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PLUS

## FFPLUS SUCCESS STORY: INNOVATION STUDY

# HPC AND AI POWER SYNTHETIC DATA TO ADVANCE CANCER IMAGING

## ORGANIZATIONS

**Better Medicine** is an Estonian SME developing AI solutions for cancer diagnostics and medical imaging. The company worked with **Pärnu Hospital**, which provided clinical expertise, imaging data and feedback from routine radiology practice. **The University of Tartu** contributed research expertise in artificial intelligence and high-performance computing, enabling the creation of high-quality synthetic CT data to strengthen tumour-detection models.



## THE CHALLENGE

Medical AI models for CT imaging require large, diverse and well-annotated datasets, which most hospitals lack. Limited tumour cases, inconsistent labelling and differences in scanners and imaging protocols reduce model reliability across clinical sites. For Better Medicine, models trained on public datasets performed poorly on local hospital scans due to a clear domain gap and too few annotated tumour cases.



**Technology used:** HPC, GenAI, Diffusion Models  
**Industry Sector:** Healthcare

## THE SOLUTION

With access to EuroHPC systems, Better Medicine developed a 2.5D generative diffusion model that produces realistic CT volumes by using information from neighbouring slices. Healthy scans from public and internal datasets formed the base, with synthetic tumours added to increase data diversity. Combining synthetic and real data to retrain the segmentation model significantly improved performance and reduced false detections.

## THE IMPACT

Better Medicine have transformed from delivering exploratory research to production of a scalable commercial solution. Access to high-performance computing made it possible to train and validate complex generative models efficiently, reducing development timelines by up to 40% and lowering overall costs. Clinically, the project demonstrated measurable improvements on real hospital imaging data, increasing trust in AI-assisted diagnostics. Hospitals with limited datasets can now deploy more accurate, locally adapted models, supporting more equitable cancer detection across patient groups.

Commercially, the ability to generate GDPR-compliant synthetic datasets creates new revenue opportunities while reducing the need for cross-border data sharing. Environmentally, more efficient HPC workflows shortened experimentation cycles, reducing wasted computation and energy use while supporting sustainable AI development.

## BENEFITS

- Over 20% improvement in tumour-segmentation accuracy on hospital data.
- Threefold reduction in false tumour detections.
- Up to 40% shorter AI development cycles.
- Scalable HPC-ready workflows for rapid model updates.
- New revenue opportunities through synthetic medical data services.



**EuroHPC**  
Joint Undertaking