

## **Supplementary Materials**

**Table S1. PubMed Search Strategy**

**Table S2. Opioid and Benzodiazepine Deprescribing Sources Identified via State Health Departments**

**Table S3. Studies Reporting Details of Deprescribing Strategies for Opioids or Benzodiazepines Only by Country (n=36)**

**Table S4. Studies Reporting Deprescribing Strategies for Concurrent Opioid and Benzodiazepine Use (n=3)**

**Table S1. PubMed Search Strategy**

| Search number | Query  | Filters                   | Results |
|---------------|--|---------------------------|---------|
| 51            | #47 AND #45  | English, from 1995 - 2020 | 2,235   |
| 48            | #47 AND #45  |                           | 2,707   |
| 47            | #44 OR #46   |                           | 72,339  |
| 46            | (discontinue[Title] OR discontinued[Title] OR discontinuing[Title] OR lower[Title] OR lowering[Title] OR lowered[Title] OR reduce[Title] OR reducing[Title] OR reduction[Title] OR reduced[Title] OR cease[Title] OR ceasing[Title] OR ceased[Title] OR stop[Title] OR stopping[Title] OR stopped[Title]) AND (medication*[Title] OR medicine[Title] OR therapy[Title] OR treatment[Title] OR dose[title] OR doses[title] OR drug*[Title] OR prescription*[Title]) |                           | 50,761  |
| 45            | #43 OR #21   |                           | 264,903 |
| 44            | ("Deprescriptions"[Mesh] ) OR (deprescription[Title/Abstract] OR deprescribe[Title/Abstract] OR deprescribing[Title/Abstract] OR taper[Title/Abstract] OR tapering[Title/Abstract] OR tapered[tiab] OR tapered[Title/Abstract])  |                           | 21,791  |
| 43            | #21 OR #22 OR #24 OR #25 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42   |                           | 264,903 |
| 42            | ("Analgesics, Opioid"[Mesh] ) OR (opioid[Title/Abstract] OR opioids[Title/Abstract])   |                           | 109,733 |
| 41            | ("Tapentadol"[Mesh] ) OR (tramadol[Title/Abstract] OR Ultram[Title/Abstract] OR Prontofort Zytram[Title/Abstract] OR Takadol[Title/Abstract] OR Theradol[Title/Abstract] OR Tiral OR[Title/Abstract])  |                           | 5,564   |
| 40            | ("Tapentadol"[Mesh]) OR (tapentadol[Title/Abstract] OR Nucynta[Title/Abstract])  |                           | 532     |
| 39            | ("Pentazocine"[Mesh]) OR (pentazocine[Title/Abstract] OR Lexir[Title/Abstract] OR Talwin[Title/Abstract] OR Fortral[Title/Abstract])   |                           | 3,041   |
| 38            | ("Oxymorphone"[Mesh]) OR (oxymorphone[Title/Abstract] OR Numorphan[Title/Abstract] OR Opana[Title/Abstract])   |                           | 804     |
| 37            | ("Oxycodone"[Mesh]) OR (oxycodone[Title/Abstract] OR Dihydro[Title/Abstract] OR Oxycone[Title/Abstract] OR Dihydrohydroxycodone[Title/Abstract] OR Oxycodone[Title/Abstract] OR Eucodal[Title/Abstract] OR Theocodin[Title/Abstract] OR Oxycontin[Title/Abstract] OR Pancodine[Title/Abstract] OR Dinarkon[Title/Abstract] OR Oxiconum OR[Title/Abstract])   |                           | 4,163   |
| 36            | ("Opium"[Mesh]) OR (opium[Title/Abstract] OR Papaveretum[Title/Abstract] OR Omnopon[Title/Abstract] OR Pantopon[Title/Abstract])   |                           | 3,793   |
| 35            | ("Morphine"[Mesh]) OR (morphine[Title/Abstract] OR Morphia[Title/Abstract])  |                           | 57,936  |
| 34            | ("Methadone"[Mesh] ) OR (methadone[Title/Abstract] OR Biodone[Title/Abstract] OR Dolophine[Title/Abstract] OR Metadol[Title/Abstract] OR Metasedin[Title/Abstract] OR Symoron[Title/Abstract] OR Methadose[Title/Abstract] OR Methex[Title/Abstract] OR Phenadone[Title/Abstract] OR Physeptone[Title/Abstract] OR Phymet[Title/Abstract] OR Pinadone[Title/Abstract] OR Amidone[Title/Abstract])  |                           | 16,976  |
| 33            | ("Meperidine"[Mesh]) OR (meperidine[Title/Abstract] OR Pethidine[Title/Abstract] OR Isonipeccain[Title/Abstract] OR  |                           | 7,893   |

|    |   |        |
|----|---|--------|
|    | Dolsin[Title/Abstract] OR Dolosal[Title/Abstract] OR Dolin[Title/Abstract] OR Dolantin[Title/Abstract] OR Dolargan[Title/Abstract] OR Lidol[Title/Abstract] OR Lydol[Title/Abstract] OR Demerol[Title/Abstract] OR Dolcontral[Title/Abstract])  |        |
| 32 | ("Levorphanol"[Mesh] ) OR (levorphanol[Title/Abstract] OR Levodroman[Title/Abstract] OR Levorphan[Title/Abstract] OR "Levo Dromoran"[Title/Abstract])   | 843    |
| 31 | ("Methadyl Acetate"[Mesh] ) OR ("Levomethadyl acetate"[Title/Abstract] OR "Methadyl Acetate"[Title/Abstract] OR Acetylmethadol[Title/Abstract] OR Alphacetylmethadol[Title/Abstract] OR Amidolacetate[Title/Abstract] OR Dimepheptanol[Title/Abstract] OR Levoacetylmethadol[Title/Abstract] OR Methadol[Title/Abstract] OR Acemethadone[Title/Abstract] OR Levomethadyl[Title/Abstract]) | 494    |
| 30 | ("Hydromorphone"[Mesh]) OR (Hydromorphone[Title/Abstract] OR Dihydromorphinone[Title/Abstract] OR Hydromorphon[Title/Abstract] OR Palladone[Title/Abstract] OR Laudacon[Title/Abstract] OR Dilaudid[Title/Abstract])  | 2,201  |
| 29 | ("Hydrocodone"[Mesh]) OR (Hydrocodone[Title/Abstract] OR Hydrocodon[Title/Abstract] OR Dihydrocodeinone[Title/Abstract] OR Dicodid[Title/Abstract] OR Robidone[Title/Abstract] OR Hydrocodeinonebitartrate[Title/Abstract] OR Hydrocon[Title/Abstract] OR Codinovo[Title/Abstract] OR Hycodan[tiab] OR Hycon[Title/Abstract])   | 1,291  |
| 28 | ("Fentanyl"[Mesh]) OR (Fentanyl[Title/Abstract] OR Phentanyl[Title/Abstract] OR Fentanest[Title/Abstract] OR Duragesic[Title/Abstract] OR Durogesic[Title/Abstract] OR Fentora[Title/Abstract] OR Sublimaze[Title/Abstract])  | 24,954 |
| 27 | ("dihydrocodeine" [Supplementary Concept]) OR (dihydrocodeine[Title/Abstract] OR Rikodeine[Title/Abstract] OR [Title/Abstract] OR Tiamon[Title/Abstract] OR Tosidrin[Title/Abstract] OR Contugesic[Title/Abstract] OR Paracodin[Title/Abstract] OR Paracodina[Title/Abstract])  | 390    |
| 25 | ("Codeine"[Mesh]) OR (Codeine[Title/Abstract] OR Ardinex[Title/Abstract] OR Isocodeine[Title/Abstract])   | 9,418  |
| 24 | ("Butorphanol"[Mesh] ) OR (Butorphanol[Title/Abstract] OR Beforal[Title/Abstract] OR Moradol[Title/Abstract] OR Stadol[Title/Abstract] OR Torbugesic[Title/Abstract] OR "Apo-Butorphanol"[Title/Abstract] OR Dolorex[Title/Abstract])   | 1,659  |
| 22 | "Buprenorphine"[Mesh] OR Buprenorphine[tiab] OR Buprenex[tiab] OR Prefin[tiab] OR Subutex[tiab] OR Buprex[tiab] OR Temgesic[tiab]   | 7,832  |
| 21 | #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20   | 91,621 |
| 20 | "Prazepam"[Mesh] OR Prazepam[tiab] OR Lysanxia[tiab] OR Reapam[tiab] OR Centrax[tiab] OR Demetrin[tiab]   | 228    |
| 19 | "Benzodiazepines"[Mesh] OR benzodiazepine*[tiab]  | 80,241 |
| 18 | "Eszopiclone"[Mesh] OR Eszopiclone[tiab] OR Lunesta[tiab] OR Estorra[tiab]  | 281    |
| 17 | "zopiclone" [Supplementary Concept] OR Zopiclone[tiab] OR Zopitan[tiab] OR Zorclone[tiab] OR Imovane[tiab] OR Ximovan[tiab] OR Zimovane[tiab] OR Limovan[tiab] OR Rhovane[tiab]   | 1,091  |
| 16 | "zaleplon" [Supplementary Concept] OR Zaleplon[tiab] OR Zelepion[tiab] OR Starnoc[tiab] OR sonata[tiab]   | 664    |
| 15 | "Zolpidem"[Mesh] OR Zolpidem[tiab] OR Zolirin[tiab] OR Zolpinox[tiab] OR Zolpimist[tiab] OR Ambien[tiab] OR Amsic[tiab] OR Bikalm[tiab] OR  | 2,528  |

|    |  |        |
|----|--|--------|
|    | Stilnoct[tiab] OR Stilnox[tiab] OR Dalparan[tiab] OR Zodormdura[tiab] OR Zoldem[tiab]  |        |
| 14 | "Triazolam"[Mesh] OR Triazolam[tiab] OR Halcion[tiab] OR Trilam[tiab] OR "Temazepam"[Mesh] OR Temazepam[tiab] OR Hydroxydiazepam[tiab] OR Oxydiazepam[tiab] OR Methyloxazepam[tiab] OR Planum[tiab] OR Remestan[tiab] OR Restoril[tiab] OR Levanxol[tiab]  | 2,255  |
| 13 | "quazepam" [Supplementary Concept] OR Quazepam[tiab] OR Quiedorm[tiab] OR Doral[tiab]  | 184    |
| 12 | "Oxazepam"[Mesh] OR Oxazepam[tiab] OR Serax[tiab] OR Tazepam[tiab] OR Adumbran[tiab]   | 1,962  |
| 11 | "halazepam" [Supplementary Concept] OR halazepam[tiab]   | 60     |
| 10 | "Nitrazepam"[Mesh] OR Nitrazepam[tiab] OR Nitrodiazepam[tiab] OR "Dormo-Puren"[tiab] OR Eatan[tiab] OR Imadorm[tiab] OR Imeson[tiab] OR Mogadon[tiab] OR Nitrazadon[tiab] OR Nitrazep[tiab] OR Novanox[tiab] OR Radedorm[tiab] OR Remnos[tiab] OR Serenade[tiab] OR Somnite[tiab] OR Alodorm[tiab] OR Dormalon[tiab]                     | 1,354  |
| 9  | "Lorazepam"[Mesh] OR lorazepam[tiab] OR Lorazepam[tiab] OR Ativan[tiab] OR "Orfidal Wyeth"[tiab] OR Temesta[tiab] OR Tolid[tiab] OR Donix[tiab] OR Duralozam[tiab] OR Durazolam[tiab] OR [tiab] OR Idalprem[tiab] OR Laubeel[tiab]   | 2,196  |
| 8  | "Flurazepam"[Mesh] OR Flurazepam[tiab] OR Dalmane[tiab] OR Dalmadorm[tiab] OR Dormodor[tiab] OR "Apo Flurazepam"[tiab]   | 1,184  |
| 7  | "Estazolam"[Mesh] OR Estazolam[tiab] OR Tasedan[tiab] OR ProSom[tiab] OR Nuctalon[tiab]  | 251    |
| 6  | "Diazepam"[Mesh] OR Diazepam [tiab] OR Diazemuls[tiab] OR Faustan[tiab] OR Valium[tiab] OR Seduxen[tiab] OR Sibazon[tiab] OR Stesolid[tiab] OR Apaurin[tiab] OR Relanium[tiab]   | 25,859 |
| 5  | "Clorazepate Dipotassium"[Mesh] OR Clorazepate[tiab] OR "clorazepate dipotassium"[tiab] OR Chlorazepate[tiab] OR Clorazepate[tiab] OR Tranxene[tiab] OR Tranxilium[tiab] OR "Clorazepic Acid"[tiab]  | 543    |
| 4  | "Clonazepam"[Mesh] OR Clonazepam[tiab] OR Anteplepsin[tiab] OR Rivotril[tiab]  | 4,570  |
| 3  | "Chlordiazepoxide"[Mesh] OR Chlordiazepoxide[tiab] OR Methaminodiazepoxide[tiab] OR Librium[tiab] OR Chlozepid[tiab] OR Elenium[tiab]  | 4,819  |
| 2  | "Bromazepam"[Mesh] OR Bromazepam[tiab] OR Bromalich[tiab] OR Bromazanil[tiab] OR Durazanil[tiab] OR Lexotan[tiab] OR Lexomil[tiab] OR Lexatin[tiab] OR Lexotanil[tiab] OR Anxyrex[tiab]  | 593    |
| 1  | "Alprazolam"[Mesh] OR alprazolam[tiab] OR Alprazolan[tiab] OR Trankimazin[tiab] OR Xanax[tiab] OR Alprox[tiab] OR Esparon[tiab] OR Cassadan[tiab] OR Kalma[tiab] OR "Novo-Alprazol"[tiab] OR "Novo Alprazol"[tiab] OR "Nu-Alpraz"[tiab] OR "Nu Alpraz"[tiab] OR Ralozam[tiab] OR Tafil[tiab] OR "Apo-Alpraz"[tiab] OR "Apo Alpraz"[tiab] | 2,724  |

Complete search strategies are available upon request.

**Table S2. Opioid and Benzodiazepine Deprescribing Sources Identified Using State Health Department Websites**

| State       | URL for OPI deprescribing recommendations  | OPI Source  | URL for BZD deprescribing recommendations | BZD Source |
|-------------|--|-------------|---|------------|
| Alabama     | <a href="https://www.alabamapublichealth.gov/pdmp/educational-materials.html">https://www.alabamapublichealth.gov/pdmp/educational-materials.html</a>  | CDC         | NR  | NR         |
| Alaska      | <a href="https://dhss.alaska.gov/dph/Director/Pages/opioids/prescribers.aspx">https://dhss.alaska.gov/dph/Director/Pages/opioids/prescribers.aspx</a>  | CDC; HHS    | NR  | NR         |
| Arizona     | <a href="https://www.azdhs.gov/audiences/clinicians/index.php#clinical-guidelines-and-references-rx-guidelines">https://www.azdhs.gov/audiences/clinicians/index.php#clinical-guidelines-and-references-rx-guidelines</a><br><a href="https://www.azdhs.gov/documents/audiences/clinicians/clinical-guidelines-recommendations/prescribing-guidelines/az-opioid-prescribing-guidelines.pdf">https://www.azdhs.gov/documents/audiences/clinicians/clinical-guidelines-recommendations/prescribing-guidelines/az-opioid-prescribing-guidelines.pdf</a> | CDC; VA/DoD | NR  | NR         |
| Arkansas    | NR   | NR          | NR  | NR         |
| California  | <a href="https://www.cdph.ca.gov/Programs/CCDPHP/DCDIC/SACB/Pages/Resources.aspx">https://www.cdph.ca.gov/Programs/CCDPHP/DCDIC/SACB/Pages/Resources.aspx</a>  | CDC         | NR  | NR         |
| Colorado    | NR   | NR          | NR  | NR         |
| Connecticut | NR   | NR          | NR  | NR         |
| Delaware    | NR   | NR          | NR  | NR         |
| Florida     | NR   | NR          | NR  | NR         |
| Georgia     | <a href="https://dph.georgia.gov/stopopioidaddiction/medical-providers-and-pharmacists">https://dph.georgia.gov/stopopioidaddiction/medical-providers-and-pharmacists</a>  | CDC         | NR  | NR         |
| Hawaii      | NR   | NR          | NR  | NR         |
| Idaho       | <a href="https://healthandwelfare.idaho.gov/providers/opioid-prescribing/opioid-prescribing-providers">https://healthandwelfare.idaho.gov/providers/opioid-prescribing/opioid-prescribing-providers</a><br><a href="https://healthandwelfare.idaho.gov/providers/opioid-prescribing/provider-resources">https://healthandwelfare.idaho.gov/providers/opioid-prescribing/provider-resources</a>   | CDC; HHS    | NR  | NR         |
| Illinois    | <a href="https://dph.illinois.gov/topics-services/opioids/prescription-opioids-and-heroin.html">https://dph.illinois.gov/topics-services/opioids/prescription-opioids-and-heroin.html</a>  | CDC         | NR  | NR         |
| Indiana     | <a href="https://www.in.gov/health/overdose-prevention/resources-for-medical-professionals/opioid-prescribing-guidelines/">https://www.in.gov/health/overdose-prevention/resources-for-medical-professionals/opioid-prescribing-guidelines/</a>  | CDC         | NR  | NR         |
| Iowa        | <a href="https://idph.iowa.gov/Bureau-of-Substance-Abuse/Prevention-Related-Programs/Current-Grants/Strategic-Initiatives-to-Prevent-Drug-Overdoses-Grant/Academic-Detailing-Resources">https://idph.iowa.gov/Bureau-of-Substance-Abuse/Prevention-Related-Programs/Current-Grants/Strategic-Initiatives-to-Prevent-Drug-Overdoses-Grant/Academic-Detailing-Resources</a>  | CDC         | NR  | NR         |
| Kansas      | NR   | NR          | NR  | NR         |
| Kentucky    | NR   | NR          | NR  | NR         |

| State         | URL for OPI deprescribing recommendations   | OPI Source                         | URL for BZD deprescribing recommendations   | BZD Source                     |
|---------------|---|------------------------------------|---|--------------------------------|
| Louisiana     | <a href="https://ldh.la.gov/page/2755">https://ldh.la.gov/page/2755</a>   | CDC                                | NR  | NR                             |
| Maine         | NR  | NR                                 | NR  | NR                             |
| Maryland      | <a href="https://health.maryland.gov/bha/Documents/CDC%20Info.pdf#search=opioid%20prescribing">https://health.maryland.gov/bha/Documents/CDC%20Info.pdf#search=opioid%20prescribing</a><br><br><a href="https://health.maryland.gov/pha/Documents/CDC%201%20_guidelines_factsheet.pdf#search=opioid%20prescribing">https://health.maryland.gov/pha/Documents/CDC%201%20_guidelines_factsheet.pdf#search=opioid%20prescribing</a><br><br><a href="https://health.maryland.gov/pdmp/Pages/-Clinical-Resources.aspx">https://health.maryland.gov/pdmp/Pages/-Clinical-Resources.aspx</a> | CDC; HHS                           | NR  | NR                             |
| Massachusetts | NR  | NR                                 | NR  | NR                             |
| Michigan      | <a href="https://www.michigan.gov/documents/mdhhs/CDC_Guidelines_Prescribing_Opioids_618282_7.pdf">https://www.michigan.gov/documents/mdhhs/CDC_Guidelines_Prescribing_Opioids_618282_7.pdf</a><br><br><a href="https://www.michigan.gov/documents/mdhhs/Checklist_for_prescribing_opioids_618296_7.pdf">https://www.michigan.gov/documents/mdhhs/Checklist_for_prescribing_opioids_618296_7.pdf</a>  | CDC                                | NR  | NR                             |
| Minnesota     | <a href="https://mn.gov/dhs/opip/provider-education/">https://mn.gov/dhs/opip/provider-education/</a><br><br><a href="https://edocs.dhs.state.mn.us/lfserv/Public/DHS-7757C-ENG">https://edocs.dhs.state.mn.us/lfserv/Public/DHS-7757C-ENG</a><br><br><a href="https://mn.gov/dhs/opip/opioid-guidelines/tapering-opioids/">https://mn.gov/dhs/opip/opioid-guidelines/tapering-opioids/</a>   | HHS; AMDG; Berna 2015; CDC; VA/DoD | NR  | NR                             |
| Mississippi   | NR  | NR                                 | NR  | NR                             |
| Missouri      | <a href="https://health.mo.gov/safety/bnodd/pdf/opiate-guidelines.pdf">https://health.mo.gov/safety/bnodd/pdf/opiate-guidelines.pdf</a>   | CDC                                | NR  | NR                             |
| Montana       | NR  | NR                                 | NR  | NR                             |
| Nebraska      | <a href="https://dhhs.ne.gov/Guidance%20Docs/Pain%20Management%20Pain%20Guidance%20Document.pdf#search=opioid%20prescribing">https://dhhs.ne.gov/Guidance%20Docs/Pain%20Management%20Pain%20Guidance%20Document.pdf#search=opioid%20prescribing</a>   | CDC; OPG                           | <a href="https://dhhs.ne.gov/Guidance%20Docs/Pain%20Management%20Pain%20Guidance%20Document.pdf#search=opioid%20prescribing">https://dhhs.ne.gov/Guidance%20Docs/Pain%20Management%20Pain%20Guidance%20Document.pdf#search=opioid%20prescribing</a> | OPG                            |
| Nevada        | <a href="https://dphh.nv.gov/Resources/opioids/Prescription_Drug_Abuse_Prevention/">https://dphh.nv.gov/Resources/opioids/Prescription_Drug_Abuse_Prevention/</a>   | CDC                                | NR  | NR                             |
| New Hampshire | NR  | NR                                 | NR  | NR                             |
| New Jersey    | NR  | NR                                 | NR  | NR                             |
| New Mexico    | <a href="https://www.nmhealth.org/publication/view/help/2244/">https://www.nmhealth.org/publication/view/help/2244/</a><br><br><a href="https://www.nmhealth.org/about/erd/ibeb/pos/ospr/">https://www.nmhealth.org/about/erd/ibeb/pos/ospr/</a>  | CDC                                | <a href="https://www.nmhealth.org/publication/view/guide/6327/">https://www.nmhealth.org/publication/view/guide/6327/</a>   | Kaiser Permanente; Pottie 2018 |
| New York      | <a href="https://www.health.ny.gov/professionals/narcotic/opioid_treatment_guidelines/">https://www.health.ny.gov/professionals/narcotic/opioid_treatment_guidelines/</a>   | CDC                                | NR  | NR                             |

| State          | URL for OPI deprescribing recommendations  | OPI Source | URL for BZD deprescribing recommendations  | BZD Source  |
|----------------|--|------------|--|-------------|
| North Carolina | <a href="https://www.ncdhhs.gov/media/1755/download">https://www.ncdhhs.gov/media/1755/download</a>  | CDC        | NR   | NR          |
| North Dakota   | NR   | NR         | NR   | NR          |
| Ohio           | <a href="https://mha.ohio.gov/static/Portals/0/assets/ResearchersAndMedia/Combating%20Opiate%20Abuse/OPG/Acute-pain-infographic.pdf?ver=2018-11-08-125608-507">https://mha.ohio.gov/static/Portals/0/assets/ResearchersAndMedia/Combating%20Opiate%20Abuse/OPG/Acute-pain-infographic.pdf?ver=2018-11-08-125608-507</a><br><br><a href="https://mha.ohio.gov/static/Portals/0/assets/ResearchersAndMedia/Combating%20Opiate%20Abuse/OPG/Guidelines-Chronic-Pain.pdf?ver=2018-11-08-133715-657">https://mha.ohio.gov/static/Portals/0/assets/ResearchersAndMedia/Combating%20Opiate%20Abuse/OPG/Guidelines-Chronic-Pain.pdf?ver=2018-11-08-133715-657</a> | CDC; HHS   | NR   | NR          |
| Oklahoma       | <a href="https://oklahoma.gov/content/dam/ok/en/health/health2/documents/pocket-guide-tapering.pdf">https://oklahoma.gov/content/dam/ok/en/health/health2/documents/pocket-guide-tapering.pdf</a>  | CDC        | NR   | NR          |
| Oregon         | <a href="https://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/SUBSTANCEUSE/OPIOIDS/Pages/task-force.aspx">https://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/SUBSTANCEUSE/OPIOIDS/Pages/task-force.aspx</a><br><br><a href="https://www.oregon.gov/omb/Topics-of-Interest/Documents/Oregon-Opioid-Tapering-Guidelines.pdf">https://www.oregon.gov/omb/Topics-of-Interest/Documents/Oregon-Opioid-Tapering-Guidelines.pdf</a>   | CDC; HHS   | NR   | NR          |
| Pennsylvania   | <a href="https://www.health.pa.gov/topics/programs/Patient-Advocacy/Pages/Healthcare.aspx">https://www.health.pa.gov/topics/programs/Patient-Advocacy/Pages/Healthcare.aspx</a>  | CDC; HHS   | <a href="https://www.health.pa.gov/topics/programs/Patient-Advocacy/Pages/Healthcare.aspx">https://www.health.pa.gov/topics/programs/Patient-Advocacy/Pages/Healthcare.aspx</a><br><br><a href="https://alosahealth.org/wp-content/uploads/2021/06/Benzo-taper-tool-2021.pdf">https://alosahealth.org/wp-content/uploads/2021/06/Benzo-taper-tool-2021.pdf</a> | Pottie 2018 |
| Rhode Island   | <a href="https://health.ri.gov/publications/quickreferenceguides/QuickReferenceToRIUpdatedPainManagementRegulations.pdf">https://health.ri.gov/publications/quickreferenceguides/QuickReferenceToRIUpdatedPainManagementRegulations.pdf</a>  | CDC        | NR   | NR          |
| South Carolina | <a href="https://scdhec.gov/opioid-epidemic">https://scdhec.gov/opioid-epidemic</a>  | CDC        | NR   | NR          |
| South Dakota   | <a href="https://doh.sd.gov/documents/news/SDOpioidAbuseStrategicPlan.pdf">https://doh.sd.gov/documents/news/SDOpioidAbuseStrategicPlan.pdf</a>  | CDC        | NR   | NR          |
| Tennessee      | <a href="https://www.tn.gov/content/dam/tn/health/healthprofboards/pain-management-clinic/ChronicPainGuidelines.pdf">https://www.tn.gov/content/dam/tn/health/healthprofboards/pain-management-clinic/ChronicPainGuidelines.pdf</a>  | HHS        | NR   | NR          |
| Texas          | <a href="https://www.dshs.texas.gov/features/substance-use-action-plan/DSHS-SubstanceUse-ActionPlan.pdf">https://www.dshs.texas.gov/features/substance-use-action-plan/DSHS-SubstanceUse-ActionPlan.pdf</a>  | HHS        | NR   | NR          |
| Utah           | <a href="https://opidemic.org/providers/">https://opidemic.org/providers/</a>  | CDC; AMDG  | NR   | NR          |

| State         | URL for OPI deprescribing recommendations  | OPI Source | URL for BZD deprescribing recommendations | BZD Source |
|---------------|--|------------|---|------------|
| Vermont       | <a href="https://www.healthvermont.gov/sites/default/files/documents/pdf/REG_opioids-prescribing-for-pain.pdf">https://www.healthvermont.gov/sites/default/files/documents/pdf/REG_opioids-prescribing-for-pain.pdf</a>  | HHS        | NR  | NR         |
| Virginia      | <a href="https://www.vdh.virginia.gov/home/the-opioid-addiction-crisis-is-a-public-health-emergency-in-virginia/">https://www.vdh.virginia.gov/home/the-opioid-addiction-crisis-is-a-public-health-emergency-in-virginia/</a>  | CDC        | NR  | NR         |
| Washington    | <a href="https://doh.wa.gov/sites/default/files/legacy/Documents/2300/2017//AMDG-Guidelines.pdf">https://doh.wa.gov/sites/default/files/legacy/Documents/2300/2017//AMDG-Guidelines.pdf</a><br><br><a href="https://doh.wa.gov/sites/default/files/legacy/Documents/2600/2017//PrescribingGLcomparisonCDC-AMDG.pdf">https://doh.wa.gov/sites/default/files/legacy/Documents/2600/2017//PrescribingGLcomparisonCDC-AMDG.pdf</a> | CDC; HHS   | NR  | NR         |
| West Virginia | <a href="https://dhhr.wv.gov/News/Pages/DHHR-Announces-Implementation-of-New-Opioid-Prescribing-Requirements.aspx">https://dhhr.wv.gov/News/Pages/DHHR-Announces-Implementation-of-New-Opioid-Prescribing-Requirements.aspx</a>  | CDC        | NR  | NR         |
| Wisconsin     | <a href="https://www.dhs.wisconsin.gov/opioids/professionals.htm">https://www.dhs.wisconsin.gov/opioids/professionals.htm</a>  | CDC        | NR  | NR         |
| Wyoming       | <a href="https://health.wyo.gov/publichealth/prevention/substanceabuseandsuicide/publications-and-reports/">https://health.wyo.gov/publichealth/prevention/substanceabuseandsuicide/publications-and-reports/</a>  | CDC        | NR  | NR         |

Abbreviations: **BZD**: benzodiazepine; **NR**: not reported; **OPI**: opioid



**Table S3. Studies Reporting Details of Deprescribing Strategies for Opioids or Benzodiazepines Only by Country (n=36)\***

| Drug to<br>deprescribe | Country       | Studies   |
|------------------------|---------------|---|
| Opioid                 | USA (n=3)     | Darnall (2018); Goodman (2018); Sullivan (2017)   |
|                        | Europe (n=2)  | Kurita (2018); Wang (2011)  |
| Benzodiazepine         | USA (n=8)     | Fung (2019); Gorenstein (2005); Hadley (2012); Otto (1993); Rickels (2000); Rosenbaum (1997); Roy-Byrne (2003); Rynn (2003)   |
|                        | Canada (n=10) | Baillargeon (2003); Belanger (2005); Belleville (2007); Dellechiaie (1995); Gosselin (2006); Morin (1995); Morin (2004); Morin (2005); O'Connor (2008); Tannenbaum (2014) |
|                        | Europe (n=9)  | Baandrup (2016); Curran (2003); Mercier-Guyon (2004); OudeVoshaar (2003); Rubio (2011); Vicens (2006); Vicens (2014); Vorms (2002); Zitman (2001)                         |
|                        | Other (n=4)   | Cardinali (2002); Kitajima (2012); Nakao (2006); Yang (2015)  |

\*Studies are alphabetically ordered

**Table S4. Studies Reporting Deprescribing Strategies for Concurrent Opioid and Benzodiazepine Use (n=3)**

| Study (year, country)    | Study design                         | Study sample/cohort   | OPI-BZD deprescribing protocol   | Outcomes evaluated   | Other details  |
|--------------------------|--------------------------------------|---|--|--|--|
| Cunningham (2016, USA)   | Prospective pre/post without control | 55 CNCP pts with fibromyalgia receiving a 3-wk (8hr/weekday) interdisciplinary rehabilitation program at the Mayo Clinic Pain Rehabilitation Center taking a daily OPI with 61% on daily OPI for a mean duration of 4.6 (SD=5.8) years (BZDs use not detailed)                                    | <p><b>OPIs:</b> individualized schedule based on current formulation and dose at program admission. Reduce daily OPI dose during days of program participation and avoid weekend reductions (pts away from the program). Reduce initial OPI dose by 10%–20% each week day during the first half to two-thirds of the deprescribing period, and then by 2.5%–10% each week day during the remaining deprescribing period.</p> <ul style="list-style-type: none"> <li>Initial reductions could be &gt;10%–20%, until decreased by 50%–80% of initial daily dose.</li> <li>Slower tapers: for those with long-term opioid use (&gt;2 years of daily use).</li> </ul> <p><b>BZDs:</b> taper schedule individualized during the 3-wk program, then at discharge clinical note recommended the primary care provider continue the current dose for the next 2-4 weeks and then continue to taper the patient by approximately 25% every 2-4 weeks until completed (Julie Cunningham, PharmD, RPh, e-mail communication, September 22, 2022).</p> | <ul style="list-style-type: none"> <li>51 out of 55 (92.7%) discontinued OPIs within 3 wks</li> <li>Mean tapering durations between pts with &lt;100 vs. &gt;200 MME/day: 10 vs. 18 days (<math>p&lt;0.001</math>).</li> <li>Significant improvements: numeric pain scores, depression catastrophizing, health perception, interference with life, and perceived life control at program completion</li> </ul> | <p>The 3-wk interdisciplinary rehabilitation program also included:</p> <ul style="list-style-type: none"> <li>8 hours of participation at clinic on week days</li> <li>Cognitive behavioral therapy</li> <li>Occupational therapy</li> <li>Biofeedback and relaxation training</li> <li>Group therapy</li> <li>Clonidine based on specific withdrawal symptoms</li> <li>Meetings with interdisciplinary treatment team twice weekly to discuss treatment progress</li> <li>Withdrawal assessment</li> </ul> |
| Gilliam (2018, USA)      | Prospective pre-post without control | 344 eligible, CNCP pts receiving a 3-wk (8hr/weekday) interdisciplinary rehabilitation program at the Mayo Clinic Pain Rehabilitation Center; the mean duration of opioid use in the opioid group was 5.8 (SD=4.9) years; 101 of 285 who completed the program were taking BZDs at pre-treatment) | Same as Cunningham (2016, USA)   | <ul style="list-style-type: none"> <li><b>OPIs:</b> 142 of 165 (86.1%) completed treatment and discontinued within 3 wks</li> <li><b>BZDs:</b> 23 of 43 (53.4%) discontinued--deprescribing duration not described</li> <li><b>OPI-BZD use:</b> 20 of 58 (34.5%) co-prescribed BZDs discontinued both drug classes--deprescribing duration not described; 58 of 58 (100%) discontinued opioids.</li> </ul>     | <p>The 3-wk interdisciplinary rehabilitation program also included:</p> <ul style="list-style-type: none"> <li>8 hours of participation at clinic on week days</li> <li>Physical and occupational therapy</li> <li>Individual and group-based CBT sessions</li> <li>Weekly individual meetings with the multidisciplinary team to discuss treatment progress</li> <li>Daily withdrawal assessment during taper and several days afterwards</li> </ul>  |
| Zaman et al. (2018, USA) | Prospective pre-post                 | 145 veterans with pain and $\geq 1$ overlapping day of OPI-BZD.   | <b>OPIs:</b> individualized schedule or to reduce to OPI <100 MME/day.   | At 6-month follow-up (% change from baseline):   | Provider centered electronic interventions provided:   |

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|  |                 |  |  |   |  |
|--|-----------------|--|--|---|--|
|  | without control | Exclusion: Pts prescribed with OPIs <90 days in the past 120 days, sublingual buprenorphine, methadone for OUD, a one-time BZD prior to a procedure, or in oncology or palliative care | <ul style="list-style-type: none"> <li>• Gradual (most patients): reduce dose by 10%–25% every 1–4 wks.</li> <li>• Rapid (medically dangerous situations): reduce dose every 1–7 days.</li> </ul> <p><b>BZDs:</b> Individualized schedule</p> <ul style="list-style-type: none"> <li>• Switch to a longer-acting BZD if no high-dose OPI use</li> <li>• Reduce dose by 50%/wk for the first 2–4 wks, then maintain dose for 1–2 months, then reduce dose by 25% every 2 wks</li> <li>• Avoid prolonged tapers over 6 months</li> </ul> | <ul style="list-style-type: none"> <li>• ↓ No. OPI-BZD pts (33%, p=0.003)</li> <li>• ↓ No. of pts ≥ 100 MME/day (30%, p&lt;0.001), and ↓ mean MME/day (22%, p&lt;0.001)</li> <li>• ↓ mean DEDD (17%, p&lt;0.001)</li> <li>• ↑ No. pts receiving OEND (94%, p&lt;0.001)</li> <li>• No significant changes in the following outcomes: annual UDS, PDMP review, or signed OIC</li> </ul> | <ul style="list-style-type: none"> <li>• Standard education on the risks of OPI-BZD uses</li> <li>• Individualized safety recommendations (overdose education, naloxone distribution, annual UDS, annual PDMP review, and signed OIC)</li> <li>• Encrypted e-mail to clinicians with a list of pts with OPI-BZD use, taper guide, alternative therapies, and withdrawal symptom management strategies.</li> <li>• EMR note and email asked clinicians to “consider benzodiazepine and/or opioid taper (to &lt;100 MME/day or off entirely if still prescribed benzodiazepine)”.</li> </ul> |
|--|-----------------|--|--|---|--|

Abbreviations: **BZD**: benzodiazepine; **CNCP**: chronic non-cancer pain; **DEDD**: diazepam equivalent daily dose; **MME**: morphine milligram equivalents; **No.**: number of; **NR**: not reported; **OEND**: opioid overdose education and naloxone distribution; **OIC**: opioid informed consent; **OPI**: opioid; **PDMP**: prescription drug monitoring program; **Pts**: patients; **SD**: standard deviation; **UDS**: urine drug screening; **wk**: week

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