

## Accepted Manuscript

Modification of population based arterial input function to incorporate individual variation

Harrison Kim

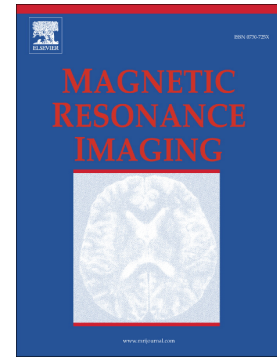
PII: S0730-725X(17)30203-5  
DOI: doi:[10.1016/j.mri.2017.09.010](https://doi.org/10.1016/j.mri.2017.09.010)  
Reference: MRI 8836

To appear in:

Received date: 5 June 2017  
Revised date: 12 September 2017  
Accepted date: 23 September 2017

Please cite this article as: Harrison Kim , Modification of population based arterial input function to incorporate individual variation. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Mri(2017), doi:[10.1016/j.mri.2017.09.010](https://doi.org/10.1016/j.mri.2017.09.010)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Technical note

## Modification of population based arterial input function to incorporate individual variation

**Harrison Kim**

Department of Radiology, University of Alabama at Birmingham

VH G082C5, 1670 University Boulevard, Birmingham, AL 35294-0012 (phone: 205-996-4088, fax: 205-975-6522, E-mail: hyunki@uab.edu).

### **Abstract**

This technical note describes how to modify a population-based arterial input function to incorporate variation among the individuals. In DCE-MRI, an arterial input function (AIF) is often distorted by pulsated inflow effect and noise. A population-based AIF (pAIF) has high signal-to-noise ratio (SNR), but cannot incorporate the individual variation. AIF variation is mainly induced by variation in cardiac output and blood volume of the individuals, which can be detected by the full width at half maximum (FWHM) during the first passage and the amplitude of AIF, respectively. Thus pAIF scaled in time and amplitude fitting to the individual AIF may serve as a high SNR AIF incorporating the individual variation. The proposed method was validated using DCE-MRI images of 18 prostate cancer patients. Root mean square error (RMSE) of pAIF from individual AIFs was  $0.88 \pm 0.48$  mM (mean  $\pm$  SD), but it was reduced to  $0.25 \pm 0.11$  mM after pAIF modification using the proposed method ( $p < 0.0001$ ).

Download English Version:

<https://daneshyari.com/en/article/5491370>

Download Persian Version:

<https://daneshyari.com/article/5491370>

[Daneshyari.com](https://daneshyari.com)