

Artificial Intelligence Assisted MRI Screening for Pediatric Cancers

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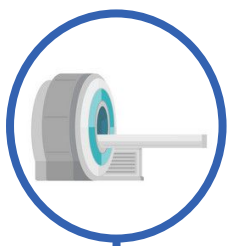


NSERC
CRSNG



Baby is born

Diagnosed with
Li-Fraumeni
Syndrome (LFS)
after genetic testing

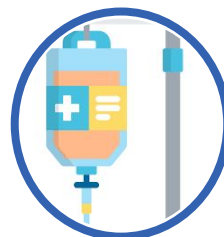


Begin cancer
surveillance protocol
including annual
whole-body MRI

Anomaly
detection
with GANs



Presence of
cancerous
lesion?

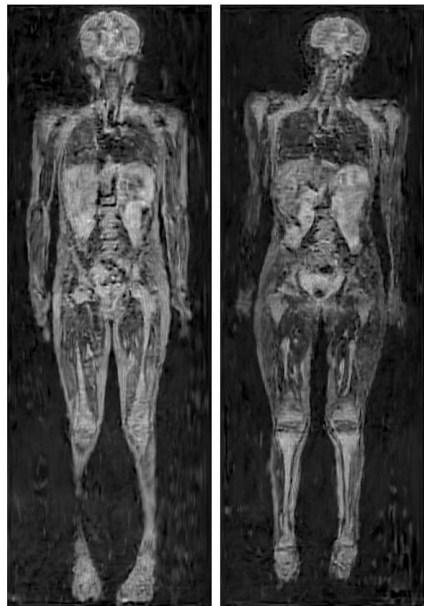


Earlier diagnosis
and less aggressive
treatment

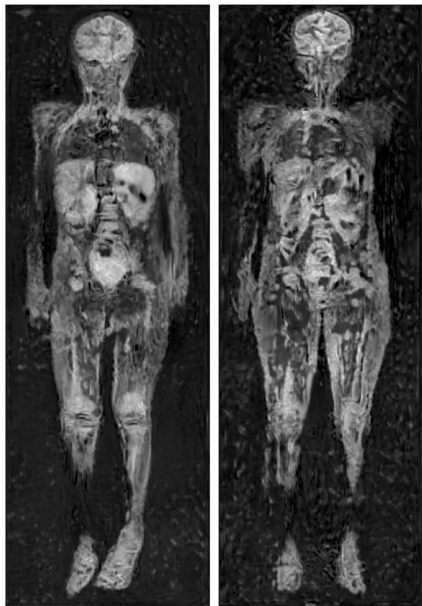


Patient is in
remission!

Generated Healthy Images



DCGAN
Radford et al. (2015)



StyleGAN
Karras et al. (2018)



PGStyleGAN
Karras et al. (2018)

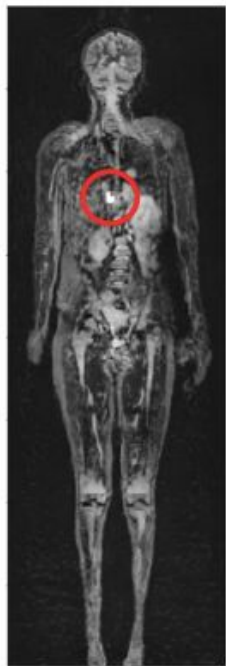


StyleGAN2
Karras et al. (2019)

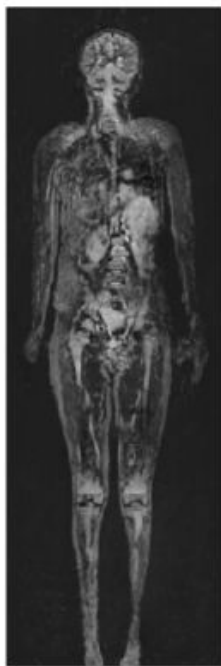
Metrics for Evaluating the Quality of GAN Images

Model	FID (Lower is better)	DFD (Lower is better)	Expert FPR (Higher is better)
DCGAN	457.30	23.72	0%
StyleGAN	481.3	19.378	0%
PGStyleGAN	442.61	18.56	20%
StyleGAN2	497.09	17.234	30%

Anomaly Detection with Imputed Nodules



Query with imputed nodule



Closest image in GAN distribution



Difference in query

