



# QIN PROSTATE

## Summary

This collection contains multiparametric MRI images collected for the purposes of detection and/or staging of prostate cancer. The MRI parameters include T1- and T2-weighted sequences as well as Diffusion Weighted and Dynamic Contrast-Enhanced MRI. The images were obtained using endorectal and phased array surface coils at 3.0T (GE Signa HDx 15.0) The value of this collection is to provide clinical image data for the development and evaluation of quantitative methods for prostate cancer characterization using multiparametric MRI. Data was provided by Brigham and Women's Hospital, PI Dr. Fiona Fennessy. MR imaging exam was performed on a GE Signa HDx 3.0 T magnet (GE Healthcare, Waukesha, WI) using a combination of 8-channel abdominal array and endorectal coil (Medrad, Pittsburgh, PA). The MR sequences included  $T_1$ - and  $T_2$ -weighted imaging, diffusion weighted (DW) imaging, and DCE MRI.  $T_1$ -weighted imaging was performed with a spoiled gradient recalled echo (SPGR) sequence with TR/TE/ = 385 ms/6.2 ms/65° over a (16 cm)<sup>2</sup> field of view (FOV).  $T_2$ -weighted imaging was performed with a FRFSE (Fast Recovery Fast Spin Echo) sequence with TR/TE = 3500/102 ms, FOV = (16 cm)<sup>2</sup>. A DW echo planar imaging sequence with trace diffusion sensitization and  $b$ -values of 0 and 500 s/mm<sup>2</sup>, and TR/TE = 2500/65 ms provided data for an Apparent Diffusion Coefficient (ADC) map. Finally, DCE MRI utilized a 3D SPGR sequence with TR/TE/ = 3.6 ms/1.3 ms/15°, FOV = (26 cm)<sup>2</sup>, with full gland coverage and reconstructed image voxel size of 1×1×6 mm (interpolated to 256×256 matrix). DCE MRI frames were acquired at approximately 5 s intervals (the number of frames varied between 12 and 16 slices resulting in the time resolution between 4.4 and 5.3 seconds) to achieve a clinically appropriate compromise between spatial and temporal resolutions. Gadopentetate dimeglumine (Magnevist, Berlex Laboratories, Wayne, New Jersey) was injected intravenously using a syringe pump (0.15 mmol/kg) at the rate of 3 ml/s followed by 20 ml saline flush at the same rate. The protocol included ~ 5 baseline scans prior to contrast injection for estimation of baseline tissue properties.


## About the NCI QIN

The mission of the QIN is to improve the role of quantitative imaging for clinical decision making in oncology by developing and validating data acquisition, analysis methods, and tools to tailor treatment for individual patients and predict or monitor the response to drug or radiation therapy. More information is available on the [Quantitative Imaging Network Collections](#) page. Interested investigators can apply to the QIN at: [Quantitative Imaging for Evaluation of Responses to Cancer Therapies \(U01\) PAR-11-150](#).

[Data Access](#) [Detailed Description](#) [Citations & Data Usage Policy](#) [Versions](#)

## Data Access

This is a **limited access** data set. To request access, please contact [help@cancerimagingarchive.net](mailto:help@cancerimagingarchive.net). Once access is granted, you can view and download these images on The Cancer Imaging Archive (TCIA) by [logging in](#) and selecting the QIN Prostate collection.

Data Type	Download all or Query/Filter
Images (DICOM, 4.4GB)	 <p>(Download requires <a href="#">TCIA Downloader App</a>)</p>

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## Detailed Description

Collection Statistics	
Modalities	MR
Number of Patients	22
Number of Studies	22
Number of Series	319
Number of Images	25,981
Image Size (GB)	4.4

A subset of datasets from this collection were used in [1]. The MR sequences included  $T_1$ - and  $T_2$ -weighted imaging, diffusion weighted (DW) imaging, and DCE MRI following the protocol described in [2].

## References

- [1] Fedorov, A., Fluckiger, J., Ayers, G. D., Li, X., Gupta, S. N., Tempany, C., Mulkern, R., Yankeelov, T.E., Fennessy, F. M. (2014). A comparison of two methods for estimating DCE-MRI parameters via individual and cohort based AIFs in prostate cancer: A step towards practical implementation. *Magnetic Resonance Imaging*, 32(4), 321–9. doi:10.1016/j.mri.2014.01.004
- [2] Hegde, J. V., Mulkern, R. V., Panych, L. P., Fennessy, F. M., Fedorov, A., Maier, S. E., & Tempany, C. M. C. (2013). Multiparametric MRI of prostate cancer: An update on state-of-the-art techniques and their performance in detecting and localizing prostate cancer. *Journal of Magnetic Resonance Imaging: JMRI*, 37(5), 1035–54. doi:10.1002/jmri.23860

## Citations & Data Usage Policy

This is a **limited access** data set. Upon receiving access you may only use it for the purposes outlined in your request to the data provider. You are not allowed to redistribute the data or use it for other purposes. See TCIA's [Data Usage Policies and Restrictions](#) for additional details. Questions may be directed to [help@cancerimagingarchive.net](mailto:help@cancerimagingarchive.net).

**Please be sure to include the following citations in your work and acknowledge the award that supported collection and sharing of these data sets (U01 CA151261, PI Fiona Fennessy) if you use this data set:**

### Data Citation

Fedorov, Andriy, Tempany, Clare, Mulkern, Robert, & Fennessy, Fiona. (2016). Data From QIN PROSTATE. The Cancer Imaging Archive. <http://doi.org/10.7937/K9/TCIA.2016.fADs26kG>

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### TCIA Citation


Clark K, Vendt B, Smith K, Freymann J, Kirby J, Koppel P, Moore S, Phillips S, Maffitt D, Pringle M, Tarbox L, Prior F. **The Cancer Imaging Archive (TCIA): Maintaining and Operating a Public Information Repository**, *Journal of Digital Imaging*, Volume 26, Number 6, December, 2013, pp 1045-1057. (paper)

## Other Publications Using This Data

- Hegde, J. V., Mulkern, R. V., Panych, L. P., Fennessy, F. M., Fedorov, A., Maier, S. E., & Tempany, C. M. C. (2013, April 18). Multiparametric MRI of prostate cancer: An update on state-of-the-art techniques and their performance in detecting and localizing prostate cancer. *J. Magn. Reson. Imaging*. Wiley-Blackwell. <http://doi.org/10.1002/jmri.23860>

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**Version 1 (Current): Updated 2014/07/02**

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