

Supplemental Material

A comparison of leak compensation during pediatric non-invasive positive pressure ventilation; a lung model study

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Additional results

Suppl. Table 1 Triggering delay time and delivered tidal volume in each patient' size

Ventilator	model	T delay, ms				Vt, ml			
		B	L1	L2	L3	B	L1	L2	L3
Servo i	10kg	107*	112*	106*	99*	73*	70*	65*	58*
	20kg	111	123	136	148	157	147	134	116
	30kg	103	106	113	130	195	191	177	153
PB840	10kg	87	90	92	112	74	72	71	60
	20kg	84	78	80	89	134	132	129	111
	30kg	98	92	91	92	197	189	184	159
C3	10kg	77	82	97	103	71	70	66	60
	20kg	71	72	82	97	115	111	107	103
	30kg	77	78	85	92	145	143	143	144
G5	10kg	89	83	84	114	75	74	69	56
	20kg	90	80	75	85	132	131	117	101
	30kg	92	87	85	81	195	193	181	163
Carestation	10kg	64	NS	NS	NS	77	NS	NS	NS
	20kg	69	57*	NS	NS	125	158*	NS	NS
	30kg	83	71	115	NS	219	203	181	NS
V500	10kg	75	NS	NS	NS	73	NS	NS	NS
	20kg	66	NS	NS	NS	138	NS	NS	NS
	30kg	104	103	99	NS	202	187	171	NS
Avea	10kg	58	NS	NS	NS	77	NS	NS	NS
	20kg	63	NS	NS	NS	137	NS	NS	NS
	30kg	72	NS	NS	NS	204	NS	NS	NS
Carina	10kg	79	92	92	115*	73	71	71	62*
	20kg	79	85	86	112	124	120	117	103
	30kg	87	98	104	116	187	183	187	164
V60	10kg	75	76	86	102	76	75	72	63
	20kg	63	67	66	98	146	144	138	117
	30kg	70	72	80	90	219	216	206	189
Vision	10kg	107	112	119	114*	73	71	70	64*
	20kg	96	94	100	109	153	150	143	127

	30kg	97	106	106	118	214	209	189	173
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Data are presented as mean

Data from the normal, obstructive and restrictive models for each weight are combined. NS, no synchronization; T delay, time from the beginning of the inspiratory effort of the lung simulator to the maximum negative airway pressure deflection needed to trigger the ventilator; V_t, delivered tidal volume.

*Servo *i*, data includes only normal and restrictive models, did not synchronize in the obstructive model.

*Carestation, data includes only normal and obstructive models, did not synchronize in the restrictive model.

*Carina, data includes only normal and restrictive models, did not synchronize in the obstructive model.

*Vision, data includes only normal and restrictive models, did not synchronize in the obstructive model.

Figure legends

Suppl. Figure 1

Synchronization, auto-triggering, and miss-triggering under increasing and decreasing leaks.

Top left) Synchronization rates under increasing and decreasing leak.

This figure shows the percentage of synchronization of each ventilator under increasing and decreasing leaks. The rate of synchronization was lower for increasing than for decreasing leaks.

Bottom left) Auto-triggering under increasing and decreasing leak.

This figure shows the percentage of auto-triggering of each ventilator under increasing and decreasing leaks. The rate of auto-triggering was higher for increasing than for decreasing leaks.

Bottom right) Miss-triggering under increasing and decreasing leak.

This figure shows the percentage of miss-triggering of each ventilator under increasing and decreasing leaks. No significant difference was observed in the rate of miss-triggering between increasing and decreasing leaks.

The histogram bars show mean values.

Suppl. Figure 2A

Representative wave forms of the G5 in the 10 kg obstructive and restrictive lung models with expiratory trigger sensitivities at 25 % and 50 % of peak inspiratory flow

Left) 10 kg obstructive lung model:

As leak level increased from B to L3, inspiratory time was longer at the 25 % of peak inspiratory flow setting but not at the 50% setting.

Right) 10 kg restrictive lung model:

As leak level increased from B to L3, inspiratory time was longer at the 25 % of peak inspiratory flow setting. On the other hand, these changes were not seen at the 50% setting.

B, baseline leak, L1, 2, 3, leak level 1, 2, 3; AP, airway pressure; EP, esophageal pressure.

Suppl. Figure 2B

Representative wave forms of the PB840 in the 10 kg obstructive and restrictive lung models with expiratory trigger sensitivities at 25 % and 50 % of peak inspiratory flow

Left) 10 kg obstructive lung model:

As leak level increased from B to L3, inspiratory time was not changed at either the 25% or 50% of peak inspiratory flow setting.

Right) 10 kg restrictive lung model:

At the 25 % of peak inspiratory flow setting, inspiratory time was approximately half of the lung simulator's inspiratory time. On the other hand, inspiratory time was longer at

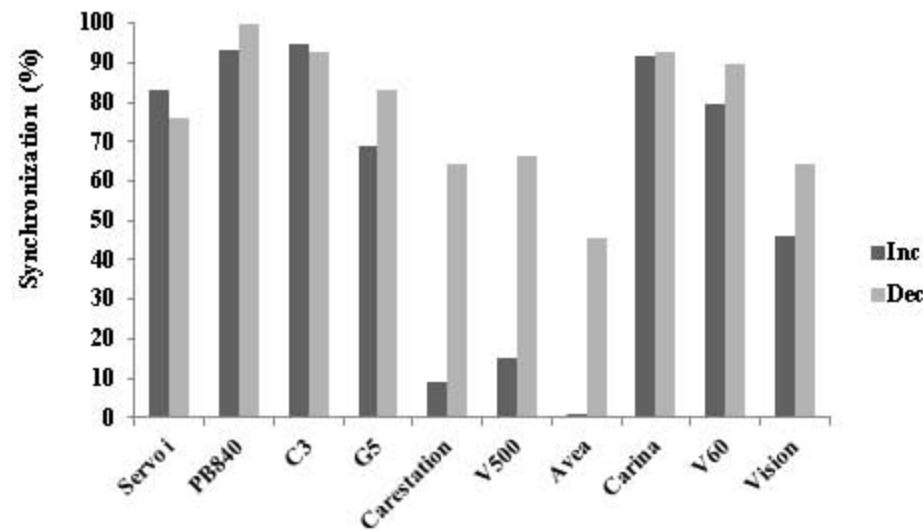
the 50% of peak inspiratory flow setting than at the 25% setting.

B, baseline leak; L1, 2, 3, leak level 1, 2, 3; AP, airway pressure; EP, esophageal pressure.

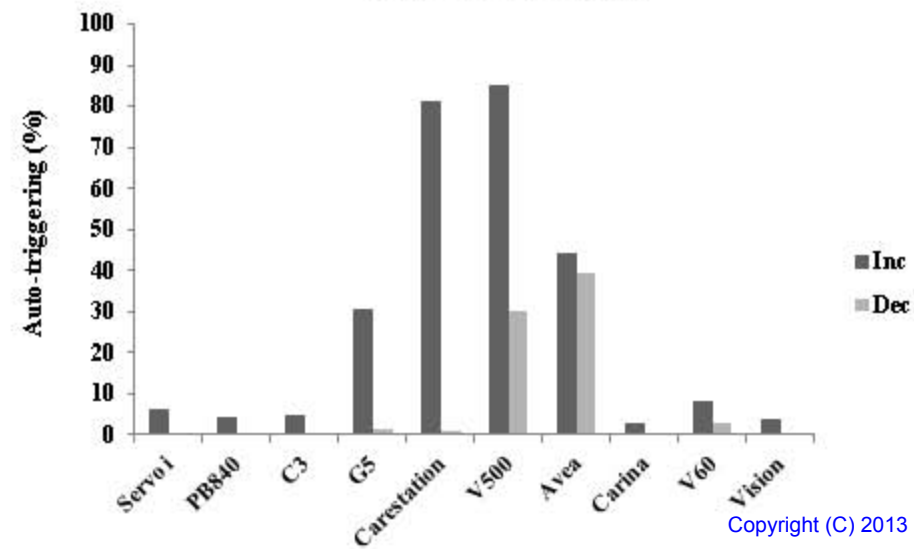
Suppl. Figure 1

ONLINE DATA SUPPLEMENT

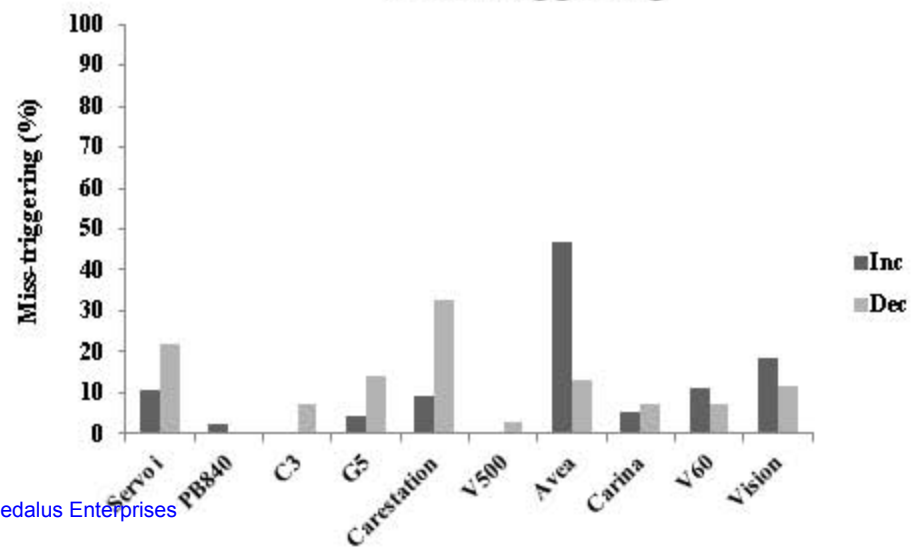
Synchronization

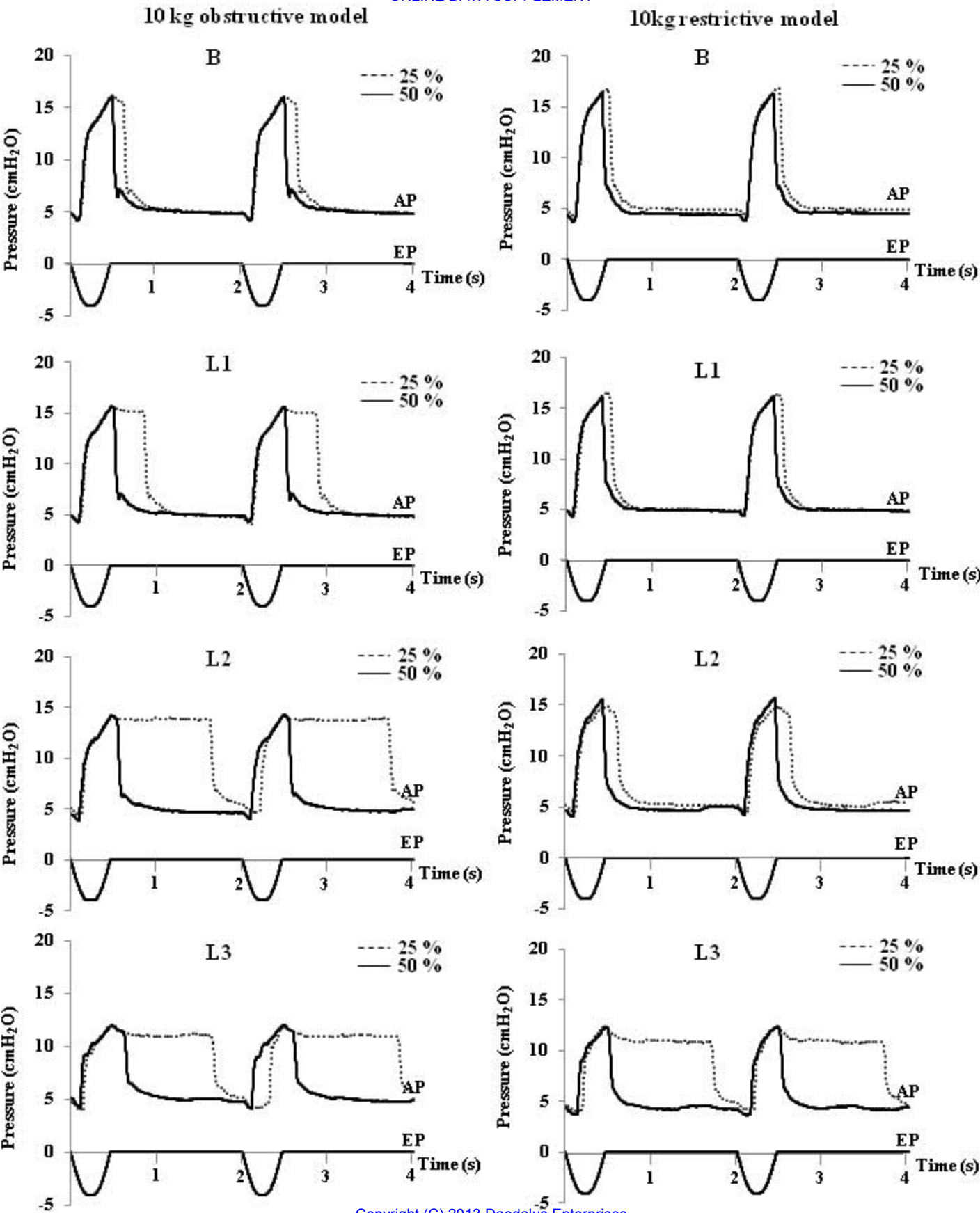


Auto-triggering



Miss-triggering





10 kg obstructive model

10kg restrictive model

