BRAIN INJURY MEDICATIONS

by Daniel Gardner, M.D. (copyright 9/94, 8/98)

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*** **PLEASE CONSULT WITH YOUR PHYSICIAN BEFORE MAKING ANY CHANGES IN YOUR CURRENT MEDICATION OR ADDING ANY NEW MEDICATIONS!*****

The following list of medications used for brain injury-related problems is based on the medical literature and my clinical experience.

CLINICAL INDICATIONS:
Disorders in the following areas:
Aggression, Anxiety, Arousal, Autonomic regulation, Cognition, Conceptual disorder, Eating, Headache, Mood Movement, Obsessions-compulsions, Perception, Seizures, Sexual function, Sleep, Speech-language

AGGRESSION:
Anticonvulsants

Carbamazepin, Valproic acid, Clonazepam, Gabapentin, Lamictal, Topiramate, Neuroleptics, Fluphenazine, Pimozide (especially for negative symptoms; check EKG at start and each dose increase over 10 mg/day), Clozaril (no extra-pyramidal side effects (EPS), but hypotension, hypersalivation, sedation , agranulocytosis)

Risperidone (low EPS), Olanzepine, Quetiapine
Medroxyprogesterone
Lithium carbonate
Amantadine (100 mg up to 100mg qid)
Beta adrenergic blockers

Inderal, Pindolol (up to 60 mg daily; less hypotension secondary to intrinsic sympathomimetic activity)

Calcium Channel Blockers
Verapamil (up to 80 mg. qid), Diltiazem, Nifedipine,
Nimodipine (selective for cerebral vasculature)
Antidepressants
Fluoxetine, Sertraline, Paroxetine, Trazodone, Nortriptyline, Desipramine
Amoxapine (metabolized to a neuroleptic), Nefazodone, Mirtazapine
Anti-anxiety medications
Buspirone, Alprazolam, Clonazepam, Lorazepam
Clonidine (hypotension and sedation; .05-.1 mg bid--starting dose. Increase by .1 mg/d, maximum dose = 2.4 mg/d)
Stimulants
Methylphenidate, Dextroamphetamine, Magnesium Pemoline, Adderall
Antihistamines
Hydroxyzine
Anticholinergics
Benztropine, Scopolamine
Dextromethorphan (sustained release) (60-90mg bid)

ANXIETY :

ANXIETY, SOMATIC PREOCCUPATION, HYPOCHONDRIASIS:
Antidepressants, Buspirone, Alprazolam, Clonazepam, Lorazepam
POST-TRAUMATIC STRESS DISORDER:
Tricyclic antidepressants:
Imipramine, Nortriptyline
Selective serotonin reuptake inhibitor antideptressants:
Fluoxetine, Sertraline, Paroxetine
Monoamine oxidase inhibitor antidepressants:
Phenylzine, Parnate

Anti-anxiety agents:
Alprazolam, Lorazepam
Beta-adrenergic blockers: Propranolol, Atenolol
Anticonvulsants: Carbamazepine

AROUSAL:

COMA RECOVERY:

L-Dopa, Amphetamine, Hyperbaric oxygen, Naloxone
"Coma Cocktail"
Neurotransmitter precursors
Vitamin C 100 mg, Co-Enzyme Q10 2400 mg tid, L-Tyrosine 2000 mg/day for one week then add Bromocriptine 2.5 mg tid up to 30 mg/d (check bp) (or may use L-Dopa), then Dextroamphetamine 5 mg twice daily up to 20 mg/day,then
Scopolamine patch (to block muscarinic receptors) behind alternating ears q3d (.5 mg/d) (Allen Childs, unpublished)

LACK OF INITIATIVE, APATHY, IMPAIRED ATTENTION AND MEMORY, HYPERACTIVITY:

Amphetamine (avoid abrupt withdrawal, leading to depression)
Bromocriptine, Pergolide, L-Dopa/Carbidopa
Amantadine (100-400 mg. per day, especially in patients with Parkinsonian symptoms of bradykinesia, rigidity, tremor, reduced spontaneity and initiation) Fluoxetine, Sertraline, Paroxetine, Selegiline 5 mg bid, Risperidone (for negative symptoms in psychosis)
Methylphenidate, Dextroamphetamine, and L-Dopa give best results in mild to moderate impairments such as mild post-concussion syndrome.
Psychostimulants are best for mild impairment with decreased attention and memory, apathy and anergy.
Other dopamine agonists are useful in more severe impairments.
Presynaptic dopamine agonists:
Methylphenidate, Dextroamphetamine, Adderall, L-Dopa
Postsynaptic dopamine agonists:
Bromocriptine (mixed), Pergolide, Amantadine (mixed)
Other antidepressants:
Imipramine, Desipramine, Amitriptyline

ATTENTION DEFICIT / HYPERACTIVITY:

Bupropion, Buspirone, Other antidepressants, Carbamazepine
Psychostimulants
Methylphenidate, Dextroamphetamine, Adderall, Magnesium pemoline
Beta-adrenergic blockers
Inderal, Pindolol,
Clonidine .05-.1mg bid, increasing by .1mg/d to 2.4 mg/d maximum
(hypervigilance, hyperactivity)

HYPERVIGILANCE AND HYPERACTIVITY:

Clonidine

EMOTIONAL INCONTINENCE/PATHOLOGICAL LAUGHING OR CRYING:

Amitriptyline, Amantadine, L-Dopa, Fluoxetine, Carbamazepine

AUTONOMIC DYSREGULATION:

(hyperthermia, diaphoresis, tachycardia, tachypnea)
Bromocriptine, Dantrolene sodium

COGNITION: Cognitive impairment in TBI. First evaluate side effects of current medications--anticholinergic, antihistaminic, sedative. These could lead to impaired memory, attention and concentration.
Naltrexone, Ergoloid mesylates, Nimodipine, Nicotine, Donepezil

CONCEPTUAL DISORDERS:

PSYCHOSIS:

Neuroleptics
Fluphenazine, Clozaril, Risperidone, Olanzepine, Quetiapine

Anticonvulsants

MONOSYMPTOMATIC DELUSIONS, PATHOLOGICAL JEALOUSY:
Pimozide, Fluoxetine

EATING DISORDERS:
OVEREATING:
Fluoxetine, Trazodone, Naltrexone, Sibutramine

LACK OF APPETITE :
Cyproheptadine

EXCESSIVE WATER DRINKING :
Demeclocycline (600 mg bid), Lithium carbonate, Captopril (12.5 mg/d)

MOOD DISORDERS:
DEPRESSION:
Incidence of post-TBI depression:15 - 25%. Depression may occur without a feeling of sadness. It may manifest as agitation, irritability, lack of pleasure, impaired cognition.

Antidepressants:
Desipramine (not sedating), Nortriptyline (sedating), Bupropion (low anticholinergic and antihistaminic side effects; activating), Trazodone (sedating), Fluoxetine, Sertraline, Paroxetine (low anticholinergic and antihistaminic side effects; activating), Amoxapine (metabolized to neuroleptic), Nefazodone (lower incidence of insomnia, GI upset, weight gain), Mirtazapine, Venlafaxine, Selegiline (MAOI, no dietary restriction when used at Parkinson's Disease doses of 5-10mg/d; antidepressant doses, 15-60 mg/d, require low tyramine diet; metabolized to amphetamine)
Psychostimulants
Methylphenidate, Dextroamphetamine, Magnesium pemoline, Adderall
TREATMENT- RESISTANT OR PARTIALLY RESPONSIVE DEPRESSIONS:
(a) Increase dose until benefits or side effects appear
(b) Change to another antidepressant
(c) Add a second antidepressant
(d) Augment antidepressants with: Buspirone, Lithium Carbonate, Thyroxine, Tri-iodothyronine, Atypical Neuroleptic, Anticonvulsant, Pindolol
MANIC DISORDER :
Lithium Carbonate
Anticonvulsants
Carbamazepine, Valproic acid, Clonazepam, Gabapentin, Lamotrigine
Calcium Channel Blockers
Verapamil, Diltiazem, Nifedipine, Nimodipine
Neuroleptics
(If single agent ineffective, consider low dose Lithium + anticonvulsants +/or neuroleptic)
POST-TRAUMATIC HEADACHES:
Nonsteroidal anti-inflammatories (NSAIDs) Antidepressants (tricyclic)
Calcium channel blockers
Verapamil, Diltiazem, Nifedipine, Nimodipine (selective for cerebral vasculature) Phenylzine (MAOI antidepressant)

MOVEMENT DISORDERS:
ABSENCE OF MOVEMENTS AFTER TBI:
Neostigmine, Physostigmine, Bromocriptine, Amantadine
INCOORDINATION
L-trytophan, Thyrotropin-releasing hormone (oral), Propranolol,
Gamma-vinyl GABA, Acetazolamide, Phthalazinol
DYSTONIA :
Dopamine agonists: Bromocriptine, L-dopa
Anticholinergics: Benztropine, Trihexyphenidyl
Baclofen
Benzodiazepines: Diazepam, Alprazolam, Lorazepam
Carbamazepine

TREMORS:
Beta-adrenergic blockers: Propranolol, Atenolol, Pindolol
Benzodiazepines, Dopamine agonists, Valproic acid, Anticholinergics, Isoniazide
PARKINSONISM:
(bradykinesia, dysarthria, decreased facial expression, rigidity)
Selegiline, L-Dopa, Pergolide, Bromocriptine
AKATHISIA:
Bromocriptine, Propranolol,Cyproheptadine
MYOCLONUS:
Clonazepam,Trazodone, L-Tryptophan, Valproic acid, Primidone, Piracetam
DYKINESIAS:
Dopamine agonists, Anticonvulsants
NEUROGENIC HETEROTOPIC OSSIFICATION:
Etidronate disodium, Nonsteroidal anti-inflammatory meds (NSAIDs)
OBSESSIVE-COMPULSIVE DISORDER:
Fluoxetine, Sertraline, Paroxetine, Clomipramine (May add Buspirone or atypical neuroleptic to antidepressant)
PERCEPTUAL DISORDERS:
HEMI-INATTENTION / NEGLECT:
Bromocriptine
SEIZURE DISORDERS:
Carbamazepine (partial seizures, simple or complex) Valproic acid (multi-focal or generalized seizures), Gabapentin (metabolized by kidneys), Lamotrigine, Topiramate

SEXUAL DISORDERS:
HYPOSEXUALITY:
Antidepressants, Yohimbine, Testosterone, Sildenafil
HYPERSEXUALITY:
Females:
(Sexual assault, frequent masturbation, violent erotic dreams, with normal testosterone levels)
Cyproterone acetate (androgen receptor blocker) 25-50 mg/d (days 5-15 of menstrual cycle)
Ethinyl estradiol 50 mcg/day (days 5-25 of menstrual cycle)
Males:
Medroxyprogesterone im: approx. 200 mg im/week decreasing to 200mg/mo with testosterone level maintained at 100 po: 60-200mg/d (fewer side effects with low dose p.o. than i.m.)
Depo-leuprolide acetate 7.5 mg im/mo, Cyproterone acetate 50mg bid, Conjugated estrogens
Both males and females: fluoxetine and other serotonin re-uptake inhibitors (reduced sex drive and function in 30%)

SLEEP DISORDERS:
NARCOLEPSY:
Fluoxetine, Psychostimulants
INSOMNIA:
Antidepressants (sedating), Valproic acid, Zolpidem, Clonazepin

SPEECH - LANGUAGE DISORDERS:
MUTISM:
Physostigmine 1 mg i.m. one time weekly x three weeks
Bromocriptine 2.5-5 mg twice daily up to 45 mg/day (increase the dose about every one month)
Imipramine
DYSPHAGIA:
L-dopa
DYSPHASIA:
Bromocriptine
DYSARTHRIA:
Clonazepam

About the author:
Daniel Gardner, MD is in the private practice of psychiatry, psychoanalysis, and neurobehavioral medicine in San Diego and Solana Beach, California. He provides treatment (problem solving, skill building, and medication management) and consults on quality of care issues with TBI

survivors, their families, health care providers, health care organizations, and insurance companies.

He is Assistant Clinical Professor of Psychiatry, UCSD School of Medicine and faculty member, San Diego Psychoanalytic Society and Institute. He was formerly medical director of NeuroCare at Stone Mountain, a post-acute brain injury rehabilitation program and is currently medical director of Hidden Valley Rehabilitation Services, a neurologic disabilities rehabilitation program in Ramona, California.

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