# Deprescribing Benzodiazepines in Older Adults

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DNP Scholarly Project

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## Dedication

I would like to dedicate this manuscript to my grandmother, Patricia Anne Tabako. She has always believed in me and motivated me to never stop achieving my goals. She is my moral compass and has inspired my nursing career from the beginning.

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**Abstract**

Benzodiazepines are well established as having the ability to produce rapid relief of anxiety and sleep disorders. However, despite their association with harm and often short therapeutic effects, they continue to be prescribed often. Through the process of aging, the accumulation of medications needed to treat various disease states contributes to polypharmacy among the elderly. Older adults have unique factors that position them at a higher susceptibility of the anticholinergic side effects of benzodiazepines which can result in falls, cognitive impairments and depression. Given these concerns, multiple professional organizations have identified the deprescribing of benzodiazepines as a national public health priority and have strongly recommended the pursuit of alternative shared decision-making approaches. While non-pharmacologic techniques are widely recognized to safely manage the common reasons clinicians provide when choosing to prescribe benzodiazepine's, there is a mounting need for prescriber education regarding these practical approaches as well as evidence-based clinical practice guidelines to support successful deprescribing (Kearney, 2017). The purpose of this DNP project was to improve prescriber knowledge of deprescribing approaches and present alternative prescribing decisions through participation of an evidence-based education program at a geriatric specialized, primary care practice in Pennsylvania. The study participants consisted of Physicians, Nurse Practitioners and Physician Assistants who prescribe benzodiazepines. The results indicated an improvement in the participants knowledge of deprescribing approaches and alternative prescribing choices, as evidenced by how they rated their attitudes, knowledge and practices after participating in the evidence-based education.

*Keywords*: benzodiazepines, deprescribing, geriatric, inappropriate, older adults

## Deprescribing Benzodiazepines in Older Adults

The use of benzodiazepines has been prevalent since first marketed in the 1960's and the once early optimistic therapeutic prescribing philosophy has been replaced with one of extreme caution. Despite the persistent endorsement for prescribers to initiate gradual dose reductions and reduce polypharmacy in older patients' medication regimens, they continue to be prescribed carelessly for long-term use. Current guidelines for prescribing benzodiazepines unquestionably advocate for avoidance in older adults, however with very little guidance for prescribers who are considering a dose reduction, complete discontinuation or substituting with a viable alternative (Pottie et al., 2018). Behind opioids, benzodiazepines are the second most common medication class linked to overdose mortality (Gerlach et al., 2018). During the aging process, there is a deterioration in the ability of body systems to maintain homeostasis, thus making older adults more vulnerable to outside stressors (Magnuson et al., 2019). Recognizing the prescribing practices of benzodiazepines among older adults is of the utmost importance, as the risk for polypharmacy and increased sensitivity to medication side effects within this population is already heightened.

As their most frequent prescribers, primary care providers are the most plausible source to provide insight into what influences their decisions to initiate, continue prescribing or deprescribe benzodiazepines to older adults (Neves et al., 2019). By increasing the awareness of the glaring risks of benzodiazepine use presented within our educational program, this will promote and simplify appropriate, evidence-based interventions aimed at reducing their use, reduce potential adverse effects in elderly adults and impact future prescribing practices. As it relates to this problem, determining how prescribers' attitudes, knowledge and practices are

affected after participating in an evidence-based education on benzodiazepines and being supplied with a deprescribing algorithm was of interest.

## Background and Significance to Healthcare

In a large primary care practice specializing in geriatrics, patients with anxiety and sleep disorders are abundant. The decision to prescribe and maintain a benzodiazepine is multifaceted and highly influenced by several factors including prescribers' attitudes, knowledge and practices involving their established risks and benefits (Neves et al., 2019). Despite clear recommendations that advise first-line treatment and approaches for anxiety and sleep disorders are non-pharmacological in nature, rates of benzodiazepine prescribing continue to trend upward (Bachhuber et al., 2016). Evidence-based guidelines are a fundamental tool for improving the quality of patient care, yet available guidelines regarding benzodiazepines are limited. Various geriatric organizations, including the American Geriatrics Society who publishes and updates the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults, support a complete avoidance of benzodiazepines in older adults, upholding the serious risks associated with their use. (Maree et al, 2016). Benzodiazepines are among those medications with the potential to cause unfavorable harm to older adults, including risk of falls and cognitive impairments, thus deeming them necessary to avoid or consider with extreme caution. Unfortunately, tools outlining systematic deprescribing strategies are not widely utilized. Existing assessment tools effectively validate the numerous potentially inappropriate medications often prescribed to older adults with a high specificity but lack the criteria for adequate implementation (Muhlack et al., 2018).

Deprescribing benzodiazepines has been proven successful. Alternative options include immediate discontinuation, gradual tapering, cognitive behavioral therapy, utilizing lower

dosages, changing routine dosing to as needed dosing, or substituting medications (Croke, 2018). While prescriber awareness of risks related to chronic benzodiazepine use may be adequate, determining their attitudes, knowledge, and practices can support successful deprescribing, as the dangers and rationales behind the recommendations are just as important as the recommendations themselves.

## Needs Assessment

A preliminary appraisal of the existing benzodiazepine recommendations revealed a consensus for the improvement in deprescribing guidelines, as new studies continue to suggest their use is linked to cognitive decline as well as the development of dementia (Maree et al., 2016). The practice setting was a primary care office, specializing in geriatrics, with a large majority of the patients being seen within various types of healthcare facilities including hospitals, retirement communities, skilled nursing facilities and assisted living facilities. The practice employs over 40 prescribers, consisting of physicians, nurse practitioners and physician assistants, with over 150 facility contracts across Eastern Pennsylvania. This author is exclusively facility-based, traveling daily to short- and long-term rehabilitation communities and functions as a certified Adult-Gerontology Primary Care Nurse Practitioner. Initial informal dialogue between prescribers at the DNP projects practice of interest suggested the continued prescribing and lack of deprescribing benzodiazepines in their older adult patients was a significant challenge and they would be eager to implement a reliable tool or algorithm, if available. As an active partner with the local accountable care organization (ACO), the practice works closely with agencies across many settings to provide optimal care for their patients. Under this model, the ACO develops processes to promote the highest level of evidence-based practice and maintains a patient-centered focus. As such, quality initiatives guide best practices

and increased accountability of providers by exposing lapses in quality and safety (Ong et al., 2016). One such initiative is the reduction or discontinuation of potentially inappropriate medications in older adults and the need for further education of clinicians prescribing benzodiazepines.

## Problem & Purpose

Benzodiazepines are commonly prescribed to older adults despite their association with negative health consequences. By presenting treatment guidelines of appropriate prescribing and effective deprescribing, it may help prescribers reaffirm why benzodiazepines are included among inappropriate medication lists for this vulnerable population and how approaches to prescribing can be adjusted accordingly. The goal of this DNP quality improvement project was to generate an effective educational training in order to improve the knowledge, attitudes and perceptions of prescribers employed in a primary care practice on the prescribing recommendations of benzodiazepines in older adults. By producing an increased awareness of the distinct physiological insults instigated by aging and age-related disparities and proposing alternative interventions, prescribers may successfully implement current treatment guidelines and promote positive patient-related outcomes.

### PICO(T) Question

Among healthcare prescribers for older adult patients, how does the educational activity and algorithm on benzodiazepines affect prescribers' attitudes, knowledge, and practices toward deprescribing benzodiazepines in the older adult population?

**Population**. The population of this project was healthcare prescribers who provide primary care services and prescribe medications to older adult patients.

**Intervention**. The intervention was to present prescriber education on current prescribing recommendations of benzodiazepines and introduce a deprescribing algorithm.

**Comparison**. The self-rated attitudes, knowledge, and practices among prescribers was compared before and after the educational program using a validated questionnaire, Perception about Use of BZD Scale (PUBS).

**Outcome**. The outcome of interest was to determine how prescribers rated their attitudes, knowledge, and practices toward the deprescribing of benzodiazepines after participating in the evidence-based education.

## Aims & Objectives

The main objective was to introduce an evidence-based educational program to impact the attitudes, knowledge and practices of the participating Nurse Practitioners, Physician Assistants and Physicians towards deprescribing benzodiazepines in their older adult patients via a validated, 30 item, 5-point Likert scale questionnaire (see Appendix C). The questionnaire examines general beliefs about benzodiazepines, including risks and benefits, attitudes about prescribing and chronic use of benzodiazepines, self-perception of knowledge about benzodiazepines and self-perception for promoting deprescribing (Neves et al., 2019). The DNP project was anticipated to produce an increased understanding of the potential harms associated with benzodiazepine use in older adults, offer recommendations about when and how to reduce their use and propose practical, non-pharmacological alternatives (Pottie et al., 2018).

## Review of Literature

Despite robust evidence of risks associated with benzodiazepine use in older adults, they are commonly prescribed in this population. The importance of exposing prescriber attitudes

towards deprescribing benzodiazepines and alternative approaches to managing the conditions associated with benzodiazepine use was the focus of the literature review.

**Literature Review Methods**

Systematic appraisal of the current literature was conducted using the electronic databases Cumulative Index of Nursing and Allied Health (CINAHL), Google Scholar and PubMed. The keywords utilized for the search were benzodiazepines, deprescribing, geriatric, inappropriate and older adults and the filters utilized were English language, full text and studies published within the last five years. Among the 89 articles that met the inclusion criteria, 34 articles were deemed relevant, 29 had the greatest evidence and 18 were chosen for this research. Utilizing the John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool (Dang et al., 2022), the literature review revealed level one evidence existed within 12 articles, level two in one article, level three in one article, level four in one article and level five in three articles (see Appendix F). Level one evidence comprises RCT's (randomized controlled trials), meta-analyses and systematic reviews (Dang et al., 2022). Level two evidence comprises quasi-experimental studies, systematic reviews of a combination of RCT's and quasi-experimental, or quasi-experimental studies only - with or without meta-analysis (Dang et al., 2022). Level three evidence comprises non-experimental studies, systematic reviews of a combination of RCT's, quasi-experimental and non-experimental studies, or non-experimental studies only - with or without meta-analysis, qualitative studies or systematic reviews with or without a meta-synthesis (Dang et al., 2022). Level four comprises cross-sectional, observational studies and clinical practice guidelines based on scientific evidence (Dang et al., 2022). Level five comprises the opinions of nationally recognized experts (Dang et al., 2022).

**Literature Review of the Evidence**

***Level I Evidence***

In a landmark qualitative systematic review conducted by Anderson et al. (2014), the barriers and enablers of prescribers regarding the deprescribing of potentially inappropriate medications among older adults were reviewed. This comprehensive review conducted across all healthcare settings, among medical and non-medical prescribers included 21 studies and revealed four analytical themes. The authors concluded an assortment of factors contribute to prescribers' behavior towards continuing or discontinuing potentially inappropriate medications and pharmacological considerations are not the only factors impacting these decisions.

Donnelly et al. (2017) performed a systematic review and meta-analysis to determine if the use of benzodiazepines in older adults is associated with an increase in hip fractures. The authors reviewed studies involving benzodiazepines and the risk of hip fracture published between 1995 and May 2015, with sample sizes ranging from 500 to 906,422 participants. The authors concluded that strong evidence exists that benzodiazepines are associated with an increased risk of hip fractures in older adults.

A randomized clinical trial executed by Fried et al. (2017) examined the effect of an assessment tool designed to reduce inappropriate medication prescribing in older adults. This study was conducted utilizing 128 community dwelling Veterans, aged 65 years and older, prescribed seven or more medications at primary care clinics within a VA Medical Center. The authors concluded use of the assessment tool TRIM (Tool to Reduce Inappropriate Medication) was associated with improved medication-related communication among patients and their clinicians, although they found no association between its use and the outcome of medication deprescribing.

A systematic review in search of the prescribing patterns of benzodiazepines among older adults revealed their widespread use persists despite evidence suggesting benzodiazepines association with the development of cognitive impairments (Gerlach et al., 2018). Among 31 studies involving patients prescribed benzodiazepines with sample sizes of 6 to 335 (diagnosis of insomnia), 220 (diagnosis of anxiety) and 7 to 610 (diagnosis of dementia), the author's determined prescribing is in excess of what the evidence suggests is acceptable. Furthermore, they claim there is little evidence to support its use for insomnia, anxiety, or dementia.

Greiver et al. (2019) conducted a pragmatic cluster randomized controlled trial to determine if evidence-based tools or interventions exist to support the deprescribing of potentially inappropriate medications among older adults and if so, how they could be disseminated to prescribers. Seven Canadian primary care practice-based research networks and 86 practice sites involving 334 family physicians or nurse practitioners were eligible for inclusion in the study. The authors concluded that older patients are complex and discontinuing medications that may be harmful could improve their health. Further, they allege multiple highly credible organizations, such as The American Geriatric Society and The Canadian Deprescribing Network, support the use of evidence-based tools in order to deprescribe among this population (Greiver et al., 2019).

In a systematic review and meta-analysis, Islam et al. (2016) aimed to establish an association between benzodiazepines and the risk of dementia. Ten studies (of the 3,696 studies identified) were included in the systematic review, eight studies were included in the meta-analysis, all which were published between 1983 and 2013. The authors concluded benzodiazepine use is significantly associated with dementia risk, and the risk of developing dementia is 78% higher in those who used benzodiazepines.

Lucchetta et al. (2018) conducted a systematic review and meta-analysis to identify if an association exists between the use of benzodiazepines and the development of dementia. A total of 981,133 (systematic review) and 980,860 (meta-analysis) adults or elderly adults were included in the review, which incorporated articles published between 2011-2017. The authors suggest there is an association between the use of benzodiazepines and the development of dementia in older adults.

A systematic review of 15 studies with a sample of 2785 adults over the age of 65 was completed to determine the incidence of misuse of opioids and benzodiazepine prescriptions in older adults and the associated risk factors (Maree et al., 2016). The authors allege that older adults are more vulnerable to the negative consequences of benzodiazepine use, making them susceptible to falls and hip fractures. They concluded that despite the limited data on this public health concern, as well as the lack of a validated benzodiazepine abuse scale in older adults, efforts to establish appropriate benzodiazepine interventions are needed in order to improve patient safety.

Page et al. (2016) conducted a systematic review and meta-analysis to determine if deprescribing is an effective intervention to reduce polypharmacy and modify health outcomes among older adults. Of the 132 papers that met the inclusion criteria, 14 studies were set in hospitals, 29 in aging care facilities and 73 were community-based and included 34,143 participants aged 73.8 ± 5.4 years. The authors determined their data suggests that deprescribing reduces mortality. Further, patient-specific deprescribing interventions significantly reduces mortality among randomized controlled trials (Page et al., 2016).

In a randomized controlled trial, Potter et al. (2016) aimed to reduce polypharmacy in older adults and investigate the outcomes of deprescribing on known adverse effects. In

Australia, 95 older adults, 52% female with a mean age of 84.3 ± 6.9 years living in four residential aged care facilities were randomized in an open study. Of the 348 medications that were targeted for deprescribing, 207 were discontinued. Medications targeted for deprescribing included those with the highest risk of adverse effects, including benzodiazepines, antidepressants, antihypertensives and anti-reflux medications. The authors concluded that deprescribing caused no significant adverse effects on survival or other clinical outcomes.

In a three-year follow up of a randomized, double-blind, placebo-controlled, parallel-group study, Puustinen et al. (2018) examined the continuance of benzodiazepine withdrawal among the original study participants. Among 92 outpatients (≥55 years) with primary insomnia and prescribed long-term benzodiazepines, 83 continued their participation in the follow up study. The authors concluded, three years after withdrawal the number of benzodiazepine-free participants decreased, with one-third of the subjects remaining benzodiazepine-free, one-third using benzodiazepines irregularly and one-third continuing benzodiazepine use regularly.

Reeve et al. (2017) conducted a systematic review to evaluate interventions to reduce benzodiazepine use among older adults. In a review of studies conducted on older adults over a 10-year period, 5063 articles were retrieved, and seven studies met the inclusion criteria. Interventions included pharmacological substitution, tapering with discontinuation and tapering with psychological support. The authors concluded benzodiazepine withdrawal is feasible in the older adult population, with discontinuation rates ranging from 27% to 80% and those highest in the pharmacological substitution intervention.

### *Level II Evidence*

In a qualitative exploratory study with snowball sampling technique, Wallis et al. (2017) aimed to expose the barriers of physicians to deprescribing in older adults. The researchers

conducted 24 participant interviews who varied in age, sex, experience and employment status to identify and subsequently analyze themes. The authors concluded that patient expectations, the culture of prescribing and organizational constraints were barriers to physicians deprescribing practices.

***Level III Evidence***

In a retrospective analysis to examine the frequency of long-term benzodiazepine use among older adults, this study included 32,182 patients over the age of 65 years who received benzodiazepine prescriptions and were treated for at least six months without discontinuation (Jacob et al., 2017). The authors assert that while long-term use of benzodiazepines is common in older people, they have known adverse effects and risks and they support their use with caution.

***Level IV Evidence***

Neves et al. (2019) performed a cross-sectional, observational study to determine the attitudes and perceptions that influence the prescribing habits of physicians. In a sample of 329 physicians who participated in the study, 89% reported a negative impact on cognitive function and a 79% association with falls as a negative impact of benzodiazepines. 68% indicated they feel competent in the reduction or cessation of benzodiazepines and 55% recognized the challenges in motivating patients to do so. The authors concluded the awareness of the risks of benzodiazepine use is adequate however the skills needed to promote their deprescribing needs improvement.

***Level V Evidence***

Garfinkel (2017) provides an overview of obstacles to deprescribing among clinicians and defends the necessity of inappropriate prescribing as a global priority. The author endorses the various risks and harms of polypharmacy among older adults and insists on the establishment of new evidence-based interventions, guidelines, research and education in order to reduce morbidity and mortality within this complex population.

Maust et al. (2016) performed a cross-sectional analysis to determine the rate of new and continued benzodiazepine use in older adults and to identify potential subpopulations at risk. The study analyzed statistics from the NAMCS (National Ambulatory Medical Care Survey) on adults aged 65 and older visiting office-based non-psychiatrist physicians (n = 98,818) and who were prescribed a benzodiazepine. The authors concluded that users of benzodiazepines are more likely to be older adults, female and with a higher rate of mental health diagnoses. They also stated that despite evidence of concerns, the availability of alternative treatments and successful methods for tapering, older adults continue to be prescribed benzodiazepines (Maust et al., 2016).

Pottie et al. (2018) developed an evidence-based practice guideline to assist clinicians with deprescribing benzodiazepines in elderly adults. Among eight clinicians (a family physician, two psychiatrists, a clinical psychologist, a clinical pharmacologist, two clinical pharmacists and a geriatrician) they applied a GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach to generate clinical recommendations and constructed a deprescribing algorithm. The authors maintain that benzodiazepines are associated with harm, effects are short-term and attempts to discontinue benzodiazepines should be offered to older adults with use over four weeks.

**Analysis of Central Concepts of Project**

The central concepts of this project are benzodiazepines and the consequences of their use, attitudes and beliefs of prescribers, deprescribing and older adults. The bulk of studies included in this research examined deprescribing and in order to support its need, each demonstrated its association with desirable outcomes (Anderson et al., 2014; Donnelly et al., 2017; Fried et al., 2017; Garfinkel, 2017; Gerlach et al., 2018; Greiver et al., 2019; Islam et al., 2016; Jacob et al., 2017; Lucchetta et al., 2018; Maree et al., 2016; Maust et al., 2016; Page et al., 2016; Potter et al., 2016; Pottie et al., 2018; Puustinen et al., 2018; Reeve et al., 2017; Wallis et al., 2017). Research depicted the negative consequences of benzodiazepine use among older adults and asserted there is a vital need to deprescribe in older adults (Anderson et al., 2014; Donnelly et al., 2017; Fried et al., 2017; Garfinkel, 2017; Gerlach et al., 2018; Islam et al., 2016; Jacob et al., 2017; Lucchetta et al., 2018; Maree et al., 2016; Maust et al., 2016; Pottie et al., 2018; Puustinen et al., 2018; Reeve et al., 2017; Wallis et al., 2017). Some research displayed a primary theme of deprescribing and although they referenced associated harms, their emphasis was on the necessary withdrawal of inappropriate medications (Fried et al., 2017; Page et al., 2016; Potter et al., 2016). Only one article of the 18 reviewed depicted a primary theme concerning the attitudes and beliefs of prescribers (Neves et al., 2019), however four additional articles also presented a purposeful examination of this as their secondary theme (Anderson et al., 2014; Garfinkel, 2017; Maust et al., 2016; Potter et al., 2016), providing an opportunity for new research in this area.

Benzodiazepines are being overprescribed to older adults. Their association with potential harm, including falls and cognitive impairment demands enhanced competence in treatment alternatives. Deprescribing, the “planned and supervised process of dose reduction or stopping of medication that might be causing harm or no longer providing benefit” (Pottie et al.,

2018, p. 340) should be established in collaboration with the patient. Despite a lack of evidence in support of prescribing benzodiazepines to older adults, an overabundance of evidence in support of deprescribing benzodiazepines to older adults, an overabundance of evidence outlining the risks associated with their use including professional societies and experts deeming them to be inappropriate in this patient population, older adults remain the largest percentage of long-term users of benzodiazepines (Gerlach et al., 2018). The literature further urges the obligation for identification of the prescribing habits and attitudes of clinicians in order to minimize benzodiazepine to improve outcomes and prevent harm in older adult patients.

**Evidence Summary and Practice Implication**

Despite a rigorous search revealing a vast selection of articles, no single article offered transparency or precise guidelines on approaching the benzodiazepine prescription crisis. The themes or concepts represented among the reviewed articles provided clarity and simplicity in order to promote an effective synthesis of the evidence. The central concepts were benzodiazepines and the consequences of their use, attitudes and beliefs of prescribers, deprescribing and older adults. Each of the articles selected equitably offered a vital piece of the puzzle and together they complemented the goal of this research.

The literature detailed the associated risks of benzodiazepine use among older adult patients. Jacob et al. (2017) presented known adverse effects and risks of benzodiazepine use among older adults, including falls, cognitive impairment, and dependence. Donnelly et al. (2017) concluded that benzodiazepines are associated with an increased risk of hip fractures in older adults. Similarly, Islam et al. (2016) established an association between benzodiazepines and the risk of dementia. Correspondingly, Lucchetta et al. (2018) suggest there is an association between the use of benzodiazepines and the development of dementia in older adults. Finally,

Gerlach et al. (2018) asserted the prescribing of benzodiazepines for older adults is substantially in excess of what the evidence suggests is appropriate and claim benzodiazepines are associated with the development of cognitive impairments.

Exploring the perspectives of those members of the healthcare team responsible for prescribing medications is critical to pursuing deprescribing interventions and evidence-based guidelines. Anderson et al. (2014) produced a review of barriers and enablers of prescribers concerning the deprescribing of potentially inappropriate medications among older adults and purport multiple factors are contributory to prescribers' habits. The research asserted prescribers were aware of polypharmacy, but unaware of which medications were inappropriate. Conversely, Neves et al. (2019) evaluated the attitudes, beliefs of prescribers and concluded while they demonstrated an awareness of the risks of benzodiazepine use, they needed the appropriate skills to promote deprescribing. Fried et al. (2017) echoed the need for improved medication-related communication among patients and their clinicians with the implementation of evidence-based assessment tools. Finally, Wallis et al. (2017) determined that patient expectations, the culture of prescribing and organizational constraints are barriers to physicians deprescribing practices.

Deprescribing is intended to reduce harm and promote quality of life. Researchers identified the lack of available research and limited data as a barrier to deprescribing and/or the inappropriate prescribing of benzodiazepines among older adults (Donnelly et al., 2017; Garfinkel, 2017; Gerlach et al.,2018; Maree et al., 2016). Pottie et al. (2018) examined the approaches to deprescribing and offered a high-quality, evidence-based practice algorithm to deprescribing benzodiazepines. Inappropriate prescribing is a global priority and experts urge that new evidence-based interventions, guidelines, research, and education is critical within this multifaceted population (Garfinkel, 2017). Greiver et al. (2019) supports the deprescribing of

potentially inappropriate medications among older adults and allege evidence-based tools are vital in order to appropriately deprescribe. Finally, demonstrating the discontinuation of benzodiazepines is possible and sustainable, Puustinen et al. (2018) examined the continuance of benzodiazepine withdrawal three years after their initial study and established the number of benzodiazepine-free participants decreased, many participants remained benzodiazepine-free, and others reduced their benzodiazepine use.

**Evidence Based Model: Conceptual and Theoretical Framework**

Theories of change convey the success with which organizations are able to adapt their current methods and processes. Kurt Lewin's three-stage theory on change (Udod & Wagner, 2018) guided this research. This theory on change is fundamental to organizational change and is recognized as an effective method to activate and enhance trust in the change process (Hussain et al., 2018). Lewin's theory (Udod & Wagner, 2018) classifies three sequential stages which must transpire before change can occur: unfreezing, movement, and refreezing. Unfreezing interrupts past behaviors and practices (Udod & Wagner, 2018). In this stage, prescribers will be encouraged to shift away from conditioned preferences. Movement is the transition stage of change, when momentum is maintained, and implementation of change occurs (Udod & Wagner, 2018). In this stage, prescriber re-education of known risks and associated harms of benzodiazepine use in older adults will occur and endorsement of evidence-based prescribing guidelines will be reinforced. Refreezing strengthens and sustains the change (Udod & Wagner, 2018). In this stage, implementing the proposed prescribing guidelines become the new standard of practice.

The Plan, Do, Study, Act (PDSA) model (McGowan & Reid, 2018) is widely recognized as an effective method for the implementation of quality improvement strategies, thus it

systematically guided improvement in clinical practices and patient outcomes for this research. This model inspires change, introspection, evaluation, and advancement and features a distinct and applicable framework (Knudsen et al., 2019). The PDSA model contains four basic steps:

- Plan – Stating the objective of the observation, test or problem and the plan to change or address it (Udod & Wagner, 2018). The problem was recognized as an overprescribing or lack of deprescribing of benzodiazepines in older adults. The change to be executed was identified as the exposure to an evidence-based prescribing guideline and algorithm with the use of education to improve prescribing habits.
- Do – Carrying out the plan (Udod & Wagner, 2018). The teaching project was implemented.
- Study – Analyzing and reflecting on the data (Udod & Wagner, 2018). The data analysis was performed, and the outcomes were appraised.
- Act – Determining the change and making modifications (Udod & Wagner, 2018). The aims and goals of the project are analyzed to determine if change was successful.

Incorporating the PDSA model profoundly benefitted the execution of this quality improvement project by creating change through its ability to plan, execute, hypothesize, and manage data with fastidious rigor and quality.

## Gap Analysis

An analysis of the current state of prescribing practices exposed an overwhelming gap in professional practice (Anderson et al., 2014; Fried et al., 2017; Wallis et al., 2017) and the need for further education of deprescribing guidelines among clinicians prescribing benzodiazepines to older adults (Neves et al., 2019; Pottie et al., 2018). While it is imperative to ascertain barriers and enablers to incite change, extensive literature reviews revealed a lack of studies examining

prescribers' attitudes, knowledge and practices towards benzodiazepines. Andersen et al. (2014) found that although prescribers fundamentally recognize the consequences of prescribing benzodiazepines to older adults, this recognition does not translate to increased deprescribing practices. Similarly, Neves et al. (2019) found that despite physician awareness of the risks associated with benzodiazepine use, this did not compel them to encourage their patients to decrease their usage. Introduction of an evidence-based, decision-making tool is critical to motivating deprescribing practices.

## Context

### Key Definitions

Several terms were utilized throughout this project including benzodiazepines, deprescribing and older adults.

- Benzodiazepines – psychoactive agents whose pharmacological properties act in the central nervous system producing many effects including sedative, hypnotic and amnesic actions (Tien et al., 2020). They are used to treat a variety of diagnoses including anxiety and insomnia and while they can be beneficial for short term use, a high proportion of those short-term users convert to long term use (Gerlach et al., 2018).
- Deprescribing – the process of reducing or stopping medications.
- Older adults – those over the age of 65. This population has the greatest risk of polypharmacy and sensitivity to medications attributed to the process of aging (Reeve et al., 2017).

### Key Stakeholders

This project impacts many stakeholders. First and foremost, the patients who are currently being treated by the participating prescribers and their future patients are the primary stakeholders, as the intended change directly impacts their health care. The execution of this project also had a direct influence on the participants (prescribers) enrolled in the study. The prescribers and their clinical input were critical to the completion of the project and they arguably have the most vital role in facilitating and allowing for the successful implementation of change. Insurance companies or other third-party payers are also stakeholders, as they are responsible for the medical bills and related costs incurred from the potential negative consequences of benzodiazepine use. Finally, families and support networks are stakeholders and are those who carry the heaviest burden of the negative consequences of ineffective deprescribing. The properties of benzodiazepines can commonly instigate disruptive behaviors such as increased agitation and anxiety which can be highly distressing (Tien et al., 2020).

## Methodology: Study of Intervention

### Project Design and Setting

This project was an evidence-based, quality improvement program, using a pre and post-test model. The project setting was a geriatric specialized, primary care practice employing over 40 prescribers treating patients in over 150 facilities across Eastern Pennsylvania.

### Population

This project was directed towards prescribers treating older adults residing within various types of healthcare facilities including hospitals, retirement communities, skilled nursing facilities and assisted living facilities. The study participants (prescribers) consist of Physicians (Doctor of Medicine and Doctor of Osteopathic Medicine), Nurse Practitioners (NP’s) and Physician Assistants (PA’s), all dedicated to the specialized care of older adult patients.

**Inclusion/Exclusion Criteria**

Inclusion criteria were prescribers (individuals in the practice with prescriptive authority), which consisted of Physicians, Nurse Practitioners and Physician Assistants. Exclusion criteria were unlicensed and/or non-prescribing clinical staff.

**Analysis of Organization Readiness for Change**

The principal investigator maintains a professional relationship with the project site and has first-hand knowledge of the organization's readiness for change. Inter-professional collaboration regularly emphasizes the need for improved prescribing practices of benzodiazepines and the organization is known for successfully implementing evidence-based change practices. Furthermore, as a clinical site for students from local colleges and universities, the change may extend well beyond the practice site, forming a foundation for the prescribing practices of future clinicians.

**Ethical Aspects and Protection of Participant Rights**

Ethics, as it relates to research with human subjects, requires informed consent. It also necessitates respect, minimized risk, and fair distribution of benefits and burdens (Resnik, 2018). This project utilized an anonymous online survey, without personal identifiers, therefore ensuring privacy and confidentiality. Respect was maintained by means of informed consent, as use of human subjects in research requires they are informed about the key elements of the study and what their participation involves (Resnik, 2018). The informed consent process is one of the most fundamental ethical features of research with human subjects. For this study, informed consent was obtained from the research subjects through the questionnaire process. The document provided an explanation of the study and served as an agreement for the participants to take part in the research study. Beneficence, which requires maximization of the benefits of

research and minimization of risk, was upheld as there were no physical or emotional harm incurred by the participants (Resnik, 2018). Justice, which requires fair distribution of the benefits and burdens of research, was maintained by way of fair inclusion/exclusion in the project (Resnik, 2018). The organization's electronic medical record system was not utilized, therefore there were no Health Insurance Portability and Accountability Act (HIPPA) violations.

## Methodology: Study Implementation

### Description of Intervention

Pottie et al. (2018) developed an evidence-based, clinical practice guideline, as well as a deprescribing algorithm to guide clinician's benzodiazepine prescribing. It is available for public use, with credit to the authors (Pottie et al., 2018). This clinical practice guideline was used to construct an evidence-based, educational PowerPoint presentation highlighting the potential harms associated with benzodiazepine use in older adults and was provided to each study participant (see Appendix D). In addition, the PowerPoint presentation it contained future practice recommendations about when and how to reduce their use as well as non-pharmacological alternatives to benzodiazepines.

### Data Collection Process

Data were collected, maintained, and stored by the principal investigator on a personal, password protected computer. A collection tool was developed on Microsoft Office Excel® by the principal investigator to reconcile the data for post-project analysis. Survey Monkey was utilized to deliver the anonymous, self-administered questionnaire, which was used with permission from Neves et al. (2019) (see Appendix A). Neves et al. (2019) assert the preliminary psychometric properties' analysis using Cronbach's alpha was used to assess the internal reliability and supported the questionnaire's structure of four dimensions. This included doctors'

beliefs about benzodiazepines, doctors' attitudes about benzodiazepines prescriptions, doctors' self-perception of literacy about BZD benzodiazepines and doctors' self-efficacy perception for promoting withdrawal of benzodiazepines (Neves et al., 2019). The principal investigator received permission from the authors to exchange the term *physician* for the term *prescriber*.

All facility associates identified through the inclusion criteria were contacted via the research facility's electronic mail system. Week one, all facility associates identified through the inclusion criteria were contacted via the facility's electronic mail system. This email included a brief overview of the research project, two separate links containing the pre- and post-intervention questionnaires and a PowerPoint. An evidence-based, educational PowerPoint presentation highlighting the potential harms associated with benzodiazepine use in older adults, as well as future practice recommendations about when and how to reduce their use as well as non-pharmacological alternatives, was provided to each participant. Pottie et al. (2018) developed an evidence-based, clinical practice guideline, as well as a deprescribing algorithm to guide clinician's benzodiazepine prescribing, which was used in this research (see Appendix E). It is available for public use, with credit to the authors. Participants were directed to complete the education and questionnaires in a timeframe of two weeks.

Week two, a reminder email was sent out to all facility associates identified through the inclusion criteria. Question number one of the pre-intervention questionnaire included the informed consent document. The participants were notified of their inability to participate in the research study, should they select "no" to informed consent. Any questionnaires with a response of "no" to informed consent were deemed invalid and not included in the research data. Question number one of the post-intervention questionnaire asked participants if they watched and read the educational program in its entirety. Both questionnaires required the participants to provide a

4-digit code unique to them, that they could easily recall. This allowed investigators to accurately match the pre- and post-survey responses.

## Data Collection Logistics

### Implementation Timeline

The projected timeline of this project was eight weeks. Week one, an email was sent to all facility associates identified through the inclusion criteria which included the document for informed consent. The email included a brief overview of the project, including the timeframe of two weeks to complete the education and questionnaires, the educational PowerPoint, along with two separate links containing the pre- and post-intervention questionnaires. Week two, a second email was sent out to all facility associates identified through the inclusion criteria reminding them to complete the questionnaires and education.

### Proposed Budget, Time, and Resources Plan

The project was cost-effective, required minimal expenses incurred by the principal investigator and was expected to cost less than $300. The project used electronic mail, Microsoft Office, Word, Excel, and PowerPoint, all at no charge, however Survey Monkey charges per month for an unlimited number of survey questions. The organization’s electronic medical record system was not utilized, therefore there were no Health Insurance Portability and Accountability Act (HIPPA) violations. The timeframe of this project was eight weeks and PDSA cycles were reviewed every other week. The project budget is depicted in Table 1.

**Table 1**

*Project Budget*

| Item/Supplies | Unit Cost | Quantity | Total Cost |
|---|---|---|---|
| Survey Monkey | $70.00 | 4-month subscription | $280.00 |

## Responsibility and Communication Plan

The principal investigator communicated a basic overview of the project to the potential participants during the pre-planning stages and prior to the educational intervention. The communication generated a strong commitment to the project from prescribers. Email communication took place to ensure research participants received any necessary support from the principal investigator and reminders to fulfill their components of the research.

## Cost Benefit Analysis

Research suggests that a substantial percentage of new benzodiazepine users convert to long-term use and older adults are the population accounting for the largest proportion of benzodiazepine prescriptions (Gerlach et al., 2018). Outlining the efficacy of deprescribing through improved prescribing guidelines may equip the prescribers with a clear evidence-based approach to safely stopping benzodiazepines (Pottie et al., 2018). Although the literature is scarce on the cost-benefit of prescriber education of benzodiazepine clinical practice guidelines, it is clear prescriber's attitudes and beliefs strongly influence their prescribing habits (Andersen et al., 2014). The expenses incurred for this project were minimal and included a survey subscription. The costs associated with the adverse effects of benzodiazepines, such as falls, fractures and cognitive impairment are incalculable, thus this small fee is far outweighed by the

benefit of an improved awareness of the magnitude of continued prescribing of benzodiazepines in older adults.

## Evaluation Plan

### Short-term Goals

Public health researchers are increasingly challenged by the current trends in decreasing response rates to research surveys, however increasing follow-up contact is noted to be helpful in increasing response rates (Smith et al., 2019). In public health research, questionnaires are a valuable data collection tool and pre-planning communication indicated the likelihood of high participation results in this project. With that in mind, and frequent communication at pre-selected intervals, it was anticipated that at least 50% of the prescribers invited to participate will partake in the program in its entirety. It was anticipated there would be a statistically significant increase in their understanding of the potential harms associated with benzodiazepine use in older adults by the end of the project.

### Long-term Goal

The evidence-based, benzodiazepine educational program will improve prescriber knowledge of deprescribing approaches and alternative prescribing decisions, as evidenced by how prescribers rated their attitudes, knowledge, and practices toward the deprescribing of benzodiazepines after participating in the evidence-based education.

## IRB Approval and Process Discussion

### Securing of Information

Data were collected, maintained and stored by the principal investigator on a personal, password and fingerprint protected computer. A collection tool was utilized on Microsoft Office

Excel® by the principal investigator to reconcile the data which identified participants by a 4-digit code known only to them. No participants were identified by name.

### Protection of Subjects

This research project utilized an anonymous online survey, without personal identifiers to ensure privacy and confidentiality. Voluntary consent to participate in this project was acquired from each participant through the questionnaire process. Participants were asked to participate in an educational program and respond to a questionnaire. No intrusive procedures or testing was performed. The organization's electronic medical record system was not utilized, therefore there were no Health Insurance Portability and Accountability Act (HIPPA) violations.

### Consent for Participation

The informed consent process is one of the most fundamental ethical features of research with human subjects. For this study, informed consent was obtained from the research subjects through the questionnaire process. The participants were provided with an explanation of the study. The informed consent document was question number one in the survey. Any data associated with a survey where the response to question number one was no was discarded. Participants were asked to acknowledge or deny their consent to participate at the end of the informed consent. Participants were notified of the purpose, expectations, and risks/benefits of the study, as well as their rights and contact information for any questions.

### Approval Letter

The research proposal was approved by the Institutional Review Board at Holy Family University by Dr. Stacy McDonald on October 1, 2021 (see Appendix B).

## Interprofessional Collaboration

### Impact of Interprofessional Collaboration

The research site is extensively facility-based, with many of the participants traveling daily to short- and long-term rehabilitation communities. Interprofessional collaboration was critical to the fulfillment of this research project, as the research site's prescribers are largely mobile and function independently of one another. The partnership necessary to coordinate all facets of the research project allowed for the successful completion of the study. Likewise, the inclusion of several disciplines in this study further strengthened the positive working relationship within the organization and established a common foundation not only for deprescribing benzodiazepines among prescribers, but support of ongoing collaborative discussions for deprescribing other pharmacological offenders (Fried et al., 2017).

**Discussion of the Implication of this Study on Advanced Practice Nursing**

The development of advanced practice nursing was introduced over 50 years ago as a solution to the lack of physicians and to meet the healthcare needs of geographically underserved and disadvantaged populations (Woo et al., 2017). Since that time, studies evaluating the quality of care provided by advanced practice nurses have shown the care provided by them to be comparable to that of physicians in terms of effectiveness and safety (Woo et al., 2017). Advanced practice nurses have fought to gain acceptance within the healthcare arena and differentiate the practice-focused Doctor of Nursing Practice (DNP) designation. While the Institute of Medicine (IOM) endorses all advanced practice nurses be prepared at the doctoral level in order to promote healthcare policy reform, the range of their strengths remains blurred (Cowan et al., 2019).

In many ways, ambiguity has controlled the evolution of advanced practice nursing. Implementing research projects in large practices employing a variety of professionals at the upper tier of the healthcare hierarchy offers a unique perspective and opportunity for establishing

confidence in the advanced practice role. This insight into the legitimacy of the scope of practice of advanced practice nurses confirms and validates their ability to coordinate comprehensive care, present quality research and demonstrate professional leadership (Jakimowicz et al., 2017).

Advanced practice nursing has developed to comprise greater responsibilities including the advancement of practice through research (Coster et al., 2018). The role of the Doctor of Nursing Practice-prepared nurse practitioner outside of academic settings is not well understood, therefore the value they bring to clinical practice settings is unfamiliar, even to other healthcare disciplines (Beeber et al., 2019). It was anticipated this study would expand on the understanding of the role and aid in the establishment of DNP's as a leader in clinical research.

## Relation to Other Evidence

Benzodiazepine use in older adults is associated with an increased risk of falls and cognitive impairment, with users tending to be older patients and consumption increasing with age (Rassmussen et al., 2021). Rassmussen et al. (2021) offered an expansive insight into shared themes of barriers and enablers to deprescribing benzodiazepines. The authors identified shared barriers indicating nurses lacked knowledge of the side effects of benzodiazepine treatment, patients had minor knowledge of alternative treatments and physicians believed deprescribing caused unnecessary anguish for the patients. They also found nurses overall had a favorable view on the use of benzodiazepines and regarded their use as necessary. A shared enabler amongst all three groups indicated an educational tool, a deprescribing brochure on benzodiazepines, could contribute to successful cessation. This study is the only identified review with a broad comparison of potential stakeholders including physicians, nurses, patient and caregivers. This lack in literature led authors to assert a need for more studies in the field to uncover potential

knowledge gaps in stakeholders who may influence the deprescribing of benzodiazepines (Rassmussen et al., 2021).

In another recent publication, Lukačišinová et al. (2021) analyzed comparisons of prescribing patterns in the use of benzodiazepines using a comprehensive geriatric assessment methodology. Their study revealed social, behavioral and cultural factors play a significant role in the use of benzodiazepines across many countries and may account for differences in prescribing patterns (Lukačišinová et al., 2021). This study included a large international sample of older adults residing in long-term care facilities and its use of a comprehensive geriatric assessment methodology allowed for robust comparisons of benzodiazepine use worldwide. The authors maintain that non-clinical factors can contribute to the prescribing of benzodiazepines in older adults and urge for further investigation of these potential influencers.

## Barriers to Implementation

Healthcare professionals have experienced significant negative impacts and stress as a result of the COVID-19 pandemic (Prasad et al., 2021). Stressors were heightened and persistent for the study participants, physicians, nurse practitioners and physician assistants working in a primary care practice dedicated to the specialized care of older adults. The participants were responsible for treating patients across various healthcare settings.

### Limitations

Despite ongoing efforts to increase participation, the sample size was small and participants were limited to those who met the inclusion criteria. Conducting studies on the entire population is impossible, therefore samples that represent the population and are adequate in size are used to draw general conclusions (Andrade, 2020). Samples that are too large are often unwarranted and samples too small are unscientific, making both a limitation that can compromise a study’s conclusions. Small sample sizes can decrease the power of the study,

increase the chance for error and affect the reliability of the findings thus rendering the study insignificant (Uttley, J. (2019).

The study site provides its clinical staff with a work-issued iPad for documenting patient information and receiving electronic mail, which does not consistently support the viewing of PowerPoint files. Because all study-related material was sent via company email, it is unknown how many participants experienced challenges with viewing the educational intervention. One participant communicated their difficulty with viewing the PowerPoint. An email was sent to all participants indicating they may need to view the PowerPoint on a laptop or desktop computer.

## Results

### Sample Demographic

The research study was completed at a geriatric family practice in Pennsylvania. The initial sample consisted of 35 (n=35) study participants who were Physicians, Nurse Practitioners or Physician Assistants. Three participants did not complete the post-intervention questionnaire and one participant did not input the unique code in the post-intervention questionnaire. Consequently, these four participants responses were not included in the final analysis. There were 28 (90.3%) female participants and 3 (9.7%) male participants (N=31). Most of female participants (n=12 or 42.8%) belong to the 36-55 age cohort. The participants years of prescribing benzodiazepines range from 1-30 years, with an average of 6 years, a median of 5 years and a standard deviation of 6.36. All participants are prescribers of benzodiazepines.

### Data Analysis

Data was extracted from Survey Monkey and the IBM® SPSS® software platform was used for statistical analysis. A paired-sample *t*-test was used to compare the mean of pre-

intervention scores with the mean post-intervention scores. The paired-sample *t*-test is used for comparison of the means of two measurements ascribed to the same participant to represent a pre-test and post-test score when an intervention is administered between the two time points (Weissgerber et al., 2018). The paired-sample *t*-test is highly reliable in evaluating an intervention effect and its result is statistically significant if the p-value is less than .05. If p is greater than .05, the test is not significant (Weissgerber et al., 2018). The paired-sample *t*-test can only compare the means for two related groups of scores, on a continuous outcome and requires the data to be normally distributed. The scores were dependent, as the pre- and post-questionnaires were obtained from the same participants and demographics. A normality test (Shapiro-Wilk test) demonstrated the difference between pre-intervention and post-intervention scores was normally distributed as indicated by the insignificant result p=.740, which is greater than .05.

The questionnaire's 5-point Likert scale was assigned a numeric value with the following values: Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), Strongly Disagree (1) for statements with a positive connotation. For statements with a negative connotation, reverse scoring was applied with the following values: Strongly Agree (1), Agree (2), Neither Agree nor Disagree (3), Disagree (4), Strongly Disagree (5). Of the 30 statements in the tool, 11 were those of a positive connotation and 19 were those of a negative connotation. The tool had a maximum score of 150 points, with a higher score indicating the likelihood of a better attitude, knowledge and/or practices towards benzodiazepines.

Results indicated a statistically significant difference between prescriber's total pre-intervention scores prior to the educational program (M=102.48, SE=2.17); t(30)= -4.84, p<.001 (see Table 2, Table 3, Table 4). Prescriber's total post-intervention scores following the

educational program (M=118.91, SE=2.32), 95% CI [-23.08, -9.38] also indicated a statistically significant difference. There was a large effect size (Cohen's d) of .869 which signified that the pre- and post-educational program scores differed by more than .869 standard deviations (see Table 5). With the p-value of the difference between the pretest and posttest scores less than .05, the null hypothesis may be rejected. It can be concluded there is a statistically significant difference between how prescribers rated their attitudes, knowledge and practices regarding benzodiazepines before and after participating in the evidence-based education. Total scores after participating in the education were higher than before participating in the program (see Table 6). The higher the score after the educational intervention, the higher the probability of a positive change in the attitudes, knowledge and practices towards the deprescribing of benzodiazepines.

**Table 2**

*Paired Samples Statistics*

| | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| TotalScore1 | 102.48 | 31 | 12.074 | 2.169 |
| TotalScore2 | 118.71 | 31 | 12.905 | 2.318 |

**Table 3**

*Paired Samples Test*

| | | | | 95% CI of the Difference | |
|---|---|---|---|---|---|
| | Mean | SD | SE Mean | Lower | Upper |
| TotalScore1 - TotalScore2 | -16.226 | 18.679 | 3.355 | -23.077 | -9.374 |

**Table 4**

*Paired Samples Test*

| | Significance Two-Sided p |
|---|---|
| TotalScore1 - TotalScore2 | <.001 |

**Table 5**

*Paired Samples Correlations*

| | N | Correlation | Significance Two-Sided p |
|---|---|---|---|
| TotalScore1 & TotalScore2 | 31 | -.117 | .529 |

**Table 6**

*Paired Samples Effect Sizes*

| | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | Standardizer | Point Estimate | Lower | Upper |
| TotalScore1 - TotalScore2 | Cohen's d | 18.649 | -.869 | -1.278 | -.449 |

## Discussion

This study was aimed at improving patient outcomes by improving knowledge of deprescribing approaches and presenting prescribing alternatives for benzodiazepines in the older adult population. Neves et al. (2019) sought to compare family physicians and other specialists' responses and applied a dimensional structure which included prescribers' beliefs about benzodiazepines, prescriber's attitudes about benzodiazepine prescription, prescriber's self-perception of literacy about benzodiazepines and prescriber's self-efficacy perception for promoting withdrawal. Despite variations in methods and design, it was observed the findings of this study were largely consistent with the study conducted by Neves et al. (2019). However, several results were unforeseen.

The results of this study indicated prescribers believe chronic use of benzodiazepines is not justified even if the patient feels better and is without side effects, whereas Neves et al. (2019) found although family physicians agreed, other specialists did not. Although the results were more consistent with the literature indicating prescribers believe benzodiazepines should not be used regularly, Anderson et al. (2014) found this does not appear to translate to variations in prescribing habits. The prescribers in this study do not feel pressured to prescribe benzodiazepines, however Neves et al. (2019) reported family physicians do feel pressured and other specialists do not. This is inconsistent with the literature that suggests patients expect a prescription for every ailment (Wallis et al., 2017). Prescribers in this study did not indicate refusal to prescribe benzodiazepines challenged the patient-prescriber relationship, however this was not the consistent with the literature. Wallis et al. (2017) reported study participants expressed their prescribing was highly influenced by concerns over maintaining the patient-prescriber relationship, Anderson et al. (2014) reported prescribers felt changes to medication

regimens may threaten the therapeutic relationship and Garfinkel et al. (2017) revealed deprescribing may be viewed as a negative approach, adversely affecting the patient-provider relationship. Additionally, prescribers in this study did not believe the easiest way to deal with a patient's anxiety was to prescribe a benzodiazepine, which was echoed by Neves et al. (2019). Nevertheless, studies indicate prescribing is an easy option compared to deprescribing which is often time-consuming, and patients deem discontinuation of a medication often warrants another prescription to replace it (Wallis et al., 2017; Garfinkel et al., 2017).

Despite the overwhelming evidence of risk and harm, anxiety and insomnia remain the primary reason for most benzodiazepine prescriptions, with alternative options seldom utilized (Maust et al., 2016). Reeve et al. (2017) proposed tapering of benzodiazepines along with patient education and pharmacological substitution has been effective, with substitution for the intention of discontinuation showing the highest success rates. Equally, the research suggests non-pharmacological approaches are appropriate for most patients, with the prescriber's agreement improving after the educational intervention and comparable findings by Neves et al. (2019). Although Neves et al. (2019) had similar findings, some studies found prescribers described an uncertainty and fear which influenced their prescribing decisions and reported challenges in discontinuing medications initiated by other prescribers (Wallis et al., 2017; Anderson, et al., 2014). The results of this study suggest despite the healthcare prescribing culture, which promotes prescribing versus deprescribing, educational programs have the ability to improve ongoing systemic practices. Deprescribing benzodiazepines can decrease the negative outcomes associated with their use and other evidence-based treatments are available and effective (Scrandis & Duarte, 2019). The evidence-based education was effective at improving the participants knowledge of deprescribing approaches and alternative prescribing choices, as

evidenced by how they rated their attitudes, knowledge and practices after participating in the study.

## Significance or Implications

The results of this study have the ability to improve clinical practice, strengthen healthcare policy, improve patient outcomes, increase quality and safety and enhance education. Further review of the literature supported focused clinical education programs and their lasting impact on benzodiazepine prescribing. In a pretest-posttest study examining factors of benzodiazepine prescribing, practitioners' attitudes, perceptions and self-efficacy principles were upheld, as the desired outcomes were found to remain consistent after six months (Creupelandt et al., 2019). The tendency to prescribe benzodiazepines to elderly patients in spite of national prescribing guidelines is often secondary to complex and personal factors attributed to prescribers and patients (Sundseth et al., 2018). An innovative analysis of audio-recorded patient discussions of benzodiazepine prescribing uncovered most conversation patterns regarding the discontinuation of benzodiazepines were more abstract than concrete. The study conducted by Turner et al. (2018) provided unique insight into the benefit of educational interventions and the ability they have to transform patient and healthcare provider deprescribing conversations.

Randomized control trials (RCTs) are widely considered the gold standard in the appraisal of educational interventions, as their design is effective in establishing causal relationships between the intervention and outcomes (Outhwaite et al., 2020). However, the impact of educational interventions can have direct effects on patients and communities and enhance overall health outcomes (Bzowyckyj et al., 2017). The dissemination of an evidence-based clinical practice guideline, designed to present the highest level of existing evidence, was beneficial to the prescribers. In determining how the prescribers' attitudes, knowledge and

practices were affected after participating in the evidence-based education, this study increased the awareness of the proven risks of benzodiazepine use in older adults as well as simplified appropriate, evidence-based interventions to reduce their use, reduce potential adverse effects and impact their future prescribing practices.

Greiver et al. (2019) conducted a pragmatic cluster randomized controlled trial to determine if evidence-based tools or interventions exist to support the deprescribing of potentially inappropriate medications among older adults and if so, how they could be disseminated to prescribers. Seven Canadian primary care practice-based research networks and 86 practice sites involving 334 family physicians or nurse practitioners were eligible for inclusion in the study. The authors concluded that older patients are complex and discontinuing medications that may be harmful could improve their health. Further, they allege multiple highly credible organizations, such as The American Geriatric Society and The Canadian Deprescribing Network, support the use of evidence-based tools in order to deprescribe among this population (Greiver et al., 2019).

Benzodiazepines are being overprescribed to older adults. Their association with potential harm, including falls and cognitive impairment demands enhanced competence in treatment alternatives. Deprescribing, the “planned and supervised process of dose reduction or stopping of medication that might be causing harm or no longer providing benefit” (Pottie et al., 2018, p. 340) should be established in collaboration with the patient. Despite a lack of evidence in support of prescribing benzodiazepines to older adults, an overabundance of evidence in support of deprescribing benzodiazepines to older adults, an overabundance of evidence outlining the risks associated with their use including professional societies and experts deeming them to be inappropriate in this patient population, older adults remain the largest percentage of

long-term users of benzodiazepines (Gerlach et al., 2018). Current health system factors along with prescriber perceptions, shape their prescribing habits. However, with increased transparency as presented in this study, policymakers can further identify these barriers and enablers to target effective interventions to promote deprescribing benzodiazepines.

The results of this study suggest that an increased understanding of the harms and risks associated with benzodiazepine use in older adults, presented with non-pharmacological alternatives, has the potential to successfully promote positive patient outcomes via deprescribing among prescribers.

## Plans for Future Scholarship

Practice scholarship allows for meaningful contributions to the advancement of nursing practice which can impact healthcare outcomes, develop innovative processes and improve existing quality of care. The foundation of the DNP Scholarly Project is built upon the successful planning, implementation, evaluation and distribution of new practice knowledge. The research data will be presented to the owners and CEO of the practice, as well as the study participants to discuss the study's findings and encourage collaboration of future education-based practice deprescribing guidelines.

A more substantial sample size over a longer time period or a follow-up study would be beneficial to establishing approaches to motivate deprescribing among prescribers and promote non-pharmaceutical alternatives. The findings of this study suggest a better understanding of the influences associated with prescribing habits may present a clear path to guiding successful tapering and deprescribing strategies. Prescribing habits are formed during the clinical process through formal U.S. medical curricula and refined through industry exposure (Brown & Fugh-

Berman, 2021). The study participants were not required to indicate their professional designation in the questionnaire process, therefore the data was unable to be analyzed by each represented medical prescribing domain. Direct comparisons are challenging, as different specialties and professional designations vary in their prescribing methodologies. While this information may have provided substantial insight into the awareness of each of the medical domain's beliefs and attitudes towards benzodiazepines, it was not the objective of the study. It is critical that we determine how to manage prescribing influences therefore future studies of the comparison between professional designations and their beliefs and attitudes towards benzodiazepine's would be valuable.

## Summary

Benzodiazepines are associated with adverse outcomes, which have been well established among older adults (Jacob et al., 2017). They have the potential to cause considerable harm, including falls and negative impact on cognitive functioning, thus making them essential to avoid or consider their use with extreme caution (Donnelly et al., 2017; Jacob et al., 2017; Lucchetta et al., 2018). Despite the availability of non-pharmaceutical options, benzodiazepines are routinely prescribed to older adults in excess of what is clinically appropriate (Gerlach et al., 2018). Primary care practitioners are frequent prescribers of benzodiazepines, consequently they would be the obvious starting point to establishing a solution for this public health problem.

The results of this project strengthen the growing body of evidence which supports the avoidance of benzodiazepine use in older adults. The findings substantiate the need for improved prescriber education with realistic, alternative shared decision-making approaches and evidence-based clinical practice guidelines to support successful deprescribing of benzodiazepines in older

adults. This project has demonstrated the benefits and impact an educational program can have when exposing the level of harm associated with continued prescribing of benzodiazepines.

All components of the DNP Essentials were achieved through the planning, implementation, evaluation and dissemination of new practice knowledge within the DNP Scholarly Project and are outlined below.

**Essential I: Scientific Underpinnings for Practice**

The first DNP Essential was achieved through utilization of science-based theories/concepts to determine significance of healthcare delivery among those served by the organization and an analysis and synthesis of research articles to compile data for the scholarly project.

**Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking**

The DNP Essential II was met through incorporating high quality, evidence-based resources to strategize and generate a quality improvement education plan, assuming a leadership role as clinical educator to mentor students at the organization site and examination of organizational and financial outcomes and their influence on accessible healthcare in the aging population.

**Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice**

This essential was fulfilled through analytic methods to critically appraise existing literature and other evidence to determine and implement the best evidence for future practice

and evaluation of health disparities in older adults in order to present findings to peers using several approaches.

**Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care**

The fourth DNP Essential was satisfied through examination of the current demands of nurse practitioners, the expectations of innovative clinical judgment supported by scientific evidence and technological developments in order to address complex patient problems as well as observation of the organization and layout of advanced clinical information systems and analysis of its impact on improving health care.

**Essential V: Health Care Policy for Advocacy in Health Care**

This essential was achieved through engagement in collaborative discussions and participation in continuing education on the impact of burnout and how nursing leadership can establish a work environment which supports nurses' psychosocial well-being and participation in collaborative dialogues on the ethical impacts of policy development and examination of opportunities for advocacy.

**Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes**

The DNP Essential VI was met through effective communication of the implementation of the scholarly project with the organization’s stakeholders and analysis of risks of vulnerable populations and their insufficient health insurance coverage and conduction of interprofessional collaborative discussions to improve health outcomes.

### Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health

The seventh essential was executed through conduction of a needs assessment to determine the study populations health needs and analysis of care delivery models of long-term care facilities and their influence on improving the health of aging adults.

### Essential VIII: Advanced Nursing Practice

The last essential was fulfilled through participation in continuing education related to the direct care/medical management of patients and patient outcomes, participation in informative discussions to initiate advanced specialty certifications, and interviewing of nursing leaders to evaluate relationship between practice and organizational structure, financial decision-making and quality of care indicators. This essential was also met through an interview of healthcare administrators to evaluate evidence-based care towards improving patient outcomes, conduction and extensive assessment of health and wellness in diverse populations to establish the expectations of the Advanced Practice Nurse and **e**ducation of elderly, low-income groups on how to better navigate through their complex health problems and transitions of care.

Integration of the DNP Essentials supported the underpinning of this project and allowed for successful achievement of the desired outcomes. This produced an increased understanding of the harms associated with benzodiazepine use in older adults, offered evidence-based practice recommendations and improved prescriber knowledge in order to reduce their use.

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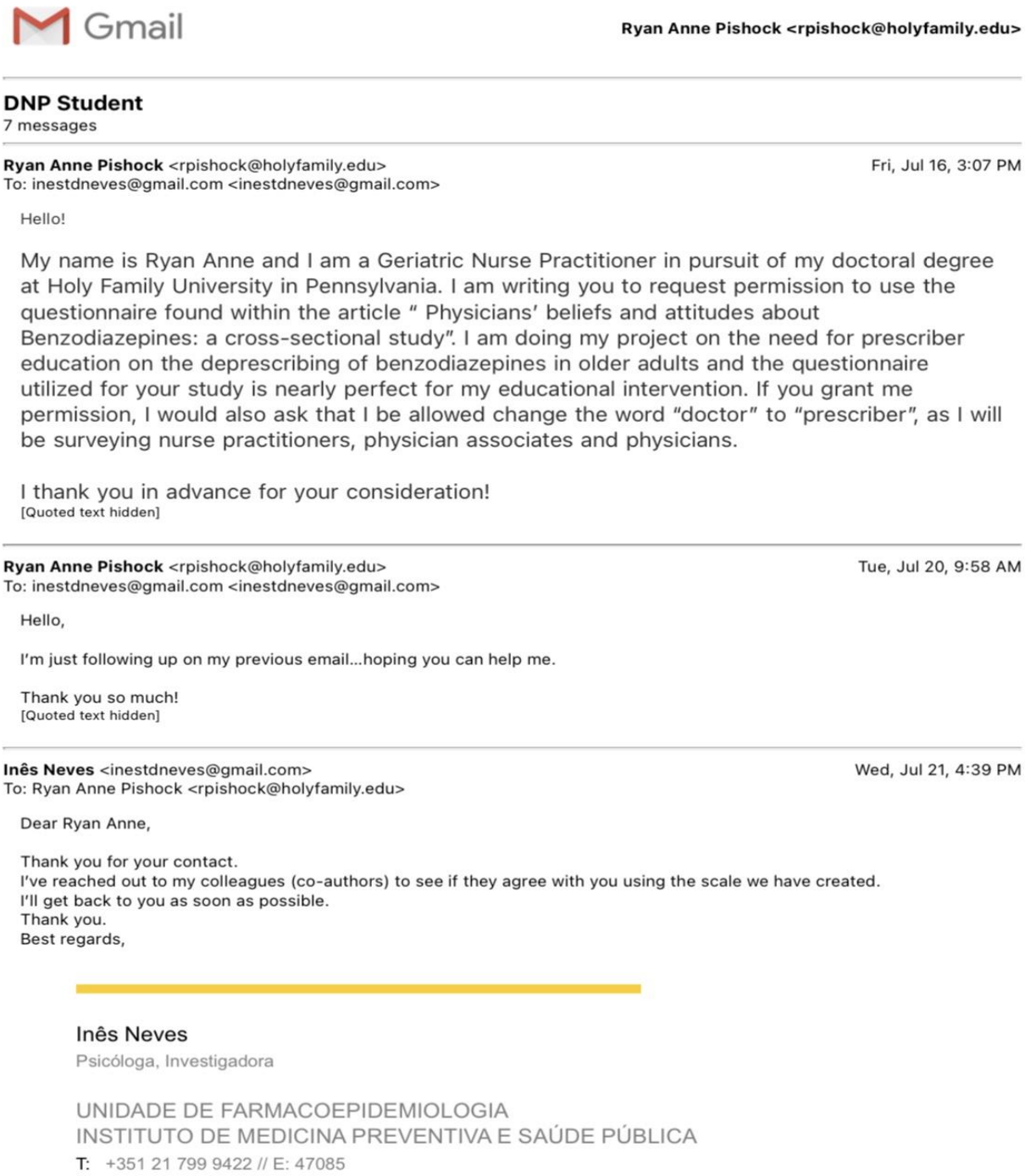
# Appendix A

## Permission to Use Research Questionnaire



Gmail — Ryan Anne Pishock <rpishock@holyfamily.edu>

**DNP Student**
7 messages

**Ryan Anne Pishock** <rpishock@holyfamily.edu> Fri, Jul 16, 3:07 PM
To: inestdneves@gmail.com <inestdneves@gmail.com>

Hello!

My name is Ryan Anne and I am a Geriatric Nurse Practitioner in pursuit of my doctoral degree at Holy Family University in Pennsylvania. I am writing you to request permission to use the questionnaire found within the article " Physicians' beliefs and attitudes about Benzodiazepines: a cross-sectional study". I am doing my project on the need for prescriber education on the deprescribing of benzodiazepines in older adults and the questionnaire utilized for your study is nearly perfect for my educational intervention. If you grant me permission, I would also ask that I be allowed change the word "doctor" to "prescriber", as I will be surveying nurse practitioners, physician associates and physicians.

I thank you in advance for your consideration!
[Quoted text hidden]

**Ryan Anne Pishock** <rpishock@holyfamily.edu> Tue, Jul 20, 9:58 AM
To: inestdneves@gmail.com <inestdneves@gmail.com>

Hello,

I'm just following up on my previous email...hoping you can help me.

Thank you so much!
[Quoted text hidden]

**Inês Neves** <inestdneves@gmail.com> Wed, Jul 21, 4:39 PM
To: Ryan Anne Pishock <rpishock@holyfamily.edu>

Dear Ryan Anne,

Thank you for your contact.
I've reached out to my colleagues (co-authors) to see if they agree with you using the scale we have created.
I'll get back to you as soon as possible.
Thank you.
Best regards,

Inês Neves
Psicóloga, Investigadora

UNIDADE DE FARMACOEPIDEMIOLOGIA
INSTITUTO DE MEDICINA PREVENTIVA E SAÚDE PÚBLICA
T: +351 21 799 9422 // E: 47085

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@: ineves@medicina.ulisboa.pt / inestdneves@gmail.com

Faculdade de Medicina da Universidade de Lisboa
Av. Prof. Egas Moniz | 1649-028 Lisboa
www.medicina.ulisboa.pt

[Quoted text hidden]

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**Ryan Anne Pishock** <rpishock@holyfamily.edu> Wed, Jul 21, 5:03 PM
To: Inês Neves <inestdneves@gmail.com>

Oh thank you so so much! I'm actively preparing my IRB application and I'm hopeful they agree so I can move forward.
Thanks again!!
[Quoted text hidden]

---

**Inês Neves** <inestdneves@gmail.com> Fri, Jul 23, 6:33 AM
To: Ryan Anne Pishock <rpishock@holyfamily.edu>

Dear Ryan Anne,

The team agreed and you can of course use our questionnaire in our PhD.
Please reference the article "Physicians' beliefs and attitudes about Benzodiazepines: a cross-sectional study" and the questionnaire in your PhD work.

Let me know if you have any additional questions.
Wish you the best success in your work.
Thank you again for your interest in our paper/questionnaire.
Best regards,
Inês Neves
[Quoted text hidden]

---

**Ryan Anne Pishock** <rpishock@holyfamily.edu> Fri, Jul 23, 8:12 AM
To: Inês Neves <inestdneves@gmail.com>

Thank you so much! This means so much to me!
[Quoted text hidden]

**Ryan Anne Pishock** <rpishock@holyfamily.edu> Tue, Aug 24, 4:07 PM
To: Inês Neves <inestdneves@gmail.com>

Good afternoon,

Thank you again to you and your team for allowing the use of your questionnaire. I would like to ask that I exchange the term "doctor" for "prescriber" as I will be surveying physicians, nurse practitioners and physician assistants who prescribe benzodiazepines.

Thank you!
[Quoted text hidden]

**Inês Neves** <inestdneves@gmail.com> Wed, Aug 25, 9:45 AM
To: Ryan Anne Pishock <rpishock@holyfamily.edu>

Dear Ryan Ann,

Yes, you can change it. I would just suggest you to explain the rational on why you change it from the original version.
Let me know if you need anything else.
Many thanks.
Best regards,
Ines Neves
[Quoted text hidden]

**Ryan Anne Pishock** <rpishock@holyfamily.edu> Wed, Aug 25, 2:06 PM
To: Inês Neves <inestdneves@gmail.com>

Thank you so much!
[Quoted text hidden]

## Appendix B

## IRB Approval

Holy Family UNIVERSITY

To: Kristin Sagedy, Ph.D., MSN, RN, CEN
Ryan Anne Pishock, MSN, RN, APRN, CRNP, AGPCNP-BC

From: Stacy McDonald, Ph.D.
Chair, Institutional Review Board
Holy Family University

Date: October 1, 2021

RE: 21-2_ Deprescribing Benzodiazepines in Older Adults

---

This letter serves as official notification from the Holy Family University Institutional Review Board concerning your research application, #21-2, titled "Deprescribing Benzodiazepines in Older Adults." This study has been approved under EXEMPT status.

You may begin data collection as proposed in your application. The authorization to recruit participants for this study is in effect for one year from the date contained in this letter and is eligible for extension. A request for extension must be received by the Holy Family University IRB chair in writing accompanied by a completed "Annual Status Report" form no later than 30 calendar days prior to the next IRB meeting date before the expiration of this authorization. The "Annual Status Report" form can be found on the University web site under About Holy Family U. > Research-IRB > Annual Status Report. Should you fail to receive approval to continue the study prior to the expiration date, all research activity must cease until an approval to extend the study is obtained.

If, for any reason, the approved study methods change, regardless of how minor the changes, except to eliminate immediate apparent harm to study participants, you are required to notify the IRB chair in writing using the IRB Project Amendment Form, which can be found on the University web site under About Holy Family U. > Research-IRB > IRB Project Amendment Form. Please be advised that Holy Family University and the IRB accept no responsibility for liabilities associated with this study. All responsibility rests with the principal investigator(s).

We wish you all the best for your successful completion of this research project. If you have any questions or concerns, please do not hesitate to contact me at smcdonald1040@holyfamily.edu or 267-341-3549.

Stacy McDonald

Stacy McDonald, Ph.D.
Chair, Institutional Review Board
Holy Family University

## Appendix C

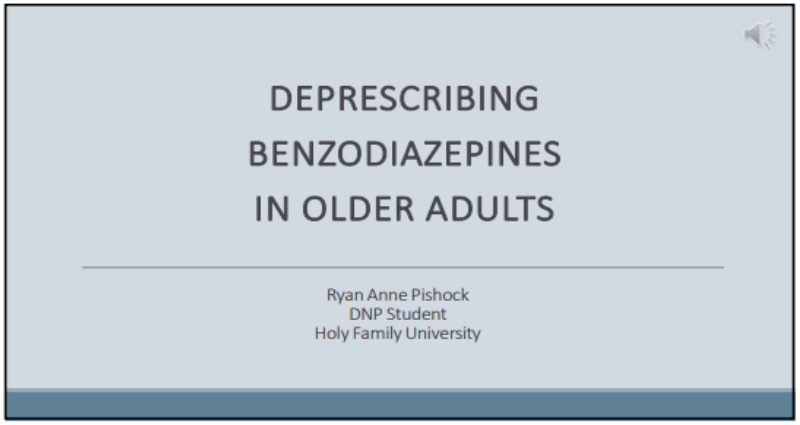
### Perception about Use of BZD Scale (PUBS) questionnaire

| **Perception about Use of BZD Scale (PUBS) questionnaire** (Neves et al., 2019) | | | | | |
|---|---|---|---|---|---|
| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| With BZD, the patient gets a high-quality sleep. | | | | | |
| With BZD, the patient does not wake up so many times during the night. | | | | | |
| With BZD, the patient feels more rested when waking up in the morning. | | | | | |
| With BZD, the patient feels less angry. | | | | | |
| Chronic use of BZD does not represent a health risk to the patient. | | | | | |
| Chronic use of BZD contributes to the patients' well-being. | | | | | |
| Chronic use of BZD is essential to the patients' anxiety control. | | | | | |
| Chronic use of BZD is a public health problem. | | | | | |
| Chronic use of BZD enhances the risk of several falls. | | | | | |
| Chronic use of BZD may impair cognitive performance. | | | | | |
| Chronic use of BZD increases the risk of road traffic accidents. | | | | | |
| I consider myself well informed about the benefits and risks of BZD. | | | | | |
| BZD consumption is unnecessary in most cases. | | | | | |
| It is important to inform the patient about the risk of tolerance associated with BZD. | | | | | |
| It is important to inform the patient about the risk of addiction associated with BZD. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Chronic use of BZD is justified if the patient feels better and without side effects. | | | | | |
| I feel pressured by patients to prescribe BZD. | | | | | |
| Patients feel like they are not taken seriously when I don't prescribe BZD. | | | | | |
| When I refuse to prescribe BZD, I'm challenging the patient-provider relationship. | | | | | |
| I have difficulties in motivating patients to stop BZD's consumption. | | | | | |
| I don't feel capable of helping patients to stop/reduce the BZD consumption. | | | | | |
| There is an acceptable level of anxiety and the prescriber should help people to deal with it. | | | | | |
| The easiest way to deal with a patients' anxiety is to prescribe a BZD. | | | | | |
| Prescribing BZD in clinical cases of anxiety is the most appropriate way to deal with those cases. | | | | | |
| My knowledge on non-pharmacological approaches is enough to help patients not to choose for BZD. | | | | | |
| Non-pharmacological approaches for anxiety need to be complemented with medication. | | | | | |
| Non-pharmacological approaches for sleep disorders need to be complemented with medications. | | | | | |
| Psychological treatment of anxiety is of difficult access. | | | | | |
| It is difficult to motivate patients to see a psychologist. | | | | | |
| Non-pharmacological approaches are appropriate for most patients. | | | | | |

# Appendix D

## Evidence-based Education PowerPoint Slides

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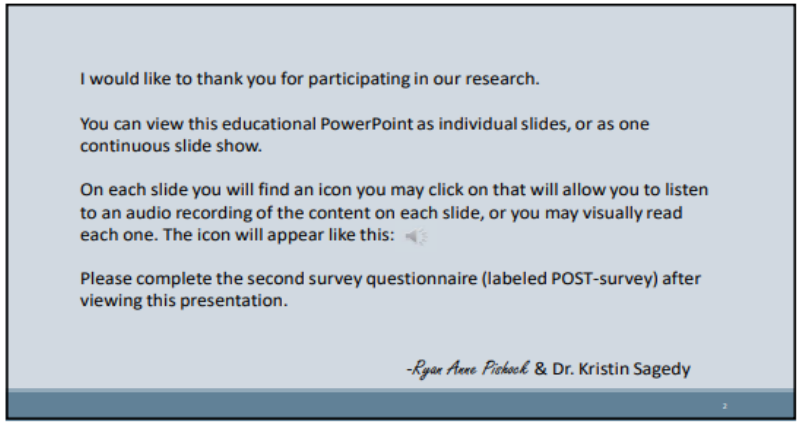


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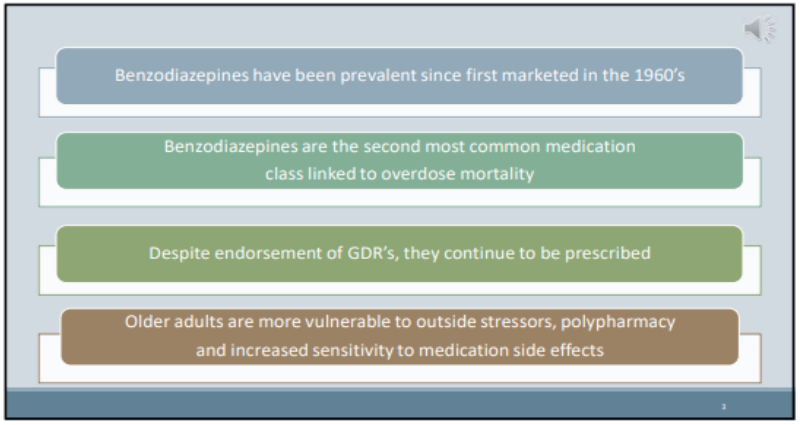


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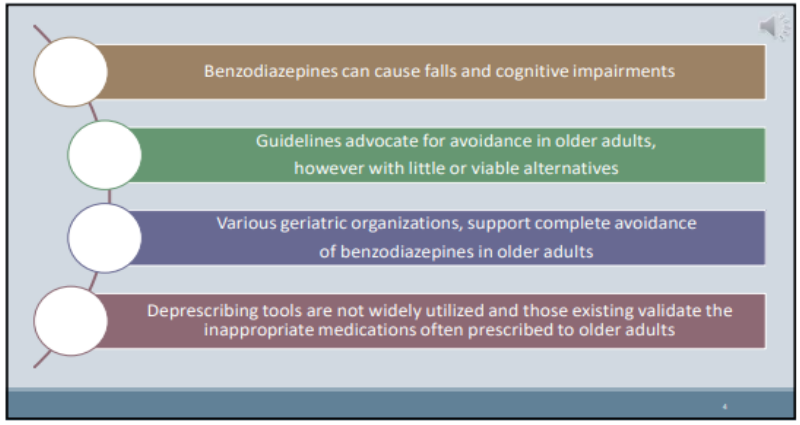
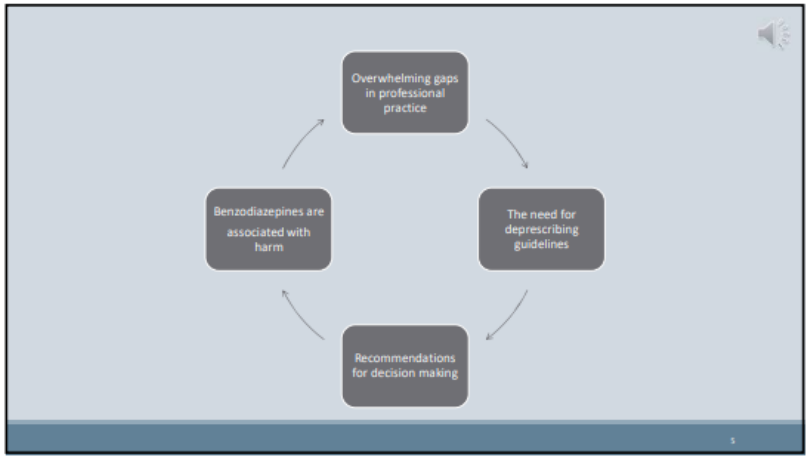
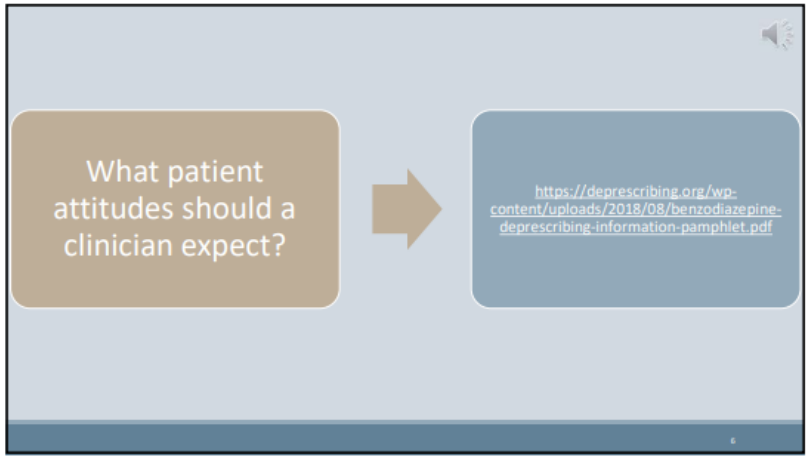


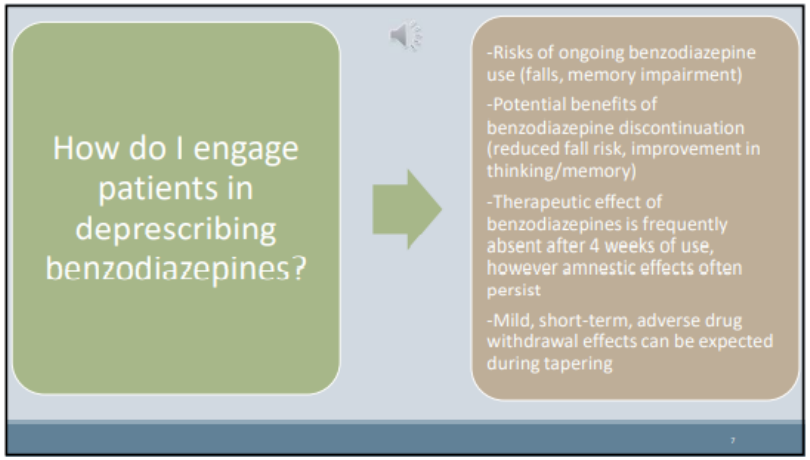

4


Overwhelming gaps in professional practice
The need for deprescribing guidelines
Recommendations for decision making
Benzodiazepines are associated with harm

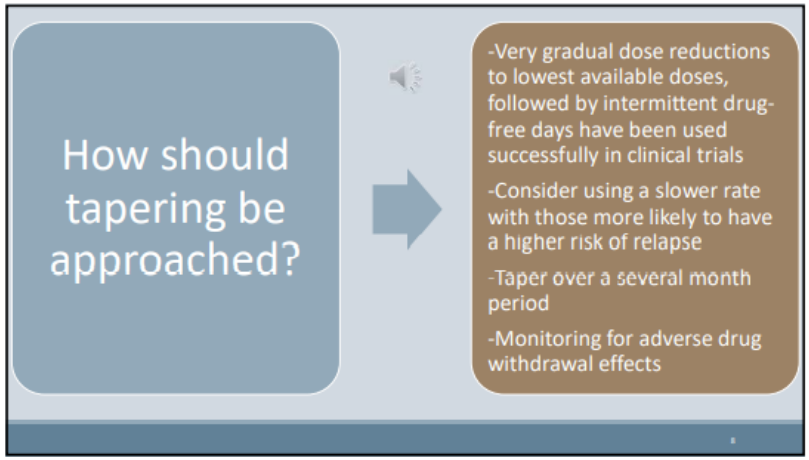
5


What patient attitudes should a clinician expect?
https://deprescribing.org/wp-content/uploads/2018/08/benzodiazepine-deprescribing-information-pamphlet.pdf

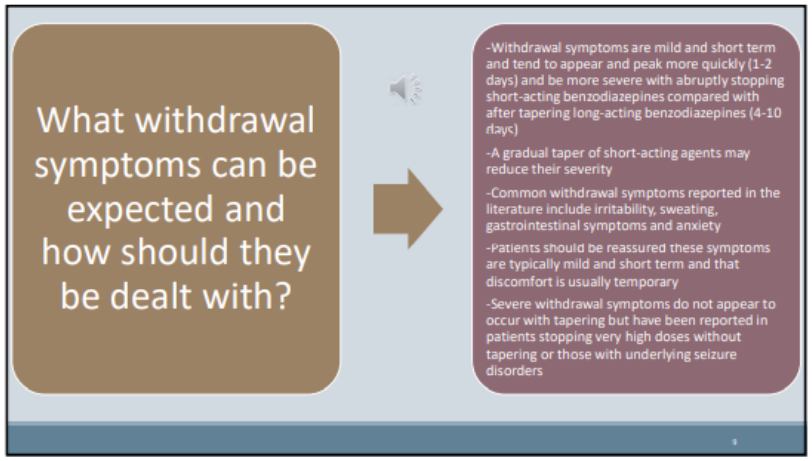
6


How do I engage patients in deprescribing benzodiazepines?
-Risks of ongoing benzodiazepine use (falls, memory impairment)
-Potential benefits of benzodiazepine discontinuation (reduced fall risk, improvement in thinking/memory)
-Therapeutic effect of benzodiazepines is frequently absent after 4 weeks of use, however amnestic effects often persist
-Mild, short-term, adverse drug withdrawal effects can be expected during tapering

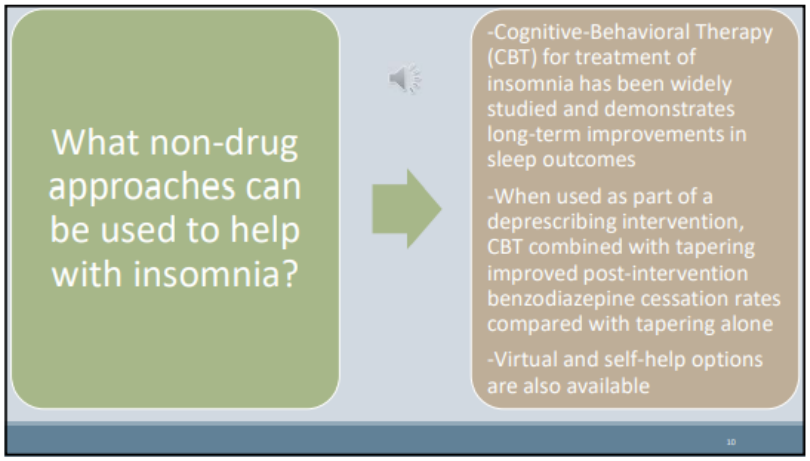
7


How should tapering be approached?
-Very gradual dose reductions to lowest available doses, followed by intermittent drug-free days have been used successfully in clinical trials
-Consider using a slower rate with those more likely to have a higher risk of relapse
-Taper over a several month period
-Monitoring for adverse drug withdrawal effects

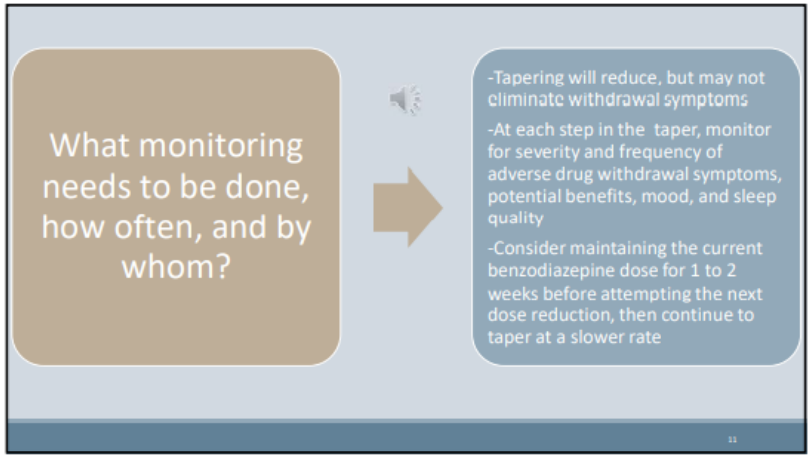
8


What withdrawal symptoms can be expected and how should they be dealt with?
-Withdrawal symptoms are mild and short term and tend to appear and peak more quickly (1-2 days) and be more severe with abruptly stopping short-acting benzodiazepines compared with after tapering long-acting benzodiazepines (4-10 days)
-A gradual taper of short-acting agents may reduce their severity
-Common withdrawal symptoms reported in the literature include irritability, sweating, gastrointestinal symptoms and anxiety
-Patients should be reassured these symptoms are typically mild and short term and that discomfort is usually temporary
-Severe withdrawal symptoms do not appear to occur with tapering but have been reported in patients stopping very high doses without tapering or those with underlying seizure disorders

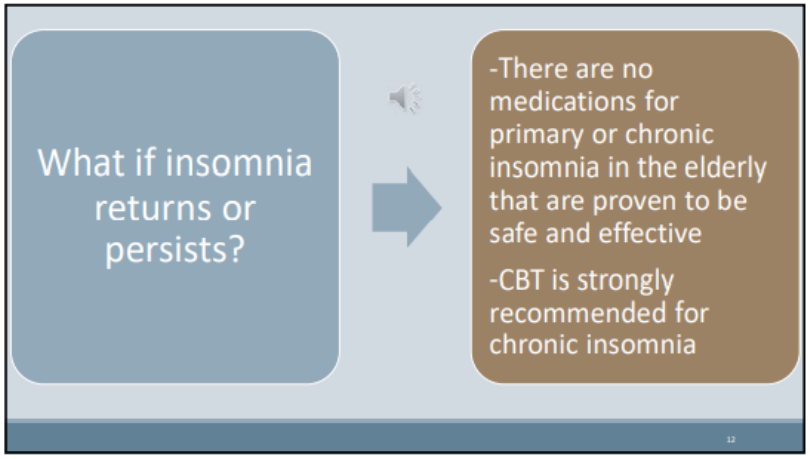
9


What non-drug approaches can be used to help with insomnia?
-Cognitive-Behavioral Therapy (CBT) for treatment of insomnia has been widely studied and demonstrates long-term improvements in sleep outcomes
-When used as part of a deprescribing intervention, CBT combined with tapering improved post-intervention benzodiazepine cessation rates compared with tapering alone
-Virtual and self-help options are also available

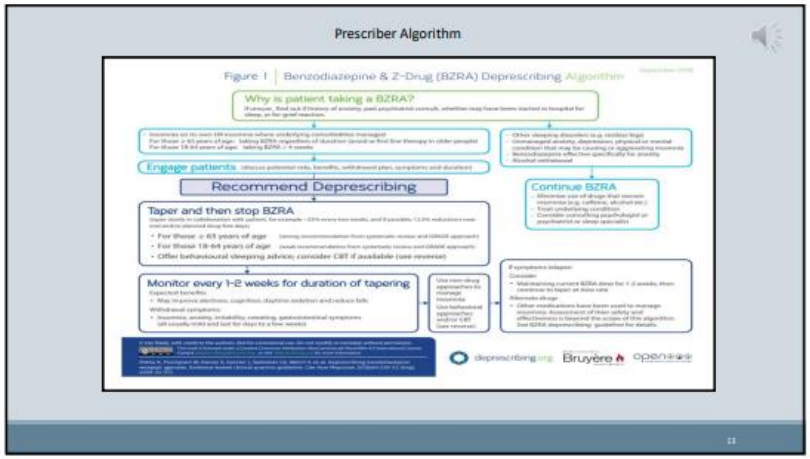
10


What monitoring needs to be done, how often, and by whom?
-Tapering will reduce, but may not eliminate withdrawal symptoms
-At each step in the taper, monitor for severity and frequency of adverse drug withdrawal symptoms, potential benefits, mood, and sleep quality
-Consider maintaining the current benzodiazepine dose for 1 to 2 weeks before attempting the next dose reduction, then continue to taper at a slower rate

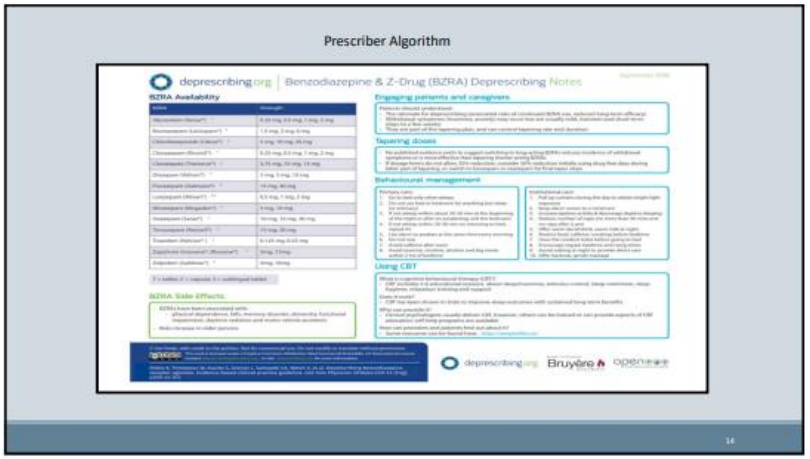
11


What if insomnia returns or persists?
-There are no medications for primary or chronic insomnia in the elderly that are proven to be safe and effective
-CBT is strongly recommended for chronic insomnia

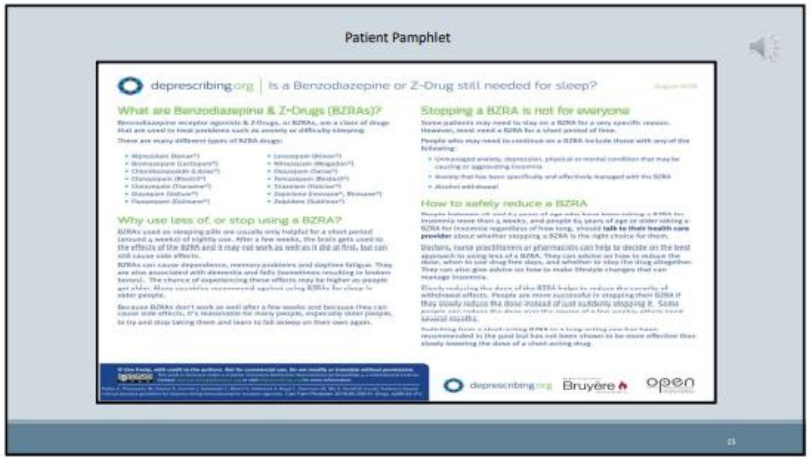
12


Prescriber Algorithm
Figure 1 | Benzodiazepine & Z-Drug (BZRA) Deprescribing Algorithm
Why is patient taking a BZRA?
Engage patients
Recommend Deprescribing
Taper and then stop BZRA
Monitor every 1-2 weeks for duration of tapering
Continue BZRA
deprescribing.org
Bruyère
open

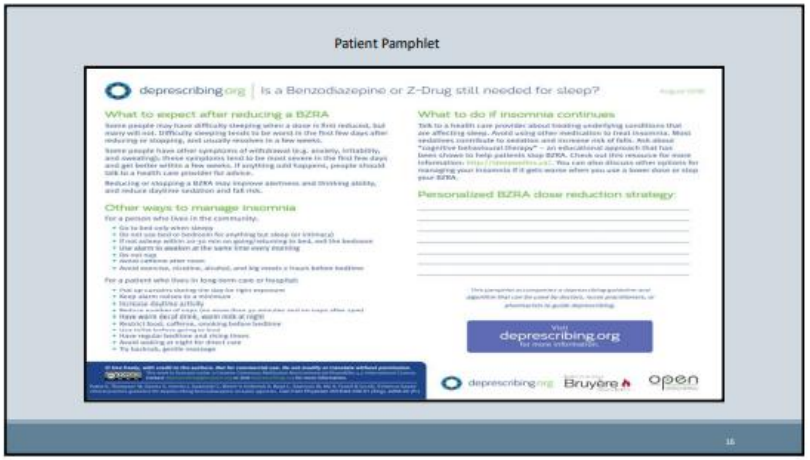
13


Prescriber Algorithm
deprescribing.org | Benzodiazepine & Z-Drug (BZRA) Deprescribing Notes
BZRA Availability
Engaging patients and caregivers
Tapering doses
Behavioural management
Using CBT
BZRA Side Effects
deprescribing.org
Bruyère
open

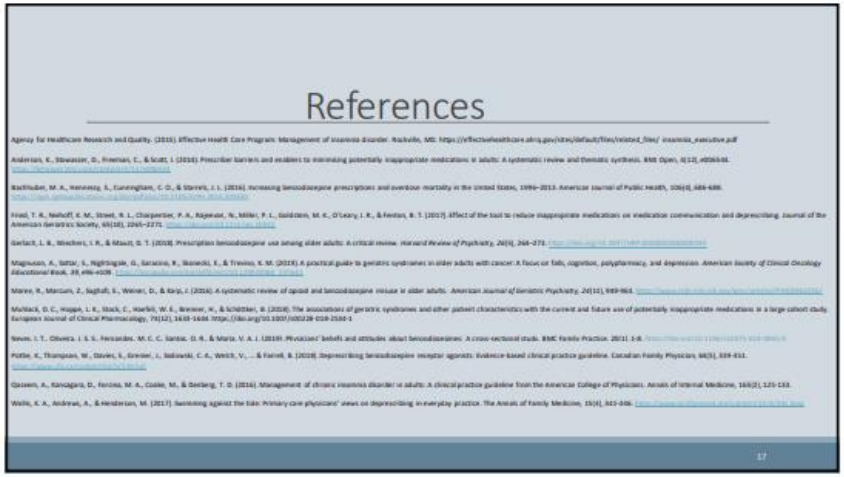
14


Patient Pamphlet
deprescribing.org | Is a Benzodiazepine or Z-Drug still needed for sleep?
What are Benzodiazepine & Z-Drugs (BZRAs)?
Why use less of, or stop using a BZRA?
Stopping a BZRA is not for everyone
How to safely reduce a BZRA
deprescribing.org
Bruyère
open

15


Patient Pamphlet
deprescribing.org | Is a Benzodiazepine or Z-Drug still needed for sleep?
What to expect after reducing a BZRA
Other ways to manage insomnia
What to do if insomnia continues
Personalized BZRA dose reduction strategy
Visit deprescribing.org for more information.
deprescribing.org
Bruyère
open

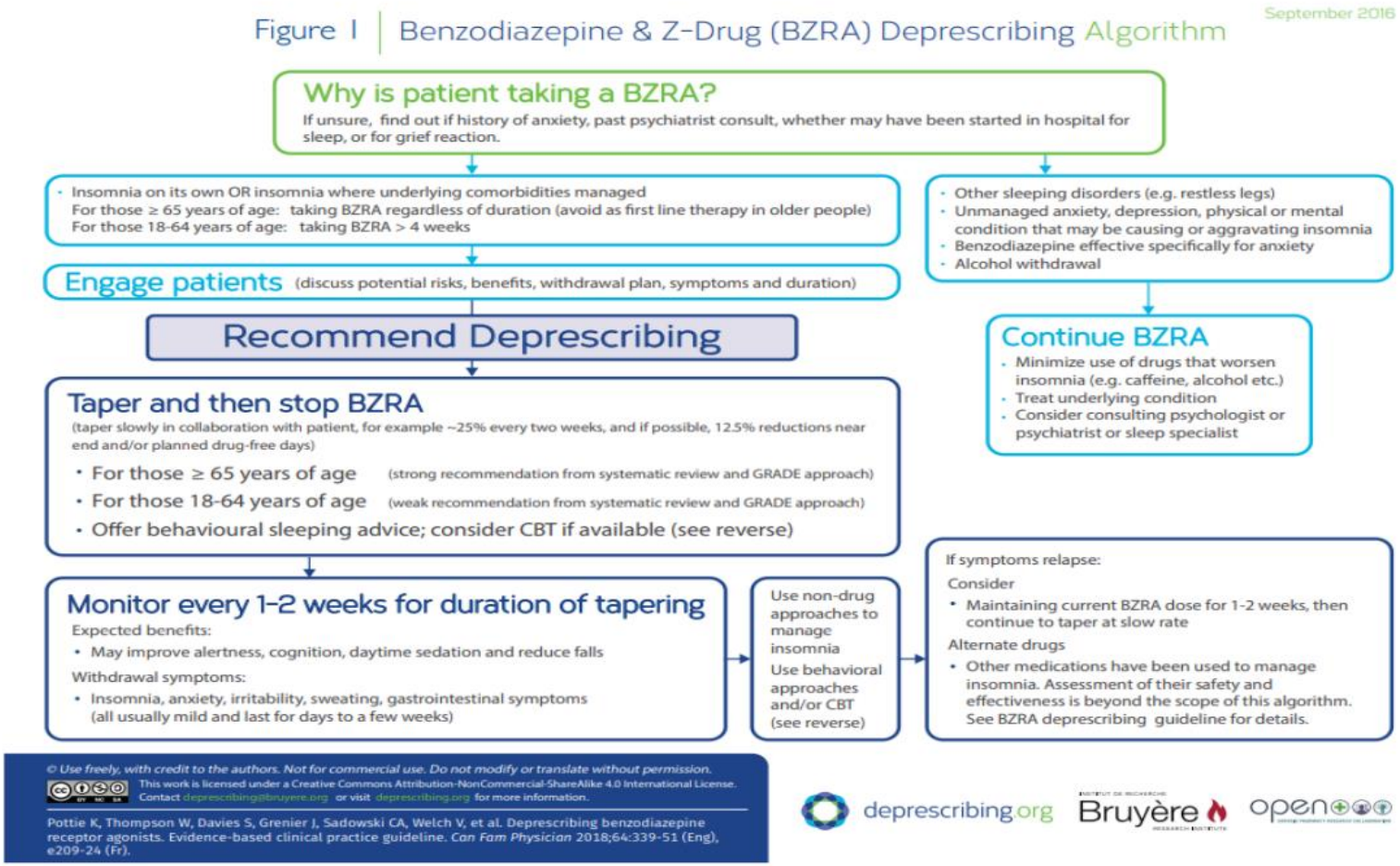
16




17

## Appendix E

## Benzodiazepine & Z-Drug (BZRA) Deprescribing Algorithm



# deprescribing.org | Benzodiazepine & Z-Drug (BZRA) Deprescribing Notes

September 2016

## BZRA Availability

| BZRA | Strength |
|---|---|
| Alprazolam (Xanax®) T | 0.25 mg, 0.5 mg, 1 mg, 2 mg |
| Bromazepam (Lectopam®) T | 1.5 mg, 3 mg, 6 mg |
| Chlordiazepoxide (Librax®) C | 5 mg, 10 mg, 25 mg |
| Clonazepam (Rivotril®) T | 0.25 mg, 0.5 mg, 1 mg, 2 mg |
| Clorazepate (Tranxene®) C | 3.75 mg, 7.5 mg, 15 mg |
| Diazepam (Valium®) T | 2 mg, 5 mg, 10 mg |
| Flurazepam (Dalmane®) C | 15 mg, 30 mg |
| Lorazepam (Ativan®) T,S | 0.5 mg, 1 mg, 2 mg |
| Nitrazepam (Mogadon®) T | 5 mg, 10 mg |
| Oxazepam (Serax®) T | 10 mg, 15 mg, 30 mg |
| Temazepam (Restoril®) C | 15 mg, 30 mg |
| Triazolam (Halcion®) T | 0.125 mg, 0.25 mg |
| Zopiclone (Imovane®, Rhovane®) T | 5mg, 7.5mg |
| Zolpidem (Sublinox®) S | 5mg, 10mg |

T = tablet, C = capsule, S = sublingual tablet

## BZRA Side Effects

- BZRAs have been associated with:
  - physical dependence, falls, memory disorder, dementia, functional impairment, daytime sedation and motor vehicle accidents
- Risks increase in older persons

## Engaging patients and caregivers

Patients should understand:
- The rationale for deprescribing (associated risks of continued BZRA use, reduced long-term efficacy)
- Withdrawal symptoms (insomnia, anxiety) may occur but are usually mild, transient and short-term (days to a few weeks)
- They are part of the tapering plan, and can control tapering rate and duration

## Tapering doses

- No published evidence exists to suggest switching to long-acting BZRAs reduces incidence of withdrawal symptoms or is more effective than tapering shorter-acting BZRAs
- If dosage forms do not allow 25% reduction, consider 50% reduction initially using drug-free days during latter part of tapering, or switch to lorazepam or oxazepam for final taper steps

## Behavioural management

Primary care:
1. Go to bed only when sleepy
2. Do not use bed or bedroom for anything but sleep (or intimacy)
3. If not asleep within about 20-30 min at the beginning of the night or after an awakening, exit the bedroom
4. If not asleep within 20-30 min on returning to bed, repeat #3
5. Use alarm to awaken at the same time every morning
6. Do not nap
7. Avoid caffeine after noon
8. Avoid exercise, nicotine, alcohol, and big meals within 2 hrs of bedtime

Institutional care:
1. Pull up curtains during the day to obtain bright light exposure
2. Keep alarm noises to a minimum
3. Increase daytime activity & discourage daytime sleeping
4. Reduce number of naps (no more than 30 mins and no naps after 2 pm)
5. Offer warm decaf drink, warm milk at night
6. Restrict food, caffeine, smoking before bedtime
7. Have the resident toilet before going to bed
8. Encourage regular bedtime and rising times
9. Avoid waking at night to provide direct care
10. Offer backrub, gentle massage

## Using CBT

What is cognitive behavioural therapy (CBT)?
- CBT includes 5-6 educational sessions about sleep/insomnia, stimulus control, sleep restriction, sleep hygiene, relaxation training and support

Does it work?
- CBT has been shown in trials to improve sleep outcomes with sustained long-term benefits

Who can provide it?
- Clinical psychologists usually deliver CBT, however, others can be trained or can provide aspects of CBT education; self-help programs are available

How can providers and patients find out about it?
- Some resources can be found here: http://sleepwellns.ca/

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Contact deprescribing@bruyere.org or visit deprescribing.org for more information.

Pottie K, Thompson W, Davies S, Grenier J, Sadowski CA, Welch V, et al. Deprescribing benzodiazepine receptor agonists. Evidence-based clinical practice guideline. *Can Fam Physician* 2018;64:339-51 (Eng), e209-24 (Fr).

deprescribing.org | Bruyère Research Institute | open

# Appendix F

## Johns Hopkins Nursing Evidence-Based Practice Summary Tool

| PICO Question: Among healthcare prescribers for older adult patients, how does the educational activity and algorithm on benzodiazepines affect prescribers' attitudes, knowledge, and practices toward deprescribing benzodiazepines in the older adult population? | | | | | | | |
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| Author/Year | Article Title/Journal | Objective/Problem | Study Design | Sample/Sample Size/Setting | Outcomes | Limitations | Evidence Level |
| Anderson, K., Stowasser, D., Freeman, C., & Scott, I. (2014) | Prescriber barriers and enablers to minimising potentially inappropriate medications in adults: a systematic review and thematic synthesis. *BMJ open* | As a landmark study, this article represents a comprehensive review of prescribers' barriers and enablers to minimizing potentially inappropriate medications among older adults. | Qualitative Systematic Review | All healthcare settings; Medical and non-medical prescribers of medicines to adults; 21 studies with four analytical themes. | A variety of factors contribute to prescribers' behavior towards continuing or discontinuing potentially inappropriate medications. The findings are consistent with those in the literature suggesting that pharmacological considerations are not the only factors impacting prescribing decisions. | Inconsistent terminology, poor indexing of search terms and most study participants were experienced primary care physicians caring for older, community-based adults. | Level I |
| Donnelly, K., Bracchi, R., Hewitt, J., Routledge, P. A., & Carter, B. (2017) | Benzodiazepines, Z-drugs and the risk of hip fracture: a systematic review and meta-analysis. *PloS one* | Despite limited data on their use, benzodiazepines have become a prescription of choice in older adults. Hip fractures in older adults lead to an increased risk of mortality and increased morbidity and benzodiazepines have been associated with increased hip fractures. | Systematic Review and Meta-Analysis | Studies involving benzodiazepines and the risk of hip fracture were published between 1995 and May 2015 were included. 9 case-control studies and 9 cohort studies were identified, the sample sizes ranged from 500 to 906,422 participants and the mean age ranged from 72.0 to 84.3 years. | Strong evidence exists that benzodiazepines are associated with an increased risk of hip fracture in the older person and those newly prescribed are at the greatest risk. | All studies included were non-randomized, and there was heterogeneity in some of the meta-analyses; The majority of studies measured dispensing or prescription data and did not confirm patient adherence; None of the studies address drug or alcohol use; The cause of falls in some cases may be due to other causes. | Level I |
| Fried, T. R., Niehoff, K. M., Street, R. L., Charpentier, P. A., Rajeevan, N., Miller, P. L., Goldstein, M. K., O'Leary, J. R., & Fenton, B. T. (2017) | Effect of the Tool to Reduce Inappropriate Medications on Medication Communication and Deprescribing. *Journal of the American Geriatrics Society* | Polypharmacy and potentially inappropriate medications are frequently prescribed to older adults. Appropriate prescribing necessitates effective communication and shared decision making. | Randomized Clinical Trial | Primary care clinics at a VA Medical Center; Participants—128 community dwelling Veterans, aged 65 years and older and prescribed 7 or more medications. | TRIM (Tool to Reduce Inappropriate Medication) improved communication and accuracy of documentation. The use of TRIM was associated with medication-related communication among both patients and their clinicians. | The study lacked sufficient power for the outcome of deprescribing; 224 participants would have been required to demonstrate a difference in two medications between the intervention and control groups; Only half of the control patients could be used in the analysis examining the number of TRIM recommendations thus the medication outcomes needs to be considered a pilot study. | Level I |

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| Garfinkel, D. (2017) | Overview of current and future research and clinical directions for drug discontinuation: psychological, traditional and professional obstacles to deprescribing. *European journal of hospital pharmacy: science and practice* | Practitioners prescribe medications based on guidelines, however there are no evidence-based medicine guidelines for treating older people. The objective of this expert review was to propose methods to deprescribing. | Expert Opinion | Expert opinion – sample not applicable. | Reducing inappropriate prescribing should be recognized as a global goal of the highest priority. In order to accomplish this, basic research and clinical principles regarding good clinical practice should be implemented with each medication prescribed. Each medication benefits should outweigh all possible risks. The author suggests a completely new comprehensive perception for providing good medical practice to older people, including new research, education, diagnosis and treatment principles, separate from the antiquated single disease models of past practice. | No identifiable limitations exist. | Level V |
| Gerlach, L. B., Wiechers, I. R., & Maust, D. T. (2018) | Prescription benzodiazepine use among older adults: A critical review. *Harvard Review of Psychiatry* | Benzodiazepine use among older adults is common, despite evidence suggesting their association with developing cognitive impairments. | Systematic Review | 31 studies found within 2 electronic database searches; Study sample sizes - 6 to 335 patients for treatment of insomnia, 220 patients for treatment of anxiety and 7 to 610 patients for treatment of dementia. | Benzodiazepine prescribing is substantially in excess of what the evidence suggests is acceptable and there is lack of evidence to support its use for insomnia, anxiety or dementia. | Inclusion of only randomized, controlled trials, lack of assessment for potential publication bias or a search to account for unpublished data. | Level I |
| Greiver, M., Dahrouge, S., O'Brien, P., Manca, D., Lussier, M. T., Wang, J., ... & Farrell, B. (2019) | Improving care for elderly patients living with polypharmacy: protocol for a pragmatic cluster randomized trial in community-based primary care practices in Canada. *Implementation Science* | Older adults with polypharmacy may be taking medications that do not benefit them and polypharmacy can be associated with poor health and reduced quality of life. Guidelines and evidence-based deprescribing tools suggest potentially inappropriate medications, such as benzodiazepines, should be deprescribed in older adult patients. | Pragmatic Cluster Randomized Controlled Trial | Seven Canadian primary care practice-based research networks and 86 practice sites involving 334 PCPs (family physicians or nurse practitioners) were eligible for inclusion. | Older patients are complex and stopping medications that may be harmful could improve health for these patients. | Data may not be captured completely in EMRs; The sample represents primary care practices that contributed EMR data rather than a random sample from the population of all primary care practices; Physicians were slightly younger and more likely to be female compared to the population of physicians who have responded to the National Physician Survey. | Level I |
| Islam, M. M., Iqbal, U., | Benzodiazepine use and risk of dementia in the | Benzodiazepines are widely used among elderly patients | | Ten studies (of 3,696 studies identified) were | Results suggest that benzodiazepine use is significantly associated with | Observational studies of meta-analysis relied on diagnosis criteria of primary | Level I |

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| Walther, B., Atique, S., Dubey, N. K., Nguyen, P. A., ... & Shabbir, S. A. (2016) | elderly population: a systematic review and meta-analysis. *Neuroepidemiology* | despite their known effect on memory and cognition. The objective of this study is to evaluate the association between benzodiazepines and the risk of dementia. | Systematic Review and Meta-Analysis | included in the systematic review, 8 studies were included in random-effects meta-analysis; Studies were published between 1983 and 2013; A total of 101,659 study subjects were included in the quantitative synthesis – 23,773 men and 48,773 women; A total of 35,482 dementia patients were included in the studies. | dementia risk. The risk of developing dementia was 78% higher in those who used benzodiazepines. | studies to identify dementia, thus the varied assessment may be imprecise; the overall estimates displayed significant variation therefore caution is necessary when coming to a conclusion; It is impossible to exclude the possibility of potential confounding by various factors; The potential for publication bias is natural in any meta-analysis of published data and may result in an overestimation of the relationship between benzodiazepine use and the risk of dementia. | |
| Jacob, L., Rapp, M. A., & Kostev, K. (2017) | Long-term use of benzodiazepines in older patients in Germany: a retrospective analysis. *Therapeutic advances in psychopharmacology* | The purpose of this study was to analyze the prevalence of long-term benzodiazepine use in older adults. | Retrospective Analysis | This study included patients over the age of 65 years who received benzodiazepine prescriptions for the first time between January 2010 and December 2014 and were treated for at least 6 months without discontinuation. A total of 6,819,472 patients were available in the database, 364,885 patients were identified as fitting the initial criteria, 149,317 were over the age of 65 and 32,182 patients selected for final inclusion. The mean age was 75.1 and 34.8% were men. | Long-term use of benzodiazepines is common in older people, especially those over the age of 80 and diagnosed with dementia, sleep disorders or depression. | A major limitation was that diagnoses could not be fully documented; Data on socioeconomic status and lifestyle-related risk factors were unavailable; Some patients might have received their follow-up prescriptions from another doctor. | Level III |
| Lucchetta, R. C., da Mata, B. P. M., & Mastroianni, P. D. C. (2018) | Association between development of dementia and use of benzodiazepines: a systematic review and meta-analysis. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy* | Benzodiazepine use and its potential to instigate the development of dementia is controversial. The objective of this study was to identify whether an association exists between the two. | Systematic Review and Meta-Analysis | A total of 981,133 (in the systematic review) and 980,860 (in the meta-analysis) adults or elderly adults were included in the study. The included articles were published between 2011-2017. | The results suggest an association between benzodiazepine use and the development of dementia. | Heterogeneity was responsible for the low confidence, although common for meta-analyses of observational studies. | Level I |

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| Maree, R., Marcum, Z., Saghafi, E., Weiner, D., & Karp, J. (2016) | A systematic review of opioid and benzodiazepine misuse in older adults. *American Journal of Geriatric Psychiatry* | Assessment of the prevalence of opioid and benzodiazepine prescription drug misuse in older adults, the risk factors associated with misuse, and age-appropriate interventions. | Systematic Review | 15 studies found via an electronic literature search; A sample of 2785 adults over the age of 65. | The authors concluded that despite the limited data on this public health concern, as well as the lack of a validated benzodiazepine abuse scale in older adults, efforts to establish appropriate benzodiazepine interventions are needed in order to improve patient safety. | Studies were not included based upon search criteria utilized and interchangeable use of terminology in the literature, exclusion of studies based on lack of specificity on older adults and lack of applicability to general populations. | Level I |
| Maust, D. T., Kales, H. C., Wiechers, I. R., Blow, F. C., & Olfson, M. (2016) | No end in sight: benzodiazepine use in older adults in the United States. *Journal of the American Geriatrics Society* | The aim of this study was to establish the rate of new and continuation of benzodiazepine use in older adults and identify subpopulations at risk. | Cross-Sectional Analysis | National Ambulatory Medical Care Survey (2007–2010); Adults visiting office-based non-psychiatrist physicians (n = 98,818) who were prescribed a benzodiazepine (new or continuation); Analysis was limited to adults aged 65 and older, demographic, clinical, and visits characteristics were used to compare visits of benzodiazepine users with those of nonusers and visits of continuation users with those of new users. | Prescribing to older adults continues despite decades of evidence documenting safety concerns, effective alternative treatments, and effective methods for tapering even chronic users. | Individual level clinical assessments of current symptoms and function were not available; There was no account for whether a prescribed medication is taken routinely or as needed; The study does not include physicians practicing in other settings. | Level V |
| Neves, I. T., Oliveira, J. S. S., Fernandes, M. C. C., Santos, O. R., & Maria, V. A. J. (2019) | Physicians' beliefs and attitudes about benzodiazepines: A cross-sectional study. *BMC Family Practice* | The perceptions and attitudes of physicians influence their prescribing behaviors, therefore determining their beliefs and attitudes towards prescribing and managing benzodiazepines is essential. | Cross-Sectional, Observational Study | A sample of 329 physicians participated in the study – 56% family medicine, 58% female. They completed an anonymous, self-administered online questionnaire, responding to 30 questions regarding their beliefs, attitudes and perceptions about benzodiazepine prescribing. | 89% of participants reported a negative impact on cognitive function and a 79% association with falls as a negative impact of benzodiazepines. 68% indicated they feel competent in the reduction or cessation of benzodiazepines and 55% recognized the challenges in motivating patients to do so. The results indicate the awareness of the risks of benzodiazepine use is adequate and the skills to promote their withdrawal needs improvement. | Accurate calculation of the response rate was not possible; The percentage of physicians 35 years or younger was 44.4% and use of an online approach could represent a bias towards younger physicians who are most prone to use of e-mail. | Level IV |
| Page, A. T., Clifford, R. M., Potter, K., Schwartz, D., & | The feasibility and effect of deprescribing in older adults on mortality and health: a systematic | Deprescribing is recommended to reverse the potential harms of inappropriate polypharmacy | Systematic Review and Meta-Analysis | A total of 132 papers met the inclusion criteria, which included 34,143 participants aged 73.8 ± | The data suggested that deprescribing reduces mortality. Deprescribing was not shown to alter mortality in randomized studies. | Language bias may have been introduced as they only included English language studies; The review included many studies that were nonrandomized and many small | Level I |

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| Etherton-Beer, C. D. (2016) | review and meta-analysis. *British journal of clinical pharmacology* | and this review aimed to determine whether or not deprescribing is a safe and effective intervention to modify health outcomes in older adults. | | 5.4 years. 14 studies were set in hospitals, 29 in aging care facilities and 73 were community based. | | RCTs of low quality; Many studies aimed to assess the feasibility of the deprescribing intervention rather than the health or mortality outcomes; The follow-up durations, settings, age and health status of participants were variable. | |
| Potter, K., Flicker, L., Page, A., & Etherton-Beer, C. (2016) | Deprescribing in Frail Older People: A Randomised Controlled Trial. *PloS one* | Deprescribing can reduce polypharmacy in frail older people and this study aimed to reduce the number of medicines consumed by people living in residential aged care facilities and explore the effect of deprescribing on falls, fractures, hospital admissions, cognitive, physical, and bowel function, quality of life, and sleep. | Randomized Controlled Trial | 95 people over age 65 years living in four residential aged care facilities in Australia were randomized in an open study. Study participants had a mean age of 84.3 ± 6.9 years and 52% were female. 348 medications were targeted for deprescribing and 207 were discontinued. | Deprescribing reduced the number of regular medicines consumed by frail older people living in residential care with no significant adverse effects on survival or other clinical outcomes. | The main weakness of this study was the open design and small sample size. | Level I |
| Pottie, K., Thompson, W., Davies, S., Grenier, J., Sadowski, C. A., Welch, V., ... & Farrell, B. (2018) | Deprescribing benzodiazepine receptor agonists: Evidence-based clinical practice guideline. *Canadian Family Physician* | To develop an evidence-based guideline to assist clinicians with decisions about tapering and discontinuing benzodiazepines. | Evidence-Based Practice Guideline | 8 clinicians consisting of a family physician, two psychiatrists, a clinical psychologist, a clinical pharmacologist, two clinical pharmacists and a geriatrician; GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach was used to generate the guideline development; 80% agreement among the team was used for consensus cutoff and all members agreed with final recommendations. | Benzodiazepines are associated with harm and effects are short-term. Attempts to discontinue benzodiazepines should be offered to older adults with continued use over four weeks. Recommendations are intended to assist, not direct prescribing habits. | They did not identify studies that compared various tapering regimens head-to-head, there is limited evidence for shared decision-making approaches related to deprescribing and most studies did not evaluate patient outcomes such as quality of life or function. | Level V |
| Puustinen, J., Lähteenmäki, R., Nurminen, J., Vahlberg, T., Aarnio, P., Partinen, M., | Long-term persistence of withdrawal of temazepam, zopiclone, and zolpidem in older adults: a 3-year follow-up study. *BMC geriatrics* | A 3 year follow up study to depict the continuance of Benzodiazepine withdrawal among older adults at 3 years from the beginning of withdrawal. | 3 year follow up study of original randomized, double-blind, placebo- | 92 outpatients (≥55 years) with primary insomnia, long-term Benzodiazepine use as hypnotics and willingness to withdraw. Three years later, use of | At 3 years after withdrawal, the number of benzodiazepine-free participants decreased, with one-third of the subjects remaining benzodiazepine-free, one-third using benzodiazepines irregularly and one- | The small sample size limits validity of conclusions; Use of Benzodiazepines was based on interview data verified from medical records but not by blood or urine. | Level I |

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| Räihä, I., Neuvonen, P. J., & Kivelä, S. L. (2018) | | | controlled, parallel-group study | Benzodiazepines was determined by interview and medical records. 83 of the original enrollees participated in the follow up study. | third continuing benzodiazepine use regularly. | | |
| Reeve, E., Ong, M., Wu, A., Jansen, J., Petrovic, M., & Gnjidic, D. (2017) | A systematic review of interventions to deprescribe benzodiazepines and other hypnotics among older people. *European journal of clinical pharmacology* | Benzodiazepines are commonly used past recommended timeframes which can lead to adverse events. This review aimed to evaluate the success of interventions to reduce benzodiazepine use. | Systematic Review | An electronic search on studies conducted in older adults published between January 1995–July 2015 were retrieved and totaled 5063 articles. Seven studies of benzodiazepines were identified. Five studies measured clinical outcomes following benzodiazepine discontinuation. | Evidence shows that Benzodiazepine withdrawal is achievable and safe in the older population, but success may vary based on interventions used. Overall, discontinuation rates ranged from 27% to 80%. | Studies conducted in a wider population may have been missed; Most studies were conducted in community-dwelling or in hospitalized older adults living in Europe and may not be generalizable to other settings or other parts of the world; Most of the studies were not powered for many of the outcomes investigated in the individual studies; Most studies had short-term follow up. | Level I |
| Wallis, K. A., Andrews, A., & Henderson, M. (2017) | Swimming against the tide: primary care physicians' views on deprescribing in everyday practice. *The Annals of Family Medicine* | Deprescribing is essential to best prescribing practices. Hospitalizations due to adverse drug events and high-risk prescribing are common but avoidable in older adults. This study aimed to explore the barriers to deprescribing and the development of an intervention to support safer prescribing. | Qualitative Exploratory Study with Snowball Sampling Technique | Three researchers conducted 24 semi-structured interviews to identify and analyze themes among physicians. Participants varied in age, sex, experience and employment status. | Physicians described deprescribing as complicated, indicating patient expectations, the culture of prescribing and organizational constraints as barriers. | Risk of bias with the snowball sampling technique; It is possible that responses that do not accurately reflect experiences in everyday practice were provided to avoid judgement. | Level II |