

Surgical Management of Elderly Patients

Antonio Crucitti
Editor


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*To my wife Fiorella, driving force, sense,
and sensibility of my life*

Foreword



It's with great pleasure that I present this book *Surgical Management of Elderly Patients* by Antonio Crucitti, President of the Italian Society of Geriatric Surgery.

I think the editor and all the other distinguished contributors have to be commended for their efforts to put together a complete and exhaustive list of topics covering the entire spectrum of surgical diseases in the elderly patient.

Geriatric surgery is not to be intended as a new surgical specialty, since most surgeons already act as "geriatric surgeons," due to the constant increase of elderly population and the need to face surgical problems even in the very old patients.

So it's timely and very useful to assemble a comprehensive book that will allow the entire surgical community and other healthcare providers to understand the issues involved in choosing surgery as a treatment option for their patients.

I'm quite sure that this text will find its definite place in the bookshelf of all surgeons.

A handwritten signature in blue ink that reads "Marco Montorsi". The signature is written in a cursive, flowing style.

Marco Montorsi
President of the ITALIAN SOCIETY of Surgery
Rozzano, Italy

Preface



The geriatric population is incredibly increasing worldwide.

Europe and many other countries in the world are currently facing increasingly complex and systemic societal challenges. Due to healthcare advances, increased wealth, improved well-being, and living standards, life expectancy has dramatically increased during these past decades. The world will have more people who live to see their 80s or 90s than ever before, even because we are attending the baby boomer generation growing and becoming older.

It is projected that between 2010 and 2060, the number of Europeans aged over 65 will double, from 88 to 153 million (about 30% of the EU population will be aged 65 + [14]). The rise of the “oldest old” is the fastest-growing part of the total population, since those over 80 will nearly triple, from 24 to 62 million.

What happens in Europe is the counterpart of a global situation: the world’s population aged 65 and over is projected to grow from 524 million to nearly 1.5 billion between the years 2010 and 2050. The number of people aged 65 or older will outnumber children under age 5, and this population aging is not only going to continue but also accelerate.

This impressive growing prompted us, as health operators, to propose continuous and adaptable clinical routes, especially related to geriatric patients. It’s time for us all to focus on approved protocols, shared clinical course, and referring centers dedicated to geriatric evaluation, with closed relations with public or academic hospitals or territorial centers, to better select surgical candidates.

We all must also be ready to recognize that multiparametric evaluation has to be related to surgical procedures; we need to create a trans-institutional relationship and multidisciplinary models that have to consider old-aged criticisms during their route, not only gaining their health status or social value but also preserving their quality of life.

Only through these modalities could we reach real advantages, considering the growing “health needs” and the more specific surgical issues, approaching these “frailty” and “demanding” patients, with new comprehensive eyes and not only from an exclusively surgical point of view.

The purpose of this book is to provide an updated, synthetic guide on the most important surgical pathologies of the elderly. Here is also supplied an essential contribution from geriatrician and anesthesiologists, and a particular focus is also present on hemostasis and thrombosis and vascular and emergency surgery.

I sincerely thank the Board of the Italian Society of Geriatric Surgeons, for its support in writing this book.



Rome, Italy
October 6, 2017

Antonio Crucitti
President of the Italian Society of
Geriatric Surgeons
Rome, Italy

Contents

Part I General Principles and Epidemiology

1 Aging: from Demography to Epidemiology	3
Nicola Ferrara, Klara Komici, Giuseppe Rengo, and Graziamaria Corbi	
2 Anesthesia for the Elderly Patient	9
Concezione Tommasino and Antonio Corcione	
3 Principles of Geriatric Surgery	31
Mario Nano and Mario Solej	
4 Perioperative Management	47
Piergaspare Palumbo, Marco Scatizzi, Giorgia Prestigiacomio, and Maddalena Baraghini	
5 Risk of Venous Thromboembolism in Surgical Elderly Patients	65
Anna Falanga and Viola Milesi	

Part II Endocrine Surgery

6 Thyroid and Parathyroid Diseases in Elderly Patients	81
Silvestro Canonico, Massimo De Falco, and Giuseppe Santangelo	
7 Breast Cancer Management in the Older Woman	97
Marsilio Francucci, Roberto Cirocchi, and Marina Vinciguerra	
8 Surgical Approach to Adrenal Diseases in the Elderly	111
Andrea Valeri, Andrea Polistena, Carlo Bergamini, and Nicola Avenia	
9 Pancreatic Neuroendocrine Tumors (pNETs)	129
Alessandro Sanguinetti, Andrea Polistena, Louis Banka Johnson, and Nicola Avenia	

Part III Gastrointestinal System

- 10 Esophageal Cancer** 161
Di Martino Natale and Monaco Luigi
- 11 Cancer of the Stomach** 179
Roberto Vergari, Vanessa Polenta, and Cristina Marmorale
- 12 Surgical Treatment of Inflammatory Bowel Diseases
in the Elderly** 191
Francesco Colombo, Gianluca Pellino, Gianluca Sampietro,
Francesco Selvaggi, Silvestro Canonico, and Diego Foschi
- 13 Diverticulosis and Diverticulitis** 207
Binda Gian Andrea, Cassini Diletta, Gianandrea Baldazzi,
and Nascimbeni Riccardo
- 14 Surgical Management of Colorectal Cancer in the
Elderly Patient** 229
Andrea Mazzari, Pasquina Tomaiuolo, Federico Perrone,
Federico Sicoli, and Antonio Crucitti
- 15 Surgical Management of Full-Thickness Rectal Prolapse
in the Elderly Patient** 241
Francesco Gabrielli, Angelo Guttadauro, Matteo Maternini,
and Nicoletta Pecora

Part IV Vascular Disorders

- 16 Cerebrovascular Disease and Critical Limb Ischaemia** 257
Carlo Setacci, Maria Agnese Mele, Giuseppe Galzerano,
Giuseppe de Donato, Domenico Benevento,
Massimiliano Walter Guerrieri, Francesco Setacci,
and Bruno Amato
- 17 Acute Peripheral Arterial Disease** 271
Francesco Speziale, Pasqualino Sirignano, Simone Cuozzo,
Wassim Mansour, Chiara Pranteda, Martina Formiconi,
Alessandro d'Adamo, and Laura Capoccia
- 18 Aortic Aneurysm in Elderly Patients** 281
Andrea Stella, Erico Gallitto, Chiara Mascoli, Rodolfo Pini,
and Alessia Sonetto
- 19 Venous Disorders of the Leg** 287
Stefano de Franciscis and Raffaele Serra

Part V Hepato-Biliary System

- 20 Cholecystectomy in Elderly: Challenge and Critical Analysis of Available Evidence** 299
Alessandro Puzziello, Domenico Landi, Fernando Vicinanza,
Giulia Pacella, Giulio Orlando, and Ileana Maria Luppino
- 21 Cancer of the Gallbladder and Biliary Tree** 311
Marco Filauro, Giulio Angelini, Federico Fazio,
and Andrea Barberis
- 22 Pancreatitis** 327
Francesco Basile, Antonio Biondi, Guido Basile,
and Marcello Donati
- 23 Benign and Malignant Lesions of the Liver** 335
Francesca Romana Ponziani, Giulia Gibiino, and Antonio Gasbarrini
- 24 Pancreatic Tumors** 347
Sergio Alfieri, Fausto Rosa, Dario Di Miceli,
and Giovanni Battista Doglietto

Part VI Abdominal Wall Defect and Soft Tissue Sarcoma

- 25 Primitive Groin Hernias** 367
Bruno Martella, Renata Lorenzetti, and Anna Claudia Colangelo
- 26 Incisional Hernias** 375
Carmelo Militello and Franco Mazzalai
- 27 The Management of Soft Tissue Sarcoma in the Elderly** 385
Sergio Sandrucci

Part VII Trauma and Non Traumatic Emergencies

- 28 Trauma in Geriatric Age** 399
Emanuele Rausa, Federico Coccolini, Giulia Montori,
Maria Agnese Kelly, Baggi Paolo, Dario Piazzalunga, Cecilia Merli,
and Luca Ansaloni
- 29 Bowel Obstructions** 411
Gennaro Perrone, Luca Ansaloni, Federico Coccolini,
Salomone Di Saverio, Massimo Sartelli, and Fausto Catena
- 30 Acute Peritonitis** 423
Massimo Sartelli, Federico Coccolini, Fausto Catena,
and Luca Ansaloni
- 31 Upper and Lower Gastrointestinal Bleeding** 427
Paola Fugazzola, Giulia Montori, Camilla Bing, Fausto Catena,
Massimo Sartelli, Luca Ansaloni, and Federico Coccolini

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Part I

General Principles and Epidemiology



Aging: from Demography to Epidemiology

1

Nicola Ferrara, Klara Komici, Giuseppe Rengo,
and Graziamaria Corbi

1.1 Demographic Aspects of Aging

Aging of the worldwide population is progressively increasing, in relation to augmented life expectancy (LE), which in 2016 was around 71.4 years according to the World Health Organization (WHO), with a greater expectation in women than men all over the world [1]. Today, for the first time in history, even in less developed countries, most people can expect to live for more than 60 years, especially because of the reduction in childhood mortality [2], while in high-income countries, it is mainly due to the increase in life expectancy of over 60-year-old individuals [3, 4]. Currently, it has been estimated that life expectancy of 60-year-old people rose from 18.7 years in 2000 to 20.4 years in 2015, with different regional rates. In particular, 12 European countries, including Italy, in 2015 showed a life expectancy that exceeded 82 years of age, with women living longer than men in every part of the world [1]. In 2016, WHO data underlined that LE was 73.8 years for women and 69.1 years for men, quite similar to 2015 data [1].

In Europe, Eurostat data demonstrated that in 2015 over 65-year-old persons represented 18.9% of the total population [5], with an expected increase to a peak of 525.5 million around 2050 followed by a gradual decline to 520 million in 2080 [6]. The comparison of 2015 and 2080 data projection shows that Europe's population will continue to age, especially because of the "baby boomer" progressive aging [6]. Importantly, the progressive aging of the older population itself should be considered, given the increase at a faster rate of the over 80-year-old population, which is expected to double between 2015 and 2080, rising from 5.3 to 12.3%. As a result of these population changes between different age groups, the old-age dependency

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ratio (the ratio between the elderly population and the working age population (15–64)) is projected to change from 28.8% in 2015 to 51.0% by 2080 [6]. The Italian Institute of Statistics (IIS) showed that in 2016, Italy was at third place in Europe for longevity, with a LE of 84.7 years for women and 80.1 years for men, and the prediction for 2065 reached 91.5 years for women and 86.6 years for men [7].

Beyond LE if we consider health life expectancy (HLE), it is clear that between the two parameters there is a gap. HLE provides a comprehensive indicator of health in a population, representing the average number of years in full health that a newborn could expect to live considering the specific mortality rates by age and average age-specific levels of health status for a given period [8]. Globally it is estimated that in 2015 the global HLE was 63.1 years for both women and men. The gap between LE and HLE is the equivalent of the years spent in comorbidity and disability [8]. The main factors contributing to these conditions are represented by chronic diseases (particularly depression, neurological disorders, loss of vision and hearing, cardiovascular disease, and diabetes) [1]. The majority of these conditions increase with age, and for many of them, the prevalence, even after correction for age, does not tend to decline. Therefore, the proportion of years spent in illness increases, with a consequent slower increase of HLE compared to LE [1]. In 2016, the WHO has calculated that the HLE was 61.5 years for men and 64.6 years for women with substantial gender differences in all regions of the world [1]. In Italy, beyond the longevity, the quality of survival is also improved, particularly among young seniors (65–74 years) [9], with 65-year-old subjects expected to experience a LE without functional limitations of 12.7 years for men and 14.2 for women in 1994, compared to the 15.5 years for men and 16.2 for women reached in 2013 [9].

1.2 Epidemiological Aspects of Aging

According to WHO data in 2016, noncommunicable chronic diseases were the main cause of health loss in more than half of cases [10]. Eurostat data shows that the elderly (≥ 65 years old) represented more than 2/5 (42.2%) of all disabled persons in the European Union in 2012 [11], with a probability of 4.2 times higher for the presence of disability in subjects ≥ 65 years compared to those aged between 15 and 44 years [11]. In Italy, in 2013 the first generation of “baby boomers” arrived at the old-age threshold in better health condition than previous generations: functional limitation is lower and also the self-reporting of “feeling bad or very bad” [9]. Aging itself determines an overall increasing level of chronic diseases in the elderly, although analysis of generation reports that particularly among young seniors (65–74 years) [9], the presence of serious chronic diseases is diminishing over the years, primarily as a result of preventive measures implemented in recent years. In 2015, IIS data showed that 24.8% of over 75-year-old persons enjoy good health, while 85.2 and 65.4% are, respectively, affected by at least one or two chronic diseases. Among over 75-year-old subjects with chronic diseases, 20.4% appear to be in good health [12], although 88.1% of them report at least one drug use in the last 2 days [13]. From 2011 to 2015, we find an increase in the use of drugs: in over 65-year-old

subjects from 79.6% in 2011 to 82.1% in 2015 [14], with an increase in consumption also in relationship to age (75.8% in subjects 65–74 years against 88.1% of those over 75) [14]. As a result, drug-related adverse events in general practice are an important cause of morbidity and are thought to be responsible for 10–30% of all hospital admissions in older patients [15]. Importantly different studies have shown that 52.3% of elderly patients use an inappropriate drug therapy [16]. The 2015 OSMED report shows that 44.8% of reported adverse drug reactions (excluding vaccines) relate to subjects of ≥ 65 years [17].

With regard to hospitalization frequency, although the total number of hospital admissions has been reduced (by over 12.8 million in 2001 to 9.4 million in 2014) (–26.7%), affecting only the component of acute care hospitalization (–29.2%), which is the main reason for admission (91.1% in 2014), in the geriatric population, 45.1% of men ≥ 65 years (24.7% in those ≥ 75 years) and 40.8% of women of the same age (23.9% in those ≥ 75 years) appeared to have been hospitalized in 2014 [18]. Furthermore, in contrary to what occurs in the general population, by comparison with 2001, in 2014 admissions of persons ≥ 75 years had an increased cost: equal to 7.3% in men and stable in women, because of disease severity [18].

With regard to “frailty,” its definition has been debated for a long time in the context of geriatrics [19–23]. According to Fried, frailty can be defined as a condition characterized by a reduction in the functional reserve with an age-dependent increase of vulnerability (so-called preclinical frailty) [21]. Acute events, which in non-vulnerable subjects are easily managed, may precipitate the clinical conditions of patients with preclinical frailty. A typical example of an acute event, which can achieve a critical framework in a fragile subject, is represented by the glyco-metabolic decompensation of both hyper- and hypoglycemic types. For these reasons these subjects need a more careful monitoring of the glyco-metabolic compensation.

The preclinical frailty framework is further aggravated in presence of particular characteristics of clinical frailty including comorbidity, polypharmacy with the relative high risk of iatrogenic damage, social and economic problems, and characteristics that lead inexorably toward a severe disability framework. Such a clinical phenotype has been proposed by Rockwood et al. [24] that focuses on the disease at the center of frailty.

In this framework diabetes and its complications play a central role in determining frailty.

The indices of Fried [19] and Rockwood [22] certainly represent the most used indexes in the definition of frailty, but they have also had more confirmations from the point of view of prognostic value in the literature.

Fried’s index (Table 1.1) is used to define the fragile phenotype in preclinical phase. Recently Op et al. [25] reported that in 8684 elderly patients, this tool effectively discriminated the social, psychological, and functional treatment of vulnerable subjects, allowing a better definition and treatment. In addition, several studies confirm its prognostic value in falls, disability, fractures, and death [26].

Frailty in the clinical index of Rockwood was constructed by counting the number of deficits accumulated over time, within a very extensive list of 70 clinical deficits (Table 1.2).

Table 1.1 Definition of preclinical frailty phenotype (*modified*) [24]

(A) <i>Characteristics of frailty</i>
Weight loss (unintentional)
Sarcopenia (muscle mass loss)
Weakness
Poor endurance
Low activity
(B) <i>Cardiovascular health study measures</i>
>4.5 kg (10 lbs) in the year before the current evaluation or unintentional weight loss of at least 5% of the previous year's body weight
Grip strength of the dominant hand lower than 20% (for sex, body mass index)
Self-reported exhaustion
Reduced energy consumption
Kcal/week: lower than 20%
M: <383 kcal/week
F: <270 kcal/week
(C) <i>Presence of frailty</i>
Frail phenotype: ≥ 3 positive criteria

Table 1.2 Frailty hypothesis of Rockwood (*modified*) [27]

1. <i>Very fit</i> . People who are robust, active, energetic, well motivated, and fit; these people commonly exercise regularly and are the fittest for the age
2. <i>Well</i> . People without active disease symptoms, but less fit than category 1. Often, they exercise or are very active occasionally, e.g., seasonally
3. <i>Managing well</i> . People whose medical problems are well controlled, but are not regularly active beyond routine walking
4. <i>Vulnerable</i> . While not dependent on others for daily help, often symptoms limit activities. A common complaint is being "slowed up" and/or being tired during the day
5. <i>Mildly frail</i> . These people often have more evident slowing and need help in high-order IADLs (finances, transportation, medications, heavy housework). Typically, mildly frail progressively impairs shopping and walking outside alone, meal preparation, and housework
6. <i>Moderately frail</i> . People need help with all outside activities and with keeping house. Inside they have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing
7. <i>Severely frail</i> . Completely dependent for personal care from whatever cause (physical or cognitive). Even so they seem stable and not at risk of dying (within 6 months)
8. <i>Very severely frail</i> . Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness
9. <i>Terminally ill</i> . Approaching the end of life. This category applies to people with a life expectancy <6 months, who are not otherwise evidently frail

It was developed based on a comprehensive geriatric assessment by counting the number of accumulated deficits, including diseases, physical and cognitive impairments, the psychosocial risk factors, and geriatric syndromes other than weakness [27, 28]. To consider a different variable as a deficit, it must be acquired, associated with age, and with a negative outcome. The total number of deficits that can be used is considered to be equal to 80, with 30–70 elements typically evaluated [29].

In comparison with Fried's index, Rockwood seems to be a more sensitive predictor for adverse health outcomes, due to its more finely graduated scale of risk and the inclusion of deficits that probably have causal relationships with adverse clinical outcomes [30].

Conclusions

To meet the challenges that demography and epidemiology are bringing to our societies, even those with a high standard of living, several care and health strategies that have been followed until now should be reviewed. In particular, the care interventions for the elderly, considered as frail and complex subjects, must be planned and implemented to be effective as part of a network of geriatric continuing care. Then interventions should respond to a multidisciplinary and multi-professional logic and take place in organized and specialized structures, where the criterion for admission must not be related to age, but should be reserved mainly for the frail elderly, after a careful assessment performed using validated multidimensional tools.

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