

Supplemental Table 1. Invasive Procedures (intubations, central venous line placement, arterial line placement, and PICC placement) over time. Data is analyzed using multilevel mixed effects negative binomial regression model. Year is treated as a categorical value in the model and the baseline value is 2009. The model controls for unit level effects addressing the issue that observations in the same ICU are correlated because they share common cluster-level random effects. Data is presented as the interval rate ratio (95% CI of IRR) and p-value. This model

Year	Model # 1 Intubations		Model # 2 Central Venous Line		Model # 3 Arterial Line		Model # 4 PICC	
	IRR	P value	IRR	P value	IRR	P value	IRR	P Value
2009	reference		reference		reference		reference	
2010	1.05 (0.96 – 1.14)	0.290	0.93 (0.86 – 1.01)	0.097	1.00 (0.92 – 1.08)	0.978	1.10 (0.99 – 1.22)	0.077
2011	0.97 (0.89 – 1.06)	0.542	0.87 (0.80 – 0.94)	0.001	0.92 (0.85 – 0.99)	0.033	1.04 (0.94 – 1.16)	0.395
2012	0.96 (0.88 – 1.04)	0.334	0.80 (0.74 – 0.86)	< 0.001	0.89 (0.83 – 0.96)	0.002	1.09 (0.99 – 1.21)	0.077
2013	0.95 (0.87 – 1.03)	0.235	0.77 (0.71 – 0.83)	< 0.001	0.86 (0.80 – 0.93)	< 0.001	1.17 (1.06 – 1.29)	0.002
2014	0.91 (0.83 – 0.99)	0.021	0.71 (0.66 – 0.77)	< 0.001	0.84 (0.78 – 0.91)	< 0.001	1.19 (1.07– 1.31)	0.001
2015	0.92 (0.85 – 1.00)	0.051	0.74 (0.68 – 0.81)	< 0.001	0.87 (0.80 – 0.93)	< 0.001	1.21 (1.09 – 1.33)	< 0.001
2016	0.91 (0.83 – 0.99)	0.025	0.71 (0.66 – 0.78)	< 0.001	0.85 (0.79 – 0.92)	< 0.001	1.21 (1.09 – 1.33)	< 0.001
2017	0.90 (0.83 – 0.98)	0.017	0.69 (0.63 – 0.74)	< 0.001	0.85 (0.79 – 0.92)	< 0.001	1.14 (1.03 – 1.26)	0.013

does not control for initial severity of illness as measured by PRISM III.