



■ UniQ PINP

## PINP for the monitoring of osteoporosis treatment

Osteoporosis affects millions of postmenopausal women worldwide. Treatments either slow down bone degradation or enhance bone formation. Patients who respond to therapy are those whose bone mineral density (BMD) remains stable or increases. Changes in BMD can only be seen after one or two years of therapy. Short-term changes in UniQ PINP, a serum marker of aminoterminal propeptide of type I procollagen, are associated with longer-term changes in BMD in postmenopausal women. UniQ PINP can be used to provide a rapid assessment of a patient's response to therapy.

## Osteoporosis

Osteoporosis is a disease affecting millions of people around the world. It is a chronic and progressive condition characterized by decreased bone mass leading to increased bone fragility and a consequential increased risk of fracture. Osteoporosis can vary from being asymptomatic to becoming a severe disease. The incidence of bone fractures increases exponentially with advancing age. Osteoporosis fractures are a major cause of morbidity and disability in older people and, in the case of hip fractures, can lead to premature death. Such fractures impose a considerable economic burden on health services worldwide.

## Treatment of osteoporosis

There are two types of therapy for osteoporosis.

Antiresorptive therapies, such as bisphosphonates, calcitonin and selective estrogen receptor modulators, inhibit bone resorption and thereby prevent further bone loss. They suppress bone formation to a lesser degree resulting in a slow net accumulation of bone.

Anabolic treatments for osteoporosis are two bioactive forms of parathyroid hormone (PTH), hPTH- 1-34 (teriparatide) and hPTH- 1-84. They have an anabolic effect on bone and the treatment is associated with initial increases of bone formation and delayed increases of bone resorption. The anabolic effects of teriparatide are expressed as increases in skeletal mass, bone turnover markers, and bone strength. Increases in bone turnover markers indicate a skeletal response to anabolic therapy, and predict later improvements in bone mineral density.

## Treatment monitoring

A primary factor for motivating osteoporotic patients to receive treatment is positive feedback from the therapy. The effectiveness of osteoporosis treatment can be quantified using BMD measurements. However, significant changes in BMD only become apparent after one or two years of therapy and patients require earlier feedback of the positive effects of treatment to motivate them to continue with the therapy. UniQ PINP as a bone formation marker provides a means for early assessment of treatment efficacy.

## PINP for monitoring patients treated with bisphosphonates

Three-month short-term changes in PINP appear to be a predictor of a longer-term BMD response or nonresponse to bisphosphonate therapy. Even a small reduction in the PINP

Three-month changes in PINP predict 24-month changes in BMD

level compared with the baseline value after three months of therapy is an independent indicator of BMD nonresponse, indicating a need for optimization of therapy.

## PINP for monitoring patients treated with teriparatide

There is a strong relationship between early change in PINP and later change in lumbar spine BMD during teriparatide therapy. PINP levels may increase rapidly showing a robust response to teriparatide treatment, as early as in the first week of therapy. Monitoring the treatment with PINP gives feed-back important for optimization of therapy and for encouraging patients to continue with the treatment.

PINP – an early aid for monitoring patients treated with teriparatide

## References

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