant the drug, and 3) assessment for side effects. Long-term prescription requires documented failures at drug discontinuation or dose reduction.

Toxicity and Interactions. Medication toxicity may be manifested in persons with MR/DD as new onset behavioral problems. For example, the prescription of a non-steroidal anti-inflammatory may produce pain from gastric irritation that manifests as hostility, aggression, or refusal to eat. The clinician must be aware of the unusual manifestation of toxic side effects. The population with MR/DD is often exquisitely sensitive to both effects and side effects of psychotropic medications, especially extrapyramidal symptoms from antipsychotic and delirium from benzodiazepines (14).

The patient with MR/DD has increased potential for drug-drug interactions, adverse drug reactions, and unrecognized complications. The clinician must know all consumed medications including over-the-counter, prescription, vitamins, and herbal remedies. The clinician should inquire about unusual diets or dietary requirements or restrictions such as in phenylketonuria (PKU).

3. Use of Antipsychotic Medications in the Population with MR/DD

Indications. Antipsychotic medications should be prescribed for specific diagnoses or for behavioral management when behaviors are dangerous to the resident or others (See Table 5), (2), (4). Many antipsychotic medications are available; however, clinicians should avoid the “older” first generation medications such as Prolixin, Haldol, and Mellaril (See Table 6 and 7).

The older medications have high rates of toxicity including neurological, cardiovascular, metabolic and gastrointestinal. Up to one-third of patients with MR/DD may develop some form of extrapyramidal syndrome (EPS) when prescribed the old, first generation antipsychotic medications. Tardive dyskinesia, akathisia, dystonia, and drug-induced Parkinson’s disease are common complications (See Table 7). Each form of EPS can produce dangerous or disabling symptoms for these patients. Some forms of toxicity such as tardive dyskinesia may be

irreversible and this damage can expose clinicians to litigation. Baseline neurological assessments are important because EPS is common in patients with MR/DD who are not receiving medication and documentation of assessment for movement disorders is not only recommended, but required.

Table 5
Common Diagnoses That Allow
Continued Antipsychotic Therapy

1. Schizophrenia
2. Schizo-Affective Disorder
3. Bipolar Disorder
4. Behavioral problems that fail two dose reduction in the previous year

(33), (34)

Table 6
A Summary of Antipsychotic Medications Commonly Prescribed for the
Adult Population with MR/DD

Drug	Healthy/Adult Daily Dose Range	Frail or Elderly Daily Dose Range	Major Advisory See PDR for full description
1st Generation Medications			
Chlorpromazine	25-1000mg	10-500mg	Anticholinergic Side Effects
Thioridazine	25-500mg	10-250mg	Blackbox Cardiac Warning
Haloperidol	1-30mg	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	Akathisia and/or withdrawal Dyskinesia Possible
<p>ABBREVIATIONS: EPS – Extrapyramidal symptoms like stiffness, tardive dyskinesia or akathisia. TD- Tardive dyskinesia or unwanted movements.</p> <p>This table provides commonly prescribed dose information. Each patient requires individualized prescription to assure appropriate doses. Consult with a child psychiatrist for treatment of children and adolescents (15),(16),(17),(18),(19),(20),(21).</p>			

Selection and Prescription of Medications. The “new” antipsychotic medications may be more effective than the older medications in management of psychosis produced by schizophrenia or the symptoms of bipolar disorder. The choice of an antipsychotic medication depends upon the desired effects as well as the perceived risk for side effects. The medication should be initiated in low dose and the titration can last over several weeks to several months. The antipsychotic medications can produce a range of metabolic problems including weight gain and diabetes (See Table 6 and 7). There are numerous side effects associated with all antipsychotic medications (See Table 6 and 7), (21). **FOR ADDITIONAL INFORMATION SEE DDMED 18 and 39.**

Most antipsychotic medications reach steady state after one week; however, their antipsychotic benefit may not occur for 4 to 6 weeks. Most immediate beneficial effect is derived from sedation. An adequate time trial at a therapeutic dose is necessary to determine efficacy/tolerability of any antipsychotic medication.

The new antipsychotic medications are demonstrated as relatively safe and effective in persons with mental retardation. Clozaril is effective; however, potential toxicities include the worsening of seizures, suppression of white blood cell count, orthostasis, cognitive dulling, other anticholinergic side effects, and required white blood cell count monitoring reduce the practicality of this medication.

Patients should receive a full therapeutic dose of the selected antipsychotic medication for at least 6 weeks prior to conclusion that medications do not produce the desired effect. Any beneficial effect from the medication warrants an additional 6 weeks at sustained dosage to

assure the clinician has afforded the medication adequate time to work. Failure on one medication warrants trial with a second medication using the previously described method. Additional doses of medicine can be used on a PRN basis when acute behavioral episodes warrant additional medication. Clozaril especially may require at least six months of therapy to accurately assess efficacy and tolerability. Non-compliance should be considered in any patient who receives substantial doses of medication and demonstrates no response or side effect.

Table 7
Common Side Effects Produced in Persons with MR/DD by Antipsychotic Drugs

Drug	EPS/TD (Movement)	CNS/Cognition (Sedation)	Metabolic (WT/BG/Lipid)	Misc. (Specific)
1st Generation				
Chlorpromazine	Moderate	High	Moderate	Cognition
Thioridazine	Moderate	High	Moderate	Cardiac
Haloperidol	High	High	Moderate	
Fluphenazine	High	High	Moderate	
2nd Generation				
Clozapine	Very Low	High	Very High	WBC/Agran.
Risperidone	Moderate	Moderate	Moderate	Prolactin
Olanzapine	Low	Moderate	Very High	
Quetiapine	Very Low	Moderate	Moderate	Orthostasis
Ziprasidone	Low	Low	Very Low	Cardiac
3rd Generation				
Aripiprazole	Low	Low	Very Low	Activation
EPS – extrapyramidal symptoms like tardive dyskinesia, dystonia, drug-induced pseudo parkinsonism or akathisia. CNS/Cog. – slowing of thought, sedation. WT - Weight gain BG - Elevated Blood glucose Lipid -Elevated Lipids				

The clinician should conduct a basic, physical examination on any patient prior to the initiation of antipsychotic medication and the neurological examination should assess for parkinsonism and other forms of extrapyramidal symptoms. A baseline measurement for blood sugar, lipid profile, and weight is required prior to initiation of antipsychotic medications as well as an abdominal “girth” measurement and lipid profile (29), (30).

Patients begun on antipsychotic medications should have annual blood sugars and lipid profiles. Weights should be monitored on a monthly basis except to those individuals who are predisposed to obesity. Patients with mild mental retardation should have dietary counseling to reduce the likelihood of excessive weight gain. An easy and effective monitoring tool is waist measurement (girth) that gives valuable information with minimal cooperation from the patient (See Table 7), (22), (29), (30).

Patients who are presently receiving old antipsychotic medications may be considered for cross-titration to new medications (See Table 6). The old antipsychotic medications including Haldol, Prolixin, and Mellaril have toxicity risks, such as EPS, that are reduced for second

generation medications. Mellaril has an FDA black box warning for cardiac abnormalities (28). The cross-titration should be accomplished with the appropriate medication being initiated at a very low dosage, while the antipsychotic is reduced in a proportionate way.

The cross-titration should be accomplished over a 6-8 week period minimum unless circumstances dictate a rapid discontinuation due to tolerability or side effects. The patients who receive antipsychotic medications should have appropriate written documentation of target symptoms, beneficial effect, and observed side effects. For those individuals without clear indication for the medication, a dose reduction should be considered. The antipsychotic should be titrated downward at a dose range of approximately 10% per month or the nearest possible increment. The patient should be assessed on a regular basis and monitored for the emergence of psychotic symptoms, behavioral problems, or other clinical symptoms that initially warranted the use of the medication. Following successful discontinuation of the medication, the patient should be re-checked every 6 months for several years to exclude the re-emergence of psychotic symptoms and routinely monitored for emergent side effects and tolerability issues.

Non-compliance with antipsychotic medications. Non-compliance with medications can be a serious problem in mildly retarded persons or individuals who refuse to take medications. Paranoid or psychotic individuals may be hesitant to take any medication. Liquid, sol-tab, and injectable forms of some medications are available that assure compliance with medication. The clinician should consider a serum level for medications for any patient receiving large doses of drugs with minimum obvious therapeutic benefit. To assess compliance, long-acting depot antipsychotics may be the only choice to assure compliance in some patient (9).

4. Use of Benzodiazepines

Benzodiazepines are commonly prescribed in the population with MR/DD (23). These medications may be beneficial for persons with anxiety disorders when other therapeutic interventions fail to control symptoms. All benzodiazepine medications have potential for producing confusion, disinhibition with impulsive behavior, and medical problems such as falls or gastroesophageal reflux disease (4). Long, half-life benzodiazepines have the potential for toxic accumulation in the patient – especially those receiving multiple other medications (See Table 8). Benzodiazepines should be prescribed with great care for the patient with MR/DD and the clinician should carefully monitor for side effects including sedation, behavioral changes, or deterioration of ADL functions. These medications are usually prescribed for persons with chronic anxiety disorders or for short-term use for acute symptoms/behaviors (See Table 8) (4). **SEE DDMED 13 and 41 FOR FURTHER INFORMATION.**

Table 8
Commonly Used Dosing Ranges for Benzodiazepine Anxiolytic Medications for the Adult
Population with MR/DD

DRUG	HEALTHY/ADULT DAILY DOSE RANGE	FRAIL/ELDELY DAILY DOSE RANGE	COMMENTS See PDR for Complete Details

Long Acting (t1/2>24hrs)			
Diazepam (VALIUM)	5 - 20mg	2 - 10mg	Very Fast Onset of Action
Clonazepam (KLONOPIN)	0.5 - 4mg	0.25 - 2mg	No Active Metabolites
Chlordiazepoxide (LIBRIUM)	5 - 300mg	5 - 100mg	Useful Treating Alcohol Withdrawal
Intermediate Acting (t1/2 = 12-24hrs)			
Alprazolam (XANAX)	0.5 - 4mg	0.25 - 2mg	Fast Onset of Action
Temazepam (RESTORIL)	15 - 30mg	7.5 - 15mg	No Active Metabolites
Lorazepam (ATIVAN)	0.5 - 6mg	0.25 - 2mg	No Active Metabolites
Oxazepam (SERAX)	15 - 60mg	7.5 - 30mg	No Active Metabolites
Short Acting (t1/2<12hrs)			
Zolpidem (AMBIEN)	5 - 10mg	5mg	Only Indicated for Acute Insomnia
Eszopiclone (LUNESTA)	1 - 3mg	1 - 2mg	Indication for Chronic Insomnia
<p>This table contains doses of psychostimulants that are commonly prescribed for persons with MR/DD. Each patient requires careful assessment and individualized prescription based on medical and psychiatric features. This information is not a guideline. Consult with child psychiatrist for children and adolescents. See PDR for additional information (4),(20),(21).</p> <p>All benzodiazepine medications may be addictive and produce delirium, falls, or excessive sedation. These medications are not recommended for children.</p>			

5. Use of Antidepressant Medication

Antidepressants are commonly prescribed for patients with MR/DD who experience depression, anxiety, impulsive-aggressive behavior, or self-injurious behavior **(4), (24), (25)**.

Antidepressants are divided into the older, first generation drugs like the tricyclics; the second generation drugs, like the selective serotonin reuptake inhibitors such as Prozac, and the new third generation medications like Mirtazapine, i.e., Remeron **(See Table 9), (9)**. Many third generation medications have a mixed effect of norepinephrine and serotonin. Medications that act on other receptor systems, such as Wellbutrin, fall into the “all other” class. The tricyclic antidepressants have a substantial risk for producing side effects, including orthostatic hypotension, dry mouth, and sedation, although these medications are highly effective for the treatment of depression. Monoamine oxidase inhibitors are rarely prescribed for patients with MR/DD because these drugs have numerous side effects that require careful monitoring along with strict dietary restrictions. All antidepressants may have side effects and may produce drug-drug interactions **(See Table 9), (3), (27)**. **SEE DDMED 12 and 55 FOR FURTHER INFORMATION.**

Table 9
Common Prescriptive Practices of Antidepressant Medications for the Adult Population with MR/DD

Drug	Healthy/Adult (Daily Dose)	Frail/Elderly (Daily Dose)	Comments (See PDR for Full Description)
1st Generation (TCA's)			
Nortriptyline	25-150mg	10-100mg	Therapeutic Level (50-150ng/ml)

2 nd Generation (SSRI's)			
Fluoxetine	10-60mg	5-40mg	Generic Available. May be Activating
Paroxetine	10-60mg	5-30mg	Generic Available. Anticholinergic
Sertraline	50-200mg	25-200mg	GI Side Effects. Take With Food
Citalopram	20-60mg	10-20mg	Few Significant Drug Interactions
Escitalopram	10-30mg	5-20mg	Few Significant Drug Interactions
3 rd Generation and Others			
Bupropion	75-450mg	75-300mg	Use Caution With Seizure Disorders
Mirtazapine	15-45mg	7.5-45mg	Weight Gain/Sedate at Lower Doses (<30)
Trazodone	50-300mg	25-150mg	Monitor Priapism and Orthostasis
Venlafaxine	75-375mg	25-225	Monitor for Hypertension
Duloxetine	40-60mg	20-40mg	hepatotoxicity
This table contains doses of antidepressant medications that are commonly prescribed for persons with MR/DD. Each patient requires careful assessment and individualized prescription based on medical and psychiatric features. This information is not a guideline. Consult with child psychiatrist for children and adolescents. See PDR for additional information (4),(20),(21).			

6. Use of Sedative-Hypnotic Medications

Sedative-hypnotics are commonly prescribed to assist with insomnia. Few sleep problems are improved with chronic, long-term sedative/hypnotic therapy and these medications should only be used as a short-term stop gap measure. The benzodiazepine sedative-hypnotics, e.g., Restoril, have all the side effects of regular benzodiazepines. Other sedative-hypnotics such as Ambien are relatively safe; however, the clinician should exercise great care in prescribing these medications. Antihistamines do not help with sleep and these drugs can produce confusion (See **Table 3**). Older drugs such as chloral hydrate or seconal are not usually prescribed for patients with MR/DD because of potential side effects (4). **SEE DDMED 16 and 41 FOR FURTHER INFORMATION.**

7. Psychostimulants

Psychostimulants are used in persons with ADD/ADHD or individuals with narcolepsy (See **Table 10**). The use of stimulants depends on the clinical features of the patient and these medications have limited demonstrated efficacy for improving behavioral problems (28). Consensus guidelines limit the use of these medications for patients with ADD/ADHD (4).

Table 10
Medication Dosing Ranges of Psychostimulants for Adults with MR/DD (4)

Medication	Starting Dose (mg)	Usual Dose Range (mg)	
		Adult (mg)	Older/Frail (mg)
Methylphenidate (Ritalin)	5-10	15-90	5-60
Dextroamphetamine	2.5-10	15-60	5-40
Amphetamine Mix (Adderal)	2.5-10	15-60	5-40
This table contains doses of psychostimulants that are commonly prescribed for persons with MR/DD. Each patient requires careful assessment and individualized prescription based on medical and psychiatric features. This information is not a guideline. Consult with child psychiatrist for children and adolescents. See PDR for additional information (4),(20),(21).			

8. Other Medications That Produce Neurological Problems

Broad ranges of non-psychotropic medications have profound effects on the CNS. Most anticonvulsants are CNS depressants and require careful monitoring for side effects. Many antihypertensives including Aldomet, angiotensin converting enzyme (ACE) inhibitors, etc., have substantial potential CNS toxicity. Anti-arrhythmic medications, e.g., digitalis, can also produce CNS effects and manifest as behavioral abnormalities. Many antispasmodics, e.g., Baclofen, can produce substantial sedation. Medications to improve continence, e.g., Ditropan, can cause confusion. Any medication that effects excitable tissue or works through the alteration of electrical conduction, e.g., anti-arrhythmics, antispasmodics, can produce substantial neurotoxicity (13).

9. Pharmacological Interventions to Enhance Intellectual Function

A broad range of medications have been advertised as improving intellectual function including herbal remedies, vitamin therapy, nootropic agents, and specific medications to enhance selective ascending neurotransmitter functions, such as cholinesterase inhibitors. Most pharmacological interventions focus on enhancement of neuronal function, while other cellular components, such as oligodendrocytes and astrocytes, may play a central role in the pathogenesis of cognitive disability.

Adaptive function may improve when specific symptoms, such as distractibility, are treated with specific medications, such as psychostimulants. Treatment of underlying disorders, such as phenylketonuria, may be effective preventive interventions.

No medication has been demonstrated to enhance cognitive function in persons with mental retardation produced by fixed neurological deficits and no available medication has an FDA indication for this purpose. Randomized controlled studies do not exist that demonstrate vitamin supplementation or herbal treatment as beneficial for cognitive enhancement. The diverse, pathobiology for mental retardation reduces the likelihood that pharmacological interventions will improve intellect through enhancement of cerebral function. Treatment focuses on optimization of available neural pathways through effective training and education. **SEE DDMED 84 FOR FURTHER INFORMATION.**

10. Medical-legal Issues

The FDA has not granted specific indications for the use of most psychotropic medications in persons with mental retardation. Pharmaceutical manufacturers will not likely seek FDA approval for available or future psychotropic medications as indicated for persons with MR/DD because of financial and regulatory issues. The patient population with mental retardation is a small, clinically heterogeneous group of individuals who pose specific challenges to clinical trials. Clinicians can alert family to the specific indications and peer-reviewed data that supports the efficacy of treatment with psychotropic medications. Multiple medical-legal issues surround the prescription of psychotropic medications for person with MR/DD (See Table 11). Each medication has specific medical-legal issues that should be addressed in the medical record. Off-label use is common and requires documentation for indication and efficacy. Polypharmacy is a serious problem in the population with MR/DD that can produce significant side effects. Patients often receive several psychotropic medications as well as non-psychiatric medications with significant psychotropic effects. Each additional medication with psychotropic effects will add to the potential confusion, sedation or gait instability of the patient with MR/DD. Many psychotropic medications alter the P450 system for metabolism and drug-drug interactions are common in all persons. The use of polypharmacy increases the risk for adverse effects and possible litigation (32). The best protection against litigation is a carefully crafted therapeutic strategy that is clearly communicated to the family and written in the medical record.

Table 11
Medico-legal Issues Associated with Specific Classes of Medications

MEDICATION CLASS	LIABILITY ISSUE	Refs.
Antipsychotics	Tardive dyskinesia Metabolic syndromes, QTc issues Increased mortality in elderly demented patients	28, 29, 30, 31
Antidepressants	Suicide, acts of aggression	35, 36
Benzodiazepines	Accidental Injury, delirium	13

11. Conclusion

Clinicians should use great care in the selection of psychotropic medications while avoiding drugs that can produce significant side effects. Old antipsychotic medications, long half-life benzodiazepines, confusing antidepressants, and toxic narcotic analgesics are examples of medications to be avoided. The limited peer-reviewed literature on the use of psychotropic medications in persons with MR/DD is sufficient to guide clinical practice. The range of effects and toxicities produced by psychotropic medications in the patient with MR/DD reflects the range of brain disorders that produce intellectual disability.

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