

Intraoperative Fluctuations in Blood Pressure and its Impact on Fluid Administration during Head and Neck Free Tissue Transfer



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Abstract

Goal: Wide swings in intraoperative blood pressure (IOBP) will lead to higher fluid administration. High fluid administration impacts outcomes in free flap surgery and control of these swings may improve outcomes in free tissue transfer.

Background: Recent evidence in cardiac and liver surgery has shown increased morbidity and mortality with poorly controlled intraoperative blood pressure (IOPB). Poorly controlled IOBP leads to elevated fluid administration. As intraoperative crystalloid volume is a risk factor for free tissue transfer outcomes we tested whether poorly controlled IOBP correlated with higher volume administration in free tissue transfer.

Study Design: Retrospective cohort

Methods: Continuous intraoperative hemodynamics from 455 cases of free-tissue transfer were analyzed. All patients had arterial lines placed at the start of the case. Elevated IOBP variability was defined as the fractional change in mean arterial pressure (FCM MAP) >15% for a 1 minute period. Total volume administration including blood products, colloid and crystalloid were available as part of the electronic anesthetic record.

Results: 38% of the study population received greater than 5L of crystalloid intraoperatively. The study group was demographically diverse, 66% male, with a median age of 62 years. Intraoperative MAP <40mm Hg and MAP FCM >15% were found to be associated with higher fluid totals. Neither pressor administration of any kind nor patient comorbidities were significantly associated with this outcome.

Conclusions: Intraoperative blood pressure variability correlates with increased fluid administration during free tissue transfer. Minimizing these fluctuations may help reduce high volume administration, which is a known risk factor for poor outcomes in free-tissue transfer.

Cohort Characteristics

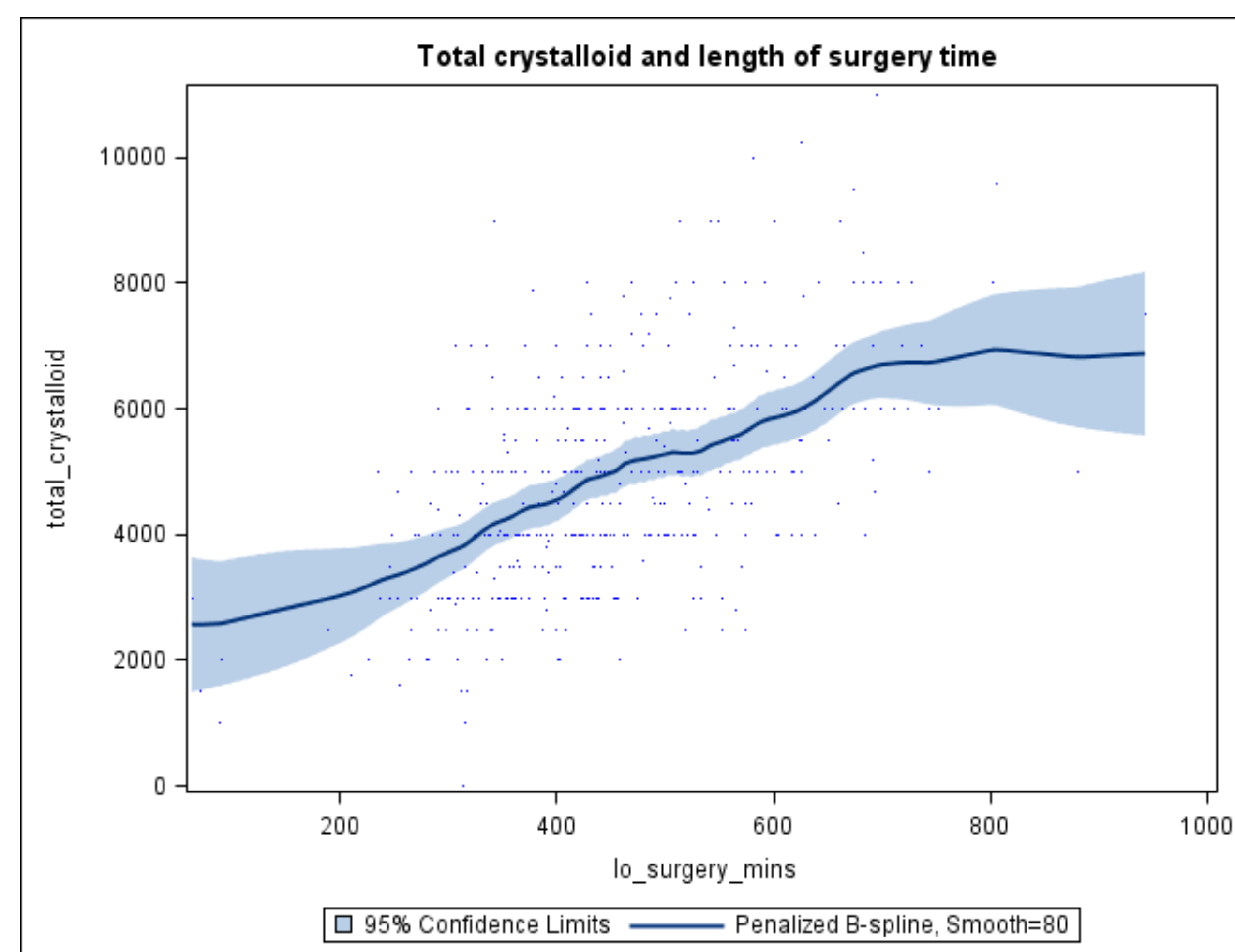
Variable	N	Mean	Std Dev	25th Pctl	50th Pctl	75th Pctl	Maximum
Age	455	62.4	13.49	54	63	71	94
Weight (Kg)	455	73.57	17.69	61	70.1	83.64	152.73
BMI	455	26.16	12.05	21.6	24.77	28.29	179.5
Length Anesthesia (min)	455	570.54	131.67	478	562	650	1015
Length of Surgery (min)	455	452.93	126.47	362	437	528	943
Crystalloid	455	4878.9	1690.13	4000	5000	6000	11000
Colloid	455	56.15	208.06	0	0	0	1500
Transfused RBC	455	185.71	313.82	0	0	250	1750
Transfused Platelets	455	2.25	33.97	0	0	0	535
Transfused FFP	455	1.66	25.44	0	0	0	446
Urine Output	455	1360.88	983	700	1100	1700	6800
EBL	455	364.68	349.27	150	300	500	3100
Length of Stay	438	10.69	8.11	6	8	13	91

ASA Status	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	4	0.88	4	0.88
2	49	10.77	53	11.65
3	321	70.55	374	82.2
4	81	17.8	455	100

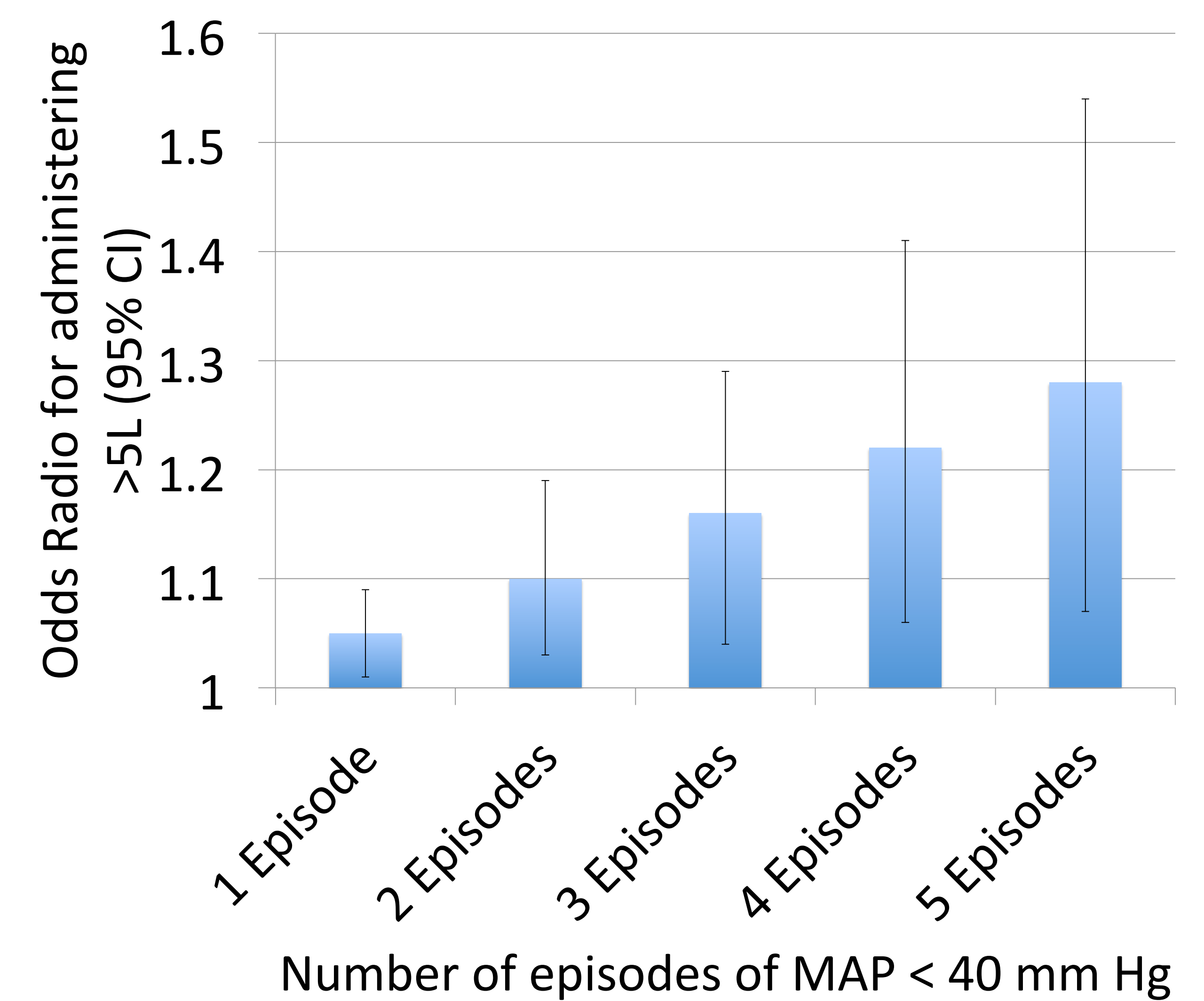
Gender	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Female	151	33.19	151	33.19
Male	304	66.81	455	100

Diabetes	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	424	93.19	424	93.19
1	31	6.81	455	100

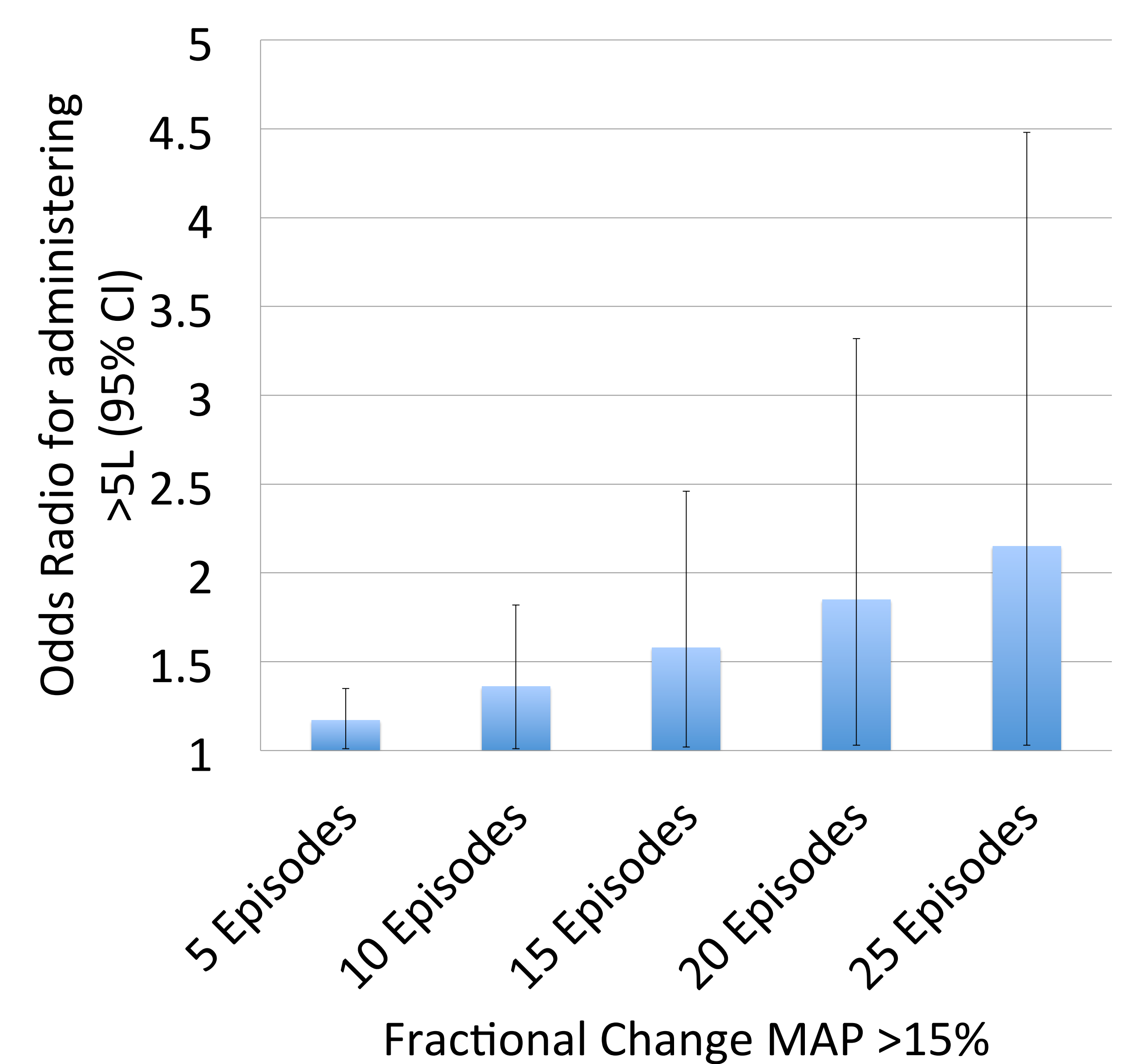
Crystalloid >5L	Frequency	Percent	Cumulative Frequency	Cumulative Percent
N	281	61.76	281	61.76
Y	174	38.24	455	100



Effect of Mean Arterial Pressure < 40 mm Hg on Fluid Administered



Effect of Blood Pressure Lability on Fluid Administered



Patients are more likely to get >5L during free flaps if they have multiple episodes of blood pressure lability and/or multiple episodes of hypotension