The certainty of aging and death is a major concern of humans with a consequent endless search for methods to contract aging’s effects and delay death as long as possible. CHARLATANS may take advantage of the wish of people to live longer, proposing miraculous, unproven, and profitable antiaging products. Conversely, key advances in the understanding of the mechanism(s) behind the biology of aging and the increase in human life expectancy during the 20th century worldwide, make it possible that postponing natural death may indeed be plausible. Prolongation of life expectancy with disability is an empty prize. Interventions that prolong not only life span but also health span involve lifestyle strategies, as well as diagnosis of diseases at an early stage and appropriate use of advanced medical care.

Human life expectancy has increased continuously for 150 years and functional status has improved, driven by improved sanitation, socioeconomic conditions, and medical advances. Nevertheless, recent data reveal no change in disability rates between 2000 and 2005 among older noninstitutionalized Americans. A slowing in life extension pace as a result of the poor lifestyle of modern young people is anticipated. Fundamental humanitarian and economic reasons call for the need to implement strategies to improve quality of life in old age. The rapid increase in the aged population will pose major challenges to health care systems in the coming years. This will have consequences on the sustainability of modern society. The search for ways to prolong health expectancy, with effective prevention of disability, has become a primary goal in medicine.

Life extension with genetic manipulation and caloric restriction has been obtained in a wide array of animal models—yeasts, worms, flies, mice, primates. Translation into humans with a consequent endless search for methods to contract aging’s effects and delay death as long as possible. CHARLATANS may take advantage of the wish of people to live longer, proposing miraculous, unproven, and profitable antiaging products. Conversely, key advances in the understanding of the mechanism(s) behind the biology of aging and the increase in human life expectancy during the 20th century worldwide, make it possible that postponing natural death may indeed be plausible. Prolongation of life expectancy with disability is an empty prize. Interventions that prolong not only life span but also health span involve lifestyle strategies, as well as diagnosis of diseases at an early stage and appropriate use of advanced medical care.

Human life expectancy has increased continuously for 150 years and functional status has improved, driven by improved sanitation, socioeconomic conditions, and medical advances. Nevertheless, recent data reveal no change in disability rates between 2000 and 2005 among older noninstitutionalized Americans. A slowing in life extension pace as a result of the poor lifestyle of modern young people is anticipated. Fundamental humanitarian and economic reasons call for the need to implement strategies to improve quality of life in old age. The rapid increase in the aged population will pose major challenges to health care systems in the coming years. This will have consequences on the sustainability of modern society. The search for ways to prolong health expectancy, with effective prevention of disability, has become a primary goal in medicine.

Life extension with genetic manipulation and caloric restriction has been obtained in a wide array of animal models—yeasts, worms, flies, mice, primates. Translation into humans with a consequent endless search for methods to contract aging’s effects and delay death as long as possible. CHARLATANS may take advantage of the wish of people to live longer, proposing miraculous, unproven, and profitable antiaging products. Conversely, key advances in the understanding of the mechanism(s) behind the biology of aging and the increase in human life expectancy during the 20th century worldwide, make it possible that postponing natural death may indeed be plausible. Prolongation of life expectancy with disability is an empty prize. Interventions that prolong not only life span but also health span involve lifestyle strategies, as well as diagnosis of diseases at an early stage and appropriate use of advanced medical care.

Human life expectancy has increased continuously for 150 years and functional status has improved, driven by improved sanitation, socioeconomic conditions, and medical advances. Nevertheless, recent data reveal no change in disability rates between 2000 and 2005 among older noninstitutionalized Americans. A slowing in life extension pace as a result of the poor lifestyle of modern young people is anticipated. Fundamental humanitarian and economic reasons call for the need to implement strategies to improve quality of life in old age. The rapid increase in the aged population will pose major challenges to health care systems in the coming years. This will have consequences on the sustainability of modern society. The search for ways to prolong health expectancy, with effective prevention of disability, has become a primary goal in medicine.

Life extension with genetic manipulation and caloric restriction has been obtained in a wide array of animal models—yeasts, worms, flies, mice, primates. Translation into humans awaits verification. Numerous studies on exercise interventions and the Mediterranean dietary pattern have consistently demonstrated not only a decrease in mortality but also a reduction in several age-associated diseases, hence, increasing health span. The development of biotechnological devices (eg, exoskeletons, bionic implants, and nanotechnology) suggests that technology will continue to push further away age-linked disability.

Even though aging has always been associated with negative connotations, people who have witnessed the recent extraordinary increase in life expectancy want to learn more about available approaches to live longer while remaining healthy. As an answer to this desire, there is a proliferation of antiaging societies, advertisements, and products, which raise concerns of possible harm, fraud, and diversion from beneficial regimes.

**THE HORMONAL FOUNTAIN OF YOUTH**

One of the most popular antiaging treatments involves human growth hormone; yet, a meta-analysis showed only small changes in body composition and a high rate of adverse events including cancer. Other hormones proposed as antiaging treatments with negative results include dehydroepiandrosterone, melatonin, and anabolic steroids. A number of beneficial effects for vitamin D, including reduced mortality and decreased falls and hip fractures, have been shown in persons with vitamin D deficiency. Testosterone treatment for sexual dysfunction and possibly frailty, and estrogen/progesterone replacement therapy for severe menopausal symptoms and osteoporotic fracture risk are well established. For these, careful selection of candidates, dosing, and follow-up are crucial. With the exception of vitamin D, current available data do not validate use of hormones to reverse or delay the aging process.

**CALORIC RESTRICTION MIMETICS**

Based on animal studies, caloric restriction (CR) might prevent atherosclerosis and cancer, but may have important side effects (eg, sexual dysfunction, infertility, depression, increased osteoporotic fractures). Weight loss in older humans is associated with increased mortality. Efforts aimed to mimic the benefit of CR, without its side effects, such as autophagy induction, have been tested through the use of antilipolytic drugs and rapamycin or its analogues. Resveratrol, a “silent information regulator” (SIR)-activating compound, has been shown to mimic CR effects extending life span and modulating insulin secretion/action in animal models.

**STEM CELLS**

The possibility of stem cell therapies to regenerate tissues has created a fair amount of hope, but the responses may be age-dependent. Stem cells with a muscle-specific
insulin-like growth factor (IGF) reversed the muscle loss seen in aging mice, and advances in stem cell research of the past 2 years cannot be ignored. Preliminary studies treating heart failure in humans with stem cells are particularly exciting,\textsuperscript{14} as is the development of stem cell scaffolds for damaged organs such as the larynx.\textsuperscript{15} Adult stem cells derived from adipose tissue appear to have excellent ability to rejuvenate persons with arthritis.\textsuperscript{16}

**AGING SUCCESSFULLY**

Measures for aging successfully entail physical parameters (eg, disease incidence, mobility, mental acuity), but also important psychological determinants, including resilience, emotional well-being, connectedness, and spirituality, which have been linked to exceptional longevity.\textsuperscript{17–20} In the view of emotional well-being, connectedness, and spirituality, which (eg, disease incidence, mobility, mental acuity), but also important psychological determinants, including resilience, emotional well-being, connectedness, and spirituality, which have been linked to exceptional longevity.\textsuperscript{17–20} In the view of older patients, the multidimensional aspects are even broader and may include having autonomy over the place and manner of the final days. It is possible that the achievement of life extension and disease/disability avoidance may have less value if other determinants of well-being are not taken into account. Successful aging may coexist with diseases and functional limitations on condition that the person receives psychological and/or social support. Finding strategies to cope successfully with stressors appears to be particularly important to reduce the development of disability.

**LIFESTYLE**

Currently, 3 lifestyle strategies with evidence-based, pleiotropic effects on longevity and disease incidence reduction exist: exercise, nutrition, and smoking avoidance.\textsuperscript{21} The effects of a healthy lifestyle have been known for decades and have been part of the World Health Organization’s approach to the prevention of chronic diseases across many nations. The unprecedented increase in type 2 diabetes incidence, despite the knowledge about lifestyle strategies, is the proof that implementing this knowledge is extremely difficult. Resources should be directed toward finding effective ways of executing these interventions. Examples of why resources should be relocated to prevention are the questionable results of drug trials for Alzheimer’s disease and the uncertainty of the utility of many medications in the old-old.

**CONCLUSION**

Who doesn’t hope for longevity combined with good health in later years? Because aging is complex, it is unlikely that one pill, or even a “polypill,” or a single “magic-bullet” procedure can slow the aging process. In the past decades, striking advances in the understanding of the aging process have come from studies in animal models. Translation of these results to humans is not yet realistic. Even simple solutions require effort that is not easy to put into practice. A balanced diet of moderate proportions and regular exercise remain the only proven fountain of youth. In the future, stem cells, information/communication technology, nanotechnology, and robotics will change the health span.

Demographic changes will test the capacity of health systems to provide quality of life for millions of older persons. Support systems from governments will be needed to cope with the challenges of these new societies. This should transform views, priorities, and strategies, focusing on the promotion of a healthy lifestyle. Compression of morbidity and of disability rather than prolongation of survival should be the main goals of disease management in older persons.

**REFERENCES**

14. Song H, Song BW, Cha MJ, et al. Modification of mesenchymal stem cells to provide quality of life for millions of older persons. Support systems from governments will be needed to cope with the challenges of these new societies. This should transform views, priorities, and strategies, focusing on the promotion of a healthy lifestyle. Compression of morbidity and of disability rather than prolongation of survival should be the main goals of disease management in older persons.

**LIFESTYLE**

Currently, 3 lifestyle strategies with evidence-based, pleiotropic effects on longevity and disease incidence reduction exist: exercise, nutrition, and smoking avoidance.\textsuperscript{21} The effects of a healthy lifestyle have been known for decades and have been part of the World Health Organization’s approach to the prevention of chronic diseases across many nations. The unprecedented increase in type 2 diabetes incidence, despite the knowledge about lifestyle strategies, is the proof that implementing this knowledge is extremely difficult. Resources should be directed toward finding effective ways of executing these interventions. Examples of why resources should be relocated to prevention are the questionable results of drug trials for Alzheimer’s disease and the uncertainty of the utility of many medications in the old-old.

**CONCLUSION**

Who doesn’t hope for longevity combined with good health in later years? Because aging is complex, it is unlikely that one pill, or even a “polypill,” or a single “magic-bullet” procedure can slow the aging process. In the past decades, striking advances in the understanding of the aging process have come from studies in animal models. Translation of these results to humans is not yet realistic. Even simple solutions require effort that is not easy to put into practice. A balanced diet of moderate proportions and regular exercise remain the only proven fountain of youth. In the future, stem cells, information/communication technology, nanotechnology, and robotics will change the health span.

Demographic changes will test the capacity of health systems to provide quality of life for millions of older persons. Support systems from governments will be needed to cope with the challenges of these new societies. This should transform views, priorities, and strategies, focusing on the promotion of a healthy lifestyle. Compression of morbidity and of disability rather than prolongation of survival should be the main goals of disease management in older persons.

**REFERENCES**

14. Song H, Song BW, Cha MJ, et al. Modification of mesenchymal stem cells to provide quality of life for millions of older persons. Support systems from governments will be needed to cope with the challenges of these new societies. This should transform views, priorities, and strategies, focusing on the promotion of a healthy lifestyle. Compression of morbidity and of disability rather than prolongation of survival should be the main goals of disease management in older persons.

**CONCLUSION**

Who doesn’t hope for longevity combined with good health in later years? Because aging is complex, it is unlikely that one pill, or even a “polypill,” or a single “magic-bullet” procedure can slow the aging process. In the past decades, striking advances in the understanding of the aging process have come from studies in animal models. Translation of these results to humans is not yet realistic. Even simple solutions require effort that is not easy to put into practice. A balanced diet of moderate proportions and regular exercise remain the only proven fountain of youth. In the future, stem cells, information/communication technology, nanotechnology, and robotics will change the health span.

Demographic changes will test the capacity of health systems to provide quality of life for millions of older persons. Support systems from governments will be needed to cope with the challenges of these new societies. This should transform views, priorities, and strategies, focusing on the promotion of a healthy lifestyle. Compression of morbidity and of disability rather than prolongation of survival should be the main goals of disease management in older persons.