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Running Header: Persistent pain in the elderly: Improving practice with Newman's theory of health as expanding consciousness

Persistent pain in the elderly: Improving practice with Newman's theory of health as expanding consciousness

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Introduction

The elderly are more likely to suffer from chronic pain, but less likely to find relief (Gloth, 2000). There are many contributing factors behind the high prevalence of persistent pain in the elderly. About 80% of older adults have at least one chronic disease typically associated with pain (Gianni et al., 2010; Gloth, 2000; Gutierrez, 2008; Hadjistavropoulos et al., 2007; Zancocci et al., 2008). The management of pain in the elderly quickly becomes more complex when one considers the interactions between multiple chronic diseases and comorbid conditions, the effects of aging on the body, and how these affect the pharmacokinetics of pharmaceutical options. Polypharmacy is common, leading to increased risk of drug-drug interactions, drug-disease interactions, and adverse effects. Older adults commonly report vague symptoms, multiple sites of pain, or present atypically, further complicating this picture. The elderly are also more likely to suffer from the numerous consequences of untreated pain, such as: decreased mobility and functional status, contrasted by increased rates of depression, isolation, and dependence (Gloth, 2000). There are unique pathophysiologic, pharmacologic, and psychosocial factors associated with aging which lead to increased prevalence of persistent pain in the elderly; these factors also affect how persistent pain is assessed and managed in this complex and vulnerable population; each of which will be discussed in detail.

This paper will examine persistent pain in the elderly, along with the factors that influence the prevalence of pain and lead to more pronounced effects in this at-risk population. Issues complicating the assessment and management of persistent pain in this vulnerable population are also reviewed, providing the reader with a comprehensive background of the issue. A review of the current literature will reveal that despite existing guidelines for the assessment and management of persistent pain, the elderly remain at an increased risk for poorly

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managed pain. Turk and Burwinkle (2005) drew from their review, “that regardless of the treatments attempted, most people with chronic pain are not cured and will continue to experience considerable pain in the foreseeable future” (p. 603). Despite an increased base of knowledge, increased awareness, and formal professional guidelines and recommendations from which to base our practice, pain remains poorly managed in the elderly. One must ask: What is missing?

Margaret Newman’s theory of health as expanding consciousness (HEC) offers a unique solution and will be applied to the issue of persistent pain in the elderly. As nurse practitioners (NPs), we are often able to form close, long-lasting therapeutic relationships with patients in a primary care setting; as such, we are uniquely positioned to improve the management of persistent pain in the elderly. NPs have a duty to care for those in need, including those most vulnerable and to promote holistic, individualized care of the patient; this theory allows the NP to fulfill these responsibilities and improve practice. Newman’s theory of HEC will be examined in depth and then applied to persistent pain in the elderly, further explained using a case scenario, and concludes with suggestions for improving practice.

Background

In 1986 the World Health Organization (WHO) declared that the under-treatment of pain was a public health crisis (Teno, Kabumoto, Wetle, Roy & Mor, 2004), and they developed the analgesic ladder, now considered “a seminal contribution” (Brennan, Carr, & Cousins, 2007, p. 215). Groups such as the International Association for the Study of Pain (IASP), the American Academy of Pain Medicine (AAPM), the American Pain Society (APS), and the American Geriatrics Society (AGS) have worked collaboratively to form guidelines aimed at improving the assessment and management of pain; some of these guidelines are specific to elderly populations.

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These guidelines are not enforced through law, nor can they change incorrectly held beliefs or poor prescribing practices. However, these guidelines do provide a basis from which to base pain management practice, as well as the rationale for continued improvements, especially in the elderly. After recently completing the “decade of pain control and research”, the latest studies reveal that we have made some improvements in our assessment and documentation of pain (Brennan, Cousins, & Carr, 2007; Stanos, 2007). Unfortunately, this has not translated into better pain management or improved outcomes for elderly patients dealing with persistent pain (American Geriatrics Society [AGS], 2002; Stanos, 2007) and suboptimal compliance with geriatric prescribing recommendations remains (Zanocchi et al., 2008).

Baby-boomers

The life expectancy in the US just rose to an all time high of 78.7 years according to the most recent data from 2009 (<http://data.worldbank.org>). However, this extended lease on life comes with some challenges, not the least of which includes chronic disease and the pain that frequently follows. Lynn and Adamson (2003) adds, “Nearly all elderly Americans now encounter severe chronic illness and disability in the last phase of life” (p. 1). This issue will become even more pertinent as the baby-boomers continue to age; many are just now reaching retirement age. The current system is not yet ready to sustain care for this large cohort, especially when one considers the multitude of co-morbid conditions, the ever-rising health care costs, and the existing health care provider shortages which are only expected to worsen.

Baby-boomers have also rated their health less favorably than the generations preceding theirs, reporting more pain, more chronic disease, and decreased functional abilities (Stein, 2007). Some may argue that these trends are simply due to improved diagnosis and changes in how we define health. However, Stein (2007) paints a more dismal picture by reminding us that

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negative self-reported health can have a strong predictive value of death, regardless of age.

Mantyselka, Turunen, Ahonen, and Kumpusalo (2003) found poor self-rated health to be an “independent predictor of mortality” (p. 2435); this same correlation between persistent pain and poorly perceived health is found throughout much of the literature (Gianni et al., 2010; Gureje, Von Korff, Simon, Gater, 1998; Mantyselka et al., 2003; Strine, Hootman, Chapman, Okoro, & Balluz, 2005).

Although an older adult is typically considered *elderly* after the age of 65, the term is often reserved for those who are frail, in poor health, or otherwise sick or disabled; this is more common by age 75. After the age of 75, the rates of morbidity and mortality increase dramatically (AGS, 2002). The AGS (2002) adds, “This group represents the fastest growing segment of the total population. The greatest challenges in geriatric medicine are represented by the oldest, sickest, and most frail patients with multiple medical problems and few social supports” (p. S205). The baby-boomers will begin to hit age 85 in the year 2030, bringing the number of Americans over the age of 85 to about 9 million (Lynn & Adamson, 2003).

Pain

Pain-Defined

Pain originated as an adaptive, protective response designed to alert us to danger. The perception of potential tissue damage allows for a reaction; a mechanism designed to protect the body from further harm. Unfortunately, the pain can last long after actual or potential tissue damage occurs.

Pain is subjective and individual, making it difficult to define. We have moved beyond defining pain solely as a sensory experience; we know that there is much more than the physiologic perception to a stimulus (Stanos, 2007). We are also aware that pain intensity is not

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directly proportionate to the severity of injury (Stanos, 2007); one must take into account the entire experience.

A widely accepted definition of pain comes from the IASP (1994) describing pain as, “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (Part III: pain terms). The AGS (2002) expands on the IASP’s definition adding, “Pain is a complex phenomenon derived from sensory stimuli or neurologic injury and modified by individual memory, expectations, and emotions” (p. S205). They acknowledge that pain is typically related to either injury or a pathological process and that this phenomenon is unique to each individual (AGS, 2002).

Persistent Pain-Defined

The terms persistent pain and chronic pain are used interchangeably; both are found in the literature. The AGS (2002) defines persistent pain as, “a painful experience that continues for a prolonged period of time that may or may not be associated with a recognizable disease process. The Anesthesia Practice Guideline for Chronic Pain Management defines chronic pain as, “persistent or episodic pain of a duration or intensity that adversely affects the function or well-being of the patient” (Chodosh et al., 2004, p. 576). The authors suggest that this definition implies that improvements made in pain management might also improve function and quality of life (QoL); pain’s negative effects on QoL will be discussed further below.

The 2009 guidelines published by the APS and the AAPM, start by using the IASP’s 1986 definition, “pain that persists beyond normal tissue healing time, which is assumed to be three months” (p. 1). The guidelines go on to add that despite the various conditions underlying persistent pain, there are common goals of treatment; pain relief and improved functioning (APS

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& AAPM, 2009). Definitions of persistent pain are now more holistic, with a focus on maintaining or improving function and QoL via adequate management of persistent pain.

Additionally, the Department of Veterans Affairs and the Department of Defense (VA/DoD) published guidelines in 2003 for chronic pain management and point out that, “The perception of pain is influenced by physiological, psychological, and social factors. The human reaction to the sensory experience, suffering, takes an added dimension in patients who have chronic, non-cancer pain” (p. 16).

For the purposes of this paper, the terms persistent pain and chronic pain will be used interchangeably, simply because much of the research still uses both terms. However, preference should go to the AGS (2002) recommendation which favors the term persistent pain, which is received more favorably and has less negative connotations. This is especially true in the elderly population and one can hope that we will be aware of this change in our practice. Similarly, the elderly may deny pain but acknowledge discomfort or soreness; these examples can serve as a reminder to be sensitive and flexible with the terminology used in our practice.

Physiology & Pathophysiology of Pain

Pain Transmission

The pathways of pain are complex and not completely understood, however, the transmission of pain does follow a general course. It should be noted that each occurrence of pain is not the same as the last, just as it is perceived differently in each individual. In general, something noxious (stubbed toe, pricked finger, burned hand) stimulates pain receptors, which are free nerve endings called nociceptors. Nociceptors are found throughout the body, everywhere but the brain. Once stimulated, action potentials are sent along afferent nerve fibers to the dorsal horn of the spinal cord. These nociceptive (pain-transmitting) fibers synapse and

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interact with nociceptive (non-pain transmitting) neurons. The dorsal horn neurons are found specifically in the substantia gelatinosa, the area made famous by Melzack & Wall's (1965) gate control theory of pain (Helms & Barone, 2008; Stanos, 2007). This is important to note, since stimulation of large nociceptive fibers can stimulate these "non-pain transmitting" neurons, thus blocking pain impulses here at the "gate" in the dorsal horn. This is accomplished through stimulation (for example, the use of transcutaneous electrical nerve stimulation (TENS), which then dominates and essentially closes the gate, thus blocking transmission of pain (Helms & Barone, 2008; Uphold & Graham, 2003; Stanos, 2007).

Transmission continues on via the ascending spinal cord pathways or tracts generally referred to as the anterolateral system, the two major components of which include the spinothalamic tract (STT) and the spinoreticular tract (SRT). The signal continues up into the brainstem and further into the central areas of the brain (Fogel Keck & Baker, 2001; Helms & Barone, 2008; Uphold & Graham, 2003).

Pain perception begins in the thalamus, but axons from this point project out to other areas of the brain. The limbic system located in the forebrain adds emotional content to this perception, contributing to the emotional reaction to pain. The cerebral cortex further interprets pain and is responsible for sensory content. (Fogel Keck & Baker, 2001; Helms & Barone, 2008; Uphold & Graham, 2003).

Pain transmission can be further explained by examining the actual pathways, or fibers which carry the action potentials. Two basic divisions exist: A fibers and C fibers. The A fibers are the largest; their size allows for quick transmission of pain. "The large A delta fibers produce sharp well-defined pain, called "fast pain" or "first pain," typically stimulated by a cut, an electrical shock, or a physical blow" (Helms & Barone, 2008, p. 40). Transmission via these

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fibers is so fast that the body reflexively retracts the affected area before the person even perceives the pain (Helms & Barone, 2008). A-delta fiber activity usually activates the sympathetic nervous system, preparing us for the “fight or flight” response with increases in heart rate, blood pressure, and/or respiratory rate (Fogel-Keck & Baker, 2001). This response allows for protection from further damage.

C fibers work next after the “first pain”, thus known as “second pain”. Conduction of pain is transmitted slower because these are smaller fibers and do not have a myelin sheath (which would help speed the travel of impulses, if present). C fibers are responsible for transmitting “dull burning or aching sensations”, and can produce constant pain (Helms & Barone, 2008, p. 40) “associated with suffering” (Fogel-Keck & Baker, 2001, p. 466). In addition, “C-fiber activity engages various brain stem and cerebral regions that contribute to the emotional, cognitive, and situational components of pain” (p. 466). This is interesting to note, as the emotional and experiential components of pain, especially persistent pain, play an important role in its management; research continues to show how just how interrelated all of the factors are which contribute to this complex phenomenon of persistent pain.

Pain Transmission: Considerations in the Elderly. There is not much solid evidence regarding physiologic changes in the transmission of pain with aging; existing research is often inconsistent or contradictory. What is known about pain transmission in the elderly is summarized nicely in the work of Helms & Barone (2008) and is discussed here. Notably, the quick A-fiber transmission of pain slows with aging, which is seen clinically as a slower response time. Elderly patients are also more reliant on the slower, second pain transmitted via C fibers; this is seen clinically when pain is described more often as burning. The elderly are less likely to describe pain as sharp, as they rely less on the faster, first pain transmitted via A

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fibers (Helms & Barone, 2008). Slowed reflexes, altered reactions, or atypical symptoms may be present, adding complexity to the assessment and management of pain in older adults. However, there is no evidence that the intensity of pain diminishes with age (AGS, 2002; Fogel Keck & Baker, 2001; Gloth, 2000; Helms & Barone, 2008).

Pain Modulation

Viewed as a feedback mechanism, the pain transmission process described above would be included as part of the positive feedback loop in which the nociceptive stimulus activates pain transmission. This is balanced by the negative feedback loop, which is composed of the brain's modulatory system which uses the endogenous opiate system (i.e., opiate receptors, endorphins) to inhibit pain (Uphold & Graham, 2003). These endogenous opioids, or neuromodulators, are released by fibers in the dorsal horn, brain stem, and in the periphery (Helms & Barone, 2008). Their role is inhibitory, decreasing the activity of pain transmitting neurons. Examples of these opioid-like substances include β -Endorphins and dynorphins, both of which help to relieve pain (Helms & Barone, 2008).

Pain is also regulated peripherally; chemicals which modulate pain transmission are released locally when tissue damage occurs. These substances include: histamine, substance P, bradykinin, acetylcholine, leukotrienes, and prostaglandins (Helms & Barone, 2008). These chemicals irritate nerve endings, stimulating the pain receptors.

The neurotransmitters found in the brain-acetylcholine, dopamine, norepinephrine, and serotonin-also play an important role in pain transmission (Uphold & Graham, 2003). These chemical mediators modify the phenomenon of pain, helping to explain part of the unique, individual variability of the pain experience (Fogel Keck & Baker, 2001). While not discussed thoroughly in this paper, a growing body of evidence indicates that persistent pain and

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depression may share some of the same pathways outlined above, and the same neurotransmitters are involved in both. This may help begin to explain why antidepressants can often be part of an effective treatment plan for persistent pain (Gloth, 2000; Gloth, 2001; Helms & Barone, 2008).

Pathogenesis of Persistent Pain

The complexities of the nervous system are even less understood when it comes to persistent pain. What is known is that repeated stimulation of pain pathway fibers (persistent nociceptive input) subsequently stimulates release of the neurotransmitters and neuromodulatory chemicals discussed above. This results in overly sensitized neurons, which become hyperexcitable and will respond to lower levels of nociceptive stimuli (hyperalgesia) and even nonnociceptive stimuli (allodynia). This progressive build up of stimulation in the CNS leads to neuroplastic changes; this phenomenon is called windup (Helms & Barone, 2008; Kindler, Bennett & Jones, 2011).

Another way that persistent pain leads to changes in the CNS involves the expansion of areas receptive to painful stimuli. The prolonged excitation of certain neurons (wide dynamic range neurons, or WDR) may activate contiguous neurons, thus expanding the field of reactivity beyond the initial site of injury. This presents clinically as a broadened, hypersensitive pain response, so that a painful reaction can now be evoked from areas which were previously non-reactive in addition to the initial location. Recent research links many chronic painful disorders by these processes just described, revealing a similar “unifying pathologic process of dysregulated nociception, referred to as “central sensitization”” (Kindler, Bennett & Jones, 2011, p. 16).

Clinically, physical exam findings may not fit the expected norm in persistent pain patients; the typical physiologic responses to pain may not be appreciated. There may be no

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evidence of a “fight or flight” response as the sympathetic nervous system (SNS) adapts to the overstimulation of persistent pain. Autonomic nervous system (ANS) responses to pain such as diaphoresis, nausea or vomiting might also be blunted or decreased with persistent pain (Helms & Barone, 2008). This requires of the provider an objective understanding of chronic pain and openness to listening, as much of the information gathered will be subjective in nature. As noted above, the initial location of pain may be broadened, and new areas may respond to both painful and non-painful stimuli. A thorough understanding of these processes will help the provider to effectively assess and manage persistent pain in elderly patients.

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General

“Aging may be defined as a progressive, generalized impairment of function, resulting in the loss of adaptive response to stress and in a growing risk of age-related disease” (Hadjistavropoulos et al., 2007, p. S1). Aging comes with some consequences; even benign wear-and-tear changes add up for a cumulative effect later in life. Older adults are more likely to suffer from conditions such as degenerative disk disease, arthritis, or other bone, joint, and musculoskeletal disorders, as well as various chronic conditions (AGS, 2002). As Gutierrez (2008) notes, “With aging, there is a gradual decline in many body system functions; some systems are more affected than others” (p. 91). These changes may increase the risk of problems or increase the chance of a negative outcome. For example, physiologic changes such as decreased eyesight or balance may increase risk of falling. Changes such as decreased bone density increase the risk of subsequent problems from the fall (i.e., a broken hip). There are unique physiologic, pharmacologic, and psychosocial factors which make assessment and management of persistent pain more difficult in this vulnerable group.

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Physiologic factors

As discussed above, physiologic changes may increase risk of some disease states, or simply add to the cumulative effects of aging. It is common for an elderly patient to have at least one, if not multiple chronic diseases, many of which are typically associated with pain. This is seen clinically when elderly patients report multiple sources of pain. Some age-related changes might also complicate the assessment and management of pain; as rates of dementia, disability, impaired sensation or difficulty communicating increase (AGS, 2002); each of which may obscure the clinical picture. However, well-supported guidelines exist which guide the assessment and treatment of pain in these patients. In addition, there are many well validated, sensitive tools for pain assessment in the elderly, including those designed for patients who are non-verbal, suffer from various degrees of dementia, or are otherwise more difficult to assess. While it is outside of the scope of this paper to discuss these tools in detail, it is worth reinforcing their availability and effectiveness, as well as emphasizing our duty to assess and treat persistent pain in the elderly; especially those most vulnerable. In a review of pain research, Gloth (2000) noted that the main risk factor for inadequate pain management was being older than age 70. Similarly, Peng et al. (2009) noted, “Lower treatment rates have been observed among the most vulnerable subgroups of older adults, including the oldest and those with cognitive or communicative impairments” (p. S13).

Pharmacologic Factors

An increased incidence of chronic disease typically translates into increased rates of medication use. Older adults currently account for 13% of the U.S. population but they use about 35% of all prescribed medications and more than 33% of over-the-counter (OTC) medications; and “of all older adults, 90% take at least one drug daily” (Gutierrez, 2008, p. 91).

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These numbers will increase drastically as the baby-boomers age. Nearly one out of five (18%) older adults report taking analgesics regularly; 63% report prescription pain medication use for longer than 6 months (AGS, 2002, p. S205), increasing the risk of interactions and adverse effects. This is discussed in more detail below under polypharmacy, a growing concern in the elderly.

Physiologic factors which affect pharmacodynamics and pharmacokinetics have many implications for the pharmacologic treatment of persistent pain in the elderly, many of which can complicate treatment. This can also affect the number of choices available for treatment options. Certain medications become inappropriate choices for some elderly patients, such as NSAIDs in renal disease, or acetaminophen with hepatic dysfunction. Contrary to what many providers believe, opioid analgesics are often safer, have less adverse effects, and can be the more appropriate choice for many elderly patients for just such reasons (AGS, 2002; Corsinovi et al., 2009; Zancocchi et al., 2008).

It is worth noting that research to support the use of many of the pharmacotherapeutic options in the elderly population is extremely lacking, as the elderly have been primarily excluded from studies. This same lack of research applies to other elderly populations who have been historically unrepresented or underrepresented, including: women, non-Caucasian patients, and those with pre-existing or co-morbid diseases (AGS, 2002; Corsinovi et al., 2009; Paice, 2007). Unfortunately, it remains that those most vulnerable are often the least represented.

Pharmacokinetics & the Elderly. “A variety of physiologic changes increase the older adult’s sensitivity to drugs and drug-induced disease” (Gutierrez, 2008, p. 91). Absorption, distribution, metabolism, and elimination are all affected by aging; each is discussed in further detail below.

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Absorption. Physiologic changes affecting the absorption of drugs are typically the result of: changes in skin integrity, decreased subcutaneous fat, changes in muscle to fat ratios, decreased total body water, and gastrointestinal tract changes. Certain medications should be used with extra caution in the elderly due to these changes. One common example is transdermal fentanyl. The AGS recommends against its use in opioid-naïve patients; use has been associated with deaths in the elderly at doses as low as 50 µg/hr.

Distribution. Drug distribution is also affected by age-related changes. The blood flow to organs is generally decreased. As noted above, reductions in total body water and lean body mass, along with increases in body fat result in a modified fat to muscle ratio. Other changes in body composition, such as cachexia or muscle wasting further affect the distribution of a drug administered to elderly patients due to changes in protein status, the effects of which depend on the drug's affinity for plasma proteins (Gloth, 2000; Paice, 2007).

In addition, drugs which are water-soluble will have higher plasma concentrations early on, but a lower distribution volume. Drugs which are lipid-soluble tend to have larger distribution volumes (Gloth, 2000). This requires the provider to carefully consider the lipophilic nature of opioids and other analgesics, as well as adjuvant medications (Paice, 2007). These are all examples of the complex array of needs and considerations involved in choosing an appropriate therapeutic medication for an elderly patient with persistent pain. Recommendations for elderly-specific dosing and other pharmacologic considerations are widely available to guide the provider in prescribing for this vulnerable population

Metabolism. Many medications are broken down, or metabolized, by the liver. Through this biotransformative process, many medications have metabolites which may build up causing side effects or toxic effects which are typically more pronounced in the elderly. The incidence of

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hepatic dysfunction increases with age, as well as other states which affect drug metabolism such as dehydration and immobility; all lead to a decrease in the biotransformation of drugs (Gutierrez, 2008). Consequently, this prolongs the half-life of the drug, increasing the chance of accumulation and/or toxicity. Half-lives can also be variable, the effects of which are more pronounced in the older adult and are worse with certain medications. Morphine exemplifies both points, as it is known to cause problems in the elderly due to its extended and variable half-life and should be used with caution (Gutierrez, 2008; VA/DoD, 2003). Methadone is a similar example, and is usually not recommended for use in the elderly (Gloth, 2000).

Certain medications are also subject to significant first-pass effects, reducing the concentration of a drug before it reaches the systemic circulation. Morphine is the exemplar once again, with considerable first-pass effects. However, if this mechanism is not functioning as well, less of the drug is metabolized meaning more Morphine hits the bloodstream; the effects of which become even more exaggerated in the elderly (Gutierrez, 2008).

Elimination. The physiologic effects of aging also affect how drugs are excreted from the body. Many drugs are excreted renally, leading to a toxic build up if kidney function is not adequate. This must be carefully considered with each patient on an individual basis; renal dosing recommendations are available (Gloth, 2000).

As one ages, both the number of functional nephrons and the glomerular filtration rate (GFR) drastically decrease, by 64% and nearly 50% respectively. There is a similar decrease in blood flow to the kidneys. These changes lead to diminished “tubular secretory mechanisms and the ability to concentrate urine” (Gutierrez, 2008, p. 96).

Gloth (2000) adds that these changes leading to a decreased rate of clearance of medications, like altered creatinine clearance, may be not be easily detected due to normal serum

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creatinine levels. This is attributed to the associated loss of muscle mass (Gloth, 2000).

However, the estimated GFR is now commonly provided with laboratory results, which is a much more accurate value of renal function in the elderly.

As discussed above, the elderly frequently have comorbid conditions, many of which further impair renal functioning. Gutierrez (2008) states, “Declines in renal function may be exaggerated by comorbid illness such as chronic hypertension and anemia, which have close associations with chronic kidney disease” (p. 96). Furthermore, common culprits such as cardiovascular disease, diabetes, or even simple dehydration can increase the half-life of a drug “by as much as 40%” (p. 96). The amount of time the drug remains in the body is increased, with subsequent increases in the chance for harmful build-up and adverse effects, which are discussed below.

Polypharmacy. Polypharmacy becomes a common issue in elderly patients, also affecting the metabolism and/or clearance of medications. Elderly patients may be taking a combination of prescription, OTC, herbal medications, and dietary supplements; this may lead to alterations in the biotransformation or elimination of certain substances (Gutierrez, 2008). This is important to note, as many patients have experienced lack of coordinated care, bouncing between specialists and within multiple healthcare systems; this can increase the chances of duplicate prescriptions or medication interactions. Nearly half (45%) of patients who regularly take pain medications reported seeing three or more providers for pain within the past five years; most (79%) were primary care providers (AGS, 2002). So in addition to the increased risk of interactions or adverse outcomes, the provider may also encounter confusion, frustration, lack of adherence, and more frequent or longer hospitalizations (Gutierrez, 2008).

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Adverse Effects. Many of the age-related changes discussed above increase the chance of adverse effects (AE), which may be more pronounced in the elderly. Gutierrez (2008) notes that the overall tissue responsiveness is reduced, and “drug receptor response can be altered because the functional capacity of organs and thus the total number or receptors decline with age, causing any adverse effects to be felt more keenly” (p. 96). The elderly are also more likely to experience AEs from medications used to manage pain, including opiates, other analgesics, and adjuvant medications; AEs may require additional medications for the prevention or treatment of the initial undesirable effects (for example, bowel meds to prevent constipation). The risk increases with the number of medications. Gloth (2000) provides an example of an elderly patient taking six medications; this patient is fourteen times more likely to experience AEs than a younger patient on the same regimen.

Adverse Effects, the Elderly, and Opioids. The review of evidence by the APS/AAPM group (2009) found that opioids were associated with more AEs than a placebo; there were also more withdrawals due to these effects. Their review found patients reported AEs between 50% and 80% of the time; those most often associated with opioids were, “nausea, constipation, somnolence, dizziness, vomiting, and pruritus” (p. 42). In contrast to these findings, the research by Corsinovi et al. (2009) found that the control group, who received non-opioid analgesics, experienced more AEs and had more withdrawals from the study due to these AEs compared with the two study groups who received opioids. Furthermore, the control group (without opioid treatment) had increased rates of depression, decreased functional status, and decreased independence with ADLs.

While AEs may be common, many are short-term and temporary; others can be prevented, such as constipation. Fear of side effects, by both patients and prescribers, is a major

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factor in the inadequate management of pain in the elderly (AGS, 2002; Corsinovi et al., 2009; Gianni et al., 2010). AEs can be minimized or avoided by starting with lower doses, carefully titrating doses upwards, and with routine management of known effects such as constipation (Corsinovi et al., 2009). Clinically, we can use these effects to our advantage: If the elderly are more sensitive to opioids, we could expect that a smaller dose will effectively treat pain for a longer period of time (Corsinovi et al., 2009). This is a generalized statement of course, but the idea is important—we can use some of these age-related changes to our advantage, in hopes of improving the management of pain for elderly patients.

Specific AEs Related to Opioid Use in the Elderly. Some AEs are of more serious concern in the elderly than others, including: delirium, cognitive impairment, and falls or increased fracture risk. However, much of the literature is contradictory on these important subjects. For example, both patients and providers fear sedation, confusion, or acute delirium as AEs of opioids, however, delirium can just as easily be caused by uncontrolled pain. Falls have been linked to either under-or-overmedication for pain; these are discussed further below.

The role that opioids play in the adverse effects of both cognitive impairment and fall risk is somewhat debated. Medications which act as CNS depressants, including opioids, can produce paradoxical effects in the elderly, producing confusion, restlessness, or disorientation (Gutierrez, 2008). These same medications may result in falls, increasing the risk of fractures due to these effects; dizziness, vertigo, and weakness are also effects of concern (Gutierrez, 2008). Both Corsinovi et al., (2009) and Peng et al., (2009) found no evidence of cognitive impairment in patients treated with opioids. The guidelines by the VA/DoD (2003) offer conflicting results, finding that older patients on opioid therapy have increased incidence of cognitive impairment and sedation; they did not find evidence that this increases the risk for

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falls. However, they did find evidence associating hip fractures with opioid use (VA/DoD, 2003).

The AAPM/APS (2009) evidence review found a 40% increased risk of fractures associated with opioids; however, they were only able to find one review from observational studies; they rated the level of evidence as low due to probable residual confounding (p. 51). They also found similar rates of increased risks with other centrally active drugs, such as benzodiazepines; increased doses were associated with higher risk of fracture. Their review discussed the importance of carefully control for and consideration of important confounders such as functional status, cognitive impairment, and bone density scores; this becomes even more important in the elderly where complex medical issues are extremely common and the consequences more pronounced.

Lastly, some research finds that cognitive function can actually improve with narcotics (Corsinovi et al., 2009; Zanolchi et al., 2008). Most recommend short-acting agents to prevent accumulation of metabolites (VA/DOD, 2003); however, Zanolchi et al., (2008) suggest that long-acting narcotics can be a safe and effective choice in the elderly. Oftentimes, opioids are more appropriate choices and are better tolerated than non-opioid analgesics, which are frequently used inappropriately in this age group (Corsinovi, et al., 2009; Gianni et al., 2010).

In general, conflicting evidence reminds us to proceed with caution in patients who are more vulnerable. At the same time, it may help to debunk and demystify many of the incorrectly held beliefs and fears for both patients and providers which have contributed to the inadequate management of pain in the elderly.

Psychosocial factors. The AGS (2002) writes, “Psychosocial factors affect and are affected by pain in older patients” (p. S205). Psychosocial factors can play a role in how pain is

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expressed, how it is managed and how effective the treatments are perceived to be. These factors also play a large role in how pain fits into the rest of the patient's life (functioning, independence, QoL); these in turn affect pain, creating a cycle. These issues are discussed in more detail below.

Pain assessment can be affected by psychosocial factors. The elderly patient may be reluctant to share their concerns, they may not want to distract or bother the provider, may fear addiction, dependence, or the side effects of analgesics, may have misinformation about their condition or available treatments, or may not think that anything could help their pain.

The elderly may also ascribe different meanings to their pain, which can have many implications. They may be reluctant to discuss pain out of fear that it means a bad diagnosis or worsening prognosis, they may fear further weakness or decline, they may fear being a burden, or they may deny their pain because it is seen as a sign of getting old. They may also believe that pain is a normal part of aging, and as such, should be endured (Fogel Keck and Baker, 2001). Still others may feel that pain is atonement for past sins, again this is seen as something to be endured (AGS, 2002; Fogel Keck & Baker, 2001). Many of the psychosocial factors are related closely to quality of life, discussed below.

The Costs of Persistent Pain

General

Persistent pain is not only common, it is also very costly. Joint pain (arthritis) and low back pain (LBP) are two of the most commonly reported sites of pain in the elderly (APS/AAPM, 2009; Chou et al., 2009). "For back pain alone, total health care expenditures in 2004 and 2005 were estimated at \$85 to \$100 billion" (Chou et al., 2009, p. 114). Interventional treatments add over \$13 billion; incremental costs add billions more. Individually, medical

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treatment for chronic low back pain costs tens of thousands of dollars per year (APS/AAPM, 2009, p. 1-2; Chou et al., 2009). Annual health care costs for pain-treatment facilities averaged \$35,651 per patient, up to \$100,000 per year (Turk and Burwinkle, 2005, p. 602).

In addition to direct medical costs, indirect costs for chronic pain are also substantial including: treatment side effects, missed days of work, activity limitations, lost productivity, functional impairments, resultant disability and disability compensation (APS/AAPM, 2009, p. 1-2; Chou et al., 2009; Gureje et al., 1998; Lee & Mercurio-Riley, 2009, p. 40 Mantyselka et al., 2003; Strine et al., 2005). Although many elderly patients have retired, some do continue to work or must work for financial reasons; persistent pain affects this aspect of life too. People with persistent pain are “more than twice as likely to have difficulty working” (Strine et al., 2005, p. 2042); pain costs U.S. companies an estimated \$61.2 billion annually, most of this is due to impaired performance on the job (Strine et al., 2005, p. 2042). Unfortunately, while persistent pain increases the chances of difficulty in one’s career, working has been found to be inversely related to poor health; in other words, continuing to work seems to be a protective factor (Mantyselka et al., 2003).

Other Costs. Pain is one of the most common reasons that people seek health care, accounting for roughly 20% of all medical visits (APS/AAPM, 2009, p. 2; Strine et al., 2005). The work of Mantyselka et al., (2003) which was conducted in Finland, found 40% of primary care visits were related to pain. Persistent pain likely leads to increased health care utilization and associated costs for society (Gianni et al., 2010; Peng et al., 2009). Additionally, the use of both pharmacologic and non-pharmacologic treatments for persistent pain have increased, despite inconsistent results and increased costs (Stanos, 2007; Zanicchi et al., 2008). Furthermore, some research suggests that patients with chronic pain may respond more slowly to

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rehabilitation therapy and require more medically complex care (Zanocchi et al., 2008). As the population ages, the rates and costs of persistent pain can be expected to continue rising.

Consequences of Persistent Pain. There are many costs associated with persistent pain which are non-monetary in nature. Persistent pain “is a leading cause of disability and can have deleterious effects on ability to work, functional status and other quality of life domains” (Chou et al., 2009, p. 114). Some common consequences of persistent pain are discussed below.

Effects on Mental Health. Persistent pain is also associated with increased rates of depression and anxiety (APS/AAPM, 2009; Gianni et al., 2010; Gureje et al., 1998; Lee & Mercurio-Riley, 2009; Mantyselka et al., 2003; Peng et al., 2009; Strine et al., 2005; Teno et al., 2004; Zanocchi et al., 2008). Specifically, “people who live with persistent pain are 4 times more likely than those without pain to suffer from depression or anxiety (Strine et al., 2005, p. 2042). Some research found these increased rates of depression despite independent functioning or cognitive status (Peng et al., 2009), suggesting an independent association between persistent pain and mental health. Supporting this association is research showing that treatment of persistent pain can help to relieve depression; Corsinovi et al. (2009) found that elderly patients treated with opioids had significant improvements in their depression scores.

Effects on Socialization and Relationships. Closely related to depression and anxiety, the effects of persistent pain on one’s social life and interactions with others can have an immense impact, especially in elderly patients. Persistent pain can negatively affect interpersonal relationships (Lee & Mercurio-Riley, 2009); and lead to social isolation (Zanocchi et al., 2008).

Self-Rated Health. Much of the literature supports a link between persistent pain and poorly self-rated health (SRH) (Gianni et al., 2010; Gureje et al., 1998; Mantyselka et al., 2003;

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Strine et al., 2005; Zanochi et al., 2008). Mantyselka et al. (2003) concluded that chronic pain was found to be independently related to poor SRH. This is important because SRH has been linked as an “independent predictor of mortality” (p. 2435); which was briefly noted during the baby-boomer discussion. The study found that the prevalence of poorly rated health in those suffering from daily persistent pain was eight times higher than those without persistent pain; this association increased with pain frequency (Mantyselka et al., 2003). These findings were supported by the work of Zanochi et al., (2008), who concluded that both the presence and intensity of pain were related to poor SRH. Poorly rated health also increases with age, which is of particular importance in the elderly population, as “daily pain is related to poor health”; likewise, poor health relates to poor recovery from chronic pain (Mantyselka et al., 2003, p. 2435). This can lead to a vicious cycle of increasing pain and decreasing health; the research suggests this leads to increased rates of morbidity and mortality rates.

Functional Status. Persistent pain is associated with decreased: activity, mobility, and functional status, as well as the decreased ability to independently complete activities of daily living (ADLs); these lead to increased levels of physical impairment, increased disability, increased dependence, and overall declines in physical and psychological well-being (Corsinovi et al., 2009; Gianni et al., 2010; Gureje, et al., 1998; Lee & Mercurio-Riley, 2009; Mantyselka et al., 2003; Peng et al. 2009; Stanos, 2007; Strine et al., 2005; Teno et al., 2004). Unfortunately, these are all associated with resultant increases in pain. It was also noted in the literature that these consequences are closely related to pain intensity; higher pain ratings often lead to greater limitations (Takai, Yamamoto-Mitani, Okamoto, Koyama, & Honda, 2010).

Other Consequences. There are countless other consequences of persistent pain. The last ones discussed here are worth noting in the elderly population. Persistent pain often leads to

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sleep disturbances (Gianni et al., 2010; Peng et al., 2009; Strine et al., 2005; Zancocchi et al., 2008); this is felt more keenly by elderly patients who often find it difficult to sleep through the night even without pain. The effects of sleep deprivation are well known, and affect all other areas of life. Persistent pain can also lead to malnutrition (Zancocchi et al., 2008) or weight loss (Teno et al., 2004); again, these effects are more pronounced in the elderly who have far less reserve—a low BMI is often an indicator of poor health and linked with increased morbidity and mortality. Lastly, persistent pain is also linked with falls (Zancocchi et al., 2008); as discussed earlier. In summary, persistent pain can affect our relationships, our basic functioning and ability to carry out tasks; our basic quality of life.

Quality of Life

“Pain is widely accepted as one of the most important determinants of quality of life because of its widespread adverse effects, including diminishing mental health and well-being and impairing the individual’s ability to perform daily activities” (Strine et al., 2005, p. 2042). Pain’s negative effects on quality of life (QoL) is well documented (Corsinovi et al., 2009; Gianni et al., 2010; Strine et al., 2005; Zancocchi et al., 2008)

Strine et al. (2005) looked specifically at how pain can affect health-related quality of life (HRQoL) and found that pain was associated with numerous ill-effects, thus decreasing HRQoL; there also seemed to be a dose-dependent relationship. This relationship “was noted between increased number of days of pain-related activity difficulty (PRAD) and increased prevalence of impaired HRQoL, disability indices, and health-risk behaviors” (Strine et al., 2005, p. 2042). The work of Zancocchi et al. (2008) lends support to these findings in an elderly population; showing that the many negative effects of persistent pain seriously compromise QoL. Their

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study urges us to work towards improving pain management in this high-risk group, in order to improve elderly patients' QoL (Zanocchi et al., 2008).

Prevalence

The prevalence rates of persistent pain appear to vary widely throughout the literature. The variance can be partially explained by differences in research design, study methods, definitions used, and in the populations studied. One large comprehensive review found that rates of persistent pain varied between 2% and 40% (APS & AAPM, 2009, p.1; Mantyselka et al., 2003). This estimate fits well with the worldwide prevalence of pain in the general population, estimated to be between 5% and 33% (Lee & Mercurio Riley, 2009; Turk & Burwinkle, 2005). Most of the literature specific to the elderly population found rates of persistent pain between 25% and greater than 50% in community-dwelling older people; rates rose to between 45% and greater than 80% in nursing home residents (AGS, 2002; Corsinovi et al., 2009; Gianni et al., 2010). Regardless of variance, the prevalence of persistent pain remains high, especially in the elderly. Unfortunately for the older adult population, the prevalence continues to rise as age increases (AGS, 2002; Hadjisovopoulos et al., 2007; Mantyselka et al., 2003).

Margaret Newman's Theory of Health as Expanding Consciousness

Introduction

Margaret Newman's theory of health as expanding consciousness (HEC) was developed during the 1970s and formally introduced to the nursing field during a speech in 1978. While Newman helped care for her mother with ALS, she began to see new relationships between time, movement, and space. Newman realized that her mother was able to experience growth despite being incapacitated; she could experience health despite disease. These ideas later informed the development of her theory after her mother's death prompted the start of her nursing education.

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She was later drawn to the work of Martha Rogers, with whom she completed her doctoral studies. Rogers' nursing theory, the science of unitary human beings, proposed that nursing view persons as whole, indivisible beings; this became the premise of Newman's theory (Newman, 1994).

Newman (1999, 2003) asserts that boundaries such as good and bad, sick and healthy limit our work; she argues that instead, these are inseparable parts of one whole, unitary self. Alternatively, nursing should view each of these as a point along a continuum. Influenced by Bentov, who viewed consciousness along a continuum, Newman contends that as human beings our life is the process of expanding on consciousness, moving along this continuum (Newman, 1994).

David Bohm's work also helped to shape Newman's ideas regarding consciousness, specifically in relation to patterns. Bohm (1980) believed there is an unseen, underlying pattern to the entire universe which he refers to as the *implicate order*. The unseen becomes known as it manifests itself in what is observable, or the *explicate order*, expressing this unseen pattern. Newman applies this to nursing by viewing whatever manifests itself in a patient's life, whether it is illness, disease, or pain, as an external manifestation of what we cannot see; the underlying, unique patterns of each individual comprising their whole being (Newman, 1994). Simply put, the underlying patterns of each person can be expressed in various ways, including disease, as such, what manifests can reveal what is meaningful to that person and how they relate to their world (Neill, 2005; Newman, 1995). Pattern is an important concept in Newman's work, which she defines as, "a characteristic of wholeness. It reveals the meaning of life. Pattern is a *dynamic relatedness* with one's environment, both human and nonhuman" (Newman, 1999, p. 228). She adds that as one begins to view illness or pain as reflecting a person's life pattern,

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what is needed then is “recognition of that pattern and acceptance of it for what it meant to that person” (Newman, 1994, p. xxiii).

Ilya Prigogine’s theory of dissipative structures also contributed to ideas in Newman’s theory. Prigogine’s work theorized that a system fluctuates in an orderly manner, similar to the natural ebb and flow of nature. The system operates in this manner until a disruption occurs, bringing about chaos; for example the turmoil which often follows a new diagnosis. The patient struggles in this disorganized, chaotic state until they reach a new understanding, leading to a new stage. Once the system (patient) reaches this new stage, operations resume but at a higher level of organization than before the disruption occurred (Newman, 1994).

This point in Prigogine’s theory in which the system (patient) enters a new stage can also be conceptualized using Arthur Young’s theory of the evolution of consciousness. Young illustrates movement along the shape of a “V”. The tip of this “V” is called the “choice point”, corresponding closely with Prigogine’s work. The choice point represents a major fluctuation, a point of chaos and disruption in which one realizes that the old ways of doing things no longer work; realizes that change is necessary to move them beyond this point. In both Prigogine’s and Young’s work, this point of disorganized chaos provides an opportunity for change and the impetus for growth. Margaret Newman utilizes these concepts in her theory. As one reflects during these times of chaos, patterns can be realized, new meanings found. Reflection can lead the way to growth, new understanding, and towards expanding consciousness (Newman, 1994).

Role of Nursing/Nurse Practitioner

Margaret Newman envisions nursing’s role by stating, “The responsibility of the nurse is not to make people well, or to prevent their getting sick, but to assist people to recognize the power that is within them to move to higher levels of consciousness” (Newman, 1994, p. xv).

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The nurse typically enters into a caring relationship with a patient during times of chaos and disorder; during times of pattern disruption. As the nurse practitioner (NP) begins a mutual relationship with the patient to examine these patterns and search for what is meaningful to them, the patient becomes open to transformation, transcendence, and expanding consciousness. Newman (1999) states that it is our responsibility to stay in partnership with patients during this time of disruption.

HEC: The Process

The process focuses on the mutual relationship between patient and nurse/NP. A spirit of caring and inquiry guide the dialogue as this relationship progresses; conversations are led by the patient and focus on meaningful people and events in the patient's life (Newman, 1994). In a research setting, the process typically involves two or three interviews. Rosa (2006) explains that prior to each interview, the researcher "prepared for the experience by centering, intending to come to know the participant and to be open to the experience which enhanced the ability to be present in the moment with each participant" (p. 351). This same intentional centering, with a focus on being truly present, can be applicable in any setting.

An interview might begin with a question like, "Tell me about the most important people and events in your life" (p. 351). The research process uses "active listening, clarifying, reflecting, self-disclosure, and intuitive hunches" which help guide questions, with a focus on understanding meaning and patterns. In other settings, the use of open-ended questions which reflect the NP's desire to know and connect with each patient can elicit the same types of responses and information. As Dexheimer-Pharris (n.d.) points out, the question itself is far less important than the conveyance of genuine concern for the patient and the intent to be open to their needs (www.healthasexpandingconsciousness.com). The relationship is built on respect

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and is without judgment, becoming a safe place for the patients to share, gain insight, and acknowledge their needs and desires; it is also where the next steps for change and growth may reveal themselves (Rosa, 2006).

Rosa's 2006 study also asked the participants to draw a self-expression; others have used photography, dance, and other aesthetic realms. After each interview, the researcher reviews and reflects on the transcript, audiotape, and in Rosa's case the subject's drawing, highlighting important people and events. The data is then organized chronologically, formed into a narrative or drawn out in a diagram; an example is provided below with the case scenario. This process works to reveal the patterns unique to each person and their story.

Subsequent interviews might involve a review of the drawing or other aesthetic materials, with time allowed for additional reflections or clarification of meanings. Patients may validate, revise, or add to what is presented; nothing is forced or drawn out. When there is nothing new to share, the narrative and life diagrams (or other visual representations) are shared but without interpretation, giving the participant time to reflect (Rosa, 2006). This step is paramount, as it allows the participant to become aware. As Newman (1994) states, "the purpose of the presentations of the evolving pattern of each of the participants' lives is to help them to gain insight into their pattern and reveal the action potential of the pattern" (p. 91). She adds that this allows the patient to identify their patterns and recognize the old ways which are no longer working; this frees a person from being stuck in this point of chaos, allowing them to transcend and grow (Newman, 1994).

During times of chaos and disorganization, people fluctuate unpredictably; this is where the nurse/NP offers time, support, being with, listening to. This is where the NP must resist the urge to fix or "do for", as this may close the door that the patient's manifesting patterns are

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trying so hard to open. By fixing or ignoring, we stifle this process just as the patient may be realizing the rules no longer apply and they need to make a change. We must partner with them during this period of chaos and disorganization, even if it doesn't feel like we are "doing" anything. This allows the patient to see what isn't working, see what needs to change, and see the action potential of the situation-this will guide the next steps in the process. The patient chooses order from chaos and disorganization; they decide that their old ways are preventing them from moving on, from healing, from transforming.

Common Themes Throughout the Process of HEC

In much of the research using Newman's theory of HEC, some similar patterns began to emerge. A common theme seemed to revolve around pushing oneself at all costs, even in the midst of crisis and suffering, patients forged ahead, attending to other's needs before their own; never taking the time to acknowledge their own needs or limitations. This selflessness and self-sacrifice was often viewed as strength or perseverance; patients typically recalled difficult childhoods, trouble with close relationships, and often viewed themselves as fighters or survivors. They've placed a high value on their ability to keep going despite adversity, to return to "life as usual" despite their struggles. Unfortunately, this appears to stifle growth and prolong healing.

For many participants with various conditions, life continues on like this until some sort of experience brings their life to a halt. This is usually brought about by a serious illness or injury, which challenges those behaviors the patient was unable to confront on their own. Some are able to reflect back and acknowledge an awareness that things needed to change, but were unable or unwilling to do so. For many, there seems to be general lack of self-awareness; the serious health event seems to challenge their selfless and sometimes stubborn ways, forcing them

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to slow down. This provides them with time for reflection, or for recognizing their limitations, for example, simply acknowledging that they cannot do everything for everyone and never take time for themselves.

Patients usually arrive at this point after becoming acutely aware of the restrictions that their illness has placed on their lives; the illness or injury seems to affect more aspects of life, becoming ever more pervasive. People become less active and more restricted; they become less independent and begin losing pleasure in activities and in life itself; they may become hopeless, depressed, or lose faith. At some point these experiences become overwhelming; even for the strongest of people, these circumstances become impossible to ignore and it becomes unfeasible to forge ahead as usual. They realize that they have been suffering and can acknowledge that life has changed, and that the old ways are no longer working; this allows for insight, opening the door for actions which lead to change and transformation (Awa, M. & Yamashita, M., 2008; Lamendola & Newman, 1994; Neill, 2005; Newman, 1994, 1995; Newman & Moch, 1991; Rosa, 2006).

Participants in Rosa's (2006) study who did not recognize "the meaning of their problem continued to forge ahead" as usual. Any attempts at new behaviors were without meaning, and thus "were easily extinguished" (p. 353). Of those who did reflect on the meaning of their problem, many saw that the very things they valued were part of the problem, for example: "keeping up an active pace, stubbornness, self-sacrifice, independence, and self-sufficiency" (p. 354). Furthermore, the participants were able to identify associated behaviors, such as self-neglect, stubbornness, or failure to follow recommendations for treatment as interfering with their health and healing process. Many patients reflected on the humanness of their condition, for example, recognizing that they do have needs, wants, desires, and deserve time for rest and

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peace; realizing they needed to slow down or that they needed to ask for and receive help from others.

With new insight comes fresh energy, used to make necessary adjustments and move towards change (Rosa, 2006). Those able to acknowledge the problem and then integrate this information into their lives were the ones who seemed able to change the harmful behaviors, opening the door for change. Those patients were able to actively seek support from others, which changed their views about relationships and allowed for growth and healing. Recognizing the events and relationships which led to suffering and determining the meaning helps one to appreciate their underlying patterns (Rosa, 2006). Rosa's work is an excellent example of expanding consciousness. Patients were stuck in a point of chaos and suffering, they had an opportunity to reflect on their past and present and search for meaning. Patterns were revealed, and insights gained. Those who were able to recognize behaviors that were preventing them from healing were able to make meaningful changes and grow; this allowed them to move beyond this problem, the process allowed them to grow, heal, and transcend, as such, they experienced HEC.

Health as Expanding Consciousness Applied to Persistent Pain

As the NP enters into a mutual relationship with a patient in a disrupted state of being, the provider using HEC knows that it is during these times of chaos and disorganization that opportunities for growth and transformation occur. The provider trusts in the process, trusts that patterns will emerge and evolve and that people will transcend. This is a chance to gain insight and understanding; not only for the patient but also the provider. HEC is a dynamic, mutual process which builds upon itself, exchanging energy and information with the supporting environment, and spilling over into the greater whole, the universe.

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Applied to persistent pain, one can imagine that patients are stuck at this “choice point”, or in a disrupted, chaotic state of being. When patients are in this position, they are faced with something new, threatening, or painful. They become aware that something isn’t right, that the old ways of doing things no longer work; this realization can be threatening (Wade, 1998). Patients are faced with a challenge; if they take the opportunity to reflect and grow, they can experience expanding consciousness.

Case Scenario

While Newman’s theory of HEC has been successfully applied in various ways with diverse populations across the globe, the literature did not reveal any studies specific to the application of her theory to persistent pain in the elderly. For illustrative purposes with this complex theory, a case scenario is provided below.

Mrs. X’s Osteoarthritis. An ill-appearing 75 year old woman presented to the NP for “a full physical”. She was accompanied by her son and she stated, “He made me come here”. She had not been to a provider in years “because they don’t do anything for you anyways”. She has a history of painful OA in both knees, “a bad hip”, and she later reveals a history of RA which had been treated by rheumatology in the past. At that time, she was seeing several different providers, on “many, many medications” and no-one seemed to be able to help her with her pain. Her son mentions that a pain consult was suggested at that last appointment, but she never made it, as her husband was diagnosed with cancer shortly thereafter. She became the primary caretaker despite her ill health and became so busy caring for him, she stopped caring for herself completely. She stopped seeing her regular providers and consequently stopped all of her medications. Her husband died almost one year ago; she has not yet resumed caring for herself.

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She initially states that she has been doing fine since her husband's death, but later admits to some difficulty completing ADLs and "getting around like I used to". Her son interjects at this point, stating that while the rheumatologist's plan may not have relieved her symptoms completely, she had been much more active and mobile before. The son recently moved to be closer to her; he was not aware that "things got so bad". He states that she barely gets around in her home, is not cooking for herself, has let go of cleaning, and has lost a considerable amount of weight. He also reports that she lies in bed most days lately, appearing "half alive"—she seems to be in extreme pain. While the patient hears this, she begins to nod in agreement and admits that it has been difficult since her husband became ill. She does suffer from daily persistent pain, "all day and all night". She states that she would rather not be here, and wishes to hasten death so that she can finally be pain free and be reunited with her husband.

One could easily assume that Mrs. X is depressed, that she is still grieving, perhaps even suicidal. A provider could easily suggest antidepressants and send her home with a consult to psychology. Or the provider might focus on treating her pain, hoping that this would also improve depression and refer her back to rheumatology. A home safety evaluation, PT/OT evaluations, or assisted living could all be suggested. One could inquire about her sleeping habits or her eating patterns. Stress management, grief counseling, or relaxation techniques could be recommended, knowing that stress often exacerbates autoimmune conditions. These are all good ideas, none of them are necessarily incorrect, and they appear to be part of a holistic approach, and yet this approach is fragmented, these are just pieces of a puzzle. This disjointed approach stems from the scientific and medical models: She has distinct disease processes, all of which can be managed with medications, consults, tests, evaluations. This is what we are taught, after all. Science teaches us that in order to understand, we take apart, we compartmentalize.

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We also learn about homeostasis; returning the system to a point of equilibrium. At the heart of it, we want to fix her up and make her whole again. We think, this woman is sick; we ought to fix her. These are all predicated on the idea that health and disease are separate entities; that wellness and illness are complete opposites. Newman asks us to think differently.

Applying Newman's work, one can see that Mrs. X is stuck. She was struggling in this chaotic, disorganized state prior to her husband's illness; she may have even had an awareness that change was needed, she may have realized that her old ways were no longer working and that her life had become painful and that she was suffering. Unfortunately, any of this information was pushed back by her husband's illness and subsequent death. The patterns of her life, her interactions within her world may have revealed something to Mrs. X, but any impending insights were placed on hold by further disruption. So as the NP meets Mrs. X., she remains in this state of chaos and disorganization. Her life has become more and more unpredictable; she is uncertain and scared.

Mrs. X. and the NP. The NP knows that the goal is not to fix Mrs. X. Instead, the NP would start the process by being truly present, ensuring a spirit of openness, caring and trust. In this trusting relationship, a dialogue would begin, focusing on events or people that have been meaningful to Mrs. X. Diagrams depicting the discussions between Mrs. X and the NP would be shared with Mrs. X, without any interpretation. The NP would allow Mrs. X. time to consider her thoughts and feelings. Mrs. X. could make changes or additions, or simply agree that they are correct representations. Mrs. X may have had an opportunity to share her story in an artistic, aesthetic form as well. Below are examples of a narrative diagram and a life diagram for Mrs. X., both are adapted from Rosa (2006) and Newman's theory of HEC.

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Childhood	Young Adulthood	Adulthood	Mature Years	Present
<p>Oldest child; caring mother who worked hard around home & with 6 siblings; strict, controlling father w/ ETOH abuse. Close to several siblings; took on a much of the caretaking duties to help mom</p> <p>Sundays involved dressing up, church, big Sunday dinners with extended family</p> <p>Recalls soreness in joints even before adolescence, but "no time for being sick or complaining"</p> <p>Relationship Code:</p> <p>Participant ☆ Neutral — Unidirectional → Bidirectional ↔ Blocked ⊗</p>	<p>Married at 18 and was moved away from family; 1st husband a hard worker</p> <p>Husband began drinking heavily after they began a family; she missed siblings</p> <p>She helped keep the books for his business in addition to keeping up the home & raising her 3 children</p> <p>Always a hard worker, never time to rest or take a break if sore; husband accused her of being lazy if she tried to rest</p> <p>Few close friends from church, neighborhood but never revealed too much about her "real life"</p>	<p>After children were through with school, divorced 1st husband</p> <p>Re-married 2nd husband</p> <p>Began volunteering; stayed active at church; began working outside the home (after divorce); enjoyed work but health became much worse, forcing her to quit</p> <p>Tried to stay busy with volunteering and church but even these became difficult</p>	<p>Has 6 grandchildren from her 3 children; 4 more grandchildren on her 2nd husband's side</p> <p>Enjoys being a grandmother</p> <p>Tried to continue big family dinners on Sundays-difficult to keep up with the work involved though</p> <p>Health seems worse and worse</p> <p>Caretaker for 2nd husband before his death</p>	<p>Continues to suffer from persistent pain; but "never really addressed it"</p> <p>Loss of husband < 1 yr ago; still in grief process</p> <p>Hasn't had Sunday dinners since before husband fell ill</p> <p>Has "let go" of house, food preparation; too exhausted & too much pain to get out of bed</p> <p>Wishes to hasten death</p> <p>Son moved closer; 2 other sons not far</p> <p>No contact with friends, siblings; "I'm kind of a hermit"</p>
<p>Mother ☆ Father ⊗ Friends → Siblings ⊗</p>	<p>Children ☆ Husband ⊗ Friends → Siblings ⊗</p>	<p>Children ☆ 1st husband ⊗ 2nd husband ⊗ Friends →</p>	<p>Children ☆ Grandkids ☆ Friends → 2nd husband ⊗</p>	<p>Children ☆ Grandkids ☆ Friends ⊗</p>

Figure 1. Mrs. X's Narrative Diagram. Adapted from Rosa, 2006.

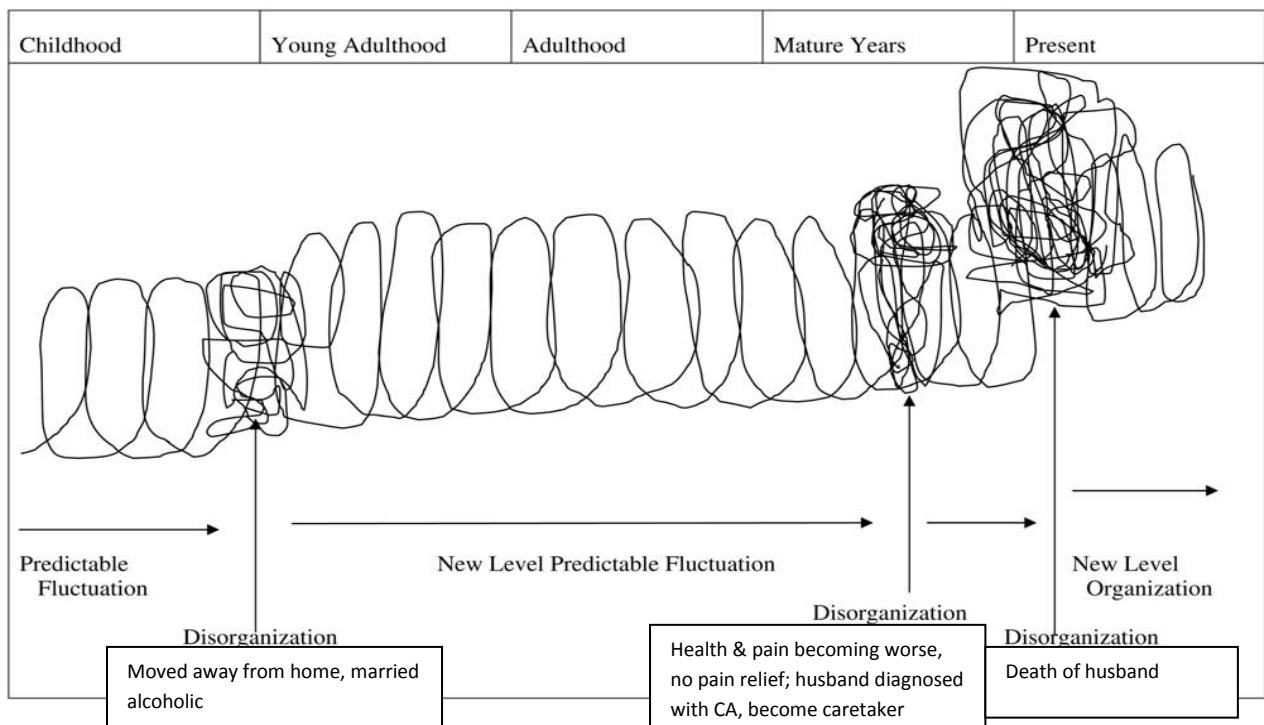


Figure 2. Mrs. X's Life Diagram. Adapted from Rosa (2006). (Based on Prigogine).

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Discussion. The chaos and disruption of chronic illnesses, particularly when accompanied by persistent pain, can be all encompassing. In addition to this, Mrs. X was faced with another instance of “forging ahead as usual”, as she became the caretaker for her husband. The same patterns that can be seen earlier in her life were once again playing out; however, this time she was unable to continue on as she had in the past. Mrs. X may have felt “stuck” when forging ahead was no longer working and she was uncertain of how to proceed. Newman (1999) explained, “When clients are in a period of disorganization, they often cannot see a connection to the past or future. Their focus is on survival, a kind of treadmill existence” (p. 228). However, as they are able to see more to their current situation, they can begin to connect the past and the present; this step allows insights into the future. Possibilities grow and there seem to be new alternatives, which Newman refers to as action potentials; the next step in the process reveals itself as one proceeds (Newman, 1999).

While there is no way to predict how patients will come through this complex process, this example of Mrs. X. and her journey is used to illustrate how the process might look. This allows the reader to follow Mrs. X. from the initial meeting with the NP, through her “choice point” or place of chaos and disorder, through to the other side of the process, which hopefully leads one to expanding consciousness.

During this process, Mrs. X. takes time to reflect on her life, and hopefully begins to see patterns. Mrs. X. may recognize that she has always been too busy to put herself first. She may recognize that she has always put everyone’s needs before her own. Rest was not a luxury she had; in fact, if she felt fatigued or was sore, she was accused of being lazy. She kept moving and kept forging ahead; she did this at great expense to her own health. Through this reflection she may understand that her body was trying to tell her that she needed to take a break, needed to

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slow down for a few moments. Looking back, Mrs. X. may also see where she started limiting her activities because of her pain; she sees where she became more and more isolated, more restricted. Newman (1999) reviewed work by Jonsdottir (1998) and Mishel (1990) with similar stories; patients were afraid and began to avoid things that would disturb their state of equilibrium; unfortunately this became more and more narrow and elusive. Patients began to isolate themselves and close themselves off from the environment, hoping to preserve what was known and certain. Mrs. X saw that she too closed herself off, especially as she cared for her husband, and she experienced more pain and uncertainty than ever before. Unfortunately, this also thwarted her growth process and the possibilities it brought. She saw that her “old ways” were keeping her stuck in this place of pain and chaos. Newman (1999) writes, “The pathway of healing is one of exploration, not repair” (p. 229).

So as Mrs. X. continues on her journey, she may get to a point where she is able to see that she needs rest, that she should try to put herself first sometimes, see that she is a human being with limitations. However, in recognizing these limits, she may feel free as she is able to identify her own needs and wants for the first time. She may start to ask those around her for help, and be able to accept it. Mrs. X. may view relationships in a whole new way, and realize the reciprocal nature of things-that she can receive in addition to give. She can now take naps in the afternoon if she is tired or in pain; even enjoy napping now without feeling “lazy”. She feels transformed. This new perspective is what Newman (1999) refers to as a paradigm shift-Mrs. X. has experienced expanding consciousness.

The NP’s role. The NP must stay in this relationship with Mrs. X despite the disorganization, despite the chaos. Newman reminds us of the importance of our role of being with another during times of uncertainty and disruption. She reminds us not to fix or do for, as

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this would stifle the very process behind growth and transformation. She challenges us to recognize this chance for growth, and resist the urge to seek what is stable and secure; she reminds us that this point of chaos is the step leading to something better (Newman, 1999). She adds, “We need to join in partnership with clients and dance their dance, even though it appears arrhythmic, until order begins to emerge out of chaos” (p. 228). She also reminds us that we know about the underlying, implicate order; we know that underlying patterns present themselves like Mrs. X’s painful OA but that this does not define Mrs. X. We can help to assure patients that this pattern is there, even if they do not see it immediately; and that they can transcend, they can arrive at a place of higher organization, if only for a while (Newman, 1999). This new place of balance and order is temporary too, as we need disequilibrium to continue growing. Newman (1999) states, “Complex behavior occurs just at the boundary between order and chaos. The rhythmic relating of nurse with client at this critical boundary is a window of opportunity for transformation in the health experience” (p. 229).

Implications for Practice

Just as Mrs. X. attempted to avoid activities and situations which would increase her pain or upset her equilibrium, elderly patients suffering from persistent pain do the same. They may become fearful of anything that might upset their careful balancing act. The problem with this is that the longer they attempt to maintain stability and avoid change, the more narrow this range of equilibrium becomes until they reach a point where life becomes unmanageable. These impending changes may seem increasingly pervasive, despite the elderly patient’s best efforts. The restrictions brought about by persistent pain typically result in loss of functional and cognitive abilities, and lead to increased rates of isolation and depression; these patients suffer in every realm of life. This cycle persists, as these changes typically lead to increased levels of

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pain. So people often continue in this restrictive, chaotic state, fearing change and the unknown; unfortunately this hinders any chance of progress or growth. As Newman (1999) wrote, “They avoided the far-from-equilibrium states that are conducive to change” (p. 229).

Adding complexity to this already complicated subject and theory, timing seems to be important for HEC. Newman (1999) reviewed Endo’s (1998) work, where Newman’s theory was applied to patients with ovarian cancer in Japan; the women studied were in “difficult life predicaments” (p. 229). It seemed that women who were able to examine their life patterns soon after their diagnosis (early in the chaotic time following diagnosis) were able to move through the process quicker or with more ease. They found themselves able to let go of old ways and of controlling behaviors. They gained insights and were able to recognize their own needs. These women felt transformed, inspired, and could move beyond, experiencing HEC (Newman, 1999).

Unfortunately, many elderly patients suffering from persistent pain come to us long after diagnosis; we are dealing with chronic conditions and long-standing pain. Newman’s review of Endo’s (1998) work provides some insight here as well. The transformative process of other participants, those who began the nurse-patient relationship later in the period of uncertainty following diagnosis, seemed to progress more slowly and with less clarity. Newman wrote, “Timing the encounter to the point of disruption (disequilibrium) appeared to be critical” (Newman, 1999, p. 229). This group’s course (with a later start to the relationship) is more representative of what we might encounter with persistent pain patients, perhaps giving us a clue as to how progress might look; however, this author suspects that the process may be even more tedious, as it is common for persistent pain patients to report suffering from their pain for many years. As Newman adds, “If they had been able to get in touch with the pattern of the relating, the meaning of the whole, they might have had a clearer opportunity for moving beyond their

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limitations” (1999, p. 229). It is important to note however, that this theory is used differently with each person, making it highly individualized and unique; hence, no predictions could be made fairly. It is the individualized nature of the theory which makes it an excellent fit for this population.

While the timing of the encounter may not be ideal, there are other factors which lend support to using Newman’s theory of HEC in the elderly. The theory itself seems to fit very well with an elderly population. Developmental goals for this age group include life review, taking a retrospective look back on life, sorting past successes from failures, and deciding what is left to do. This lends itself well to some of the questions one might ask when examining what is meaningful and searching for patterns. Another correlation can be found in the frailty research, for example the work by Walston et al. (2006) which points out that assessment and management of frail, elderly adults is inherently more complex, for example, the chief complaint is typically vague, and may not be related to assessment findings or other results; in fact, everything about the encounter may be atypical. Symptoms and diseases are multisystem, multidimensional, and often chronic. The article’s authors go further, discussing fractal patterns and chaos theory. While not discussed here, this also relates quite well to many of the underlying principles of Newman’s theory of HEC. Additionally, the theory of HEC offers a suitable, holistic way to approach patients at this level of complexity, in a particularly vulnerable population.

In addition, as we are dealing with chronic diseases, comorbid conditions, vulnerable populations, and the persistent pain that accompanies these issues, the goal is a long-lasting, effective solution. We want results that can persist over time as we are dealing with ongoing suffering; Newman’s theory provides us with the necessary tools. As NPs providing primary care, we typically form long-term relationships with patients; this presents a unique opportunity

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to use Newman's theory of HEC. At the heart of Newman's theory is the importance of relationships, including: how we relate to others and our world, how everything shares in the same interrelatedness, and how this energy and information is then exchanged with the greater pattern of the whole, the universe. For these reasons, NPs are in a unique position to use Newman's theory of HEC to improve the management of persistent pain in the elderly.

In summary, Margaret Newman's theory of HEC is well suited for use in the elderly population, in particular persistent pain patients. An idea for future research would be aimed at earlier intervention; the goal of which is forming the therapeutic relationship early in the period of disorganization, just after diagnosis. Another idea for future research would be to compare these results (early relationship) with typical elderly persistent pain patients (later relationship or no relationship). In closing, Newman (1994) reminds us that "whatever transforms you, transforms your practice" (p. 116).

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