Getting More than an Earful:

The True Cost of Undiagnosed and Untreated Hearing Loss

on Health-Related Quality of Life (HRQol)

by Leigh E. Powell

Introduction

As increasing numbers of healthcare professionals adopt population health models and health-related quality of life (HRQol) measurements, more connections are drawn between previously distinct medical conditions. By now most people – even those who don't suffer from a hearing impairment – are aware that studies link hearing loss to depression and dementia. In that instance, scientific research has medically certified a common-sense conclusion: the less you hear the less you can effectively communicate and socially participate, leading to withdrawal and isolation.

With hearing loss, co-morbidity issues touch every facet of well-being: physical, mental, social *and* vocational. While the occupational component easily translates to real dollars in lost income, disability benefits and medical expenses, it becomes more difficult to place a monetary value on the mental and social impact. In a twisted take on trickle-down theory, these HRQol components both drive and feed off one another unless the cycle is broken through proper diagnosis and treatment. According to a Johns Hopkins study released in February 2012, nearly 27 million Americans ages 50 and older suffer from hearing loss; yet only one in seven adopts the use of hearing aids.[i] Accounting for all the health conditions and risks that hearing loss either causes or exacerbates, one doesn't need an actuary to determine that the costs related to the 23 million who go untreated add up to an astronomical figure.

Hearing Loss Hurts – Adding Injury (and Costs) to Impairment

Although we *hear* sounds with our ears, the brain *listens* by doing the heavy lifting to both filter and process the noise. This helps explain the link between hearing and balance issues: a 2012 Johns Hopkins Medicine study found that individuals with mild hearing loss were three times as likely to have a history of falling; each additional 10-decibels of hearing loss increased the risk of falls by 1.4 fold.[ii] The researcher, Dr. Frank Lin, theorized that "cognitive load" was partly to blame concluding, "Gait and balance are things most people take for granted, but they are actually very cognitively demanding. If hearing loss imposes a cognitive load, there may be fewer cognitive resources to help with maintaining balance and gait."[iii] The findings remained consistent, even when accounting for other risk factors associated with falls, such as age; and excluding those with moderate to severe hearing loss didn't alter the results.[iv]

Falls are costly; in 2012 the CDC reported that direct medical costs for falls among older adults (based on 2010 data) total $30 billion, adjusting for inflation. Nearly two-thirds of the costs related to non-fatal falls

stem from hospitalization; that single line-item on the expense sheet *averages* over **$34,000** (in 2012 dollars).[v] According to U.S. Department of Labor data, over 17% of all disabling occupational injuries result from falls. Yet, those $30 billion in medical costs don't even account for the income and productivity loss that accompany a temporary or permanent period of disability, nor the additional services required when injuries from a fall impact independent living. By 2020, the annual direct and indirect costs of fall injuries are expected to reach $67.7 billion (in 2012 dollars).[vi]

A mental health connection is just as unavoidable: depression and pain are inextricably linked. The September 2004 issue *Harvard Mental Health Letter* featured an article that highlighted the convergence of depression and pain in the neural pathways of the nervous system. The brain conduits that process pain signals use some of the same neurotransmitters involved with mood regulation. When that regulation is disrupted, both physical pain and negative emotions such as sadness, hopelessness and anxiety intensify.[vii]

Regardless if an injury is caused by or in any way tied to hearing loss, the same Johns Hopkins researcher determined that hearing loss in older adults can prolong both injury AND illness. Among Dr. Lin's key findings: hearing-impaired older adults logged a 36 percent higher incidence rate of prolonged injury or illness (defined as lasting more than 10 days).[viii]

Lost in Translation

In February 2011, Johns Hopkins Medicine released a widely publicized study linking hearing loss to a significantly higher risk of developing dementia among seniors. They recently followed that research up with an even more startling finding in January 2014: the brain of an older adult with hearing loss shrinks at an accelerated rate.[ix]

However, the risk of suffering from declines in cognition and mental health extends across ALL age groups. A nationwide study that analyzed more than 18,000 responses from 2005-2010 National Health and Nutrition Examination Surveys found that more than 11 percent of those with some hearing problems indicated moderate to severe depression compared to 6 percent of those with good or excellent hearing.[x] The severity of the hearing loss tended to track with a higher risk of depression, with one notable exception: those with profoundly severe to total hearing loss were HALF as likely to be depressed as those with excellent hearing. The lead researcher, Dr. Chuan-Ming Li, reasoned this was likely the result of earlier diagnosis and treatment with hearing aids or cochlear implants.[xi] The analysis also drew connections between hearing loss and low education level, living alone, smoking and binge drinking – all of which are also associated with depression.[xii]

Once again, these HRQol components seamlessly interlace like the strings of a tennis racket. Social Security Disability rolls have swollen to morbidly obese proportions in recent years, particularly with the passage of Clinton's Family and Medical Leave Act and amendments to the American Disabilities Act that have expanded the definition of disability. A significant part of the increase stems from mental disorders; individuals with psychiatric impairments - including depression - comprise the largest constituency of Social Security Disability beneficiaries, accounting for 27 percent in 1999.[xiii]

Heard You the Third Time – Hearing Loss in the Workplace

David Allen, author of *Getting Things Done: The Art of Stress-Free Productivity*, writes, "If you don't pay appropriate attention to what has your attention, it will take more of your attention than it deserves." Americans with untreated hearing loss suffer a loss of productivity both while engaged in work and due to increased rates of absenteeism, resulting in chronic underemployment and career trajectories that prematurely plateau. Untreated hearing loss results in a loss of income up to $30K per year, depending on the degree of impairment.[xiv] In some cases, hearing impaired individuals cap their income years before they enter the workforce: according to a 1995 study published in the *International Journal of Pediatric Otorhinolaryngology*, hearing-impaired children who do not receive appropriate care incur overall lifetime costs of $1MM in special education, lost wages and health complications.[xv] Whether some of the income deficit is due to disability that is prolonged by depression or depression arising from the social isolation associated with hearing loss, the circle remains unbroken absent intervention from an ear professional.

While statistics are difficult to come by, it is reasonable to conclude that the same risks of injury outlined earlier pose on-the-job threats to the safety of hearing-impaired individuals, their co-workers and, depending on their vocation, quite possibly the public at large. As before, the physical, mental and occupational components intersect and overlap.

First Aid: Influencing the HRQol Equation

Hearing aids can measurably treat ***95 percent*** of all hearing loss, and with proper fitting their use can appreciably improve HRQol in a remarkably short amount of time. Using the World Health's Disability Assessment (Schedule II) that measures self-reported deficiencies in the areas of communication (concentration, memory, analysis, learning and conversational aptitude) and participation (e.g., involvement in community activities, emotional and economic consequences of personal health), test subjects receiving immediate treatment improved scores for communication by 36.5 percent and participation scores by 13.7 percent after just 10 weeks. The improvement continued, albeit at a slower rate, at two-, six- and twelve-month intervals.[xvi]

Adoption of hearing aids mitigates income loss by 90 to 100 percent for those with milder hearing loss and by 56 to77 percent for those with moderate-to-severe impairment.[xvii] Despite the efficacy and compounding benefits of hearing aids, only 40 percent of Americans in the moderate-to-severe category adopt their use, dropping even further to a mere 10 percent utilization rate for those with mild hearing loss, largely due to lack of coverage combined with prohibitive costs.[xviii] In efforts to address this gap, more insurance companies are covering at least a portion of the cost, including a program UnitedHealthcare recently launched to make hearing aids more affordable not just for their own enrollees, but the public at large. Despite overwhelming evidence of a clear relationship between proper treatment and earning

potential (not to mention the opportunity to reduce dependence on the welfare system and mitigate health claims for related conditions), states have been slow to adopt coverage. While 16 states currently mandate pay for pediatric hearing aids, only THREE (Arkansas, New Hampshire and Rhode Island) require coverage for BOTH children and adults.

Perhaps the variable of the formula bearing the highest potential to influence hearing aid adoption (and thus improve overall health and yield the largest benefit) is the employer. A comprehensive analysis of Americans age 12 and older revealed that **one in five** registered hearing loss in at least one ear, and nearly a fifth suffered from such severe hearing loss that it hindered communication.[xix] Using 2013 Bureau of Labor Force statistics, this places nearly ***29 million*** hearing-impaired citizens age 16 and over in the current workforce.[xx] Both the incidence rate and the severity of hearing loss increase with age; the same labor survey reveals that adults age 45 and older comprise the lion's share (44%) of civilian employment.[xxi]

Perhaps ironically, it will take a loud and clear and oft-repeated message to convey the far-reaching effects of untreated hearing loss – effects that extend well beyond the inability to hear clearly. A two-pronged approach consisting of 1) awareness campaigns highlighting the far-reaching emotional, physical and financial consequences of untreated hearing loss combined with 2) initiatives to lower the costs of and increase access to appropriate hearing care may be all that is needed to significantly improve health-related quality of life for the millions of hearing-impaired Americans.

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