Open Access Journal of
Gerontology & Geriatric Medicine
ISSN: 2575-8543

Juniper Publishers
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Mini Review
Volume 2 Issue 5 – September 2017
DOI: 10.19080/OAJGGM.2017.02.555599

OAJ Gerontol & Geriatric Med
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Aging and Chronic Diseases

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Submission: September 25, 2017; **Published:** September 27, 2017

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Introduction

Aging and chronic diseases as public health issues represent one of the major health concerns in the world. Given the projected growth of the elderly through the next 25 or more years and the growing concern for any population group to remain independent for as long as possible, a major public policy focus will have to be directed towards this segment of society.

As elsewhere in the world, the population in the United States is aging. As an example, the current estimate of number of individuals over 65 years of age in the USA is in excess of 36.3 million citizens, accounting for 12% of the population. There are also 4.9 million individuals 85 years of age or older. By the year 2030, the number of older individuals is expected to reach roughly 20% of the U.S. population. Recent estimates project the older population to rise to 87.7 million individuals by the year 2050. Older women comprise 58 percent of the population at age 65 and 69 percent of the same population at age 85. The majority of older men are veterans with that trend continuing.

Programs In Aging

There is perhaps no program more in need of podiatric involvement at the public level than the concerns for the aging patients and the entire aspect of gerontology and geriatrics. In the stress of today's society, physical and psychosocial degeneration associated with aging and chronic disease, years of micro-trauma, use and misuses, as well as neglect, contribute to the development of foot problems in the elderly. The US Department of Veterans Affairs some years ago identified that painful feet are the fourth common cause of discomfort in the elderly. If we recognize that motivation is a key for the elderly to remain active and productive, so that there is a quality of life and life is worth living, the ability to walk and remain ambulatory is an important catalyst to society's goal of independent living and dignity for our elderly. To the aged, the poor, and patients with physical or mental impairments, the inability to move about means social segregation, a loss of efficiency, declining health and resultant personality and emotional changes. In effect, the elderly are running out of time, out of health, out of usefulness, out of enjoyment and out of everything except life, and that's not far away. The ability to retain the dignity of old age is becoming a lost phase of society. Foot problems produce immobility and this deprives the elderly of their self-respect and increases their social poverty. To be old, poor and sick automatically requires total rehabilitation to convert some of the negatives to positives.

The measurable outcomes of immobility include body system changes such as; impaired and sluggish blood flow, cardiovascular stress, chronic constipation, muscle weakness, weakened bone structure, incontinence, pressure ulcers, increased agitation, depression, decreased appetite, increased insomnia, and increased urinary infections. The quality of life changes include; reduced social contact, withdrawal from surroundings, loss of participation in activities, loss of independent or assisted mobility, decreased desire to eat, loss of independent or assisted toileting, loss of independent or assisted bathing and/or dressing, increased problems with sleep patterns, loss of interest in others, and a loss of desire to live, to discover life and/or to love. There are many broad factors that contribute to the development of foot problems in the elderly. Some of the factors include the following:

a. The degree of ambulation

b. The duration of hospitalization or institutionalization

c. Previous types of podiatric and other foot care services

d. The environment

e. Emotional adjustment to age, disease, and life style

f. Current medications and therapeutic programs

g. Associated systemic diseases

h. Associated foot change from youth to old age

i. Past foot conditions and/or pedal manifestations of chronic disease.

In general, the aging patient is usually taking more than one drug for one or more diseases and may have unusual sensitivities

or dosage modifications. They are usually more susceptible to local infection. Atrophy, degenerative musculoskeletal diseases, neuropathy and neurologic diseases, and vascular impairment, additionally complicate the management of the elderly. Many elderly are confused, not only to associated mental and emotional changes due to new stress, but to degenerative processes, such as failing eyesight and a loss of hearing. Ambulation when limited increases physical deterioration and creates an environment of social isolation. Tissues do not heal well when traumatized and injuries to the lower extremity are more common in the elderly. The clinical management of older adults requires continuing assessment, early diagnosis, appropriate therapy and care, continued management and health education to prevent exacerbations of pre-existing conditions. Although many times the social problem may be primary, the inability to take care of one's self, inadequate nutrition, and depression from being alone, creates physical problems. The aged are more prone to immobility, impairment, disability, hospitalization, and extended care following even minor foot infections. A key to any program in aging is recognizing problems, finding the problem, listening to the patient, and attempting to bring all of the community services into a coordinated program for the elderly.

Clinical Foot Problems Associated With Aging And Chronic Disease

The primary risk factors that contribute to the development of foot problems include but are not limited to the following: aging, diabetes, prior foot ulcer or amputation, impaired vision, inability to bend, patients who live alone, tobacco use, dementia, alcohol abuse, risk taking behavior, obesity, sensory loss, loss of protective sensation, altered biomechanics and pathomechanics, structural abnormalities, altered gait and ambulatory dysfunction, abnormal or excessive foot pressure, subkeratotic and/or subungual hematoma, history of previous foot ulcers, peripheral arterial and vascular disease, decreased or absent pedal pulses, peripheral neuropathy, soft tissue and plantar fat pad atrophy, toenail pathology, xerosis, fissures, deformities (limited joint mobility, hallux valgus, digiti flexus, prominent metatarsal heads and prolapse, and other related systemic diseases. The primary subjective symptoms of podalgia or foot pain include the following examples: dermatologic (exquisitely painful or painless lesions, slow healing or non-healing wounds or necrosis, skin color changes such as cyanosis or redness, chronic itching, scaling or dry feet, and recurrent infections, such as paronychia, tinea pedis, onychomycosis, and bacterial infection); peripheral vascular (cold feet, intermittent claudication involving the calf or foot, and pain at rest, especially nocturnal, relieved by dependency); musculoskeletal (gradual change in foot shape, change in shoe size, painless change in foot shape, ambulatory dysfunction, and joint changes and deformity); and neurologic (sensory change, burning, tingling, clawing sensation, motor changes, weakness, foot drop, and autonomic changes, such as diminished sweating).

In the USA, Medicare (public health care) can provide coverage for what is defined as primary care if the criteria of vascular and sensory deficits are met with systemic risk diseases, such as diabetes mellitus and peripheral or lower extremity arterial diseases. In addition, the following Class Findings required for management will augment the patient's clinical symptoms and signs. They include (A) nontraumatic amputation of foot or integral skeletal portion thereof, (B) absent posterior tibial pulse; advanced trophic changes as, hair growth (decrease or absent), toenail changes (thickening), pigmentary changes (discoloration), skin texture (thin, shiny), skin color (rubor or redness), and absent dorsalis pulse, and (C) claudication, temperature changes (e.g., cold feet), edema, paresthesias (abnormal spontaneous sensations

in the feet), and burning. Medicare provides coverage for the evaluation and management of a diabetic patient with diabetic sensory neuropathy, resulting in a loss of protective sensation(LOPS). The criteria must include the following: a diagnosis of LOPS (loss of protective sensation), a history of diabetes mellitus, physical examination consisting of findings regarding at least the following elements; visual inspection of the forefoot, hindfoot, and toe web spaces, evaluation of protective sensation, foot structure and biomechanics, vascular status, skin integrity, evaluation and recommendation of appropriate footwear, and patient education.

As we enter into the twenty-first century, the care problems associated with chronic disease and aging will become more significant as to time and expenditures.

The primary onychial clinical findings include but are not limited to the following: onychatrophia, onychia sicca, onycholysis, subungual hyperkeratosis, onychexallis, diabetic onychopathy, onychauxis, onychogryphosis, onychomycosis onychia, paronychia, onychitis, onychalgia, subungual abscess, subungual heloma, subungual exostosis, periungual verruca, onychophyma, onychomadesis onychoschizia, onychyphemia, onychoclasis, onychomalacia, onychoptosis, subungual spur, onychophosis, subungual hematoma, splinter hemorrhage, onychocryptosis, periungual ulcerative granulation tissue, onychodysplasia, onychodystrophy, onychorrhexis, Beau's lines, pterygium, onychoclasis, diabetic onychopathy, hypertrophic onychodystrophy, and subungual ulceration. Onychial changes are also related to the following cutaneous and systemic diseases included as examples: psoriasis, mucocutaneous lichen planus, anemia, diabetes mellitus, chronic obstructive pulmonary disease, myocardial infarction, Raynaud's disease, hyperthyroidism, hypothyroidism, vasospastic states, endocarditis, cardiac disease, hypertension, malignancy, rheumatoid arthritis, cirrhosis, alcohol abuse, and coagulopathies. The primary dermatologic clinical findings include but are not limited to the following: exquisitely painful or painless wounds, slow healing or non-healing wounds, trophic ulceration, necrosis, skin color changes such as cyanosis

How to cite this article: Arthur e Helfand. Aging and Chronic Diseases. OAJ Gerontol & Geriatric Med. 2017; 2(5): 555599. DOI: 10.19080/OAJGGM.2017.02.555599

or redness, changes in texture and turgor, pigmentation (hemosiderin deposition), scaling, xerosis, dryness, recurrent infections (paronychia, tinea pedis, onychomycosis, pyoderma, cellulitis), keratotic lesions without hemorrhage or hematoma (tyloma, heloma durum, heloma miliare, heloma molle, heloma neurofibrosuum, heloma vasculare, onychophosis, subungual heloma, intractable plantar keratosis), keratotic lesions with hemorrhage or hematoma (preulcerative), keratin dysfunction, porokeratosis, eccrine poroma, verruca, psoriasis, fissures, pruritus, hyperhidrosis, bromidrosis, maceration, diminished or absent hair growth, diabetic dermopathy, necrobiosis lipoidica diabeticorum, bullous diabeticorum, ulceration, allergic excoriation & dermatoses, neurologic excoriation & dermatoses, emotional excoriation & dermatoses, contact dermatitis, stasis dermatitis, malignancy, atopic dermatitis, Nummular eczema, neurodermatitis, and simple and hemorrhagic bullae.

As we enter into the twenty-first century, the care problems associated with chronic disease and aging will become more significant as to time and expenditures.

The primary vascular clinical findings include but are not limited to the following: intermittent claudication, muscle, limb weakness, ischemic or resting limb pain, vasospasm, paresthesia, coldness, varicosities, fatigue, numbness, tingling, night cramps, burning, pain, swelling, poor healing, ulceration, pallor, venous swelling, dry skin, xerosis, atrophy of soft tissue, blebs, rest pain, decreased or absent posterior tibial or dorsalis pedis pulses, decreased or absent popliteal pulse, femoral pulse change, decreased capillary filling time, edema, tissue loss, ulceration, increased venous filling time, trophic changes, loss of hair, onychial changes (thickening, onychodystrophy, brittleness, onychopathy, nutritional changes, subungual hemorrhage, discoloration, onycholysis, onychauxis, onychorrhexis, subungual keratosis and deformity), pigmentary discoloration, skin texture (thin, shiny, dystrophic, and parchment like), skin color (rubor, cyanosis, or erythema, temperature changes (coldness or decreased warmth), vascular bruits, edema, necrosis (localized and demarcated), gangrene, decreased Doppler, oscillometric and radiometric studies, abnormal ankle-brachial index, muscle wasting, atrophy repeated foot infections, and potential amputation. In addition, elevated dermal temperature difference between feet of more than 2 degrees centigrade may be indicative of early Charcot changes (neuropathic arthropathy). The primary neurological clinical findings include but are not limited to the following: sensory changes and deficits (pallesthesia or loss of vibratory sensation, burning, tingling, and clawing sensations), pain and hyperactivity, loss of two-point discrimination, joint position or proprioceptive changes, reflex change (diminished or absent - superficial plantar, Achilles, and/or patellar), motor changes (atrophy, muscle wasting, weakness, gait change, podalgia, and/or foot drop), autonomic changes (diminished sweating or hyperhidrosis), Loss Of Protective Sensation (LOPS), changes in pain and temperature perception, hyperesthesia, possible perfusion, and diabetic dermopathy or pretibial lesions (shin spots). In addition, thickened skin with calluses under high-pressure areas may demonstrate an intrinsic minus foot (marked digital contractures, metatarsal prolapse, prominent metatarsal heads, and plantar fat pad atrophy and displacement), bowstring tendons, and a Charcot foot.

The primary musculoskeletal findings include but are not limited to the following: gradual change in shape or size of the foot, a sudden and painless change in foot shape with swelling and no history of trauma, cavus feet with claw toe, drop foot, “Rocker Bottom Foot” or Charcot foot, neuropathic arthropathy, elevated plantar pressure, decreased muscle strength, decreased ranges of motion, multiple foot deformities, limited joint mobility, abnormal foot pressure and subsequent ulceration, structural abnormalities or foot deformities (hammertoes, claw toes, prominent metatarsal heads, atrophy of plantar fat pad, plantar fat pad displacement, foot muscle atrophy, hallux valgus, hallux varus, hallux limitus, hallux rigidus, digiti quinti varus, overlapping toes, underriding toes, tailor’s bunion, plantar fasciitis, metatarsal prolapse, spur formation, calcaneal spurs, bursitis, periostitis, decalcification, stress fractures, tendonitis, tenosynovitis, metatarsalgia, Morton’s syndrome, joint swelling, Haglund’s Deformity, neuritis, entrapment syndrome, neuroma, sesamoid erosion and/ or displacement, Tendo-Achilles contracture, phalangeal reabsorption, functional abnormalities, pes cavus, splay foot, equinus, pes planus, pes valgo planus, pronation, the residuals of arthritis (degenerative, Rheumatoid, and gouty), biomechanical and pathomechanical variations, podalgia, pododynia dysbasia, as well as gait and footwear changes.

There are a number of mechanical factors that also contribute to clinical foot problems related to aging and chronic diseases. The primary factors include but are not limited to: body mass, ambulatory speed, tissue trauma, weight diffusion, weight dispersion, footwear, flooring, pathomechanics (defined as structural change in relation to function), and biomechanics (defined as forces that change and affect the foot in relation to function, imbalance, force, compression stress, tensile stress, shearing stress, friction, elasticity, and fluid pressure. Footwear for the mature and aging foot should encompass the technical properties to cope with these forces, as well as be designed with adjustable fastening around the foot and heel, so as to prevent trauma and falls.

The signs of systemic diseases are most common when associated with the various forms of arthritis, peripheral arterial and vascular insufficiency, disease, degenerations of the neurological system, and metabolic diseases such as diabetes mellitus and gout. Osteoporosis is also a factor for demineralization and a loss of bone substance. The stress of ambulation can result in fractures, which may be sub-clinical initially. The post-stroke patient’s rehabilitation may be delayed by a foot problem that produces an antalgic gait, minor as it may

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be considered. The primary clinical findings associated with degenerative joint disease (osteoarthritis), gout, and rheumatoid arthritis has also been included in the above clinical summaries.

Summary

As we enter into the twenty-first century, the care problems associated with chronic disease and aging will become more significant as to time and expenditures. The involvement NOW in community programs, as they relate to foot care and the delivery of podiatric services, will produce an aging population that has less pain, that will have complications minimized, that will remain viable members of society, and that will be kept walking.

Public health needs to address the needs of the aging and their concurrent diseases, such as diabetes mellitus, peripheral vascular and arterial diseases, and the various forms of arthritis. It is important to recognize that the ability to walk and move about has a profound impact on the physical and psychological aspects of life. It is also important to recognize that foot care provided by Doctors of Podiatric Medicine/Podiatrists must be of high quality, delivered with compassion, and be cost effective. In addition, that public health programs plan for foot and podiatric care that must include assessment, education, and counseling, in addition to treatment considerations.

The real test is yet to come. The challenge to use what we have learned and now know must be put to use, for then and only then, will the true meaning of concerned practitioner surface and permit comfort, compassion, and dignity to serve as primary public health concerns for the elderly.

The above information was abstracted and edited from Public Health and Podiatric Medicine – Principles and Practice – Second Edition, Arthur E. Helfand, DPM, Editor – published by the American Public Health Association, Washington, DC, in 2006.

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DOI: 10.19080/OAJGGM.2017.02.555599

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