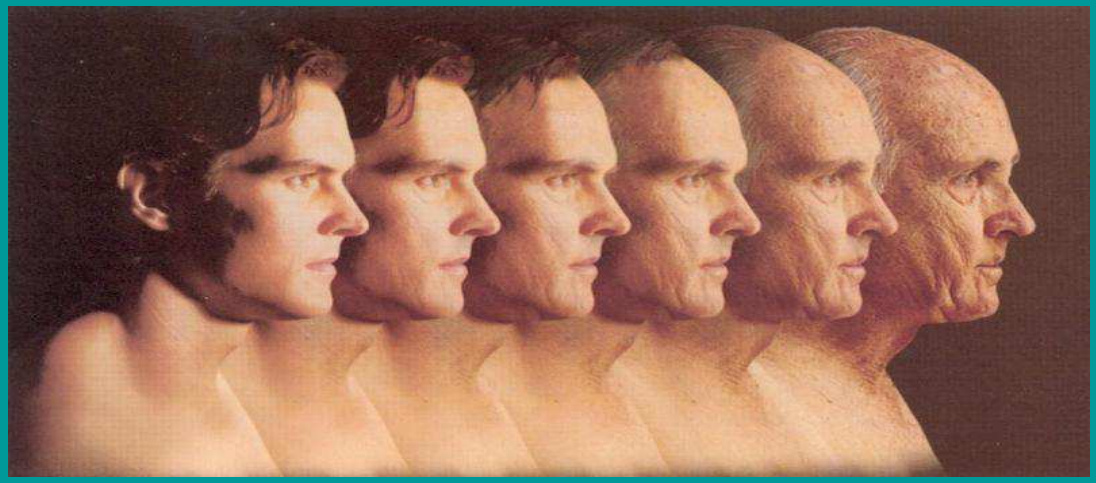
Aging.
Demographical data and socio-economical aspects.
Definitions of geriatrics and gerontology.

Aging *is a process of gradual maturation.*
Senescence *is the process by which the capacity for cell division and the capacity for growth and function are lost over time, ultimately leading to death.*



Aging is thought to have the **positive component** of development (eg, increased wisdom, experience, and expertise) and the **negative component** of decline. The term **senescence** is the most common term for the decline component and refers only to changes that are deleterious.

The changes that occur with aging can be categorized as those that result from aging itself and those that result from diseases, lifestyle, and exposures.

Normal aging is sometimes used to refer to changes attributed to aging itself.

Usual aging (sometimes also but confusingly referred to as normal aging) refers to the common complex of diseases and impairments that occur in many elderly people. However, this complex is hard to define because people age very differently: Some acquire diseases and impairments, and others seem to escape disease altogether and are said to have died of "old age." Some animals, including certain birds and fish, do not appear to age at all.

Successful (healthy) aging refers to a process by which deleterious effects are minimized, preserving function until senescence makes continued life impossible.

People who age successfully avoid experiencing many of the undesirable features of aging and, whether they have a disease or not, remain functional both physically and mentally.

The percentage of community-dwelling people > 65 who report needing assistance with activities of daily living has decreased over the last 2 decades, as has the percentage of people with debilitating disease.

One viable explanation for these changes is an increase in the percentage of people who are aging successfully, although there may be other explanations.

Disease versus aging:

With aging, many physiologic functions decline.

Many of these declines are attributed to aging itself; in other words, they are considered normal, not disease-related.

The distinction between normal and disease-related may be clear or may simply be defined by statistical distribution.

With presbyopia (decreased accommodation of the lens of the eye), the distinction seems clear because presbyopia occurs in virtually all elderly people and no cause or explanation has been identified other than aging itself.

However, with glucose control and cognition, statistical distribution may define the distinction between normal and disease-related.

Some degree of glucose intolerance is considered part of normal aging, but diabetes, although very common, is considered a disease.

Cognitive decline is nearly universal with aging and is considered normal aging; however, dementia, although common in late life, is considered a disease.

Longevity

The maximum life span--about 125 yr for women and somewhat shorter for men--has changed little in recorded history.

Several factors influence longevity:

•Heredity affects longevity primarily by influencing whether a person will contract a disease.

• Inheriting a propensity to hypercholesterolemia is likely to result in a short life, whereas inheriting genes that protect against coronary artery disease and cancer helps ensure a long life.

•Medical treatment contributes to increased survival after diseases are contracted, especially when diseases (eg, infectious diseases, some cancers) are curable.

• Another important influence on longevity is lifestyle.

• Not smoking, maintaining a healthy weight and diet, and exercising appropriately help people avoid disease.

• Similarly, some lifestyle choices help prevent injury.

•Exposure to environmental toxins can shorten life span even among people with the most robust genetic makeup.

Aging in Moldova

According to the data of the National Buro of Statistics – at 1 January 2007 the number of persons older than 65 years was 368615 persons.

The specific aspect for Moldova is the fact that 2/3 of persons are from the rural sector.

The mean longevity of life in Moldova is 68.4 years – 64.6 years for men and 72.2 years for women.

As the population >= 65 yr increases in the US and worldwide, demographics can help in the development of policies on aging.

World Demographics
Geriatric Essentials

By 2025, the world's population is expected to include > 830 million people >= 65.

The percentage of the population >= 65 will be highest in developed countries, but the absolute number will be higher in developing rather than developed countries.

Population Characteristics

The world's population is aging.

In Italy, Greece, and Sweden, > 17% of the population is >= 65, compared with 12.4% in the US.

Between 2002 and 2025, the total number of people >= 65 is expected to increase by 11 to 70% in European countries and by up to 170% in some developing countries.

By 2025, the countries with the highest percentage of people >= 65 are expected to be Japan (with 28%), Italy (with 24.7%), and Germany (with 24.6%).

However, because developing countries such as China and India have the largest total populations, they have and will continue to have the largest absolute number of elderly people.

In 2002, the greatest number of people >= 80 lived in China, followed by the US and India.

By 2025, the world's population is expected to include over 830 million people >= 65; most will live in developing rather than developed countries.

The exceptional growth in the percentage of the elderly worldwide is related to:

- the substantial decrease in birth rates during the past 25 yr in many countries,
- the migration of younger people out of certain areas because of economic reasons,
- and the decrease in overall mortality (including that due to infectious diseases in developing countries and that due to coronary artery disease and stroke in European and other developed countries).

In the US, Canada, and Australia, mortality due to coronary artery disease has decreased by an average of 50% during the past 25 yr.

Life expectancy:

Life expectancy, determined from mortality rate data for 2002, is longest for Japanese, Canadian, Australian, French, and Spanish women.

In most countries, men have a shorter life expectancy.

However, in some developing countries (eg, India, Bangladesh), life expectancy for men and women is nearly identical.

In countries such as those of the former Soviet Union, life expectancy decreased by about 4 yr in the early 1990s, probably because of a higher incidence of fatal disorders related to alcohol or cigarette use and because social and economic disruptions increased.

Ramifications for the elderly in these countries are uncertain, but the mortality rate for this group has increased.

Active or disability-free life expectancy:

Active or disability-free life expectancy (average number of years a person is likely to remain in an active or a nondisabled state) is calculated by using life table techniques that consider all possible transitions in and out of a disabled state.

The concept of active life expectancy has expanded to include higher orders of functioning, such as cognitive (eg, dementia-free) life expectancy.

In certain US communities, active life expectancy at age 65 seems to vary from 11.3 to 13.0 yr for men and from 15.3 to 17.1 yr for women.

In Japan, active life expectancy at age 65 seems to be slightly longer: 14.7 yr for men and 17.7 yr for women.

However, the usual self-reported measures of physical disability can be interpreted differently from country to country, possibly resulting in variation.

For all countries studied, physical disability (measured by calculating difficulty with activities of daily living) increases with aging.

The goal of medical care is to maintain physical functioning as long as possible and to postpone the onset of disability close to the time of death (called compression of morbidity or squaring of the morbidity curve).

Use of Health Care Services

As the number of elderly people increases, the global burden of age-associated chronic disorders (eg, cardiovascular disease, hip fracture, Alzheimer's disease) also increases.

People with these disorders are likely to need more medical services and home or institutional care.

For example, hip fractures commonly cause physical limitation, hospitalization, and a lengthy period of morbidity.

Hip fracture rates in 6 countries were compared, based on national hospital discharge data, and were corrected for national differences in counting transfers between hospitals.

Rates were high but somewhat variable.

They increased with aging and were higher in women than men.

Age-adjusted hip fracture rates were highest in Finland, the US, and Sweden for men and in Switzerland, the US, and Scotland for women. Rates were lowest in Venezuela and Chile.

The percentage of all people hospitalized each year varies widely throughout industrialized countries.

In 1996, hospitalization rates were highest in Austria, Finland, and Iceland (1 in 4 people) and lowest in Japan (1 in 10) and Mexico (1 in 17).

The median for industrialized countries was 1 in 6.

In the US, the rate was 1 in 8.

The average inpatient stay also varies widely; in 1996, the average was 10.6 days.

The average stay was longest in Japan and the Netherlands (> 32 days) and lowest in Denmark, Ireland, Mexico, New Zealand, Sweden, Turkey, and the US (< 8 days).

The rhytme of aging in Moldova is higer than in the developped countries.

The number of persons with the ege higer than 75 years increases.

The structure of the population of the Republic of Moldova is a little different according to the districts.

For example the indices of demographic aging:

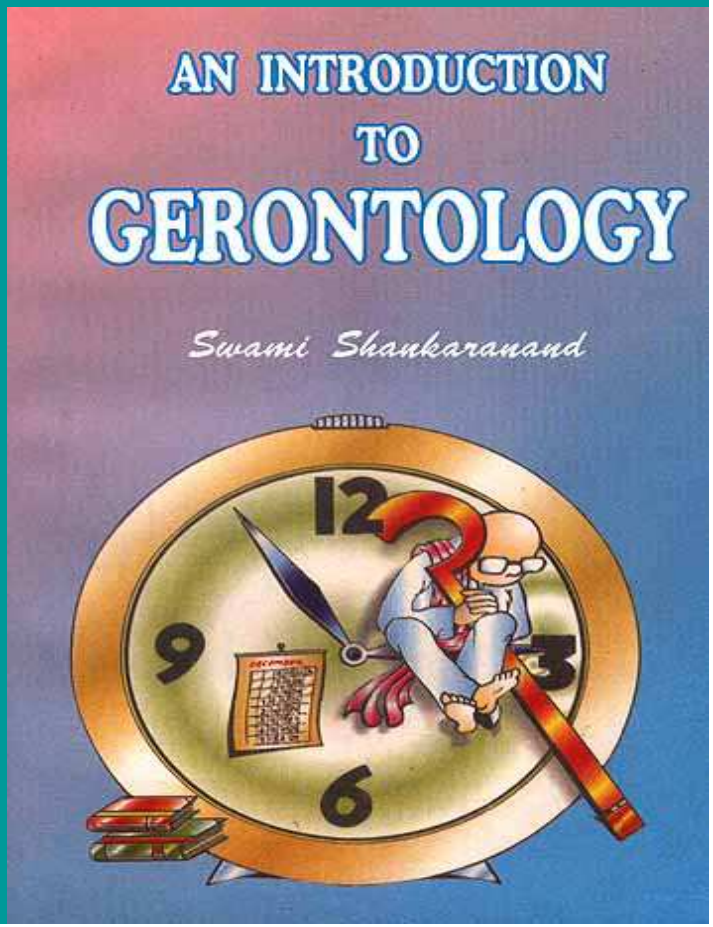
In the North are:

Donduseni – 24,9%, Briceni – 22,9%, Edinet – 22,5%, Drochia – 21,7%, Riscani – 21,8% et Ocnita – 21,1%.

In teh South are:

Ialoveni – 10,4%, Criuleni – 11,7%, Dubasari – 12,9%, et à Chisinau – 10,7%.

Geriatrics and gerontology



Geriatrics is the branch of medicine that focuses on health care of the elderly.

It **aims** to promote health and to prevent and treat diseases and disabilities in older adults.

Geriatrics was separated from internal medicine as a distinct entity in the same way that pediatrics is separated from adult internal medicine and neonatology is separated from pediatrics.

There is no set age at which patients may be under the care of a geriatrician. Rather, this is determined by a profile of the typical problems that geriatrics focuses on.

The term geriatrics differs from **gerontology** which is the study of the aging process itself.

The term comes from the Greek *geron* meaning "old man" and *iatros* meaning "healer".

However "Geriatrics" is considered by some as "Medical Gerontology".

Differences between adult and geriatric medicine

•The body of an elderly person is substantially different physiologically from that of an adult.
• Old age is the period of manifestation of decline of the various organ systems in the body.
•This varies according to various reserves in the organs, as smokers, for example, consume their respiratory system reserve early and rapidly.
•Many people cannot differentiate between Disease and Aging effects, e.g. renal impairment may be a part of aging but renal failure is not.
• Also urinary incontinence is not part of normal aging, but it is a disease that may occur at any age and is frequently treatable.
• Geriatricians aim to treat the disease and to decrease the effects of aging on the body.
•Years of training and experience, above and beyond basic medical training, go into recognizing the difference between what is normal aging and what is in fact pathological.

•The decline in physiological reserve in organs makes the elderly develop diseases (such as dehydration from a mild gastroenteritis) and be liable to complications from mild problems.
•Fever in elderly persons may cause confusion leading to a and to a fracture of the neck of the femur ("breaking her/his hip").
•Functional ability, independence and quality of life issues are of greater concern to geriatricians, perhaps, than to adult physicians.
•Treating an elderly person is not like treating an adult.
•A major difference between geriatrics and adult medicine is that elderly persons sometimes cannot make decisions for themselves.
• The issues of power of attorney, privacy, legal responsibility, and informed consent must always be considered in geriatric procedure.
• Elder abuse is also a major concern in this age group.
• In a sense, geriatricians often have to "treat" the caregivers and sometimes, the family, rather than just the elder.

•Elderly people have specific issues as regard medications.
•Elderly people particularly are subjected to polypharmacy due to many causes.
•Some elderly people have multiple medical disorders; some use many herbs; some adult physicians just prescribe medications to their specialty without reviewing other medications used by the elder patient.
•This polypharmacy may result in many drug interactions and may cause some drug adverse reactions.
•Drugs are excreted mostly by the kidneys or the liver, either of which maybe impaired in the elderly, and as a result the medication might need adjustment, either renal (kidneys) or hepatic (liver).
•The presentation of disease in elderly persons may be vague and non-specific, or it may include delirium or falls.
•(Pneumonia, for example, may present with fever, low-grade fever, dehydration, confusion or falls.)
• Some elderly people may find it hard to describe their symptoms in words, especially if the disease is active and causing confusion, or if they have cognitive impairment.
•Delirium in the elderly may be caused by a minor problem such as or by something as serious and life-threatening as a heart attack (myocardial infarction).

History of geriatrics

The Canon of Medicine, written by Abu Ali Ibn Sina (Avicenna) in 1025, was the first book to offer instruction in the care of the aged, foreshadowing modern gerontology and geriatrics.

In a chapter entitled "Regimen of Old Age", Avicenna was concerned with how "old folk need plenty of sleep", how their bodies should be anointed with oil, and recommended exercises such as walking or horse-riding.

Thesis III of the *Canon* discussed the diet suitable for old people, and dedicated several sections to elderly patients who become constipated.

The famous Arabic physician, Ibn Al-Jazzar Al-Qayrawani (Algizar, circa 898-980), also wrote a special book on the medicine and health of the elderly, entitled *Kitab Tibb al-Machayikh* or *Teb al-Mashaikh wa hefz sehatahom*.

He also wrote a book on sleep disorders and another one on forgetfulness and how to strengthen memory, entitled *Kitab al-Nissian wa Toroq Taqwiati Adhakira*, and a treatise on causes of mortality entitled *Rissala Fi Asbab al-Wafah*.

Another Arabic physician in the 9th century, Ishaq ibn Hunayn (died 910), the son of Hunayn Ibn Ishaq, wrote a *Treatise on Drugs for Forgetfulness* (*Risalah al-Shafiyah fi adwiyat al-nisyan*).

The first modern geriatric hospital was founded in Belgrade, Serbia in 1881 by doctor Laza Lazarević.
The term geriatrics was proposed in 1909 by Dr. Ignatz Leo Nascher, former Chief of Clinic in the Mount Sinai Hospital Outpatient Department (New York City) and a "Father" of geriatrics in the United States.
Modern geriatrics in the United Kingdom really began with the "Mother" of Geriatrics, Dr. Marjorie Warren.
Warren emphasized that rehabilitation was essential to the care of older people. Using her experiences as a physician in a London Workhouse infirmary, she believed that merely keeping older people fed until they died was not enough; they needed diagnosis, treatment, care and support.
She found that patients, some of whom had previously been bedridden, were able to gain some degree of independence with the correct assessment and treatment.

The practice of geriatrics in the UK is also one with a rich multi-disciplinary history.
It values all the professions, not just medicine, for their contributions in optimizing the well-being and independence of older people.
Another "hero" of British Geriatrics is Bernard Isaacs, who described the "giants" of geriatrics mentioned above: immobility and instability, incontinence and impaired intellect.
Isaacs asserted that if you look closely enough, all common problems with older people relate back to one or more of these giants.
The care of older people in the UK has been advanced by the implementation of the National Service Frameworks for Older People, which outlines key areas for attention.

Gerontology (from Greek: γέρον, *geron*, "old man"; and λόγος, *logos*, "speech" lit. "to talk about old age") is the study of the social, psychological and biological aspects of aging.

It is distinguished from geriatrics, which is the branch of medicine that studies the disease of the elderly.

Gerontology includes these and other endeavors:

- studying physical, mental, and social changes in people as they age;
- investigating the aging process itself (biogerontology);
- investigating the interface of normal aging and age-related disease (geroscience);
- investigating the effects of our aging population on society, including the fiscal effects of pensions, entitlements, life and health insurance, and retirement planning;
- applying this knowledge to policies and programs, including a macroscopic (i.e. government planning) and microscopic (i.e. running a nursing home) perspective.

The multidisciplinary focus of gerontology means that there are a number of sub-fields, as well as associated fields such as psychology and sociology that also cross over into gerontology.
However, that there is an overlap should not be taken as to construe that they are the same.

For example, a psychologist may specialize in early adults (and not be a gerontologist) or specialize in older adults (and be a gerontologist).

History of Gerontology

It may be said that the history of gerontology begins with agriculture; prior to this the hunter-gatherer societies that existed could only support a marginal existence: food supply was short; frequent movement a necessity.

These and other reasons meant that extremely few reached 'old age'. However, it could be argued that in a society with a life expectancy of 14 (such as 10,000 BC), being '40' was 'old'.

Things changed with the coming of agriculture.

A more stable food supply and the lack of frequent movement meant that humans could now survive longer, and beginning perhaps around 4000 BC, a regular segment of the population began to attain 'old age' in places such as Mesopotamia and the Indus river valleys.

Agriculture didn't simply bring a steady food supply; it also suddenly made older persons an economic benefit instead of a burden.

Older persons could stay and watch the farm (or children); make pottery or jewelry, and perform social functions, such as story-telling (oral tradition, religion, etc). and teaching the younger generation techniques for farming, tool-making, etc.

After this change, the views of elder persons in societies waxed and waned, but generally the proportion of the population over 50 or 60 remained small.

Note that in ancient Egypt, Pharaoh Pepi II was said to have lived to 100 years old.

Certainly Ramses II lived to about 90; modern scientific testing of his mummy supports the written record.

Ancient Greeks valued old persons for their wisdom (some reaching 80, 90, or 100 years old), while old age was devalued in Roman times.

In the medieval Islamic world, elderly people were valued by Muslim physicians.

Avicenna's *The Canon of Medicine* (1025) was the first book to offer instruction for the care of the aged, foreshadowing modern gerontology and geriatrics.

The Canon of Medicine recognized four periods of life: the period of growth, prime of life, period of elderly decline (from forty to sixty), and decrepit age.

He states that during the last period, "there is hardness of their bones, roughness of the skin, and the long time since they produced semen, and vaporal breath".

However, he agreed with Galen that the earth element is more prominent in the aged and decrepit than in other periods.

Avicenna did not agree with the concept of infirmity, however, stating: "There is no need to assert that there are three states of the human body—sickness, health and a state which is neither health nor disease. The first two cover everything."

The famous Arabic physician, Ibn Al-Jazzar Al-Qayrawani (Algizar, circa 898-980), also wrote a special book on the medicine and health of the elderly, entitled *Kitab Tibb al-Machayikh* or *Teb al-Mashaikh wa hefz sehatahom*.

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In medieval Europe on the other hand, during its Dark Ages, negative opinions of the elderly prevailed; old women were often burned at the stake as witches.

However, with the coming of the Renaissance old age returned to favor in Europe, as persons such as Michelangelo and Andrea Doria exemplified the ideals of living long, active, productive lives.

While the number of aged humans, and the maximum ages lived to, tended to increase in every century since the 1300s, society tended to consider caring for an elderly relative as a family issue.

It was not until the coming of the Industrial Revolution with its techniques of mass production that ideas shifted in favor of a societal care-system.

Care homes for the aged emerged in the 1800s.

Note that some early pioneers, such as Michel Eugène Chevreul, who himself lived to be 102 in the 1880s, believed that aging itself should be a science to be studied.

The word itself was coined circa 1903.

It was not until the 1940s, however, that pioneers like began organizing 'gerontology' into its own field.
Recognizing that there were experts in many fields all dealing with the elderly, it became apparent that a group like the Gerontological Society of America was needed (founded in 1945).
Two decades later, James Birren was appointed as the founding director of the first academic research center devoted exclusively to the study of aging, the Ethel Percy Andrus Gerontology Center at the University of Southern California.
In 1975, the USC Leonard Davis School of Gerontology became the first academic gerontology department, with Birren as its founding dean.
In the 1950s to the 1970s, the field was mainly social and concerned with issues such as nursing homes and health care.
However, research by Leonard Hayflick in the 1960s (showing that a cell line culture will only divide about 50 times) helped lead to a separate branch, biogerontology.
It became apparent that simply 'treating' aging wasn't enough.
Finding out about the aging process, and what could be done about it, became an issue.

The biogerontological field was also bolstered when research by Cynthia Kenyon and others demonstrated that life extension was possible in lower life forms such as fruit flies, worms, and yeast.

So far, however, nothing more than incremental (marginal) increases in life span have been seen in any mammalian species.

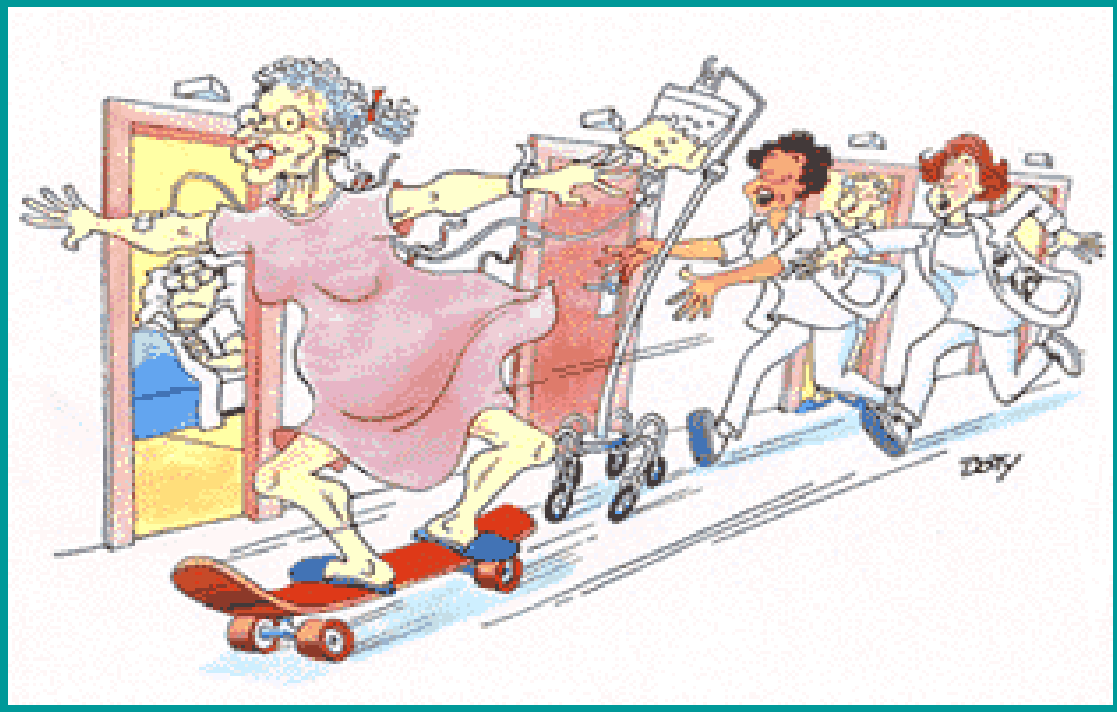
Today, social gerontology remains the largest sector of the field, but the biogerontological side is seen as being the 'hot' side.

The goal of gerontology is the successful aging along with the increase of longevity.

For every person it is convenient to promote the helth aging by the life hygiene, a good social life, an adequate place of living ...

So, a trough gerontologic culture must be developped, including the reletions in the society.

The geriatrics goals are the pathology treatment and in the chronic cases to mantain an optimal quality of life in dependence on the situation.
It is important to establish a good tactic for the modality of living, to make a psychologic and social support.



Geriatrician

-A doctor

-Must prevent and eliminate the pain of the patient

-Knows how the practical health old person looks like

-Must be gerontologist and know the gerontopsyhology, social gerontology

-Has the goal to solve the real, complex situations which have a different aspect

-Must know the cardiology, neurology, endocrinology, rehabilitation ...

The geriatric pathologies

-Polypathology
-Atypical presentation
-4 giants of geriatrics - Immobilization, Instability, Incontinence, Intellect disturbances
-Less expressive clinical picture
-The acute disease represents a “rupture” with the autonomy loss and confusion which very quickly leads to death
-The chronic situation is the source of dependence
-The urgent necessity of the geriatric evaluation (social, functional, psychological)