**Supplementary Figures and Tables**

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**Supplementary Figure 1:** Scatter plot demonstrating the strong correlation between KH ePVS and Duarte ePV (r=0.738, p<0.001).



**Supplementary Figure 2:** Relationship between and composite of 30-day CV mortality or HF hospitalization modeled using a piecewise linear spline with a single knot at 0.



**Supplementary Figure 3:** Relationship between KH ePVS and composite of 30-day CV mortality or HF hospitalization modeled using a piecewise linear spline with a single knot at 0.



**Supplementary Table 1:** Correlation between estimated plasma volume and in hospital weight loss, urine output at 24 hours, and baseline NT-proBNP

| **Variable 1** | **Variable 2** | **N** | **r†** | **P-value** |
| --- | --- | --- | --- | --- |
| Kaplan-Hakim ePVS | Duarte ePV | 6345 | 0.738 | <.001 |
| Duarte ePV | In-hospital change in Body Weight (kg) | 3878 | 0.008 | 0.611 |
| Duarte ePV | Urine Output | 5467 | -0.005 | 0.691 |
| Duarte ePV | Baseline NT-proBNP | 3301 | 0.160 | <.001 |
| Kaplan-Hakim ePVS | In-hospital change in Body Weight (kg) | 3891 | 0.147 | <.001 |
| Kaplan-Hakim ePVS | Urine Output | 5495 | -0.129 | <.001 |
| Kaplan-Hakim ePVS | Baseline NT-proBNP | 3321 | 0.275 | <.001 |
| † Spearman's rank correlation coefficient. | | | | |

**Supplementary Table 2.1: Association between components of PVS and 30 day all-cause mortality**

|  | **Unadjusted** | | **Adjusted+** | | |
| --- | --- | --- | --- | --- | --- |
|  | **OR (95% CI)** | **P-value** | **OR (95% CI)** | **P-value** | **C-index** |
| **KH components** |  |  |  |  |  |
| Hematocrit (per 0.1 unit increase ) | 0.04 (0.01, 0.18) | <.001 | 0.26 (0.05, 1.28) | 0.098 | 0.707 |
| Weight (per 10 kg increase) | 1.03 (1.00, 1.06) | 0.097 | 1.08 (1.04, 1.11) | <.001 |
| Female | 0.924 (0.78, 1.10) | 0.364 | 1.05 (0.87, 1.27) | 0.598 |
|  |  |  |  |  |  |
| **Duarte components** |  |  |  |  |  |
| Hematocrit (per 0.1 unit increase ) | 0.04 (0.01, 0.18) | <.001 | 0.31 (0.02, 3.42) | 0.340 | 0.701 |
| Hemoglobin (truncated) (per 5 g/dL increase) | 0.71 (0.58, 0.88) | 0.002 | 0.98 (0.68, 1.40) | 0.837 |
| † Adjustment variables include: Age (low/high), baseline BUN (log), dyspnea, hospitalization in prior year, baseline sodium (high), JVP, baseline systolic blood pressure (high), NT-proBNP. | | | | | |

**Supplementary Table 2.2: Association between components of PVS and 180 day all-cause mortality**

| **Table 6.1: Association between components of PVS and 180 day all-cause mortality** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | **Unadjusted** | | **Adjusted+** | | |
|  | **HR (95% CI)** | **P-value** | **HR (95% CI)** | **P-value** | **C-index** |
| **KH components** |  |  |  |  |  |
| Hematocrit (per 0.1 unit increase ) | 0.72 (0.64, 0.81) | <.001 | 0.59 (0.16, 2.13) | 0.417 | 0.709 |
| Weight (per 10 kg increase) | 0.91 (0.89, 0.94) | <.001 | 0.98 (0.95, 1.01) | 0.197 |
| Female | 1.02 (0.89, 1.17) | 0.801 | 0.97 (0.84, 1.13) | 0.726 |
|  |  |  |  |  |  |
| **Duarte components** |  |  |  |  |  |
| Hematocrit (per 0.1 unit increase ) | 0.72 (0.64, 0.81) | <.001 | 1.04 (0.14, 7.74) | 0.968 | 0.709 |
| Hemoglobin (truncated) (per 5 g/dL increase) | 0.69 (0.59, 0.80) | <.001 | 0.91 (0.71, 1.18) | 0.476 |
| † Adjustment variables include: Age (low/high), baseline BUN (log), dyspnea, hospitalization in prior year, baseline sodium (high), JVP, baseline systolic blood pressure (high), NT-proBNP. | | | | | |

**Supplementary Table 3:** Association between ePVS and Outcomes Modified by Heart Failure Type

| **Outcome** | **HFrEF (LVEF ≤ 40%)** | **HFpEF (LVEF > 40%)** | **Interaction** |
| --- | --- | --- | --- |
|  | **HR/OR (95% CI)** | **HR/OR (95% CI)** | **P-Value** |
| **30 day CV Mortality and Re hospitalization for HF (adjusted)** |  |  |  |
| **Continuous Duarte ePV** |  |  |  |
| 1 unit increase Duarte ePV | 1.1 (1.01-1.2) | 1.1 (0.9-1.35) | 0.978 |
| **Quartile-based Duarte ePV** |  |  |  |
| Q1 | Reference | Reference | 0.227 |
| Q2 | 1.19 (0.86-1.64) | 3.62 (1.02-12.86) |
| Q3 | 1.52 (1.12-2.07) | 2.51 (0.69-9.09) |
| Q4 | 1.41 (1.02-1.93) | 3.69 (1.1-12.34) |
| **Continuous KH** |  |  |  |
| KH ePVS ≤0 (per 10 unit increase) + | 1.2 (1.02-1.4) | 1.12 (0.75-1.68) | 0.774 |
| KH ePVS >0 (per 10 percent increase) + | 0.68 (0.53-0.86) | 1.07 (0.6-1.88) | 0.148 |
| **Quartile-based KH** |  |  |  |
| Q1 | Reference | Reference | 0.476 |
| Q2 | 1.2 (0.87-1.65) | 0.74 (0.3-1.82) |
| Q3 | 1.3 (0.95-1.78) | 1.31 (0.61-2.8) |
| Q4 | 0.93 (0.67-1.29) | 1.12 (0.52-2.42) |
| **180 Day Mortality (adjusted)** |  |  |  |
| **Continuous Duarte ePV** |  |  |  |
| 1 unit increase Duarte ePV | 1.04 (0.97-1.12) | 1.02 (0.88-1.19) | 0.822 |
| Quartile-based Duarte ePV |  |  |  |
| Q1 | Reference | Reference | 0.079 |
| Q2 | 1.08 (0.83-1.42) | 0.74 (0.38-1.48) |
| Q3 | 1.36 (1.05-1.75) | 0.55 (0.27-1.11) |
| Q4 | 1.19 (0.92-1.55) | 0.94 (0.52-1.7) |
| **Continuous KH** |  |  |  |
| 10 percent increase PVS | 1.07 (1-1.15) | 1.16 (0.96-1.4) | 0.444 |
| **Quartile-based KH** |  |  |  |
| Q1 | Reference | Reference | 0.277 |
| Q2 | 1.46 (1.09-1.97) | 1.03 (0.53-2) |  |
| Q3 | 1.54 (1.15-2.05) | 0.85 (0.45-1.6) |  |
| Q4 | 1.48 (1.11-1.98) | 1.27 (0.7-2.31) |  |
| + KH ePVS modeled using a piecewise linear spline with a single knot at 0.  Hazard ratios are reported for the 180 outcome. Odds ratios are reported for the 30 day outcome.  Adjustment variables include: Age, baseline BUN (log), dyspnea, hospitalization in prior year, baseline sodium, JVP, baseline systolic blood pressure, NT-proBNP. | | | |