

# Abstract

**Charles University in Prague, Faculty of Pharmacy in Hradec Králové**  
**Department of Biological and Medical Sciences**

**Author:** Silvia Klčová

**Thesis supervisor:** PhDr. Zděnka Kudláčková, Ph.D.

**Form:** Bachelor thesis

**Study programme:** Medical bioanalytics

**Thesis title:** Osteoporosis – Current trends in diagnostics and therapy

**Background:** This bachelor thesis is focused on elucidating the problem of osteoporosis. The aim of this work is to summarize current knowledge about this disease, especially about the methods of its diagnosis and therapy.

**Main findings:** Osteoporosis is a progressive metabolic bone disease that is based on an imbalance in bone remodeling. This disease is characterized by a loss of bone tissue and the formation of porous bones, that are prone to fracture. Fractures are the most serious complication of osteoporosis. This thesis describes in detail the currently used diagnostic methods and therapeutic principles. Recognition of the presence of osteoporosis and subsequent initiation of therapeutic measures is essential for the management of this condition. There are several instrumental and laboratory methods used for diagnosis, which are based on different principles. Pharmacotherapy affecting bone remodeling, by inducing changes in the presence or functionality of executive bone cells, is most commonly used to manage osteoporosis. To improve the quality of life in people suffering from osteoporosis, it is also recommended to perform adequate physical activity and eat a balanced diet.

**Conclusions:** The most widely used technique for examining bone density is dual-energy X-ray absorptiometry. Laboratory methods of diagnosis aim to determine the levels of hormones, enzymes, and other substances related to bone metabolism. Also, levels of bone turnover markers can be examined. Osteoporosis cannot be cured, it is only possible to reduce the risk of complications. Therapy of the disease involves the use of pharmacological agents, that suppress bone resorption or promote bone formation. Overall bone health can be improved by strength exercises and exercises to promote stability, balance, and flexibility. The diet of osteoporotic patients should not lack sufficient intake of micronutrients and macronutrients, especially proteins and calcium. Vitamin D supplementation is also appropriate.

**Key words:** bone, fracture, osteoporosis, diagnostics, densitometry, bone turnover markers, pharmacotherapy, physical activity