

# Geriatric Care and Treatment

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A systematic compilation of existing scientific literature

*April 2003*



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SBU • Statens beredning för medicinsk utvärdering  
*The Swedish Council on Technology Assessment in Health Care*



# Contents

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<b>1. Summary</b> – <i>Gunnar Akner</i>	<b>9</b>
<b>2. Background</b> – <i>Gunnar Akner</i>	<b>23</b>
<b>3. Methods</b> – <i>Gunnar Akner</i>	<b>43</b>
<b>4. Cognitive disorders, including confusional states</b> – <i>Sture Eriksson and Lars-Olof Wahlund</i>	<b>49</b>
<b>5. Depression</b> – <i>Sture Eriksson</i>	<b>85</b>
<b>6. Stroke</b> – <i>Ingegerd Nydevik</i>	<b>99</b>
<b>7. Parkinson’s disease</b> – <i>Ann-Kathrine Granérus</i>	<b>119</b>
<b>8. Heart failure</b> – <i>Thomas Wallén and Bodil Lernfelt</i>	<b>129</b>
<b>9. High blood pressure (hypertension)</b> – <i>Bodil Lernfelt and Thomas Wallén</i>	<b>139</b>
<b>10. Chronic obstructive pulmonary disease (COPD)</b> – <i>Bodil Lernfelt</i>	<b>149</b>
<b>11. Osteoporosis and fracture prevention</b> – <i>Dan Mellström</i>	<b>163</b>
<b>12. Infections</b> – <i>Ragnar Norrby</i>	<b>171</b>
<b>13. Urinary incontinence</b> – <i>Ulla Molander</i>	<b>189</b>
<b>14. Chronic pain</b> – <i>Karin Styrborn</i>	<b>201</b>
<b>15. Skin ulcers – venous leg ulcers, diabetic foot ulcers and pressure ulcers</b> – <i>Vivianne Schubert</i>	<b>215</b>
<b>16. Drug treatment</b> – <i>Gunnar Akner and Lars Boréus</i>	<b>233</b>
<b>17. Malnutrition</b> – <i>Gunnar Akner</i>	<b>257</b>

<b>18. Emergency geriatric care – Åke Rundgren</b>	<b>265</b>
<b>19. Geriatric rehabilitation, teamwork</b> – Karin Styrborn and Sölve Elmståhl	<b>277</b>
<b>20. Coordinated service and care planning</b> <b>(case management) in geriatrics and community</b> <b>care – Karin Styrborn</b>	<b>295</b>
<b>21. Palliative care – Ulla Molander</b>	<b>307</b>
<b>22. Comments from a nursing perspective – Helle Wijk</b>	<b>315</b>
<b>23. Glossary</b>	<b>325</b>
<b>Contributors to this report</b>	<b>329</b>

## List of tables

---

1	Medical analysis of an 85-year old woman with multiple diagnoses	16
2	Treatment methods	36
4.1	Treatment of cognitive disorders in the elderly	55
4.2	Treatment of confusion/delirium in the elderly	62
5	Treatment of depression in the elderly	88
6.1	Stroke in elderly patients. Treatment in the acute phase	105
6.2	Stroke in elderly patients. Treatment later in the progression	106
6.3	Stroke in elderly patients. Preventive treatment (secondary prevention)	109
7	Treatment of Parkinson's disease in the elderly	124
8.1	Treatment of heart failure in elderly patients aged 75+	133
8.2	Treatment of heart failure in elderly patients aged 65+	134
9	Treatment of high blood pressure in elderly people	143
10	Treatment of chronic obstructive pulmonary disease (COPD) in the elderly	153
11	Treatment of osteoporosis and fracture prevention in elderly people	166
12.1	Infections in the elderly. Treatment of lower respiratory tract infections	175
12.2	Infections in the elderly. Treatment of urinary tract infections	176
12.3	Infections in the elderly. Treatment of herpes zoster (shingles)	177
12.4	Infections in the elderly. Vaccinations	178
13	Treatment of urinary incontinence in the elderly	192
14	Managing chronic pain in the elderly 65+	209
15.1	Treatment of venous leg ulcers in the elderly	220
15.2	Treatment of diabetic foot ulcers in the elderly	222
15.3	Treatment of pressure ulcers in the elderly	223
16.1	Drug treatment in the elderly – problem areas	241
16.2	Drug treatment in the elderly – individual drugs	242
17	Treatment of malnutrition in the elderly	261
18	Treatment studies relating to emergency geriatric care	272
19	Geriatric rehabilitation, teamwork 80+ (years)	286
20.1	Coordinated service and care planning, inclusion age 75+	302
20.2	Coordinated service and care planning, inclusion age 65+	302
21	Palliative care of the elderly	310

## List of figures

---

1.1	Potential connections between the patient's symptoms and objective findings	18
1.2	Comparison of the number of RCTs, CCTs and UCTs for each problem area, in the order in which they occur in this report	19
1.3	Comparison of the number of RCTs and CCTs for the problem areas, in descending order by RCT	20
1.4	Comparison of the number of RCTs for drug studies with the number of RCTs for other treatment methods, in descending order by drug RTCs	21
1.5	Compilation of the number of inpatient diagnoses in 1999 (according to the Swedish National Board of Health and Welfare register) for the problem areas discussed in this report	22
2.1	The organization of elderly care	25
2.2	Citizen demands – science	33
2.3	Quality of life in elderly care	35
2.4	Examples of professional groups often involved in the treatment and care of elderly people	37
4	The diagnosis of dementia in an age range of 5-year intervals	63
5	The diagnosis of depression in an age range of 5-year intervals	92
6	The diagnosis of stroke in an age range of 5-year intervals	110
7	The diagnosis of Parkinson's disease in an age range of 5-year intervals	125
8	The diagnosis of chronic heart failure in an age range of 5-year intervals	135
9	The diagnosis of high blood pressure in an age range of 5-year intervals	145
10	The diagnosis of chronic obstructive pulmonary disease (COPD) in an age range of 5-year intervals	156
11	The diagnosis of osteoporosis in an age range of 5-year intervals	167
12.1	The diagnosis of pneumonia in an age range of 5-year intervals	179
12.2	The diagnosis of urinary tract infection in an age range of 5-year intervals	180
12.3	The diagnosis of herpes zoster (shingles) in an age range of 5-year intervals	181
13	The diagnosis of urinary incontinence in an age range of 5-year intervals	195
14	The diagnosis of chronic pain in an age range of 5-year intervals	211
15	The diagnosis of skin ulcers in an age range of 5-year intervals	225
16	Top 20 drug sales (DDD) to persons over 65 years of age in Sweden in 2000	244
17	The diagnosis of malnutrition in an age range of 5-year intervals	262

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## Chairman and editor

Gunnar Akner

## Planning group

Gunnar Akner

Sölve Elmståhl

Karin Styrborn

Helle Wijk

## Authors

Gunnar Akner

Sölve Elmståhl

Ann-Kathrine Granéus

Dan Mellström

Ragnar Norrby

Åke Rundgren

Karin Styrborn

Thomas Wallén

Lars Boréus

Sture Eriksson

Bodil Lernfelt

Ulla Molander

Ingegerd Nydevik

Vivianne Schubert

Lars-Olof Wahlund

Helle Wijk

## Editors

Helena Dahlgren

Ewalotte Ränzlöv

## English translation

Jennifer Evans



# 1. Summary

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*Gunnar Akner*

## Summary

The vast majority of elderly people in Sweden are in good health and can take care of themselves into a very advanced age. However, many suffer from illnesses and injuries that can cause various functional impairments and subsequent need for care. Elderly people treated in inpatient facilities or living in municipal “special housing” often suffer from several concurrent chronic diseases (multimorbidity) and conditions after injuries (stroke, fractures, etc) – and many concurrent treatments (multiple treatments). This group of elderly patients often need significant care from the public sector.

## Multimorbidity

The problem of multiple diagnoses (multimorbidity) in elderly people is illustrated in Table 1 on page 16, with a problem analysis of an 85-year old woman. When elderly people with multimorbidity come in for a medical consultation, they often generate a long list of symptoms and signs, which can be linked (with varying degrees of probability) to diseases, conditions after injuries, drug side effects, somatization of social and psychological problems, etc. This whole complex presentation of symptoms, functional impairments, organ and system diseases and possible drug side effects often changes unpredictably over time. The chronic problems are compounded by acute incidents (CVA, infections, falls, fractures, etc) in the “downhill” process of aging, with all the ethical problems that this brings. At the same time, the elderly patient’s wishes and values must be respected in a complex organization with a multitude of professional categories and many more individual caregivers.

As Table 1 shows, analyzing this complicated medical situation requires broad medical skills, time, computerized information processing and

good continuity. Since many professional groups are involved in the care of the individual elderly patient, the need for coordination in both assessing the patient and setting up a treatment program is crucial (Figure 1.1). In addition, a well thought-out system for evaluating the progress and effect of all the treatment measures over time is vital. It is crucial that geriatric care be reorganized to meet these needs for assessment and coordination.

As a matter of human rights, all treatments must be based as strongly as possible on solid scientific knowledge and a recommended treatment must have a reasonable chance of improving the ailment/symptoms. This is as important for a 40-year old with a suspected acute myocardial infarction, as for an 85-year old patient with multiple ailments. It would be unacceptable age discrimination (ageism) if people over a certain age were not given access to the same qualified medical assessment and treatment as younger patients.

## **Format of the report**

What expertise is available on the care of the elderly? This report summarizes the results of an extensive systematic literary review aiming to catalog (but not evaluate) the published literature on treatment studies in 18 different areas that are significant to geriatric care – care of patients older than 65. The aim has been to provide a basis for SBU to prioritize important evaluation projects in the field of geriatric care.

Each chapter/problem area has four sections: Definition, Background, Summary of published trials and Comments. The trials are listed in table form with treatment methods listed by row and types of trials listed by column, divided into:

- Randomized controlled trials (RCT)
- Controlled clinical trials (CCT)
- Uncontrolled clinical trials (UCT)

One or two primary authors are responsible for each chapter. In addition, special searches have been made on the areas of Nursing and Physiotherapy/Physical training for each chapter. These search results are also included in the tables of each chapter.

The goal of these uniform tables is to clearly show which treatment methods have been studied for each problem area, without linking this to medical specialties, activities or professional categories.

It is important to emphasize that the report only compiles *the number* of published scientific treatment trials in each problem area. None of the individual studies are evaluated here, as regards quality or results. The tables simply indicate how many trials of each type exist in each area.

Besides the literature review for the 18 problem areas (with reference lists at the end of each chapter), the report contains three additional chapters: “Background,” “Methods” and “Comments from a nursing perspective.”

Figure 1.2 shows a compilation of the number of RCTs, CCTs and UCTs for the 18 problem areas in the order in which they are covered in the report.

Figure 1.3 shows the number of RCTs and CCTs only as listed in Figure 1.2, but sorted by number of RCTs in descending order. This table shows that there are far more RCTs, nearly 200, for cognitive disorders (dementia conditions). As an aside, there are 51 published RCTs on acetylcholine esterase inhibitors. After that are an array of problem areas with about 50 RCTs on things like stroke, infections, skin ulcers, chronic obstructive pulmonary disease (COPD) and depression. The least number of RCTs exist for palliative care, confusion, chronic pain and malnutrition.

The largest number of UCTs are found in the fields of drug treatment, cognitive disorders, urinary incontinence, chronic pain and palliative care.

Figure 1.4 compares the number of RCTs regarding *drug treatments* with the number of RCTs for *other* treatments, in descending order. This table clearly shows that in most areas there are most RCTs for drug treatments. For COPD, equal numbers of RCTs have been published for drug treatments and other treatments. In five areas: skin ulcers, stroke, urinary incontinence, chronic pain and malnutrition, *other studies* (non-pharmacological) are predominant.

Figure 1.5 shows a compilation of the National Board of Health and Welfare's diagnosis registry for people aged 65+ admitted for inpatient care in Sweden in 1999. Each chapter also contains a figure showing the frequency of each diagnosis/problem area in the 1999 inpatient registry, divided into 5-year age ranges from 20 and up, to illustrate the age distribution of the diagnosis.

## **Lack of good quality studies**

As figures 1.2–1.3 and the tables in each chapter show, there is a great lack of good quality scientific studies on the effect of different treatment methods on various ailments of the elderly. Even greater is the lack of studies highlighting the effects, both positive and negative (side effects), of pursuing several different treatment methods at once. There are very few treatment studies at all regarding care recipients aged 80+. As a result of this, much of the practical, clinical, regular care of the elderly is currently based on “proven experience” and the application of results from treatment research on significantly younger people. This means that our base of scientific expertise is weakest for the age groups (75+) that most often receive various types of treatments.

Dividing treatment trials into drug and non-drug treatments places a heavy focus on drugs – often because as a rule there are more trials for drug treatments. However, this detracts from studies of other, potentially valuable treatment methods. By listing the treatment methods studied in a common table for each problem area, we hope to stimulate further research based on the vital patient perspectives: “Did the patient improve?” and “Can the improvement be linked to the specific treatment method?”

## **Some conclusions**

### **1. Inaccurate inpatient statistics**

The 18 problem areas covered in this report were selected by a planning group consisting of three experienced geriatricians with research training, and one geriatric-specialist nurse with research training. However, other equally important areas are not covered in this report.

As Figure 1.5 indicates, the number of inpatient diagnoses for 1999 differs greatly between the selected problem areas. As expected, stroke diagnoses were frequent (27,859 in all), while there were surprisingly few diagnoses in the areas of urinary incontinence (222), chronic pain (122) and malnutrition (103). According to their respective chapters, these three conditions are very common in geriatric care and in fact constitute public health issues in these age ranges. The explanation for the great divergence in actual prevalence and the statistics is that inpatient diagnoses are based on acute illnesses, while underlying clinical problems (chronic ailments) are less often specified as formal diagnoses in the discharge notes. This indicates that today's inpatient statistics do not give an accurate picture of the total ailment statistics of elderly people.

## **2. Incomplete indexing**

The scientific articles referring to clinical treatment trials of elderly patients in various databases are not consistently indexed, making it hard to gain easy access to all treatment literature in any given area. In addition, some abstracts (summaries) of trial articles do not contain information on the age of the patients, which means that some articles may have been excluded even though they referred to patients with an average age over 65. On the whole, the report shows a very large percentage of the available scientific literature on clinical trials of people over 65, but does not claim to be a complete listing.

## **3. Great variation between problem areas**

The number of published clinical treatment trials and the types of studies vary widely between the selected problem areas (see Figures 1.2–1.3 and also points 6–7). It is also important to point out that even if an area has many RCTs, this does not necessarily mean that a satisfactory treatment method is available; this is discussed further in Chapters 2 and 3, “Background” and “Methods.”

## **4. Poorest knowledge base where the need is greatest**

Initially our intent was only to cover clinical trials of patients aged 75+. However, we soon realized that only a handful of trials exist where the entire patient population fell into that age range. In addition, the Medline database only has two age categories for patients: “over 65” and “over 80.” This forced us to lower our age minimum to 65.

The average age of inpatients at many clinics is around 75, in geriatric care over 80 and in municipal elderly care often above 85. Paradoxically, the patient groups who receive the most inpatient care and the most “multiple treatments” are the ones for whom we have the poorest basis of scientific material. This lack of knowledge on the effects of treatment on elderly people, plus the fact that elderly people in general are more sensitive to side effects of medications, make careful and regular evaluation of the effects of treatment especially crucial for elderly patients. As the “Drug treatment” chapter indicates, this is especially true in cases of polypharmacy (concurrent treatment with several drugs). One can question if it is ethically defensible that many elderly patients receive a large number of long-term drug prescriptions with no structured evaluation of whether or not they create the desired effect in relation to the indications.

## **5. Important to convert science to practice**

It is important to create good conditions for converting the results of published scientific trials into solid practice, so that they can benefit the patients in elderly care. To do this, elderly care must be organized to allow structured monitoring of the effects of different types of treatments on individual patients over time. This demands more continuity between the patient and the treating physician, as well as the development of uniform documentation defined by the clinical problem

## **6. Need for evaluation in elderly care**

As Figure 1.3 shows, only a limited number of problem areas have extensive enough published scientific literature related to the elderly that an evaluation can be done:

- Cognitive disorders (dementia)
- Drug treatment
- Stroke
- Infections
- Skin ulcers
- Geriatric rehabilitation
- COPD (chronic obstructive pulmonary disease)
- Depression

Of these, SBU has previously evaluated stroke and COPD, and extensive reviews of depression and dementia are under way. This leaves four possible areas for scientific evaluation. All of the other areas have so few published trials that they cannot be evaluated. The goal here must be to stimulate further treatment research (see point 7).

## **7. Need for clinical treatment research in elderly care**

There is a pressing need for clinical treatment research on elderly patients, particularly for those over 75. All of the writers of these chapters have pointed out the lack of knowledge and the need for more clinical trials. In particular, these areas show a significant lack of trials for the elderly:

- Palliative care
- Confusion/delirium
- Chronic pain
- Malnutrition
- Emergency geriatric care
- Parkinson's disease
- High blood pressure
- Urinary incontinence
- Heart failure
- Osteoporosis
- Coordinated service and care planning

Considering that many elderly patients have many concurrent ailments (multimorbidity) and many concurrent treatments (multiple treatments), there is also an urgent need for studies of the effect of several concurrent treatments, both combination treatments within one method (such as multiple drugs) and combinations of different treatment methods (such as drugs, nutrition and training).

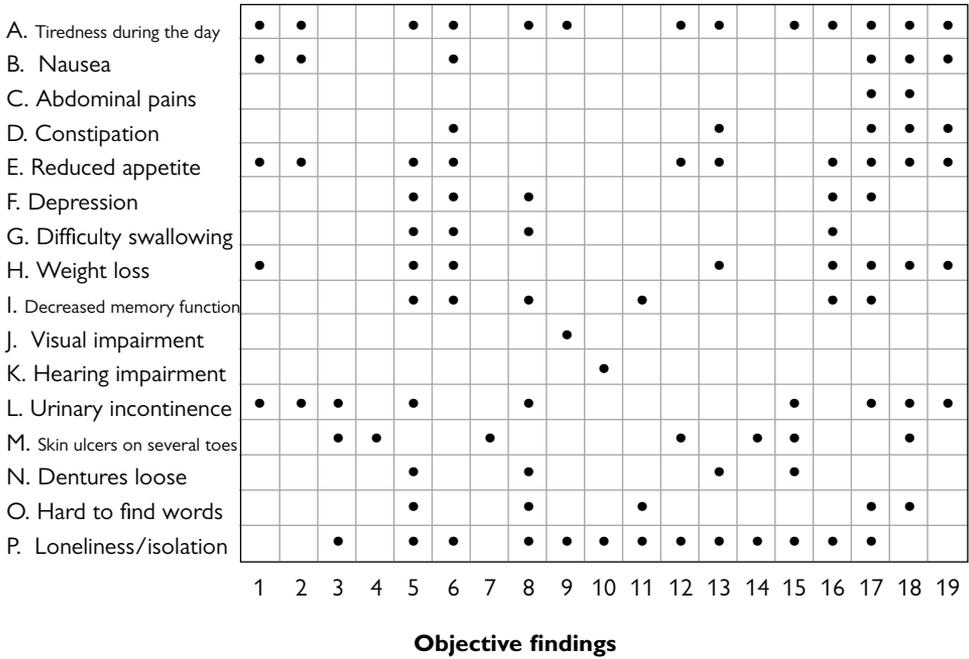
**Table 1** Medical analysis of an 85-year old woman with multiple diagnoses. During the consultation, the patient described 16 different symptoms, and many objective signs and pathological blood samples. In addition to the “Physical examination” (current status) and “Blood tests,” several other possible examinations are available, such as ECG, X-rays, ultrasound, functional examinations, etc. The analysis resulted in an overall “Assessment,” codified in a five-part diagnostic matrix: organ, system, functional and symptom diagnoses; and suspected drug side effects. The diagnoses are not completely separate; many are interrelated in a complex web that is often further complicated by social and psychological problems and positive and negative effects of the individual treatment program. The diagnoses under the “Assessment” heading can be clarified by specifying the symptoms (A–P) and findings (1–19) that are potentially related to the diagnosis. For example, the organ diagnosis “Heart failure” can potentially be linked to symptom A and findings 1, 2, 3 and 7. Similarly, the function diagnosis “Muscle weakness” can potentially be linked to symptoms A and H and findings 5, 12, 13, 14, 15, 16 and 17.

Patient's symptoms	Objective findings	
	Physical examination	Blood tests
A. Tiredness during the day B. Nausea C. Abdominal pains D. Constipation E. Reduced appetite F. Depression G. Difficulty swallowing H. Weight loss I. Decreased memory function J. Visual impairment K. Hearing impairment L. Urinary incontinence M. Skin ulcers on several toes N. Dentures loose O. Hard to find words P. Loneliness/isolation	1. Rapid resting heart rate 2. Pulmonary rales 3. Swelling of the legs 4. Skin ulcers on several toes 5. Weakness left arm and leg 6. Low spirits 7. High blood pressure 8. Impaired memory 9. Impaired vision 10. Impaired hearing 11. Difficulty naming objects 12. Difficulty walking 13. Muscle weakness 14. Prone to falls 15. Need of ADL assistance	16. Low hemoglobin (Hb) 17. Abnormal salt balance 18. High blood sugar 19. Elevated serum creatinine

**Assessment**

<b>Organ diagnoses</b>	<b>System diagnoses</b>	<b>Function diagnoses</b>	<b>Symptom diagnoses</b>	<b>Suspected drug side effects</b>
Heart failure Diabetes mellitus Glaucoma Cataract Vascular stenosis in the legs Vascular dementia Kidney failure Urinary incontinence	Malnutrition Atheromatosis High blood pressure Anemia Peripheral edema Skin ulcers Abnormal salt balance	Condition after stroke – left-side paralysis – aphasia – difficulty swallowing Decreased memory Depression Visual impairment Hearing impairment Muscle weakness Prone to falls Physical inactivity	Tiredness during the day Constipation Abdominal pains Reduced appetite Swelling of the legs	Tiredness during the day Constipation Nausea Reduced appetite Muscle weakness

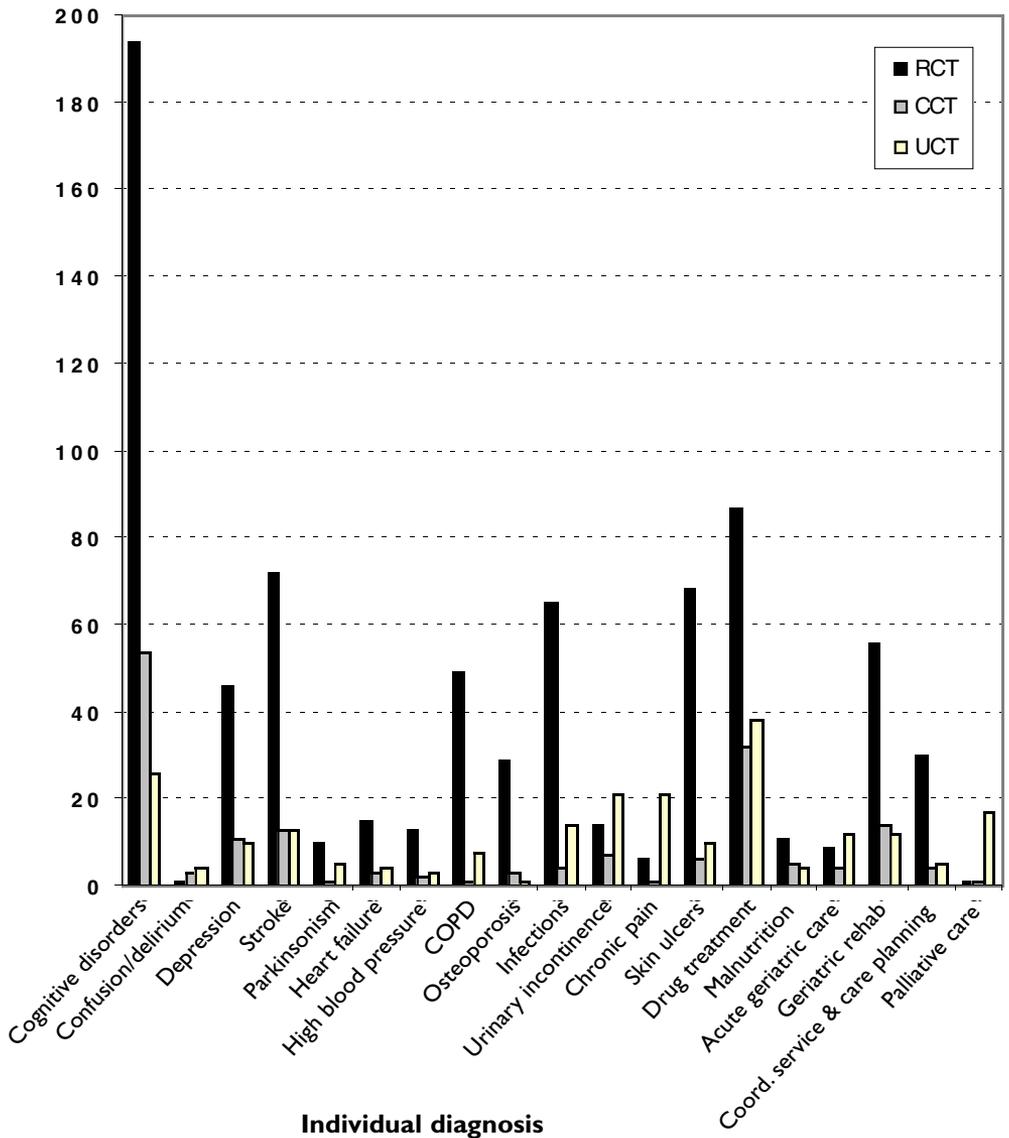
**Patient's symptoms**



**Objective findings**

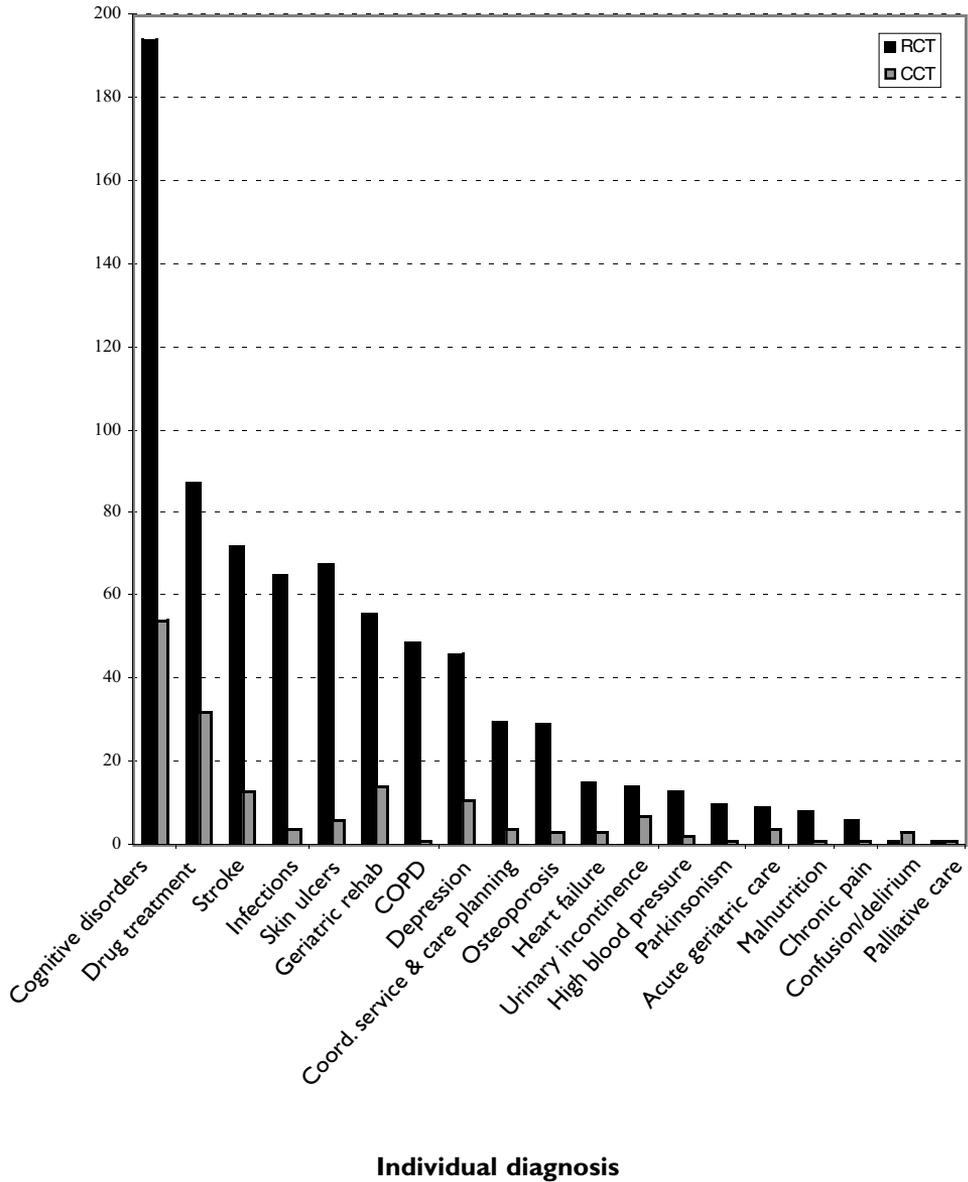
**Figure 1.1** Potential connections between the patient's symptoms and objective findings. The symptoms are marked with the letters A–P as defined in Table 1. The findings from the examinations are marked with the numbers 1–19 as defined in Table 1. Each point in the figure is thereby defined with a combination of a letter and a number to indicate a potential link between the patient's symptoms and the findings.

## Number of studies



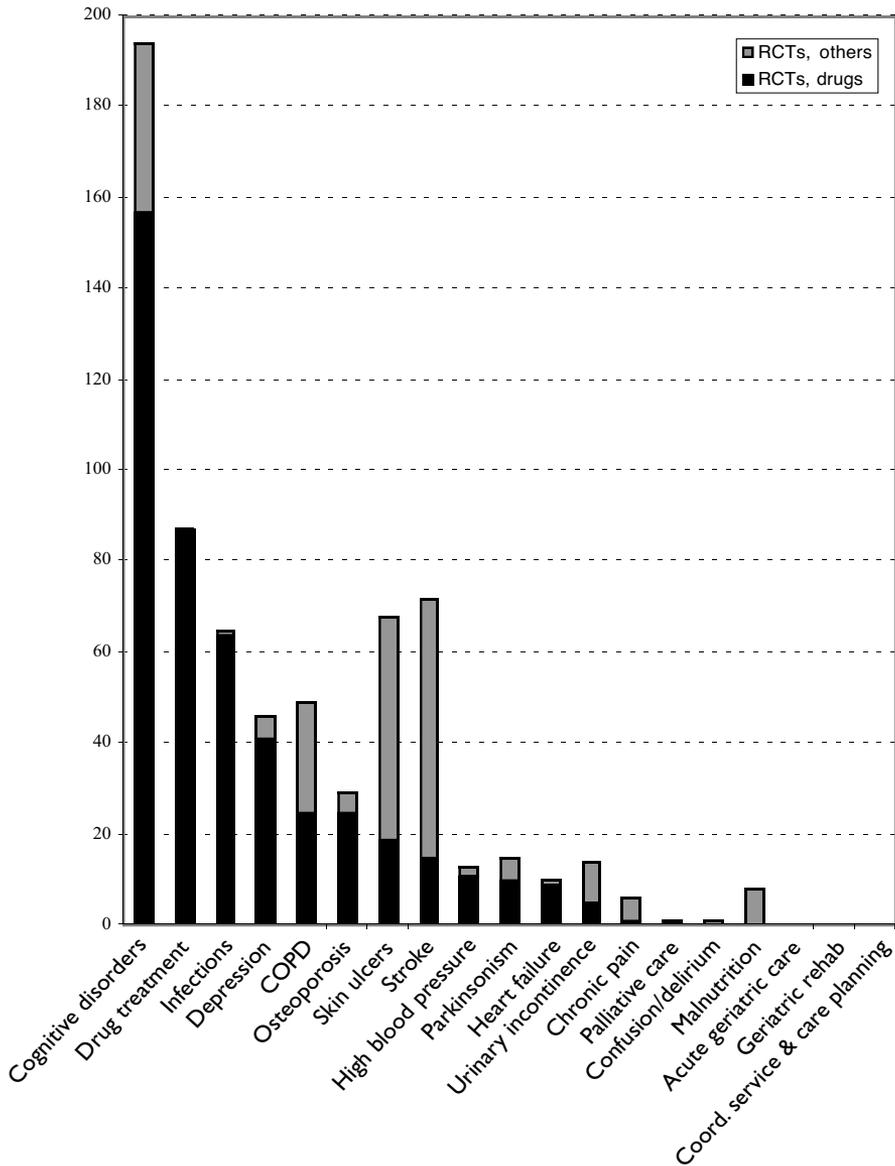
**Figure 1.2** Comparison of the number of RCTs, CCTs and UCTs for each problem area, in the order in which they occur in this report.

## Number of studies



**Figure 1.3** Comparison of the number of RCTs and CCTs for the problem areas, in descending order by RCT.

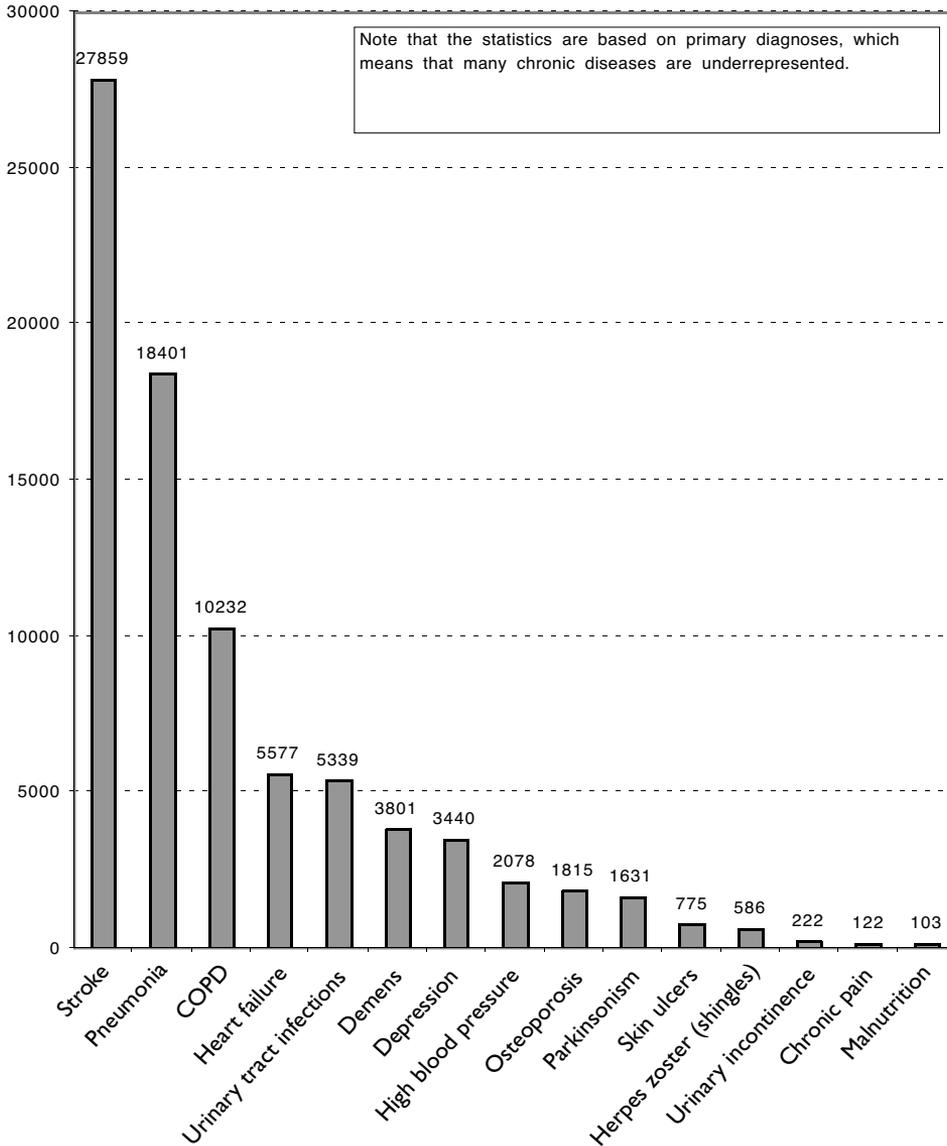
## Number of studies



### Individual diagnosis

**Figure 1.4** Comparison of the number of RCTs for drug studies with the number of RCTs for other treatment methods, in descending order by drug RCTs.

## Number of diagnoses



### Individual diagnosis

**Figur 1.5** Compilation of the number of inpatient diagnoses in 1999 (according to the Swedish National Board of Health and Welfare register) for the problem areas discussed in this report.

## 2. Background

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*Gunnar Akner*

### **The concept of “treatment” in elderly care**

Elderly patients often receive many different types of *active care* or treatment measures; yet the term *treatment* is used differently in different aspects of healthcare. The Swedish National Encyclopedia defines treatment as “Active care of a person or animal that is suffering of an illness or similar.” Drugs, surgical intervention, dental care and casts are some measures that are generally classified as treatments. In addition, there are many types of active care that are often not designated as treatments, but as adaptation, coordination, measures, intervention, nursing, rehabilitation, training, etc. These unspecified terms make it difficult to assess the effect of “active treatment measures” taken.

The case description in this section (see page 38) illustrates this problem and gives an example of the terms multimorbidity and multiple treatments. The patient in question presented 16 clinical problems and was treated with 12 different drugs (polypharmacy), plus nine other treatment methods.

On the whole, the patient’s condition improved significantly after 13 days of care, but afterwards it was not possible to analyze when the improvement occurred or the specific effect(s) of the ten different treatment methods. Note that one of the methods (drug treatment) in this case consisted of 12 different drugs, at least four of which were unclear in terms of both indications and effects. There was also a clear suspicion of negative effects (side effects) from several of the drugs.

Obviously, a complex situation like this requires expertise, dedication and time to analyze and determine which one or more of the treatments have an effect on which condition(s). This analysis should be done in a pleasant, non-stressful environment with the utmost respect for the patient.

## Multimorbidity – an integrated clinical analysis

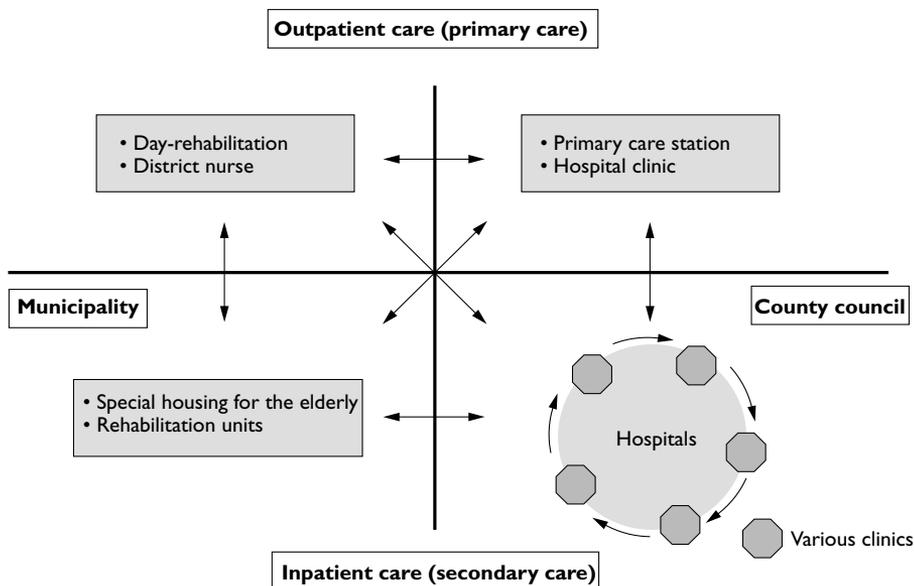
Elderly people with multiple diagnoses often demonstrate a very complicated clinical picture, where not only medical, but also social and psychological/existential aspects need to be assessed at the same time. Often the situation regards the patient's condition in the final stages of life, with perhaps only a few years left – which naturally poses a number of ethical problems. As a rule, such problems are treated:

- with several/many different treatment methods (*what*) (Table 2)
- by several different professional categories (*who*) (Figure 2.4)
- in various types of organizations – such as outpatient vs. inpatient care, county vs. municipal care, etc. (*how*) (Figure 2.1).

This creates a huge need for coordination between the different forms of treatment, and a continuous overall assessment of the effects of the treatment types over time.

An integrated multiple differential diagnostic process resulting in an overall assessment of problems and effects of multiple treatment methods is a complex kind of clinical analysis. One of the weakest links in Swedish elderly care today is its lack of physicians trained in, and in particular interested in, this kind of integrated, multi-faceted clinical analysis. In fact, the task is so complex that it is not enough to have well structured, standardized examination methods for the patients' problems; computer support is necessary to manage the huge amount of data usually collected about the patients.

In addition, many different professional categories (Figure 2.4) in different types of organizations (Figure 2.1) are involved in collecting data about the patients, but the databases are not compiled from the patient's perspective, in understandable categories. Often, it is not possible to analyze the patient's condition over time, particularly as regards the effect of all the different treatment measures. The case description illustrates this problem.



**Figure 2.1** The organization of elderly care.

The principal organization of Swedish healthcare, with two organizational bodies (municipality/county) and out/inpatient care, creates four different alternative combinations (quadrants), which are often independent of one another. The arrows show that the patients can move both within and between the quadrants.

This diagram is further complicated by 23 different professional categories (see Figure 2.4) of caregivers, which can be employees in one quadrant, but work in another. Different care facilities and professional groups do not have access to medical records from other quadrants, and often not even within the same quadrant.

## Multiple treatments – “rehabilitation”

*Rehabilitation* is a common term in elderly care, both in Sweden and internationally, that clearly illustrates the problems related to the term *multiple treatments*. The Swedish National Encyclopedia defines rehabilitation as:

”Restoring lost functionality (in contrast to habilitation: the development of a new ability). Rehabilitation includes medical, psychological,

educational and social measures, aimed at helping the sick or injured to regain the best possible functionality and provide conditions for a normal life. Today this includes interventions for all types of functional disabilities and handicaps.”

This definition combines an objective (patient perspective): to “restore lost functionality” or “regain the best possible functional capacity” and a method (caregiver perspective): various types of “measures” or “interventions” taken to achieve the objective.

In its 1964 report (SOU 1964:43), the Committee on Social Policy defined rehabilitation as follows: “the re-establishment of the best possible physical, psychological, social and financial functional capacity with respect to the person’s handicap.” This also emphasizes the patient’s perspective.

A report from the National Swedish Board of Health and Welfare, the Federation of Swedish County Councils and the Swedish Association of Local Authorities in 1993 (SoS report 1993:10) defined rehabilitation as: “timely, coordinated, comprehensive intervention from multiple areas of expertise and multiple bodies in order to combine medical, psychological, educational, social and technical intervention according to the individual’s needs, conditions and interests.” This definition emphasizes the caregiver perspective. Since many different types of healthcare ensure the patients access to combined care measures (treatments), this definition includes a great deal of adult inpatient healthcare as a whole.

Commonly in clinical elderly care, the term rehabilitation is considered to be synonymous with paramedicine – a caregiver perspective where rehabilitation is provided by physiotherapists, occupational therapists, speech therapists and so on, and the measures focus primarily on various types of functional support. In healthcare in general and elderly care in particular, the word rehabilitation is often used as a prefix to several caregiver-related terms, such as rehabilitation *efforts*, rehabilitation *staff*, rehabilitation *program*, rehabilitation *activities*, rehabilitation *measures*, etc.

The problem with switching between the caregiver and patient perspective is the risk for misunderstandings. “Sending a patient for rehabilitation measures” includes the assumption that the patient will be “rehabili-

tated,” without critical analysis of whether, and if so how, the patient improves, and if that improvement can be linked to any specific measures.

It is also misleading if the term rehabilitation can come to mean completely different combinations of treatment methods that are only partially defined by prefixes such as:

- *Geriatric* rehabilitation
- *Myocardial* infarction rehabilitation
- *COPD* (chronic obstructive pulmonary disease) rehabilitation
- *Orthopedic* rehabilitation
- *Psychiatric* rehabilitation
- *Social* rehabilitation
- *Stroke* rehabilitation

All of these rehabilitation-related terms actually refer to complex, individually established, clinical treatment programs with varying content involving teams of several different professional categories.

*Clinical work:* If the term “rehabilitation” is used with no explanation of the intended or prescribed treatment methods, this makes it difficult to analyze which methods were of clinical importance to the patient during the treatment period. However, if the term is used with a clear specification, it can increase our understanding of the need to combine and coordinate different treatment methods in order to reduce certain symptoms (such as pain and tiredness) or to improve certain functions (such as moving or eating unaided).

*Clinical research:* If the term “rehabilitation” is used with no explanation of the intended or prescribed treatment methods, this makes it difficult to analyze which methods were of clinical importance to the patient during the treatment period. However, if the term is used with a clear specification, this can facilitate compilations of the results of complex treatment programs for patient groups with multiple ailments.

*Education:* If the term “rehabilitation” is used with no explanation of the intended or prescribed treatment measures, it increases the risk of misunderstandings between different student categories. However, if the term is used with a clear specification, it can increase the students’

understanding that there can be a need for several concurrent treatment methods for isolated or combined ailments.

*Economy:* DRG<sup>1</sup>-based payments for inpatient care can vary widely depending on whether or not the patient receives the classification (not diagnosis) “rehabilitative measures”– even though this category can vary widely both qualitatively and quantitatively. Using the term with a clear specification makes it possible to differentiate between different intervention levels in inpatient care.

In summary, it is crucial that the word “rehabilitation” is always followed by a specification (prefix) for the individual case.

## **Evaluating the effect of a treatment**

Evaluating the effect of a specific treatment method usually requires several result markers, as effects can occur on several levels. Assume that a patient is being treated with Renitec® (= enalapril, an ACE inhibitor) for heart failure. Here are some methods/markers for evaluating the effect of the treatment:

### *Subjective*

- Symptom score: The effect on a specific symptom or combination of symptoms, such as tiredness, shortness of breath, chest pains or subjective functional capability
- Health-related quality of life according to a validated form
- “Global score”: Survey form with questions about if and possibly to what degree the patient is satisfied with the treatment.

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<sup>1</sup> DRG = Diagnosis-related groups a payment system based on diagnoses

## *Objective*

Evaluated through various examination methods, such as:

- Physical capacity (ergonomic test on bicycle)
- Blood pressure
- Heart rate
- Electrocardiogram
- Walking ability
- Echocardiography
- Blood tests
- Number of hospitalizations over the course of a year due to increased heart failure

Analysis becomes more complex if the patient is being treated with multiple treatment methods for one ailment, or if several different treatment methods are being used for several concurrent ailments.

## **Treatment effect in scientific studies and in regular health-care**

The case description (pg. 38) clearly illustrates the difference between treatment effects in scientific studies and treatment effects in regular healthcare.

### **Treatment effect in scientific studies**

The structured listing of the published treatment literature in this report illustrates the effects/results found to be achievable under well-defined, controlled scientific conditions – homogenous, carefully checked patient data, clear and specific treatment programs, known compliance with the treatment, structured and standardized instruments for assessing the effect, and motivated staff with clearly delineated project periods.

This report does not constitute a systematic evaluation of the scientific treatment literature in these areas. However, two evaluation components are present in the report:

### 1. *Type of study*

A controlled clinical trial (RCT, CCT) provides more information on the treatment potential of a given method than a comparable study with no control group (UCT). As a rule, randomized trials (RCTs) are preferable to controlled trials with no randomization (CCTs). Consequently, an RCT is generally of greater informational value than a CCT, which in turn is better than a UCT. However, we must emphasize that this “order of importance” does not necessarily apply to any given study: RCTs can have extremely varied scientific quality, depending on factors such as the number of patients participating, how the randomizing was done, the dropout rate and whether or not the trial was double-blind. An open (non-blind) RCT with a small number of patients and non-specified randomization can be less valuable than a double-blind CCT with many well-matched controls. Though a UCT is less valuable than RCTs and CCTs, the UCT column has been included in all chapters to give an idea of the types of treatment methods studied in uncontrolled trials. This can inspire new controlled clinical trials.

### 2. *The authors' comments*

The authors give their personal assessments of the treatment literature in each area.

In summary, this report only shows to what degree treatment within the selected areas of elderly care have been systematically studied. The aim was not to evaluate the articles' scientific quality, nor to specify the results of the treatments. It is therefore important to emphasize that even if a certain number of RCTs or CCTs have been published for a specific problem area, this does not always mean that a good treatment is available. There can be several reasons for this:

*Study quality:* RCTs and CCTs can be of low quality (see above).

*Result type:* Well-done RCTs/CCTs can present conflicting results in relation to placebo control, natural course, etc.

*Effect specificity:* As a rule, multiple effect variables must be analyzed in order to evaluate the effect of a given treatment (see above). The results of a treatment may very well differ depending on the selected effect variables.

*Effect relevance:* Well-done RCTs/CCTs can present results that show a significant positive effect as opposed to the placebo in a meta analysis, but the effect may still be of questionable clinical relevance – for example because the effect has little practical significance to the patient.

*Effect variability:* If a treatment in a study is shown to have a significant positive effect on a given variable in a scientific study, this effect does not benefit all patients who receive the treatment. The number needed to treat (NNT) is an important value here, indicating how many patients must be treated for a given period for one of them to statistically receive a given positive effect of the treatment.

One example of the difficulty of evaluating effect in scientific studies is the treatment of depression with selective serotonin reuptake inhibitors (SSRI). The table in chapter 5, “Depression,” lists 22 studies (19 RCTs) of the treatment effects of SSRIs on depression in patients aged 65+. The table shows that six of the studies are placebo-controlled (and include several different SSRIs), while the other studies compare different antidepressives with each other. However, very few trials investigate the effect of different doses and treatment periods of treatment with a specific SSRI for depression in patients aged 65+, despite the large number of randomized trials.

### **Treatment effect in regular healthcare**

When scientific knowledge is transferred to practical regular healthcare, the situation is hugely different from the effect of treatment in the scientific studies: The patients are much more heterogeneous than those in the studies, and often suffer from several simultaneous ailments. The diagnostics, treatment, effect evaluation and documentation rarely follow the standard methods, but rather local traditions and individual employees’ personal methods. In addition, compliance with the treatment is often unclear and rarely analyzed. The risk is great that the effects will be “watered down” as compared with what is possible to achieve under the more rigorous conditions of a trial.

The case description on page 38 illustrates the dilemma. The patient had been under an SSRI prescription for three years, but the records

showed no standardized evaluation of the effect, just comments like “looks alert,” “seems to be well,” “is maintaining her weight” and so on. Therefore it was impossible to come to any conclusions on the effect of the depression treatment during the initial phase, nor why the treatment continued for three years.

It is critical that both evaluation perspectives – the scientific and the practical – be closely linked, in accordance with the motto of physician ethics: that treatment should be based on “science *and* proven experience.”

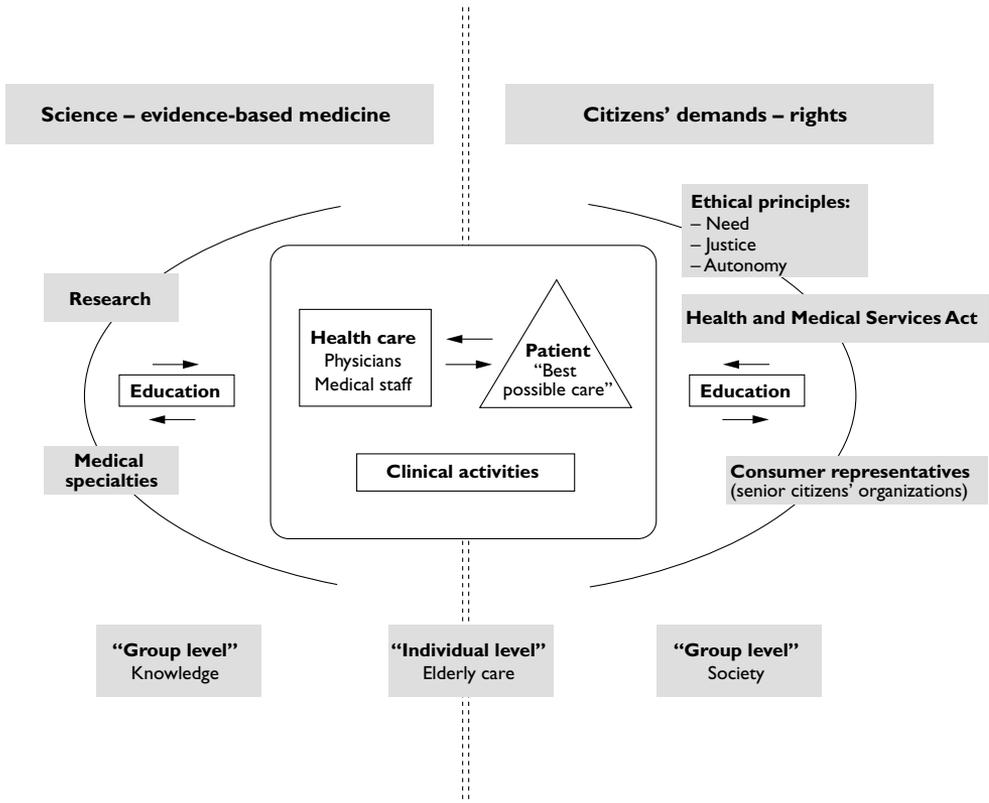
### **Various perspectives that affect the evaluation of treatment effects**

The relationship between potential treatment results under optimal scientific conditions and treatment in regular clinical healthcare should also be viewed from the individual–group and the actual – desired perspective.

#### **Individual and group**

*Individual perspective:* The individual patient has every right to demand qualified diagnostics, treatment and effect evaluation according to a scientifically established optimal procedure, adapted to the specific situation. This individual perspective is dominant in healthcare and municipal elderly care; physicians and other healthcare professionals focus primarily on the quality of care provided to individual patients.

*Group perspective:* Citizens as a group have the right to demand that socially funded healthcare be organized in such a way as to provide the conditions for optimal treatment and optimal use of available resources to treat illness or injury. This group perspective is predominant in politics, among administrators in authorities on the central and local levels, and managers within healthcare.



**Figure 2.2** Citizen demands – science.

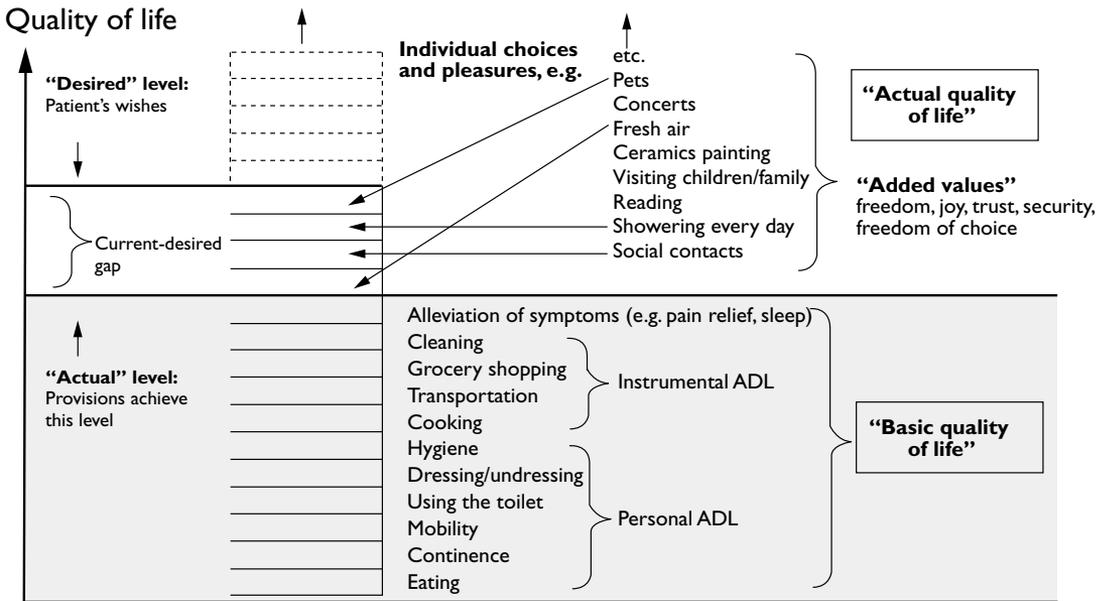
A patient’s meeting with medical professionals is a meeting on the individual level, where the patient/citizen has the right to demand, through current legislation, ethical priorities (group level), the best possible assessment and treatment available for his/her specific medical problem(s) based on and the general level of expertise (group level).

### **The “actual” and “desired” situations**

The organization and staffing of various clinics and other units that provide care for the elderly, including special municipal housing for the elderly, is usually not based on a systematic, rational analysis of average nursing workload or an index of the need for labor; usually it is based on traditional staffing and various measures taken to “make it work.” The serious drawback of this method is that changes in the patients’ functional condition and their need for help/support do not lead directly to changes in the organization and staffing. This problem is illustrated in Figure 2.3.

If provisions for elderly care only allow staffing of units for “basic nursing” (basic quality of life) while political objectives and programs speak of “added value” (actual quality of life), this leads to a continuous frustration between the actual situation and the desired situation in elderly care. The system can continue to work only if existing staff finds ways to adapt to a heavier workload and are forced to concentrate on basic care at the expense of “added value.” Without clear annual reports and evaluations of the activities, explicitly including the “added value,” decision-makers can be lulled into thinking that everything works well. If, in addition to this, continued budget cuts are made, this can lead to a vicious circle.

Add to this the care unit managers’ quality development goals and the requirements of the Health and Medical Services Act that counties and municipalities are to pursue research – neither of which is based on a needs and cost analysis. Clearly, an unacceptable gap can easily arise between the actual and desired situations. This frustration can maintain and perhaps even further an unsatisfactory healthcare quality for the elderly patients.



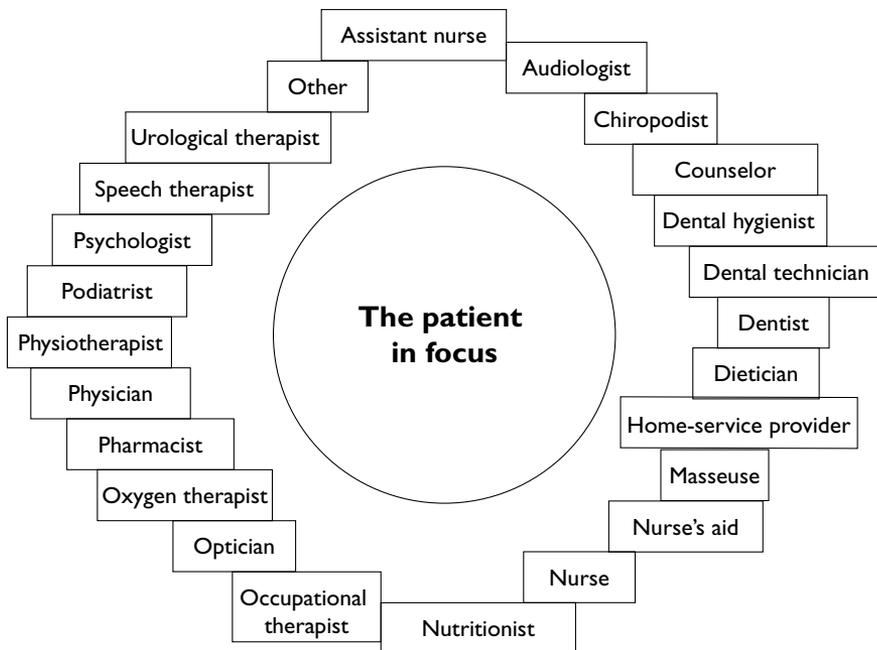
**Figure 2.3** Quality of life in elderly care.

The concept of “basic quality of life” is similar for most people, and codified in Katz’s Activities of Daily Living (ADL) ladder for personal and instrumental ADL. This figure also gives some examples of “actual quality of life” – which naturally can vary significantly more than the “basic quality of life.” Orders placed for municipal elderly care rarely allow more staffing than can meet the demands for “basic nursing” (basic quality of life, the “actual” level). The “desired” level will vary greatly depending on the individual person’s situation and interests. The “actual” – “desired” gap can be used as a measure of the quality of elderly care.

**Table 2** Treatment methods.

Examples of 18 different treatment methods that are common in elderly care with a specification on two levels.

<b>Treatment method</b>	<b>Specification 1</b>	<b>Specification 2</b>
Adaptive measures	Home adaptations Lighting	Removal of thresholds Reading lamp
ADL-training/help	Dressing and undressing, washing, cleaning etc	
Aids	Walking Vision Hearing Urinary incontinence	Walker Glasses Hearing aid Incontinence disposables
Compression for edema	Support stockings	
Dental care	Removal of caries Fitting new dentures	
Drug treatment	Beta-blockers Diuretics	Metoprolol Furosemide
Education	Instruction	Group lectures
Electricity	Transcutaneous nerve stimulation	
Foot care	Nail cutting, filing of calluses	
Massage		
Nutrition	Special diet Consistency adapted food Supplements	High-energy, high-protein diet Minced food Protein supplements
Oxygen treatment	Oxygen tanks	
Physical training	Muscle strength Balance Condition	Quadriceps training  Bicycling
Psychotherapy	Counseling/support Cognitive psychotherapy	Contact person
Skin ulcer treatment	Changing bandages	Bandages
Speech training	Aphasia training	
Surgery	Operation of gallstones	Laparoscopy
Swallowing training		



**Figure 2.4** Examples of professional groups often involved in the treatment and care of elderly people.

## Appendix

### Case description

*Gunnar Akner*

The patient was an 87-year old, skinny, physically inactive widow, mother of two, who lived alone. She had eight different continuous drug prescriptions. She was able to walk unaided and had no home service. The patient was admitted to a geriatric clinic for emergency care after falling and striking her back, after which she was unable to take care of herself due to back pain. X-rays showed no fracture. During the course of her 13-day hospital stay, the patient was subjected to the following ten active care measures (treatments):

1. *Drugs*: On arrival the patient had eight different drugs and was given four more during her stay: two analgesics, one soporific and one laxative.
2. *Nutrition*: The patient usually ate two full meals a day: breakfast at 8 a.m. and dinner at 3 p.m. In the evening she had a cup of tea and a sandwich. During her hospitalization she received three full meals a day (breakfast, lunch, dinner) and at least two snacks (afternoon and evening), plus the “drink cart” 2–3 times a day. A nutritional analysis determined that her intake of energy, nutrients and water was at least 50% higher at the hospital than at home.
3. *Physical activity/training*: The patient was assigned motion and walking training “according to ability” several times a day via the physical therapist and the staff on the ward.
4. *Aids*: Upon admission, the physical therapist helped the patient try out a walker. The occupational therapist gave advice on suitable sitting positions for her back and how to get around in order to minimize the pain. The nurse provided incontinence aids.
5. *Support calls*: The physician and the counselor had support talks with the patient several times about her depression.

6. *Social contact:* At the hospital, the patient was treated in a 2-bed room and was surrounded with people most of the day. At home she was visited by her daughter once a week, but was otherwise socially isolated except for occasional phone calls. The counselor in the ward talked with her several times during her period of care to see if she was interested in some kind of social activation in the local senior citizens' association.
7. *Foot care:* One of the ward's nurses was also a trained chiropodist and took care of the patient's dry feet with long-uncut toenails and beginning corns on several toes. After daily foot massage with oil, nail clipping and filing of corns, she was able to visit the hospital's shoe store, with assistance, and buy new, more comfortable shoes.
8. *Dental care:* In her fall, the patient broke off part of a tooth, for which the hospital dentist was contacted. During the examination, the dentist noted dry mucous membranes in the mouth and several caries-damaged teeth. The broken tooth was fixed and two of the caries-damaged teeth were pulled. A small denture was also provided. A discussion was initiated as to whether the dryness in the mouth could have contributed to her weight loss and if it could be a side effect of a medication.
9. *Help with ADL (activities of daily living):* The patient daily received help from the staff (mainly nurse's aids and assistant nurses) with ADL as needed. The need was great at first, but decreased over time.
10. *Instruction:* Throughout the duration of care, the patient received detailed information on her condition from the different professional groups involved. On discharge, the responsible physician summarized the sequence of events and gave the woman a written summary of her clinical problems and the whole treatment program.

The Table below shows that the patient had at least 16 different clinical problems during the duration of care and was treated with at least ten different methods (see above). Six of the 16 problems were treated with drugs.

<b>Current clinical problems</b>	<b>Treatment methods</b>	<b>Specification</b>	<b>Drug side effects</b>
Back pain	Drugs Physical training	Analgetics Activation, changing position	
Difficulties walking/moving and prone to falls	Physical training Aids Foot care	Walking/balance training Walker	Possibly
Tiredness and shortness of breath on exertion	Physical training		Possibly
Physical inactivity	Instruction Physical training Nutrition	Information/education Condition/muscle strength Energy, protein, vitamins	
Dizziness			Possibly
Sleeping problems	Drugs		
Constipation	Drugs		Probably
Urinary incontinence	Aids	Incontinence disposables	Possibly
Dryness in the mouth	Saliva stimulation Dental care		Probably
Malnutrition	Nutrition	Energy, protein, vitamins	
Polypharmacy	Instruction Try discontinuing some		
Loneliness	Social activation		
Depression	Conversation, support Drugs		
High blood pressure	Drugs	Two antihypertensive agents: one diuretic and one beta-blocker	
Impaired cognitive function			Possibly
Dry mucous membranes in the vagina/vulva	Drugs	Estrogen locally and in tablet form	

During the 13-day duration of care, the patient met the house physician on 10 daily rounds, the consulting specialist 5 times and several paramedics and other staff categories daily. On the rounds, all drug prescriptions were reviewed, copies of the patient's primary care records were ordered and the patient's regular physician was consulted by telephone about her continued treatment. This allowed four of the eight prescriptions to be discontinued as they were no longer motivated, and the possibility of discontinuing one or two more after discharge was discussed. According to the Pharmaceutical Codex (FASS), there was a risk that several of the woman's problems (tiredness, muscle weakness, drop in blood pressure, dryness of the mouth, constipation, impaired cognitive function) were related to drug side effects. This led to a suspicion that drug side effect(s) could have contributed to the fall in her home. The woman was discharged in significantly better condition, with a planned checkup with her regular physician three weeks later. On discharge, the remaining drugs were for:

- a) depression (for the past three years)
- b) two hormone treatments against a tendency to sensitive vaginal membranes and urinary incontinence (for the past four years)
- c) two drugs against high blood pressure (for the past 18 years)
- d) analgesics as needed
- e) sleeping pills as needed (The two last items were introduced during hospitalization and planned to be discontinued soon.)

When the physician went to write the discharge notes a few days later, he didn't remember exactly what "active care" measures were taken during the duration of care. Of the ten different treatment methods, only the drug treatments were documented so carefully that it was detailed which dose was given each day of the original eight prescriptions (seven at discharge). Of the other nine treatment methods, each professional group knew in detail what had been done from a qualitative viewpoint during the duration of care, but the dose (quantity) of nutrition, training, social support, ADL assistance, etc. had not been documented and was difficult to reconstruct after the patient was discharged. In actuality, no one person in the staff (team) had full knowledge of the total amount of "active care" the patient received.

The physician was unable to analyze the specific effect of the ten different treatment methods individually, but briefly wrote that the patient was given adequate pain alleviation and “mobilized according to ability” by paramedics and healthcare staff. He also wrote briefly that four of the eight prescriptions the patient had at admission were discontinued and three new ones were introduced. He also stated that they planned to offer the patient opportunities for increased social activation after discharge. The diagnosis was “Fall with vertebral contusion but no fracture” and “Rehabilitation.” In addition to this, the patient had at least twelve clinical problems/diagnoses (pains, difficulty walking, shortness of breath, dizziness, sleeping problems, constipation, urinary incontinence, dryness of the mouth, malnutrition, depression, high blood pressure and dry vaginal membranes), but it was not the hospital’s practice to specify these in the discharge notes, despite the fact that all had received active treatment during the hospitalization.

A year later, a medical student used the patient’s hospital records to try to analyze:

- a) which of the “active care measures” taken during the patient’s hospitalization was/were actually significant for the woman’s regaining her previous functional capacity
- b) which provided more general activation and support
- c) which were ineffective or even had negative effects (side effects)

The available documentation did not allow the student to follow the progress of the patient’s clinical condition, because there were no continuous evaluation scales for symptoms and functions during her hospitalization (such as pain during the day, the effect of analgesics, physical function measured in muscular strength or balance, degree of constipation, degree of dizziness, etc.). The only measures at any given time, aside from routine lab tests, were body weight at admission and the Katz ADL index at admission and discharge.

# 3. Methods

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*Gunnar Akner*

## **The assignment**

Early in 2000, the SBU board of directors ordered a scientific report on the need for evaluation in elderly care. The report was to serve as a basis for the SBU board to decide on which areas of elderly care would later be targeted for systematic evaluation. The report catalogs the scientific literature available on treatment of elderly patients in 18 different problem areas.

## **Limitations**

Since the care and treatment of elderly patients constitutes a very large percentage of the total healthcare services provided in society, the project had to be delimited in some way. Often the boundary for “elderly” is drawn at retirement age (65), but since most people are in very good health between 65 and 75, it would be better to draw that boundary at 75. A search of the Medline database in February 2002 on the search word “aged 65+” resulted in 1,281,806 hits, while “80+” resulted in 446,993 hits. This extensive literature covers the entire range of elderly care, including gerontology (the study of normal aging), epidemiology, diagnostics, treatment, prevention, public health aspects, etc. in a large number of areas. This general report was limited to the effects of various treatment methods for 18 common problem areas in elderly care.

## **The procedure**

A planning group consisting of Gunnar Akner, Sölve Elmståhl, Karin Styrborn and Helle Wijk discussed which parts of elderly care were suitable for inclusion in the report. The group also proposed people to write each chapter.

## **Problem areas**

The group selected 18 key problem areas in elderly care, of which 12 refer to organ or system-related problems. The other six refer to more general

areas, such as drug treatment, malnutrition, acute geriatric medicine, geriatric rehabilitation, coordinated service and care planning and palliative care.

Figure 1.5 in the summary chapter shows the number of inpatient diagnoses of patients aged 65+ for the areas included in the report, based on the National Board of Health and Welfare's 1999 statistics. The large difference in the number of diagnoses illustrates not only actual differences in prevalence, but also how diagnoses are made in elderly care. Some diseases/conditions are not formally diagnosed, even though they are treated with active measures, such as skin ulcers, urinary incontinence, pain and malnutrition. For example, several Swedish studies show that 20–30% of all elderly patients in inpatient care suffer from malnutrition. According to the official diagnostic statistics, only 103 cases were recorded in 1999. This type of official underreporting is probably common for several diagnoses, since inpatient diagnostics focus on the dominant clinical problems during the inpatient care episode, rather than on individual concurrent “underlying” problems.

Several other significant problem areas in elderly care are not summarized in this report, such as malignant diseases (cancer), diabetes mellitus, prevention of falls, visual impairment, and hearing impairment. Some information on trials regarding malignant diseases in the elderly is listed in the “Palliative care” chapter.

## **Instructions to the authors**

All authors received standardized instructions in the beginning of June 2000: to search through scientific literature in the best way possible to find published clinical trials in their specific area, and to summarize them in a given table template. The authors were also asked to include a comments section with their personal opinions on the available knowledge and how they would prioritize the needs for research in their area.

## **Literature search**

The authors' instructions were to search in Medline and other databases for clinical trials of patients aged 75+ in each problem area.

The term “treatment” was clarified as “all forms of treatment, such as drugs, physiotherapy, nutrition, occupational therapy, stress management, adaptations, aids, etc.” The aim was not to review the articles, only to classify and tabulate them into three types:

- *RCT (randomized controlled trials)*
- *CCT (controlled clinical trials)*
- *UCT (uncontrolled clinical trials)*

## **Comments on the literature searches**

### *1. Search*

The authors searched for relevant treatment literature in their areas. Some worked with an information officer at a medical library, while others searched on their own using sources like PubMed and their own reference files. Each author specifies how they did their search.

### *2. Ages*

The original instructions to the authors were to search for RCTs, CCTs and UCTs for patients over age 75. This proved impossible, since the Medline database only indexes patients aged 65+ and 80+. Another problem was that it was often impossible to determine from the abstracts whether the patients in these studies were all 65+ at inclusion in the trials or had a mean age of 65+ at the end of the trial.

After much discussion, the planning group decided to accept studies where the average age at inclusion was 65+. By definition this means that some of the patients were under 65. Since there were generally only a handful of published studies of patient groups aged 75+, it was decided not to specifically differentiate these patients from those aged 65–75 (with the exception of the “Chronic heart failure” and “Coordinated service and care planning” chapters).

### *3. Search period*

The amount of research on the problem areas varies, so the amount of literature available is very unevenly distributed between them. Some authors searched in all of Medline, from 1966–2000, while others lim-

ited their search to the latest ten years, 1991–2000. This means that the comparison between the number of published articles for each problem area are not completely comparable. The search period for each chapter is specified under the heading “Search strategy.”

#### *4. Searching for treatment strategies in the field of nursing*

For several chapters, a second systematic search was done for treatment studies in the field of nursing in collaboration with a documentalist. The search strategy is defined in its own section in each chapter. Several of these studies came via the Cinahl database and were often not included in the hits each main author found. However, closer checking determined that nearly all articles in the field of nursing (“Cinahl articles”) were also present in Medline, but were indexed in such a way that the broad search did not return them.

#### *5. Searching on physical training*

Physical training or physical treatment is included in many tables. In connection with a manuscript review, physiotherapist and assistant professor Kerstin Frändin found that the “physical training”/“physiotherapy” area was poorly defined for some sections, where she felt that there were more controlled trials. For this reason, additional Medline searches were done for the following areas: Dementia, confusion, depression, stroke, Parkinson’s disease, heart failure, COPD, osteoporosis, infections (separate searches for pneumonia, urinary tract infection, herpes zoster), urinary incontinence, skin ulcers, malnutrition and chronic pain. Each illness and condition was searched for in combination with the words “physiotherapy,” “physical training,” and “exercise,” and was limited to age 65+, “clinical trials,” English language and human studies. The few treatment articles found in this search that were not in the previous searches are included in each table.

## *6. Endpoints*

The authors of the chapters on high blood pressure and osteoporosis chose to search only for treatment studies with endpoints they determined to be clinically relevant to the patients, such as symptom reduction, acute myocardial infarction, fracture, functional impairment, health-related quality of life and mortality. However, they excluded studies that only investigated intermediary endpoints (surrogate variables), such as effects on blood pressure and bone density. All other authors included all treatment literature, regardless of the endpoints studied. Since treatment of high blood pressure and osteoporosis are secondary preventive treatments, it seems reasonable to select articles for these conditions that study clinically relevant treatment effects.

## *7. Inclusion and tabulation of articles*

The instructions to the authors were to carry out a literature search and tabulate the published articles in three columns, RCT, CCT and UCT. In many cases, the authors have detailed knowledge of the area and have read the whole articles. In other cases, the number of hits was so great that it was impossible to obtain and read all the articles in their entirety. In these cases, the articles were categorized in one of the three table columns by the information in their abstracts. As a rule, the abstract text or a summary of the abstract in Medline tells what type of study it is. If it was not possible to determine the type of study from the abstract, the article was excluded. Another factor for exclusion was if the abstract text did not specify that the average age of the patients in the study at inclusion was over 65. This means that several of the chapters' problem areas actually included more trials than specified in the tables. However, many of these articles are probably in the UCT category. Information in the abstracts does not give a completely reliable picture of a study, making this a somewhat unsatisfactory basis for selecting articles, but in our estimation the tables still give a good idea of the volume of published treatment studies in the areas.

## Reading the report

Each chapter has six sections:

1. *Definition* of key terms
2. *Background*, a general description of the problem area
3. *Compilation of published treatment studies* in a tabulation of the literature search and a description of the search strategy
4. *Comments*, where each author briefly assesses the amount of knowledge available in each area and points out the need for research
5. *Tables and figures*

The different types of published clinical trials are listed vertically under “Treatment methods” in three columns, RCT, CCT and UCT.

To focus on the treatment method used, the results of the literature searches (main search plus additional searches for nursing and physical therapy) have been integrated in the same table for each problem area. This provides an overview of which treatment methods have been studied in each area and which trials were RCTs, CCTs and UCTs.

The chapters also include a figure showing the number of diagnoses in different age groups based on the National Board of Health and Welfare’s inpatient register.

6. *References*

## 4. Cognitive disorders, including confusional states

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*Sture Eriksson and Lars-Olof Wahlund*

### **Definition**

#### **Cognitive disorder**

Cognitive disorders impair cognitive functions, affecting primarily memory, orientation, abstraction ability, logic and visuospatial ability. This includes:

- Deliriums
- Dementia disorders
- Amnestic disorders

#### **Dementia**

Dementia is a condition of cognitive failure leading to:

- Impaired memory
- And at least one of the following:
  - Aphasia
  - Agnosia
  - Apraxia
  - Executive impairment

where the impairment is so marked that it gives professional and/or social consequences [1]. The most common dementia disorder is Alzheimer's disease. Several brain injuries can also lead to dementia disorders.

## Confusion

DSM-IV and the WHO's ICD-10 define confusion/delirium as:

*“A condition characterized by:*

- a) altered consciousness with impaired ability to maintain attention to external stimuli*
- b) impaired cognitive ability (such as memory, orientation, linguistic ability) or impaired perception ability, which is not solely due to an existing dementia*
- c) rapid onset of these impairments (hours–days), which usually fluctuate over the course of a day*
- d) causation by a physical disease or somatic influence (drug side effect)”*

## Background

Cognitive disorders fall into two main classes – confusional states and dementias. At least for dementia disorders, in particular Alzheimer's disease, age has become a less important factor. The disease is not an effect of aging, but the result of metabolic changes in the brain due to factors such as amyloid metabolism and inflammatory processes. Therefore, it does not seem necessary to study these conditions solely in 75+ patients.

Symptoms of dementia disorders fall into three main categories:

- Cognitive symptoms
- Behavioral and psychological symptoms of dementia (BPSD)
- Functional symptoms

Today, cognitive symptoms are perceived as primarily the result of a lack of neuronal function, while BPSD has a multifactorial background including brain damage, individual factors like psychological reactions, and social factors – mainly interaction, but also organizational and cultural factors.

Functional symptoms are considered to be mainly a result of cognitive failure and BPSD. However, literature on the subject only partially follows this categorization; in older literature in particular, it is sometimes difficult to determine what effects the results actually show.

In terms of medical specialties, these conditions have come more and more to fall under psychogeriatric activities. Organizationally, these activities can belong to the fields of geriatrics, psychiatry, neurology and sometimes primary care. The working methods, diagnostic methods and treatment are similar, regardless of the specialist field. However, many patients with cognitive disorders are treated in municipal primary care.

Studies in several Swedish counties – Västerbotten, for example – have shown wide variation in the content of care and the expertise of the caregivers. It is crucial that the organization and content of medical care in this field be expanded to meet the rising demand.

## **Summary of published clinical trials**

### **Search strategy for cognitive disorders of the elderly**

In February 2001, the following search words were queried in all of Medline, from 1966–2001, only in conjunction with *elderly* – patients with an average age over 65.

#### *Alzheimer's disease:*

A Medline search on the words (Alzheimer) AND (double [WORD] AND blind\* [WORD]) gave 535 hits, including several reviews and comments on studies.

#### *Vascular dementia:*

Searching for “vascular dementia,” “double blind” and “treatment” returned 20 hits for RCTs. Many different substances have been tested, including purely antihypertensive or hemoreological treatments, with evaluations of cognitive functions. Some studies also deal with BPSD treatments on patients with vascular dementia.

### *Dementia NOS:*

Search: Dementia AND randomized AND NOT blind, Dementia AND randomized AND behavioural, Dementia AND randomized and music, Dementia AND music, Dementia AND massage, Dementia AND random AND intervention. This profile returned several hits that also included drug treatments. These were removed manually.

Uncontrolled clinical trials were only included when no controlled trials existed.

### **Additional search strategy for “clinical trials in nursing”**

*Medline:* 356 hits, of which 33 are included.

*Cinahl:* 350 hits, of which 8 are included (duplicates excluded).

*Search path:* Delirium-dementia-amnestic-cognitive disorders, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy) aged, nursing, nursing care.

*Exclusions:* Non-English, reviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, individual case studies.

For a summary, see Table 4.1, Treatment of cognitive disorders in the elderly.

### **Search strategy for confusion/delirium**

Searches were done in the Medline database via PubMed. The search words “delirium,” “confusional state,” “double blind” and “treatment” gave 30 hits, but none of them contained delirium, but “organic brain syndrome.”

This provided a varied selection of diagnostic conditions, many psychiatric; it was not possible to fully separate out treatment of purely confusional states. We then expanded our Medline search back to 1966 using the search words “delirium/therapy,” “drug therapy,” “nursing,” “prevention and control,” “rehabilitation” and “therapy.” In all searches, the age range was limited to individuals aged 65+.

For a summary, see Table 4.2, Treatment of confusion/delirium in the elderly.

## Comments

As the tables show, the clinical trials mainly dealt with treatment of Alzheimer's. A lesser number of the trials included vascular dementia, but it was hard to find articles studying the effects of treatments on confusional states. Confusional states are difficult to clearly delimit, difficult to measure quantitatively, and have varying terminology, so it is easy to understand that few studies exist and those which do exist are hard to find. Therefore, it is urgent that more clinical trials are conducted for confusional states.

The range of knowledge is best as regards Alzheimer's disease, which is the only disorder for which registered drugs are available. Treatment with acetylcholinesterase inhibitors has been shown to have an effect on cognitive functions and also functional abilities, usually measured as ADL abilities. These drugs are routinely prescribed for mild to moderately severe Alzheimer's disease.

Since BPSD has multifactorial causation mechanisms, this will naturally be reflected in the treatment strategies. Relatively few drug trials have been done using modern techniques for BPSD. The only large, recent trials that have affected a drug's registration in recent years are for the neuroleptic drug risperidone. It is important to note that risperidone has only proven effective against psychotic conditions and some aggressiveness, but not for things like wandering or anxiety. Fewer trials have been done for other neuroleptics, but we can still draw one important conclusion – that they have significant risks for side effects, and sometimes their benefit is doubtful. Some interesting observations in these trials indicate that other treatment methods than drugs are of interest with BPSD. As a rule, the trials show limited effects, so research in this field must continue. We are aware that other trials are under way and also planned in Sweden.

The methodological problems, however, are much greater for vascular dementias and confusional states, which at least partially explains the lack of research activity in this field. We do see signs of growing interest in

evaluating the effect of acetylcholinesterase inhibitors on vascular dementias and confusional states, so it is likely that we will see more trials in this field in the future. It is vital that these trials are done.

**Table 4.1** Treatment of cognitive disorders in the elderly.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs*</b>					
Acetylsalicylic acid	Aspirin	1			2
ACE inhibitors	Ceranapril	1			3
Acetylcholine agonists	ABT-418 (nicotine)	1			4
	Arecoline (muscarine)		1		5
	Bethanechol (muscarine)		2		6–7
	Citicoline	1			8
	2-dimethylaminoethanol		1		9
	Choline bitartrate		1		10
	Lecithin	2	2		11–12/13–14
	Linopirdine	1			15
	Lu25-109 (muscarine)	1			16
	Nicotine patches	1	2		17/18–19
	RS 86 (muscarine)		2		20–21
Xanomeline	4			22–25	
Acetylcholinesterase inhibitors	Amiridin	1			26
	Donepezil	6	1		27–32/33
	Eptastigmine	3			34–36
	Physostigmine	8	4		37–44/45–48
	Galantamine	2			49–50
	Huperzine-A	1			51
	Metrifonate	10			52–61
	Rivastigmine	3			62–64
	Tacrine	12	3		65–76/77–79
	Velnacrine	5			80–84
Aminopyridine analogs	Besipirdine	2			85–86
Antiepileptics	Carbamazepine	1			87
	Valproate			1	88
Anticoagulants	Warfarin			1	89
Antioxidants	Idebenone	2			90–91
	Nicergoline	1			92
Benzodiazepines	Lorazepam		1		93
Calcium antagonists	Nicardipine	1			94
	Nimodipine	2			95–96
	Nitrendipine	2			97–98

\* Some of the studied drugs are not registered in Sweden for this indication

*Table continued on next page*

**Table 4.1** continued

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
Colostrinin		1			99
Phosphatidylserine		1			100
Phosphodiesterase inhibitors	Denbufylline	1			101
	Pentoxifylline	3			102–104
	Propentofylline	2	1		105–106/107
Gangliosides	GM-1	1	1		108/109
Ginkgo biloba		5			110–114
Hormones	ACTH analogs	1	2		115/116–117
	Estrogens	4			118–121
	Posatirelin (TRH analog)	2			122–123
	Prednisone	1			124
	Somatostatin	1	1		125
	Vasopressin analogs	1	1		126/127
Inositol		1			128
Carnitine (acetyl L carnitine)		7			129–135
MAO inhibitors	MAO-B (Selegiline = l-deprenyl)	10	1	1	136–145/ 146/147
	Unspecific (tranylcypromine)		1		148
Neuroleptics	Haloperidol	2	1		149–150/151
	Loxapine	1			152
	Risperidone	1			153
NMDA-agonister	Cycloserine	4	1		154–157/158
	Milacemide	2			159–160
NMDA antagonists	Memantine	2			161–162
Nootropic drugs	Aniracetam	1			163
	Oxiracetam	2	1		164–165/166
	Piracetam	2	1		167–168/169
	Pyritinol	2			170–171
	Sabeluzole	1			172
	Xantinel nicotinate	1			173
NSAID	Diclofenac/ misoprostol	1			174
	Indomethacin		1		175

Table continued on next page

**Table 4.1** continued

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
Opioid antagonists	Naloxone Naltrexone	3	1 2		176–178/179 180–181
Psychotropics	Various types of psychotropic drug treatments, prospective trial			1	182
Serotonin agonists	L-tryptophan	1			183
Selective serotonin reuptake inhibitors (SSRI)	Citalopram	1	1		184/185
	Fluoxetine	1			186
	Fluvoxamine	1			187
	Sertraline	1			188
	Zimeldine		1		189
Tricyclic antidepressants	Doxepin			1	190
	Imipramine	1			191
	Clomipramine	1			192
Vasoactive substances	Buflomedil		1		193
	Choto-san	1			194
	Cyclandelate	1			195
	Naftidrofuryl	1			196
	Secale alkaloids/Ergot alkaloids (Hydergin®)	2	2		197–198/ 199–200
	Sulodexide (heparin)	1			201
	Vincamine	1			202
Vitamins	Thiamine		1		203
	Methyltetrahydrofolic acid	1			204
	Vitamin B12 + folic acid			1	205
Participation in a clinical drug trial			1		206
Discontinuation of drugs	Neuroleptics	1	1		207/208
<b>Physical treatment</b>					
Physical training				2	209–210
Walks		1			211
Physiotherapy		1			212

Table continued on next page

**Table 4.1** *continued*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
Rocking in a rocking chair	Average 101 min/day for 6 weeks (crossover)			1	213
Social interaction	With nurses		1		214
Simulated presence:	Recording of conversations	1			215
<b>Memory training</b>					
Memory training		3			216–218
Reminiscence therapy	Reminiscence-focused music therapy for 5 days			1	219
Semantic priming				1	220
Cognitive-behavioral intervention in a group setting for 8 wks		1			221
Cognitive stimulation		1			222
<b>Virtual environment</b>	Present a visuo-constructional completion task		1		223
<b>Skin stimuli</b>					
Massage	Caregiver-provided slow-stroke massage			1	224
Touch	Expressive physical touch			1	225
	Three different “essential” oils, gentle hand treatment			1	226

*Table continued on next page*

**Table 4.1** *continued*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Light stimuli</b>					
Light therapy	Bright light for 1 hr/day for 4 weeks (crossover study)	1			227
	Bright light for 2 hrs/day for 2 weeks (crossover study)	1			228
	Bright light (2,500 lx) 2 hrs/day x 2 periods of 10 days			1	229
Floor pattern	2-D floor pattern to prevent patients from leaving the ward		1		230
<b>Sound stimuli</b>					
Music	Favorite music during bath: 10 times in 2 weeks	1			231
	Big band music from the 1920s–30s daily for 6 months	1			232
	Comparison of favorite music–relaxing classical music	1			233
	Dinner music: various types, three 2-week periods		1		234
	Relaxing music at meals		1		235
	Relaxing music at meals: intro/washout/reintro			1	236
	Music therapy, 30 min twice a week for 8 weeks			1	237
	Relaxing classical music and favorite music			1	238
	Music therapy, 30 min 5 days/wk for 4 weeks			1	239

*Table continued on next page*

**Table 4.1** continued

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
"White noise" (tape player)	Two environmental "white noise" audio tapes			1	240
<b>Worship service</b>	Providing a meaningful worship service			1	241
<b>Pets</b>	"Canine therapy"	1			242
<b>Multiple treatments</b>					
Activity + drug guidelines + education		1			243
Package of care:	Additional stimulation or stimulation-retreat relief from stimulation	1			244
Case management	Comparison between care given by a team and by individual caregivers	1			245
Multidisciplinary, psychogeriatric team		1			246
Video recording of loved ones + social activities + music				1	247
"Dementia program"			1		248
Admission for psychiatric care (inpatient)				1	249
Dementia daytime care			1		250
Aroma therapy and massage, separately or combined		1			251
<b>IT support for family</b>					
Communication, information and decision support		4	1		252–255/256

Table continued on next page

**Table 4.1** *continued*

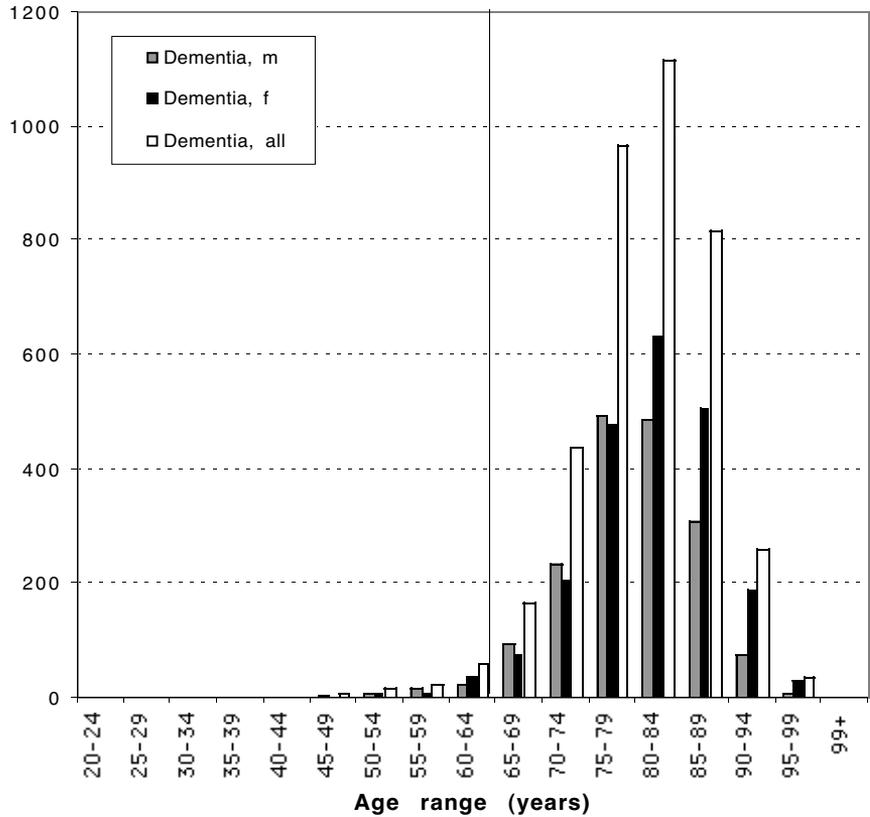
Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Assessment scales</b>					
Comparison of several different assessment scales	Reanalysis of previous RCT: Different professional groups used different scales	1			257
Introduction of assessment scale				1	258
<b>Instruction</b>					
Team	Training of all staff in handling behavioral problems		1		259
Patients	“Geragogy”: Comparison between two instruction techniques	1			260
Doctors	CME (newsletters, seminars, practice-based tools)	2			261–262
Care staff	Social service interventions for caregivers	1			263
	Compared effect of group discussions—group lectures, both by telephone	1			264
	Integrity-promoting care, 3 months’ training		1		265
	Staff education program on dementia			1	266
Family	Family training, 10-day training program	1		1	267–268
<b>Family/loved ones</b>					
Relief		2			269–270
Family intervention	Advice and support	5			271–275
<b>Total</b>		<b>194</b>	<b>54</b>	<b>26</b>	

**Table 4.2** Treatment of confusion/delirium in the elderly.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drug</b>	* Mianserin			1	3
	Remoxipride			1	4
	Trazodone			1	5
	Comparison of mianserin vs. haloperidol		1		6
<b>Care program</b>	Consultation by a geriatric internist or psychiatrist and follow-up by a liaison nurse	1			7
	Use of guidelines and delirium team		1		8
<b>Prevention</b>	Standardized coordination of six risk factors for delirium		1		9
	Reorganization of postoperative care after operation of hip fracture			1	10
<b>Total</b>		<b>1</b>	<b>3</b>	<b>4</b>	

\* Some of the studied drugs are not registered in Sweden for this indication

## Number of diagnoses



**Figure 4** The diagnosis of dementia in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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### **Confusion/delirium in the elderly**

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# 5. Depression

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*Sture Eriksson*

## Definition

In 1994, the American Psychiatric Association defined depression as [1]:

*“A condition characterized by depressed mood, decreased interest in daily activities, altered appetite, difficulties sleeping, psychomotor agitation or depression, tiredness and a feeling of loss of energy, feelings of guilt, reduced concentration and thoughts about death.”*

## Background

Depressive symptoms are considered frequent among the elderly, 10–12%. It is believed that several triggers may be involved [2]. One possibility is that during the process of aging, the brain changes in such a way that depressive symptoms can occur due to changes in transmitter systems, primarily serotonin. Other concurrent diseases, such as dementia disorders, are also believed to contribute to the development of depressive symptoms. Aging also involves a clear change in the entire living situation, which can also lead to depressive symptoms. Losing friends and loved ones, no longer being active on a professional and social plane, and approaching death are possible factors that can contribute to the incidence of depressive symptoms. Katona [3] presents a more in-depth analysis of these factors. As a rule, the elderly usually only demonstrate a handful of the above symptoms, which often makes diagnosing depression more difficult than it is in younger people [4].

The complex background in this field creates methodological difficulties in studying clinical trials [5], which has led to elderly patients being excluded from these trials. This in turn means that there are relatively few studies that evaluate treatment effects on elderly patients.

Widely varying terminology regarding depressive symptoms also contributes to difficulties in analyzing existing literature. Depression,

depressive symptoms and dysthymia can all be used more or less synonymously. Not even the concept of “elderly” is uniformly applied in the studies

## **Summary of published clinical trials**

### **Search strategy**

Searches were done in Medline using the terms “elderly,” “treatment” and “depression,” and all substances listed in the Pharmaceutical Codex for treating depression. This chapter’s table is based on published clinical trials that were mainly double-blind. As far as possible, we have only included trials that include “elderly” or “geriatric patients”; however, many trials were very unspecific about the age ranges of the patients.

### **Additional search strategy for “clinical trials in nursing”**

*Medline:* 85 hits, of which 10 are included.

*Cinahl:* 61 hits, of which 6 are included (duplicates excluded).

*Search path:* Depressive disorder, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Exclusions:* Non-English, reviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, individual case studies.

For a summary, see Table 5, Treatment of depression in the elderly.

## Comments

Even though the level of knowledge on the treatment of depressive symptoms in the elderly is limited, we can still see that trials exist that verify the antidepressive effect of drugs on the elderly. The most common side effects are anticholinergic effects.

In Swedish clinical practice, selective serotonin reuptake inhibitors (SSRI) and selective noradrenalin reuptake inhibitors (SNRI) are the most common first choice, even though there is no clear indication that they are superior to other substances, such as tricyclic antidepressants. They do, however, seem to have a better range of side effects in clinical practice, primarily that they have little or no anticholinergic effect.

The amount of literature on other types of treatments (non-pharmaceutical) is less extensive and sometimes less methodical; for example, placebo controls are hard to use. Electroconvulsive therapy (ECT) may be a preferable treatment, especially for severe depressive conditions and situations where drug treatment is not possible because of the risk for side effects. However, we were unable to find any double-blind trials with elderly patients that verify these findings. Mulsant and others state that when reviewing uncontrolled trials, about 80% of the patients see an effect [57]. Treatments like light therapy and cognitive therapy potentially have a lower risk for side effects, and it would be interesting to study in more detail the effects of this kind of treatment for depression in the elderly. No double-blind trials with elderly patients were found, which may be understandable because of the methodological difficulties. However, reviews of uncontrolled studies of cognitive therapy with the elderly indicate beneficial effects [71]. The effects of somatic illnesses and major life changes are also aspects that are worth more study.

**Table 5** Treatment of depression in the elderly.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
SSRIs (selective serotonin reuptake inhibitors)	Citalopram vs. placebo	1			6
	Citalopram vs. amitriptyline vs. placebo	1			7
	Citalopram iv vs. citalopram po vs. placebo	1			8
	Citalopram vs. mianserin	1			9
	Fluoxetine vs. placebo	2			10–11
	Fluoxetine ± estrogen vs. placebo	1			12
	Fluoxetine vs. amitriptyline	1			13
	Fluoxetine vs. paroxetine	1			14
	Fluoxetine vs. sertraline	1			15
	Fluoxetine vs. doxepin		1		16
	Fluoxetine			1	17
	Fluvoxamine vs. dothiepin	1			18
	Fluvoxamine vs. mianserin		1		19
	Mirtazapine vs. amitriptyline	1			20
	Paroxetine vs. amitriptyline	2			21–22
	Paroxetine vs. fluoxetine	1			14
	Paroxetine vs. clomipramine	1			23
	Paroxetine vs. mianserin	1			24
	Paroxetine vs. psychotherapy vs. placebo	1			25
	Sertraline vs. amitriptyline	1			26
	Sertraline – fluoxetine	1			15
	Sertraline vs. imipramine	1			27
	Sertraline vs. nortriptyline	2			28–29
Sertraline vs. placebo	1			30	
SNRIs (selective noradrenalin reuptake inhibitors)	Reboxetine vs. imipramine	1			31
	Milnacipran vs. imipramine	1			32
SSRI + SNRI	Venlafaxin vs. dothiepin	1			33
Nonselective monoamine reuptake inhibitors					
<i>Tricyclic antidepressants</i>	Amitriptyline vs. citalopram	1			7
	Amitriptyline vs. fluoxetine	1			13
	Amitriptyline vs. mirtazapine	1			20
	Amitriptyline vs. paroxetine	2			21–22
	Amitriptyline vs. sertraline	1			26
	Amitriptyline vs. lofepramine vs. placebo		1		34

Table continued on next page

**Table 5** *continued*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
	Desipramine vs. adinazolam	1			35
	Dothiepin vs. venlafaxine	1			33
	Dothiepin – fluvoxamine	1			18
	Dothiepin – lofepramine	1			36
	Dothiepin vs. venlafaxine	1			33
	Doxepin vs. fluoxetine		1		16
	Imipramine vs. buspirone vs. placebo	1			37
	Imipramine – befloxtatone	1			38
	Imipramine – brofaromine	1			39
	Imipramine vs. mianserin	1			40
	Imipramine vs. milnacipran	1			32
	Imipramine vs. moclobemide	1			41
	Imipramine – reboxetine	1			31
	Imipramine vs. sertraline	1			27
	Clomipramine vs. paroxetine	1			23
	Lofepramine vs. placebo	1			42
	Lofepramine – amitriptyline	1	1		34
	Lofepramine vs. dothiepin	1			36
	Lofepramine vs. mianserin		1		43
	Nortriptyline vs. placebo (prevention of relapses)	1			44
	Nortriptyline vs. phenelzine vs. placebo	1			45
	Nortriptyline + psychotherapy (post-hoc study)	1			46
	Nortriptyline vs. sertraline	2			28–29
	Nortriptyline			1	47
<i>Tetracyclic antidepressant</i>	Maprotiline vs. mianserin	1			48
	Maprotiline vs. moclobemide	1			49
	Mianserine – citalopram	1			9
	Mianserine vs. fluvoxamine	1			19
	Mianserine vs. imipramine	1			40
	Mianserine vs. lofepramine	1			43
	Mianserine vs. maprotiline	1			48
	Mianserin vs. moclobemide	1			49
	Mianserine vs. imipramine	1			24
	Mianserine vs. lofepramine		1		43

*Table continued on next page*

**Table 5** continued

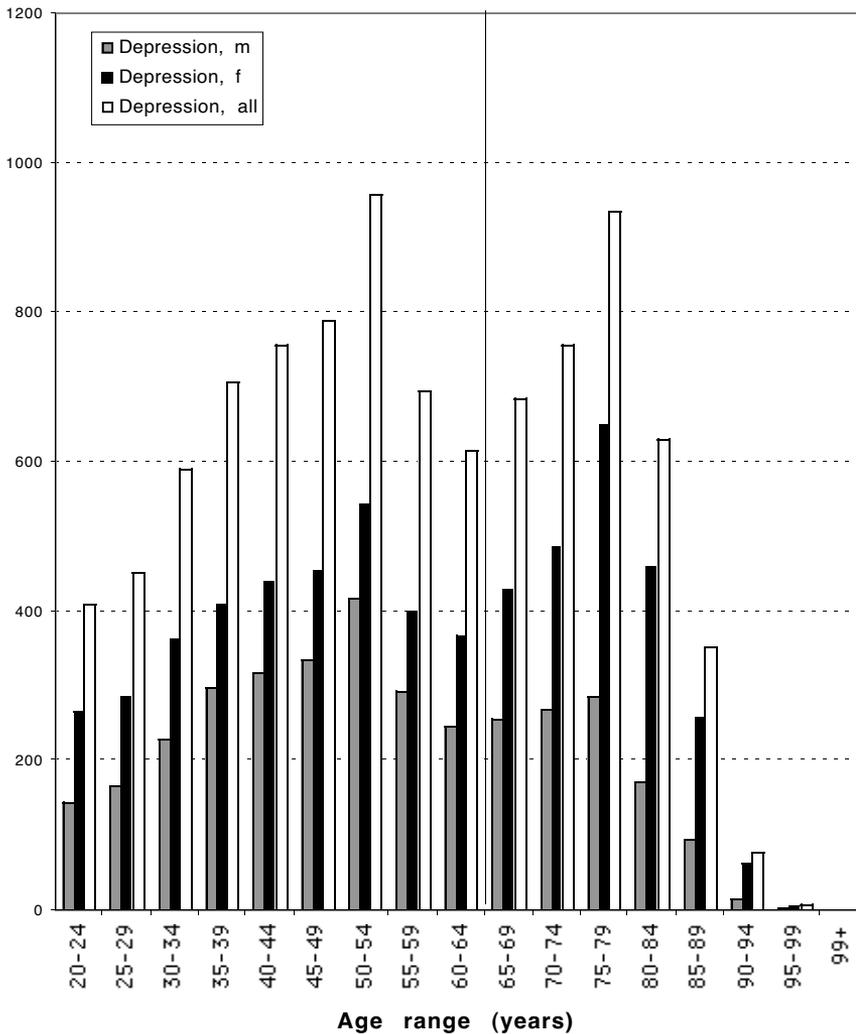
Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
Trazodone	Trazodone vs. folic acid	1			50
MAO-A inhibitors	Moclobemide vs. placebo	1			51
	Moclobemide vs. imipramine	1			41
	Moclobemide vs. maprotiline	1			49
	Two studies in one: Moclobemide vs. mianserin or maprotiline	1			49
	Befloxatone vs. imipramine	1			38
	Brofaromine vs. imipramine	1			39
Nonselective MAO inhibitors	Phenelzine vs. nortriptyline	1			45
Presynaptic $\alpha_2$ -antagonists	Mirtazapine vs. amitriptyline	1			20
Benzodiazepines	Adinazolam vs. desipramine	1			35
Azaspirane derivates	Buspirone vs. imipramine vs. placebo	1			37
Peripheral vasodilators	Cyclandelate vs. placebo		1		53
Folic acid	5-methyltetrahydrofolic acid vs. vs. trazodone	1			50
Other	5-hydroxy tryptophan vs. dihydroergocristine vs. placebo		1		54
	Viloxazine (Vivalan®)	1			52
Combinations of drugs	Fluphenazine/nortriptyline vs. promazine		1		55
<b>Physical training</b>	10 weeks of supervised weight-lifting exercise followed by 10 weeks of unsupervised exercise	1			56

Table continued on next page

**Table 5** *continued*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Electroconvulsive Therapy (ECT)</b>				1	57
<b>Psychotherapy</b>	Psychotherapy vs. paroxetine vs. placebo	1			25
	Psychotherapy + nortriptyline (post-hoc study)	1			46
	Group reminiscence counselling Control-relevant psychosocial intervention	1			58
		1			59
	Geropsychiatric nurse in conjunction with trained older adult volunteers	1			60
	Cognitive psychotherapy vs. group handiwork vs. placebo		1		61
	Cognitive group psychotherapy		1	1	62/63
	Psychosocial treatment			1	64
	Cognitive-behavioral group therapy vs. focused visual imagery group therapy vs. education discussion groups			1	65
	Group psychotherapy integrated in an overall treatment plan			1	66
Structured life review process		1	1	67/68	
<b>Care program</b>	Individual package of care that was formulated by the community psychogeriatric team	1			69
	Medicare prospective payment system		1		70
	TQM (total quality management) principles to develop a plan: instruction, counseling, psychotropics as needed			1	71
	Common multidisciplinary interventions			1	72
<b>Total</b>		<b>46</b>	<b>11</b>	<b>10</b>	

## Number of diagnoses



**Figure 5** The diagnosis of depression in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65.

Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 6. Stroke

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*Ingegerd Nydevik*

## Definition

The WHO defines stroke as:

*Suddenly occurring focal disruption of brain function, with symptoms lasting at least 24 hours or leading to death, where the cause is not obviously anything other than vascular.*

## Background

Stroke is the third most common cause of death and the most common cause of handicaps in Sweden. In 2000, the National Swedish Board of Health and Welfare published national guidelines for stroke care [1], including epidemiological and health economic data. Stroke costs society huge amounts of money in lost production and high treatment costs. The risk of stroke increases sharply with age. The average age at onset is 75 (73 for men, 77 for women). Eighty percent of stroke patients are over 65. Since the percentage of elderly people in Sweden is expected to increase in the coming years, it is assumed that the number of stroke patients will increase by 30% between 2000 and 2010. Stroke is at the root of much of the need for inpatient care and housing for the elderly. It is also the patient group that requires the most rehabilitation among elderly patients. Stroke victims very often suffer from multiple diseases (multimorbidity), commonly with disorders caused by arteriosclerosis, such as cardiovascular diseases, as well as diabetes and vascular dementia.

The costs to society for nursing home care, social services and other post-stroke care are significantly higher than for the emergency care at onset.

Extensive research has been done on various aspects of stroke. We have reviewed works published on post-stroke treatment in the past ten

years, where the average age of the patient groups was over 65. Only the most common treatment types were included in the searches. Studies of epidemiology, prognosis, primary prevention and other follow-ups or descriptive studies not involving treatment were not included, nor were surgical treatment methods. Review articles and meta analyses were not included.

## **Summary of published clinical trials**

### **Search strategy**

Searches were made in Medline (Pubmed and Ovid), Cinahl and Amed (Cats). The databases are constructed somewhat differently and require different search strategies. In Medline, we searched for articles on cerebrovascular disorders/rh (rehabilitation) and /dt (drug therapy) for the 65+ age range in the years 1991–2001. Reviews and meta analyses were excluded. This provided primarily 124 references in the area of rehabilitation and 95 references in drug treatment.

In Amed, we searched for “stroke” or “cerebrovascular disorders” combined with “aged” and “rehabilitation,” which returned 79 references. In Cinahl, we searched for “cerebrovascular disorders”/rh (rehabilitation) and “aged 65–79 years” or “aged 80 and over” and “yr=1991–2001.” This combination gave 367 hits. Combining these with “clinical trials” provided 42 references, several of which were reviews, descriptive studies, etc., which are not included in this review. The remaining 34 articles were included. Cinahl also specifies the reference lists of each found article, which gave us some further original articles that were not located through our initial search. These were also included.

In addition, the material was further expanded with several articles we received from colleagues. Searches were also made in the areas of dysphagia and language/speech disorders, but the material has not been fully worked up, so it was not included.

## **Additional search strategy for “clinical trials in nursing”**

*Medline:* 348 hits, of which 23 are included.

*Cinahl:* 65 hits, of which 1 is included (duplicates excluded).

*Search path:* Stroke, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Exclusions:* Non-English, reviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, and individual case studies.

### **Workup**

All references were reviewed as to the average age of the patients and the type of study. The majority of excluded articles were left out because the average patient age was too low, and some because the articles turned out to be reviews or commentaries, or because they otherwise did not meet the specified criteria. Including “nursing,” a total of 97 clinical trials are included in this material.

The table in this chapter shows the studies grouped by treatment method. In several cases, a trial was applicable to more than one heading; we tabulated them under the most common method.

The classification “randomized controlled trial” (RCT), “controlled clinical trial” (CCT) and “uncontrolled clinical trial” (UCT) was not always clear, especially in the rehabilitation trials, so our classification may be uncertain in some cases. Many different methods have been used, and some trials are pilot projects or case studies. A more detailed review is required for a more precise classification.

For a summary, see tables 6.1–6.3, Treatment of stroke in the elderly.

## Comments

The following comments do not refer to trials in the nursing field. These trials are commented on in Chapter 22.

Many stroke studies include elderly people, but considering that the average age of onset is 75, it is peculiar that the majority of studies concern people with an average age under 65. The average age is over 75 in just 18 trials reviewed here: [18, 21, 23, 25, 27, 37, 43, 47, 50, 60–62, 65–67, 70, 74, 94]. Of these, 14 are rehabilitation studies and only 1 is a drug trial [94]. Although old age is not listed as a criterion for exclusion, the elderly seem to be underrepresented in the patient groups available for study—possibly because they are not cared for at the clinics pursuing the trials.

Most trials regarding drug treatment in the acute phase have had negative results. Thrombolysis treatment within three hours after onset is the exception, whereas later introduction of treatment has shown no effect. Heparin has not been shown to have any sure effect for progressive stroke.

Amphetamine treatment in combination with physical training has proven to have better results than training alone.

The drug trials referred to here did not specifically study the importance of the patient's age to the effect of treatment, except for one or two trials that excluded patients aged 75+. This did not affect the results, however [13].

In the acute phase, inpatient care in the stroke unit led to reduced mortality, reduced need for institutional care and increased capability for activity than care at a “regular” ward or in the home. Elderly stroke patients and those with severe effects draw at least as much benefit from care at specialized care and rehabilitation units at least as younger patients [60–61]. One study compared the organization of care at a stroke unit, a medical ward and a geriatric ward to determine why the stroke unit had better results. The results of the study were surprising: “Rehabilitation nursing was rarely observed on the stroke unit, never on

the general medical ward but always on the elderly care unit.” The study also gave interesting results on teamwork in the units [92].

Nutrition via PEG was found to work better than a nasogastric tube in the acute phase after a stroke [37].

Subacute rehabilitation in a rehabilitation ward at a hospital gave better results as regards mortality and dependency than post-stroke care in primary or municipal care (including home rehab and municipal inpatient rehab), according to a Norwegian study [65]. This study also showed that the rehabilitation results were the same whether the patient had been treated at a stroke unit or a regular medical ward in the acute phase.

Good results can also be achieved when rehabilitation is introduced for chronic symptoms [19, 29, 31, 32, 35, 77] in terms of motor function, balance, oxygen uptake, and also social function, self-esteem and ADL function. Most of the referred studies dealt with patients whose symptoms were unchanged or increased after several years before training began.

Day hospital rehabilitation can give good results if training is intense in the chronic phase [77] and can be a less expensive, more effective form of care than inpatient rehabilitation [78].

Home rehabilitation as a follow-up after early release has been shown to have good results [59, 80–84, 86] and appears to be cost-effective for people with moderate to light symptoms [81], but can be a burden on the family, both financially and psychosocially [55, 80, 89]. In comparison with very early release to the home (within 72 hours after onset), care at a stroke unit results in clearly lower mortality and dependency [62].

Trials dealing with training methods show consistent good results regardless of age. Elderly patients also show increased motor activity areas in the brain in PET scans after task-oriented arm training [26]. One effective training method is walking on a treadmill with partial bodyweight support [25, 31, 33, 35].

## Summary and conclusions

There is still little information on specific drug treatments in the acute phase, but the trials provide convincing evidence that good care and rehabilitation in specialized stroke units, in both the acute and subacute phases, give significantly better results than care at non-specialized units. Elderly patients benefit at least as much from this care as younger patients.

Home rehabilitation is a valuable complement after discharge for patients with moderate symptoms.

Intensive training provides significant effects even for elderly patients with chronic symptoms remaining several years after the stroke. Such training is ideal for day hospital rehabilitation.

Today's medical care organization has minimal allowance for actual rehabilitation of elderly stroke patients, at onset or later on, even though this is probably more beneficial from a social-economic standpoint. Statistics from Riksstroke (the National Stroke Register) indicate that elderly patients are less often treated at stroke units in the acute phase than younger patients, at least in metropolitan areas. Many sufferers of severe stroke are quickly transferred to municipal housing without being offered rehabilitation. There is therefore an urgent need for health-economy studies of rehabilitation of the elderly.

Models for an effective care organization for rehabilitating elderly stroke patients must be developed and evaluated. Coordinating efforts between different caregivers and professional groups, and models for regular rehabilitation and function preservation in elderly care are key components of such an organization.

Continued development of specific training methods using new technologies is likely to improve rehabilitation results in the future.

**Table 6.1** Stroke in elderly patients. Treatment in the acute phase.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs*</b>					
<i>Heparin/heparinoids</i>	Certoparin	1			2
	Danaparoid	1			3
	Heparin		1		4
<i>Neuroprotection</i>					
GABA derivatives	Piracetam		2		5–6
Glycine antagonists	Gavestinel	2			7–8
NMDA antagonists	AR-R15896AR	1			9
Calcium antagonists	Nimodipine	1			10
Phospholipid modulators	Citicoline	1			11
Sodium channel blockers	Sipatrigine	1			12
Glutamate antagonists	Lubeluzole	1			13
<i>Tissue plasminogen activators</i>		2	2		14–15/ 16–17
<b>Oxygen</b>		1			18
<b>Total</b>		<b>12</b>	<b>5</b>	<b>0</b>	

\* Some of the studied drugs are not registered in Sweden for this indication

**Table 6.2** Stroke in elderly patients. Treatment later in the progression.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Physical training</b>	Task-related circuit training 3 times/wk x 4 wks	1			19
	Treatment of sensorimotor stimulation x 6 wks	1			20
	Affected shoulder strapped x 6 wks	1			21
	Arm vs. leg training 30 min, 5 days/wk x 20 wks	1			22
	Motor relearning programme vs. "Bobath"	1			23
	Additional physiotherapy	1			24
	Treadmill re-training and a specific schedule of physiotherapy	1			25
	Task-oriented arm training	1			26
	Standard post-stroke physio- therapy 30 vs. 60 min	1			27
	Exercise training group 3 times/week x 10 wks	1			28
	Visual feedback training	1			29
	Warm-up, aerobic exercises, lower extremity muscle strengthening, and a cool down 3 days/wk x 10 wks	1			30
	Body weight support and treadmill stimulation	1			31
	Trunk rotation and scanning training	1			32
	Partial body weight-supported treadmill training vs. "aggressive bracing-assisted walking program"		1		33

*Table continued on next page*

**Table 6.2** *continued*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
	Repetitive bilateral arm training with rhythmic auditory cueing in 5-min periods 3 times/wk			1	34
	Treadmill exercise 40 min, 3 x/wk x 6 mos.			1	35
	Gait re-education with the Bobath concept			1	36
<b>Nutrition</b>	PEG vs. nasogastric tube	1			37
<b>Perceptual treatment</b>	2.5 hrs/wk x 6 wks	1			38
<b>ADL training</b>	Encourage independence in personal and instrumental activities of daily living	1			39
	Goal-directed action vs. rote exercise		1		40
	Leisure therapy and conventional occupational therapy	1			41
	Occupationally embedded exercise involving a simple dice game with a rote exercise	1			42
	Materials-based occupation vs. imagery-based occupation vs. rote exercise	1			43
	Domiciliary occupational therapy	1			44
	Occupational therapy treatment 1 hr x 12			1	45
<b>Apraxia training</b>	Teaching patients strategies to compensate for the presence of apraxia, 12 weeks		1		46
<b>Acupuncture vs. TNS vs. placebo</b>		3			47–49

*Table continued on next page*

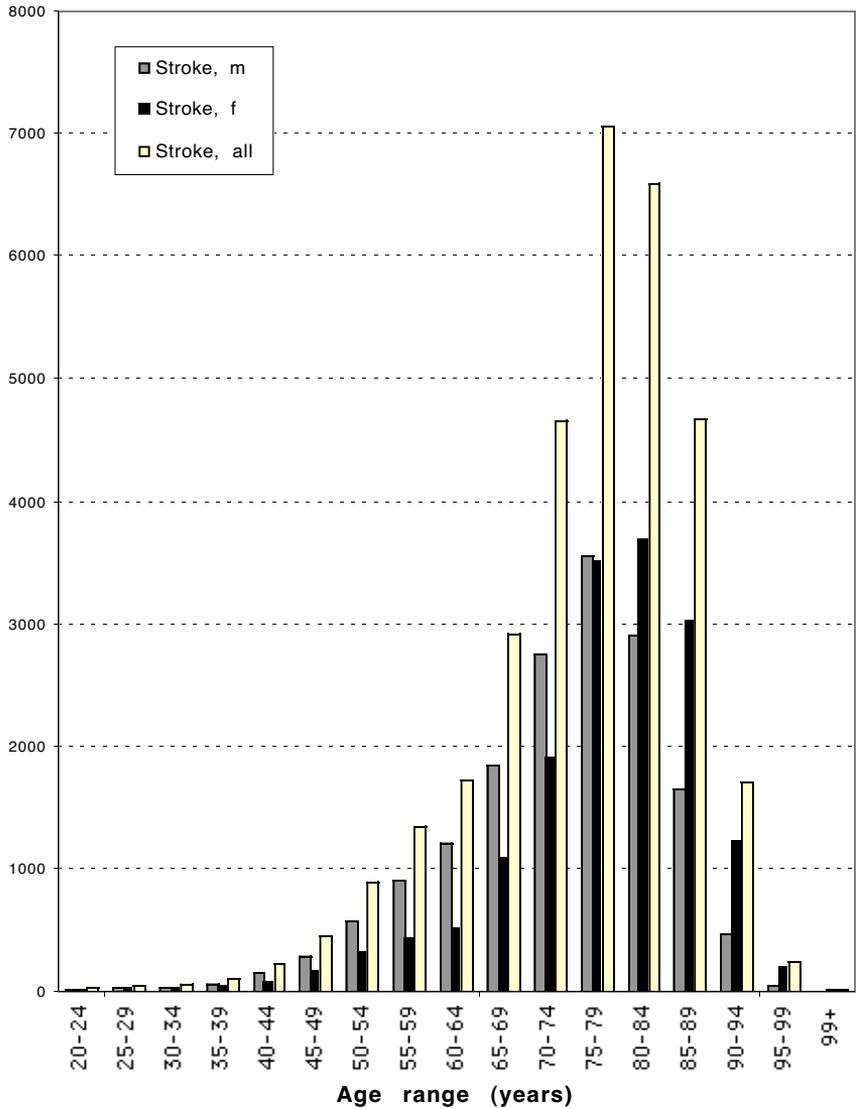
**Table 6.2** *continued*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Positive airway pressure</b>		1			50
<b>Body position during care</b>	Comp. O <sub>2</sub> saturation lying–sitting		1		51
<b>Patient education</b>	Supportive-educative nursing intervention			1	52
<b>Staff training</b>	Physiotherapist-led stroke training programme for nurses			1	53
<b>Counseling/ social support</b>	Contact with a stroke family care worker	2			54–55
<b>Two concurrent treatment methods</b>	Physical training + amphetamines	1			56
	Physical training + drug (fluoxetine vs. maprotiline vs. placebo)	1			57
<b>Comparative care forms</b>	Stroke unit	15	3	1	58–72/ 73–75/76 77–79
	Outpatient care vs. conventional care	3			
	Home care vs. conventional care	9	1	1	80–88/ 89/90 91–92
	Comp. choice of care form–outcome			2	
	“Managed care” (health-economic analysis)			1	93
<b>Total</b>		<b>56</b>	<b>8</b>	<b>12</b>	

**Table 6.3** Stroke in elderly patients. Preventive treatment (secondary prevention).

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Blood pressure and thrombocyte function</b>	Transdermal glyceryl trinitrate	1			94
<b>Risk of recurrence</b>	Antiplatelet agents (ASA, dipyridamole and combination)	3			95–97
<b>Risk that stroke patients with dementia do not receive preventive treatment for recurrence</b>				1	98
<b>Total</b>		<b>4</b>		<b>1</b>	
<b>Total Table 6.1–6.3</b>		<b>72</b>	<b>13</b>	<b>13</b>	

### Number of diagnosis



**Figure 6** The diagnosis of stroke in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 7. Parkinson's disease

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*Ann-Kathrine Granérus*

## Definition

The internationally accepted definition of Parkinson's disease is [1–2]:

- *one of three cardinal symptoms: tremor, rigidity and hypokinesia, or*
- *two of four cardinal symptoms, where the fourth is reduced postural reflexes.*

In addition to this:

- *slow progression of symptoms (months at the least, usually six months or more)*
- *no other neurological symptoms*
- *no neuroleptic treatment in the patient's history*
- *positive effect of DOPA treatment is a strong indicator for the diagnosis*

## Background

Parkinson's disease (PD) is a significantly age-related disease. The average age of onset is 55–60, and the disease is very uncommon among people under age 30. The prevalence varies from country to country, but is usually somewhere between 100 and 200 sufferers per 100,000 citizens. By age 70, the prevalence increases to more than 1%, and it doubles in even older groups [1]. The reason for the increasing prevalence with advancing age is partly that the disease is age-related and partly that modern treatment methods give PD patients almost the same life expectancy as individuals of the same age without PD. Before levodopa was introduced, PD patients had significantly higher mortality and were not expected to live longer than ten years [3]. In Sweden, an estimated 15,000–20,000 patients suffer from PD, half of them over 70 years of age. The percentage of elderly PD patients will likely increase as society grows older and treatments improve. With this in mind, it is crucial that treatment studies of PD also include elderly people, and that the effects and side effects of treatment are specified in relation to age.

## Summary of published clinical trials

### Search strategy

Medline was searched with the criteria “Parkinson’s disease”/“parkinsonism in elderly patients” and “antiparkinsonian treatment” (including various drugs, operations and electroconvulsive therapy (ECT)), in articles published since 1989. These keywords provided 50 references, but a more detailed review eliminated 35 of them for various reasons, for example that the average age was under 65. Of the remaining 15 articles, two were meta analyses [4, 5]. As the table in this chapter shows, nine of the 13 remaining studies were randomized and controlled, one was controlled but not randomized, and three were uncontrolled. Altogether the studies involved 1,943 patients. References [10, 15 and 16] compare the effects of two different drugs.

### Kompletterande sökstrategi på ”behandlingsstudier inom omvårdnad”

*Medline:* 21 hits, of which 0 are included.

*Cinahl:* 9 hits, of which 0 are included (duplicates excluded).

*Search path:* Parkinson, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Exclusions:* Non-English, reviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, individual case studies.

For a summary, see Table 7, Treatment of Parkinson’s disease in the elderly.

### Comments

Only three of the studies [6, 7, 11], two of which are based on the same patient material [6, 7], specify the number of patients aged 75+, a total of 3.1% of all patients in trials that noted age. This figure concurs with Mitchell’s meta analysis, which found that 5.5% of patients whose

age was specified were over 75 [4]. The trials by Bowes et. al. [6, 7] study the effect of levodopa on walking ability and morning stiffness in 14 patients, 13 of whom were over 65 and 11 of them were over 75. The results are not correlated with age (but the material was not very extensive).

An uncontrolled trial studied the effect of levodopa on 150 patients, 108 of them over 65 and 49 of these over 75. This was one of the few studies that correlated the treatment effect to age (poorer effect on balance and walking with increasing age). It also compared the patients with the balance and walking ability of 150 controls of the same age [11].

Another ten studies indicate that patients aged 75+ were included, but the precise age and the precise number of patients in various age groups is not specified, nor is the treatment effect correlated to age.

In three studies, the lower age limit was 60 or 63; one uncontrolled trial on ECT as antiparkinson treatment [18], one about the (lack of) effect of apomorphine on speech ability [12] and a study on giving bromocriptine to elderly patients [14]. In none of these trials are the results correlated to age. One uncontrolled trial on treatment results after pallidotomy indicates that the prognosis is better for patients under 70 [19].

A meta analysis by Mitchell et al encompasses 112 articles [4]. It turned out that patients aged 75+ were only included in 42 of these, while others either didn't include older patients or didn't specify the ages of the patients. Only eight of the articles specified the exact number of patients in different age groups, and of the total 145 patients in these, only eight were 75+ (5.5%). One study shows that ten patients were treated with selegiline and levodopa, with a table showing that four of them are over 65, but none are over 75 [17]. It is a small study that does not correlate the effect of treatment with age. Another meta analysis involves treatment with levodopa and selegiline and includes five articles that compare the effect in 254 and 257 patients respectively, who were treated with levodopa with or without selegiline [5]. In this compilation, the average age is about 64, while the spread is close to ten years. This means that relatively elderly patients were also included. Though the patient material is significant, the results are not correlated with age.

## Summary and conclusions

The literature review on Parkinson's disease (PD) shows that very few trials focus on elderly patients, even though PD is a significantly age-related disease.

Drug trials sponsored by pharmaceutical companies usually make sure that their patient base do not have significant other ailments than PD. Since increasing age is a risk factor for disease in general, this may be a partial explanation to why relatively few studies include elderly PD patients. It also means that the *patient material does not reflect the true situation*. Patients with other concurrent diseases are likely to be taking other medications. Very few studies, if any, focus on the problems of *drug interaction* between antiparkinsonian drugs and other medications.

PD patients are above all characterized by their increased tendency toward mental side effects in connection with drug treatment. Several trials show only a few percent of patients suffering mental side effects in connection with the drug, while in practice about half of elderly PD patients suffer such side effects.

Naturally this is significant for the ability to provide adequate treatment. There is a need to analyze in greater detail which patients are in the risk zone for developing *side effects from antiparkinsonian drugs*, where mental side effects are among the foremost in elderly patients. An evaluation of cardiovascular effects of antiparkinsonian drugs is also critical for elderly patients.

*Comorbidity with dementia and depression* is not uncommon, and needs special consideration. The trigger mechanisms and risk factors for PD combined with these conditions need further study.

Many patients develop fluctuating symptoms with *long-term treatment of PD*, which can lead to major therapeutic problems. Studies of younger PD patients appear to indicate that early introduction of a dopamine agonist reduces the risk of fluctuating symptoms, and some authors advocate initiating treatment with a single drug, a dopamine

agonist or MAO-B inhibitor. The problem here is that none of these substances has the same favorable effect on Parkinson's symptoms that levodopa has, while the risk of side effects is at least as great as with dopa. The question is in what way elderly PD patients stand to gain from a treatment that limits the motor problems that occur ten years down the line, but provides less antiparkinson effect and possibly greater side effects right now.

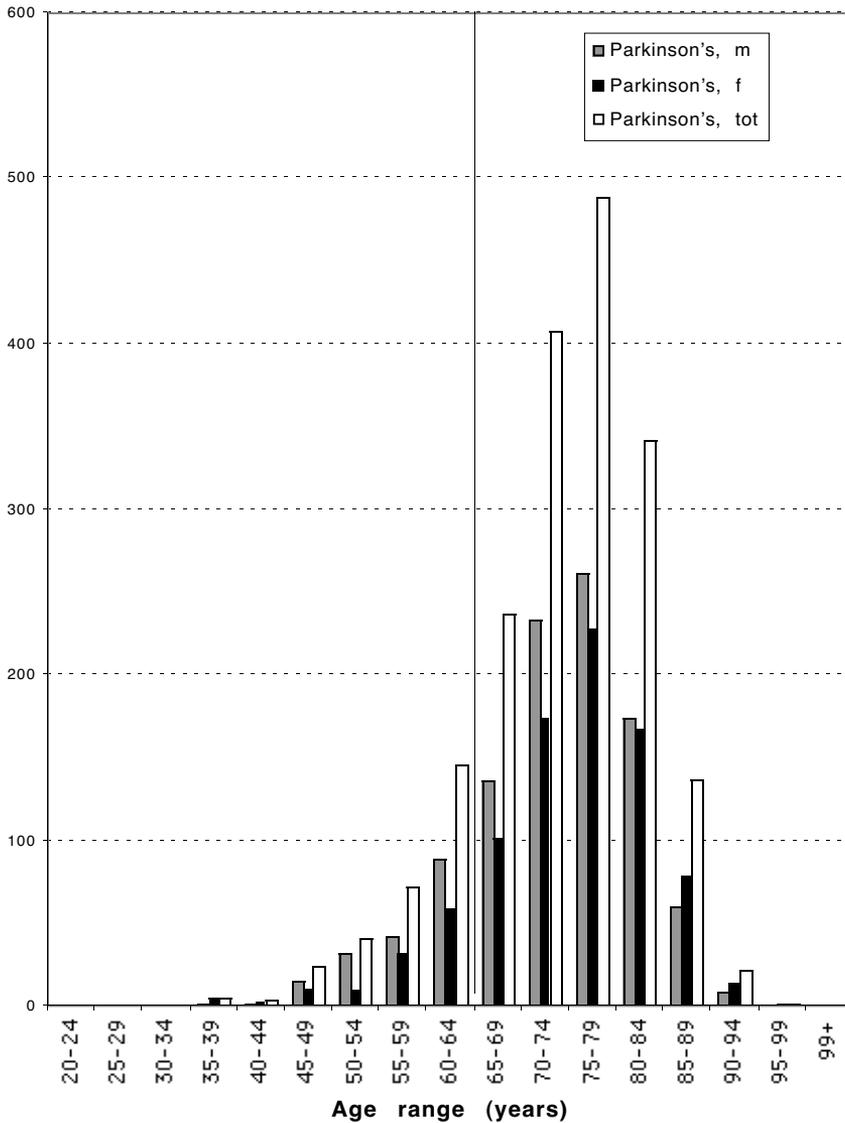
More evaluation is needed for elderly PD patients in general, regarding drug interactions, risk factors for side effects of anti-PD drugs, treatment strategies with concurrent dementia or depression, etc.

The most important question is which treatment strategy best benefits elderly patients in both the long and the short term. Social economy aspects are also significant here – not only as regards drug costs, but also social measures in general.

**Table 7** Treatment of Parkinson's disease in the elderly.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
Levodopa (L-DOPA)	L-DOPA vs. placebo:	2			6,7
	Controlled-release L-DOPA vs. standard L-DOPA	2		1	8,9,10
	L-DOPA			1	11
Dopamine agonists	Apomorphine vs. placebo	1			12
	Bromocriptine vs. placebo (without L-DOPA)		1		13
	Bromocriptine vs. placebo (in addition to L-DOPA)	1			14
	Cabergoline vs. placebo (in addition to L-DOPA)	1			15
MAO-B inhibitors	Selegiline vs. placebo (in addition to L-DOPA)	2			16,17
<b>Electroconvulsive therapy</b>				1	18
<b>Surgery</b>					
Pallidotomy	Unilateral vs. bilateral pallidotomy			1	19
<b>Physical training</b>	4-week body weight-supported treadmill training program	1			20
	8-week, supervised PoleStriding exercise program			1	21
<b>Total</b>		<b>10</b>	<b>1</b>	<b>5</b>	

## Number of diagnosis



**Figure 7** The diagnosis of Parkinson's disease in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 8. Heart failure

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*Thomas Wallén and Bodil Lernfelt*

## Definition

The European Society of Cardiology has defined heart failure as [1]:

- 1. Symptoms of heart failure at rest or work*
- 2. Objective signs of impaired heart function at rest*
- 3. Heart failure treatment has effect.*

Criteria 1 and 2 must be met. Criterion 3 is used in cases where the diagnosis is in doubt.

## Background

Heart failure can be caused by systolic or diastolic dysfunction, often occurring at the same time. Heart failure caused by diastolic dysfunction [2] can cause typical symptoms and/or clinical signs of heart failure despite normal systolic function.

The prevalence of heart failure increases dramatically with age. The diagnosis applies to about 10% of the population aged 75+ [3–5], and an estimated 2/3 of all heart failure patients are in this age range [6]. Heart failure is a serious disease with high mortality, and is at the root of a large percentage of hospital admissions of elderly patients [6]. With mild heart failure, mortality is about 5–10% per year. The one-year mortality of the worst patients is an estimated 40–50% [7].

It is difficult to diagnose heart failure in the elderly. The most common causes of heart failure are chronic ischemic heart disease and hypertension [8]. Common symptoms of heart failure, such as shortness of breath and tiredness, can also have other causes, including to some degree aging itself. Current European guidelines for diagnosing heart failure require objective signs of reduced left ventricular function, using mainly echoardiography [1]. Many elderly patients are not examined

with cardiography, but with ultrasound, which can lead to both over and underdiagnosis. Heart failure in the elderly differs from heart failure in younger patients. Up to 50% of elderly patients with heart failure have normal left ventricular systolic function, usually with an underlying left ventricular diastolic dysfunction at the cause of the heart failure [8–9].

The studies on which modern treatment recommendations are based consist mainly of patients with an average age of 60–65. The majority of the patients in the trials are men, and systolic dysfunction (ejection fraction (EF) <40%) was a requirement for inclusion. Patients being treated in hospitals for heart failure often differ significantly from the patients in the trials. In one French trial, 73% of the patients were over 70 (median 76) and 45% had an EF of over 40% [6]. In the highest age ranges, the number of women increased, as did the percentage with a normal EF. The problems faced today in treating heart failure in the elderly are that the documentation of treating diastolic dysfunction is sketchy and that the treatment recommendations for systolic dysfunction are based on studies of middle-aged men, making them difficult to transfer to significantly older men and women.

## **Summary of published clinical trials**

### **Search strategy**

The keywords used to identify relevant studies in PubMed were: “Heart failure,” “congestive/drug therapy,” “congestive/diet therapy,” “controlled clinical trials,” “randomized controlled trials” and “aged”. In the Science Citation Index search, the keywords were: “congestive heart failure,” “elderly,” “old” and “aged” for the period 1966–2000.

### **Additional search strategy for “clinical trials in nursing”**

*Medline:* 139 hits, of which 8 are included.

*Search path:* Congestive heart failure, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Exclusions:* Non-English, reviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, individual case studies.

For a summary, see Table 8.1, Treatment of heart failure in the elderly.

## Comments

The prevalence of heart failure has been studied even at advanced ages, but only in exceptional cases is the diagnosis made using echocardiography or another diagnostic method to obtain objective signs of impaired heart function. In the past ten years, several studies have focused on the incidence of left ventricular diastolic dysfunction and normal left ventricular systolic function in a large percentage of elderly patients with heart failure. Among the studies on which current treatment recommendations are based, most did not include patients aged 80+, and the average age in the trials was often 60–65 [29–40]. A majority of the patients in the trials are men.

ACE inhibitors and beta blockers have been studied on the elderly and shown a well-documented effect on morbidity and mortality in patients with left ventricular systolic dysfunction. However, there is still limited documentation of treatments of patients with heart failure and left ventricular diastolic dysfunction.

A handful of clinical trials have specifically studied patients of advanced age. The trials compiled in the tables include two mortality studies with an average follow-up of six months for the one and two years for the other [7, 18]. Other studies have about 2–3 months' follow-up and are morbidity studies. One of the studies listed here has no relevance to geriatric inpatient or outpatient care, but sheds light on emergency treatment of elderly patients with heart failure [12].

Of the listed trials, eight relate to ACE inhibitors, one of them done on patients with normal left ventricular systolic function. All of the studies concur that even patients of advanced age with left ventricular systolic dysfunction benefit from ACE inhibitors as regards both symptoms and prognosis.

No trials have been published for beta blockers that specifically present the results for patients aged 65+. The trials that have shown significant improvement in morbidity and mortality [35–37, 40] have included patients up to age 80, but the average age was 58–64, and 80% of the participants were men. On the other hand, nothing seems to indicate that beta blockers would be less effective in older patients.

Angiotensin-II receptor blockers have been studied on elderly patients, and even though the ELITE study showed positive effects on mortality in elderly heart-failure patients, this was a secondary endpoint and requires further trials to evaluate this treatment [18].

Spirolactone has been studied in younger patients, but there is no scientific data for older patients [38].

In summary, modern treatment recommendations for heart failure are based on studies where the average age is usually 60–65, most of which did not even include patients over 80. The documentation of treating left ventricular diastolic dysfunction is still very limited. Ongoing studies with Angiotensin-II receptor blockers, etc., do not have an upper age limit. They will also show the treatment results for left ventricular diastolic dysfunction. Another possibility is to go through existing large clinical trials and specifically analyze the 65+ age range. Other vital research projects are the multidisciplinary intervention to prevent early recurrence and also studies of the effect of physical training, including energy-saving ADL (activities of daily life).

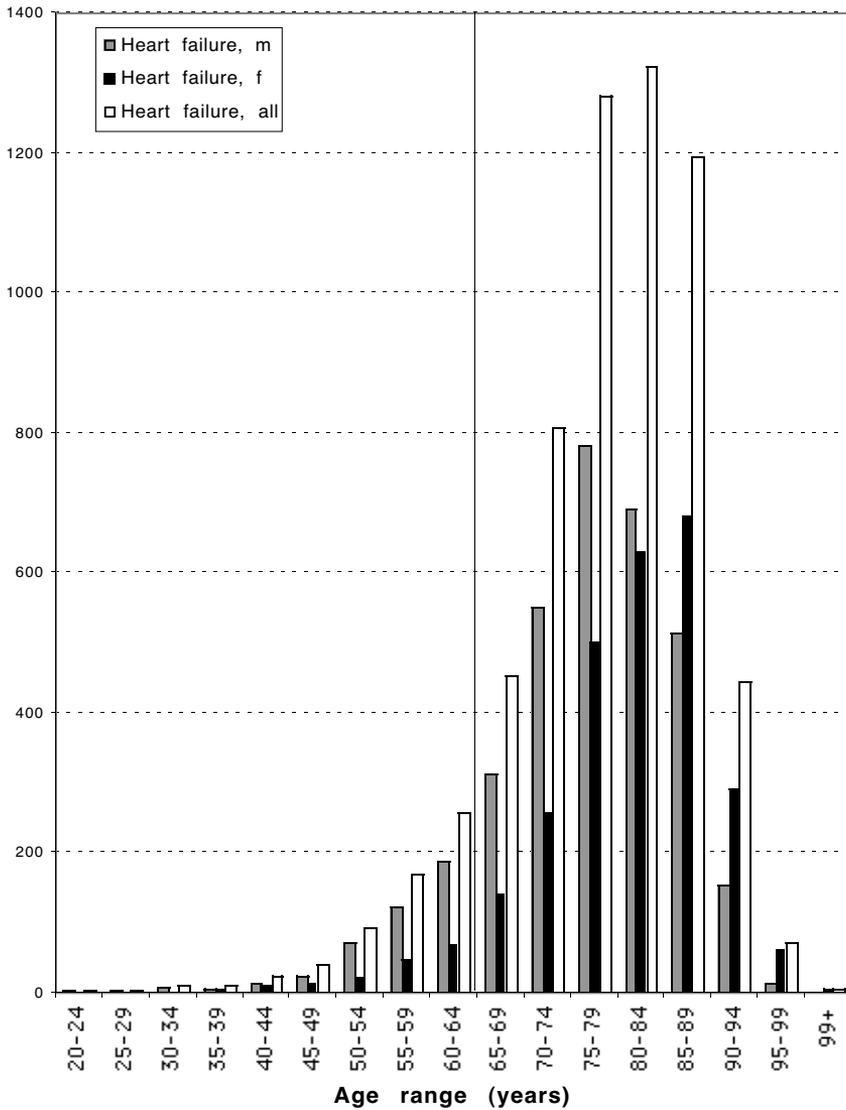
**Table 8.1** Treatment of heart failure in elderly patients aged 75+.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
ACE inhibitors	Captopril	1			10
	Enalapril	1			11
Phosphodiesterase inhibitors/Dopamine derivatives	Amrinone vs. dobutamine both emergency IV)	1			12
Comparison of various ACE inhibitors – digitalis (retrospective cohort study)				1	13
<b>Total &gt;75 år</b>		<b>3</b>	<b>0</b>	<b>1</b>	

**Table 8.2** Treatment of heart failure in elderly patients aged 65+.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
Digitalis	Digoxin vs. ibopamine	1			14
Diuretics	Hydrochlorothiazide/amiloride vs, hydrochlorothiazide/triamterene	1			15
ACE inhibitors	Enalapril (additional treatment)	1	1		7/16
	Lisinopril (additional treatment)		1		17
	Captopril vs. delapril	1			18
	Captopril vs. ibopamine (additional treatment)	1			19
	Captopril vs. losartan	1			20
Angiotensin-II receptor	Losartan vs kaptopril antagonists	1			20
Dopamine derivatives	Ibopamine vs. digoxin	1			14
	Ibopamine vs. captopril	1			19
Compliance	Digoxin			1	21
	Telephone/video conference	1			22
Discontinuation	Furosemide (placebo)		1		23
	Digoxin			2	24–25
<b>Education</b>	Intensive, systematic, tailored and planned education and support	1			26
<b>Care program</b>	Outpatient, nurse-monitored, symptom-management programme	1			27
	Discharge planning	1			28
	Multidisciplinary intervention: education, diet, medication, counseling	2			29–30
<b>Total &gt;65 år</b>		<b>12</b>	<b>3</b>	<b>3</b>	
<b>Total Table 8.1–8.2</b>		<b>15</b>	<b>3</b>	<b>4</b>	

## Number of diagnosis



**Figure 8** The diagnosis of chronic heart failure in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 9. High blood pressure (hypertension)

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*Bodil Lernfelt and Thomas Wallén*

## Definition

According to WHO-ISH [1]:

	<i>Systolic BP</i>	<i>Diastolic BP</i>
<i>Level 1 – mild hypertension</i>	<i>140–159</i>	<i>90–99</i>
<i>Level 2 – moderate hypertension</i>	<i>160–179</i>	<i>100–109</i>
<i>Level 3 – severe hypertension</i>	<i>≥180</i>	<i>≥110</i>
<i>Isolated systolic hypertension</i>	<i>≥140</i>	<i>&lt;90</i>

## Background

The prevalence of hypertension in elderly people depends on how hypertension is defined in this age group. Data from Dalby and Gothenburg has shown that 25% of the Swedish population over the age of 70 is currently being treated for high blood pressure – equally many women as men. According to the above definition of “Level 1 – mild hypertension,” the prevalence of hypertension among 80 year-olds is about 75% [2]. Today most doctors will initiate antihypertensive treatment in patients aged 70–75+ at a systolic pressure of over 160 or a diastolic pressure over 95. The incidence of systolic hypertension increases with age. Systolic hypertension with a systolic blood pressure of over 160 occurs in 10% of 60 year-olds and over 25% of those 80 or older [3].

Blood pressure increases with age [2, 4–6]. Hypertension accentuates age-related changes in the heart and blood vessels and causes them to develop earlier. The result is increased vascular stiffness in major arteries with an increase in systolic blood pressure, causing increased load on the heart. Hypertension and aging give rise to increased left ventricular stiffness and the development of left ventricular hypertrophy and deterioration in diastolic left ventricular function [7, 8].

In the final stages of life, both systolic and diastolic blood pressure diminish [4, 5, 9]. This blood pressure reduction takes place over a number of years and appears to relate to degenerative changes in the heart, brain, and other organ systems due to age and disease [7, 10].

Besides structural changes in the heart and blood vessels caused by aging and high blood pressure, complicating diseases occur in a majority of hypertensive elderly people. Around 70% of 65+ patients with hypertension have a complicating disease. The proportion of patients with hypertension and complicating diseases increases with age, in men to a higher degree than in women. The difference between elderly and middle-aged hypertension patients is particularly noticeable in the prevalence of ischemic heart disease and heart failure. The existence of other concurrent risk factors or organ damage is a determining factor for the risk of complications [1]. Up to 75 years of age there is a demonstrable correlation between high blood pressure and increased morbidity and mortality [11–15].

In recent years, the correlation between high blood pressure and the subsequent development of dementia has been widely noted [10, 16, 17]. Systolic blood pressure is a more important risk indicator in elderly people than diastolic [3]. In people with isolated systolic hypertension, a positive correlation has been demonstrated between systolic blood pressure and mortality, whilst diastolic blood pressure in the same analysis was negatively connected to mortality [3]. In the highest ages ( $\geq 85$ ), the correlation between blood pressure, morbidity, and mortality is reversed [18–20]. One explanation for this may be the reduction in both systolic and diastolic blood pressure that is observed after 80 years of age. This reduction in blood pressure seems most pronounced in the sickest people in a population.

In the last decade, we have had the opportunity to reconsider treatment routines for elderly hypertension patients. More prospective, randomized, controlled multicenter studies have been published that included only elderly patients, and the effect of antihypertensive treatment on morbidity and mortality in elderly people has been demonstrated. Despite these studies, there are still many unanswered questions when it concerns the oldest hypertensive patients, and there is still a tendency among many doctors to accept high blood pressure levels in the elderly [21].

## Summary of published clinical trials

### Search strategy

A compilation of studies has been made by searching in PubMed for the period 1980–2001. All studies are multicenter studies showing results for patients over 65 (aged). All but two are randomized [23, 33]. In the non-randomized studies, every other patient was selected for the control group. Studies including patients under 60 years of age were not included.

### Additional search strategy for “clinical trials in nursing”

*Medline:* 68 hits, of which 5 were included.

*Cinahl:* 12 hits, of which 0 were included (duplicates excluded).

*Search path:* Hypertension, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Excluded:* Non-English, overviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, and individual case studies.

For a summary, see Table 9, Treatment of high blood pressure in the elderly.

### Comments

Only two studies had exclusively patients over 70 [27, 34]. In other studies, the lower age limit for inclusion has been 60 or 65. However, the average age in the later studies has often been over 70, and most have had a long follow-up time (2–5 years). The earliest studies included only patients with diastolic hypertension. In later studies, both systolic and diastolic blood pressure were used to define hypertension. Three studies only deal with systolic hypertension [26, 32, 33].

In recent years, a large number of studies have been published that compare the effects of different drugs on systolic and diastolic blood pressure, tolerance, microalbuminuria (the presence of albumin in the urine), left

ventricular enlargement etc. Several of these studies could have been included in the table for this chapter, since they included a significant proportion of elderly patients. However, we have chosen to focus on the studies that have specifically studied the effect of antihypertensive treatment on morbidity and mortality in elderly people with hypertension. These studies are used as bases for current treatment recommendations.

The significance of blood pressure treatment compared with placebo to morbidity and mortality is well documented in blood pressures over 160/100 and up to 80 years of age. For people over 80, there has been more uncertainty regarding the benefit of treatment. A meta analysis, in which data was collected relating to patients over 80 included in randomized controlled treatment studies, showed no distinction in mortality between treated and untreated people [40]. However, antihypertensive treatment significantly reduced the incidence of stroke and heart failure.

Treating hypertension, both systolic and diastolic, has a documented positive effect on morbidity and mortality, and is also worthwhile from the standpoint of health economics. Since the risk of illness increases with age, the benefits of treatment are greater among elderly people than middle-aged hypertension patients. Some of the above studies compare various drug treatments. The non-selected material on elderly hypertension patients has not yet produced any data indicating that a certain type of drug is better than others.

One study of quality of life as regards treatment with different blood pressure drugs in elderly people shows that elderly people with high blood pressure generally have a good quality of life, and that blood pressure can be treated without affecting quality of life [29].

In summary, there is good documentation of antihypertensive treatment up to 80 years of age. At the most advanced ages, the effects of treatment are harder to assess and the number of very old patients taking part in studies is limited. Future studies are needed that include both the oldest and sickest patients, and particularly analyzing patients over 75.

**Table 9** Treatment of high blood pressure in elderly people.

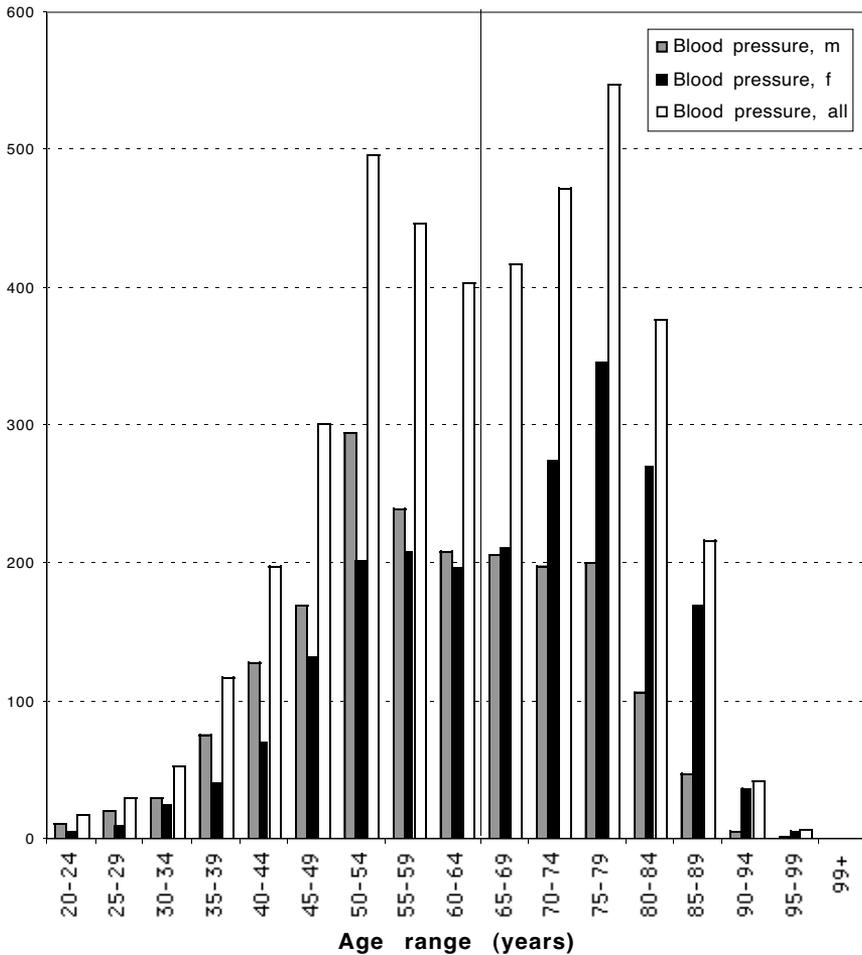
Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
Diuretics	Hydrochlorothiazide + triamterene vs. placebo (both with the possible addition of methyldopa)	1			22
Calcium antagonists	Nifedipine vs. placebo		1		23
Beta-blockers + diuretics	Atenolol + bendrofluzide	1			24
	Metoprolol + hydrochlorothiazide	1			25
	Chlorthalidone + atenolol vs. placebo	1			26
	Beta-blockers (3 different) + diuretic vs. placebo	1			27
	Atenolol vs. hydrochlorothiazide + amiloride vs. placebo	1			28
Diuretics + Calcium antagonists	Hydrochlorothiazide vs. felodipine	1			29
Angiotensin II-antagonist vs. ACE inhibitor	Valsartan vs. lisinopril (both with the addition of hydrochlorothiazide)	1			30
Diuretic + Calcium antagonists + beta-blockers	Chlorthalidone vs. nifedipine vs. atenolol + chlorthalidone vs. "free treatment"	1			31
	Nitrendipine + enalapril + hydrochlorothiazide vs. placebo	1			32
	Nitrendipine + captopril + hydrochlorothiazide vs. placebo		1		33
Beta-blockers vs. diuretics and Calcium antagonists vs. ACE inhibitors	Old: Atenolol, metoprolol, pindolol vs. hydrochlorothiazide + amiloride New: Enalapril or lisinopril or felodipine or isradipine	1			34
Unspecified	Compare treated–not treated repeated blood pressures checks during the day			1	35
Exposure	Diuretics			1	36

Table continued on next page

**Table 9** continued

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Nutrition</b>					
Na restriction vs. weight reduction vs. combination vs. "normal treatment"		1			37
Nutrition vs. diuretics	(Na <100 mmol/d, K >75 mmol/d, BMI >25) vs. chlorthalidone	1			38
<b>Education</b>	Developing a culturally sensitive community-based self management program			1	39
<b>Total</b>		<b>13</b>	<b>2</b>	<b>3</b>	

## Number of diagnosis



**Figure 9** The diagnosis of high blood pressure in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 10. Chronic obstructive pulmonary disease (COPD)

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*Bodil Lernfelt*

## Definition

*Chronic obstructive pulmonary disease is characterized by chronic impairment of the ventilatory capacity, with only minor variation. This impaired ventilatory capacity is obstructive in nature and best demonstrated using spirometry. Impaired 1-second forced expiratory volume, FEV<sub>1</sub> (see footnote) is the characteristic finding of spirometry. The disease is caused by a combination of emphysema and bronchiolitis, with narrowing of the small airways [1].*

## Classification by degree of severity

### *Preclinical COPD*

FEV<sub>1</sub> >80% of the expected value with or without symptoms

### *Mild COPD*

FEV<sub>1</sub>/VC <70%

FEV<sub>1</sub> 60–79% of the expected value with or without symptoms

### *Moderate COPD*

FEV<sub>1</sub>/VC <70%

FEV<sub>1</sub> 40–59% of the expected value with or without symptoms, and with no other negative prognostic factors

### *Severe COPD*

FEV<sub>1</sub>/VC <70%

FEV<sub>1</sub> <40% of the expected value or FEV<sub>1</sub> <50% of the expected value and existence of other negative prognostic factors.

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FEV<sub>1</sub> = 1-second forced expiratory volume

FVC = forced vital capacity

Respiratory insufficiency is defined as arterial PaO<sub>2</sub> <8.0 kPa with or without arterial PaCO<sub>2</sub> >6.7 kPa

## Background

Chronic obstructive pulmonary disease (COPD) appears in about 15–20% of the smoking population [2]. The airway obstruction in COPD is mostly irreversible (incurable), as opposed to asthma, where the obstruction is episodic. However, there is a small reversible element with COPD that can be affected by drugs [1]. COPD appears as a result of chronic airway inflammation and the development of emphysema. The long-term prognosis with COPD is poor, and it can often lead to impaired gaseous exchange and respiratory insufficiency, as well as early death. Patients with COPD often have a chronic phlegm-producing cough, but it can also occur with impaired gaseous exchange in patients who are not troubled by a chronic cough [1].

Lung function measured as FEV<sub>1</sub> decreases with age. In normal people, the reduction is estimated at about 30 ml per year [3]. In smokers, lung function is impaired twice as fast, and in some smokers who are particularly susceptible, the reduction in FEV<sub>1</sub> can be as much as 100 ml/year [2]. These people develop COPD early.

Diagnosing COPD in elderly people is difficult, and differential diagnosis in relation to heart failure and ischemic heart disease is particularly hard, since the symptoms are often the same. Also, both diseases often occur at the same time. Dyspnea, fatigue and ankle edema can also be found in normal elderly people to some extent, and not related to a specific disease. To avoid over and under-diagnosis, spirometry needs to be done on elderly patients significantly more often than at present.

Epidemiological surveys of COPD are often hard to assess, because the definition of the condition varies. However, it is clear that the incidence of COPD increases with age and that COPD patients have high levels of consumption of both inpatient and outpatient care. More active care means that very sick patients are surviving longer, and we are currently seeing an increasing number of COPD and respiratory insufficiency patients on geriatric wards and in special housing for the elderly.

Lung function, measured as FEV<sub>1</sub>, is the most important prognostic factor in COPD [4, 5]. A FEV<sub>1</sub> of less than 1 liter means the prognosis is poor. Factors such as advanced age, hypercapnia (accumulation of car-

bon dioxide), hypoxia (impaired oxygen saturation), peripheral edema, tachycardia (increased pulse) and malnutrition also affect the prognosis negatively. The degree of reversibility following inhalation of a bronchodilator is also a prognostic factor.

It is unclear to what extent optimal treatment and management of patients with COPD improves survival. Stopping smoking reduces the degree of impairment in lung function. Oxygen treatment for patients with respiratory insufficiency is the only treatment principle in which an individual treatment has been shown to prolong life. Otherwise, it has proven very hard to study the effect of individual measures in major data. None of the drugs currently available have proved able to influence the long-term impairment of lung function seen in COPD patients [1, 4, 5, 6].

## **Summary of published clinical trials**

### **Search strategy**

A compilation of studies has been made by searching in PubMed. The search included randomized controlled studies relating to COPD (Chronic Obstructive Pulmonary Disease) showing results for patients over 65 (aged) and over 80. An exclusion was made for the diagnosis of asthma and for studies where the results related to patients under 65 (middle-age, adult, child).

The table shows randomized controlled treatment studies of chronic obstructive pulmonary disease, in which results are given for patients over 65 years of age. The studies may also include patients under 65.

### **Additional search strategy for “clinical trials in nursing”**

*Medline:* 72 hits, of which 0 were included.

*Cinahl:* 27 hits, of which 0 were included (duplicates excluded).

*Search path:* Lung diseases obstructive, therapy (diet-therapy, drug-therapy, prevention and control, radiotherapy, surgery, therapy), nursing care/nursing, aged/old age.

*Excluded:* Non-English, overviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, and individual case studies.

For a summary, see Table 10, Treatment of COPD in the elderly.

## **Comments**

Apart from stopping smoking, there is no treatment that affects the impairment of lung function that takes place with COPD. Oxygen treatment is the only therapy proven to have a beneficial effect on mortality from COPD. The summary of clinical trials for COPD illustrates the difficulty of assessing the benefit of an individual therapy. No clinical trials have included only COPD patients over 70, and only four show results including patients over 80 [20, 34, 42, 59]. Data on the effect of different treatment methods on COPD in elderly people is thus very limited. Treatment of COPD in elderly people is multidisciplinary and includes medical treatment aimed at both the basic disease and against other simultaneous conditions (osteoporosis, heart failure), plus nutritional treatment, rehabilitation, home adaptations, nursing, and energy-saving measures to enable patients to make the most of their capacity. Research projects are needed to study the extent to which improved multidisciplinary care of elderly COPD patients can reduce the need for inpatient care.

**Table 10** Treatment of chronic obstructive pulmonary disease (COPD) in the elderly.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
Anticholinergics	Ipratropium vs. albuterol	1			7
	Ipratropium vs. terbutaline	1			8
	Ipratropium vs. salbutamol vs. placebo	1			9
	Ipratropium vs. salbutamol vs. aminophylline	1			10
	Ipratropium vs. aminophylline vs. placebo	1			11
	Oxipropium vs. untreated	1			12
	Tiotropium vs. placebo	1			13
$\beta$ 2-stimulants	Terbutaline vs. placebo	1			14
	Terbutaline vs. ipratropium	1			8
	Salbutamol vs. placebo	1			15
	Salbutamol vs. ipratropium vs. placebo	1			9
	Salbutamol vs. combination fenoterol/ipratropium vs. placebo	1			16
	Salbutamol vs. ipratropium vs. aminophylline	1			10
	Combination salbutamol + ipratropium vs. ipratropium alone	1			17
	Albuterol vs. placebo	1			18
	Albuterol vs. ipratropium	1			7
	Combination fenoterol/ipratropim vs. salbutamol vs. placebo	1			16
	Addition of salbutamol in COPD patient treated on respirator at various tidal volumes	1			19
Xanthine derivatives	Theophylline	2			20–21
	Aminophylline vs. ipratropium vs. placebo	1			11
	Aminophylline vs. ipratropium vs. salbutamol	1			10

Table continued on next page

**Table 10** *continued*

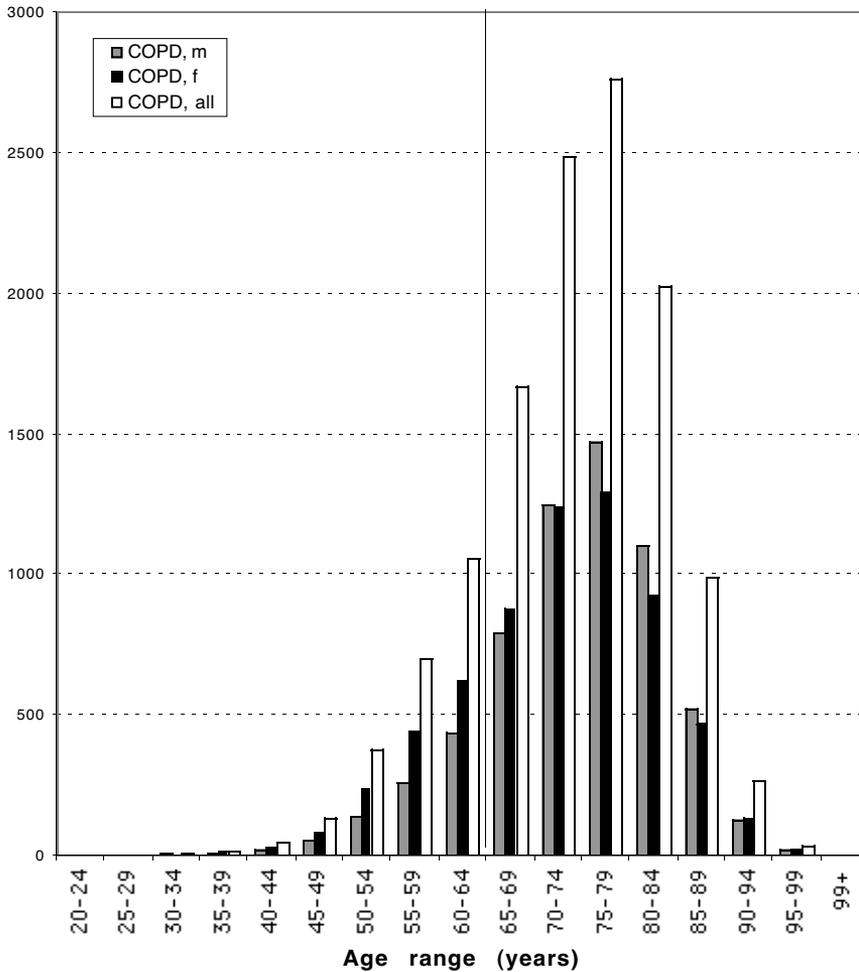
Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
Glucocorticoids					
– Local	Beclomethazone vs. placebo	2			22–23
– Systemic	“Glucocorticoids” vs. placebo	1			24
	Prednisone vs. placebo	1			25
Opiates	Morphine (long-acting) vs. placebo	1			26
Nitrous oxide				1	27
Calcium antagonists	Isradipine vs. placebo	1			28
N-acetylcysteine	Acetylcysteine vs. placebo	1			29
Oral anabolic steroids	Stanozolol 12 mg/d x 27 weeks vs. placebo (both groups received treatment with training)	1			30
Growth hormone	rhGH vs. placebo	1			31
Angiotensin-II receptor blockade	Losartan vs. placebo in COPD with pulmonary hypertension	1			32
Discontinuation	Theophylline	1			33
<b>Inhalation technique</b>		1			34
<b>Oxygen</b>		3	1		35–37/38
<b>Ventilation</b>	Non-invasive ventilation	3			39–41
	CPAP and hyperventilation	1			42
	Nasal intermittent positive pressure ventilation			1	43
<b>Physical training</b>					
Breathing muscles	Breathing muscle training 5 x 10 min/day with gradually increased resistance vs. placebo	1			44
	Exhalation training in water	1			45
	Arm training x 21–24 times	1			46
	Inspiratory muscle training and whole body reconditioning	1			47
Walking	Comparison of walking training with and without coaching	1			48

*Table continued on next page*

**Table 10** *continued*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
General	6-week supervised, multi-modality endurance exercise training program		1		49
<b>Nutrition</b>	Oral nutritional supplement to normal food	2		1	50–51/52
	Enteral nutrition + 1000 kcal over and above normal dietary intake vs. sham-feeding	1			53
	Cf active – passive eating on O <sub>2</sub> saturation	1			54
	Cf high – low carbohydrate intake at max. effort	1			55
<b>Acupressure</b>	Acupressure as an adjunct to a pulmonary rehabilitation program	1			56
<b>Education</b>	8-week cognitive-behavioral self-help educational program			1	57
<b>COPD rehabilitation</b>	6-week multidisciplinary rehabilitation program	1			58
	12-week incremental respiratory rehabilitation x 4/days			1	59
	8 weeks' admission + 16 weeks' outpatient care	1			60
	Training + education vs. education	1			61
	Lung rehabilitation program at home, 12 weeks	1			62
	Quality of life follow-up after COPD rehab			1	63
<b>Care program</b>	Hospital-based home care program			1	64
<b>Health economics</b>	6 months' respiratory rehabilitation (2 months' admission, 4 months' outpatient care)	1			65
<b>Telephonic advice</b>	Interactive video phone at home			1	66
<b>Totalt</b>		<b>49</b>	<b>1</b>	<b>8</b>	

## Number of diagnosis



**Figure 10** The diagnosis of chronic obstructive pulmonary disease (COPD) in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 11. Osteoporosis and fracture prevention

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*Dan Mellström*

## Definition

The diagnosis of osteoporosis (brittle bones) was given its operational definition by the WHO in 1994 [1]. This diagnosis is based on bone density measurement at the hip, spine, and forearm, and only includes women, not men and children.

*Normal bone mass* is when the bone density is between 1 SD (standard deviation) from the average value in young adult women in the same population.

*Reduced bone mass*, osteopenia, is considered to be when the bone density is between 1 and 2.5 SD below the average value in young adult women in the same population.

*Osteoporosis* is when the bone density is more than 2.5 SD below the average value in young adult women in the same population.

*Established osteoporosis* is when the bone density is more than 2.5 SD below the average value in young adult women in the same population and there is one or more osteoporosis-related fractures.

## Background

Swedish and Norwegian women have the world's highest risk of hip fractures [2] and the highest risk in Europe of vertebral fractures [3]. Fractures that are normally considered as osteoporosis-related are fractures of a hip, vertebra, wrist, or forearm. Such fractures amount to about 70,000 annually [4].

Like the majority of common diseases, osteoporosis fractures are age-dependent. The risk of a hip fracture increases considerably after 75

years of age, and triples between 80 and 85 in Swedish women. In 1999, the Swedish Osteoporosis Society (SOS) issued new recommendations for the investigation and treatment of osteoporosis [4].

Apart from low bone density, fractures can be caused by multiple risk factors, which normally covary with low bone density. However, there are risk factors specifically related to the risk of fracture. The risk of hip fracture in Nordic women increases 40% per SD of increased height [5]. The purpose of this survey is to elucidate the extent to which the studies included people aged 75 and older, and the extent to which drugs had an effect at these ages.

## **Summary of published clinical trials**

### **Search strategy**

A search of Medline with the criterion “Treatment of osteoporosis” with studies including fracture data. Medline was queried specifically for each treatment strategy with calcium, vitamin D, estrogen, SERM, bisphosphonate, anabolic steroids, GH, IGF-1, parathormone, calcitonin, calcitriol, bisphosphonate, sodium fluoride and hip protectors.

### **Additional search strategy for “clinical trials in nursing”**

*Medline:* 74 hits, of which 3 were included.

*Cinahl:* 38 hits, of which 1 was included (duplicates excluded).

*Search path:* Osteoporosis, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Excluded:* Non-English, overviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, and individual case studies.

For a summary, see Table 11, Treatment of osteoporosis and fracture prevention in elderly people.

## Comments

Age is the greatest risk factor for both osteoporosis and fractures, and should be taken into consideration when deciding upon active treatment for osteoporosis. This outlook will repudiate the indication for active drug treatment for osteoporosis in elderly people with strong risk factors such as fractures. It will also increase interest in drug treatment for age-related osteoporosis.

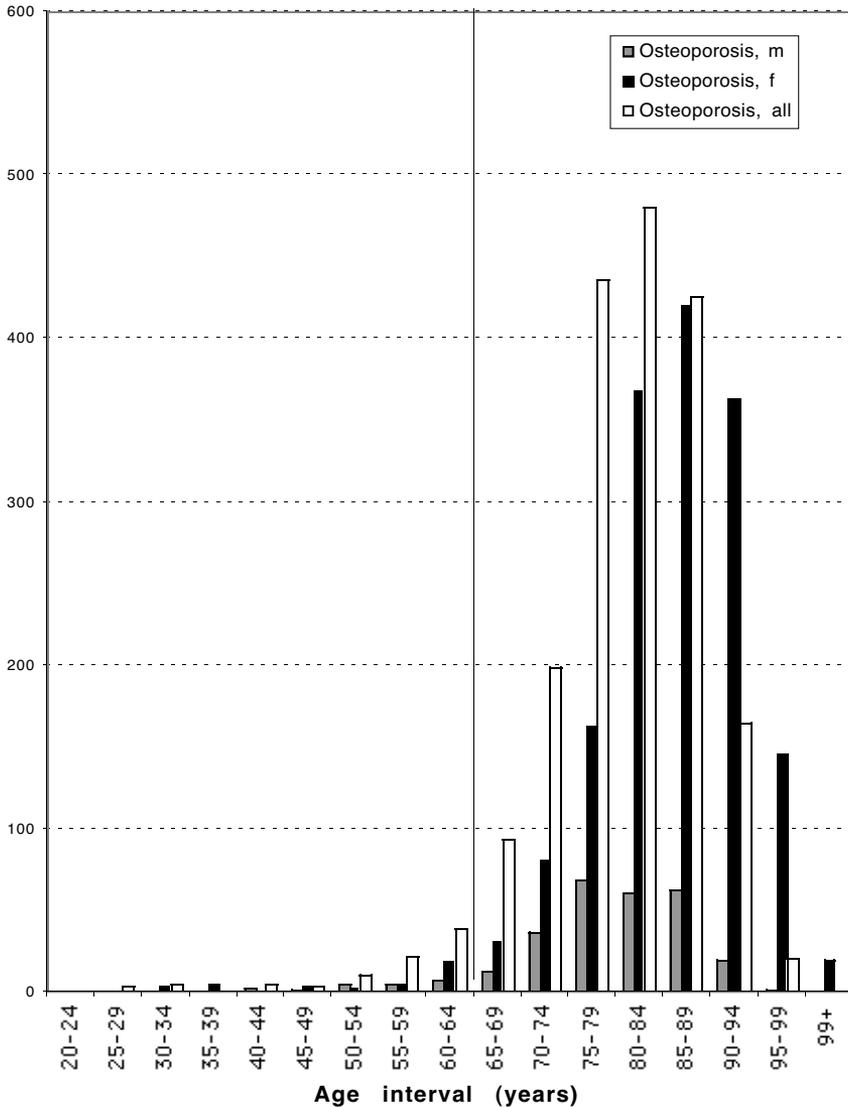
Only a few patients with osteoporosis are diagnosed and treated. The reason for the major underdiagnosis and undertreatment of osteoporosis is that the diagnosis was not defined until 1994 and that the non-invasive method of measuring bone density in the lumbar vertebrae and hip was only discovered in the early 1990s. Most important of all is the fact that the indication for treating osteoporosis with estrogen was only approved in 1993, with bisphosphonate in 1994 and SERM in 1997. New treatment regimes with an anabolic strategy are being tried, and intermittent treatment with parathormone will probably be approved for the treatment of osteoporosis within a few years. The majority of drug trials used as the basis for the indication of osteoporosis were done in the last decade. These drug trials were strictly regulated in terms of control, randomization, and endpoints in the form of fractures.

There are quite a large number of clinical trials relating to osteoporosis fractures in people over 65. The majority of these studies have been published in high quality periodicals. A number of studies had an average age over 80 in the patient group [9, 12, 25, 34, 35]. Even if the average age was 65–70, the majority of the published drug trials included patients over 80. The total number of patients over 75 in these studies is often large [17, 24]. It is therefore reasonable to assert that treatment with calcium/vitamin D, bisphosphonate, SERM, PTH and hip protectors has included a representative proportion of people aged 75 and over. See also SBU's assessment report on brittle bones, expected to be published in the autumn of 2003.

**Table 11** Treatment of osteoporosis and fracture prevention in elderly people.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
Calcium	Calcium vs. placebo	3			6–8
Vitamin D	Vitamin D3 vs. placebo	1	1		9/10
	Calcitriol vs. Calcium	1			11
Combination calcium + Vitamin D	x 3 years	2	1		12–13/14
Estrogen	Transdermal estrogen/progestin vs. placebo	1			15
	Oral estrogen/progestin vs. placebo	1			16
Selective estrogen receptor modulators (SERM)	Raloxifen vs. placebo	1			17
	Raloxifen vs. calcium/Vitamin D	1			18
Parathormone	Parathormone (1–34) sc vs. placebo	1			19
Calcitonin	Intranasal calcitonin vs. placebo	2			20–21
Bisphosphonate	Alendronate vs. placebo	3			22–24
	Risedronate x 3 years vs. placebo	3			25–27
	Cyclic etidronate vs. placebo	3	1		28–30/31
Na fluoride	Fluoride – placebo	2			32–33
<b>Hip protectors</b>	External hip protector vs. control	2			34–35
<b>Physical training</b>					
Walking	Self-paced brisk walking) vs. placebo (upper limb exercises)”	1			36
	Home exercise program			1	37
<b>Care program</b>	Home visit by health visitor	1			38
<b>Totalt</b>		<b>29</b>	<b>3</b>	<b>1</b>	

## Number of diagnosis



**Figure 11** The diagnosis of osteoporosis in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 12. Infections

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*Ragnar Norrby*

## **Background**

Infections are common in elderly people. The reason for the increased frequency of infections in this age group is failing immune defenses and underlying diseases. Examples of infections that arise due to failing immune defenses are herpes zoster (shingles) and lower respiratory tract infections caused by RS virus [1–3]. Examples of more common underlying diseases in elderly people that are often complicated by infections are atrophy (thinning) of the vaginal mucous membrane in elderly women and prostate enlargement or cancer in elderly men, giving predisposition to urinary tract infections; and chronic obstructive pulmonary disease (COPD), giving a predisposition to bacterial lower respiratory tract infections [4–6].

In some cases, there is also a clear increase in the degree of severity of infections in elderly people. For example, herpes zoster, which in elderly people is more frequently complicated by long-term pain than in younger people [1, 2]. Other examples are pneumococcal bacteremia (bacteria in the blood) in pneumonia patients, and infections caused by flu viruses, for which advanced age in itself has been identified as a risk factor in increased mortality and/or a complicated course [7, 8].

There are many clinical trials on infections in elderly people, if this simply means a literature search using “infection” and “elderly” as terms. In the huge majority of cases, these studies have included elderly patients, but their aim has not been to specifically study the treatment of elderly people. Confining the studies to those specifically aimed at the treatment of infections in patients over 65 or 75 makes the results too poor for the majority of infection types. The chief reason for this is probably that these studies were aimed at documenting indications for antimicrobial drugs and that they permitted inclusion of adult patients with no age restrictions (usually such trials tend to exclude patients over 75 or

80). Studies of this type do not regularly reflect the natural course of infections in elderly people – for example, mortality is significantly lower than that reported in reports that are not from clinical trials.

For reasons stated above, this survey of the literature has been limited to several areas in which there are systematic clinical trials involving elderly patients. These are:

1. treatment of lower respiratory tract infections
2. treatment and prophylaxis of urinary tract infections
3. treatment of herpes zoster (shingles)
4. flu vaccination of elderly people or medical staff as a method of reducing the frequency of flu infections in elderly people, and use of other vaccines to reduce infection frequencies in elderly people..

## **Summary of published clinical trials**

### **Search strategy**

The results of a literature search in Medline and PubMed for the years 1966–2001 for the abovementioned treatment indications relating to “elderly” (over 65 years of age) are shown in Tables 12.1–12.4. With few exceptions, the searches were restricted so that the word “elderly” had to be included in the publication title. Using “elderly” as a general search word returns far too many hits (over 1,000), even with an age restriction of 80 or over.

### **Additional search strategy for “clinical trials in nursing”**

*Medline:* 94 hits, of which 13 included.

*Cinahl:* 43 hits, of which 0 included (duplicates excluded).

*Search path:* Surgical wound infection, sepsis, pneumonia, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Excluded:* Non-English, reviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, and individual case studies.

For a summary, see Tables 12.1–12.4, Infections in the elderly.

## Comments

Within these selected areas, there is relatively comprehensive scientific documentation, some of which is of high quality. The majority of it is relevant to Swedish conditions.

### *Lower respiratory tract infections*

There is very probably a large and growing group of elderly patients with chronic obstructive pulmonary disease. When they get lower respiratory tract infections, their prognosis is poor and they need extensive care. This group of patients is incompletely studied in terms of the optimum treatment and prophylaxis of infection (see below). It is important that such studies be done on non-selected and preferably consecutive patients, rather than in the form of drug trials, which tend to select patients who are less ill and give a false picture of low mortality and short care times.

### *Urinary tract infections*

It should be pointed out here that well-implemented studies have shown that the treatment of bacteria in the urine of elderly men and women without symptoms does not give positive effects, but can give negative ones in the form of selection of resistant bacteria [25–26]. This applies in particular to patients who are chronic catheter-wearers. Likewise, it must be considered well documented that local vaginal estrogen substitution is an effective way of reducing the frequency of symptomatic urinary tract infections in elderly women [35–37]. These messages have probably not reached everyone affected. The section on urinary tract infections includes studies of antibiotic prophylaxis in transurethral prostatectomy. Even if these studies were not restricted to men over 65 years of age, this age group is entirely dominant in the patient material.

### *Herpes zoster (shingles)*

Herpes zoster is a grossly underestimated problem in elderly people. After the age of 70, the incidence has been estimated to be up to 5% per year, and it is estimated that up to 50% of sufferers develop postherpetic neuralgia (pain that remains three months or more after the illness). The clinical trials referred to above show that antiviral treatment commenced early (within 48 hours of the start of symptoms) gives some reduction in the time with pain [1, 44].

More disheartening are the studies listed above on the treatment of pain in postherpetic neuralgia. Although considerable differences were found, these are of dubious clinical significance, and it still seems difficult to achieve effective pain relief. Vaccination studies, with non-deactivated varicella zoster virus or new vaccines, should be given high priority.

### *Flu vaccination*

Of very major importance are the three studies documenting that flu vaccinations for staff in geriatric care reduces the mortality of elderly people in flu epidemics [66–68]. These studies, like the wealth of studies showing the positive effects on morbidity and mortality of vaccinating elderly people against flu, should be the target of increased attention. Most likely there is good justification from a health economic standpoint for offering free vaccination to both elderly people and those caring for them. One has the impression that in Sweden, these issues are not being sufficiently discussed among those in charge of health-care.

### *Other vaccines*

There is a need for effective vaccines, but studies so far have not shown positive effects in elderly people. As indicated above, there is a need for an effective vaccine to protect against herpes zoster. Furthermore, there is a need to study the newer, more immunogenic, protein-conjugated pneumococcus vaccines, to see whether they yield better clinical protection against pneumonia in elderly people caused by pneumococcus.

**Table 12.1** Infections in the elderly. Treatment of lower respiratory tract infections.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
Antibiotics	Cephalosporins	3	1		9–11/12
	Macrolides	1	1		13/12
	Quinolones	1	1		11/12
Immune stimulation (prevention)	OM-85 BV	1			14
ACE inhibitors (prevention)				1	15
<b>Manipulation</b>	Adjuvant osteopathic manipulation	1			16
<b>Care form</b>	Cf hospital admission with home treatment in pneumonia			3	17–19
	How doctors with different specialties treat pneumonia			1	20
<b>Care program</b>	Treatment program			2	21–22
<b>Total</b>		<b>7</b>	<b>3</b>	<b>7</b>	

**Table 12.2** Infections in the elderly. Treatment of urinary tract infections.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
Antibiotics	Penicillins	1			23
	Quinolones	1			23
	Not defined in abstract	3			24–26
Antimycotics	Fluconazole vs. amphotericin B	1			27
Monobactam (prevention)	Aztreonam prophylaxis in conjunction with urinary catheterization	1			28
Antibiotics (prevention)	Prophylaxis in prostatectomy	6			29–34
Estrogen (prev)	Local (vaginal)	3			35–37
	Systemic (oral)	2			38–39
<b>Total</b>		<b>18</b>	<b>0</b>	<b>0</b>	

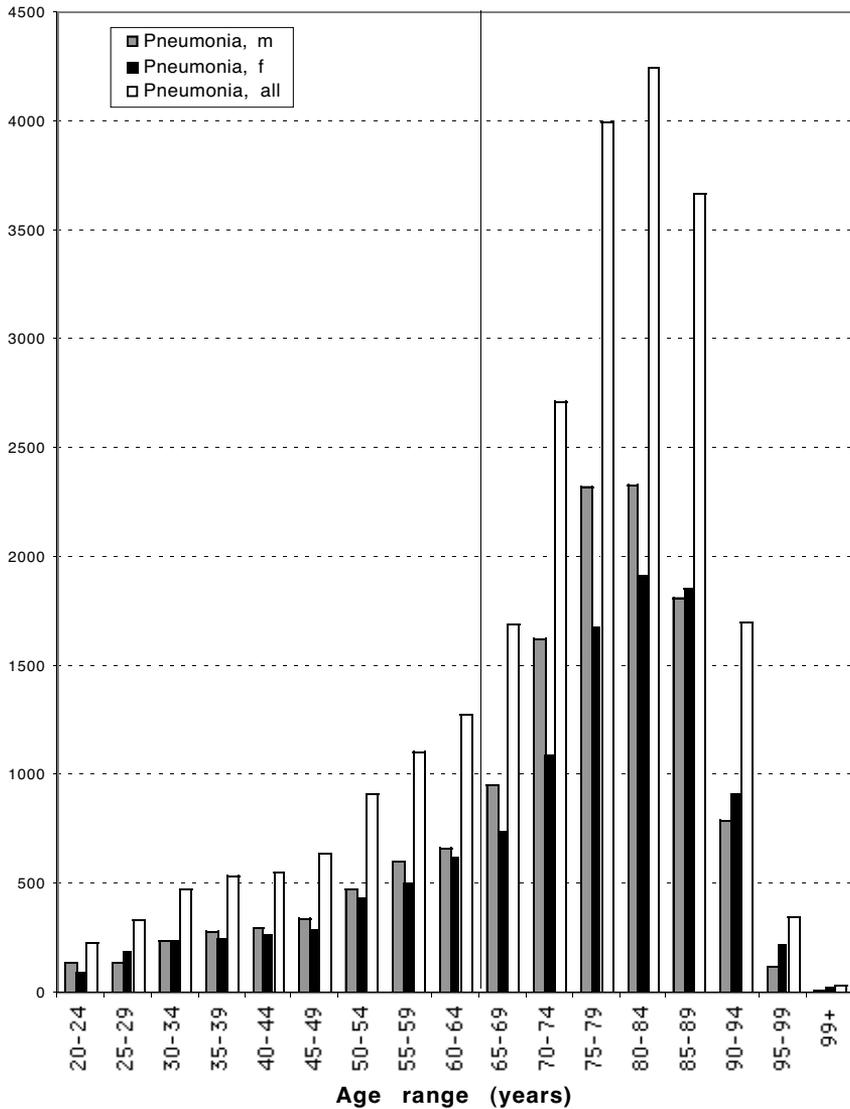
**Table 12.3** Infections in the elderly. Treatment of herpes zoster (shingles).

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
Nucleosides	Aciclovir	5			1, 40–43
	Valaciclovir	2			1, 41
	Famciclovir	2			44–45
	Netivudine	1			40
Glukocorticoider	Prednisone	1			42
	Methylprednisolone	1			46
$\alpha$ 2-interferon		1			43
Tricylcic antidepressant	Amitriptyline	3			47–49
	Maprotiline	1			48
	Nortriptyline	1			49
GABA analog	Gabapentin	1			50
Opiates	Oxycodone	1			51
ASA	Local treatment	1			52
Lidocaine	Local treatment	1			52
<b>Total</b>		<b>22</b>	<b>0</b>	<b>0</b>	

**Table 12.4** *Infections in the elderly. Vaccinations.*

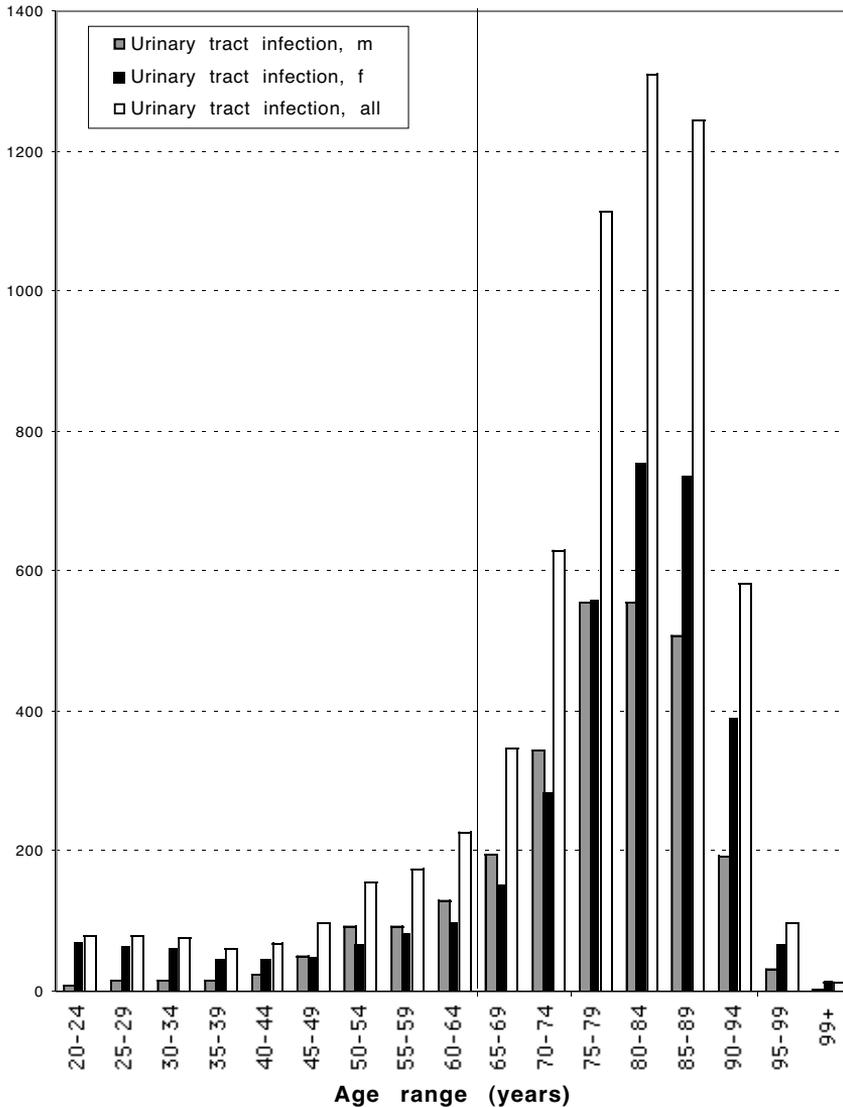
Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
Flu	Patients	6	1	7	53–58/ 59/8, 60–65 66–68
	Staff	3			
<b>Pneumococcus</b>		5			69–73
<b>RSV</b>		2			74–75
<b>Varicella-zoster</b>		2			76–77
<b>Total</b>		<b>18</b>	<b>1</b>	<b>7</b>	
<b>Total Table 12.1–12.4</b>		<b>65</b>	<b>4</b>	<b>14</b>	

## Number of diagnosis



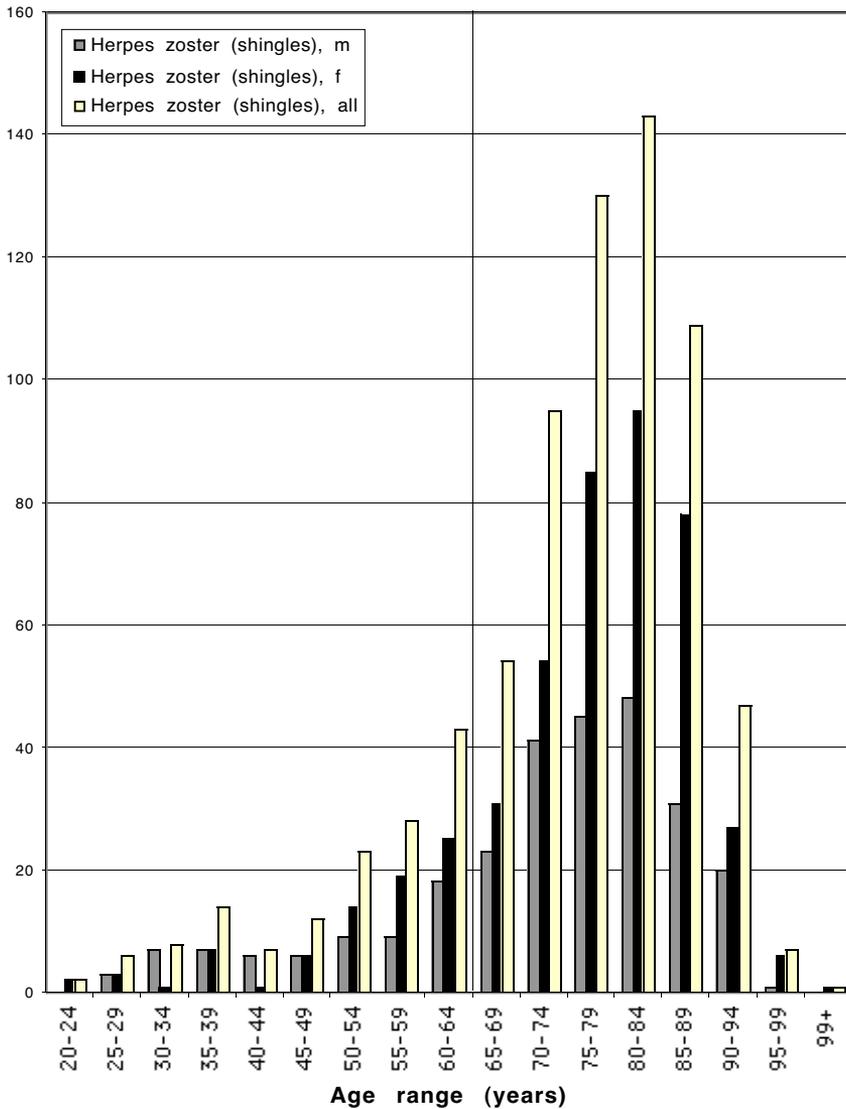
**Figure 12.1** The diagnosis of pneumonia in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

## Number of diagnosis



**Figure 12.2** The diagnosis of urinary tract infection in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

## Number of diagnosis



**Figure 12.3** The diagnosis of herpes zoster (shingles) in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 13. Urinary incontinence

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*Ulla Molander*

## **Definition**

Urinary incontinence is defined by the International Continence Society as [1]:

*“a condition where involuntary loss of urine is a social or hygienic problem and is objectively demonstrable.”*

## **Background**

Urinary incontinence is a condition with many origins, which causes the sufferer a great deal of discomfort, can cause a loss of self-confidence and a sense of shame, and may lead to isolation.

Urinary incontinence has major social, human, and even economic consequences, and its significance is expected to rise in the future as the number of elderly people increases. The prevalence varies in different studies, chiefly because they are performed with different definitions and selected groups.

Traditionally, urinary incontinence is divided into stress, urgency, mixed, and overflow incontinence. Following an international consensus conference in 1998, the World Health Organization recommended that urinary incontinence be classified as a disease [2].

Urinary incontinence occurs in all ages, but the problem increases with age [3–8]. The disease is three times as common in women than men, which is probably mainly due to anatomical reasons. In women, the prevalence increases linearly with age, while in men, there is a sharp increase after 70 [3–8].

In the elderly being cared for in an institution, prevalence figures well in excess of 50% are not uncommon [8–10], for which reason urinary

incontinence can be regarded as one of our greatest national diseases. The correlation between urinary incontinence and hospitalization plus nursing home care has recently been studied. Women had twice the risk and men three times the risk of needing nursing home care if they suffered from urinary incontinence, regardless of age, sex and the presence of any other diseases [11].

Urinary incontinence is economically costly to society; in 1990 the total cost of urinary incontinence in Sweden came to almost SEK 2 billion or around 2% of the total healthcare costs. For urinary incontinence aids alone, the costs for 1990 came to SEK 660 million. In 1996, this cost had risen to just over SEK 1 billion [12–14].

## **Summary of published clinical trials**

### **Search strategy**

A search was made in Medline for the period 1980–2000 using the search words “urinary incontinence,” “aged,” “old,” “elderly,” and “aged 75 and over.”

This gave a total of 193 hits, and all these abstracts have been assessed. Many studies dealing with elderly “geriatric” patients, chiefly from the USA, had patients from age 55 and upward. These have not been included here, since the average age in them was often also relatively low, under 70. Very few studies relate only to the truly old, over 75. Some studies in nursing homes only gave average ages, which are often high, but occasional younger patients cannot be ruled out. However, these studies have been included in the compilation. Moreover, studies with participants aged 60 and older have been included. Sixty is a common limit for inclusion in the studies, but 65 or 75 is not.

### **Additional search strategy for “clinical trials in nursing”**

*Medline:* 131 hits, of which 16 are included.

*Cinahl:* 112 hits, of which 1 is included (duplicates excluded).

*Search path:* Urinary-incontinence, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Excluded:* Non-English, reviews, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, and individual case studies.

For a summary, see Table 13, Treatment of urinary incontinence in the elderly.

## **Comments**

Studies relating to the treatment of urinary incontinence in the elderly are still few in number. Many studies only included a small number of patients; too many were uncontrolled, and many studies of elderly people encompass several different treatments at once, with no possibility of assessing the different stages.

In terms of drug treatment, there is a total of twelve studies, but they relate to several different drugs and in some of the studies, several drugs are used at the same time, and also physiotherapy. The same applies to studies of physiotherapy – many of them included several different treatments simultaneously, which made them hard to evaluate. Many of these studies were also uncontrolled.

It is crucial that more research and development be done of treatments for elderly people with incontinence.

**Table 13** Treatment of urinary incontinence in the elderly.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>					
Anticholinergics	Oxybutynin vs. placebo	3			15–17
	Terodoline vs. placebo	1			18
	Emepronium bromide vs. placebo		1		19
Hormones	– Estrogen		Estradiol vs. placebo	1	20
			Not specified	1	21
	– ADH	Desmopressin			1
Tricyclic antidepressants	Imipramine		1		23
Sympathomimetics	Phenylpropanolamine vs. pelvic floor training	1			24
Combined treatments	Propantheline + flavoxate toilet training + pelvic floor training		1		25
	Imipramine + oxybutynin + flavoxate + fenypropanteline + estrogen or urocholine + toilet training			1	26
	A diverse range of management strategies, including various toileting programs			1	27
<b>Training</b>	Daily walking training			1	28
	Pelvic floor training vs. phenylpropanolamine	1			24
	Different prompted voiding schedules		1	2	29/30–31
	Individualized form of habit training for urinary incontinence	1			32
	Behavior therapy program for urinary incontinence	1			33

Table continued on next page

**Table 13** *continued*

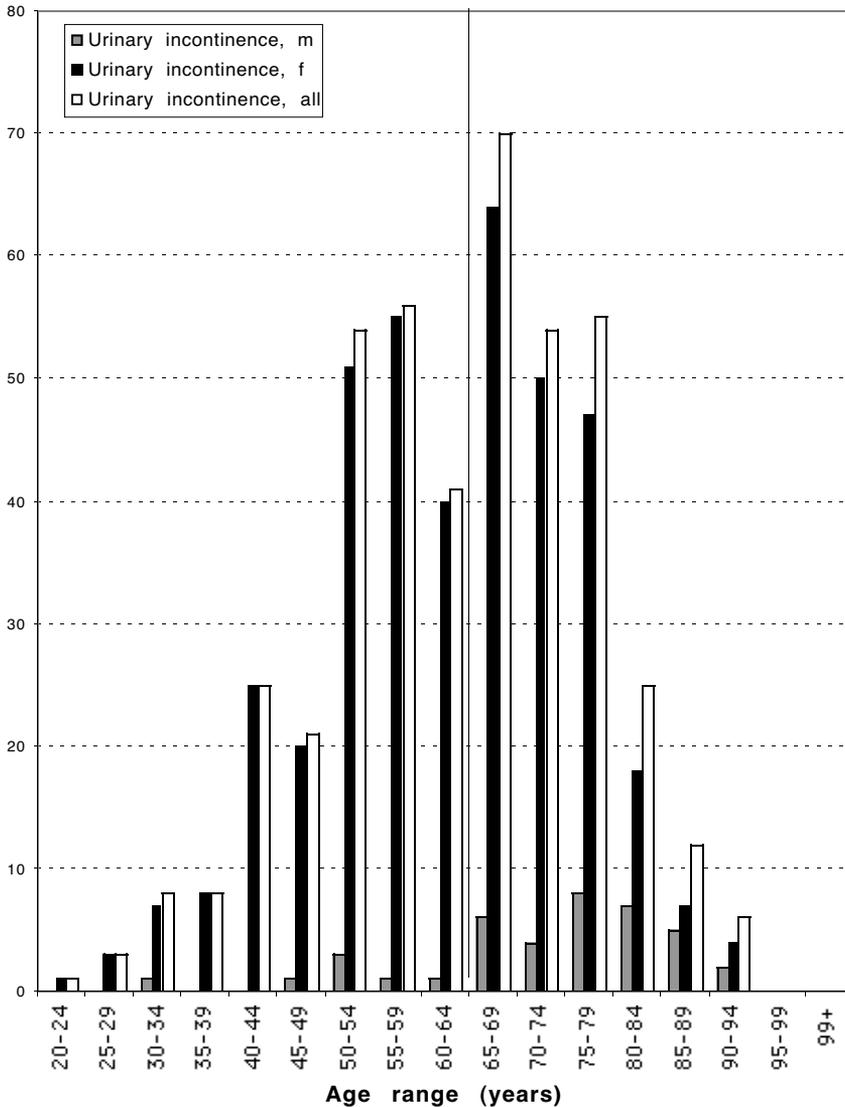
Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
	Biofeedback-assisted pelvic floor muscle training	1			34
	Bladder-sphincter feedback: Habit training to gradually increase the voiding interval and relaxation training to cope with the urge to void		1	1	35/36
	Biofeedback-assisted pelvic floor muscle training and prompted voiding	1			37
<b>Electrical stimulation</b>				1	38
<b>Collagen injection</b>				2	39–40
<b>Surgery</b>	Pubovaginal slings			1	41
<b>Aids</b>	Testing of incontinence pads	1		1	42/43
	Reason for changing urinary catheter	1			44
	Cf urinary catheterization–incontinence pads (effect and costs)	1			45
	External urine collection device			1	46
<b>Self-care</b>				1	47
<b>Education</b>	Non-invasive treatment strategies			1	48
	Visual aids and completion of bladder records and quizzes			1	49
<b>Care form</b>	Treatment/referral of patients with urinary incontinence	1			50
	Quality control management system regarding how well a prompted voiding toileting program continued to be implemented			2	51–52
	A staff management system for maintaining improvements in continence			1	53

*Table continued on next page*

**Table 13** *continued*

<b>Treatment methods</b>	<b>Specification</b>	<b>Number of studies</b>			<b>Reference number</b>
		<b>RCT</b>	<b>CCT</b>	<b>UCT</b>	
<b>Follow-up</b>	Long-term follow-up of treatment effect (2–3 years)			1	54
<b>Prevention</b>	Non-invasive self-managed interventions on 12 remediable risk factors			1	55
<b>Total</b>		<b>14</b>	<b>7</b>	<b>21</b>	

## Number of diagnosis



**Figure 13** The diagnosis of urinary incontinence in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented

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# 14. Chronic pain

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*Karin Styrborn*

## Definition

According to the International Association for the Study of Pain (IASP), pain is defined as:

*“an unpleasant sensory and/or emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain is always subjective and may occur in the absence of tissue damage” [1, 2].*

This definition shows the complex connection between pain and experienced suffering, which leads to difficulties in deciding on treatment strategies in both clinical work and clinical research. A full discussion is available in the Swedish Board of Health and Welfare’s reports, “Managing Chronic Pain” from 1994 and “Pain Management in Terminal Care” from 2001 [2, 3].

## Background

Several theories have dealt with the trigger mechanisms for pain, different types of pain and their varying symptoms. The first distinction is between acute and chronic pain. The latter remains longer than normal after tissue damage and goes on continuously or at intervals for more than 3–6 months [1, 2, 4]. Long-term or chronic pain has a pattern of expression that is different from acute pain, since the body’s autonomic response mechanisms adapt. It is also often more difficult to manage with conventional analgesics [2].

The occurrence of *acute pain* has proven to be relatively independent of age, with a prevalence of about 5% [5]. On the other hand, studies have shown that manifestations of acute pain change with age; why is not entirely clear. “Silent” myocardial infarctions occur in about one-third of elderly infarction patients, as well as mild abdominal pain or a lack of direct pain in peritonitis [5, 6, 7].

The fact that the prevalence of *chronic pain* increases with age is due to the age-related increase in frequency of various long-term diseases of the musculoskeletal system (osteoarthritis, arthritis), cardiovascular system with ischemias, diabetes and its complications, neurological diseases such as stroke, and cancer diseases. Epidemiological studies show a 25–40% prevalence of chronic pain in age groups over 70 [4, 5, 8]. However, Brattberg et al have shown that among the very oldest, a certain reduction of self-reported musculoskeletal pain can be observed, which requires further discussion and analysis [10].

All pain, but particularly chronic pain, can be associated with impaired functional ability and poorer mental wellbeing, which sometimes leads to depressive conditions. For older and more vulnerable patients, often with considerable comorbidity, pain can be the restricting factor in daily life and level of activity [5, 8, 9, 11].

The most common method of managing chronic pain, aside from nursing interventions, is drug prescription [4, 12, 13]. However, pharmacological treatment opportunities are limited by the increased risk of various types of side effects with age, particularly confusion and hemorrhaging. For pharmacological intervention to be effective, a thorough pain analysis is needed to determine the trigger and symptoms, as well as the patient's coping function. There are different strategies for managing pain of nociceptive (triggered by an organ), neuropathic (from neural pathways or the central nervous system) and psychogenic origins [2, 3]. Additionally, elderly patients with multiple diagnoses may have a mixture of these trigger mechanisms, and this must be considered in selecting drugs and dosages, and in deciding on other strategies for pain management. Many times, combined treatments must be tried. A multi-dimensional and multiprofessional strategy is required both in treating patients and in research [4, 5, 14, 16, 17].

Strategies for pain management other than pharmacological ones are used in clinical practice [3, 4, 5]. Research into these exists in the paramedical field and in nursing research. This may involve treatments such as acupuncture, TENS (transcutaneous electrical nerve stimulation), ultrasound, heat, cold, relaxation, muscle training, stretching, fitness training, hand training, various compensatory techniques when functional ability is impaired, testing appliances and other activities.

Various forms of psychological support, such as psychotherapy, may be required in addition to medical inpatient and outpatient care. The psychological aspects of pain/suffering as well as coping strategies, in which the multiprofessional team has a central role, have also been studied and tested [5, 6, 16, 18, 19, 20]. Tactile stimulation has been started in Sweden, both in terminal care and in severely ill dementia patients.

## Summary of published clinical trials

### Search strategy

The search period was restricted to the years 1990–2000 due to the large number of articles.

A data search was done via PubMed on Medline, Cinahl (to also cover nursing research, primarily in the USA) and on the Swedish SweMed and Spriline. The number of articles, their titles and where necessary, abstracts, randomized controlled trials (RCT), controlled clinical trials (CCT) and also reviews were requested. A search was made for all languages where the articles had an abstract in English.

The searches were done on the Medline/PubMed database using MeSH terminology from the Index in the National Library of Medicine in the USA (2000) for the following terms.

There was a large number of hits for the keywords “*Pain*” and “*aged*” (= 65+), plus “*aged, 80 and over.*” A cursory check of a hundred or so titles showed the majority to be unsuitable for this report, with its emphasis on geriatric treatment trials. For this reason, the search was further restricted to mainly include the term “chronic pain.”

Pain (MeSH term) + free text search as follows:

1. Chronic pain (general)
2. Chronic pain – clinical trials
3. Pain + geriatric\*
4. Chronic pain + elderly in SweMed
5. Pain/chronic pain + elderly/in old age + geriatric\* in Cinahl
6. Pain + elderly (but restricted to 65+) in Spriline

## **Additional search strategy for “clinical trials in nursing” (65+)**

*Search strategy:* Search period 1990–2000, for the age group of “80 and over,” but with a lower limit of 65 as an inclusion age in the study population and with the requirement that ages were specified in the abstract.

*Search path:* Pain, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Excluded:* Non-English, reviews, letters, articles with a wide age range (under 65) where only the average age is specified, articles with no defined age range, pilot studies, and individual case studies.

*Medline:* 321 hits, of which 38 were included.

*Cinahl:* 150 hits, of which 6 were included (duplicates excluded).

*Comments:* Since the search was made for “pain” in general, and not restricted to “chronic pain,” a final manual adjustment was made to the included trials in relation to the inclusion age (18 had to be deleted) and the restriction “chronic pain” (9 were related to pre or postoperative care and direct intensive care). Of the original 44 articles, 17 remained, divided into 2 RCTs [15, 42], no CCTs and 15 other trials (UCTs) [22–27, 31–34, 39–40, 42–43, 45].

## **Assessment of the search strategy**

A difficulty arose with the planned age limit of 75+ for the assignment, since the databases only have the limit 65+, and in Medline “aged, 80 and over.” In some cases, an average age was stated in the abstract. Primarily, the limits of 65+ and 80+ years of age have been used in this general compilation, but the number of articles relating to the age group of 80+ was so few in this area that it was not worth listing them separately. Instead, the reference list shows in parentheses if the article had a study population older than 65+.

Within this search area, many articles were excluded because the age of the study population was not mentioned at all in the abstract or title,

even with the terms “older” or “elderly.” No thoughts on the age aspects were discussed in these abstracts. Since a search was made in these cases for the subgroup “80 and over,” it is plausible that some part of the study population ought to have belonged to the 80+ group. This exclusion of articles was particularly common in trials focusing on the effects of drugs or their dosage forms, but also occurred in other fields.

According to instructions, the analysis focused on clinical trials in a broad multidimensional and interprofessional perspective. It was principally based on actual available abstracts, in some cases also complemented with original articles from other sources, plus a Swedish doctoral thesis within the field, and other relevant literature.

### **Results of data search**

A data search in PubMed for the period 1990–2000 returned nearly 3,000 articles for the 65+ age group in the area of chronic pain, almost 300 clinical trials with the restriction 80+, and another 100 for “free search + geriatric\*.” As already stated in the methods section, many articles were then excluded due to a lack of information about the study population’s inclusion age and average age, or the fact that the words “older” or “elderly” were not mentioned in the title or abstract. In addition, it turned out that in reality, articles in the 80+ subgroup search only rarely related to a study population aged 75+ or 80+. Therefore, this compilation includes the whole 65+ group, with comments if an older study group is indicated in a particular reference.

In the Cinahl search, just over 300 articles were found within the field, but with some exclusions due to no abstract or a very brief and general one. However, the majority of articles (263/311) were well suited to our study purposes of geriatric clinical trials from a broad multiprofessional perspective.

Searching in SweMed and Spriline only added a few further studies. In all, there were 13 articles: 5 RCTs [15, 20, 21, 38, 41], 1 CCT [14] and 7 UCTs [25, 28–30, 35–37].

For a summary, see Table 14, Treatment of chronic pain in the elderly. The table includes 28 articles in which the author’s search gave 13 results, and the additional nursing search gave a further 17. Only two overlapped [15, 25].

## Comments

A major body of knowledge exists for the area of chronic pain, but it is considerably restricted when searching for studies focusing on people in the 65+ age range. Study populations with an inclusion age of 75+ are very rare, particularly when controlled trials, RCTs and CCTs, are sought. This may seem surprising, since epidemiological studies are reporting an increasing prevalence of chronic pain with rising age, and everyday clinical treatment of this is highly common.

The studies shown in the table span a broad area, where the treatment emphasis/intervention was mainly pain assessment; the nursing, and psychological aspects of pain management; pain perception; and behavior (the “coping” function). Some holistic approaches have gained ground here, including a multidisciplinary outlook in assessing the pattern of symptoms of elderly patients, and the subjective dimension, which can be influenced in various ways to relieve chronic pain [14, 16, 17]. Two articles studied the significance of physical activity to pain intensity and pain assessment [36, 41]. Three studies [35, 37, 38] and one doctoral thesis [11] have been published by Swedish nursing researchers. They often discussed the lack of agreement between the staff’s and the patients’ assessment of the pain – staff can underestimate the patient’s experience of pain and symptoms, such as discomfort and impaired functional level. The assessment and treatment of pain in patients with cognitive impairment is another area urgently in need of research [21, 22, 26, 30, 32, 47]. Even family members’ perception of the patient’s pain has been considered, particularly in studies of palliative care [20, 33, 34, 46].

*Drug prescriptions* are probably the most common treatment of chronic pain [4, 5, 12, 13]. In searches, a total of seven clinical drug trials were found for the age group of 65+, of which only one was an RCT [21], and that related to postoperative hip pain, so it falls into the borderland between acute and long-term pain. Several authors cited the need for reliable pain assessment and observation instruments specially adapted for the group of elderly people with multiple diagnoses, with or without dementia [21, 48, 49, 50]. The need for more methodological research within this area is great, particularly to obtain reliable outcome measures for various trial formats.

The search found a large number of *pain studies* relating to older patients, but most were descriptive or explorative in nature. Many reviews were also found, spanning widely diverse fields: osteoarthritis/arthritis, foot problems, inguinal hernias, anal fissures, trigeminal neuralgia, oral pain, post-herpetic pain, post-stroke pain, contractures, lumbar pain, chronic leg ulcers, etc. Interventions included drug therapy (oral, liquid, patches) or combined treatments of analgesics with antidepressants or antiepileptics. Other interventions related to the nursing care, such as lying position, symptom control, or physical training. The patient's coping function or a comparison between patient and staff assessments of pain experienced and/or pain behavior were other areas. The more nursing-focused Cinahl database had the most clinical studies relating to elderly patients and their care. These studies were principally descriptive and qualitative in nature, with many suggestions for more in-depth research.

Studies regarding the connection between the medical-biological causes of pain and its effect on impaired functional ability are clearly lacking, as are studies of the psychological experience of both pain itself and the limitations it entails.

In the borderland between acute and chronic pain lies cancer-related pain, which is a relatively well-investigated area compared with other conditions, and is assumed to be applicable to older patients. Their increased sensitivity to side effects makes them more vulnerable. We need to generate more knowledge in order to develop a greater understanding of pain in the elderly, particularly in everyday clinical practice [3, 25].

An in-depth review of current research in the field of pain in the elderly needs to be done, over and above this review inventory. The results shown in good-quality international descriptive and qualitative studies should be widely attainable in clinical practice in Sweden. More space should be given to studies of pain management in the elderly with various complementary methods in addition to or in conjunction with pharmacological treatment.

Performing RCTs in this area entails considerable methodological problems, partly because each elderly patient may display a unique pain pro-

file. Furthermore, reliable pain assessment instruments that are adapted to the elderly are needed. Pain is a complex, subjective experience that often has its origins in an illness, and which also affects functional ability and mental wellbeing. Measuring and assessing these consequences requires a multidimensional and multiprofessional perspective, particularly when dealing with elderly people with multiple morbidity.

**Table 14** Managing chronic pain in the elderly 65+.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Drugs</b>	Post-op hip fracture/cognitive status	1		1	21/22
	Musculoskeletal problems			1	23
	Breakthrough pain, cancer/home care			1	24
	Cancer pain/nursing home (USA)			1	25
	Drug prescription/cognitive status			1	26
	Kombinationsbeh/svår cancersmärta			1	27
<b>Pain treatment/assessment</b>	Assessment of effect		1		14
	Hospital patients + 1 year after discharge			1	28
	Nursing home patients			1	29
	Nursing home patients/cognitive status			1	30
	Long-term care			1	31
	Municipal care/cognitive status			1	32
	Palliative care – relatives' perspective			2	33,34
	Patient – subjective problems, discomfort			1	35
	Musculoskeletal/functional impairment			1	36
Staff assessment compared with patient's	1		1	38/37	
<b>Physical treatment methods</b>	Tactile stimulation			1	39
	TENS			1	40
<b>Physical training</b>		1			41
<b>Psychotherapy</b>	Cognitive behavioral therapy	1			15

Table continued on next page

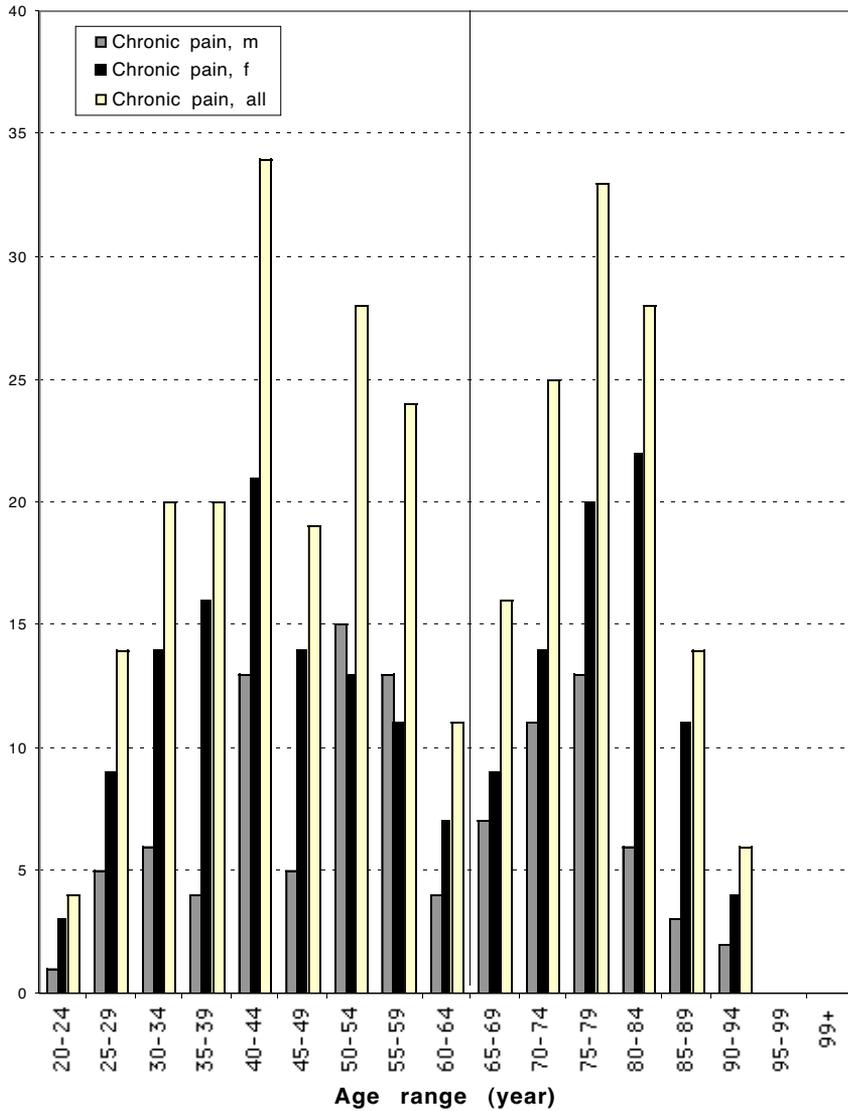
**Table 14** *continued*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Coping</b>	Osteoarthritis patients			1	42
	Cancer patients			1	43
<b>Education</b>	Severely ill hospital patients and relatives	1			20
	Cancer patients	1			44
	Cultural patterns			1	45
<b>Total</b>		<b>6*</b>	<b>1</b>	<b>21</b>	

\*) Only a small number of RCT trials depending on the exclusion criteria.

Many articles were excluded because the age of the study population was not specified in the abstract; thus there was no information on the prospective significance of age factors. This means that many studies that might also be relevant to elderly patients were excluded. Above all, this applies to controlled drug trials, in which different preparations (analgesics) or their dose forms were compared, with or without combination with other pharmacological treatment or other pain management methods. The problem with controlled studies from a methodological point of view, is that elderly people often suffer from multiple ailments with a complex pattern of illness.

## Number of diagnosis



**Figure 14** The diagnosis of chronic pain in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 15. Skin ulcers – venous leg ulcers, diabetic foot ulcers and pressure ulcers

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*Vivianne Schubert*

## Definitions

### Ulcers

*A chronic leg ulcer is a wound that heals slowly, is localized to the lower part of the leg, and is caused by poor circulation [1].*

*Diabetes mellitus with peripheral vascular disease and polyneuropathy is regarded as the most common cause of diabetic foot ulcers. Triggering factors may include pressure injuries from tight shoes [2].*

*Pressure ulcers are characterized by local skin injury, caused by external pressure that is too high and lasts too long, and shearing or friction against the skin. This inhibits the blood supply, leading to a lack of oxygen and nutrients in the skin [3].*

### Ulcer healing

The ulcer is healed when the skin has closed (total re-epithelialization) and when the former ulcer area is no longer moist (e.g. against a compress) [3].

## Background

The reasons that chronic leg, foot and pressure ulcers arise are often complicated. Disturbances occur in the arterial and venous micro/macro-circulation. Patients with diabetes mellitus are represented in all skin ulcer groups.

About 70% of all chronic leg ulcers are due to venous insufficiency. Arterial insufficiency occurs in about 48% of chronic foot ulcers. Foot ulcers with multifactorial causes are estimated at about 25%. Foot ulcers occur in about 24% of diabetes patients [4]. Four out of five foot ulcers in diabetes patients are caused by external force against the foot, and around 70% of all amputations in Sweden are due to foot ulcers in diabetics [2].

In a prevalence study, 26% of pressure ulcers were recorded as being on heels, and 10% on ankles (malleolae). The majority of pressure ulcers, 34%, were localized to the sacrum. A total of 90% of pressure ulcers were recorded below the umbilical plane [3].

The purpose of treating chronic ulcers is for patients to feel optimum satisfaction with their treatment, for rapid ulcer healing to be achieved, and to prevent foot or leg amputation. The purpose is also to achieve better mobility and function of the damaged area at a reasonable cost. The treatment should be designed in consultation with the patient and the results documented regularly.

Ulcers should be described once a week by:

- a) clinical assessment of the ulcer status and skin reaction around the ulcers
- b) signs of inflammation/infection [5]
- c) measurement of area or volume
- d) degree of ulceration
- e) pain analysis
- f) odor
- g) localization of the ulcer
- h) fluid secretion.

Ulcer healing and treatment results should be analyzed through:

- a) ulcer area reduction per unit of time [6]
- b) ulcer volume reduction per unit of time
- c) calculation of a prognostic ulcer-healing index [7]
- d) changes to the degree of ulceration
- e) total ulcer healing
- f) treatment period
- g) photographic documentation

- h) current treatment
- i) prophylactic measures
- j) physiological documentation of the studied treatment effect, through such things as examination of the skin microcirculation and/or transcutaneous oxygen tension (tcPO<sub>2</sub>) [8–10].

## Summary of published clinical trials

### Search strategy

Search words used to identify relevant studies via Medline (Ovid and PubMed, 65+, 1990–2000) are “wound,” “aged,” “treatment,” “therapy,” “diabetes mellitus,” “foot ulcer,” “venous leg ulcer,” “pressure sore,” “pressure ulcer,” “decubitus ulcer,” “randomized controlled trial.”

### Additional search strategy for “clinical trials in nursing”

*Medline:* 257 hits, of which 24 were included.

*Cinahl:* 87 hits, of which 1 was included (duplicates excluded).

*Search path:* Skin-ulcer, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy aged, nursing, nursing care.

*Excluded:* Non-English, reviews, letters, articles with a wide undefined age range, and individual case studies.

For a summary, see the three tables:

Table 15.1 Treatment of venous leg ulcers in the elderly

Table 15.2 Treatment of diabetic foot ulcers in the elderly

Table 15.3 Treatment of pressure ulcers in the elderly.

## Comments

When new local ulcer treatment products are introduced, they often lack adequate scientific documentation, and this makes it harder for staff to make a decision about the product. The treatment studies listed here from international publications mostly describe products available in Swedish healthcare today. The majority describe the effect of the local treatment on ulcer healing, but few objectively confirm the effect

of the treatment manifested in an improvement of local blood flow and oxygen transport in the skin/ulcer area.

Randomization methods vary between ulcer studies, and there is no standardized means of randomization. The number of ulcer patients studied varied widely, and the groups studied were often small. The dropout rate is sometimes high.

Studies that describe ulcer healing by calculating ulcer area as “length x width” should not be accepted; this way of estimating the area of an ulcer has been reported to give an average area that is 31% too large [11]. Reliable statistical methodology should therefore be used to describe the ulcer healing rate.

The need of and wish for more training in trigger mechanisms, preventive measures, and ulcer treatment is very great among all personnel categories in elderly care, especially municipal. The presence of pressure ulcers indicates a gap in knowledge on which preventive measures should be adopted in the care of elderly patients with chronic ulcers.

Education about diabetic foot ulcers is crucial, since the frequency of patients with diabetes tends to increase in the elderly population in Sweden, and probably also diabetic complications in the form of chronic foot ulcers.

### **The need for research and development/assessment relating to skin ulcers in geriatric care**

- An “Expert center in ulcer treatment” is needed, where medically established ulcer researchers agree on a national plan for training healthcare staff who deal with patients with acute or chronic skin ulcers.
- Assess the quality of nursing through regular prevalence and incidence studies of skin ulcers among patients older than 75. Assess the frequency of methicillin-resistant staphylococcus aureus (MRSA) in care of the elderly.
- Set up basic research on which factors positively or negatively affect the healing rate of chronic ulcers among patients older than 75.

- More, well-designed ulcer treatment studies among patients older than 75 with and without diabetes.
- Regular assessment of ulcer treatment products with a documented effect based on well-designed, randomized controlled studies.
- Assess costs of preparations in the same product category and establish recommendations for local ulcer treatment.

**Table 15.1** Treatment of venous leg ulcers in the elderly.

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>SYSTEMIC TREATMENT</b>					
<b>Drugs</b>					
Phosphodiesterase inhibitors	Oxyntifylline vs. placebo	2			12–13
Flavonoids	Daflon vs. placebo	2			14–15
ASA	Aspirin vs. placebo	1			16
Calcium antagonists	Nifedipine vs. placebo	1			17
Glucosides	Oxerutin vs. placebo	1			18
<b>LOCAL TREATMENT</b>					
<b>Dressings</b>					
	Iodine	2			19–20
	Iodine vs. hydrocolloid vs. paraffin	1			21
	Hydrocolloid	1	1		22/23
	Hydrofiber dressing vs. alginate dressing	1			24
	Comparison of hydrocellular vs. hydrocolloid dressings	1			25
	Polyurethane foam vs. hydrocellular dressing	1			26
	Zinc oxide vs. hydrocolloid	1			27
	Zinc oxide vs. alginate	1			28
	Hydroxyethylrutosides	1			29
	Allogeneic cultured human skin equivalent	1			30
	Hypertonic gel	1			31
	Hyaluronic acid		1		32

*Table continued on next page*

**Table 15.1** continued

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
	Cryopreserved cultured epidermal allografts vs. hydrocolloid dressings	1			33
	Hydrogel			1	34
<b>Growth factors</b>	Granulocyte-macrophage CSF vs. placebo	1			35
	TGF- $\beta$ 2	1			36
<b>Maggot treatment</b>		1			37
<b>External compression</b>	Pneumatic compression	2			38–39
	Short-stretch bandages vs. four-layer bandage system vs. long stretch-paste bandage system	1			40
	Four layer vs. short stretch compression bandages	1			41
	Compression	1			42
	Cutinova foam vs. allewyn with Jobst ulcer care stockings	1			43
<b>Local analgesics</b>	EMLA	1			44
<b>Ultrasound</b>	Low-frequency ultrasound (30 kHz)	1			45
<b>Electromagnetic radiation</b>	600–800 Hz	1			46
<b>Hyperbaric oxygen treatment</b>		1			47
<b>Total venous leg ulcers</b>		<b>33</b>	<b>2</b>	<b>1</b>	

**Table 15.2** Treatment of diabetic foot ulcers in the elderly.

Treatment methods	Specification	Number of studies			Reference
		RCT	CCT	UCT	
<b>SYSTEMIC TREATMENT</b>					
<b>Drugs</b>					
Antibiotics	Imipenem/cilastin vs. piperacillin/clindamycin	1			48
<b>LOCAL TREATMENT</b>					
<b>Dressings</b>					
	Adhesive zinc oxide tape (MeZinc) vs. adhesive occlusive hydrocolloid dressing (DuoDerm)	1			49
	Iodine vs. gentamycin/streptokinase streptodornase/saline dressing	1			50
	Semi-permeable polymeric membrane vs. saline dressing	1			51
	Allevyn vs. Kaltostat	1			52
<b>Serotonin antagonists</b>	Ketanserin	1			53
<b>Growth factors</b>	Activated thrombocyte supernatant (CT-102)	1			54
	Recombinant human platelet-derived growth factor	2			55–56
	Basic fibroblast growth factor	1			57
<b>Electrical stimulation</b>	Asymmetric biphasic vs. symmetric biphasic square-wave pulse vs. low levels of stimulation current (MC), or no electrical stimulation	1			58
<b>Hyperbaric oxygen treatment</b>		3		1	59–62
<b>Total diabetic foot ulcers</b>		<b>14</b>	<b>0</b>	<b>1</b>	

**Table 15.3** Treatment of pressure ulcers in the elderly.

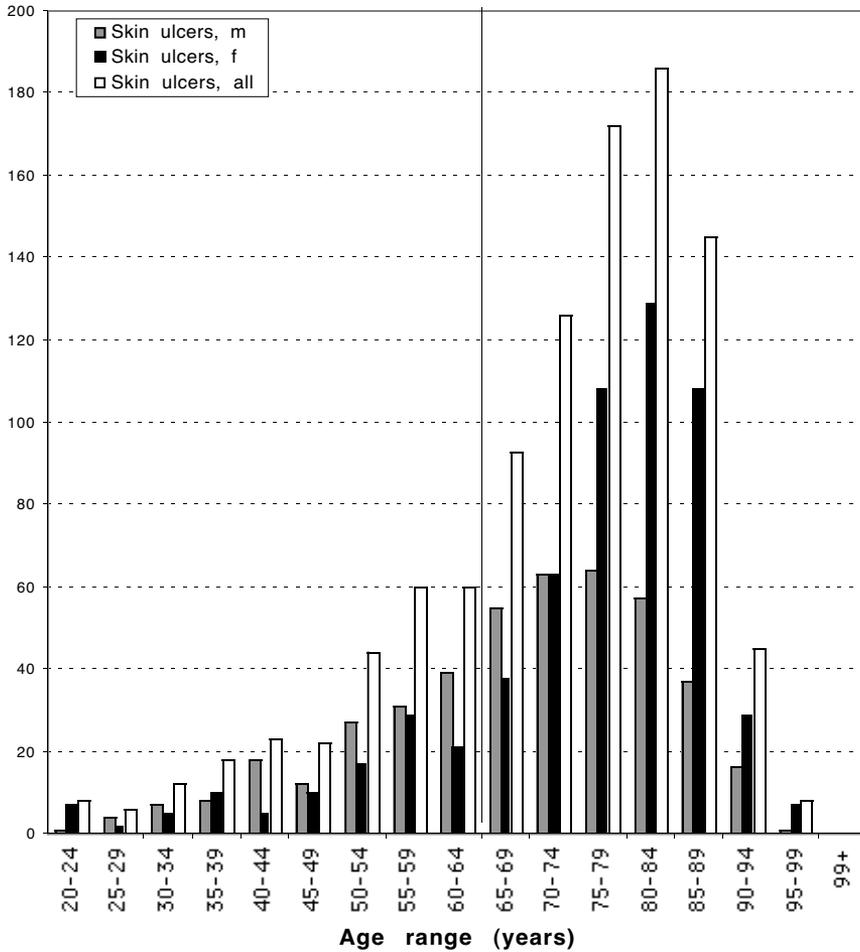
Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>SYSTEMIC TREATMENT</b>					
<b>Nutrition</b>	Oral nutritional supplements: energy 400 kcal/d, protein 16 g/d	1			63
<b>LOCAL TREATMENT</b>					
<b>Dressings</b>	Comparison of two hydrogel dressings	1			64
	Amorphous hydrogel vs. dextranomer paste	1			65
	Amorphous hydrocolloid	1			66
	Comparison of two hydrocolloid dressings	1			67
	Triangle-shaped hydrocolloid border dressing vs. oval shape, hydrocolloid dressing	1			68
	Hydrogel vs. hydrocolloid vs. saline dressing	1			69
	Hydrocolloid vs. saline dressing	1			70
	Epi-Lock dressing vs. saline dressing		1		71
	Alginate vs. dextranomer paste	1			72
	An active based cream F14001 against a placebo non-active based cream		1		73
<b>Growth factors</b>	Recombinant platelet-derived growth factor-BB vs. placebo	2			74–75
	Recombinant basic fibroblast growth factor (bFGF) vs. placebo	1			76
<b>Mattresses</b>	Low-air-loss bed vs. corrugated foam mattress	1			77
	Health economic analysis of the previous study	1			78
	Rolling bed			1	79
<b>Hydrotherapy</b>	Hydrotherapy (Whirlpool) vs. saline dressing + relief	1			80

Table continued on next page

**Table 15.3** *continued*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Ultrasound</b>	Ultrasound treatment vs. placebo (sham)	1			81
<b>Electrical stimulation</b>	Pulsed low-intensity direct current (300 to 600 microA) vs. placebo (sham)	1			82
<b>Phototherapy</b>	Pulsed monochromatic infrared (956 nm) and red (637 nm) light vs. standard treatment	1			83
<b>Surgery</b>	Myocutaneous flap procedure			1	84
<b>CARE PROGRAM</b>	Hospital or home treatment			1	85
<b>PREVENTION</b>	Two dry-flotation pressure-reducing surfaces	1			86
	Mattress replacement vs. foam overlay	1			87
	Relief (effective pressure care)			1	88
	Comparison of seven mattress overlays	1			89
	Ulcer prevention at hospice (three levels of pressure support)		1		90
	13 different heel-protecting devices		1		91
	Pressure ulcer prevention program			3	92–94
	Health economic analysis of costs of ulcer prevention (turning, pressure-reducing mattresses, chair cushions, miscellaneous preventive devices)			1	95
<b>Total pressure ulcers</b>		<b>21</b>	<b>4</b>	<b>8</b>	
<b>Total Table 15.1–15.3</b>		<b>68</b>	<b>6</b>	<b>10</b>	

## Number of diagnosis



**Figure 15** The diagnosis of skin ulcers in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 16. Drug treatment

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*Gunnar Akner and Lars Boréus*

## **Background**

With age comes an increased risk of being affected by various illnesses. Elderly people often have several illnesses at the same time (multimorbidity) meaning that they will often be treated with a number of different drugs at the same time (polypharmacy). Polypharmacy is common in the elderly. According to a national survey, 17% of the Swedish population over 65 account for around 40% of the drug costs [1]. Of those aged 75 or older, 90% use drugs, distributed as follows for different types of housing [1–2]:

<i>Type of housing</i>	<i>Number of drugs per person</i>
Own house	3–4
Senior citizens' home	4–5
Nursing home	7–9

The most common drugs in use are cardiovascular, psychotropics, painkillers and laxatives [1–3]. Polypharmacy has been found to be significantly correlated to such things as age, hospital stays in the past six months, home nursing in the last year, and visits to the doctor in the last year [4].

At the same time, aging leads to changes in the body's sensitivity to drugs (pharmacodynamics) and how drugs are metabolized in the body (pharmacokinetics), compared with younger people. Overall, this means a significant risk that drug treatment of the elderly may have a different effect compared to younger people:

- the effect may be stronger than intended (toxicity)
- the effect may be weaker than intended or absent
- the effect may be of a different kind than intended (adverse drug reactions = side effects).

Other chapters in this SBU report contain tables showing published trials relating to drug treatment in a range of different problem areas (dementia, depression, heart failure etc). Polypharmacy, combined with altered pharmacodynamics and pharmacokinetics in the elderly, means that drug treatment as such should be identified as a special problem area with risks of ill health, due to e.g. side effects [5]. This chapter gives a summary of published studies where problems have been investigated on the group and individual levels.

### *Group level*

The problem areas of polypharmacy, drug side effects, drug-related admissions to hospital, interactions, and compliance.

### *Individual level*

Possible distinctions between older and younger people in terms of the pharmacokinetics and pharmacodynamics of individual drugs, plus side effects and interactions.

Clinical trials of the 20 most-used drugs in all individuals over 65 in Sweden for the year 2000, expressed as defined daily doses (DDD), which represents the assumed average daily dose for adults using the drug for the main indication, see Figure 16.

## **Summary of published clinical trials**

### **Search strategy**

#### **Data on problem areas**

We have searched Medline (PubMed) for published studies in the following problem areas:

- Polypharmacy in the elderly
- Adverse drug reactions (side effects) in the elderly
- Drug-related hospital admissions
- Drug-drug interactions in the elderly
- Drug compliance in the elderly.

The search was restricted to the last decade, the English language, “clinical trials,” “human” and “aged” (= over 65 years of age). No review articles have been included. Abstracts were studied and relevant articles were selected.

*Polypharmacy:* 19 hits in total. Eight considered relevant.

*Side effects:* 366 hits in total. The majority of hits related to individual drugs, but five hits were found relating to side effects in conjunction with polypharmacy. Searching for a combination of “drug adverse reactions” plus “drug side effects” and “polypharmacy” gave no further hits.

*Drug-related hospital admissions:* 88 hits in total. The majority related to all patients admitted to hospital regardless of age (despite the search criterion >65 years of age). Some references clearly related to older people.

*Interactions:* 675 hits in total. Almost all related to interactions between two substances or occasionally substance groups. Searching for “related articles” returned just over 100 articles, the majority of them summaries or editorials/letters without abstracts.

*Compliance:* 637 hits in total. Only one considered relevant.

For all five areas, some references appeared by searching for “related articles.” The articles have been divided into three table columns – randomized controlled trials (RCTs), controlled clinical trials (CCTs) and uncontrolled clinical trials (UCTs) – by the information in the abstract text or according to the indexing in PubMed.

## **Data on individual drugs**

### *1. Pharmaceutical companies*

We wrote to the 23 pharmaceutical companies operating in Sweden, and asked them to present the published literature relating to effect data in the elderly (over 75 years of age) for each of their drugs on the “top 20 list” (Figure 16) in terms of “pharmacodynamics,” “pharmacokinetics,” “side effects,” “interaction” and “compliance.” The results of this questionnaire were highly variable: Some pharmaceutical companies presented available information, but several companies responded briefly that the requested documentation either did not exist,

or that they were unable to help produce it. One company referred us to their international division.

### *2. The Swedish Medical Products Agency*

We gained access to the Swedish Medical Products Agency's product monographs for the corresponding products described above under "Pharmaceutical Companies." These monographs largely correspond to the information in the Pharmaceutical Codex (in Swedish FASS), issued by the pharmaceutical companies. Neither the Pharmaceutical Codex nor the monographs have a special heading for "Elderly." No data or treatment advice was given in the monographs regarding treatment in geriatrics. According to the Swedish Medical Products Agency, these monographs were written in conjunction with registration without being subsequently updated. They can thus often be out of date and of little use in clinical work.

### *3. Searching in Medline (PubMed)*

We started with the "top 20 list" (Figure 16) and searched in PubMed (the entire file since 1966) using the search words "(generic name)" and "elderly." This gave a highly variable number of hits (the extremes were 63 for zopiclone and 4,589 for acetylsalicylic acid). All titles were assessed and all abstracts considered relevant for our purposes were selected. The remaining references are presented in Table 16.2. The requirement for inclusion was that the trials should be RCTs or CCTs, but a few UCTs were also included if they were perceived as relevant. It should be observed that some of the references in Table 16.2 also appear in the chapters relating to the treatment of various illnesses.

### **Additional search strategy for "clinical trials in nursing**

*Medline:* 47 hits, of which 2 were included.

*Cinahl:* 57 hits, of which 1 was included (duplicates excluded).

*Search path:* Polypharmacy, aged, nursing, nursing care.

*Excluded:* Non-English, outlines, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, and individual case studies.

The results of the above searches and information retrieval are shown in the following two tables:

Table 16.1: Drug treatment in the elderly – problem areas

Table 16.2: Drug treatment in the elderly – individual drugs (generic names)

## Comments

As is apparent from this report, the data is deficient for the majority of drugs used in people over 65, particularly for drugs that have been registered for a long time. For patients aged 75+, there are practically no studies comparing effect variables with younger age groups. All this creates a paradox: drugs are very widely prescribed for elderly people, yet data in the form of controlled clinical trials is significantly poorer for this group than in younger people. This means the likelihood of age-specific differences in effect and side effects must be extrapolated from literature data for younger patients.

As is apparent from many other chapters in this SBU report, there is a great need for controlled studies regarding the effects of drug treatment in various diseases/conditions in the elderly in authentic situations – meaning that other treatments are going on simultaneously, which may include other drugs.

## Need for research/development relating to drug treatment in the elderly

The study demonstrates the great need for further research:

### *1. Desired and undesired effects in the elderly compared with younger people*

*NNT:* Is the likelihood of a desired effect of a given drug different in the elderly compared with younger people? The concept of NNT (number needed to treat) may be applicable here. NNT should be interpreted as “How many people must be treated with a given drug over a given period in order for the desired effect to be achieved in one

person? NNT cannot currently be stated for different age groups, but future treatment studies with drugs should be set up so that this question can be answered.

*Age-related side effects:* Is the likelihood (risk) of undesired effects (side effects) from a given drug different in the elderly compared with younger people? In the Pharmaceutical Codex, caution is often recommended in dosing elderly people, but as a rule this warning does not seem to be based on controlled studies, but primarily on the knowledge that elderly people often have impaired liver and kidney function compared with younger people, and also often have several other illnesses, which may influence the effects of drug treatment. Future clinical drug trials should be set up so that the side effects lists in the Pharmaceutical Codex can be listed according to age, stating which side effects are common in different age ranges (age-weighted side effect lists).

*Additive effects:* It is vital to focus on the issue of possible additive effects. Suppose, for example, that a person is being treated with ten different drugs and five of them have a stated “common” (defined as a prevalence >1% in clinical trials) side effect of “tiredness” and “loss of appetite.” How great is the cumulative risk that patients of various ages will develop tiredness or loss of appetite related to this polypharmacy? This kind of consideration is highly significant in the clinical assessment of elderly people, who often have diffuse symptoms of this kind.

*Detection:* Another central issue is how we can improve the system for detecting drug side effects. This is known to be difficult in elderly patients with multiple diagnoses, since different symptoms and examination findings can also be interpreted as being related to different illnesses or to aging itself. The only current obligation is to report side effects from new drugs, or serious side effects from previously registered drugs. Since the overwhelming majority of all drug side effects do not belong in either of these categories, they are not reported, but only visible in connection with occasional research projects or special studies. If doctors and nurses do not continually raise the question of possible side effects, chances are that they will not be detected.

## *2. Interactions in the elderly compared with younger people*

Elderly people are often treated with several drugs at the same time (polypharmacy), but it is generally unclear whether the effect and metabolism of drugs is altered by several other drugs given simultaneously. It is therefore vital to study pharmacokinetics and pharmacodynamics in conjunction with various combinations of polypharmacy.

## *3. Compliance in the elderly*

The compliance of patients with drug treatment is often unknown, which adds to the difficulties of assessing whether or not specific symptoms and signs are related to the drug treatment. It is crucial to encourage studies of compliance in drug treatment of elderly people, above all in normal housing, but also in special accommodation. Some urgent questions to answer are: How is compliance affected by the number of drugs prescribed? How is compliance affected by the elderly patient's and care-provider's knowledge and attitudes to drug treatment?

## *4. Drug-related visits to emergency departments/hospital admissions*

In a meta-analysis in 1993 based on 36 articles published from 1966–1989 from a range of different countries, it was noted that drug-related problems were the cause of on average 5.1% of all hospital admissions (95% confidence interval 4.4–5.8%) [6]. In a 1983 Swedish study, the corresponding figure was 16% [7].

In seven studies that specifically examined elderly patients (over 65 years of age), it was found that 5–19% of all hospital admissions of elderly patients were due to definite or probable drug side effects [25–31]. In five of these studies, the frequency varied between 13 and 19%.

Taken as a whole, this means that drug-related problems are one of the most common causes of hospital admission. There is thus significant potential for savings, both of human suffering and of inpatient care costs. Several of the reasons stated for drug-related admissions were assessed as preventable [7].

### *5. Headings in the Pharmaceutical Codex*

We feel that there is strong cause to introduce a heading of “Elderly” in the Pharmaceutical Codex, with a set of sub-headings such as pharmacodynamics, pharmacokinetics, side effects, and interactions, stating the currently existing data. This should stimulate interest in and generate demand for further data from both the medical profession and above all from senior citizens.

**Table 16.1** Drug treatment in the elderly – problem areas.

Area	Number of search hits	Selected (including “related articles”)	Number of studies			Reference number
			RCT	CCT	UCT	
Polypharmacy	19	8	6	1	1	8–13/ 14/15
Side effects	366	11	4		7	16–19/ 20–26
Drug-related hospital admissions	88	7			7	27–33
Interactions	675	5	1		4	34/35–38
Compliance	637	12	7	2	3	39–45/ 46–47/ 48–50
<b>Total</b>	<b>1 785</b>	<b>43</b>	<b>18</b>	<b>3</b>	<b>22</b>	

**Table 16.2** Drug treatment in the elderly – individual drugs.

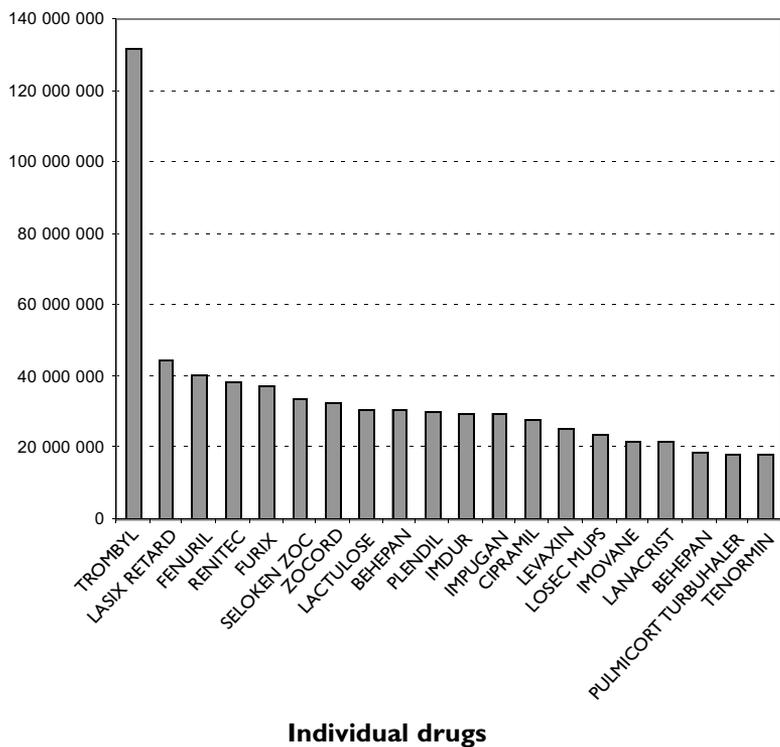
Drug	Pharmaco-kinetics	Pharmaco-dynamics	Side effects	Interactions	Number of studies			Reference number
					RCT	CCT	UCT	
Acetylsalicylic acid	4	1	1 2		2 4		2 2	51/52 53–56 57–58
Alprenolol					–	–	–	
Budesonid			2			2		59–60
Citalopram	1 1 1	4			5	1	1	61/62–65 66 67
Cyanocobalamin	1	3 2 1			4	2	1	68/69–71 72–73 74
Digoxin	1 1	1 2 1		2	4	3	1	75/76/ 77–78 79/80–81 82
Enalapril	1	7 1 3			8	1	3	83/84–90 91 92–94
Felodipine		10		1	11			95–104/ 105
Furosemide	1	1				2		106/107
Isosorbide mononitrate	1	4 1 3			5	1	3	108/ 109–112 113 114–116
Carbamide/urea		4 2 2			4	2	2	117–120 121–122 123–124
Lactulose		4 1			4	1		125–128 129
L-thyroxine	1				1			130

*Table continued on next page*

**Table 16.2** *continued*

Drugs	Pharmaco-kinetics	Pharmaco-dynamics	Side effects	Inter-actions	Number of studies			Reference number
					RCT	CCT	UCT	
Metoprolol		7		1	8			131–137/ 138
	4	1				5		139–142/ 143
		1					1	144
Omeprazole	1	4			5			145/ 146–149
		2				2		150–151
Simvastatin		2			2			152–153
		1				1		154
		2					2	155–156
Zopiclone	1	6			6			157–162
		1				2		163/164
<b>Total</b>	<b>20</b>	<b>85</b>	<b>5</b>	<b>4</b>	<b>69</b>	<b>29</b>	<b>16</b>	

**DDD (defined daily doses)**



**Figure 16** Top 20 drug sales (DDD) to persons over 65 years of age in Sweden in 2000 (men + women). The data for the figure has been produced in conjunction with Ali Vetr of the Karolinska pharmacy.

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## General

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## Problem areas (Table 16.1)

### *Polypharmacy*

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### **Individual drugs** (alphabetical order by generic substance – Table 16.2)

#### *Alprenolol* (e.g. *Tenormin*®)

No relevant references for elderly people.

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*Lactulose*

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*Metoprolol (e.g. Seloken®)*

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*Omeprazole (e.g. Losec®)*

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*Simvastatin (e.g. Zocord®)*

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*Zopiclone* (e.g. *Imovane*®, *Zopiklon*®)

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# 17. Malnutrition

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*Gunnar Akner*

## **Definition**

There is no internationally accepted definition of the diagnosis of malnutrition. Different research groups have used different criteria or combinations of criteria, including body composition, energy metabolism, biochemical variables, and functional analyses.

## **Background**

A combination of advanced age, multiple chronic diseases and polypharmacy lead to an increased risk of developing malnutrition, often through a combination of several different pathophysiological mechanisms working together. However, the prevalence is hard to assess, since there is no generally accepted definition of the concept of “malnutrition.” This is one of several explanations for the major variation in reported prevalence of malnutrition in people over 75 being cared for in Swedish geriatric clinics or nursing homes (10–66% with an average of 31%) [1–9].

## **Summary of published clinical trials**

The Swedish Board of Health and Welfare has recently published a report from an expert committee, who reviewed the literature relating to controlled treatment studies in the field of nutrition, emphasizing malnutrition in different diagnoses [10, 11]. One of the diagnosis groups is malnutrition “in elderly people with multimorbidity” and data in the table is taken from this report. It should be emphasized that the tables in the expert report relate to nutritional treatment for elderly people with multimorbidity over 70 (in the majority of studies, over 80), both with and without malnutrition. The following summary, however, includes only studies in which the authors defined part or all of the included patients as malnourished using specially stated criteria.

## Search strategy

It proved hard to find relevant literature in the Medline database that collectively described the effect of nutritional treatment. In the spring of 1998, one search with the Ovid search program of the index words “nutritional and metabolic diseases,” followed by “nutrition disorders,” “wasting + starvation” and the combination of “diet therapy,” “drug therapy,” “nursing,” “rehabilitation” and “therapy,” limited to human studies, adults, English language and removing leader articles and letters with no age limit, yielded only 69 articles in all the literature, none of which had clear relevance to the field of internal medicine/geriatric care.

The poor results had several possible reasons, including that the indexing of treatment-oriented nutrition articles in Medline is not uniform. Nutritional treatment can be found under terms such as “nutrition,” “diet,” “intervention,” “supplement” and “support.” Treatment studies are occasionally included as a subsidiary stage in articles also discussing epidemiological conditions, diagnosis or prognosis.

Through a supplementary search in Medline using the index words “protein-energy malnutrition/explode all,” augmented by a search in PubMed including the search aid “Related articles” plus reference files from several of the members in the Swedish Board of Health and Welfare’s expert group, the articles mentioned in the table below were located, supplemented by a corresponding search up to the spring of 2001. It should be emphasized that the compilation relates to malnutrition in the elderly, regardless of the underlying diagnosis or combination of diagnoses.

### **Additional search strategy for “clinical trials in nursing”**

*Medline:* 79 hits, of which 1 was included.

*Cinahl:* 91 hits, of which 1 was included (duplicates excluded).

*Search path:* Malnutrition, therapy, nursing care/nursing, aged/old age.

*Excluded:* Non-English, outlines, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, and individual case studies.

For a summary, see Table 17, Treatment of malnutrition in the elderly.

## Comments

The above discussed compilations of literature describe the current body of knowledge relating to treatment of malnutrition in the elderly as of the year 2000 [10, 11]. A number of factors make this literature hard to interpret:

1. The studies contain heterogeneous patient material with highly variable underlying diagnoses (case-mix), making it hard to compare them.
2. There is no consensus definition of the diagnosis “malnutrition.”
3. The nutritional treatments given were generally highly heterogeneous with:
  - various additions of energy, macro/micro nutrients, and water in addition to normal food
  - often unclear compliance with nutritional treatment and varying effects on the intake of normal food
  - highly variable treatment times.
4. In many studies, the emphasis has been on nutritional surrogate endpoints, such as weight, BMI (body mass index), fat mass, muscle mass, and various biochemical analyses. There is a dearth of studies of clinically relevant endpoints, such as morbidity, hospitalization periods, functional condition, health-related quality of life, and mortality.

In the light of this, it is presently difficult to design evidence-based guidelines for nutritional treatment in elderly patients with multimorbidity and malnutrition. It would be of value in itself to have a supple-

mentary detailed analysis of the nine controlled treatment studies (8 RCTs and 1 CCT) of elderly people with malnutrition shown in the table for this chapter, with an in-depth method analysis of things like randomization procedure, dropout rates etc., and attempts at standardized quality assessments of each and every study.

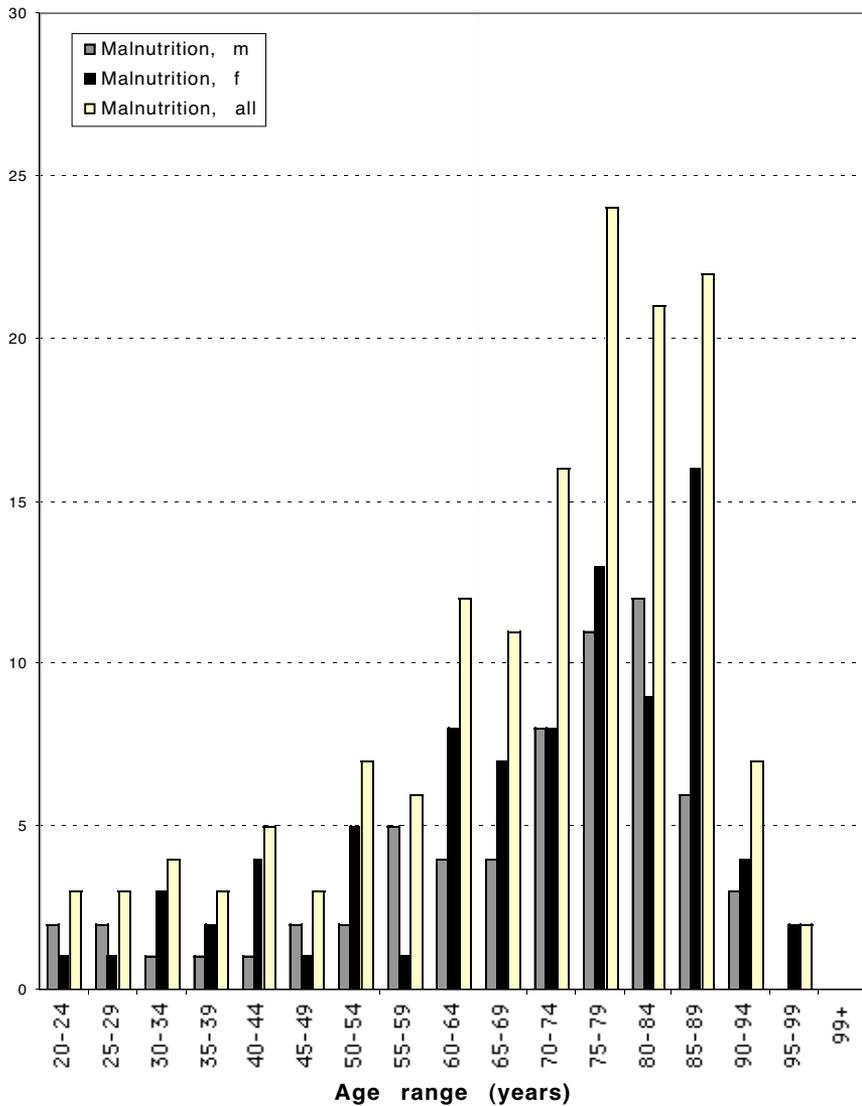
However, considering the standardization problems described above, it is doubtful how much a deeper analysis might be able to add, beyond the summaries made in the referred literature. Instead, it would be more important to stimulate new randomized controlled treatment studies into the effect of different forms of treatment, such as food/nutrition, drugs (androgenic anabolic steroids, growth hormone, anti-inflammatory drugs etc.), physical training and various combinations of these methods on malnutrition in the elderly associated with different diseases/injuries or combinations of diseases/injuries.

This presupposes that standardized operational criteria are used for the diagnosis “malnutrition,” that treatments are standardized (amount of energy, protein and water per kilo of body weight, plus amount of micronutrients added) including treatment time, that habitual food intake is monitored, and above all that clinically relevant endpoints are used.

**Table 17** *Treatment of malnutrition in the elderly.*

Treatment methods	Specification	Number of studies			Reference number
		RCT	CCT	UCT	
<b>Nutritional supplements</b>	Nutritionally enriched food	1			12
	Oral nutritional supplement (sachet)	1			13
	Oral nutritional drink	5	1	1	4,14–17/ 18/19
	Intervention protocols			1	20
	Oral nutritional drink or enteral nutrition			1	21
	Enteral nutrition (probe)			1	22
	Oral nutritional drink vs. enteral nutrition	1			23
<b>Total</b>		<b>8</b>	<b>1</b>	<b>4</b>	

## Number of diagnosis



**Figure 17** The diagnosis of malnutrition in an age range of 5-year intervals according to statistics from the National Swedish Board of Health and Welfare's Inpatient Care Register for 1999. The line shows the boundary for age 65. Note that the statistics are based on primary diagnoses, which means that many chronic diseases are underrepresented.

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# 18. Emergency geriatric care

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*Åke Rundgren*

## **Background**

The loss of various functions in the elderly during hospital care is a common and serious side effect of the care network of most hospitals in the industrialized world [1–4]. Even for less serious complaints, hospital care can entail an irreversible deterioration in the functional status of elderly people, and thereby increased dependency and poorer quality of life. Such effects can appear early and progress rapidly.

People aged 65 years of age and older make up 17.3% of the Swedish population [5], but constituted 40.3% of patients discharged from inpatient care in 1998 [6] and represented about 50% of all prescription drug costs [7]. In the 90+ age group, about 40% were being cared for in hospitals in 1998 [6]. Large groups of elderly people are often cared for as inpatients, which subjects them to considerable risk. It is possible to partly or entirely avoid the effects of hospitalization [1–4], though some of the measures that have been studied have been resource-consuming and not always precise in terms of measures and costs.

The complexity of illness at advanced ages, in terms of both diagnosis and treatment, makes geriatric expertise crucial, especially in acute emergencies when rapid, correct handling can help prevent unnecessary deterioration in the patient's health. Doctors in emergency wards usually lack such expertise, which leads to poorer-quality assessments and decisions. The same applies to the staff at monitoring units, which specialize in both internal medicine and surgery and tend to have a strongly technical function, aimed at diagnosis and monitoring.

Because of the large proportion of elderly people seeking care in emergency wards and admitted to monitoring units, various attempts have been made to increase the geriatric element in the operation. This has led to the idea of a special field of expertise in emergency geriatric care.

Emergency geriatric care means a clinical care system aimed at improving the outcome in a heterogeneous group of elderly people admitted to hospital due to an acute illness [8].

### **Working methods in emergency geriatric care**

In an outline, Palmer describes fundamental characteristics of an emergency geriatric unit [9] with four key elements:

- Specially designed and adapted wards
- Patient-centered care
- Advance care planning prior to discharge
- Regular follow-up and monitoring of medical measures.

According to Covinsky, other aspects that distinguish emergency geriatric care from other emergency care are [10]:

1. Emergency care for the elderly should work according to a biopsychosocial model, combining the prevailing view of illness with a model that includes the patient, the social context in which he or she lives, and society's different systems for sick and handicapped people. The emergency care model is biomedical, but since the elderly often have complex needs, the biopsychosocial model is better suited for emergency geriatric care, as it relates patients' need to their often complex social situation.
2. Emergency care for elderly people must focus on the patient's physical environment, to facilitate and support the ADL functions. Ordinary emergency care emphasizes such issues very little or not at all. The hospital environment may facilitate or inhibit the patient's functional improvement, but often has limitations for elderly people that can lead to functional deterioration, or create feelings of alienation and depression. The physical environment must stimulate patients to manage by themselves for as long as possible.
3. Emergency care for the elderly focuses primarily on function, while the emphasis in general emergency care is illness and diagnosis. An illness-oriented attitude is often ineffective in elderly patients with multiple chronic illnesses, which integrate with the patient's environment and lead to dependency. The functional viewpoint makes it

possible to look at the patient's quality of life rather than just treating illnesses. Thus, functional deterioration can more easily be prevented.

4. Ordinary emergency care emphasizes above all the efforts of the doctor, while geriatric care, especially emergency geriatric care, is team-oriented. The patient benefits from the skills of the multidisciplinary team members.
5. Emergency care is a question of “here and now” – the patient's situation at the hospital. In geriatric care, the emphasis is on how medical decisions will affect the patient in his/her home environment, and what needs the patient might have in the long term to live with the least possible effective care. Geriatric care is geared toward the patient's function both in and out of the hospital.

### **What does emergency geriatric care mean?**

Most elderly people admitted to hospitals in Sweden have come in via the emergency wards [11]. No evidence has been found that elderly patients overuse emergency admissions [11–14]. One Swedish study found that most elderly people came to emergency wards during the daytime between 7:00 a.m. and 5:00 p.m. – at hours when primary care is most available [11]. Thus, it is important to analyze emergency admissions from the perspective of the continuum of care.

Unlike most other medical specialties, geriatric care is largely organized according to local conditions. But it is also shaped by the evaluations of healthcare policy makers or officials in public or private operations. Both in Sweden and other countries with geriatric care, there is great variation in the emphasis and volume of the operation.

An examination of the literature regarding emergency geriatric care, which forms the basis of this summary, shows that emergency geriatric care mainly falls into five categories:

1. Patients with acute conditions are taken to an emergency geriatric unit, known as ACE units (acute care for elders) in the USA. These are almost always units with an environment adapted to the elderly, advance care planning, and emphasis on rehabilitation.

2. Geriatric units at emergency hospitals primarily taking in patients with medically stable conditions from other clinics. Geriatric units are often located outside the emergency hospital. Moving into emergency hospital very often results in an increase in emergency measures at these units.
3. Emergency geriatric care can also be regarded as care of elderly people in the hospital's emergency admissions ward. Emergency medical assessments are predominant here, even though the medical staff at the emergency admissions ward try to employ geriatric aspects in their care
4. Geriatric teams working on a consultant basis at an emergency admissions ward and/or at monitoring units, but who do not have direct responsibility for care at these units.
5. Geriatric teams on wards at emergency hospitals, with a consultant function on the various specialist wards. This working method aims to assess the elderly patient as thoroughly as possible from medical, social, and psychological aspects, so as to create a care plan and long-term follow-up on this basis.

In principle, this gives us three models of geriatric care [9]:

- The *segregated model* – one or more wards earmarked for geriatric patients.
- The *integrated model* – the patients are admitted to regular wards and some geriatric patients are earmarked for care by a geriatric team.
- The *consultation model* – the patients are admitted to regular wards and ward staff consult a special geriatric team.

This makes it difficult to systematically analyze the literature in this area, especially because there is little comparability between the studies. The focus of this assessment is chiefly geriatric units that accept elderly patients direct from emergency admissions. It also highlights other forms of emergency care and assessment of acutely ill elderly people.

## Summary of published clinical trials

### Search strategy

A search was done on Medline for publications in the period 1966–2000 on emergency geriatric care. Initially, “acute geriatrics” and “acute geriatric medicine” were searched. “Acute geriatric units,” “geriatric units,” and “geriatric wards” were also tried. On the basis of adequate studies, a search was made of “related articles” listed in Medline. The keywords “emergency wards” and “emergency care of elderly” were also tried.

As the table shows, several RCTs exist regarding the effects of care at emergency geriatric units. The trials under the heading “Emergency wards” in the table are often comparative descriptions between older and younger patients at one emergency ward, rather than the effects of care of the elderly in different types of emergency wards.

### Specification of ages in the various studies

The age of the patients studied varied between trials.

#### *For emergency wards*

Age 75 and older [11]

Age 70 and older [16]

Age 65 and older [12–15, 17, 18]

Others stated average ages [19] (men 81.1, SD 7.7; women 83.2, SD 6.1).

#### *For the emergency geriatric units*

Age 75 and older [22, 30]

Age 70 and older [21, 24–26]

Others stated average ages:

[20] (79, no distribution)

[23] (men 73.6; women 79.6 range 52–95)

[27] (82.4 SD 7.4)

[25] (81.8 SD 7.2)

*For geriatric consultation teams*

Age 75 and older [29, 33]

Age 65 and older [31, 32, 34]

For a summary, see Table 18 Treatment studies relating to emergency geriatric care.

## Comments

The number of publications on emergency geriatric care are limited, with are only a handful of published RCTs. There are considerably more works relating to elderly people in emergency hospitals and geriatric assessment of elderly people in emergency hospitals. There are very few Swedish studies on emergency geriatric care, which is lamentable, since healthcare structures differ in many ways between countries, making comparisons difficult. However, one Swedish study from Umeå of emergency geriatric care was recently published [25], and one relating to hip fractures was done in Malmö and published in 1999 [19].

Stroke units can very much resemble emergency geriatric units in their design and methods, but stroke units are not dealt with in this presentation. Emergency geriatric units differ in terms of patient composition, emphasis, and physical layout. As described above, the age of the study subjects has varied in the studies presented. The higher the age, the greater the likelihood of treatment results being affected negatively, which can mean longer periods in care and more patients moving into nursing homes.

Various diagnoses result in radically different durations of care. Things like strokes and malignant diseases involve significantly longer hospitalizations than things like infections and fragility fractures.

In addition, local conditions, such as the existence or lack of well-developed primary care, home nursing, and municipal rehabilitation, lead to widely varying opportunities for geriatric care.

These different conditions make it difficult to implement generalized emergency geriatric care in Sweden. Despite this, there are many interesting findings in the field of emergency geriatric care that can be

applied. The issue of high quality care for existing elderly patients should be one of the most important in Swedish healthcare.

One example is that the environment in hospital emergency wards is noisy, visually disturbing, impersonal, and frightening, and lacks the atmosphere of a home environment, which is an important element for sick elderly people. An environment such as an emergency ward can easily trigger confusion or a general deterioration. However, there are no controlled studies in this area.

In summary, it can be said that the literature indicates that systematic, well thought out geriatric care, preferably in special units, gives better results in terms of survival and physical functional ability of the elderly, when compared with the results of care on wards with no geriatric element.

**Table 18** Treatment studies relating to emergency geriatric care.

Type of treatment unit	Number of studies			Reference number
	RCT	CCT	UCT	
Emergency ward		1	8	12/11, 13–19
Emergency geriatric unit (inpatient care)	6	2	1	20–25/26–27/28
Geriatric consulting team	3	1	3	29–31/32/33–35
<b>Total</b>	<b>9</b>	<b>4</b>	<b>12</b>	

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# 19. Geriatric rehabilitation, teamwork

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*Karin Styrborn and Sölve Elmståhl*

## Definition

A Swedish report entitled “Rehabilitation – for all ages and diagnoses. A basis for planning from the Swedish Board of Health and Welfare, the Federation of Swedish County Councils and the Swedish Association of Local Authorities” [102] defines rehabilitation as:

*“early, coordinated and multilateral efforts from various fields of competence and operations, combining medical, psychological, educational, social, and technical strategies on the basis of the needs, requirements, and interests of the individual.”*

## Background

This report has focused on the general principles regarding the effects of geriatric rehabilitation and teamwork. In doing so, it provided more disease-specific rehabilitation studies for other authors in this report.

One of the starting points for auditing the existing expertise in the field of *geriatric rehabilitation* was to describe existing studies and areas of expertise on the basis of a functional perspective in accordance with the WHO handicap model [111]. This perspective enables a wider perspective on rehabilitative strategies for the elderly than a purely diagnostic one; elderly people often have several illnesses at the same time. The latter perspective has been dealt with in other SBU reports relating to common diseases in the elderly, such as hypertension and dementia.

## Geriatric working method – teamwork

The specialty of geriatrics has international roots and its approach is based on long experience and a clinical research basis originating in the UK and the USA [46, 96, 100, 103, 104, 107, 108, 109, 110].

Teamwork and a holistic perspective on the problems of elderly patients are its primary characteristics. The above definition amounts to a broad natural basis for geriatric teamwork. A team consists of several people with different skills, often from different professions, working together to achieve a defined goal. Terms such as interdisciplinary team and multidisciplinary team are sometimes used synonymously, which is not entirely correct. In Europe, Canada and Australia, interdisciplinary teamwork applies in geriatrics, and this concept is also beginning to gain ground in the USA [104, 109].

- *Interdisciplinary team:* The whole team, consisting of various professional groups, regularly gets together to share its assessments prior to joint planning of the rehabilitation process on the basis of a common goal, where the participation of the patient and his/her relatives plays a key role [104, 107, 109].
- *Multidisciplinary team:* Each professional group works in isolation around the same patient on the basis of its own expertise and goals, often independent of each other's treatment strategies or goals, and through written referral procedures between them [103].

The team includes doctors, nurses (and nursing staff), occupational therapists, physiotherapists, hospital social workers, speech therapists, dieticians and occasionally neuropsychologists etc; however, these last three groups most often work on a consultant basis. Collaboration with dental and foot care is assumed in most places. Nursing issues and the active role of nurses in rehabilitation work with the elderly has a special position in the UK and the USA [94, 105, 107, 108].

### **Geriatric rehabilitation**

Geriatric rehabilitation is a vital category of elderly care, and includes major input from the healthcare services regardless of which institution is in charge. It encompasses large groups of elderly people with healthcare needs. The term geriatric rehabilitation relates to various, generally multiple, treatment strategies, with two different, overlapping aims:

- *Function-restorative treatment strategies*, aiming at the patient's regaining medical, social, and psychological functions, and thereby returning to previous conditions.

- *Function-preserving treatment strategies*, aiming at the person being able to maintain a functional level, which is the case for a large proportion of elderly people with varying function loss and who are being looked after by medical and elderly care. A prerequisite here is the availability of rehabilitation initiatives.

As age increases, so does the prevalence of disease and disability, and in the 80+ age range, a very large proportion of the population has some form of disability. Aging affects all biological functions, and these effects are also influenced by environment and lifestyle factors, which results in impaired reserve capacity and gradually also function. Expertise in rehabilitation is therefore important in order to identify significant factors in the individual's ability to regain and/or maintain functions in the light of illness and impaired reserve capacity. Diagnosing medical conditions in the elderly is essential to the assessment of causes of functional impairment and to implementing rehabilitation.

A model describing the multidimensional aspects of the term disablement has been presented by the WHO, in its ICF classification [111]. The concept is based on three levels; the organ level (impairment), individual level (activity) and social level (participation). Incapacity may exist on one or more levels. The following example describes the interaction between the levels: a hip fracture (organ level) causes impaired mobility (activity) and reduced social involvement (participation), which in turn can lead in the long run to inactivity atrophy and thus impact on organs. Individual conditions such as multimorbidity, differences in vulnerability, personality and coping ability may interact on all three levels. Environmentally related factors are things like social support, appliances, and economic resources. Diagnosis on an organ level among elderly people is often not distinct from other disciplines, but may be harder to implement with an elderly person. In some cases, treatment strategies can be modified as a result of increased vulnerability or interaction, as with polypharmacy [106, 111].

## Treatment goals

agnosis and treatment are aimed at both pathophysiological mechanisms on a cell/organ level, and combined functions on an individual level. Combined instruments are therefore routinely used, which describe activities comprising several different functions on an individual level, such as ADL ability or cognitive ability. These instruments may pick up pathological conditions, which may emanate from several different organ systems – which has major significance in the choice of therapy..

Targets of treatment may be different, and partly overlapping:

- *curative*, aimed at the organ level
- *rehabilitative*, functional training and adaptation aiming to help the patient recuperate or adapt to incapacity
- *compensatory* in which the patient receives aids such as appliances and adaptation of environmental factors

From this, it follows that the target group in geriatric rehabilitation often includes elderly patients with multiple diagnoses, with choice of treatment and therapy adapted to the person's capacity. Interdisciplinary methods are another characteristic of teamwork, which includes several fields of expertise for both diagnosis and treatment. The choice of follow-up instrument is not merely restricted to the organ level, but also includes more complex functions on an individual level. A starting point for defining geriatric rehabilitation is that at least two professions are involved in diagnosis and treatment, or at least two organ levels are the object of rehabilitation strategies.

## Summary of published clinical trials

### Search strategy

The search was restricted to the period 1990–2000 due to the large number of available studies.

The *databases* used were PubMed in Medline, Cinahl (nursing studies, mostly from the USA), SweMed, and Spriline.

Randomized controlled trials (RCT), controlled clinical trials (CCT), and also reviews were searched in all languages, with abstracts in English.

The *keywords* used were: “rehabilitation,” “patient care team (PCT),” “rehabil,” “geriatri,” “aged (=65+),” and “aged, 80 and over (80+).” A free text search was also done in Medline using “geriatric/exercise,” “rehabilitation,” and “PCT.” In Cinahl, the search terms “rehabilitation” (MeSH term), “rehabil,” “elderly/aged/in-old-age, +80,” “multi-disciplinary care team” (MCT, MeSH term) and “geriatric” (free text) were used in combination. Other additional sources were used, such as those listed as references or attached articles.

### **Assessment of the search strategy**

Due to the breadth of the assignment, a large volume of available articles (mainly titles and abstracts) were inspected manually, and their suitability for Swedish conditions assessed. Crucial to determining the limits of what is “geriatric rehabilitation” was whether more than one caring profession was involved in the treatment. The basic principles of teamwork and the holistic viewpoint have to be mentioned, and the rehabilitation goal was functional improvement in a broad perspective, and not simply measuring isolated restricted physiological parameters.

Conformity has been strived for in judging between different search strategies, and this has been done several times. Both authors did an independent study of sections of the material, and a good level of conformity was found (96%).

### **Results of the data search**

A total of 102 studies with the age group of 80+ are shown in Table 19, divided into randomized controlled trials (RCT), controlled clinical trials (CCT) and uncontrolled trials (UCT). Studies of nursing with rehabilitative content have been included in the compilation, if they generally fulfilled the assessment strategy. Three studies aimed at common health issues and medications are included under the heading “Specific focus, Other.”

In Table 19, the studies have been divided by the following principles:

- *organization or team* – the structure where treatment was carried out, or the main profession involved in or responsible for the treatment.
- *specific focus* – the main direction of the rehabilitation strategies. Often, however, there are multiple treatment strategies aimed at several organ systems at once.

The data search showed a large body of knowledge in the area of rehabilitation and the elderly (65+), for which reason it was necessary to restrict it to the period 1990–2000 and focus on the 80+ group. A search of titles in “rehabilitation and geriatrics” found 1,210 references, of which 605 met our restrictions. A search of “rehabilitation and 80+” gave 665 references, of which 485 related to geriatric rehabilitation strategies. There were 310 RCTs, of which 180 were relevant. After screening abstracts, 56 RCTs remained that met the inclusion criteria.

The search words “rehabilitation + patient care team” (80+) resulted in 101 studies, of which 48 corresponded to the criteria; 7 were RCTs and 2 were CCTs. The keywords “geriatric + patient care team” gave 185 articles, 51 of them relevant, of which 12 were RCTs and 3 were CCTs.

The keyword “exercise” was also tried with the addition of “geriatric”; 65 articles were found, of which 37 were relevant: 7 RCTs and no CCTs remained.

The Cinahl database, with 65+ as the only search restriction, returned almost 600 articles on the search words “rehabil + geriatri/multidisciplinary care team.” All abstracts were read to sift out the age group of 75+. This left 47 RCTs, of which 17 were relevant to our study, but many had already been found on PubMed.

A large number of articles have been excluded from this compilation. The most common reasons are that they were too diagnosis-specific; for example, aimed only at the fields of dementia epidemiology, dementia care, psychogeriatrics or incontinence. Articles in the field of dementia were included if the study involved rehabilitation aimed at physical functional ability, possibly in parallel with other nursing strategies (meaning that it was a team approach). Other excluded studies were

drug treatment, operation technique, anesthesia, relatives' situation, studies relating to specific ethnic minorities, and methodological studies or health economic studies. Similarly, if the abstract was so brief that it was impossible to judge the content of the article. Studies with an inclusion age under 65 have not been included, even when the average patient age exceeded 75. The majority of the articles, about 85–90%, were in English, but articles in German, French, Spanish, and Italian have also been included.

*RCT studies:* In a search for RCT studies in geriatric rehabilitation for the older elderly group (80+), we found a total of 127 articles with the different search strategies, of which 79 were relevant to our question. Once double hits had been excluded, 56 RCTs remained. These reflect how broad the area of rehabilitation is, with studies of hospitals, home rehabilitation, nursing homes, and day rehabilitation or via a “geriatric evaluation team” with several consultancy functions. Various emphases have been placed on the special knowledge of the professional groups involved, but the multi-faceted picture of the problems of elderly people was clear. The main focus of the outcome measures was on an individual and social level, with different ADL measurements and quality of life aspects. Some ten articles were found with several search strategies [1, 2, 13, 17, 24, 36, 41, 44, 50, 65, 68], but the majority were found only through one specific search path.

*CCTs:* The corresponding figure for CCTs was 32 articles found; 14 out of 20 were relevant after the duplicates had been removed. A majority of these studies related to teams and various forms of healthcare, such as day rehabilitation, home rehabilitation, and teamwork. Five studies were related to functional training.

## Comments

The discussion of geriatric rehabilitation is often restricted to the principle diagnoses of stroke and hip fracture. However, the field includes many more diagnoses and treatment strategies. Occasionally, orthopedic geriatric rehabilitation is added, including other fractures, particularly compression of vertebrae, and amputations. In our compilation of the international literature, we would also like to point out other important

fields of rehabilitation of the elderly, such as “cardiac rehabilitation,” following both myocardial infarctions and heart failure, “respiratory rehabilitation,” postoperative rehabilitation, risk of falling, and various forms of general improvement in physical activity. Many kinds of treatments were employed: “geriatric assessment” in inpatient and outpatient care, which can also be day rehabilitation or home rehabilitation, specific interdisciplinary teamwork, care planning and rehabilitation planning (which may sometimes be a part of nursing), and different forms of physiotherapy or occupational therapy.

The trials have related to both hospital and nursing home patients, and elderly people living at home who needed improved functional ability. Often these patients’ medical profile is too complex for the RCT format to be used in the studies, for which reason several of the references appear under CCT. More research is needed in the area of general geriatric rehabilitation in a broad perspective, preferably with both multidisciplinary and multiprofessional approach.

The controlled trials, RCTs and CCTs, have been divided up according to organization and the specific focus of the rehabilitation. Several trials were related to organizational differences in rehabilitation results, such as between geriatric hospital care and home or day rehabilitation. A division has also been made by team members and by diagnoses included in RCTs or CCTs. In some cases, it was apparent that it was difficult or impossible to assess the impact of individual team members on the outcome of geriatric rehabilitation with the RCT or CCT format.

The literature search for the 80+ age group shows that in the field of geriatric rehabilitation today, there is a large body of knowledge from 1990–2000. These are primarily international studies, but also from clinical geriatric research in Sweden, especially from physiotherapy and occupational therapy. The results of these studies in geriatric rehabilitation may also be of use to other specialties in Sweden working with elderly people, and not just in geriatrics, so it is important that this knowledge be implemented.

The majority of the included studies originate from the UK, the USA, and some from Canada and Australia; and from 1995 and onwards from

Germany, Holland and other countries. Relatively few come from the other Nordic countries (excluding Sweden); these are often shown in databases like Spriline. The aim of these studies is more often qualitative or semi-qualitative, for which reason and because of the conditions of the assignment, they are not included in this compilation. Differences in research traditions and publication strategy in the field of geriatric rehabilitation should be included here. There is a need for research into the rehabilitation of elderly people, employing different methods to broaden the evidence-based body of knowledge.

International cultural differences in the organization of healthcare and elderly care are reflected in how studies are designed in different countries. Therefore, the applicability of the results of RCT studies to other organizations and countries must be further discussed. These studies may perhaps not be applicable at all to Swedish conditions; deeper analysis is necessary to assess which new areas of research should be focused on in Sweden. The need for research relating to term analysis in geriatric rehabilitation is probably crucial, and the WHO's new (ICF) classification for disabilities and assessment of rehabilitation will be of great value to this [111].

**Table 19** Geriatric rehabilitation, teamwork 80+ (years).

Treatment methods	Number of studies				Reference number
	RCT	CCT	UCT	Reviews	
<b>Organizational form/Team</b>					
Geriatric assessment/ inpatient rehabilitation	7	1	2	2	24,30,38,40,44, 54,56/60/95,97/ 80,82
Geriatric assessment/ outpatient rehabilitation	4				10,12,13,21
Day rehabilitation	2	2			11,42/61,69
Home rehabilitation	6	1		2	19,29,31,34,41, 53/70/85,88
Interdisciplinary team	5	2	1	1	15,16,35,36, 46/57,65/96/77
Discharge/rehabilitation planning	3	1	1		47,48,50/68/101
Nursing interventions		1	1	1	58/94/74
Occupational therapist intervention	4		1		3,4,8,33/91
Physiotherapist intervention	2				9,43
Intervention of a geriatrician (M.D.)				1	75
<b>Specific goals</b>					
Functional training	9	5		6	1,2,7,18,23,28,32, 39,49/62,63,64, 66,67/78,79,81, 84,87,90
Lung rehabilitation	1		1		52/99
Cardiac rehabilitation	2		2	2	22,45/92,98/71,89
Surgical rehabilitation (postoperative)				2	76,83
Fall prevention/hip fracture	6			2	14,17,25,37, 51,55/72,86
Stroke	2		1		20,26/102
Depression/behavioral support and therapy	1		1		6/93
Quality of life/goal setting	1		1		27/100
Other	1	1		1	5/59/73
<b>Total</b>	<b>56</b>	<b>14</b>	<b>12</b>	<b>20</b>	

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*RCTs*

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## 20. Coordinated service and care planning (case management) in geriatrics and community care

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*Karin Styrborn*

### Definition

The concept of “coordinated service and care planning” is defined in the National Swedish Board of Health and Welfare’s “Information Transfer and Coordinated Care Planning” regulations (SOFS 1996:36, medical and social statutes) as follows:

*“A process pursued in collaboration with the patient, aiming to coordinate planning of the continued medical and social services for the patient when transferring from one form of care to another.”*

### Background

Coordinated service and care planning has become a central concept in Swedish elderly care, and the subject of increasing regulation. The statute cited above forms the basis of the regulations, beginning with the definition, followed by the specific stages of the process, such as informing social services and outpatient care centers, whether planning can be done by telephone or if personal meetings are necessary, etc. The agencies responsible for medical care have since proposed that local collaboration agreements be established to focus on issues like coordinated service and care planning.

The Swedish concept – “coordinated service and care planning” – is difficult to translate to English in order to search for evidence-based data in international databases. Swedish tradition, legislation and regulations give the term a special meaning, which does not even correspond to the otherwise similar social and health services organizations in the other

Scandinavian countries. The nearest approximation in English is “discharge planning,” which is used in the transition between hospital and community care based on the community responsibility for healthcare services [31, 47, 54, 55, 58]. However, this term also seems to have varying meanings in the literature, particularly in research articles. Sometimes it refers to actual planning of the hospital discharge, other times to interventions to take place *after* discharge, such as home care, home rehabilitation or check-ups in the home [1, 5, 12, 48, 57]. The focus is on the patient’s need for care and various types of planning for continuity of care [36, 46, 58].

*Case management* is a primarily American term for planning care and coordinating resources for rehabilitation, post-discharge care and home care based on insurance provisions and the people involved. A *case manager* works with this process, alone or in a consulting team, usually consisting of a specially trained nurse or social worker [42, 43, 44, 45, 52]. *Case management* is distinct from *care planning*, which in Swedish is called “individual care planning (IVP). This concept has been interpreted differently through the years: as an approach, an organizational form, a method or a specific nursing document [51]. In 1994, SBU defined it as: “IVP should be seen as a working method to ensure reliable, safe, consistent nursing care.” The nurse in charge is responsible for this during the duration of care [50].

In some projects, mainly in research situations, another meaning can be read into case management or discharge planning, where the intervention can be performed by geriatric assessment teams/units. This seems natural, since the patient group is usually elderly, multimorbid patients. This form of research is more like the Swedish system of physician-led geriatric teams that evaluate, treat and generate long-term treatment and rehabilitation plans and discharge plans [4, 7, 20, 25, 49, 58].

*Community health nursing/nurse* are terms mainly found in literature and research reports from the UK, Canada and Australia. This is similar to the Swedish district nurse, except that the Swedish *district nurse* has greater responsibility for medical treatments, etc [3].

*Health visitors* are a British concept, and are mainly a form of preventive care. They also serve as a link between hospitals, primary and community

care [8]. These countries and the Netherlands also have the term *liaison nurse/liaison intervention*, usually in connection with psychiatric care/follow-up care, to help coordinate with community care [32, 37, 56].

## Summary of published studies

### Search strategy

The time period was limited to 1990–2000 because of the huge number of articles. The databases searched were PubMed in Medline, Cinahl (to also cover nursing research, mainly in the USA) and the Swedish SweMed and Spriline.

Articles in all languages with abstracts in English were requested, with the subgroups randomized controlled trials (RCT), controlled clinical trials (CCT) and reviews, plus some Swedish theses in the area. The vast majority of articles were written in English (831 of 908 in Medline with the age group 80+).

The searches were done on the Medline/PubMed database using MeSH terminology from the Index in the National Library of Medicine in the USA (2000) for the following terms:

1. discharge planning (patient discharge), case management, community health nurse/nursing (health visitor)

A free text search was then done for the terms:

1. discharge planning (patient discharge), case management, community health nurse/nursing (health visitor)
2. discharge team
3. liaison nurse or liaison intervention
4. discharge planning in SweMed
5. discharge planning and patient care plan and elderly/in old age (=65+) in Cinahl
6. service and care planning and patient care plan and elderly (=65+) in Spriline.

## **Evaluation of search strategy**

A broad search was considered necessary, since this is a relatively new research area. Reading the available abstracts allowed many articles to be eliminated because they did not correspond to the Swedish concept of “coordinated service and care planning” as described above. More disease-specific care planning programs were generally excluded, unless it was clear that they involved multidisciplinary care teams.

One difficulty arose in the specified age limit of 75+, since the databases only have a 65+ age group, plus “aged 80 and over” in Medline and Cinahl. In some cases, the average age or inclusion age for the trial was specified in the abstract. Generally, the age ranges of 65+ and 80+ were used in the data search for this review. All abstracts were then read through a second time with a further screening for inclusion ages of 75+ (80+ was only found in one or two cases) or 65+. If the inclusion age of 65+ was not clearly specified in the abstract, or if the average age was under 65, the trials were excluded. These delimiters have caused some problems in this review. For example, trials in the 80+ age range sometimes only had one member of the study population over 80, while the average age was 61, making the study inapplicable

## **Results of data search**

Even though the data search was limited to the period of 1990–2000, a huge number of articles was found. The Medline search returned nearly 3,100 references for the 65+ age group, and over 1,100 for the 80+ group, the majority of them found using the indexed MeSH terms “discharge planning, case management and/or community health nursing.”

However, many of the articles were not relevant to the Swedish concept of “coordinated service and care planning,” but dealt with things like drug treatments and follow-up, care planning programs for a specific ailment or a move from intensive care, etc. The review focused on studies returned in the search for the 80+ group, with some additions of interesting articles from the 65+ group.

Of the 980 articles found in the 80+ group using MeSH terminology, 47 were RCTs, of which only 21 met the criteria; 2 were CCTs; and 1 other study and 28 reviews (though only 5 relevant) were found.

The free-text search on “discharge team” returned 119 articles in the 80+ age range (of which 55 were relevant), 15 of them RCTs (of which 11 were relevant). The corresponding figures for “liaison nurse/intervention” were 13 articles, of which only 4 were relevant: 2 RCTs, 1 CCT and 1 review.

A closer analysis of the abstracts in terms of the inclusion age and average age of the study population showed that many of the RCTs in the 80+ group had to be moved to the 65+ group, as only a small portion of them involved patients aged 75+, and very rarely did they involve patients aged 80+.

In the databases with more Scandinavian studies and more focus on nursing, especially Cinahl, we found a larger percentage of relevant articles (69 of 92) with the keywords “in-old-age” and “discharge-planning.” The results were 4 RCTs, 3 CCTs and 4 other trials (UCTs), but only one in each group could be classified in the 75+/80+ age range; the others were 65+. SweMed, which only had the age classification 65+, returned 31 articles, of which only 4 met the criteria for this review (1 CCT and 1 UCT). Spriline, which also only had the 65+ delimiter, returned 6 relevant articles of 60 hits.

Tables 20.1 and 20.2 show the published studies for the years 1990–2000 for “Coordinated service and care planning,” divided up by treatment strategy (mainly the above keywords) and study design for the 75+/80+ and 65+ age ranges.

## Comments

This review includes 39 studies (30 RCTs, 4 CCTs, 5 UCTs) corresponding to the original question for the field of “coordinated service and care planning.” However, only about a quarter of the articles refer to a study group over 75 years of age. Articles were primarily excluded because they referred to medical planning and follow-up of a specific diagnosis, were drug trials, or didn’t meet the inclusion criteria (75+, or at least 65+).

Another large group of studies that were not included were RCT-format interventions only relating to measures taken *after* discharge, such as

home visits by various personnel categories or teams, home health care, and home rehabilitation [57]. The latter does not include what is meant by the Swedish concept of “coordinated service and care planning.” However, studies were included where the intervention included planning for follow-ups such as home visits by district nurses or a geriatric team, etc., while the patient was still in the hospital [1, 3, 5, 6, 12].

International clinical research in this area has focused more on *continuity and quality of medical care* from various angles than we do in Sweden. The articles have also focused on the quality of documentation. Endpoints in RCTs were often limited to various costs – for example, for earlier discharge, fewer repeat hospital stays or placement in nursing homes – simple organizational data. In some cases, mortality/survival were the endpoints. A trial format based on the patient perspective is very rare. With elderly patients, who are often multimorbid and have functional disabilities, there are methodological and ethical limits to how one can set up studies on discharge planning and its effects.

A handful of studies were found with this search strategy that dealt with patient satisfaction, opinions of family members, or the quality of discharge planning from a nursing standpoint. Some studies were not RCT format [35, 36, 38, 39, 53]. The nursing aspects often related to which healthcare measures were required of nurses on the next level of care, and to what degree that care was given in quantitative terms, or what type of continued long-term inpatient care was needed [41]. It was less common that planning for other care measures, such as home help or family aid, was included or used as an endpoint [3, 5, 6, 8].

More Scandinavian studies are needed, especially Swedish studies, based on our organizational situation where health services work together with social services. An RCT involving “case management” in the USA is usually of limited value for clinical application in everyday Swedish care because of the vast differences in organization, financial management systems, legal aspects and care traditions. However, they can be valuable on a more theoretical level, as a suggestion for new research. Other potentially instructive articles found in the review were interesting descriptive explorative studies, pilot and follow-up studies, and

studies with a qualitative approach in databases like Cinahl and to some degree SweMed. We are beginning to see international studies on collaboration between different caregivers with a qualitative method approach as a complement to RCTs and CCTs [33, 52]. More Swedish studies are needed regarding the patients' need for medical, nursing, functional and psychosocial care and how they are met, both during hospitalization and after discharge [40, 46, 57, 58].

In summary, a relatively large body of knowledge exists in the field of “coordinated service and care planning,” seen from a broad perspective in international research, both in the medical-geriatric and nursing fields, and in more orientation towards organization in health services research. However, its direct applicability to Swedish-style *coordinated service and care planning* is highly dubious. There is great need of high-quality Swedish studies with a multidisciplinary (and multiprofessional) approach for application to everyday clinical care.

A closer analysis of the studies referred to here does not provide any evidence-based knowledge that can be applied directly to Swedish health-care or form a basis for a Swedish action program. This is because of the difficulties in translating even high-quality research results achieved in a different health and social services structure into a Swedish everyday care situation in terms of interaction between multiple caregivers and professions. However, these studies could form a basis for a brainstorming workshop or a larger work group involving representatives from many involved parties to generate new research issues, create multi-center studies, or initiate national and local R&D projects on collaboration focusing on the total situation of elderly, multimorbid patients.

**Table 20.1** Coordinated service and care planning, inclusion age 75+.

Treatment methods/ search words	Number of studies			Reference number
	RCT	CCT	UCT	
A. Discharge planning/Case management/ Community health nursing (MeSH terms)	5	1		1,3,5,7,8/31
B. Discharge team	3			4,6,9
C. Liaison nurse/Liaison intervention	1			2
D. Discharge planning/Patient care plan (Cinahl)			1	35
<b>Total</b>	<b>9</b>	<b>1</b>	<b>1</b>	

**Table 20.2** Coordinated service and care planning, inclusion age 65+.

Treatment methods/ search words	Number of studies			Reference number
	RCT	CCT	UCT	
A. Discharge planning/Case management/ Community health nursing (MeSH terms)	18		1	10,11,13–15, 17–29/38
B. Discharge team	2			12,30
C. Liaison nurse/Liaison intervention	1	1		16/32
D. Discharge planning/Patient care plan (Cinahl)		2	3	33–34/ 36,37,39
<b>Total</b>	<b>21</b>	<b>3</b>	<b>4</b>	
<b>Total for tables 20.1–20.2</b>	<b>30</b>	<b>4</b>	<b>5</b>	

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### *RCTs with inclusion age 75+*

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# 21. Palliative care

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*Ulla Molander*

## Definition

The WHO defined the concept of palliative care in 1990 as [1]:

*“the active, total care of patients and their families via an interdisciplinary care team at a time when their disease is no longer responsive to curative treatment. The goal of palliative care is to give the highest possible quality of life to the patient and his/her relatives. Palliative care shall meet physical, psychological, social and spiritual needs. It should also give family members support in their grief.”*

## Background

Palliative care is an internationally accepted term defining the care provided at the end stages of life when no cure is possible. Certain criteria must be met for the name palliative care to apply: It must be active care of the whole dying person; the family members must participate and receive help and support during the patient’s illness and in their own bereavement. Several different skills must be available to participate in the care. Help must be available 24 hours a day.

Palliative care must be based on four cornerstones:

- Control of symptoms – easing pain, nausea and other difficult symptoms
- Collaboration in a team of caregivers
- Good communication between the care team and the patient/family member, and within the care team.
- Support to family members during the sickness and after the bereavement.

Over 90,000 people die in Sweden each year. Sudden, unexpected deaths as a result of cardiac arrest have dropped in recent years, while deaths

due to cancers are on the rise. This is a result of increasing life expectancy; the longer we live, the greater the risk is of developing a cancer disease. Today, the majority of deaths (about 80%) are “slow deaths” [2]. We know very little about people’s final time and what type of care they receive.

In Sweden, infant mortality has never been so low and life spans have never been as long as they are today. The average life expectancy in 1999 was 81.9 for women and 76.0 for men [3]. Over half of those who die today are over 80, and of all deaths in Sweden, 90% are past retirement age.

The proportion of the Swedish population aged 65+ has swelled from 8.4% in 1900 to 17.3% in 1999. By 2015, that figure is expected to grow to 21%, and by 2040, fully 25% of the population is expected to be over 65. More than half of that increase will be people over 80 [3].

Today, the last year of life represents 18% of municipal elderly care costs [2].

With the expected population development, we can expect ever-increasing pressure on the elderly care system, especially care in the last stage of life, when the number of deaths is expected to increase by 7.6% by 2010 [2].

The elderly are also a very vulnerable group, for example in terms of relief of their symptoms. Studies show that pain is common in elderly people living in special housing, but that the condition is poorly treated, often because the elderly have difficulty expressing themselves due to conditions like dementia or aphasia [4–5].

Studies of palliative care are often difficult to carry out; research on the last phase of life has ethical considerations, it’s hard to maintain constant variables, and often it is impossible to randomize [6–7].

## Summary of published clinical trials

### Search strategy

A literature search in Medline for the period 1980–2000 with the keywords “palliative care,” “aged,” “old,” “older,” “elderly,” and “aged 75 and over” returned 92 hits. Several treatment methods are included.

### Additional search strategy for “clinical trials in nursing”

*Medline:* 116 hits, of which 7 are included.

*Cinahl:* : 9 hits, of which 0 are included (duplicates excluded).

*Search path:* Palliative care, therapy (diet-therapy, drug-therapy, prevention and control, radio-therapy, surgery, therapy), nursing care/nursing, aged/old age.

*Exclusions:* Non-English, outlines, letters, articles with a wide age range where only the average age is specified, articles with no defined age range, pilot studies, individual case studies.

For a summary, see Table 21, Palliative care of the elderly.

### Comments

Research in palliative medicine is extremely limited, especially for the elderly. Palliative care for diseases other than cancer also needs to be studied and highlighted. More effort, and particularly financial investments, are needed to support research and multidisciplinary collaboration.

**Table 21** Palliative care of the elderly.

Treatment methods	Specification	Problem	Number of studies			Reference number
			RCT	CCT	UCT	
<b>Drugs</b>	Oral spray with vs. without mucin	Dry mouth in hospice patients	1			8
	Analgesics	Pains			2	4,9
	Cytostatics as adjuvant or palliative chemotherapy	Colon/rectal cancer			1	10
	Cytostatics Vindesine + VP16-213	Lung cancer (small-cell)			1	11
<b>Nutrition</b>	Nutrition + hydration	Terminal care with hunger, thirst, dry mouth			1	12
<b>Radiation</b>	Combined laser and radioactive radiation	Esophageal and stomach cancer with dysphagia		1		13
	Hypofractionated radiotherapy	Bladder cancer with local symptoms			1	14
	Radiotherapy	Various types of cancer, primarily head/neck and skin			1	15
		Lung cancer with hemoptysis, dyspnea and cough			1	16
	Laser treatment	Colon/rectal cancer			1	17
<b>Photo-coagulation</b>	Esophageal cancer with dysphagia				1	18
<b>Instillation of Bacillus Calmette Guerin (BCG)</b>	Intravesical instillation	Bladder cancer with frequent urination urge			1	19

*Table continued on next page*

**Table 21** *continued*

Treatment methods	Specification	Problem	Number of studies			Reference number
			RCT	CCT	UCT	
<b>Surgery</b>	Metallic self-expanding stents	Colon/rectal cancer			1	20
	Minimal invasive endoscopic therapeutic procedures, such as endoprotheses, laser, PEG, etc.	Various diseases, including malignant tumors			1	21
	Various surgical measures	Patients in nursing homes with various diseases			1	22
<b>Combination treatment</b>	Several different drugs + diet				1	23
	Evaluation of treatment programs	Cancer in breast and head/neck			1	24
	Palliative management, including analgesics and narcotics	Fever in Alzheimer's patients			1	25
<b>Total</b>			<b>1</b>	<b>1</b>	<b>17</b>	

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## 22. Comments from a nursing perspective

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*Helle Wijk*

The field of geriatrics includes specific, highly qualified skills in both medicine and nursing. The professional reception and care a geriatric specialist nurse gives an elderly patient is based on an understanding and knowledge of the multifaceted, multifactorial pattern of disease and its influencing factors, which are characteristic to geriatrics [1]. As confirmation of this role, the title of specialist nurse in elderly care was protected by law in Sweden as of 1 July 2001.

Several nursing problems that often accompany healthy or unhealthy aging can be remedied and relieved if they are discovered and treated in time. Some examples are pain, eating disorders and nutrition problems, changes in swallowing reflexes, incontinence, difficulty moving, falls, fractures and pressure sores. The effects of various interventions in these problem areas have been studied relatively little, especially in the “older elderly” group [2].

Good quality nursing care demands that the nurse’s actions are based on science and proven experience. Many routines and nursing documents used today are based on tradition and solid experience, but have never been the subject of scientific trials. Since the first Swedish nursing theses were published in the mid 1970s, however, nursing research has expanded rapidly [3]. Of the 409 theses produced between 1975 and 1998 by people with moderately long nursing training in Sweden, 42 were written by nurses. In more recent years, nursing research becomes much more prevalent (1990–1998: 80%), which is also illustrated by the fact that the number of research nurses has doubled since 1992. Nursing research, which is primarily clinical, has brought new expertise in many areas, with elderly care the most prominent (about 30%). Examples of areas of geriatric nursing research are dementia, nutrition, hip fracture problems, stroke, pressure sores and alternating care [4].

Swedish nursing research in *dementia and confusional states* is mainly characterized by the aim to build up understanding of the dementia patient's daily life and care on equal terms [5, 6, 7]. Areas that have been studied in-depth are interaction with and reception of people suffering from dementia disorders [8, 9, 10, 11, 12, 13, 14, 15], studies on the caregivers' and family members' situation [16, 17, 18], and research on other aspects than the purely pharmacological [19, 20, 21].

Risk assessment, prevention and treatment of *skin/ulcers* is another important area of geriatric nursing that has the potential to provide great benefits, not only in the patient's quality of life, but also in terms of cost efficiency with preventive treatment [22, 23].

Research on *malnutrition* in the elderly describes the problem of malnutrition and analyzes various types of evaluation and assessment instruments. However, there is a dearth of clinical trials to evaluate the effects of measures taken for malnutrition. Swedish theses in the area have dealt with eating disorders in connection with stroke, dementia and Parkinson's disease [9, 24], assessment of these [25], and habits, values and culture in connection with meals in geriatric nursing [26].

*Urinary incontinence* is another vital area of geriatric nursing, where studies are needed to evaluate various regimes for achieving urinary continence and to evaluate various incontinence aids [27, 28].

Assessment, treatment and evaluation of the various dimensions of *pain* (physical, psychological, social and existential pain) is an essential area, where geriatric specialist nurses have a key role [29, 30]. The Swedish Nurses' Association has produced evidence-based guidelines for assessment, patient education and complementary methods regarding nursing of cancer in adults [31]. The few studies that present specific geriatric nursing studies on pain focus on the effect of correct assessment, information and education of the patient and family members, and the importance of using complementary methods along with traditional pharmacological treatment.

Studies in *palliative nursing* consist of little patient material with a wide age range. There is an urgent need for effect evaluations, particularly from the perspective of the family members, Evaluation of different types of

work organization in palliative care, such as counsel teams, hospital-assisted home care, palliative specialist units and hospices, is also crucial. Several doctoral theses on palliative nursing have been published in recent years in Sweden, but few studies focusing purely on treatment [32, 33, 34, 35, 36].

Studies of nursing in *heart failure* emphasize the importance and effect of instruction, care programs and outpatient nurse clinics to reduce relapses and increase compliance with pharmaceutical treatments [37].

The effect of treatments in nursing of elderly patients with *high blood pressure* has a relatively poor scientific basis [38]. Studies of hypertension in the elderly primarily cover the effect of preventive measures such as instruction, care programs and counsel. Few focus on the 75+ age range and none evaluate cost effectiveness.

*Chronic obstructive pulmonary disease* (COPD) is a complex nursing problem, where small-scale trials have studied the effect of self-help programs [39], home care [40, 41], rehabilitation and treatment-oriented nursing measures [42, 43], and how physical, psychological and social status affect functional ability [44].

Nursing research in *osteoporosis* has thus far focused on the importance of preventive measures like diet and exercise, the problem of confusion in hip-fracture patients [45], social, economic and psychological aspects of rehabilitating hip-fracture patients [46], and falls among the elderly [47, 48].

Though patients with *Parkinson's disease* have a multifaceted nursing need that increases as the disease progresses, few clinical trials exist [9].

Studies of *CVA/stroke* evaluate the effect of information, instruction and guidelines for rehabilitation after a stroke and the differences between traditional and specialized stroke rehabilitation. Other areas of focus are nutrition in stroke patients [24, 25] and the effect of activation [49].

The scientific basis for nursing measures in *depressed* patients is very limited [50], which in part can be explained by the fact that depression in elderly nursing home patients is an underdiagnosed syndrome, which means that it is inadequately treated [51]. Above all, studies are urgently

needed of the value of group therapy, and to evaluate the effect of implemented care programs.

With *polypharmacy*, nurses have a key role in identifying, informing, evaluating effects and compliance, and discovering interactions and side effects. Strict administrative routines for drug prescriptions are crucial, as well as greater knowledge of age-related changes in uptake and drug effects [52]. This study recommends guidelines and risk assessment instruments where there is little or no evaluation of various strategies to combat polypharmacy in the elderly.

Continued education for nurses in the field of geriatrics is advancing rapidly, which is a key reason for the strong focus on geriatrics in nursing research. A survey of which nursing schools in Sweden can offer specialist training for nurses in elderly care showed that more than half of the institutions (56%) already offer or are planning to offer geriatric specialist training for nurses on the 40–60-credit level [53].

Since the Vårdal Foundation for Health Care Sciences and Allergy Research was founded in 1994 to support research and research training, many seminars have been held on problem identification. One important emphasis is on prioritizing applied clinical research focused on monitoring and evaluating the results of care measures from the patients' perspective, including a health-economic analysis [54, 55]. Doctoral theses in the field of nursing often focus on problem identification and descriptions of causation, but studies of the effect of various nursing measures, including the cost aspect, are limited. Quantitative randomized intervention studies are needed to determine the effects and costs of nursing efforts. Thus far this type of study is very rare in nursing research.

An excerpt from the healthcare commission's HSU 2000 report, "Nursing in the Health Services," concludes that vital areas in both national and international nursing work that have not yet been the subject of scientific study should be identified and analyzed, and that scientifically defined areas should be identified to support the application of existing research [56].

## Method for the literature search

This report focuses on the existence of clinical trials in the field of geriatrics. A focused search was done for studies in nursing research, with an emphasis on the effect of nursing measures. These studies are included in the tables in each section.

The summary shows studies dating from 1990 on, in the 75+ population, after a division into randomized controlled trials, controlled clinical trials and uncontrolled clinical trials. Outlines, pilot studies and small case studies have been excluded. Only English-language studies were included.

The summary is based on searches in the specified focus areas for articles related to nursing and treatment. The searches resulted in a total of 2,269 hits, all of which were reviewed. To make it possible to categorize the findings, the studies were selected on the basis of the contents of the abstract, not the complete article. If no abstract existed, the article was excluded. This may mean that some relevant articles were neglected. A large number of the studies turned out to be outlines, which were not included. Similarly, the majority of studies involved a study population with a wide age range where only the average age was specified, and were therefore also excluded. This report makes no claims to being a complete listing of research in the field of geriatric nursing today; it simply offers a general overview of the points of emphasis and blind spots existing in clinical trials regarding geriatric nursing.

## Comments

Of 15 areas searched for in the target group of patients aged 75+, the fields of *urinary incontinence*, *pain*, *skin ulcers* and *cognitive disorders* stand out in terms of the number and quality of clinical trials with a clear focus on nursing. These four areas contain such a high degree of evidence that a more detailed review of the literature would be of great value. In the field of *urinary incontinence*, the search resulted in 16 trials (included here), of which 8 were randomized/controlled. The trials listed here evaluate several important regimes for achieving continence in the elderly, as well as various types of incontinence aids.

The search in the field of *pain* resulted in 38 included studies, of which 12 were randomized/controlled. They evaluate and present complementary interventions for pain relief that are very important from a nursing standpoint, such as relaxation techniques, touch, music, coping, and patient education.

In the field of *skin/ulcers*, the search resulted in 24 trials (12 of them randomized/controlled) evaluating various dressing regimes, materials, bed comfort and care programs for avoiding pressure sores in the elderly. The search in the field of *cognitive disorders including confusional states* resulted in 33 included clinical trials (25 randomized/controlled) that evaluated the implementation of care programs, the effect of specially designed environments and dementia-specific work organization, interventions for disruptive behavior, wandering and anxiety.

Of the 15 searched areas, the lack of controlled and randomized clinical trials with a clear focus on nursing is particularly obvious in *Parkinson's disease, high blood pressure, chronic obstructive pulmonary disease, drug treatment of the elderly, malnutrition, and palliative care*. These are all areas where the effect of nursing efforts, such as diet and exercise regimes, physical activity, treatment of fever and oral thrush, implementation of care programs, and preventative interventions, is in urgent need of further research and should be widely encouraged.

Evaluation of the treatment effect of nursing efforts for the remaining five areas covered in this report (*depressive conditions, stroke, heart failure, osteoporosis and infections*) are naturally just as important as for the areas already discussed. Fortunately, in these fields, both randomized and controlled clinical trials are presented in parallel with qualitative research.

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## 23. Glossary

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<b>ACE inhibitors</b>	Angiotensin converting enzyme inhibitors. Drugs that inhibit the formation of angiotensin II; used for heart failure and high blood pressure
<b>Acetylcholinesterase</b>	Enzyme that breaks down and deactivates acetylcholine
<b>ADL</b>	Activities of Daily Life. ADL training is part of rehabilitation and trains the patient's ability to manage daily functions like hygiene, eating, etc
<b>Agent</b>	Active factor or substance, such as a bacteria or virus
<b>Agnosia</b>	Inability to interpret and recognize what one sees, hears or feels
<b>Albumin</b>	Water-soluble protein
<b>Amnesia</b>	Loss of memory
<b>Analgesics</b>	Painkiller drugs
<b>Anticholinergic</b>	Substance that blocks parts of the autonomic nervous system, including stomach and intestinal activity
<b>Aphagia</b>	Inability to swallow
<b>Aphasia</b>	Inability to speak or formulate one's thoughts into meaningful words
<b>Apraxia</b>	Inability to perform certain movements (that one used to be able to do)
<b>Arteriosclerosis</b>	Hardening of the arteries. The most common form of arteriosclerosis is characterized by occasional fatty deposits that gradually harden
<b>Audio-</b>	Related to hearing
<b>Beta blockers</b>	Beta-receptor blocking drugs; a substance that slows the activities of the sympathetic nervous system; used primarily to treat cardiovascular disease
<b>Blinding</b>	The participants in a trial do not know what treatment they are receiving. If a trial is triple-blind, neither the patient, caregiver nor analyst knows who belongs to which group.
<b>BPSD</b>	Behavioral and psychological symptoms of dementia
<b>CCT</b>	Controlled clinical trial

<b>Cholinergic</b>	Having to do with acetylcholine (which occurs in the parasympathetic nervous system)
<b>Compliance</b>	Adherence to the treatment instructions
<b>Coping</b>	Working through (a problem)
<b>CVA</b>	Cerebrovascular accident, commonly called a stroke, a sudden brain injury caused by a blood clot or bleeding in the brain
<b>Delirium</b>	Transient state of confusion with worry, anxiety, trembling, sweats and hallucinations
<b>Diastolic blood pressure</b>	Blood pressure between contractions (beats) of the heart
<b>Diuretics</b>	Drugs that increase the flow of urine; used in treating heart failure, high blood pressure and other ailments
<b>Drop-out rate</b>	People who agree to participate in a trial, but abandon it before the end
<b>Dysphagia</b>	Difficulty swallowing
<b>Dysthymia</b>	Depression, persistently low mood
<b>Geriatrics</b>	The medical specialty that focuses on the diseases of aging
<b>Hemorheologic</b>	Treatment aimed at improving blood flow in various organs and tissues
<b>Hypokinesia</b>	Reduced ability to move
<b>Incidence</b>	The number of new cases of an illness in a certain population over a certain period of time, usually a year
<b>Interaction</b>	Action of one on another; (sometimes) counteraction, as in drug interaction
<b>Irreversible</b>	Incurable (opposite of reversible)
<b>Ischemia</b>	Lack of oxygen in a part of the body
<b>Laparoscopy</b>	Examination of the abdominal cavity from inside using a tubular instrument inserted through the abdominal wall
<b>Mnemonic</b>	Having to do with the memory
<b>Morbidity</b>	Incidence of illness
<b>Mortality</b>	Incidence of death
<b>NNT</b>	Number needed to treat – how many patients must be treated to prevent one adverse outcome

<b>Nootropic</b>	Having a positive effect on the brain's cognitive functions; for example, nootropic drugs
<b>PEG</b>	Percutaneous endoscopic gastrostomy; a gastrostomy (a surgical opening into the stomach) is made through the skin using an endoscope (a flexible, lighted instrument)
<b>Pharmacodynamics</b>	The study of the effects of drugs
<b>Pharmacokinetics</b>	How drugs are taken up, distributed and eventually eliminated from the body
<b>Placebo</b>	A “sham” drug or treatment that has no effect on the patient
<b>Population</b>	In statistics, a group of people or phenomena with a common, measurable characteristic
<b>Postural</b>	Having to do with the posture (how the body is held)
<b>Prevalence</b>	The number of people with a certain disease/condition in a given population at a given time
<b>Prospective data</b>	Used to describe the format of a study, collected after the study is set up, but before it is carried out. Antonym: retrospective
<b>RCT</b>	Randomized controlled trial, with a control group and random distribution between the groups
<b>Recurrence</b>	Return of the disease/condition
<b>Rigidity</b>	Stiffness
<b>Spirometry</b>	Measuring the air volumes a person can breathe in and out. The vital capacity is the maximum volume that can be exhaled. FEV <sub>1</sub> , the maximum volume that can be exhaled in one second
<b>SSRI</b>	Selective serotonin reuptake inhibitors, drugs that prevent the body from reabsorbing serotonin; used to treat depression
<b>Surrogate endpoint</b>	A measurement related to the actual endpoint of a measure, which is used instead of the actual endpoint in a clinical trial
<b>Systolic blood pressure</b>	The blood pressure when the heart contracts (beats)
<b>TENS</b>	Transcutaneous (through the skin) electrical nerve stimulation
<b>Thrombolysis</b>	Dissolving a thrombosis (blood clot) by activating plasmin
<b>Urinary incontinence</b>	Unintentional leaking of urine
<b>Vascular</b>	Having to do with blood vessels



# Contributors to this report

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## Chairman and editor

Consulting physician, Gunnar Akner, MD  
Nutrition and Pharmacotherapy Unit A1:05  
Research and Development Unit for Elderly Care  
Department of Geriatric Medicine  
Karolinska Hospital  
171 76 Stockholm  
e-mail: [gunnar.akner@chello.se](mailto:gunnar.akner@chello.se)

## Planning group

Consulting physician, Gunnar Akner, MD, PhD  
(address: see above)

Consulting physician, Sölve Elmståhl, professor  
Centre for Geriatric Development  
Malmö University Hospital, Entrance 59  
205 02 Malmö

Consulting physician, Karin Styrborn, MD  
Department of Geriatric Medicine  
Uppsala University Hospital  
Box 609  
751 25 Uppsala

Quality Coordinator, Helle Wijk, MD  
Senior Lecturer, Department of Nursing, Gothenburg University  
Sahlgrenska Geriatrics  
Sahlgrenska University Hospital  
413 45 Göteborg

## **Other authors**

Professor emeritus Lars Boréus  
Division of Clinical Pharmacology  
Karolinska Hospital  
171 76 Stockholm

Consulting physician, associate professor Sture Eriksson  
Geriatric Medicine  
Department of Community Medicine and Rehabilitation  
Umeå University  
901 85 Umeå

Consulting physician, professor Ann-Kathrine Granérus  
Department of Geriatrics  
Linköping University Hospital  
581 85 Linköping

Consulting physician, Bodil Lernfelt, MD  
Department of Geriatric Medicine  
SU/Östra Hospital  
416 85 Göteborg

Consulting physician, associate professor Dan Mellström  
Göteborg University  
Department of Geriatric Medicine  
SU/Östra Hospital  
416 85 Göteborg

Consulting physician, associate professor Ulla Molander, MD  
Sahlgrenska Geriatrics  
Sahlgrenska University Hospital  
413 45 Göteborg

Director General, Professor Ragnar Norrby  
Swedish Institute for Infectious Disease Control  
171 82 Solna, Sweden

Consulting physician, Ingegerd Nydevik, MD  
Department of Geriatric Medicine  
Södertälje Hospital  
151 86 Södertälje

Consulting physician, associate professor Åke Rundgren  
Department of Geriatric Medicine  
SU/Östra Hospital  
416 85 Göteborg

Consulting physician, associate professor Vivianne Schubert  
Björkliden 24  
187 41 Täby

Consulting physician, professor Lars-Olof Wahlund  
Geriatric Clinical Department  
Huddinge University Hospital  
141 86 Huddinge

Consulting physician, Thomas Wallén, MD  
Sahlgrenska Geriatrics  
Sahlgrenska University Hospital  
413 45 Göteborg

### **Editorial work**

Helena Dahlgren  
Ewalotte Ränzlöv  
SBU  
Box 5650  
114 86 Stockholm

### **English translation**

Jennifer Evans

