Online Appendix

In this set of appendices, we provide more details on our data, perform additional tests that examine the robustness of our key results, and provide supplementary findings.

Appendix 1: Variation in *NumSites*

Our empirical specification (1) exploits intra-physician variation in the level of multi-siting from month to month to generate the identification. We use the *xtsum* function in Stata to find that the amount of x-sectional variation is 0.169, while the amount of temporal variation is 0.241.

Table A1. Inter and Intra-Physician Variation in Num. Sites

Variable		Mean	Std. Dev.
Num. Sites	overall	1.111463	0.3390997
	between		0.1668173
	within		0.2427581

Table A2 below provides the distribution of *NumSites*, specifically to show that the vast majority of the observations involve 2 or fewer sites; 3 or fewer levels of multi-siting account for more than 99% of the observations.

Table A2. Distribution of NumSites

NumSites	Freq.	Percent	Cum.
1	854,982	89.61	89.61
2	92,363	9.68	99.29
3	6,442	0.68	99.96
4	327	0.03	100
5	31	0	100

Appendix 2: Alternative Specifications of *NumSites*

We consider a Herfindahl measure of the variable *NumSites*, based on the concentration of patient volume at specific hospital sites. Table A3 provides the results. We find that the coefficient for the Herfindahl Index (*NumSites*) is negative and statistically significant, indicating that greater concentration of patient volume at hospitals lowers LOS and complication rates.

Table A3. Herfindahl Index for Multi-Siting

	LOS	Complication
Physician-Hospital FE	x	x
Time FE	x	x
Categorical Patient Controls	x	x
ED Arrival	0.040***	0.005**
	(0.009)	(0.002)
Charlson Index	0.072***	0.015***
	(0.001)	(0.000)
Female	0.030***	-0.001
	(0.002)	(0.001)
Age	0.006***	0.001***
	(0.000)	(0.000)
Hosp. Util.	-0.120***	0.016***
	(0.007)	(0.003)
Physician Vol.	-0.059***	-0.014***
	(0.003)	(0.001)
Herfindahl Index (Num. Sites)	-0.054***	-0.009**
	(0.010)	(0.004)
Number of observations	942,566	942,566
R-Sq	0.118	0.051

note: *** p<0.01, ** p<0.05, * p<0.1

We extend the analysis on the moderating effect of patient complexity by categorizing patients into 4 levels of acuity based on an even split. We then interacted the *NumSites* variable with these categorical levels of severity. We report the findings in Table A4. We find that relative to the baseline level of lowest severity, a higher level of multi-siting leads to worse outcomes (longer LOS, greater likelihood of complications) for the more severe patient.

Table A4. Severity - Multi-Siting: Quartiles of Charlson Index

	LOS	Comp.
	(1)	(2)
Physician-Hospital FE	x	x
Time Fixed Effects	x	x
Patient Categorical Controls	x	x
ED Arrival	0.039***	0.005**
	(0.009)	(0.002)
Female	0.030***	-0.001
	(0.002)	(0.001)
Age	0.006***	0.001***
	(0.000)	(0.000)
Hosp. Util.	-0.119***	0.016***
	(0.007)	(0.003)
Phy. Workload	-0.060***	-0.014***
	(0.003)	(0.001)
Charlson Quartile 2	0.047***	0.009***
	(0.007)	(0.003)
Charlson Quartile 3	0.133***	0.023***
	(0.009)	(0.004)
Charlson Quartile 4	0.224***	0.048***
	(0.011)	(0.005)
Num. Sites	0.008*	-0.000
	(0.005)	(0.002)
Charlson Quartile 2 x Num. Sites	0.018***	0.004*
	(0.006)	(0.002)
Charlson Quartile 3 x Num. Sites	0.021***	0.008***
	(0.008)	(0.003)
Charlson Quartile 4 x Num. Sites	0.028***	0.007*
	(0.009)	(0.004)
Number of observations	941,703	941,703
R-Sq.	0.118	0.051

note: *** p<0.01, ** p<0.05, * p<0.1

Appendix 3: Temporal Effects

To examine whether there were significant changes in the level of multi-siting during the study period, we plotted a time series of the average level of *NumSites* observed in the data for each of the years during the study period. Figure A1 below demonstrates that the average level of multi-siting remained stable during the study period.

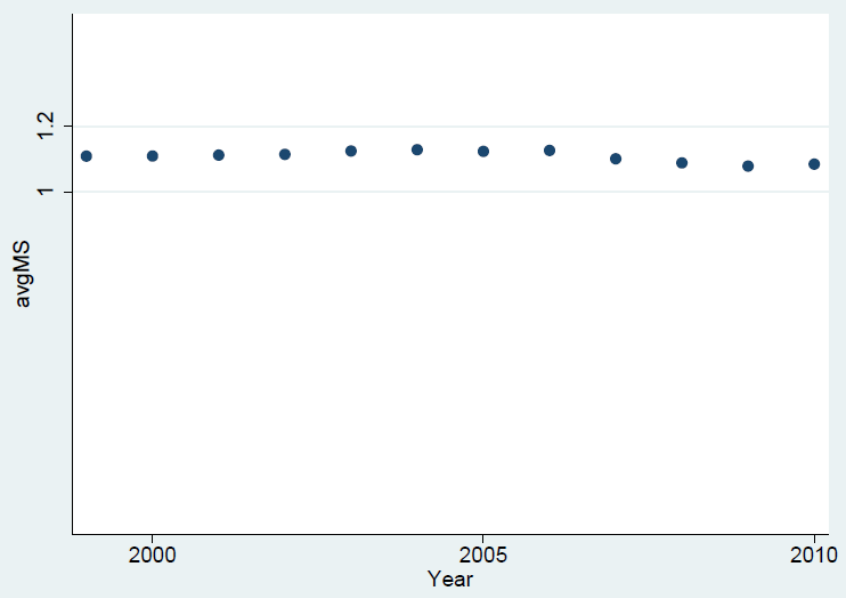

Figure A1: Average Multi-Siting Over Time

We next created a time variable based on the number of years elapsed since 1999 (defined as year – 1999). We then interacted this with the *NumSites* variable, to see if the effect of multi-siting changed over time. We do not find any effect on complications or LOS over time (Table A5). In other words, over time, physicians do not appear to get better or worse at multi-siting over this time period.

Table A5. Changes in Multi-Siting's Effect over Time

	LOS	Comp.
	(1)	(2)
Physician-Hospital FE	x	x
Time Fixed Effects	x	x
Patient Categorical Controls	x	x
ED Arrival	0.039***	0.005**
	(0.009)	(0.002)
Charlson Index	0.071***	0.015***
	(0.001)	(0.000)
Female	0.030***	-0.001
	(0.002)	(0.001)
Age	0.006***	0.001***
	(0.000)	(0.000)
Hosp. Util.	-0.119***	0.016***
	(0.007)	(0.003)
Phy. Workload	-0.060***	-0.014***
	(0.003)	(0.001)
Num. Sites	0.035***	0.000
	(0.010)	(0.004)
Years Since 1999 x Num. Sites	-0.003	0.001
	(0.002)	(0.001)
Number of observations	941,703	941,703
R-Sq.	0.118	0.051

note: *** p<0.01, ** p<0.05, * p<0.1

Appendix 4: Mortality Effects

Although lengths of stay and in-hospital complications are the two outcomes of interest in the present study, we also considered the effect of multi-siting on a third outcome – in-hospital mortality. Essentially, we ran model (1), but with an incidence of in-hospital mortality as the outcome of interest. Table A8 provides the results of the analysis. We find that there is no statistically significant effect of multi-siting on in-hospital mortality. It is plausible that

physicians take additional precautions to avoid the most severe consequences of mortality, even when multi-siting.

Table A6. Mortality Effects of Multi-Siting

	Mort. Effects
	(1)
Physician-Hospital FE	x
Time Fixed Effects	x
Patient Categorical Controls	x
ED Arrival	0.005***
	(0.001)
Charlson Index	0.004***
	(0.000)
Female	-0.002***
	(0.000)
Age	0.001***
	(0.000)
Hosp. Util.	-0.007***
	(0.002)
Phy. Workload	-0.006***
	(0.001)
Num. Sites	0.001
	(0.001)
Number of observations	941,703
R-Sq.	0.021

note: *** p<0.01, ** p<0.05, * p<0.1