**Medications Associated with Geriatric Syndrome (MAGS) and their Prevalence in Older Hospitalized Adults Discharged to Skilled Nursing Facilities**

**Appendix 1**

**“--”** = Syndrome not reported as adverse effect in LexiComp or US FDA Drug Inserts for that drug

**Frequency undefined** = Syndrome mentioned as adverse effect in LexiComp but frequency is not reported

All medications included below were approved by the expert panel

**Table A1: Inclusion criteria for list of medications associated with Unintentional Weight and Appetite Loss**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Major Medication Category** | **Medication name** | **Literature search** | **Incidence for Weight Loss/Anorexia/Decreased Appetite in Lexicomp or US FDA Drug Inserts** | **Present in AGS 2015 Beers List** | **If “yes” did the rationale in the AGS 2015 Beers List mention the syndrome?** |
| Antidepressants | Fluoxetine | [1, 2] | 4 - 17% | Yes | No |
| Sertraline | [2] | 3 - 11% | Yes | No |
| Duloxetine | [2] | 6 - 8% | Yes | Yes |
| Anticonvulsants | Topiramate | [1] | 4 - 15% | Yes | No |
| Zonisamide | [1] | 3% | Yes | No |
| Bupropion | [1] | 14 - 23% | Yes | No |
| Antidiabetics | Acarbose | [1] | -- | No | n/a |
| Exenatide | [1] | 1 - 5% | No | n/a |
| Liraglutide | [1] | 10% | No | n/a |
| Metformin | [1, 2] | -- | No | n/a |
| Miglitol | [1] | -- | No | n/a |
| Pramlintide | [1] | ≤17% | No | n/a |
| Antimicrobial | Azithromycin | [2] | 2 - 10% | No | n/a |
| Xifaxan | [2] | 2 - 5% | No | n/a |
| Others | Amantadine | [3] | 1 - 10% | No | n/a |
| Donepezil | [4] | 2 - 8% | Yes | No |
| Galantamine | [4] | 5 - 9% | Yes | No |
| Rivastigmine | [4] | 3 - 26% | Yes | No |

**TableA2: Inclusion criteria for list of medications associated with Depression**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Medication**  **name** | **Literature search\*** | **Incidence for Depression/Emotional disturbances/Mood changes in Lexicomp or US FDA Drug Inserts** | **Present on the AGS 2015 Beers List** | **If “Yes” did the rationale in the AGS 2015 Beers List mention the syndrome?** |
| Antipsychotics | Aripiprazole | [5] | <1% | Yes | No |
| Quetiapine (fumarate) | [5] | 1-3% | Yes | No |
| Anticonvulsants | Topiramate | [6] | ≤9% | Yes | No |
| Levetiracetam | [7, 8] | 3-5% | Yes | No |
| Phenytoin | [9, 10] | Frequency undefined | Yes | No |
| Primidone | [11] | Frequency undefined | Yes | No |
| Tiagabine | [10] | 1-7% | Yes | No |
| Vigabatrin | [12] | 4-7% | Yes | No |
| Phenobarbital | [13] | Frequency undefined | Yes | No |
| Opioid agonists | Loperamide | [14] | -- | Yes | No |
| Meperidine | [14] | Frequency undefined | Yes | No |
| Pentazocine | [14] | Frequency undefined | Yes | No |
| Propoxyphene | [14] | Frequency undefined | Yes | No |
| Tramadol | [14] | 1-5% | Yes | No |
| Acetylmorphine | [14] | -- | Yes | No |
| Alphaprodine | [14] | -- | Yes | No |
| Anileridine | [14] | -- | Yes | No |
| Bromadol | [14] | -- | Yes | No |
| Buprenorphine | [14] | 1-11% | Yes | No |
| Carfentanil | [14] | -- | Yes | No |
| Codeine | [14] | Frequency undefined | Yes | No |
| Desomorphine | [14] | -- | Yes | No |
| Dextropropoxyphene | [14] | Frequency undefined | Yes | No |
| Diacetyldihydromorphine | [14] | -- | Yes | No |
| Diacetylmorphine | [14] | -- | Yes | No |
| Dibenzoylmorphine | [14] | -- | Yes | No |
| Dihydrocodeine | [14] | -- | Yes | No |
| Dihydromorphine | [14] | -- | Yes | No |
| Diphenoxylate | [14] | Frequency undefined | Yes | No |
| Dipropanoylmorphine | [14] | -- | Yes | No |
| Ethymorphine | [14] | -- | Yes | No |
| Etonitazene | [14] | -- | Yes | No |
| Fentanyl | [14] | 1-10% | Yes | No |
| Hydrocodone | [14] | 1-10% | Yes | No |
| Hydromorphone | [14] | Frequency undefined | Yes | No |
| Levorphanol | [14] | Frequency undefined | Yes | No |
| Methadone | [14] | -- | Yes | No |
| Morphine | [14] | 1-10% | Yes | No |
| Nicomorphine | [14] | -- | Yes | No |
| Opium | [14] | -- | Yes | No |
| Oxycodone | [14] | <1% | Yes | No |
| Oxymorphone | [14] | <10% | Yes | No |
| Papaverine | [14] | Frequency undefined | Yes | No |
| Pethidine | [14] | Frequency undefined | Yes | No |
| Tapentadol | [14] | 1% | Yes | No |
| Thebaine | [14] | -- | Yes | No |
| Antihypertensives | Methyldopa | [15] | Frequency undefined | Yes | No |
| Clonidine | [16] | 1-4% | Yes | No |
| Sotalol | [17] | 1-4% | No | n/a |
| Acebutolol | [17] | 2% | No | n/a |
| Atenolol | [17] | 1-10% | No | n/a |
| Betaxolol | [17] | <1% | No | n/a |
| Bisoprolol | [17] | <1% | No | n/a |
| Bucindolol | [17] | -- | No | n/a |
| Carteolol | [17] | -- | No | n/a |
| Carvedilol | [17] | 1-10% | No | n/a |
| Esmolol | [17] | <1% | No | n/a |
| Labetalol | [17] | Frequency undefined | No | n/a |
| Metoprolol | [17] | 5% | No | n/a |
| Nadolol | [17] | 1-10% | No | n/a |
| Nebivolol | [17] | -- | No | n/a |
| Penbutolol | [17] | -- | No | n/a |
| Pindolol | [17] | -- | No | n/a |
| Propranolol | [18, 19] | <1% | No | n/a |
| Timolol | [17] | Frequency undefined | No | n/a |
| Reserpine | [20] | Frequency undefined | Yes | No |
| Hormone Replacement | Beclomethasone | [21-23] | -- | Yes | No |
| Budesonide | [21-23] | -- | Yes | No |
| Buserelin | [24, 25] | 8% | No | n/a |
| Ciclesonide | [21-23] | -- | Yes | No |
| Cortisone | [21-23] | -- | Yes | No |
| Deslorelin | [24, 25] | -- | No | n/a |
| Desogestrel/Ethinyl Estradiol | [26, 27] | -- | No | n/a |
| Dexamethasone | [21-23] | -- | Yes | No |
| Dienogest/Estradiol Valerate | [26, 27] | -- | No | n/a |
| Drospirenone/Ethinyl Estradiol | [26, 27] | -- | No | n/a |
| Drospirenone/Ethinyl Estradiol/Levomefolate | [26, 27] | -- | No | n/a |
| Ethynodioldiacetate/Ethinyl Estradiol | [26, 27] | -- | No | n/a |
| Fludrocortisone | [21-23] | Frequency undefined | Yes | No |
| Flunisolide | [21-23] | -- | Yes | No |
| Fluticasone | [21-23] | <1% | Yes | No |
| Goserelin | [24, 25] | 10-54% | No | n/a |
| Histrelin | [24, 25] | <2% | No | n/a |
| Hydrocortisone | [21-23] | Frequency undefined | Yes | No |
| Leuprorelin | [24, 25] | ≤31% | No | n/a |
| Levonorgestrel | [26, 27] | -- | No | n/a |
| Levonorgestrel/Ethinyl Estradiol | [26, 27] | -- | No | n/a |
| Mestranol/Norethindrone | [26, 27] | Frequency undefined | No | n/a |
| Methylprednisolone | [21-23] | Frequency undefined | Yes | No |
| Mometasone | [21-23] | 10% | Yes | No |
| Nafarelin | [24, 25] | 3% | No | n/a |
| Norethindrone | [26, 27] | Frequency undefined | No | n/a |
| Norethindrone/Ethinyl Estradiol | [26, 27] | 4-6% | No | n/a |
| Norethindrone/Ethinyl Estradiol/Fe | [26, 27] | 2% | No | n/a |
| Norgestimate/Ethinyl Estradiol | [26, 27] | Frequency undefined | No | n/a |
| Norgestrel/Ethinyl Estradiol | [26, 27] | -- | No | n/a |
| Norgestrel/Ethinyl Estradiol/Fe | [26, 27] | -- | No | n/a |
| Prednisolone | [21-23] | -- | Yes | No |
| Prednisone | [21-23, 28] | Frequency undefined | Yes | No |
| Propionate | [21-23] | -- | Yes | No |
| Tamoxifen | [29, 30] | 2-18% | No | n/a |
| Triamcinolone | [21-23] | Frequency undefined | Yes | No |
| Triptorelin | [24, 25] | Frequency undefined | No | n/a |
| Ulipristal | [26, 27] | -- | No | n/a |
| Others | Avitriptan | [31] | -- | No | n/a |
| Almotriptan | [31] | -- | No | n/a |
| Donitriptan | [31] | -- | No | n/a |
| Efavirenz | [32] | ≤19% | No | n/a |
| Eletriptan | [31] | <1% | No | n/a |
| Frovatriptan | [31] | <1% | No | n/a |
| Interferon - α | [33-38] | >10% | No | n/a |
| Interferon - β | [39-41] | <1% | No | n/a |
| Isotretinoin | [42-48] | Frequency undefined | No | n/a |
| Naratriptan | [31] | <1% | No | n/a |
| Rizatriptan | [31] | -- | No | n/a |
| Sumatriptan | [31] | -- | No | n/a |
| Varenicline | [49] | 4-11% | No | n/a |
| Zolmitriptan | [31] | ≤1% | No | n/a |

\*Drug list and references adapted from Chapter 18: Depression by Sheila Botts and Melody Ryan in [15]

**Table A3: Inclusion criteria for list of medications associated with Urinary Incontinence**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Major Medication Category** | **Medication name** | **Literature search** | **Incidence for Urinary Incontinence in Lexicomp or US FDA Drug Inserts** | **Present on the AGS 2015 Beers List** | **If “Yes” did the rationale in the AGS 2015 Beers List mention the syndrome?** |
| Antipsychotics | Aripiprazole | [50] | ≤5% | Yes | No |
| Quetiapine (fumarate) | [50] | -- | Yes | No |
| Asenapine | [50] | -- | Yes | No |
| Chlorpromazine | [50] | 1 - 10% | Yes | No |
| Clozapine | [50, 51] | 1-2% | Yes | No |
| Fluphenazine | [50] | -- | Yes | No |
| Haloperidol | [50] | -- | Yes | No |
| Iloperidone | [50] | ≥1% | Yes | No |
| Loxapine | [50] | -- | Yes | No |
| Lurasidone | [50] | -- | Yes | No |
| Olanzapine | [50] | ≥2% | Yes | No |
| Paliperidone | [50] | ≤2% | Yes | No |
| Perphenazine | [50] | Frequency undefined | Yes | No |
| Pimozide | [50] | -- | Yes | No |
| Promazine | [50] | -- | Yes | No |
| Risperidone | [50] | <4% | Yes | No |
| Thioridazine | [50] | -- | Yes | No |
| Thiothixene | [50] | -- | Yes | No |
| Trifluoperazine | [50] | -- | Yes | No |
| Triflupromazine | [50] | -- | Yes | No |
| Ziprasidone | [50] | <1% | Yes | No |
| Antidepressants | Clomipramine | [50] | 5% | Yes | No |
| Doxepin | [50] | <1% | Yes | No |
| Imipramine | [50] | -- | Yes | No |
| Antiepileptics | Gabapentin | [52] | -- | Yes | No |
| Pregabalin | [52] | ≤3% | Yes | No |
| Antiparkinsonism | Reserpine | [50] | -- | Yes | No |
| Opioid agonists | Tramadol | [53] | 1 – 5% | Yes | No |
| Buprenorphine | [53] | <1% | Yes | No |
| Codeine | [53] | -- | Yes | No |
| Hydrocodone | [53] | -- | Yes | No |
| Methadone | [53] | -- | Yes | No |
| Morphine | [53] | 1 - 10 % | Yes | No |
| Oxycodone | [53] | -- | Yes | No |
| Oxymorphone | [53] | -- | Yes | No |
| Antihypertensives | Clonidine | [53] | 1 – 4% | Yes | No |
| Methyldopa | [53] | -- | Yes | No |
| Guanabenz | [53] | -- | Yes | No |
| Guanfacine | [53] | 2 – 5% | Yes | No |
| Spironolactone | [53] | -- | Yes | No |
| Tizanidine | [53] | -- | No | n/a |
| Triamterene | [50, 53] | -- | Yes | No |
| Amiloride | [50, 53] | -- | Yes | No |
| Bumetanide | [50, 53] | -- | No | n/a |
| Chlorthalidone | [50, 53] | -- | No | n/a |
| Eplerenone | [50, 53] | -- | No | n/a |
| Ethacrynic acid | [50, 53] | -- | No | n/a |
| Furosemide | [50, 53] | -- | No | n/a |
| Hydrochlorothiazide | [53] | -- | No | n/a |
| Torsemide | [50] | -- | No | n/a |
| Reserpine | [48] | -- | Yes | No |
| Doxazosin\* | [53] | 1% | Yes | No |
| Prazosin\* | [53] | -- | Yes | No |
| Terazosin\* | [53] | <1% | Yes | No |
| Alfuzosin\* | [53] | -- | No | n/a |
| Silodosin\* | [53] | -- | No | n/a |
| Tamsulosin\* | [53] | -- | No | n/a |
| Anticholinergics and/or Antihistaminics | Benztropine | [53] | -- | Yes | Yes |
| Chlorpheniramine | [53] | -- | Yes | Yes |
| Dicyclomine | [53] | -- | Yes | Yes |
| Diphenhydramine | [53] | -- | Yes | Yes |
| Doxylamine | [53] | -- | Yes | Yes |
| Hydroxyzine | [53] | -- | Yes | Yes |
| Scopolamine (Hyoscine) | [53] | -- | Yes | No |
| Trihexyphenidyl | [53] | -- | Yes | No |
| Glycopyrrolate | [53] | 15 % | No | n/a |
| Ipratropium | [53] | -- | No | n/a |
| Tiotropium | [53] | -- | No | n/a |
| Muscle Relaxers | Orphenadrine | [54] | -- | Yes | Yes |
| Others | Mirabegron |  | -- | No | n/a |

**\*In women only**

**Table A4: Inclusion criteria for list of medications associated with Delirium**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Major Medication Category** | **Medication name** | **Literature search** | **Incidence for Delirium or confusion in LexiComp or US FDA Drug Inserts** | **Present on the AGS 2015 Beers List** | **If “Yes” did the rationale in the AGS 2015 Beers List mention the syndrome?** |
| Antidepressants [55] | Mirtazapine | [56-60] | <2% | Yes | No |
| Clomipramine | [57, 59, 61, 62] | <3% | Yes | Yes |
| Doxepin | [57-59, 61, 62] | Frequency undefined | Yes | Yes |
| Imipramine | [57, 59-62] | Frequency undefined | Yes | Yes |
| Amitriptyline | [56, 57, 59-62] | Frequency undefined | Yes | Yes |
| Desipramine | [57, 59-62] | Frequency undefined | Yes | Yes |
| Nortriptyline | [57-62] | Frequency undefined | Yes | Yes |
| Protriptyline | [59, 62] | Frequency undefined | Yes | Yes |
| Trimipramine | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Amozapine | [55] | -- | No | n/a |
| Butriptyline | [55] | -- | No | n/a |
| Dosulepin | [59] | -- | No | n/a |
| Iprindole | [55] | -- | No | n/a |
| Lofepramine | [55] | -- | No | n/a |
| Opipramol | [59] | -- | No | n/a |
| Antiepileptics | Oxcarbazepine | [57, 59, 61, 62] | 1-10% | No | n/a |
| Carbamazepine | [57, 59, 61, 62] | Frequency undefined | Yes | No |
| Lithium | [58, 59] | Frequency undefined | Yes | No |
| Antiparkinsonism | Entacapone | [59, 60] | <1% | No | n/a |
| Tolcapone | [55] | 10-11% | No | n/a |
| Bromocriptine | [59, 62] | Frequency undefined | No | n/a |
| Benzodiazapines [63] | Alprazolam | [57, 59, 61] | 1-10% | Yes | Yes |
| Chlordiazepoxide | [57, 59, 62] | Frequency undefined | Yes | Yes |
| Clonazepam | [57, 59, 62] | Frequency undefined | Yes | Yes |
| Clorazepate | [57, 59, 61] | Frequency undefined | Yes | Yes |
| Diazepam | [57-59, 61, 62] | Frequency undefined | Yes | Yes |
| Estazolam | [57, 59] | 2% | Yes | Yes |
| Flurazepam | [57, 59] | Frequency undefined | Yes | Yes |
| Halazepam | [63] | -- | Yes | Yes |
| Lorazepam | [57, 59] | Frequency undefined | Yes | Yes |
| Oxazepam | [56, 57, 59] | Frequency undefined | Yes | Yes |
| Quazepam | [63] | Frequency undefined | Yes | Yes |
| Temazepam | [56-59, 62] | 1-10% | Yes | Yes |
| Triazolam | [57, 59, 62] | <1% | Yes | Yes |
| Bretazenil | [63] | -- | Yes | Yes |
| Bromazepam | [63] | Frequency undefined | Yes | Yes |
| Camazepam | [63] | -- | Yes | Yes |
| Cinolazepam | [63] | -- | Yes | Yes |
| Clobazam | [63] | Frequency undefined | Yes | Yes |
| Clotiazepam | [63] | -- | Yes | Yes |
| Cloxazolam | [63] | -- | Yes | Yes |
| Delorazepam | [63] | -- | Yes | Yes |
| Diclazepam | [63] | -- | Yes | Yes |
| Ethyl carfluzepate | [63] | -- | Yes | Yes |
| Ethyl loflazepate | [63] | -- | Yes | Yes |
| Etizolam | [63] | -- | Yes | Yes |
| Flubromazepam | [63] | -- | Yes | Yes |
| Flunitrazepam | [63] | -- | Yes | Yes |
| Flutoprazepam | [63] | -- | Yes | Yes |
| Ketazolam | [63] | -- | Yes | Yes |
| Loprazolam | [63] | -- | Yes | Yes |
| Lormetazepam | [63] | -- | Yes | Yes |
| Medazepam | [63] | -- | Yes | Yes |
| Midazolam | [59] | <1% | Yes | Yes |
| Nimetzepam | [63] | -- | Yes | Yes |
| Nitrazepam | [63] | Frequency undefined | Yes | Yes |
| Nordazepam | [63] | -- | Yes | Yes |
| Phenazepam | [63] | -- | Yes | Yes |
| Pinazepam | [63] | -- | Yes | Yes |
| Prazepam | [63] | -- | Yes | Yes |
| Premazepam | [63] | -- | Yes | Yes |
| Pyrazolam | [63] | -- | Yes | Yes |
| Tetrazepam | [63] | -- | Yes | Yes |
| Clidinium-Chlordiazepoxide | [63] | -- | Yes | Yes |
| Non-Benzodiazepine Hypnotics [55] | Amobarbital | [55] | -- | Yes | Yes |
| Butabarbital | [55] | <1% | Yes | Yes |
| Butalbital | [57] | -- | Yes | Yes |
| Mephobarbital | [55] | -- | Yes | Yes |
| Pentobarbital | [55] | Frequency undefined | Yes | Yes |
| Secobarbital | [55] | <1% | Yes | Yes |
| Aprobarbital | [55] | -- | Yes | Yes |
| Hexobarbital | [57] | -- | Yes | Yes |
| Bentazepam | [55] | -- | Yes | Yes |
| Brotizolam | [55] | -- | Yes | Yes |
| Deschloroetizolam | [55] | -- | Yes | Yes |
| Zaleplon | [57] | ≤1% | Yes | Yes |
| Zolpidem | [56, 57] | 1-10% | Yes | Yes |
| Baclofen | [59, 60] | 1-11% | Yes | Yes |
| Chloral Hydrate | [55] | Frequency undefined | Yes | Yes |
| Glutethimide | [55] | -- | Yes | Yes |
| Paraldehyde | [55] | -- | Yes | Yes |
| Zopiclone | [56] | Frequency undefined | Yes | Yes |
| Eszopiclone | [55] | ≤3% | Yes | Yes |
| Meprobamate | [57] | -- | Yes | Yes |
| Phenobarbital | [57, 59] | Frequency undefined | Yes | Yes |
| Opioid agonists [63] | Opium | [57] | -- | Yes | Yes |
| Tramadol | [56, 57, 59, 62] | 1-5% | Yes | Yes |
| Codeine | [56, 57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Hydrocodone | [57-59] | <1% | Yes | Yes |
| Methadone | [57, 59] | Frequency undefined | Yes | Yes |
| Morphine | [57, 59, 61, 62] | >10% | Yes | Yes |
| Oxycodone | [57, 59, 62] | 1-5% | Yes | Yes |
| Oxymorphone | [63] | 3% | Yes | Yes |
| Loperamide | [57, 59, 60, 62] | Frequency undefined | Yes | Yes |
| Meperidine | [59, 61, 62] | Frequency undefined | Yes | Yes |
| Propoxyphene | [57-59] | -- | Yes | Yes |
| Acetylmorphine | [63] | -- | Yes | Yes |
| Alphaprodine | [63] | -- | Yes | Yes |
| Anileridine | [63] | -- | Yes | Yes |
| Bromadol | [63] | -- | Yes | Yes |
| Carfentanil | [63] | -- | Yes | Yes |
| Desomorphine | [63] | -- | Yes | Yes |
| Dextropropoxyphene | [63] | -- | Yes | Yes |
| Diacetyldihydromorphine | [63] | -- | Yes | Yes |
| Diacetylmorphine | [63] | -- | Yes | Yes |
| Dibenzoylmorphine | [63] | -- | Yes | Yes |
| Dihydrocodeine | [63] | -- | Yes | Yes |
| Dihydromorphine | [63] | -- | Yes | Yes |
| Diphenoxylate | [57] | Frequency undefined | Yes | Yes |
| Dipropanoylmorphine | [63] | -- | Yes | Yes |
| Ethymorphine | [63] | -- | Yes | Yes |
| Etonitazene | [63] | -- | Yes | Yes |
| Fentanyl | [57-59, 61, 62] | >10% | Yes | Yes |
| Hydromorphone | [63] | Frequency undefined | Yes | Yes |
| Levorphanol | [63] | Frequency undefined | Yes | Yes |
| Nicomorphine | [63] | -- | Yes | Yes |
| Pethidine | [61] | Frequency undefined | Yes | Yes |
| Tapentadol | [63] | 1% | Yes | Yes |
| Thebaine | [63] | -- | Yes | Yes |
| Papaverine | [57] | Frequency undefined | Yes | Yes |
| Buprenorphine | [63] | Frequency undefined | Yes | Yes |
| Pentazocine | [57] | Frequency undefined | Yes | Yes |
| Antihypertensives | Tizanidine | [59, 60] | Frequency undefined | No | n/a |
| Antiarrhythmic | Disopyramide | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Digoxin | [59, 61] | Frequency undefined | Yes | No |
| Anticholinergics and/or Antihistaminics [55] | Dicyclomine | [57-62] | Frequency undefined | Yes | Yes |
| Scopolamine (Hyoscine) | [59, 61, 62] | Frequency undefined | Yes | Yes |
| Trihexyphenidyl | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Glycopyrrolate | [55] | Frequency undefined | No | n/a |
| Ipratropium | [56, 59] | -- | No | n/a |
| Tiotropium | [56] | -- | No | n/a |
| Hyoscyamine | [57-62] | Frequency undefined | Yes | Yes |
| Propantheline | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Clidinium | [57, 59] | -- | Yes | Yes |
| Emepronium | [59] | -- | No | n/a |
| Methscopolamine | [57] | Frequency undefined | No | n/a |
| Procyclidine | [59, 61, 62] | Frequency undefined | No | n/a |
| Propiverine | [59] | -- | No | n/a |
| Tropatepine | [59] | -- | No | n/a |
| Benztropine | [57, 59-62] | Frequency undefined | Yes | Yes |
| Clemastine | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Atropine | [58-62] | Frequency undefined | Yes | Yes |
| Belladonna alkaloids | [57, 59, 61] | -- | Yes | Yes |
| Doxylamine | [57, 59] | Frequency undefined | Yes | Yes |
| Hydroxyzine | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Brompheniramine | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Dimenhydrinate | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Loratadine | [57, 59, 60] | <2% | No | n/a |
| Tripelennamine | [57] | -- | No | n/a |
| Alimemazine | [59, 61] | -- | No | n/a |
| Phenyltoloxamine | [57] | -- | No | n/a |
| Pyrilamine | [59, 61, 62] | -- | No | n/a |
| Cyproheptadine | [57, 60-62] | Frequency undefined | Yes | Yes |
| Dexbrompheniramine | [57] | -- | Yes | Yes |
| Dexchlorpheniramine | [57, 59] | Frequency undefined | Yes | Yes |
| Triprolidine | [57] | -- | Yes | Yes |
| Azatadine | [57] | -- | No | n/a |
| Pheniramine | [57] | -- | No | n/a |
| Fesoterodine | [59] | Frequency undefined | Yes | Yes |
| Benzhexol | [55] | Frequency undefined | No | n/a |
| Darifenacin | [59, 61, 62] | Frequency undefined | Yes | Yes |
| Flavoxate | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Homatropine | [59] | Frequency undefined | Yes | Yes |
| Oxybutynin | [56-62] | 1-5% | Yes | Yes |
| Solifenacin | [59] | <1% | Yes | Yes |
| Tolterodine | [56-62] | <1% | Yes | Yes |
| Trospium | [59] | <1% | Yes | Yes |
| Diphenhydramine | [57, 58, 60-62] | Frequency undefined | Yes | Yes |
| Carbinoxamine | [59, 61, 62] | Frequency undefined | Yes | Yes |
| Desloratadine | [59] | -- | No | n/a |
| Fexofenadine | [59] | -- | No | n/a |
| Levocetirizine | [59] | -- | No | n/a |
| Cetirizine | [57, 59, 60] | <2% | No | n/a |
| Chlorpheniramine | [57, 59-62] | Frequency undefined | Yes | Yes |
| Cimetidine | [59-62] | Frequency undefined | Yes | Yes |
| Famotidine | [59] | <1% | Yes | Yes |
| Nizatidine | [59] | <1% | Yes | Yes |
| Ranitidine | [58-60, 62] | Frequency undefined | Yes | Yes |
| Astemizole | [57] | -- | No | n/a |
| Ketotifen | [59] | -- | No | n/a |
| Antiemetic [55] | Meclizine | [57, 59-62] | Frequency undefined | Yes | Yes |
| Levomepromazine | [59, 60, 62] | -- | No | n/a |
| Droperidol | [55] | Frequency undefined | No | n/a |
| Domperidone | [59] | -- | No | n/a |
| Muscle Relaxers [55] | Orphenadrine | [57, 61, 62] | Frequency undefined | Yes | Yes |
| Carisoprodol | [57, 59, 60] | Frequency undefined | Yes | Yes |
| Chlorzoxazone | [57] | -- | Yes | Yes |
| Cyclobenzaprine | [57, 59-62] | 1-3% | Yes | Yes |
| Metaxalone | [57] | -- | Yes | Yes |
| Methocarbamol | [57, 59, 60] | Frequency undefined | Yes | Yes |
| Alverine | [59, 61] | -- | No | n/a |
| Camsoprodol | [55] | -- | No | n/a |
| Chlorphenasin | [55] | -- | No | n/a |
| Dantrolene | [55] | Frequency undefined | No | n/a |
| Other | Amantadine | [59-62] | 1-10% | No | n/a |
| Theophylline | [59, 61, 62] | -- | Yes | Yes |

**Table A5: Inclusion criteria for list of medications associated with Cognitive Impairment**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Major Medication Category** | **Medication Name** | **Literature Search** | **Incidence for memory/cognitive impairment/dysfunction, mental deficiency, decreased mental acuity/amnesia in Lexicomp or US FDA Drug Inserts** | **Present on the AGS 2015 Beers List** | **If “Yes” did the rationale in the AGS 2015 Beers List mention the syndrome?** |
| Antipsychotics | Thioproperazine |  | -- | Yes | Yes |
| Timiperone |  | -- | Yes | Yes |
| Aripiprazole | [59] | <1% | Yes | Yes |
| Quetiapine (fumarate) | [57-61, 64, 65] | -- | Yes | Yes |
| Asenapine | [59] | -- | Yes | Yes |
| Clozapine | [58, 60-62, 65] | -- | Yes | Yes |
| Iloperidone | [59] | -- | Yes | Yes |
| Lurasidone | [55] | -- | Yes | Yes |
| Olanzapine | [57-62, 64, 65] | -- | Yes | Yes |
| Paliperidone | [59] | -- | Yes | Yes |
| Risperidone | [56, 57, 59-61, 64, 66] | -- | Yes | Yes |
| Ziprasidone | [57, 59] | Frequency undefined | Yes | Yes |
| Molindone | [59, 61, 62] | -- | Yes | Yes |
| Amisulpride |  | -- | Yes | Yes |
| Blonanserin |  | -- | Yes | Yes |
| Clotapine |  | -- | Yes | Yes |
| Melperone | [56] | -- | Yes | Yes |
| Nemonapride |  | -- | Yes | Yes |
| Remoxipride |  | -- | Yes | Yes |
| Sertindole |  | -- | Yes | Yes |
| Zotepine |  | -- | Yes | Yes |
| Fluspirilene |  | -- | Yes | Yes |
| Chlorpromazine | [57-62, 64, 66] | -- | Yes | Yes |
| Fluphenazine | [57, 59, 60, 62] | -- | Yes | Yes |
| Perphenazine | [57, 59-61, 64] | -- | Yes | Yes |
| Promazine | [59, 61, 65] | -- | Yes | Yes |
| Thioridazine | [56-62, 64, 65] | -- | Yes | Yes |
| Trifluoperazine | [57, 59, 61, 64] | -- | Yes | Yes |
| Triflupromazine | [57] | -- | Yes | Yes |
| Mesoridazine |  | -- | Yes | Yes |
| Prochlorperazine | [57, 59, 60, 62, 64, 66] | -- | Yes | Yes |
| Promethazine | [57, 59-62] | -- | Yes | Yes |
| Acepromazine | [59, 67] | -- | Yes | Yes |
| Aceprometazine | [59, 67] | -- | Yes | Yes |
| Dixyrazine |  | -- | Yes | Yes |
| Pipotiazine |  | -- | Yes | Yes |
| Prothipendyl |  | -- | Yes | Yes |
| Perphenazine-amitriptyline | [60] | -- | Yes | Yes |
| Haloperidol | [57, 59-61, 66] | -- | Yes | Yes |
| Loxapine | [57, 59, 61, 62] | -- | Yes | Yes |
| Pimozide | [59, 61, 62] | -- | Yes | Yes |
| Thiothixene | [59, 60, 62] | -- | Yes | Yes |
| Benperidol |  | -- | Yes | Yes |
| Chlorprothixene | [57] | -- | Yes | Yes |
| Clopentixol |  | -- | Yes | Yes |
| Cyamemazine |  | -- | Yes | Yes |
| Flupentixol |  | -- | Yes | Yes |
| Penfluiridol |  | -- | Yes | Yes |
| Perazine |  | -- | Yes | Yes |
| Pericyazine | [56] | -- | Yes | Yes |
| Zuclopenthixol |  | -- | Yes | Yes |
| Antidepressants | Mirtazapine | [56, 57, 59, 60] | -- | No | n/a |
| Clomipramine | [57, 59, 61, 62, 67] | 7-9% | Yes | Yes |
| Doxepin | [57-59, 61, 62, 64, 65] | -- | Yes | Yes |
| Imipramine | [57, 59, 61, 62, 64, 66, 67] | -- | Yes | Yes |
| Amitriptyline | [56-62, 64-67] | Frequency undefined | Yes | Yes |
| Desipramine | [57, 59-62, 64] | -- | Yes | Yes |
| Nortriptyline | [57-62, 64, 65] | -- | Yes | Yes |
| Protriptyline | [59, 62, 66] | -- | Yes | Yes |
| Trimipramine | [57, 59, 61, 62, 67] | -- | Yes | Yes |
| Amozapine |  | -- | No | n/a |
| Butriptyline |  | -- | No | n/a |
| Dosulepin | [59, 66] | -- | No | n/a |
| Iprindole | [55] | -- | No | n/a |
| Lofepramine |  | -- | No | n/a |
| Opipramol | [59] | -- | No | n/a |
| Amoxapine | [59, 61] | -- | Yes | Yes |
| Antiepileptics | Oxcarbazepine | [57, 59, 61, 62] | Frequency undefined | Yes | No |
| Carbamazepine | [57, 59, 61, 62, 64] | -- | Yes | No |
| Lithium | [58, 59, 66] | Frequency undefined | Yes | No |
| Antiparkinsonism | Entacapone | [59, 60] | -- | No | n/a |
| Tolcapone |  | 1% | No | n/a |
| Bromocriptine | [59, 62] | Frequency undefined | No | n/a |
| Benzodiazapines [68] | Alprazolam | [57, 59, 61, 64] | >10% | Yes | Yes |
| Chlordiazepoxide | [57, 59, 62, 64] | Frequency undefined | Yes | Yes |
| Clonazepam | [57, 59, 62, 66] | Frequency undefined | Yes | Yes |
| Clorazepate | [57, 59, 61] | Frequency undefined | Yes | Yes |
| Diazepam | [57-59, 61, 62, 65, 66] | Frequency undefined | Yes | Yes |
| Estazolam | [57, 59] | Frequency undefined | Yes | Yes |
| Flurazepam | [57, 59] | Frequency undefined | Yes | Yes |
| Halazepam | [68] | -- | Yes | Yes |
| Lorazepam | [57, 59] | Frequency undefined | Yes | Yes |
| Oxazepam | [56, 57, 59] | Frequency undefined | Yes | Yes |
| Quazepam | [68] | Frequency undefined | Yes | Yes |
| Temazepam | [56-59, 62, 66] | Frequency undefined | Yes | Yes |
| Triazolam | [57, 59, 62, 64] | <1% | Yes | Yes |
| Bretazenil | [68] | -- | Yes | Yes |
| Bromazepam | [68] | Frequency undefined | Yes | Yes |
| Camazepam | [68] | -- | Yes | Yes |
| Cinolazepam | [68] | -- | Yes | Yes |
| Clobazam | [68] | Frequency undefined | Yes | Yes |
| Clotiazepam | [68] | -- | Yes | Yes |
| Cloxazolam | [68] | -- | Yes | Yes |
| Delorazepam | [68] | -- | Yes | Yes |
| Diclazepam | [68] | -- | Yes | Yes |
| Ethyl carfluzepate | [68] | -- | Yes | Yes |
| Ethyl loflazepate | [68] | -- | Yes | Yes |
| Etizolam | [68] | -- | Yes | Yes |
| Flubromazepam | [68] | -- | Yes | Yes |
| Flunitrazepam | [68] | -- | Yes | Yes |
| Flutoprazepam | [68] | -- | Yes | Yes |
| Ketazolam | [68] | -- | Yes | Yes |
| Loprazolam | [68] | -- | Yes | Yes |
| Lormetazepam | [68] | -- | Yes | Yes |
| Medazepam | [68] | -- | Yes | Yes |
| Midazolam | [59] | Frequency undefined | Yes | Yes |
| Nimetzepam | [68] | -- | Yes | Yes |
| Nitrazepam | [68] | Frequency undefined | Yes | Yes |
| Nordazepam | [68] | -- | Yes | Yes |
| Phenazepam | [68] | -- | Yes | Yes |
| Pinazepam | [68] | -- | Yes | Yes |
| Prazepam | [68] | -- | Yes | Yes |
| Premazepam | [68] | -- | Yes | Yes |
| Pyrazolam | [68] | -- | Yes | Yes |
| Tetrazepam | [68] | -- | Yes | Yes |
| Clidinium-Chlordiazepoxide | [68] | -- | Yes | Yes |
| Non-Benzodiazepine Hypnotics | Amobarbital |  | Frequency undefined | Yes | Yes |
| Butabarbital |  | Frequency undefined | Yes | Yes |
| Butalbital | [57] | -- | Yes | Yes |
| Mephobarbital |  | -- | Yes | Yes |
| Pentobarbital |  | Frequency undefined | Yes | Yes |
| Secobarbital |  | Frequency undefined | Yes | Yes |
| Aprobarbital |  | -- | Yes | Yes |
| Hexobarbital | [57] | -- | Yes | Yes |
| Bentazepam |  | -- | Yes | Yes |
| Brotizolam | [55] | -- | Yes | Yes |
| Deschloroetizolam |  | -- | Yes | Yes |
| Zaleplon | [57] | 2-4% | Yes | Yes |
| Zolpidem | [56, 57] | Frequency undefined | Yes | Yes |
| Baclofen | [59, 60, 64] | <1% | Yes | Yes |
| Chloral Hydrate |  | Frequency undefined | Yes | Yes |
| Glutethimide |  | -- | Yes | Yes |
| Paraldehyde |  | Frequency undefined | Yes | Yes |
| Zopiclone | [56] | Frequency undefined | Yes | Yes |
| Eszopiclone |  | <1% | Yes | Yes |
| Meprobamate | [57] | Frequency undefined | Yes | Yes |
| Phenobarbital | [57, 59] | -- | Yes | Yes |
| Opioid agonists [69] | Opium | [57] | -- | Yes | Yes |
| Tramadol | [56, 57, 59, 62, 64, 66] | <1% | Yes | Yes |
| Codeine | [56, 57, 59, 61, 62, 64, 66] | Frequency undefined | Yes | Yes |
| Hydrocodone | [57-59, 64] | Frequency undefined | Yes | Yes |
| Methadone | [57, 59, 64] | Frequency undefined | Yes | Yes |
| Morphine | [57, 59, 61, 62, 64] | Frequency undefined | Yes | Yes |
| Oxycodone | [57, 59, 62, 64, 66] | Frequency undefined | Yes | Yes |
| Oxymorphone | [69] | Frequency undefined | Yes | Yes |
| Loperamide | [57, 59, 60, 62, 64, 66] | Frequency undefined | Yes | Yes |
| Meperidine | [59, 61, 62] | Frequency undefined | Yes | Yes |
| Propoxyphene | [57-59, 64, 65] | -- | Yes | Yes |
| Acetylmorphine | [69] | -- | Yes | Yes |
| Alphaprodine | [69] | -- | Yes | Yes |
| Anileridine | [69] | -- | Yes | Yes |
| Bromadol | [69] | -- | Yes | Yes |
| Carfentanil | [69] | -- | Yes | Yes |
| Desomorphine | [69] | -- | Yes | Yes |
| Dextropropoxyphene | [69] | -- | Yes | Yes |
| Diacetyldihydromorphine | [69] | -- | Yes | Yes |
| Diacetylmorphine | [69] | -- | Yes | Yes |
| Dibenzoylmorphine | [69] | -- | Yes | Yes |
| Dihydrocodeine | [69] | Frequency undefined | Yes | Yes |
| Dihydromorphine | [69] | -- | Yes | Yes |
| Diphenoxylate | [57] | -- | Yes | Yes |
| Dipropanoylmorphine | [69] | -- | Yes | Yes |
| Ethymorphine | [69] | -- | Yes | Yes |
| Etonitazene | [69] | -- | Yes | Yes |
| Fentanyl | [57-59, 61, 62, 66] | Frequency undefined | Yes | Yes |
| Hydromorphone | [69] | Frequency undefined | Yes | Yes |
| Levorphanol | [69] | Frequency undefined | Yes | Yes |
| Nicomorphine | [69] | -- | Yes | Yes |
| Pethidine | [61] | Frequency undefined | Yes | Yes |
| Tapentadol | [69] | <1% | Yes | Yes |
| Thebaine | [69] | -- | Yes | Yes |
| Papaverine | [57] | -- | Yes | Yes |
| Buprenorphine | [69] | <1% | Yes | Yes |
| Pentazocine | [57] | Frequency undefined | Yes | Yes |
| Antihypertensives | Tizanidine | [59, 60] | Frequency undefined | No | n/a |
| Antiarrhythmic | Disopyramide | [57, 59, 61, 62, 67] | -- | Yes | Yes |
| Digoxin | [59, 61] | 5% | Yes | No |
| Anticholinergics and/or Antihistaminics [70] | Dicyclomine | [57-62] | Frequency undefined | Yes | Yes |
| Scopolamine (Hyoscine) | [59, 61, 62, 64] | Frequency undefined | Yes | Yes |
| Trihexyphenidyl | [57, 59, 61, 62, 64, 65, 67] | Frequency undefined | Yes | Yes |
| Glycopyrrolate | [70] | -- | No | n/a |
| Ipratropium | [56, 59, 65] | -- | No | n/a |
| Tiotropium | [56] | -- | No | n/a |
| Hyoscyamine | [57-62] | Frequency undefined | Yes | Yes |
| Propantheline | [57, 59, 61, 62, 64, 65] | -- | Yes | Yes |
| Clidinium | [57, 59] | Frequency undefined | Yes | Yes |
| Emepronium | [59, 65] | -- | No | n/a |
| Methscopolamine | [57] | Frequency undefined | No | n/a |
| Procyclidine | [59, 61, 62] | Frequency undefined | No | n/a |
| Propiverine | [59] | -- | No | n/a |
| Tropatepine | [59, 67] | -- | No | n/a |
| Benztropine | [57, 59-62, 65] | Frequency undefined | Yes | Yes |
| Clemastine | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Atropine | [58-62, 64, 66] | -- | Yes | Yes |
| Belladonna alkaloids | [57, 59, 61, 64, 67] | -- | Yes | Yes |
| Doxylamine | [57, 59] | Frequency undefined | Yes | Yes |
| Hydroxyzine | [57, 59, 61, 62, 66, 67] | -- | Yes | Yes |
| Brompheniramine | [57, 59, 61, 62] | -- | Yes | Yes |
| Dimenhydrinate | [57, 59, 61, 62] | -- | Yes | Yes |
| Loratadine | [57, 59, 60, 64, 66] | <2% | No | n/a |
| Tripelennamine | [57] | -- | No | n/a |
| Alimemazine | [59, 61, 67] | -- | No | n/a |
| Phenyltoloxamine | [57] | -- | No | n/a |
| Pyrilamine | [59, 61, 62] | -- | No | n/a |
| Cyproheptadine | [57, 59-62, 66] | Frequency undefined | Yes | Yes |
| Dexbrompheniramine | [57] | -- | Yes | Yes |
| Dexchlorpheniramine | [57, 59, 66, 67] | -- | Yes | Yes |
| Triprolidine | [57] | Frequency undefined | Yes | Yes |
| Azatadine | [57] | -- | No | n/a |
| Pheniramine | [57] | -- | No | n/a |
| Fesoterodine | [59] | Frequency undefined | Yes | Yes |
| Benzhexol | [70] | Frequency undefined | No | n/a |
| Darifenacin | [59, 61, 62] | Frequency undefined | Yes | Yes |
| Flavoxate | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Homatropine | [59, 64] | Frequency undefined | No | n/a |
| Oxybutynin | [56-62, 66, 67] | Frequency undefined | Yes | Yes |
| Solifenacin | [59] | Frequency undefined | Yes | Yes |
| Tolterodine | [56-62, 64, 66] | <1% | Yes | Yes |
| Trospium | [59] | -- | Yes | Yes |
| Diphenhydramine | [57-62, 64] | -- | Yes | Yes |
| Carbinoxamine | [59, 61, 62] | Frequency undefined | Yes | Yes |
| Desloratadine | [59] | -- | No | n/a |
| Fexofenadine | [59, 64, 66] | -- | No | n/a |
| Levocetirizine | [59] | -- | No | n/a |
| Cetirizine | [57, 59, 60, 64, 66] | -- | No | n/a |
| Chlorpheniramine | [57, 59-62, 64, 67] | -- | Yes | Yes |
| Cimetidine | [59-62] | -- | Yes | Yes |
| Famotidine | [59] | -- | Yes | Yes |
| Nizatidine | [59] | -- | Yes | Yes |
| Ranitidine | [58-60, 62, 64-66] | -- | Yes | Yes |
| Astemizole | [57] | -- | No | n/a |
| Ketotifen | [59] | Frequency undefined | No | n/a |
| Antiemetic | Meclizine | [57, 59-62] | Frequency undefined | Yes | Yes |
| Levomepromazine | [59, 60, 62, 67] | Frequency undefined | No | n/a |
| Broperidol |  | -- | No | n/a |
| Droperidol |  | -- | No | n/a |
| Domperidone | [59, 66] | -- | No | n/a |
| Muscle Relaxers | Orphenadrine | [57, 59, 61, 62, 65, 67] | Frequency undefined | Yes | Yes |
|  | Carisoprodol | [57, 59, 60] | Frequency undefined | Yes | Yes |
|  | Chlorzoxazone | [57] | Frequency undefined | Yes | Yes |
|  | Cyclobenzaprine | [57, 59-62, 64] | 1-3% | Yes | Yes |
|  | Metaxalone | [57] | Frequency undefined | Yes | Yes |
|  | Methocarbamol | [57, 59, 60, 64] | Frequency undefined | Yes | Yes |
|  | Alverine | [59, 61] | -- | No | n/a |
|  | Camsoprodol |  | -- | No | n/a |
|  | Chlorphenasin |  | -- | No | n/a |
|  | Dantrolene |  | Frequency undefined | No | n/a |
| Others | Amantadine | [59-62] | Frequency undefined | No | n/a |
|  | Theophylline | [59, 61, 62, 65-67] | -- | Yes | Yes |

**Table A6: Inclusion criteria for list of medications associated with Falls**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Major Medication Category** | **Medication Name** | **Literature search** | **Incidence for falls, falling, gait disturbance/instability, abnormalities in gait in LexiComp** | **Present on the AGS 2015 Beers List** | **If “Yes” did the rationale in the AGS 2015 Beers List mention the syndrome?** |
| Antipsychotics [71] | Thioproperazine | [71] | -- | Yes | Yes |
| Timiperone | [71] | -- | Yes | Yes |
| Buspirone | [57] | -- | Yes | Yes |
| Aripiprazole | [59] | <1% | Yes | Yes |
| Quetiapine (fumarate) | [57-61] | 2% | Yes | Yes |
| Asenapine | [59] | -- | Yes | Yes |
| Clozapine | [58-62] | -- | Yes | Yes |
| Iloperidone | [59] | -- | Yes | Yes |
| Lurasidone | [71] | -- | Yes | Yes |
| Olanzapine | [57-62] | Frequency undefined | Yes | Yes |
| Paliperidone | [59] | -- | Yes | Yes |
| Risperidone | [56, 57, 59-61] | 4% | Yes | Yes |
| Ziprasidone | [57, 59] | ≥1% | Yes | Yes |
| Molindone | [59, 61, 62] | -- | Yes | Yes |
| Amisulpride | [71] | -- | Yes | Yes |
| Blonanserin | [71] | -- | Yes | Yes |
| Clotapine | [71] | -- | Yes | Yes |
| Melperone | [56] | -- | Yes | Yes |
| Nemonapride | [71] | -- | Yes | Yes |
| Remoxipride | [71] | -- | Yes | Yes |
| Sertindole | [71] | -- | Yes | Yes |
| Zotepine | [71] | -- | Yes | Yes |
| Fluspirilene | [71] | -- | Yes | Yes |
| Chlorpromazine | [57-62] | -- | Yes | Yes |
| Fluphenazine | [57, 59, 60, 62] | -- | Yes | Yes |
| Perphenazine | [57, 59-61] | -- | Yes | Yes |
| Promazine | [59, 61] | -- | Yes | Yes |
| Thioridazine | [56, 57, 59-62] | -- | Yes | Yes |
| Trifluoperazine | [57, 59, 61] | -- | Yes | Yes |
| Triflupromazine | [57] | -- | Yes | Yes |
| Mesoridazine | [71] | -- | Yes | Yes |
| Prochlorperazine | [57, 59, 60, 62] | -- | Yes | Yes |
| Promethazine | [57, 59-62] | -- | Yes | Yes |
| Acepromazine | [59] | -- | Yes | Yes |
| Aceprometazine | [59] | -- | Yes | Yes |
| Dixyrazine | [71] | -- | Yes | Yes |
| Pipotiazine | [71] | -- | Yes | Yes |
| Prothipendyl | [71] | -- | Yes | Yes |
| Perphenazine-amitriptyline | [60] | -- | Yes | Yes |
| Haloperidol | [57, 59-61] | -- | Yes | Yes |
| Loxapine | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Pimozide | [59, 61, 62] | -- | Yes | Yes |
| Thiothixene | [59, 60, 62] | -- | Yes | Yes |
| Benperidol | [71] | -- | Yes | Yes |
| Chlorprothixene | [57] | -- | Yes | Yes |
| Clopentixol | [71] | -- | Yes | Yes |
| Cyamemazine | [71] | -- | Yes | Yes |
| Flupentixol | [71] | -- | Yes | Yes |
| Penfluiridol | [71] | -- | Yes | Yes |
| Perazine | [71] | -- | Yes | Yes |
| Pericyazine | [56] | -- | Yes | Yes |
| Zuclopenthixol | [71] | -- | Yes | Yes |
| Antidepressants [71] | Bupropion | [59, 61] | -- | Yes | Yes |
| Mianserin | [56] | -- | Yes | Yes |
| Mirtazapine | [56-60] | -- | Yes | Yes |
| Duloxetine | [71] | <1% | Yes | Yes |
| Venlafaxine | [57, 59] | <1% | Yes | Yes |
| Fluoxetine | [57-59, 62] | Frequency undefined | Yes | Yes |
| Sertraline | [57, 59] | Frequency undefined | Yes | Yes |
| Citalopram | [56-59] | Frequency undefined | Yes | Yes |
| Fluvoxamine | [59, 61, 62] | Frequency undefined | Yes | Yes |
| Paroxetine | [57-62] | Frequency undefined | Yes | Yes |
| Escitalopram | [57, 59] | <1% | Yes | Yes |
| Nefazodone | [57, 59] | -- | Yes | Yes |
| Trazodone | [57, 59-61] | <1% | Yes | Yes |
| Maprotiline | [59] | -- | Yes | Yes |
| Clomipramine | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Doxepin | [57-59, 61, 62] | Frequency undefined | Yes | Yes |
| Imipramine | [57, 59-62] | Frequency undefined | Yes | Yes |
| Amitriptyline | [56, 57, 59-62] | Frequency undefined | Yes | Yes |
| Desipramine | [57, 59-62] | Frequency undefined | Yes | Yes |
| Nortriptyline | [57-62] | Frequency undefined | Yes | Yes |
| Protriptyline | [59, 62] | Frequency undefined | Yes | Yes |
| Trimipramine | [57, 59, 61, 62] | Frequency undefined | Yes | Yes |
| Amozapine | [71] | -- | Yes | Yes |
| Butriptyline | [71] | -- | Yes | Yes |
| Dosulepin | [59] | -- | Yes | Yes |
| Iprindole | [71] | -- | Yes | Yes |
| Lofepramine | [71] | -- | Yes | Yes |
| Opipramol | [59] | -- | Yes | Yes |
| Amoxapine | [59, 61] | Frequency undefined | Yes | Yes |
| Antiepileptics[71] | Sodium Valproate | [71] | -- | No | n/a |
| Oxcarbazepine | [57, 59, 61, 62] | 4% | Yes | No |
| Gabapentin | [56, 57] | 2% | Yes | Yes |
| Pregabalin | [71] | ≤8% | Yes | Yes |
| Topiramate | [71] | -- | No | n/a |
| Levetiracetam | [57] | 1-10% | Yes | Yes |
| Phenytoin | [57] | -- | No | n/a |
| Primidone | [57] | -- | No | n/a |
| Tiagabine | [57] | 3-5% | Yes | Yes |
| Vigabatrin | [71] | -- | Yes | Yes |
| Zonisamide | [71] | ≥1% | Yes | Yes |
| Beclamide | [71] | -- | Yes | Yes |
| Brivaracetam | [71] | -- | Yes | Yes |
| Eslicarbazepine acetate | [71] | 3% | Yes | Yes |
| Ethosuximide | [71] | -- | Yes | Yes |
| Ethotoin | [71] | -- | Yes | Yes |
| Fosphenytoin | [71] | -- | Yes | Yes |
| Mephenytoin | [71] | -- | Yes | Yes |
| Mesuximide | [71] | -- | Yes | Yes |
| Perampanel | [71] | 4-16% | Yes | Yes |
| Phenacemide | [71] | -- | Yes | Yes |
| Pheneturide | [71] | -- | Yes | Yes |
| Phensuximide | [71] | -- | Yes | Yes |
| Progabide | [71] | -- | Yes | Yes |
| Selectracetam | [71] | -- | Yes | Yes |
| Trimethadione | [71] | -- | Yes | Yes |
| Valproic Acid | [57, 59] | 1-5% | Yes | Yes |
| Valpromide | [71] | -- | Yes | Yes |
| Carbamazepine | [57, 59, 61, 62] | -- | Yes | Yes |
| Divalproex Sodium | [59] | 1-5% | Yes | Yes |
| Lamotrigine | [57] | -- | Yes | Yes |
| Lithium | [58, 59] | -- | Yes | Yes |
| Ethadione | [71] | -- | Yes | Yes |
| Paramethadione | [71] | -- | Yes | Yes |
| Antiparkinsonism [72] | Entacapone | [59, 60] | -- | No | n/a |
| Levodopa / Carbidopa | [56, 59] | Frequency undefined | No | n/a |
| Tolcapone | [72] | -- | No | n/a |
| Rotigotine | [72] | -- | No | n/a |
| Apomorphine | [72] | -- | No | n/a |
| Bromocriptine | [59, 62] | -- | No | n/a |
| Phenelzine | [57, 59, 62] | -- | No | n/a |
| Rasagiline | [72] | 5% | No | n/a |
| Tranylcypromine | [57] | -- | No | n/a |
| Isocarboxazid | [72] | -- | No | n/a |
| Selegiline | [56, 57, 59] | -- | No | n/a |
| Pramipexole | [57, 59] | 4% | No | n/a |
| Ropinirole | [57] | 1-10% | No | n/a |
| Benzodiazapines | Alprazolam | [57, 59, 61] | Frequency undefined | Yes | Yes |
| Chlordiazepoxide | [57, 59, 62] | Frequency undefined | Yes | Yes |
| Clonazepam | [57, 59, 62] | Frequency undefined | Yes | Yes |
| Clorazepate | [57, 59, 61] | Frequency undefined | Yes | Yes |
| Diazepam | [57-59, 61, 62] | Frequency undefined | Yes | Yes |
| Estazolam | [57, 59] | Frequency undefined | Yes | Yes |
| Flurazepam | [57, 59] | Frequency undefined | Yes | Yes |
| Halazepam | [71] | -- | Yes | Yes |
| Lorazepam | [59] | 1% | Yes | Yes |
| Oxazepam | [56, 57, 59] | Frequency undefined | Yes | Yes |
| Quazepam | [71] | Frequency undefined | Yes | Yes |
| Temazepam | [56-59, 62] | Frequency undefined | Yes | Yes |
| Triazolam | [57, 59, 62] | Frequency undefined | Yes | Yes |
| Bretazenil | [71] | -- | Yes | Yes |
| Bromazepam | [71] | Frequency undefined | Yes | Yes |
| Camazepam | [71] | -- | Yes | Yes |
| Cinolazepam | [71] | -- | Yes | Yes |
| Clobazam | [71] | Frequency undefined | Yes | Yes |
| Clotiazepam | [71] | Frequency undefined | Yes | Yes |
| Cloxazolam | [71] | -- | Yes | Yes |
| Delorazepam | [71] | -- | Yes | Yes |
| Diclazepam | [71] | -- | Yes | Yes |
| Ethyl carfluzepate | [71] | -- | Yes | Yes |
| Ethyl loflazepate | [71] | -- | Yes | Yes |
| Etizolam | [71] | -- | Yes | Yes |
| Flubromazepam | [71] | -- | Yes | Yes |
| Flunitrazepam | [71] | -- | Yes | Yes |
| Flutoprazepam | [71] | -- | Yes | Yes |
| Ketazolam | [71] | -- | Yes | Yes |
| Loprazolam | [71] | -- | Yes | Yes |
| Lormetazepam | [71] | -- | Yes | Yes |
| Medazepam | [71] | -- | Yes | Yes |
| Midazolam | [59] | Frequency undefined | Yes | Yes |
| Nimetzepam | [71] | -- | Yes | Yes |
| Nitrazepam | [71] | Frequency undefined | Yes | Yes |
| Nordazepam | [71] | -- | Yes | Yes |
| Phenazepam | [71] | -- | Yes | Yes |
| Pinazepam | [71] | -- | Yes | Yes |
| Prazepam | [71] | -- | Yes | Yes |
| Premazepam | [71] | -- | Yes | Yes |
| Pyrazolam | [71] | -- | Yes | Yes |
| Tetrazepam | [71] | -- | Yes | Yes |
| Clidinium-Chlordiazepoxide | [71] | -- | Yes | Yes |
| Non-Benzodiazepine Hypnotics | Amobarbital | [71] | -- | Yes | Yes |
| Butabarbital | [71] | -- | Yes | Yes |
| Butalbital | [57] | -- | Yes | Yes |
| Mephobarbital | [71] | -- | Yes | Yes |
| Pentobarbital | [71] | -- | Yes | Yes |
| Secobarbital | [71] | -- | Yes | Yes |
| Aprobarbital | [71] | -- | Yes | Yes |
| Hexobarbital | [57] | -- | Yes | Yes |
| Bentazepam | [71] | -- | Yes | Yes |
| Brotizolam | [71] | -- | Yes | Yes |
| Deschloroetizolam | [71] | -- | Yes | Yes |
| Zaleplon | [57] | Frequency undefined | Yes | Yes |
| Zolpidem | [56, 57] | Frequency undefined | Yes | Yes |
| Baclofen | [59, 60] | -- | Yes | Yes |
| Chloral Hydrate | [71] | Frequency undefined | Yes | Yes |
| Glutethimide | [71] | -- | Yes | Yes |
| Paraldehyde | [71] | -- | Yes | Yes |
| Zopiclone | [56] | Frequency undefined | Yes | Yes |
| Valnoctamide | [71] | -- | Yes | Yes |
| Eszopiclone | [71] | Frequency undefined | Yes | Yes |
| Meprobamate | [57] | -- | Yes | Yes |
| Phenobarbital | [57, 59] | -- | Yes | Yes |
| Opioid agonists [73] | Opium | [57] | -- | Yes | Yes |
| Tramadol | [56, 57, 59, 62] | <1% | Yes | Yes |
| Codeine | [56, 57, 59, 61, 62] | -- | Yes | Yes |
| Hydrocodone | [57-59] | 1-10% | Yes | Yes |
| Methadone | [57, 59] | -- | Yes | Yes |
| Morphine | [57, 59, 61, 62] | 1-10% | Yes | Yes |
| Oxycodone | [57, 59, 62] | -- | Yes | Yes |
| Oxymorphone | [73] | -- | Yes | Yes |
| Loperamide | [57, 59, 60, 62] | -- | Yes | Yes |
| Meperidine | [59, 61, 62] | -- | Yes | Yes |
| Propoxyphene | [57-59] | -- | Yes | Yes |
| Acetylmorphine | [73] | -- | Yes | Yes |
| Alphaprodine | [73] | -- | Yes | Yes |
| Anileridine | [73] | -- | Yes | Yes |
| Bromadol | [73] | -- | Yes | Yes |
| Carfentanil | [73] | -- | Yes | Yes |
| Desomorphine | [73] | -- | Yes | Yes |
| Dextropropoxyphene | [73] | -- | Yes | Yes |
| Diacetyldihydromorphine | [73] | -- | Yes | Yes |
| Diacetylmorphine | [73] | -- | Yes | Yes |
| Dibenzoylmorphine | [73] | -- | Yes | Yes |
| Dihydrocodeine | [73] | -- | Yes | Yes |
| Dihydromorphine | [73] | -- | Yes | Yes |
| Diphenoxylate | [57] | -- | Yes | Yes |
| Dipropanoylmorphine | [73] | -- | Yes | Yes |
| Ethymorphine | [73] | -- | Yes | Yes |
| Etonitazene | [73] | -- | Yes | Yes |
| Fentanyl | [57-59, 61, 62] | 1-10% | Yes | Yes |
| Hydromorphone | [73] | Frequency undefined | Yes | Yes |
| Levorphanol | [73] | -- | Yes | Yes |
| Nicomorphine | [73] | -- | Yes | Yes |
| Pethidine | [61] | -- | Yes | Yes |
| Tapentadol | [73] | -- | Yes | Yes |
| Thebaine | [73] | -- | Yes | Yes |
| Papaverine | [57] | -- | Yes | Yes |
| Buprenorphine | [73] | -- | Yes | Yes |
| Pentazocine | [57] | -- | Yes | Yes |
| Non-Opioid/Non-Steroidal Anti inflammatory and/or Analgesics | Dichloralphenazone | [57] | -- | No | n/a |
| Colchicine | [59, 61] | -- | Yes | Yes |
| Lumiracoxib | [59] | -- | No | n/a |
| Nefopam | [59] | -- | No | n/a |
| Ketorolac | [59] | -- | Yes | No |
| Celecoxib | [59] | -- | No | n/a |
| Antihypertensives [73] | Spironolactone | [73] | -- | Yes | No |
| Idazoxan | [73] | -- | No | n/a |
| Phenoxybenzamine | [73] | -- | No | n/a |
| Tolazoline | [73] | -- | No | n/a |
| Yohimbine | [73] | -- | No | n/a |
| Pseudoephedrine | [59] | -- | Yes | Yes |
| Guanabenz | [57] | -- | Yes | Yes |
| Atipamezole | [73] | -- | No | n/a |
| Doxazosin | [57] | -- | Yes | Yes |
| Prazosin | [57] | -- | Yes | Yes |
| Terazosin | [57] | -- | Yes | Yes |
| Alfuzosin | [73] | -- | No | n/a |
| Silodosin | [73] | -- | No | n/a |
| Tamsulosin | [56, 57] | -- | No | n/a |
| Phentolamine | [73] | -- | No | n/a |
| Carvedilol | [73] | -- | No | n/a |
| Candesartan | [73] | -- | No | n/a |
| Eprosartan | [73] | -- | No | n/a |
| Irbesartan | [73] | -- | No | n/a |
| Olmesartan | [73] | -- | No | n/a |
| Telmisartan | [73] | -- | No | n/a |
| Valsartan | [73] | -- | No | n/a |
| Losartan | [73] | -- | No | n/a |
| Benzaepril | [59] | -- | No | n/a |
| Enalapril | [73] | -- | No | n/a |
| Fosinopril | [73] | -- | No | n/a |
| Quinapril | [73] | -- | No | n/a |
| Ramipril | [73] | -- | No | n/a |
| Trandolapril | [59] | -- | No | n/a |
| Captopril | [59, 61] | -- | No | n/a |
| Lisinopril | [73] | -- | No | n/a |
| Moexipril | [73] | -- | No | n/a |
| Perindopril | [73] | Frequency undefined | No | n/a |
| Guanethidine | [57] | -- | No | n/a |
| Hydralazine | [59, 61] | -- | No | n/a |
| Minoxidil | [73] | -- | No | n/a |
| Sotalol | [73] | -- | No | n/a |
| Acebutolol | [73] | -- | No | n/a |
| Atenolol | [59, 61] | -- | No | n/a |
| Betaxolol | [59] | -- | No | n/a |
| Bisoprolol | [73] | -- | No | n/a |
| Bucindolol | [73] | -- | No | n/a |
| Carteolol | [73] | -- | No | n/a |
| Esmolol | [73] | -- | No | n/a |
| Labetalol | [73] | -- | No | n/a |
| Metoprolol | [59, 61] | -- | No | n/a |
| Nadolol | [73] | -- | No | n/a |
| Nebivolol | [73] | -- | No | n/a |
| Penbutolol | [73] | -- | No | n/a |
| Pindolol | [73] | -- | No | n/a |
| Propranolol | [73] | -- | No | n/a |
| Timolol | [73] | -- | No | n/a |
| Diltiazem | [59] | -- | Yes | No |
| Verapamil | [73] | -- | Yes | No |
| Aranidipine | [73] | -- | No | n/a |
| Azelnidipine | [73] | -- | No | n/a |
| Benidipine | [73] | -- | No | n/a |
| Clevidipine | [73] | -- | No | n/a |
| Efonidipine | [73] | -- | No | n/a |
| Fendiline | [73] | -- | No | n/a |
| Gallopamil | [73] | -- | No | n/a |
| Lacidipine | [73] | -- | No | n/a |
| Lercanidipine | [73] | -- | No | n/a |
| Manidipine | [73] | -- | No | n/a |
| Nilvadipine | [73] | -- | No | n/a |
| Nitrendipine | [73] | -- | No | n/a |
| Pranidipine | [73] | -- | No | n/a |
| Tizanidine | [59, 60] | -- | No | n/a |
| Clonidine | [57] | -- | Yes | Yes |
| Methyldopa | [57] | -- | Yes | Yes |
| Guanfacine | [57] | -- | Yes | Yes |
| Felodipine | [73] | -- | No | n/a |
| Nifedipine | [59, 61] | -- | Yes | Yes |
| Amlodipine | [73] | -- | No | n/a |
| Isradipine | [73] | -- | No | n/a |
| Nicardipine | [73] | -- | No | n/a |
| Nimodipine | [73] | -- | No | n/a |
| Nisoldipine | [73] | -- | No | n/a |
| Bumetanide | [73] | -- | No | n/a |
| Ethacrynic acid | [73] | -- | No | n/a |
| Furosemide | [59, 61] | -- | No | n/a |
| Torsemide | [73] | -- | No | n/a |
| Isosorbide Dinitrate | [59, 61] | -- | No | n/a |
| Isosorbide Mononitrate | [59, 61] | -- | No | n/a |
| Nitroglycerin | [73] | -- | No | n/a |
| Triamterene | [59, 61] | -- | Yes | No |
| Eplerenone | [73] | -- | No | n/a |
| Amiloride | [73] | -- | Yes | No |
| Chlorothiazide | [73] | -- | No | n/a |
| Hydrochlorothiazide | [73] | -- | No | n/a |
| Polythiazide | [73] | -- | No | n/a |
| Chlorthalidone | [59, 61] | -- | No | n/a |
| Indapamide | [73] | -- | No | n/a |
| Metolazone | [73] | -- | No | n/a |
| Reserpine | [57] | -- | Yes | Yes |
| Antiarrhythmic | Disopyramide | [57, 59, 61, 62] | -- | Yes | Yes |
| Quinidine | [59, 61] | -- | No | n/a |
| Digoxin | [59, 61] | -- | Yes | No |
| Antidiabetics [74] | Nateglinide | [74] | -- | No | n/a |
| Repaglinide | [74] | -- | No | n/a |
| Exenatide | [74] | -- | No | n/a |
| Liraglutide | [74] | -- | No | n/a |
| Lixisenatide | [74] | -- | No | n/a |
| Insulin | [74] | -- | Yes | Yes |
| NPH | [74] | -- | Yes | Yes |
| Aspart | [74] | -- | Yes | Yes |
| Detemir Insulin | [74] | -- | Yes | Yes |
| Glargine Insulin | [74] | -- | Yes | Yes |
| Glusine | [74] | -- | Yes | Yes |
| Lispro | [74] | -- | Yes | Yes |
| Glyburide | [74] | -- | Yes | Yes |
| Acetohexamide | [74] | -- | No | n/a |
| Chlorpropamide | [74] | -- | Yes | Yes |
| Gliclazide | [74] | -- | No | n/a |
| Glimepiride | [74] | -- | No | n/a |
| Glipizide | [74] | <1% | No | n/a |
| Gliquidone | [74] | -- | No | n/a |
| Glycopyramide | [74] | -- | No | n/a |
| Tolazamide | [74] | -- | No | n/a |
| Tolbutamide | [74] | -- | No | n/a |
| Anticholinergics and/or Antihistaminics [75] | Dicyclomine | [57-62] | -- | Yes | Yes |
| Scopolamine (Hyoscine) | [59, 61, 62] | -- | Yes | Yes |
| Trihexyphenidyl | [57, 59, 61, 62] | -- | Yes | Yes |
| Glycopyrrolate | [75] | -- | No | n/a |
| Ipratropium | [56, 59] | -- | No | n/a |
| Tiotropium | [56] | -- | No | n/a |
| Hyoscyamine | [57-62] | -- | Yes | Yes |
| Propantheline | [57, 59, 61, 62] | -- | Yes | Yes |
| Clidinium | [57, 59] | -- | Yes | Yes |
| Emepronium | [59] | -- | No | n/a |
| Methscopolamine | [57, 59] | -- | No | n/a |
| Procyclidine | [59, 61, 62] | -- | No | n/a |
| Propiverine | [59] | -- | No | n/a |
| Tropatepine | [59] | -- | No | n/a |
| Benztropine | [57, 59-62] | -- | Yes | Yes |
| Clemastine | [57, 59, 61, 62] | -- | Yes | Yes |
| Atropine | [58-62] | -- | Yes | Yes |
| Belladonna alkaloids | [57, 59, 61] | -- | Yes | Yes |
| Doxylamine | [57, 59] | -- | Yes | Yes |
| Hydroxyzine | [57, 59, 61, 62] | -- | Yes | Yes |
| Brompheniramine | [57, 59, 61, 62] | -- | Yes | Yes |
| Dimenhydrinate | [57, 59, 61, 62] | -- | Yes | Yes |
| Loratadine | [57, 59, 60] | -- | No | n/a |
| Tripelennamine | [57, 59] | -- | No | n/a |
| Alimemazine | [59, 61] | -- | No | n/a |
| Phenyltoloxamine | [57, 59] | -- | No | n/a |
| Pyrilamine | [59, 61, 62] | -- | No | n/a |
| Cyproheptadine | [57, 59-62] | -- | Yes | Yes |
| Dexbrompheniramine | [57] | -- | Yes | Yes |
| Dexchlorpheniramine | [57, 59] | -- | Yes | Yes |
| Triprolidine | [57] | -- | Yes | Yes |
| Azatadine | [57] | -- | No | n/a |
| Pheniramine | [57] | -- | No | n/a |
| Fesoterodine | [59] | -- | Yes | Yes |
| Benzhexol | [75] | -- | No | n/a |
| Darifenacin | [59, 61, 62] | -- | Yes | Yes |
| Flavoxate | [57, 59, 61, 62] | -- | No | n/a |
| Homatropine | [59] | -- | No | n/a |
| Oxybutynin | [56-62] | 1-5% | Yes | Yes |
| Solifenacin | [59] | -- | Yes | Yes |
| Tolterodine | [56-62] | -- | Yes | Yes |
| Trospium | [59] | -- | Yes | Yes |
| Diphenhydramine | [57-62] | -- | Yes | Yes |
| Carbinoxamine | [59, 61, 62] | -- | Yes | Yes |
| Desloratadine | [59] | -- | No | n/a |
| Fexofenadine | [59] | -- | No | n/a |
| Levocetirizine | [59] | -- | No | n/a |
| Cetirizine | [57, 59, 60] | -- | No | n/a |
| Chlorpheniramine | [57, 59-62] | -- | Yes | Yes |
| Cimetidine | [59-62] | -- | Yes | Yes |
| Famotidine | [59] | -- | Yes | Yes |
| Nizatidine | [59] | -- | Yes | Yes |
| Ranitidine | [58-60, 62] | -- | Yes | Yes |
| Astemizole | [57] | -- | No | n/a |
| Ketotifen | [59] | -- | No | n/a |
| Antiemetic | Meclizine | [57, 59-62] | -- | Yes | Yes |
| Levomepromazine | [59, 60, 62] | -- | No | n/a |
| Trimethobenzamide | [57] | -- | No | n/a |
| Broperidol | [72] | -- | No | n/a |
| Droperidol | [72] | -- | No | n/a |
| Metoclopramide | [57, 59] | -- | Yes | Yes |
| Domperidone | [59] | -- | No | n/a |
| Hormone Replacement | Cortisone | [59] | -- | Yes | No |
| Dexamethasone | [59] | -- | Yes | No |
| Hydrocortisone | [59, 61] | -- | Yes | No |
| Methylprednisolone | [59] | -- | Yes | No |
| Prednisolone | [59] | -- | Yes | No |
| Fluticasone-salmeterol | [59] | -- | Yes | No |
| Muscle Relaxers [76] | Orphenadrine | [57, 59, 61, 62] | -- | Yes | Yes |
| Carisoprodol | [57, 59, 60] | -- | Yes | Yes |
| Chlorzoxazone | [57] | -- | Yes | Yes |
| Cyclobenzaprine | [57, 59-62] | -- | Yes | Yes |
| Metaxalone | [57] | -- | Yes | Yes |
| Methocarbamol | [57, 59, 60] | -- | Yes | Yes |
| Alverine | [59, 61] | -- | No | n/a |
| Camsoprodol | [76] | -- | No | n/a |
| Chlorphenasin | [76] | -- | No | n/a |
| Pancuronium | [59] | -- | No | n/a |
| Dantrolene | [76] | -- | No | n/a |
| Immunosuppressants | Cyclosporine | [59] | -- | No | n/a |
| Methotrexate | [59] | -- | No | n/a |
| Azathioprine | [59] | -- | No | n/a |
| Non-Opioid Cough Suppressant & Expectorant | Guaifenesin | [59] | -- | No | n/a |
| Benzonatate | [57] | -- | No | n/a |
| Dextromethorphan | [57, 59] | -- | No | n/a |
| Antimicrobial | Gentamicin | [59] | Frequency undefined | No | n/a |
| Cycloserine | [59] | -- | No | n/a |
| Cefamandole | [59] | -- | No | n/a |
| Cefoxitin | [59] | -- | No | n/a |
| Cephalothin | [59] | -- | No | n/a |
| Vancomycin | [59] | -- | No | n/a |
| Clindamycin | [59] | -- | No | n/a |
| Ampicillin | [59] | -- | No | n/a |
| Piperacillin | [59] | -- | No | n/a |
| Others | Tyrosine Hydroxylase | [72] | -- | No | n/a |
| Amantadine | [59-62] | <1% | No | n/a |
| Theophylline | [59, 61, 62] | Frequency undefined | Yes | Yes |
| Dipyridamole | [59, 61] | Frequency undefined | Yes | Yes |
| Naratriptan | [59] | Frequency undefined | No | n/a |
| Sumatriptan | [59] | Frequency undefined | No | n/a |
| Zolmitriptan | [59] | Frequency undefined | No | n/a |
| Bisacodyl | [59] | Frequency undefined | No | n/a |
| Warfarin | [59, 61] | Frequency undefined | Yes | No |

References:

1. Domecq JP, Prutsky G, Leppin A, Sonbol MB, Altayar O, Undavalli C, Wang Z, Elraiyah T, Brito JP, Mauck KF: **Drugs commonly associated with weight change: a systematic review and meta-analysis**. *The Journal of Clinical Endocrinology & Metabolism* 2015, **100**(2):363-370.

2. Sloane PD, Ivey J, Helton M, Barrick AL, Cerna A: **Nutritional issues in long-term care**. *J Am Med Dir Assoc* 2008, **9**(7):476-485.

3. Gaddey HL, Holder K: **Unintentional weight loss in older adults**. *American family physician* 2014, **89**(9):718-722.

4. Gillette Guyonnet S, Abellan Van Kan G, Alix E, Andrieu S, Belmin J, Berrut G, Bonnefoy M, Brocker P, Constans T, Ferry M *et al*: **IANA (International Academy on Nutrition and Aging) Expert Group: weight loss and Alzheimer's disease**. *J Nutr Health Aging* 2007, **11**(1):38-48.

5. Blazer DG, Kessler RC, McGonagle KA: **The prevalence and distribution of major depression in a national community sample: the National Comorbidity Survey**. *Am J Psychiatry* 1994, **15**:24-27.

6. Mula M, Trimble MR, Lhatoo SD, Sander JW: **Topiramate and psychiatric adverse events in patients with epilepsy**. *Epilepsia* 2003, **44**(5):659-663.

7. Mula M, Trimble M, Yuen A, Liu R, Sander J: **Psychiatric adverse events during levetiracetam therapy**. *Neurology* 2003, **61**(5):704-706.

8. Wier LM, Tavares SB, Tyrka AR, Price LH, Carpenter LL: **Levetiracetam-induced depression in a healthy adult**. *The Journal of clinical psychiatry* 2006, **67**(7):1159.

9. Garrison S, Henson H: **Dilantin toxicity and vegetative depression: a report of two cases**. *Archives of physical medicine and rehabilitation* 1990, **71**(6):422-423.

10. Dodrill CB, Arnett JL, Deaton R, Lenz GT, Sommerville KW: **Tiagabine versus phenytoin and carbamazepine as add-on therapies: effects on abilities, adjustment, and mood**. *Epilepsy research* 2000, **42**(2):123-132.

11. Lopez-Gomez M, Ramirez-Bermudez J, Campillo C, Sosa A, Espinola M, Ruiz I: **Primidone is associated with interictal depression in patients with epilepsy**. *Epilepsy & Behavior* 2005, **6**(3):413-416.

12. Levinson DF, Devinsky O: **Psychiatric adverse events during vigabatrin therapy**. *Neurology* 1999, **53**(7):1503-1503.

13. Brent DA, Crumrine PK, Varma RR, Allan M, AlIman C: **Phenobarbital treatment and major depressive disorder in children with epilepsy**. *Pediatrics* 1987, **80**(6):909-917.

14. Scherrer JF, Svrakic DM, Freedland KE, Chrusciel T, Balasubramanian S, Bucholz KK, Lawler EV, Lustman PJ: **Prescription opioid analgesics increase the risk of depression**. *Journal of general internal medicine* 2014, **29**(3):491-499.

15. Tisdale JE, Miller DA: **Drug-induced diseases: prevention, detection, and management**: ASHP; 2010.

16. Raftos J, Bauer G, Lewis R, Stokes G, Mitchell A, Young A, Maclachlan I: **Clonidine in the treatment of severe hypertension**. *The Medical journal of Australia* 1973, **1**(16):786-793.

17. Avorn J: **Increased Antidepressant Use in Patients Prescribed β-Blockers**. *JAMA: The Journal of the American Medical Association* 1986, **255**(3):357.

18. Griffin SJ, Friedman MJ: **Depressive symptoms in propranolol users**. *Journal of Clinical Psychiatry* 1986.

19. Waal HJ: **Propranolol-induced depression**. *BMJ* 1967, **2**(5543):50-50.

20. Goodwin F, Ebert M, Bunney W: **Mental effects of reserpine in man: a review**. *Psychiatric complications of medical drugs* 1972:73-101.

21. Brown ES, Suppes T: **Mood symptoms during corticosteroid therapy: a review**. *Harvard review of psychiatry* 1998, **5**(5):239-246.

22. Patten SB, Williams JV, Love EJ: **Self-reported depressive symptoms following treatment with corticosteroids and sedative-hypnotics**. *The International Journal of Psychiatry in Medicine* 1996, **26**(1):15-24.

23. Sutor B, Wells LA, Rummans TA: **Steroid-induced depressive psychosis responsive to electroconvulsive therapy**. *The Journal of ECT* 1996, **12**(2):104-107.

24. Warnock JK, Bundren JC: **Anxiety and mood disorders associated with gonadotropin-releasing hormone agonist therapy**. *Psychopharmacology bulletin* 1997, **33**(2):311.

25. Toren P, Dor J, Mester R, Mozes T, Blumensohn R, Rehavi M, Weizman A: **Depression in women treated with a gonadotropinreleasing hormone agonist**. *Biological psychiatry* 1996, **39**(5):378-382.

26. Oinonen KA, Mazmanian D: **To what extent do oral contraceptives influence mood and affect?** *Journal of affective disorders* 2002, **70**(3):229-240.

27. Parry BL, Rush AJ: **Oral contraceptives and depressive symptomatology: Biologic mechanisms**. *Comprehensive psychiatry* 1979, **20**(4):347-358.

28. Grigg JR: **Prednisone mood disorder with associated catatonia**. *Journal of geriatric psychiatry and neurology* 1989, **2**(1):41-44.

29. Shariff S, Cumming C, Lees A, Handman M, Cumming D: **Mood disorder in women with early breast cancer taking tamoxifen, an estradiol receptor antagonist**. *Annals of the New York Academy of Sciences* 1995, **761**(1):365-368.

30. Day R, Ganz PA, Costantino JP: **Tamoxifen and depression: more evidence from the National Surgical Adjuvant Breast and Bowel Project's breast cancer prevention (P-1) randomized study**. *Journal of the National Cancer Institute* 2001, **93**(21):1615-1623.

31. Millson D, Frischer M, Croft P, Goadsby P: **Are triptans with enhanced lipophilicity used for the acute treatment of migraine associated with an increased consulting rate for depressive illness?** *Cephalalgia* 2000, **20**(8):732-737.

32. Journot V, Chêne G, De Castro N, Rancinan C, Cassuto J-P, Allard C, Vildé J-L, Sobel A, Garré M, Molina J-M: **Use of efavirenz is not associated with a higher risk of depressive disorders: a substudy of the randomized clinical trial ALIZE-ANRS 099**. *Clinical infectious diseases* 2006, **42**(12):1790-1799.

33. Maes M, Bonaccorso S, Marino V, Puzella A, Pasquini M, Biondi M, Artini M, Almerighi C, MELTZER M: **Treatment with interferon-alpha (IFN-) of hepatitis C patients induces lower serum dipeptidyl peptidase IV activity, which is related to IFN--induced depressive and anxiety symptoms and immune activation**. *Mol Psychiatry* 2001, **6**:475-480.

34. Malaguarnera M, Laurino A, Di Fazio I, Pistone G, Castorina M, Guccione N, Rampello L: **Neuropsychiatric effects and type of IFN-α in chronic hepatitis C**. *Journal of Interferon & Cytokine Research* 2001, **21**(5):273-278.

35. Fried MW, Shiffman ML, Reddy KR, Smith C, Marinos G, Gonçales Jr FL, Häussinger D, Diago M, Carosi G, Dhumeaux D: **Peginterferon alfa-2a plus ribavirin for chronic hepatitis C virus infection**. *New England Journal of Medicine* 2002, **347**(13):975-982.

36. Castéra L, Zigante F, Bastie A, Buffet C, Dhumeaux D, Hardy P: **Incidence of interferon alfa–induced depression in patients with chronic hepatitis C**. *Hepatology* 2002, **35**(4):978-979.

37. Quarantini LC, Bressan RA, Galvão A, Batista‐Neves S, Paraná R, Miranda‐Scippa Â: **Incidence of psychiatric side effects during pegylated interferon‐α retreatment in nonresponder hepatitis C virus‐infected patients**. *Liver International* 2007, **27**(8):1098-1102.

38. Lotrich FE, Rabinovitz M, Gironda P, Pollock BG: **Depression following pegylated interferon-alpha: characteristics and vulnerability**. *Journal of psychosomatic research* 2007, **63**(2):131-135.

39. Patten SB, Metz LM: **Interferon β1a and depression in secondary progressive MS: Data from the SPECTRIMS Trial**. *Neurology* 2002, **59**(5):744-746.

40. Feinstein A, O'Connor P, Feinstein K: **Multiple Sclerosis, interferon beta-1b and depression**. *Journal of neurology* 2002, **249**(7):815-820.

41. Porcel J, Rio J, Sánchez-Betancourt A, Arevalo M, Tintore M, Tellez N, Borras C, Nos C, Montalban X: **Long-term emotional state of multiple sclerosis patients treated with interferon beta**. *Multiple Sclerosis* 2006, **12**(6):802-807.

42. Hetzen PG, Carney JF, Walker AE, Stewart JJ: **Depression—a side effect of 13-cis-retinoic acid therapy**. *Journal of the American Academy of Dermatology* 1983, **9**(2):278-279.

43. Scheinman PL, Peck GL, Rubinow DR, DiGiovanna JJ, Abangan DL, Ravin PD: **Acute depression from isotretinoin**. *Journal of the American Academy of Dermatology* 1990, **22**(6):1112-1114.

44. Hanson N, Leachman S: **Safety issues in isotretinoin therapy**. In: *Seminars in cutaneous medicine and surgery: 2001*: WB Saunders; 2001: 166-183.

45. Wysowski DK, Pitts M, Beitz J: **An analysis of reports of depression and suicide in patients treated with isotretinoin**. *Journal of the American Academy of Dermatology* 2001, **45**(4):515-519.

46. Azoulay L, Blais L, Koren G, LeLorier J, Berard A: **Does Isotretinoin Increase the Risk of Depression?** *J Clin Psychiatry* 2008, **69**(4):526-532.

47. Jick SS, Kremers HM, Vasilakis-Scaramozza C: **Isotretinoin use and risk of depression, psychotic symptoms, suicide, and attempted suicide**. *Archives of dermatology* 2000, **136**(10):1231-1236.

48. Kellett S, Gawkrodger D: **A prospective study of the responsiveness of depression and suicidal ideation in acne patients to different phases of isotretinoin therapy**. *European Journal of Dermatology* 2005, **15**(6):484-488.

49. Ahmed AI, Ali AN, Kramers C, Härmark LV, Burger DM, Verhoeven WM: **Neuropsychiatric adverse events of varenicline: a systematic review of published reports**. *Journal of clinical psychopharmacology* 2013, **33**(1):55-62.

50. Tsakiris P, Oelke M, Michel MC: **Drug-induced urinary incontinence**. *Drugs Aging* 2008, **25**(7):541-549.

51. Fuller MA, Borovicka MC, Jaskiw GE, Simon MR, Kwon K, Konicki PE: **Clozapine-induced urinary incontinence: incidence and treatment with ephedrine**. *The Journal of clinical psychiatry* 1996, **57**(11):514-518.

52. Hall SA, Yang M, Gates MA, Steers WD, Tennstedt SL, McKinlay JB: **Associations of commonly used medications with urinary incontinence in a community based sample**. *J Urol* 2012, **188**(1):183-189.

53. Gibbs CF, Johnson TM, 2nd, Ouslander JG: **Office management of geriatric urinary incontinence**. *Am J Med* 2007, **120**(3):211-220.

54. Eng ML, Birch JT: **Medication Use and Polypharmacy in Older Adults**. 2014:55-71.

55. Alagiakrishnan K, Wiens CA: **An approach to drug induced delirium in the elderly**. *Postgrad Med J* 2004, **80**(945):388-393.

56. Gnjidic D, Bell JS, Hilmer SN, Lonnroos E, Sulkava R, Hartikainen S: **Drug Burden Index associated with function in community-dwelling older people in Finland: a cross-sectional study**. *Ann Med* 2012, **44**(5):458-467.

57. Hilmer SN, Mager DE, Simonsick EM, Ling SM, Windham BG, Harris TB, Shorr RI, Bauer DC, Abernethy DR, Health ABCS: **Drug burden index score and functional decline in older people**. *Am J Med* 2009, **122**(12):1142-1149 e1141-1142.

58. Chew ML, Mulsant BH, Pollock BG, Lehman ME, Greenspan A, Mahmoud RA, Kirshner MA, Sorisio DA, Bies RR, Gharabawi G: **Anticholinergic activity of 107 medications commonly used by older adults**. *J Am Geriatr Soc* 2008, **56**(7):1333-1341.

59. Salahudeen MS, Duffull SB, Nishtala PS: **Anticholinergic burden quantified by anticholinergic risk scales and adverse outcomes in older people: a systematic review**. *BMC Geriatr* 2015, **15**(1):31.

60. Rudolph JL, Salow MJ, Angelini MC, McGlinchey RE: **The anticholinergic risk scale and anticholinergic adverse effects in older persons**. *Arch Intern Med* 2008, **168**(5):508-513.

61. Cai X, Campbell N, Khan B, Callahan C, Boustani M: **Long-term anticholinergic use and the aging brain**. *Alzheimers Dement* 2013, **9**(4):377-385.

62. Carnahan RM, Lund BC, Perry PJ, Pollock BG, Culp KR: **The Anticholinergic Drug Scale as a measure of drug-related anticholinergic burden: associations with serum anticholinergic activity**. *J Clin Pharmacol* 2006, **46**(12):1481-1486.

63. Pisani MA, Murphy TE, Araujo KL, Slattum P, Van Ness PH, Inouye SK: **Benzodiazepine and opioid use and the duration of intensive care unit delirium in an older population**. *Crit Care Med* 2009, **37**(1):177-183.

64. Han L, Agostini JV, Allore HG: **Cumulative anticholinergic exposure is associated with poor memory and executive function in older men**. *J Am Geriatr Soc* 2008, **56**(12):2203-2210.

65. Ehrt U, Broich K, Larsen JP, Ballard C, Aarsland D: **Use of drugs with anticholinergic effect and impact on cognition in Parkinson's disease: a cohort study**. *J Neurol Neurosurg Psychiatry* 2010, **81**(2):160-165.

66. Sittironnarit G, Ames D, Bush AI, Faux N, Flicker L, Foster J, Hilmer S, Lautenschlager NT, Maruff P, Masters CL *et al*: **Effects of anticholinergic drugs on cognitive function in older Australians: results from the AIBL study**. *Dement Geriatr Cogn Disord* 2011, **31**(3):173-178.

67. Ancelin ML, Artero S, Portet F, Dupuy AM, Touchon J, Ritchie K: **Non-degenerative mild cognitive impairment in elderly people and use of anticholinergic drugs: longitudinal cohort study**. *BMJ* 2006, **332**(7539):455-459.

68. Barker MJ, Greenwood KM, Jackson M, Crowe SF: **Cognitive effects of long-term benzodiazepine use: a meta-analysis**. *CNS Drugs* 2004, **18**(1):37-48.

69. Chau DL, Walker V, Pai L, Cho LM: **Opiates and elderly: use and side effects**. *Clin Interv Aging* 2008, **3**(2):273-278.

70. Gray SL, Anderson ML, Dublin S, Hanlon JT, Hubbard R, Walker R, Yu O, Crane PK, Larson EB: **Cumulative use of strong anticholinergics and incident dementia: a prospective cohort study**. *JAMA Intern Med* 2015, **175**(3):401-407.

71. Woolcott JC, Richardson KJ, Wiens MO, Patel B, Marin J, Khan KM, Marra CA: **Meta-analysis of the impact of 9 medication classes on falls in elderly persons**. *Arch Intern Med* 2009, **169**(21):1952-1960.

72. Moden B, Merlo J, Ohlsson H, Rosvall M: **Psychotropic drugs and falling accidents among the elderly: a nested case control study in the whole population of Scania, Sweden**. *J Epidemiol Community Health* 2010, **64**(5):440-446.

73. Chou R, Turner JA, Devine EB, Hansen RN, Sullivan SD, Blazina I, Dana T, Bougatsos C, Deyo RA: **The effectiveness and risks of long-term opioid therapy for chronic pain: a systematic review for a National Institutes of Health Pathways to Prevention Workshop**. *Ann Intern Med* 2015, **162**(4):276-286.

74. Peron EP, Ogbonna KC, Donohoe KL: **Antidiabetic Medications and Polypharmacy**. *Clinics in geriatric medicine* 2015, **31**(1):17-27.

75. Ruxton K, Woodman RJ, Mangoni AA: **Drugs with anticholinergic effects and cognitive impairment, falls and all-cause mortality in older adults: A systematic review and meta-analysis**. *Br J Clin Pharmacol* 2015, **80**(2):209-220.

76. Spence MM, Shin PJ, Lee EA, Gibbs NE: **Risk of injury associated with skeletal muscle relaxant use in older adults**. *Ann Pharmacother* 2013, **47**(7-8):993-998.