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## Pharmacotherapeutic Challenges for Treating the Baby Boomer Cohort

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# Pharmacotherapeutic challenges for treating the baby boomer cohort

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## Abstract

As the baby boomer cohort ages, they have an ever-increasing number of comorbidities and associated poly-pharmaceutical treatment needs. The challenge for healthcare providers is to stay current of advancements in providing for this aging population. Baby boomers can expect a longer life expectancy than any previous generation. Yet, longevity has not correlated with better health. This cohort is noted for being goal driven and more self-assured than younger generations. They are resourceful and will often attempt to fix things themselves, including their healthcare. They believe hard work deserves justifiable rewards and relaxation. These beliefs have resulted in baby boomers utilizing more alcohol and illicit drugs. Altogether this means today's healthcare providers must be aware of potential interactions from the polypharmacy of prescribed medication, and they must include and understand additional complications associated with supplemental medications and illegal drugs.

## KEYWORDS

ageism, geriatric dentistry, pharmacology

## 1 | INTRODUCTION

The baby boomer cohort is aging and there is conflicting evidence if they will be physically and cognitively healthier than preceding generations.<sup>1</sup> While heart disease, stroke, and cancer remain the leading cause of death in the United States,<sup>2,3</sup> advancements in health care are decreasing these deaths and extending life expectancy in all age groups.<sup>1</sup> One of the most significant reasons for the decrease in deaths and the increase in longevity is the development and utilization of new medications for the treatment of these morbidities. However, a result of this longevity is an increase in obesity, diabetes, and high blood pressure.<sup>4</sup> These comorbidities are being treated with an increasing number of prescriptions known as polypharmacy.<sup>5</sup> More medications potentially can increase

the risk of adverse drug reactions (ADR), a leading cause in hospitalization for this cohort.<sup>6</sup> In addition, baby boomers are resourceful and self-assured, when combined with the massive amount of media advertisement for self-care products, it results in an increase in over-the-counter herbal medications to supplement their already expanding polypharmacy of prescribed medications. This inclusion exacerbates the potential for ADR.<sup>7</sup> Furthermore, there has been an observed increase in illicit drug use in this cohort.<sup>8</sup> The baby boomers have become the largest group of new users of marijuana.<sup>9</sup> Unfortunately, since marijuana is a schedule I drug, there is almost no research into the effects on the body and potential reactions with other medications and diseases. Consequently, today's health care provider are in a challenging position of trying to manage an aging patient pool with comorbidities and

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polypharmacies, all without comprehensive knowledge of potential risks.

## 1.1 | Demographics

Born between 1946 and 1964, the first baby boomers achieved the age of 65 in 2010. Every day since then, an additional 10 000 more will reach the age of 65 and it will continue until 2030. Current estimates put the number of baby boomers above 73 million.<sup>1</sup> The number of persons over the age of 65 grew by 16.0% in 2018. The reported increase in life expectancy from 69.7 years in 1960 to 79.7 in 2017, has further increased the number of older adults.<sup>10</sup> Census projections predict that in 2034, older adults will outnumber children under the age of 18.<sup>10</sup> One factor increasing the divide between the generational numbers is that many of the people reaching 65 have not had children. Furthering this divide is a decreasing fertility rate seen around the world. This has resulted in a decrease of availability of intergenerational care givers.<sup>11</sup> Therefore, this increase in longevity brings new challenges for this population, such as how long will they maintain good health? Also, what chronic conditions can they be expected to face? Will they be able to survive independently, and can they afford the longer expected utilization of their expanding healthcare needs? More importantly, will there be sufficient numbers of trained healthcare providers, and will they be able to maintain and understand all the needs of this expanding and ailing population?

Along with the decreasing systemic health of the baby boomer cohort, other reports are showing an increase in disabilities, both physical and mental.<sup>12</sup> Interestingly, these studies detail an increase in disabilities of this cohort, while documenting a decline in disability among the oldest Americans aged 85 and older.<sup>13</sup> A decline in mobility accounts for approximately 40% of the disabilities reported.<sup>14</sup> The increasing rise in obesity is directly related to disability and physical limitations.<sup>15</sup> As one physician has pointed out, “Most patients of this generation are relying too much on the medications and not changing their lifestyles and that’s why their health is actually worse”.<sup>4</sup> And therein lies the paradox between an increasing life expectancy and a decrease in health conditions, due to their increased dependency on prescription drugs.<sup>16</sup> Diseases that prior generations saw as life-threatening are now managed with polypharmacy.

## 1.2 | Polypharmacy

Unfortunately, there is no clear-cut definition of polypharmacy in the literature. In a systematic review,<sup>17</sup> some studies used a strict numerical threshold of the number

**TABLE 1** Commonly prescribed medication and potential side-effects.

Name	TX	Effects
Metformin	Diabetes	Nausea Diarrhea Lactic acidosis
Atorvastatin	Hyperlipidemia	Rhabdomyolysis ↑ Blood sugar
Lisinopril	Hypertension	Dizziness Lightheadedness Fainting
Albuterol	Asthma	Hypertension Irregular heartbeat
Amlodipine	Hypertension	Dizziness Lightheadedness Fainting Swelling ankles
Gabapentin	Seizure and neuropathic pain	Drowsiness Dizziness Double vision Swelling ankles
Omeprazole	Ulcers and GERD	Irregular heartbeat Muscle spasms Seizures

Note: Lexicomp for Dental Professionals: <https://www.wolterskluwer.com/en/solutions/lexicomp/who-we-help/dentists>

[Correction added on 19 May 2023, after first online publication, Table 1 has been modified in this version]

of drugs, while other studies used the appropriate use of polypharmacy, which includes the length of treatment, drug interactions, and the identification of patients with an increased potential for negative outcomes. Even singular medications often come with unwanted side effects (see Table 1). The increase in polypharmacy can be attributed to the singular disease-treatment protocols long established in healthcare.<sup>18</sup> One disease is treated with one drug. One study cites 90% of baby boomers take a single drug, 80% take 2, and 38% take five or more.<sup>19</sup> This continued increase in polypharmacy can result in serious drug interactions with other drugs, foods, and/or the varied diseases they are attempting to treat. Drug-drug interactions have been shown to increase exponentially with each additional drug added to the treatment regimen.<sup>20</sup> One study notes, ADR are noted to account for about 3% of all hospitalizations in the United States which costs the healthcare systems in excess of \$1.3 billion annually.<sup>21</sup> Another study estimates ADR’s in hospitalized patients account for 106 000 deaths annually.<sup>22</sup> Sixty-one percent of emergency department visits are for persons 65 or older presenting with ADR’s.<sup>23</sup>

One commonly noted reaction is the relationship between drugs utilized to treat diabetes and hyperlipidemia.<sup>24</sup> An increase in diabetes often results in a corresponding increase in triglycerides and LDL. A

common side effect of statins, which are used to treat hyperlipidemia, is an increase in blood glucose, thereby increasing the effects of diabetes.<sup>24</sup> Wastesson et al. postulates, "It is difficult to disentangle the negative consequences of polypharmacy from the underlying health conditions for which the drugs are prescribed", in what they termed "confounding by multimorbidity."<sup>19</sup> This poses a problem for healthcare providers: are the drugs helping or hindering the progress of comorbidity?

### 1.3 | Healthcare providers

This author has noticed that dentists often are under the misconception that their care is limited to the oral cavity. Yet, they must consider supplemental care when they prescribe for post-operative management of dental treatment. The most common prescriptions are for pain management with non-steroidal anti-inflammatory drugs (NSAID's) and antimicrobial treatment of oral infections.<sup>25</sup> Therefore, dentists should be aware of potentially fatal ADR's that could affect patient care. One significant example is the reaction between NSAID's and lithium used to treat bipolar depression. NSAID's inhibit renal excretion of lithium and could lead to a toxic reaction.<sup>24</sup> Another example is the concurrent use of antibiotics and blood thinners. Metronidazole and fluconazole are noted to inhibit the metabolism of Warfarin and lead to increased bleeding. Unfortunately, any of these combinations could lead to adverse or even fatal outcomes.<sup>24</sup> It is imperative that the dental practitioner be well versed on their patients' current medications and has reviewed potential adverse reactions before adding to their polypharmacy.

Healthcare providers must take into consideration the physiological changes observed in an aging human body. These changes can be both pharmacokinetic and pharmacodynamic. Considering pharmacokinetics, any person's response to medication can be attributed to their reserve capacity and organ function. These physiological changes result in slower absorption, metabolism, and excretion of medications.<sup>21</sup> The corresponding response pharmacodynamically is prolonged effects at lower dosages of the drugs. Additionally, the aging body loses muscle mass and accumulates fat compared to younger persons. Total body water volume can be decreased by 10%–15% for a person over the age of 65 compared to another person who is half their age.<sup>21</sup> The decrease in water volume creates a decreased absorption of hydrophilic drugs like Metformin.<sup>21</sup> Additionally, an increase in body fat leads to an increased accumulation of lipophilic drugs, potentiating their effects. Some of the most commonly used drugs to treat hyperlipidemia, high blood pressure, and depression are lipophilic.<sup>21</sup> Therefore, aging adults do not require the

dosages typical for younger adults and the elimination of the drugs from their body takes more time.<sup>21</sup> The variation in pharmacological effects of drugs in the elderly needs rigorous investigation. Ironically, the majority of clinical drug trials exclude older adults due to their comorbidities and the polypharmacy need for the treatment of their multiple diseases.<sup>21</sup>

### 1.4 | Herbal medicinal products

To further complicate the issues of prescription polypharmacy, there is data showing that 25% of the population are taking herbal medicinal products (HMP) concurrently with their prescription medications.<sup>26</sup> Due to the pervading marketing from HMP companies, dietary supplements sales are valued at \$151.9 billion a year, with compounded annual growth rates estimated at 8.9% through 2030.<sup>27</sup> The prevailing assumption is that HMP's are natural ingredients and therefore "safe" for consumption, when in fact, HMP's contain pharmacologically active ingredients which can potentiate ADR.<sup>28</sup> The baby boomer cohort known for their self-assured and resourceful nature, have been drawn to use these dietary supplements to treat their growing comorbidities. The concurrent utilization of prescription medications with HMP's varies widely between 5.3% and 88.3%.<sup>26</sup> In addition, it has been reported that unless specifically asked, patients rarely list HMP's along with their prescribed medications.<sup>26</sup> For instance, patients do not consider that a dentist needs to know what HMP's they may be taking as a supplement such as ginseng, which they use to improve their lifestyle or enhance their overall performance.<sup>29</sup> They may also be treating themselves with Astragalus and Echinacea for respiratory ailments like the cold or flu.<sup>29</sup> Garlic is a common HMP for treatment of stress and fatigue.<sup>29</sup> These HMP's are also known as "adaptogens"<sup>30</sup> for their ability to help the body adapt to mental and physical conditions. One noted side effect of these HMP's is they all increase the risk of bleeding.<sup>29</sup> A patient scheduled for a surgical procedure might post-operatively present with an unanticipated complication, such as excessive bleeding. Subsequently, taking any of these concurrently with aspirin or warfarin could result in a dangerous herb-drug interaction<sup>29</sup> (see Table 2).

Patient compliance with taking prescription medications must be considered when dealing with management of polypharmacy. Some medications must be taken on an empty stomach, such as Bisphosphonates.<sup>31</sup> Some are best taken with food, such as NSAID's.<sup>31</sup> Other medication must be taken at certain times of the day or multiple times a day.<sup>20</sup> Regardless of prescription directions, the increased use of polypharmacy creates a situation which can be difficult for a patient to maintain. There exists a

TABLE 2 Commonly used herbal medicinal products.

Name	Common	TX	Effect
Herbae pulvis standardisatus	Belladonna	Asthma, cold, flu Parkinson's disease	Tachycardia, Seizure Hallucinations
Larrea tridentate	Grease weed – creosote bush	Athlete's foot, nail fungus	Hepatitis Kidney failure Liver failure
Boswellia serrata	Ayurveda	Arthritis, diabetes, stroke	Nausea Diarrhea Heartburn
Allium sativum	Garlic	Heart and blood disorders	Heartburn Diarrhea Bleeding
Panax quinquefolius	American ginseng	Stress and boost ↑ Immune system	Birth defects Insomnia Increase insulin levels Bleeding
Astragalus membranaceus	Astragalus	Hay fever ↓ Diabetes ↓ Kidney disease	↑ Auto-immune diseases Bleeding
Echinacea pallida	Echinacea	↓ Inflammation ↑ Immune response	↑ Auto-immune diseases Bleeding
Zingiber officinale	Ginger	Brain and nervous system	Heartburn Diarrhea Bleeding

Note: Lexicomp for Dental Professionals: <https://www.wolterskluwer.com/en/solutions/lexicomp/who-we-help/dentists>

multitude of reasons why a patient will neglect taking their medication as prescribed. The most common is forgetfulness.<sup>20</sup> Memory loss may occur with aging and some of these medications can lead to confusion and blurred vision making it difficult to see and remember directions.<sup>20</sup> The CDC reports up to 30% of prescriptions are never filled and 50% of patients fail to continue to take the full course of the medications as prescribed. The consequences of this is a reported 30%–50% increase in chronic disease treatment failures accounting for up to 125 000 death annually.<sup>32</sup>

## 1.5 | Substance abuse disorder

Substance use disorder (SUD), which includes alcoholism and illicit drug abuse, are on the increase among baby boomers.<sup>8</sup> Alcohol remains the most abused drug, with approximately 65% of the aging population exceeding daily guidelines and thus should be considered high-risk drinkers.<sup>8</sup> Grant et al. reported a 107% increase in alcohol use disorder in adults 65 or older over a period from 2001 to 2013.<sup>33</sup> According to the National Institute on Drug Abuse, alcohol abuse also contributes to a greater risk of obesity, diabetes, high blood pressure, and heart disease. The document further reports that alcohol abuse contributes

to an increased risk of liver damage or failure which would further diminish drug metabolism in the body.<sup>34</sup> Lesser amounts of alcohol are needed to produce harmful effects in the older population compared to younger cohorts,<sup>35</sup> thereby, leading to significantly worsening medical conditions. Alcohol Use Disorders were associated with a 19% increase in hospitalization from 2007 to 2014.<sup>36</sup>

Another component of the SUD problem is the increased use of psychoactive drug's and their abuse among older adults. Persons over the age of 65 represent 16% of the population but consume nearly one-third of all prescription medications.<sup>8</sup> This particular group of drugs includes sedative-hypnotics and narcotic-analgesics used for treating anxiety, depression, insomnia, and chronic pain.<sup>37</sup> They have a high potential for abuse. A major contributor to the increased drug use is seen in assisted-living residences (ALR), where 50% of ALR's report more than 80% of their residents are on psychoactive medications.<sup>38</sup> The opioid crisis has been well documented and discussed in the literature and in health care training.<sup>39–41</sup> However, health care providers in ALR's still consider these drugs a viable adjunct in the management of their patients. Whether prescribed by their physician or requested by the patient, these medications are often administered by unlicensed assistive personnel who are untrained in recognizing and monitoring ADR.<sup>42</sup>



## 1.6 | Marijuana

As marijuana use has become more socially acceptable across the United States, it comes as no surprise to see an increase in utilization, for both recreational and medicinal purposes.<sup>34</sup> The driving force for marijuana utilization came from its supposed medicinal benefits. In 1996, California was the first state to legalize marijuana use for pain and nausea management after chemotherapy treatment.<sup>43</sup> Since then, claims have been made that marijuana has been beneficial for treating Parkinson's, Multiple Sclerosis, Epilepsy, and HIV, to name just a few.<sup>34</sup> While states are moving to codify the use of marijuana, it is still considered a Schedule-1 drug by the Federal government. By definition, a schedule-1 drug has no known current accepted medical use and a high potential for abuse.<sup>44</sup> Therefore, research on its effects is not funded in the United States. Information concerning the effects on a human body and potential drug interactions come from other countries.<sup>45</sup> Based on this information, the American Dental Association (ADA) has listed effects of marijuana use that include tachycardia, hypertension, and increased risk of opportunistic infections.<sup>46</sup> Despite reports of limited health effects on many diseases<sup>47</sup> states continue to pass legislation that ranges from total legalization to limited Cannabidiol (CBD) and tetrahydrocannabinol (THC) use. In only four states is any form of marijuana use fully illegal: Idaho, Wyoming, Kansas, and South Carolina.<sup>48</sup> The New York Times reported that five states voted in the 2022 midterms to further change their qualification for marijuana use.<sup>49</sup> Further, Colorado has legalized the possession and use of psychedelic plants and fungi.<sup>49</sup> Therefore, it is not surprising to see an increased utilization of marijuana in adults 65 and older across the states that have legalized its use. However, it is surprising the amount of increased use by baby boomers. Over an 8-year period, baby boomers use of marijuana has increased from 0.4% to 2.9%, this increase may be partly attributed to baby boomers having previously utilized marijuana when they were younger.<sup>9</sup>

## 1.7 | Age bias

There is an age-related bias, that substance abuse is a disorder more likely associated with younger or middle-aged adults.<sup>8</sup> Consequently, health care providers are often hesitant to inquire about the social habits of their patients. This, in turn, can lead to underdiagnosed and/or untreated disease.<sup>50</sup> Additionally, older adults are likely to hide or deny addictive behavior, seeking instead to treat their own ailments. Therefore, SUD among older adults has resulted in an increase in admissions to treatment facilities from 3.4% to 7.0% during a period of 12 years.<sup>23</sup> Unfortunately,

only 7% of SUD treatment facilities have reported having a program designed for seniors<sup>51</sup> further leading to the undertreatment of the disease. The Substance Abuse and Mental Health Services Administration (SAMHSA) predicts that treatment service requirements will double in the next decade.<sup>51</sup>

## 1.8 | Insurance

In the world of managed healthcare, patients may not always see the same provider. Insurance coverages may often limit how and with whom a patient is covered for care. This creates a situation where different electronic patient record systems may not communicate well among providers.<sup>52</sup> In addition, not all insurance programs offer the same level of coverage, tending to be more restrictive for less quality programs while being more comprehensive for private insurance plans.<sup>4</sup> This creates a situation where better insurance plans may result in better care which in turn results in better outcomes. This is known as Confounding by Indication.<sup>53</sup> Consequently, a question may be posed to providers: is managed care helping or hurting the patient?

Even the most seasoned healthcare provider may have problems understanding the complexities associated with polypharmacy. The dentist is required to know all the medications and supplements that are prescribed, self-prescribed, or illicitly taken by the patient. Clinically, the dentist should also know how each of the patient's diseases are being managed, especially if there may be potential complications during dental treatment. If needed, the dentist can communicate with other healthcare providers, in order to clarify any questions related to systemic health treatments. Currently, there are an ever-expanding number of resources available to assist in understanding these complex treatment scenarios. There are web-based databases that allow for medication entry and have cross-referenced interaction verification, which are free or require a minimal subscription. Websites such as LexiComp (online.lexi.com) have extensive information about drugs, dosages, contraindications, and complications for a minimal subscription fee. Other websites such as Drugs.com (drugs.com) and WebMD (webmd.com) are less extensive but offer a quick check for potential adverse reaction at no charge. Additionally, several electronic patient record (EPR) systems have built-in medication reference databases or additional software packages that will link to subscription services. The Federal bill known as the Health Information Technology for Economic and Clinical Health (HiTECH 2009) sets the funding and guidelines for states to establish prescription monitoring systems and develop Electronic Prescription protocols.<sup>54</sup> Then in

2010, the DEA established the Electronic Prescription for Controlled Substances (EPCS) certification to standardize management and security of prescribing electronically.<sup>55</sup> All pharmacies, in the 50 states and US territories, now are following these two Federal Laws. Patients are creatures of habit and, while they may need to see different providers based on their insurance coverage, they will almost always pick up their medications at a single convenient location. This makes the patients' pharmacist another significant resource for medication verification and reference for potential ADR. With permission from the patient, a call to the patient's pharmacist will allow you to get a complete list of all medications and dosages from all providers. The patient's pharmacist should become your first line of communication about your patients' medicinal requirements.

## 2 | CONCLUSION

The increasing number of comorbidities and their treatment by polypharmacy require changes to the healthcare management of older adult populations. Healthcare providers will need to delve further into their patients' medical records to fill in the details about their patients' treatments. Rather than simply asking for any changes to a medical history, specific pointed inquiries about medical conditions and treatment is an absolute necessity. The provider needs to overcome their inherent bias and hesitance to inquire about medical issues outside their range of care. Complete and comprehensive documentation is required for all healthcare providers. Furthermore, providers will be managing more patients and more medications and will require implementation of integrated EPR systems with informative databases. Interactive database inquiries will provide readily available information up to date with current medications and potential side effects. A more standardized EPR system will be required to allow seamless communication between providers. The groundwork has been laid for communication between diverse records systems. Healthcare institutes must make the investment when purchasing this newer technology. Research will be required to understand the aging population's reaction to an increasing polypharmacy. State and Federal regulations will have to address changes in medical options, such as the Federal classification of marijuana. The number of states allowing marijuana utilization requires that studies be made to determine potential interaction with other prescription medicinal products. And the health service industry and government sectors will need to have a fundamental shift in thinking how they will provide care for the increasing numbers of baby boomers.

## CONFLICT OF INTEREST STATEMENT

The author declares no conflicts of interest.

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