

## Development of a system to measure the bone mineral density from x-rays

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### Project Outline

#### Background

Several guidelines recommend measuring bone mineral density (BMD) through Dual-energy X-ray absorptiometry (DXA) in the diagnosis of osteoporosis. However, as institutions that have access to DXA are limited, several patients are undiagnosed and untreated.

#### Aim

Develop an artificial intelligence (AI) based method to measure the BMD from hip x-rays and to diagnose osteoporosis.

#### Current results

Developed an AI model (BMD-GAN) using a dataset that includes CT images, x-rays, and DXA results. In the analysis using data from 3 institutions, the correlation between BMD measured from x-ray (Xp-BMD) has a correlation coefficient  $r=0.89$  between the BMD measured from DXA (DXA-BMD).



#### Expected effects

1. BMD measurement and diagnosis of osteoporosis made from x-rays.
2. Early treatment of osteoporosis and prevention of fragility fractures.

#### Future plans

1. Perform a multi-institute analysis to confirm the robustness of the system
2. Acquire medical device approval and coverage by the Japanese Health Insurance system as a device that serves as a substitute for DXA.

Target disease: osteoporosis

Technical features & marketability: Growth expected due to aging society

Possible cooperate collaboration: medical device approval