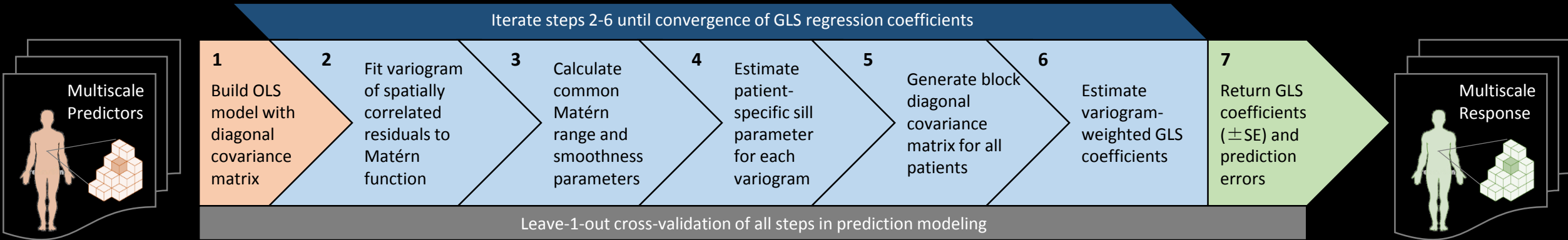


BIP (JOINT IM-TH): Variogram-weighted generalized least squares regression to predict spatially variant tumor voxel response on longitudinal FDG-PET/CT imaging of FLARE-RT protocol patients

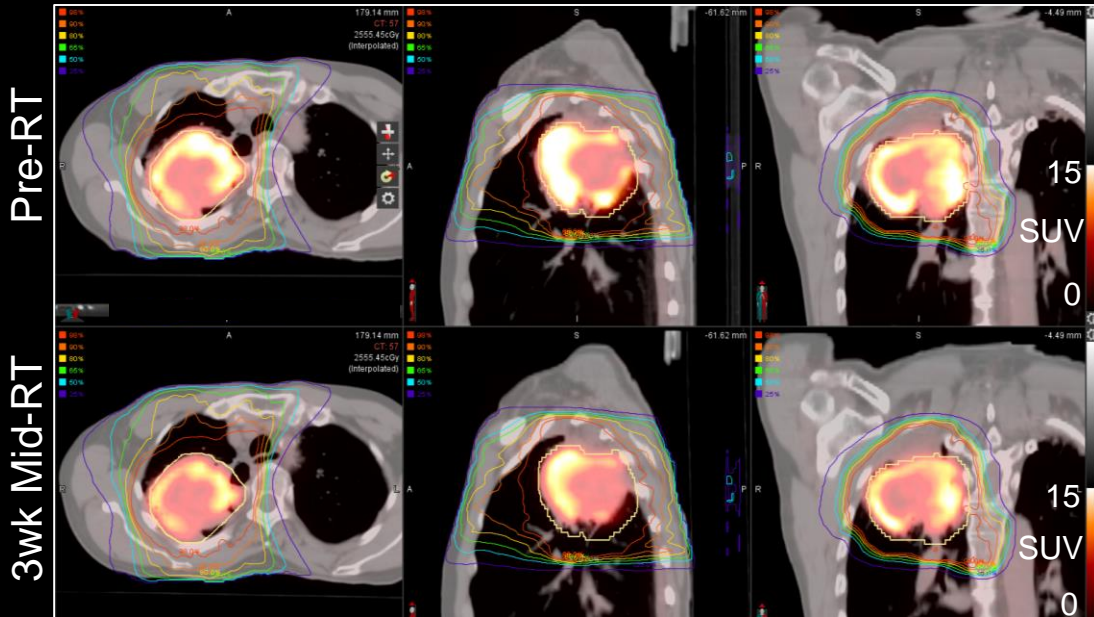
Stephen R. Bowen

WED AUG 1, 2018 7:30AM-9:30AM

Longitudinal & Functional Imaging



[¹⁸F]FDG PET/CT



| Patient Variables | Univariate | | | Multivariate Patient | | | Multivariate Patient + Voxel | | | |
|--|------------|--------------|---------|----------------------|-------------|---------|------------------------------|---------------|---------|-------|
| | β | (95% CI) | P-value | β | (95% CI) | P-value | β | (95% CI) | P-value | |
| Adenocarcinoma (vs. other) | 27.0 | (7.2, 50.4) | 0.008 | 28.1 | (5.2, 56.0) | 0.016 | 25.0 | (2.8, 51.9) | 0.028 | |
| preRT SUV _{mean} (per 50% increase) | -3.9 | (-9.6, 2.2) | 0.20 | 0.6 | (-6.3, 8.1) | 0.85 | -10.3 | (-16.7, -3.5) | 0.006 | |
| preRT MTV (per 50% increase) | 16.5 | (13.7, 19.4) | <0.001 | | | | | | | |
| Dose _{mean} (per 1-Gy increase) | -6.0 | (-8.3, -3.7) | <0.001 | | | | | | | |
| Voxel Variables | | | | | | | | | | |
| preRT SUV (per 50% increase) | 21.7 | (21.0, 22.3) | <0.001 | | | | 21.7 | (21.0, 22.3) | <0.001 | |
| Dose (per 1-Gy increase) | -0.8 | (-1.0, -0.5) | <0.001 | | | | | | | |
| Multivariate Prediction Error | | | | Apparent | | LOOCV | | Apparent | | LOOCV |
| Mean absolute error (SUV) | | | | 2.4 | | 2.5 | | 1.8 | | 1.9 |

Cross-validated models of baseline patient and tumor voxel variables predict week 3 mid-treatment FDG-PET voxel SUV response