Supplementary Online Content

Lee T. S-K, Goyal P, Li C, Zhao K. Computational fluid dynamics to evaluate the effectiveness of inferior turbinate reduction techniques to improve nasal airflow [published online January 25, 2018]. *JAMA Facial Plast Surg*. doi:10.1001/jamafacial.2017.2296

eTable. CFD Data

This supplementary material has been provided by the authors to give readers additional information about their work.

Patient 1 Models	Left Nasal Cavity Volume	Right Nasal Cavity Volume	Total Nasal Cavity Volume = Left + Right + nasopharynx	Total Flow Rate	% Change of Total Flow Rate	Location Specific Effect Ratio - Left	Location Specific Effect Ratio - Right	Location Specific Effect - Total Nasal Cavity
Control	6.144	9.805	23.505	216.796				
Anterior 1/3	7.01	10.574	25.14	228.3	5%	8.39	5.54	7.036
Middle 1/3	7.449	10.872	25.877	225.544	4%	7.13	-0.52	3.688
Posterior 1/3	6.693	10.438	24.798	229.011	6%	12.21	8.7	9.449
Anterior 2/3	8.47	11.658	27.684	253.426	17%	8.9	8.59	8.766
Posterior 2/3	8.216	11.562	27.445	258.882	19%	11.52	10.36	10.681
Full Length	9.487	12.431	29.585	305.817	41%	14.93	14.88	14.641
Patient 2 Models	Left Nasal Cavity Volume	Right Nasal Cavity Volume	Total Nasal Cavity Volume = Left + Right + nasopharynx	Total Flow Rate	% Change of Total Flow Rate	Location Specific Effect Ratio - Left	Location Specific Effect Ratio - Right	Location Specific Effect - Total Nasal Cavity
Control	5.671	9.574	20.569	232.863				
Anterior 1/3	6.044	10.079	21.446	234.221	1%	9.04	-4.02	1.55
Middle 1/3	6.324	9.957	21.605	237.8	2%	7.27	0.45	4.77
Posterior 1/3	6.585	10.234	22.258	238.323	2%	1.69	5.95	3.23
Anterior 2/3	6.698	10.461	22.483	240.727	3%	10.18	-2.93	4.11
Posterior 2/3	7.238	10.616	23.294	244.303	5%	4.95	3.53	4.2
Full Length	7.612	11.121	24.172	255.742	10%	8.61	3.99	6.35
Patient 3 Models	Left Nasal Cavity Volume	Right Nasal Cavity Volume	Total Nasal Cavity Volume = Left + Right + nasopharynx	Total Flow Rate	% Change of Total Flow Rate	Location Specific Effect Ratio - Left	Location Specific Effect Ratio - Right	Location Specific Effect - Total Nasal Cavity
Control	7.075	9.544	21.856	110.059				
Anterior 1/3	7.777	10.038	23.051	119.426	9%	13.2	0.2	7.84
Middle 1/3	7.843	10.218	23.297	120.072	1%	16.92	-4.43	6.94

Posterior 1/3	7.673	9.912	22.821	111.352	19%	1.63	0.87	1.34
Anterior 2/3	8.447	10.716	24.399	130.807	13%	20.02	-5.73	8.16
Posterior 2/3	8.358	10.51	24.103	124.579	30%	15.13	-5.05	6.46
Full Length	8.971	10.939	25.145	142.623	9%	23.92	-9.16	9.9
Patient 4 Models	**Left Nasal Cavity Volume**	**Right Nasal Cavity Volume**	**Total Nasal Cavity Volume = Left + Right + nasopharynx**	**Total Flow Rate**	**% Change of Total Flow Rate**	**Location Specific Effect Ratio - Left**	**Location Specific Effect Ratio - Right**	**Location Specific Effect - Total Nasal Cavity**
Control	6.606	7.042	18.998	112.27				
Anterior 1/3	7.338	7.913	20.601	123.305	10%	5.41	8.12	6.88
Middle 1/3	7.999	8.318	21.668	130.662	16%	4.64	9.34	6.89
Posterior 1/3	7.455	7.931	20.929	147.75	32%	25.96	15.1	18.38
Anterior 2/3	8.749	9.191	23.29	158.555	41%	7.02	14.54	10.78
Posterior 2/3	8.776	9.142	23.461	192.96	72%	20.57	17.16	18.08
Full Length	9.523	10.017	25.083	275.483	145%	27.65	27.75	26.82
Patient 5 Models	**Left Nasal Cavity Volume**	**Right Nasal Cavity Volume**	**Total Nasal Cavity Volume = Left + Right + nasopharynx**	**Total Flow Rate**	**% Change of Total Flow Rate**	**Location Specific Effect Ratio - Left**	**Location Specific Effect Ratio - Right**	**Location Specific Effect - Total Nasal Cavity**
Control	9.84	9.029	36.512	297.159				
Anterior 1/3	10.564	9.736	37.942	325.397	10%	11.64	28.03	19.74
Middle 1/3	10.594	10.085	38.322	321.977	8%	14.69	13.01	13.71
Posterior 1/3	10.399	9.837	38.18	307.64	4%	7.16	8.03	6.28
Anterior 2/3	11.318	10.778	39.739	370.689	25%	16.94	27.73	22.79
Posterior 2/3	11.15	10.87	39.964	351.524	18%	18.36	16.48	15.75
Full Length	11.884	11.572	41.401	426.123	43%	22.06	32.99	26.38

eTable. CFD Data - Manipulated partial ITR models were compared to their respective control models for each patient. Total nasal cavity volume includes the left and the right nasal cavity volumes and the nasopharynx volume, which were not affected in all ITRs.

The nasal air flow rate in ml/second is simulated under restful breathing. % change of total flow rate reports a percentage change in flow rate when compared to the control model. A positive percentage indicates increase in nasal airflow when compared to the control model. The location-specific effect was identified using a ratio calculated by dividing the change in nasal airflow rate from the control model by the change in nasal cavity volume from the control model. A high ratio indicates the inferior turbinate reduction at the particular location is more effective at increasing the nasal airflow. A negative ratio indicates the ITR at the particular location of the inferior turbinate worsened nasal airflow. The location specific effects for the left nasal cavity, right nasal cavity and total nasal cavity (left + right nasal cavity combined) are reported. One can note, the site of most effective partial ITR sometimes differ from one side to the other within same individuals (i.e. Patient 2,3 & 5 when comparing the one-third length partial ITR models).