GUIDE FOR INITIAL SETTINGS FOR **VOLUME CONTROLLED** VENTILATION FOR DRAEGER OXYLOG 3000 PLUS

Assumes patient is apnoeic from sedation & nursed at 30° to minimise aspiration

	LUNG PROTECTIVE STRATEGY (all other patients >1yo if cuffed tube)	**OBSTRUCTIVE STRATEGY** (asthma/COPD if cuffed tube >1yo)
Mode	**VC-SIMV** *(default)*	**VC-SIMV** *(default)*
VT	**6**ml/kg **ideal** body weight- **see chart**	**6**ml/kg **ideal** body weight- **see chart**
RR	**18** breaths/min then titrate to normal pCO_2/pH	**9** breaths/min then examine **EXPIRATORY FLOW TIME CURVES.** ↓ RR if not fully expiring. **-permissive hypercapnoea** (pH > 7.1)
Pmax*(alarm)*	high enough to allow desired VT *(if alarms, see below)*	high enough to allow desired VT *(if alarms, see below)*
FiO_2	titrate using FiO_2/PEEP scale→**SpO_2 of 88-95%**	minimal FiO_2 for **SpO_2 88-95%**
PEEP	**0**	
Tinsp	I:E = 1:2 *(default)*	**titrate Tinsp so that I:E = ≥1:4**
Slope	⎍ *(default)*	⎍ **(i.e. fast inspiratory flow rate)**
AutoFlow	OFF	OFF (as lowers Pmax by 5cm thus may limit VT delivered)
Other	if high PEEP results in ↓BP, give fluids & inotropes keeping MAP>65 (for paediatric values, check chart) if P_{max} alarms, check for patient agitation/ tube obstruction. if not the cause, perform **INSPIRATORY HOLD MANOEUVRE** - if Pplat >30 ↓TV by 1ml/kg steps (min 4ml/kg)	sedate ++++, avoid ongoing paralysis If ↓↓BP + difficult to ventilate, **disconnect** tube & allow to expire stacked breaths if P_{max} alarms, check for patient agitation/ tube obstruction. If not the cause, perform **INSPIRATORY HOLD MANOEUVRE** - if Pplat >30 ↓TV by 1ml/kg steps (min 4ml/kg)

FiO_2 %	40	40	50	50	60	70	70	80	90	90	90	100
PEEP cmH2O	5	8	8	10	10	10	12	14	14	16	18	20

Further modifications depends on **hourly ABGs and haemodynamics**

	5'0" 153cm	5'2" 156cm	5'4" 163cm	5'6" 168cm	5'8" 173cm	5'10" 178cm	6' 183cm	6'2" 188cm	6'4" 193cm
VT women (6ml/kg IBW)	276	295	330	360	385	415	440	470	490
VT men (6ml/kg IBW)	305	320	360	385	415	440	470	490	520

Other patients (i.e. modifications from **LUNG PROTECTIVE STRATEGY**)

- **HEAD INJURY:** too much PEEP can ↓BP and thus ↓ cerebral perfusion pressure. PEEP=5*(default)* is OK. 30° head up. Aim for CO_2 35-40mmHg
- **METABOLIC ACIDOSIS:** RR ≥ patient achieved, $ETCO_2$ ≤ patient achieved. Lighten sedation to allow patient to add additional breaths as required -add pressure support (**Δsupp=10, Trigger=2**) to these breaths as patient tired.
- **HYPERTENSIVE APO:** start PEEP at 10cmH_20 and rapidly titrate up while rapidly titrating IV GTN for SBP≤140.
- **OBESE:** start PEEP at 10cmH_20 and titrate as per PEEP/FiO_2 scale. Reverse Trendelenburg/ramped
- **CARDIOGENIC SHOCK:** avoid high-level PEEP as can ↓BP .
- **PREGNANCY:** left lateral position. **TV: 8ml/kg** ideal body weight, **RR 20-22bpm** aim for low/normal pCO_2&normal pH.

If patient is crashing….

- **Take the ventilator out of the equation-bag the patient to feel how they are to ventilate**
- Check the **tube**- displaced/ dislodged/ obstructed
- Check the **patient**- pneumothorax -bedside US/CXR and needle/finger thoracostomy
- Check the **ventilator**

GUIDE FOR INITIAL SETTINGS FOR **PRESSURE CONTROLLED** VENTILATION FOR DRAEGER OXYLOG 3000 PLUS

Assumes patient is apnoeic from sedation & nursed at 30° to minimise aspiration.

Recommended for all UNCUFFED tubes

	LUNG PROTECTIVE STRATEGY (all other patients)	**OBSTRUCTIVE STRATEGY (bronchiolitis/asthma)**
Mode	**PC-SIMV+**	**PC-SIMV+**
VT	*can't be set in PC mode- VT determined by Pisnp*	*can't be set in PC mode- VT determined by Pisnp*
RR	**see chart-** then titrate to normal pCO_2/pH	**(1/2 normal RR)- see chart** then **EXPIRATORY FLOW TIME CURVES**. ↓ RR if not fully expiring **-permissive hypercapnoea** (pH > 7.1)
Pmax*(alarm)*	high enough to allow desired VT *(if alarms, see below)*	high enough to allow desired VT *(if alarms, see below)*
FiO_2	titrate using FiO_2/PEEP scale→**SpO_2 of 88-95%**	minimal FiO_2 for **SpO_2 88-95%**
PEEP	**5** *(default)*	
Pinsp	**start at 20 and titrate to VT of 6ml/kg Ideal Body Weight** ***-see chart***	**start at 20 and titrate to VT of 6ml/kg Ideal Body Weight** ***-see chart***
Tinsp	I:E=1:2 *(default)*	**titrate Tinsp so that I:E = ≥1:4**
Slope	⎍ *(default)*	⎍ **(i.e. fast inspiratory flow rate)**
Other	▪ if high PEEP results in ↓BP, give fluids & inotropes keeping SBP as per chart ▪ if P_{max} alarms, check for patient agitation/ tube obstruction. if not the cause, perform **INSPIRATORY HOLD MANOEUVRE**- if Pplat >30 ↓TV by 1ml/kg steps (min 4ml/kg)	▪ **sedate ++++**, avoid ongoing paralysis ▪ if ↓↓BP + difficult to ventilate, **disconnect** tube & allow to expire stacked breaths ▪ if P_{max} alarms, check for patient agitation/ tube obstruction. if not the cause, perform **INSPIRATORY HOLD MANOEUVRE**- if Pplat >30 ↓TV by 1ml/kg steps (min 4ml/kg)

FiO_2 %	40	40	50	50	60	70	70	80	90	90	90	100
PEEP cmH_2O	5	8	8	10	10	10	12	14	14	16	18	20

Further modifications depends on **hourly ABGs and haemodynamics**

	Age/IBW	**VT (6ml/Kg)**	**RR (obstructive RR)**	**Systolic BP**
	< 1 year	*Oxylog 3000 can not accurately deliver VT < 50ml; use NeoPuff*		
50-250ml use Oxylog 3000 plus paediatric circuit	**1 year/ 10kg**	60ml	32 (16)	≥ 65
	2 years/ 13kg	78ml	28 (14)	≥ 65
	4 years/ 15kg	90ml	26 (13)	≥ 70
	6 years/ 20kg	120ml	24 (12)	≥ 75
	8 years/ 25kg	150ml	22 (11)	≥ 80
	10 years/ 30kg	180ml	20 (10)	≥ 85
	12 years/40kg	240ml	20 (10)	≥ 90
>250ml use Oxylog 3000 plus adult circuit	**14 years/50kg**	300ml	18 (9)	≥ 90
	17 years+/70kg	420ml	18 (9)	≥ 90

Other patients (i.e. modifications from **LUNG PROTECTIVE STRATEGY**)

- **HEAD INJURY:** too much PEEP can ↓BP and thus ↓ cerebral perfusion pressure. PEEP=5*(default)* is OK. 30° head up. Aim for CO_2 35-40mmHg
- **METABOLIC ACIDOSIS:** RR ≥ patient achieved, $ETCO_2$ ≤ patient achieved. Lighten sedation to allow patient to add additional breaths as required -add pressure support (**Δsupp=10, Trigger=2**) to these breaths as patient tired.

If patient is crashing….

- **Take the ventilator out of the equation-bag the patient to feel how they are to ventilate**
- Check the **tube**- displaced/ dislodged/ obstructed
- Check the **patient**- pneumothorax -bedside US/CXR and needle/finger thoracostomy
- Check the **ventilator**

GUIDE FOR **NON-INVASIVE VENTILATION** USING THE DRAEGER OXYLOG 3000 PLUS

a blood gas should be performed on commencement of NIV and hourly there after

	OXYGENATION STRATEGY (same principles as protective lung strategy)	**OBSTRUCTIVE STRATEGY** (asthma/COPD)
Mode	**PC-SIMV+** and in settings press **NIV: ON**	**PC-SIMV+** and in settings press **NIV: ON**
VT	*does not work in this mode*	*does not work in this mode*
RR	*does not work in this mode*	*does not work in this mode*
Pmax *(IPAP alarm)*	**25**	**25**
Pinsp *(IPAP- EPAP)*	start at 5 and titrate over a few breaths to a **VT of 6ml/kg IBW** – *see chart* (if Pinsp = 0 then this mode is CPAP)	start at 5 and titrate over a few breaths to a **VT of 6ml/kg IBW** – *see chart*
FiO_2	titrate using FiO_2/PEEP scale ➔ **SpO_2 of 88-95%**	minimal FiO_2 for **SpO_2 86-92% in CO_2 retainers** minimal FiO_2 for **SpO_2 88-95% in NON-CO_2 retainers**
PEEP (EPAP)	FiO_2 % : 40 / 40 / 50 / 50 / 60 / 70 / 70 / 80 / 90 / 90 / 90 / 100 PEEP cmH_2O : 5 / 8 / 8 / 10 / 10 / 10 / 12 / 14 / 14 / 16 / 18 / 20	**5** *(default)*
Tinsp	I:E=1:2 *(default)*	**titrate Tinsp so that I:E = ≥1:4**
Slope	⎍ *(default)*	⎍ **(i.e. fast inspiratory flow rate)**
Other	• if after 15minutes, RR > 25 breaths/min, ↑Pinsp so that **VT ↑ by 1ml/kg IBW** – *see chart* • if there is persistent/worsening acidosis after an hour, ↑Pinsp so that **VT ↑ by 1ml/kg IBW** • if high PEEP results in ↓BP, give fluids & inotropes keeping MAP ≥ 65mmHg	▪ if after 15minutes, RR > 25 breaths/min, ↑Pinsp so that **VT ↑ by 1ml/kg IBW** – *see chart* ▪ if there is persistent/worsening acidosis after an hour, ↑Pinsp so that **VT ↑ by 1ml/kg IBW**

A properly fitted mask is as important as the settings – try deflating the mask to improve seal and comfort. If that fails, ask the respiratory ward/ICU for help. Please note, if mask has exhalation valve, the Oxylog wont be able to calculate TV

	5'0" 153cm	5'2" 156cm	5'4" 163cm	5'6" 168cm	5'8" 173cm	5'10" 178cm	6'0" 183cm	6'2" 188cm	6'4" 193cm
6ml/kg female	276	296	330	360	385	415	440	470	490
6ml/kg male	305	320	360	385	415	440	470	490	520
8ml/kg female	364	401	438	474	511	548	585	622	658
8ml/kg male	400	437	474	510	547	584	621	658	694
10ml/kg female	455	500	546	592	638	685	730	777	822
10ml/kg male	500	546	592	638	685	730	777	822	868

Specific patient populations

- **HYPERTENSIVE APO:** Both BPAP (PEEP + Pinsp) and CPAP (PEEP + Pinsp=0) are equally effective. Start PEEP at 10cmH_2O and titrate up as per oxygenation strategy while rapidly titrating high-dose IV GTN to patient's normal blood pressure. IV diuretic if patient is clinically overloaded. Avoid NIV if patient is hypotensive (cardiogenic shock).
- **MORBIDLY OBESE:** start PEEP at 10 cmH_2O (to prevent actelectasis) and titrate up as per oxygenation strategy
- **OBSTRUCTIVE SLEEP APNOEA:** PEEP/EPAP/CPAP is used to *splint the upper airway open* (as opposed to the alveoli). This often requires PEEP/EPAP/CPAP between 15-25cmH_2O. If patient's CPAP level isn't known, start at PEEP of 10 cmH_2O and with every few breaths titrate up minimum required for obstruction to cease.
- **OBSTRUCED LUNGS (COPD/ASTHMA):** PEEP should not exceed 10cmH_2O. Check the medical record for previous NIV pressures if available. When interpreting these pressures, please note that the Oxylog 3000 uses PEEP & Pinsp, not EPAP & IPAP. To convert, utilise the following
  - PEEP = EPAP
  - Pinsp = IPAP-EPAP

Consider intubation/ palliation (i.e. NIV is failing) if

- **FiO_2 requirement >60% for >2 hours**
- **IPAP > 25cm H_20 needed to achieve VT**
- **RR > 25 breaths per minute despite VT of 10ml/kg ideal body weight**