

# Adequate antimicrobial treatment in elderly patients

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## **Valorisation of the manuscript**

## **Relevance for society and economy**

The population in the developed countries is ageing. In 2012 the European life expectancy at birth was 83 years for women and 78 years for men. It is expected that the life expectancy will increase further. However, not only in the developed countries, but also in the developing countries life expectancy is increasing. The United Nations predicts that the global life expectancy will reach 76 years in 2045-2050 and 82 years in 2095-2100 [1]. Another trend in the developed countries is a decreasing birth rate, e.g. in the Netherlands the birthrate in 1950 was 23‰ (= 23 per 1000 inhabitants) and in 2013 it decreased to 10‰ [2], resulting in a relatively larger elderly proportion of the population. As a result of the ageing population many governments are extending the retirement age to 67 years. Further extending of the retirement age can be expected with increasing life expectancy. A substantial proportion of the working population will consist of elderly people. Elderly people have more comorbidities and experience more infections. Elderly people use more antimicrobial agents than younger people. Improving antimicrobial therapy for elderly patients will decrease morbidity and mortality of infections in elderly patients. This is important for the elderly patient and his or her family, but it will also keep the sickness absence in the working elderly population as short as possible. Furthermore, correct dosing might lead to a decrease of antimicrobial resistance. Increasing antimicrobial resistance is a worldwide problem. Antimicrobial stewardship programs are an internationally recognized method to control antimicrobial resistance. Antimicrobial stewardship programs focus on correct antimicrobial therapy, recognizing and controlling antimicrobial resistance. The Dutch Ministry of Health supports these programs. They obligated all Dutch hospitals to have working antimicrobial stewardship programs and antibiotic teams in every Dutch hospital by the end of 2015.

The goal of this thesis was to study the use and the pharmacokinetics of antimicrobial drugs in elderly and very elderly patients. The ultimate goal by improving the antimicrobial therapy in elderly patients is to improve the health of elderly patients.

## **Target groups**

Many doctors, such as general practitioners, medical microbiologists and infectious disease specialists, ICU doctors, internal medicine doctors and surgeons, will regularly prescribe antimicrobial therapy to elderly patients. Studies about the use of antimicrobial therapy and antimicrobial pharmacokinetics will improve the knowledge of these doctors, who are treating infections in elderly patients. These studies are also important for the elderly patients themselves and for their families. These studies might also be useful for policy makers of the Ministry of Health and Economics, directories of Hospitals and Nursing homes and insurance companies.

## **Activities, innovations, planning and realization**

Traditionally the antimicrobial use in the Netherlands has been low. There are many activities to keep this antimicrobial use low and to improve antimicrobial therapy. However, focus on elderly patients has been lacking, while the necessity and the importance of this increasing age group is acknowledged. This thesis adds more insight in antimicrobial treatment in elderly patients and shows that the elderly patients are a large growing group that consume high quantities of antimicrobial drugs. This thesis indicates that focus on elderly patients is warranted.

The antimicrobial stewardship programs and teams have just recently started and have to evolve to reduce antimicrobial consumption, to ensure correct antimicrobial therapy and to control antimicrobial resistance in the future. The antimicrobial stewardship teams consist of medical microbiologists, infectious disease specialists and clinical pharmacists that focuses on the hospitals. Strategies have to be developed that focus on patient groups that consume the highest quantity of antimicrobial drugs, i.e. the elderly patients. Additionally, general practioners and internist geriatricians might have to be included in these teams and programs.

The Dutch Working Party on Antibiotic Policy (SWAB) monitors antimicrobial resistance in hospitals and in the community, but might have to extend this surveillance to nursing homes. Recently, the yearly SWAB report on human antimicrobial use and surveillance of antimicrobial resistance (Nethmap) included in 2014 a more complete chapter of antimicrobial use in Primary Care and Dutch hospitals [3]. Unfortunately, there was no focus on elderly patients or on other high antimicrobial drugs consuming patient groups.

Finally, more advertisement in more easily accessible programs can also be used to address the importance of antimicrobial therapy in elderly patients. For instance, the European Antibiotic Awareness Day, which is an initiative of the European Centre for Disease Prevention and Control (ECDC), is held yearly to improve awareness of antibiotics. This day could focus on high consuming patient groups, such as the elderly patients.

## **References**

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