

Simulating Response Variable

$C \angle - (S) \angle L \quad V \angle \odot \equiv \angle \quad \quad (L) \odot (S)$					
Z_1, Z_2, Z_3, Z_4					
$C \angle - (S) \angle L$ $V \angle \odot \equiv \angle$ $ \quad (L) \odot (S)$	$N \odot \square \odot P$ $(\vee \odot \equiv)$ $\odot \odot \nearrow$ $\triangle$	$Q \angle - \angle \phi$ $\odot 1$ $(\vee \odot \equiv)$ $\nearrow \nearrow 1^*)$	$Q \angle - \angle \phi$ $\odot 2$ $(\vee \odot \equiv)$ $\nearrow \nearrow 2^*)$	$Q \angle - \angle \phi$ $\odot 3$ $(\vee \odot \equiv)$ $\nearrow \nearrow 3^*)$	$Q \angle - \angle \phi$ $\odot 4$ $(\vee \odot \equiv)$ $\nearrow \nearrow 4^*)$
Z_1	Count Pre Infusion	$q_{45}(0.8)$	$q_{55}(0.45)$	$q_{65}(0.75)$	$q_{80}(0.6)$
Z_2	Diameter Length	$q_{60}(0.8)$	$q_{80}(0.95)$	$q_{85}(0.9)$	$q_{95}(0.87)$
Z_3	Eigenvector Centrality	$q_{75}(0.9)$	$q_{80}(0.8)$	$q_{90}(0.9)$	$q_{95}(0.7)$
Z_4	Central Eigen	$q_{55}(0.65)$	$q_{70}(0.7)$	$q_{85}(0.5)$	$q_{90}(0.45)$

*Weights are rescaled to sum to 1



$$\begin{aligned}
 & L \equiv \emptyset \odot \angle \odot \quad L \sqcup (S). \quad N \square \emptyset (L) \equiv \emptyset \odot \angle \odot \\
 & \quad \quad \quad M \square \triangle \odot (L) \\
 & \eta_{\alpha}(\mathbf{Z}) = 0.8Z_1 + 0.99Z_2 + 0.9Z_3 + 0.85Z_4 \\
 & N \square \emptyset (L) \equiv \emptyset \odot \angle \odot \quad M \square \triangle \odot (L): \\
 & \eta_{\alpha}(\mathbf{Z}) = 0.8Z_1 + 0.99Z_2 + 0.9Z_3 + 0.85Z_4 + 0.015Z_1Z_2 - 0.025Z_2Z_3 + 0.03Z_3Z_4
 \end{aligned}$$



$$\begin{aligned}
 & G \odot \emptyset \odot \odot \angle \nearrow \nearrow \cap \quad R \cap (S) P \square \emptyset (S) \odot \\
 & \quad \quad \quad V \angle \odot \equiv \angle \quad | \quad (L) \odot \\
 & \Pr(y = 1) = \frac{\exp\{\eta_{\alpha}(\mathbf{Z})\}}{1 + \exp\{\eta_{\alpha}(\mathbf{Z})\}}
 \end{aligned}$$

Supplementary Figure 2: Simulation strategy step 2: Outcome simulation.