

Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Psychiatric Medications by Category and Class

| Antidepressants | Antipsychotics | Lithium Salts | Sedatives/Anxiolytics | Stimulants |
|---|--------------------------------|----------------------|-------------------------------------|---------------------------------|
| <i>Selective Serotonin Reuptake Inhibitors (SSRIs)</i> | <i>Atypical Antipsychotics</i> | <i>Lithium Salts</i> | <i>Short-Acting Benzodiazepines</i> | <i>Amphetamines</i> |
| Citalopram | Aripiprazole | Lithium | Alprazolam | Amphetamine |
| Escitalopram | Clozapine | | Clobazam | Amphetamine / Dextroamphetamine |
| Fluoxetine | Fluoxetine/Olanzapine | | Clonazepam | |
| Fluoxetine/Olanzapine | Olanzapine | | Estazolam | Dexmethylphenidate |
| Fluvoxamine | Paliperidone | | Lorazepam | Dextroamphetamine |
| Paroxetine | Quetiapine | | Midazolam | Lisdexamfetamine |
| Sertraline | Risperidone | | Oxazepam | Dimesylate |
| SSRIs, NOS | Ziprasidone | | Temazepam | Methamphetamine |
| | | | Triazolam | Methylphenidate |
| <i>Serotonin/Norepinephrine Reuptake Inhibitors (SNRIs)</i> | <i>Typical Antipsychotics</i> | | <i>Non-Benzodiazepines</i> | Amphetamines, NOS |
| Desvenlafaxine | Chlorpromazine | | Buspirone | <i>Miscellaneous</i> |
| Duloxetine | Fluphenazine | | Butabarbital | <i>Stimulants</i> |
| Milnacipran | Haloperidol | | Chloral Hydrate | Armodafinil |
| Venlafaxine | Haloperidol/Fluphenazine | | Eszopiclone | Atomoxetine |
| | Loxapine | | Meprobamate | Modafinil |
| <i>Triazolopyridines</i> | Perphenazine | | Phenobarbital | Stimulants, NOS |
| Trazodone | Amitriptyline/Perphenazine | | Ramelteon | |
| | Thioridazine | | Secobarbital | |
| <i>Aminoketones</i> | Thiothixene | | Zaleplon | |
| Bupropion | Trifluoperazine | | Zolpidem | |
| | | | Barbituric Acid Derivatives, NOS | |

eTable 1. Psychiatric Medications by Category and Class

| Antidepressants | Antipsychotics | Lithium Salts | Sedatives/Anxiolytics | Stimulants |
|---|-------------------------------------|----------------------|------------------------------------|-------------------------------|
| <i>Tricyclic Antidepressants</i> | <i>Miscellaneous Antipsychotics</i> | | <i>Long-Acting Benzodiazepines</i> | |
| Amitriptyline | Pimozide | | Chlordiazepoxide | |
| Amitriptyline/Chlordiazepoxide | Antipsychotics, NOS | | Amitriptyline/Chlordiazepoxide | |
| Amitriptyline/Perphenazine | | | Clorazepate | |
| Amoxapine | | | Diazepam | |
| Clomipramine | | | Flurazepam | |
| Desipramine | | | Quazepam | |
| Doxepin | | | | |
| Imipramine | | | <i>Miscellaneous</i> | |
| Nortriptyline | | | <i>Sedatives/Anxiolytics</i> | |
| Protriptyline | | | Benzodiazepine | |
| Trimipramine | | | Derivatives, NOS | |
| Tricyclic Antidepressants, NOS | | | Sedatives/Anxiolytics, NOS | |
| | | | | |
| <i>Tetracyclic Antidepressants</i> | | | | |
| Maprotiline | | | | |
| Mirtazapine | | | | |
| | | | | |
| <i>Monoamine Oxidase Inhibitors (MAOIs)</i> | | | | |
| Isocarboxazid | | | | |
| Phenelzine Sulfate | | | | |
| Selegiline | | | | |
| Tranylcypromine | | | | |
| MAOI, NOS | | | | |
| | | | | |
| <i>Miscellaneous Antidepressants</i> | | | | |
| Nefazodone | | | | |
| Antidepressants, NOS | | | | |
| | | | | NOS - Not otherwise specified |

eTable 2. Adverse Drug Effect by Category

| Abnormal Behavior or Mood | Disturbance In Consciousness | Muscular |
|----------------------------------|-------------------------------------|----------------------------|
| Abnormal Behavior | Depressed Level Of Consciousness | Asthenia |
| Aggression | Encephalopathy | Dysarthria |
| Agitation | Lethargy | Dysphonia |
| Anger | Loss Of Consciousness | Facial Paresis |
| Anxiety | Sedation | Hypotonia |
| Bruxism | Somnolence | Muscle Atrophy |
| Crying | Stupor | Muscle Strain |
| Decreased Activity | Unresponsive To Stimuli | Muscle Tightness |
| Decreased Appetite | | Muscular Weakness |
| Delusion | Fall Or Head Injury | Paresis |
| Depression | Fall | |
| Disturbance In Attention | Head Injury | Pain |
| Drooling | | Abdominal Discomfort |
| Emotional Disorder | Gastrointestinal | Abdominal Pain |
| Euphoric Mood | Constipation | Arthralgia |
| Excessive Masturbation | Diarrhoea | Back Pain |
| Homicidal Ideation | Dry Mouth | Burning Sensation |
| Insomnia | Dyspepsia | Chest Discomfort |
| Irritability | Dysphagia | Chest Pain |
| Listless | Epigastric Discomfort | Dysuria |
| Logorrhoea | Gastritis | Ear Pain |
| Mania | Gastrooesophageal Reflux Disease | Eye Irritation |
| Mood Altered | Nausea | Eye Pain |
| Mood Swings | Stomach Discomfort | Facial Pain |
| Nervousness | Vomiting | Flank Pain |
| Oral Intake Reduced | | Headache |
| Panic Attack | Hypersensitivity Reaction | Migraine |
| Paranoia | Anaphylactic Reaction | Musculoskeletal Chest Pain |
| Psychomotor Hyperactivity | Angioneurotic Oedema | Musculoskeletal Stiffness |
| Psychomotor Retardation | Dermatitis | Myalgia |
| Restlessness | Dermatitis Allergic | Neck Pain |

eTable 2. Adverse Drug Effect by Category

| Abnormal Behavior or Mood (cont.) | Hypersensitivity Reaction (cont.) | Pain (cont.) |
|---|--|------------------------------|
| Screaming | Dermatitis Contact | Oral Pain |
| Self Injurious Behaviour | Dermatitis Exfoliative Generalised | Pain In Extremity |
| Self Mutilation | Drug Eruption | Pain In Jaw |
| Sluggishness | Drug Hypersensitivity | Pharyngolaryngeal Discomfort |
| Suicidal Ideation | Erythema | Photophobia |
| Tearfulness | Eye Pruritus | Throat Irritation |
| | Face Oedema | Toothache |
| | Lip Swelling | |
| Abnormal Drug Level | Oedema Mouth | Respiration |
| Anticonvulsant Drug Level Abnormal | Oedema Peripheral | Apnoea |
| Anticonvulsant Drug Level Above Therapeutic | Oral Pruritus | Cough |
| Antidepressant Drug Level Above Therapeutic | Oropharyngeal Swelling | Dyspnoea |
| Antidepressant Drug Level Increased | Periorbital Oedema | Hyperventilation |
| Antipsychotic Drug Level Above Therapeutic | Pharyngeal Oedema | Hypoxia |
| Antipsychotic Drug Level Increased | Photosensitivity Allergic Reaction | Oxygen Saturation Decreased |
| | Pruritus | Respiratory Acidosis |
| Altered Mental Status | Pruritus Generalized | Respiratory Depression |
| Akinaesthesia | Rash | Respiratory Distress |
| Amnesia | Rash Generalised | Respiratory Failure |
| Aphasia | Rash Maculo-Papular | Respiratory Rate Decreased |
| Aphonia | Rash Papular | Wheezing |
| Confusional State | Rash Pruritic | |
| Delirium | Rash Vesicular | Sensory |
| Disorientation | Swelling | Aphasia |
| Formication | Swelling Face | Aphonia |
| Hallucination | Swollen Tongue | Balance Disorder |
| Hallucination, Auditory | Tongue Eruption | Diplopia |
| Hallucination, Visual | Tongue Oedema | Dizziness |
| Incoherent | Urticaria | Dysgeusia |
| Memory Impairment | Urticaria Generalized | Feeling Abnormal |
| Mental Disorder | | Feeling Drunk |
| Mental Impairment | | Feeling Hot |
| Mental Status Changes | | |

eTable 2. Adverse Drug Effect by Category

| Cardiovascular | Movement Disorder or Spasticity | Sensory (cont.) |
|---|--|------------------------|
| Blood Pressure Decreased | Akathisia | Feeling Jittery |
| Blood Pressure Increased | Blepharospasm | Hypoaesthesia |
| Bradycardia | Coordination Abnormal | Hypoaesthesia Facial |
| Cardiac Arrest | Dyskinesia | Hypoaesthesia Oral |
| Electrocardiogram QRS Complex Prolonged | Dystonia | Oral Dysaesthesia |
| Electrocardiogram QT Prolonged | Extrapyramidal Disorder | Paraesthesia |
| Extrasystoles | Gait Disturbance | Paraesthesia Oral |
| Heart Rate Abnormal | Hemiparesis | Sensation Of Heaviness |
| Heart Rate Increased | Hypertonia | Skin Burning Sensation |
| Hypertension | Laryngospasm | Tinnitus |
| Hypertensive Emergency | Motor Dysfunction | Vertigo |
| Hypotension | Movement Disorder | Vision Blurred |
| Palpitations | Muscle Contractions Involuntary | Visual Acuity Reduced |
| Presyncope | Muscle Rigidity | Visual Disturbance |
| Sinus Tachycardia | Muscle Spasms | |
| Syncope | Muscle Spasticity | |
| Tachycardia | Muscle Twitching | |
| | Myoclonus | |
| | Oesophageal Spasm | |
| | Parkinsonism | |
| | Tardive Dyskinesia | |
| | Tic | |
| | Tongue Spasm | |
| | Torticollis | |
| | Tremor | |
| | Trismus | |

eTable 3. Numbers of Cases and National Estimates of Annual Emergency Department (ED) Visits for Psychiatric Medication Adverse Drug Events, by Patient Sex, Patient Age, and Medication Category—United States, 2009-2011

| Sex, Age Group, and Psychiatric Medication | ED Visits for Adverse Drug Events ^a | | | | Hospitalization Rate (%) | Est. Annual ED Visits per 10,000 Outpatient Prescription Visits ^b | |
|--|--|---------------------------|--------------------------------|--------------|--------------------------|--|--------------|
| | No. of Cases | Est. Annual No. of Visits | Proportion of Age Group Visits | | | No. | (95% CI) |
| | | | % | (95% CI) | | | |
| Females | | | | | | | |
| <i>19 to 44 years old</i> | | | | | | | |
| Sedatives/Anxiolytics | 306 | 6,849 | 25.5 | (22.4-28.7) | 11.8 | 4.8 | (4.1-5.5) |
| Antidepressants | 400 | 9,710 | 36.2 | (32.5-40.0) | 5.5 | 4.5 | (3.8-5.1) |
| Antipsychotics | 306 | 6,861 | 25.6 | (22.4-28.8) | 8.0 | 16.2 | (13.7-18.7) |
| Lithium Salts | 41 | 773 | 2.9 | (1.6-4.2) | ^c | 13.1 | (9.0-17.1) |
| Stimulants | 50 | 1,143 | 4.3 | (3.0-5.5) | ^c | 4.0 | (3.1-4.8) |
| Two drugs from different psychiatric medication categories | 71 | 1,474 | 5.5 | (3.8-7.2) | ^c | Not applicable | |
| <i>45 to 64 years old</i> | | | | | | | |
| Sedatives/Anxiolytics | 309 | 6,818 | 37.8 | (34.4-41.2) | 25.0 | 3.0 | (2.5-3.4) |
| Antidepressants | 215 | 5,218 | 28.9 | (24.9-32.9) | 11.8 | 1.7 | (1.4-1.9) |
| Antipsychotics | 143 | 3,048 | 16.9 | (13.8-19.9) | 24.0 | 6.2 | (5.0-7.3) |
| Lithium Salts | 66 | 1,157 | 6.4 | (3.3-9.6) | 55.0 | 20.7 | (13.7-27.8) |
| Stimulant | 5 | ^c | ^c | ^c | ^c | ^c | ^c |
| Two drugs from different psychiatric medication categories | 68 | 1,725 | 9.6 | (7.4-11.7) | 33.6 | Not applicable | |
| <i>≥65 years old</i> | | | | | | | |
| Sedatives/Anxiolytics | 238 | 5,370 | 52.0 | (46.4-57.6) | 34.7 | 3.0 | (2.6-3.5) |
| Antidepressants | 136 | 3,122 | 30.2 | (25.0-35.5) | 25.2 | 1.6 | (1.3-1.9) |
| Antipsychotics | 56 | 1,329 | 12.9 | (9.7-16.0) | 30.0 | 6.2 | (4.9-7.6) |
| Lithium Salts | 15 | ^c | ^c | ^c | ^c | ^c | ^c |
| Stimulants | 1 | ^c | ^c | ^c | ^c | ^c | ^c |
| Two drugs from different psychiatric medication categories | 9 | ^c | ^c | ^c | ^c | Not applicable | |
| Males | | | | | | | |
| <i>19 to 44 years old</i> | | | | | | | |
| Sedatives/Anxiolytics | 190 | 4,053 | 23.5 | (19.6-27.4) | 15.3 | 5.1 | (4.2-6.0) |
| Antidepressants | 161 | 3,721 | 21.6 | (17.5-25.7) | 11.5 | 3.8 | (3.1-4.5) |
| Antipsychotics | 376 | 6,917 | 40.1 | (34.4-45.9) | 11.9 | 19.9 | (16.7-23.1) |
| Lithium Salts | 20 | ^c | ^c | ^c | ^c | ^c | ^c |
| Stimulants | 57 | 1,334 | 7.7 | (4.7-10.8) | ^c | 4.9 | (3.5-6.4) |
| Two drugs from different psychiatric medication categories | 35 | 931 | 5.4 | (3.7-7.1) | ^c | Not applicable | |

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|--|--|---------------------------|--------------------------------|--------------|--------------------------|--|--------------|
| | No. of Cases | Est. Annual No. of Visits | Proportion of Age Group Visits | | Hospitalization Rate (%) | No. | (95% CI) |
| | | | % | (95% CI) | | | |
| Males | | | | | | | |
| <i>45 to 64 years old</i> | | | | | | | |
| Sedatives/Anxiolytics | 186 | 4,494 | 38.6 | (33.7-43.5) | 30.4 | 3.4 | (2.8-3.9) |
| Antidepressants | 122 | 2,663 | 22.9 | (17.8-28.0) | 21.0 | 1.8 | (1.5-2.2) |
| Antipsychotics | 141 | 2,813 | 24.2 | (20.5-27.8) | 18.6 | 7.6 | (6.2-9.0) |
| Lithium Salts | 43 | 949 | 8.1 | (5.6-10.7) | 69.7 | 27.3 | (18.9-35.7) |
| Stimulant | 11 | ^c | ^c | ^c | ^c | ^c | ^c |
| Two drugs from different psychiatric medication categories | 33 | 499 | 4.3 | (2.4-6.1) | ^c | Not applicable | |
| <i>≥65 years old</i> | | | | | | | |
| Sedatives/Anxiolytics | 142 | 3,123 | 61.8 | (55.8-67.9) | 27.4 | 3.9 | (3.3-4.6) |
| Antidepressants | 42 | 942 | 18.7 | (13.1-24.2) | ^c | 1.0 | (0.8-1.3) |
| Antipsychotics | 33 | 610 | 12.1 | (7.1-17.1) | ^c | 4.3 | (3.0-5.6) |
| Lithium Salts | 12 | ^c | ^c | ^c | ^c | ^c | ^c |
| Stimulants | 0 | ^c | ^c | ^c | ^c | ^c | ^c |
| Two drugs from different psychiatric medication categories | 9 | ^c | ^c | ^c | ^c | Not applicable | |
| ^a Number of cases and national estimates of ED visits from the National Electronic Injury Surveillance System—Cooperative Adverse Drug Event Surveillance (NEISS-CADES) project. The hospitalization rate is the ratio of ED visits resulting in admission, observation, or transfer to total ED visits for adverse drug events involving the specified medication category. ^b Estimated annual numbers of outpatient prescription visits for each medication category are from the National Ambulatory Medical Care Survey (NAMCS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS) for 2009 and 2010 and include outpatient prescription visits in which multiple psychiatric medications were prescribed at a single visit. ^c Statistically unreliable estimate | | | | | | | |