



Guy's and St Thomas'
NHS Foundation Trust

Tracheostomy ventilation in motor neurone disease

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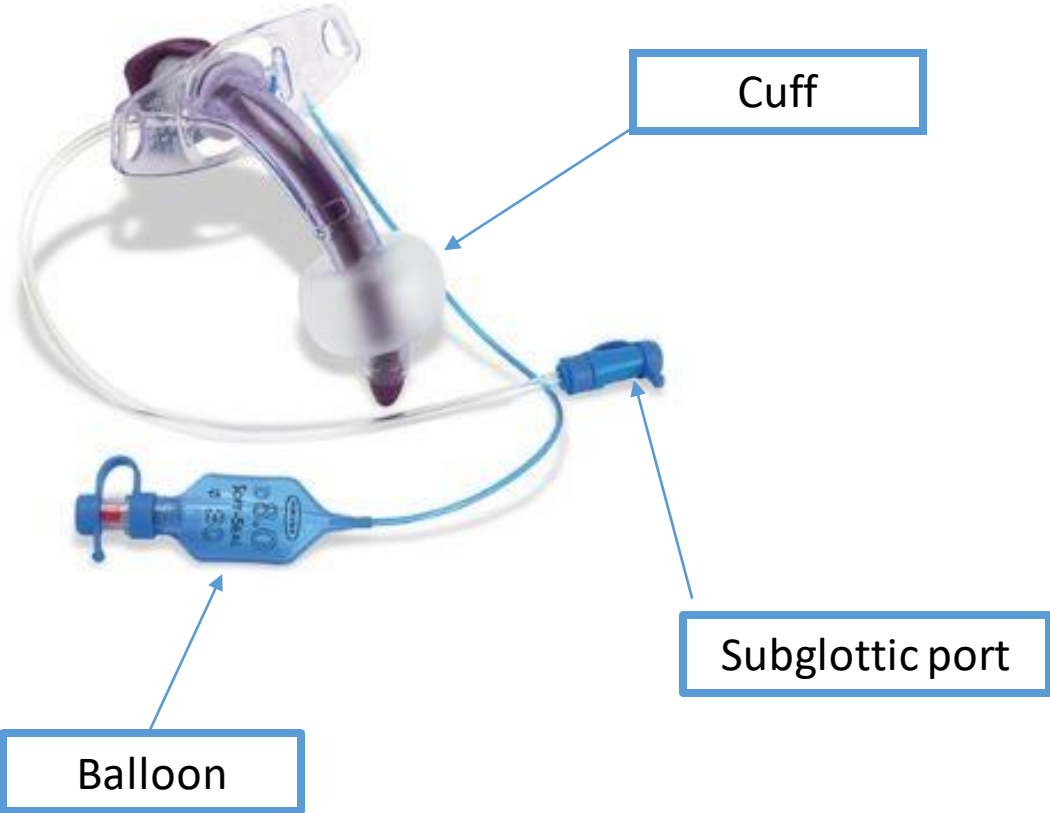
Lane Fox Service



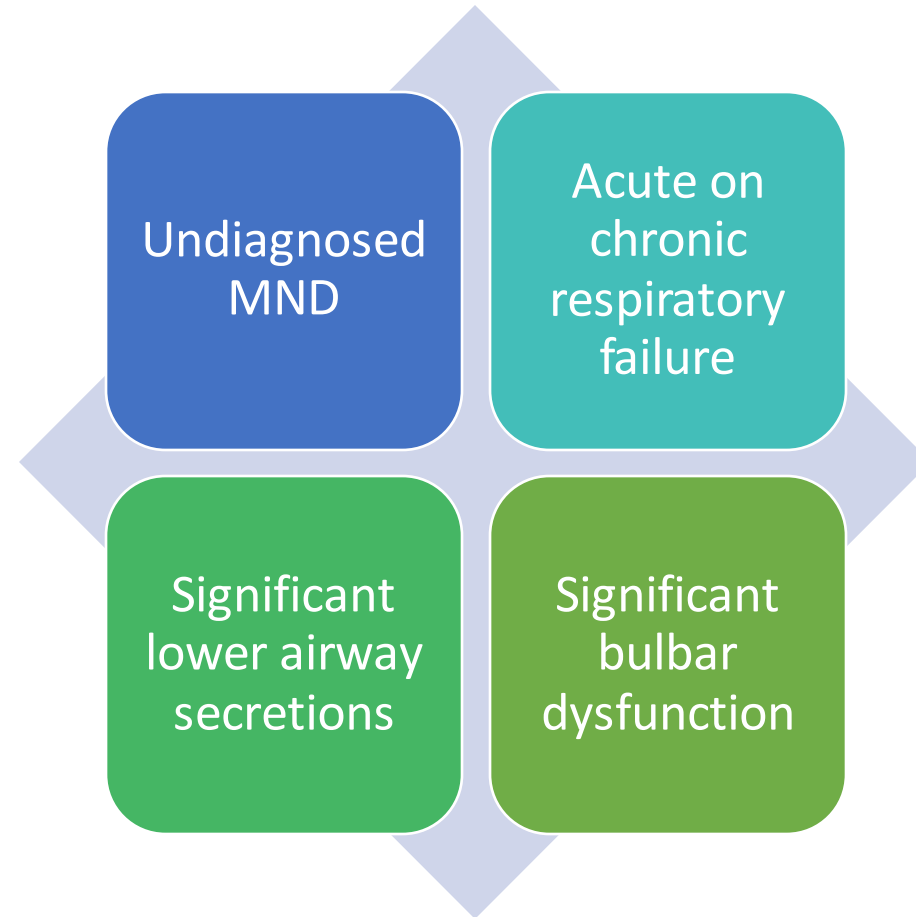
What is it?

- An artificial airway
- Opening normally between 2nd and 3rd tracheal cartilage rings
- Bypasses normal path for respiration
- Ventilation via the trachea = **Invasive ventilation**
- Different components:
 - Inner tube essential
 - +/- subglottic port
 - +/- cuff

Tracheostomy components



Circumstances leading to Tracheostomy ventilation (TV)



Advantages	Disadvantages
Liberation from NIV mask and associated pressure sores	Prolonged hospital stay
Better access to lower airway secretions	Extreme medicalisation of home environment
Reduction in aspiration of oral secretions	Individual's social circumstances may mean returning home not possible
Likely extended life expectancy	Risk of de-cannulation
Effective form of ventilation for patients with severe bulbar dysfunction	Limited care agencies experienced in caring for this cohort of patients
	Life expectancy possibly extended in severe disease state



From hospital to home

- Lengthy discharge process
- Require 24hr care either at home or in specialist nursing home
- CHC funding application , once approved goes to panel
- Selected care agency undergo extensive training prior to patients d/c home
- Carer crisis since pandemic




PRODUCT	SUPPLIED BY:	Supplier Company	Order Code:	NUMBER REQUIRED
Ventilator and filters NIPPY 3+ or 4 Ventilator	Lane Fox Unit	Breas Medical	Provided on Discharge	2
Humidification unit (Fisher & Paykel MR850)	Lane Fox Unit	Fisher & Paykel Healthcare	Provided on Discharge	1
Suction Unit	District Nurses CCG	Local policy	Local policy	2 – at least be should be portable
Cough assist machine (NIPPY Clearway)	Lane Fox Unit	Breas Medical	Provided on Discharge	1
Heated wire vent/humidifier circuits (Fisher and Payker RT202 including MR290 Chamber)	District Nurses CCG	Fisher & Paykel Healthcare	NHS supplies Chain Code: FDC205 (Box of 10)	One circuit per fortnight
Whisper swivel valve (Phillips Respirationics 3321113)	District Nurses CCG	Phillips Respirationics	NHS supplies chain Code : FDE078	X1 per month
Clearway Disposable 2mm circuit (Breas Medical 0960.101)	District Nurses CCG	Breas Medical	NHS supply chain code: FAG2543	1 x every 6 weeks
Smooth bore breathing system limb 1.8m (Intersurgical 5018000)	District Nurses CCG	Intersurgical	NHS supply chain code: FDB951	x1 per fortnight
Water for inhalation (sterile) (Aquilant Critical Care Carefusion AirLife 500.186)	District Nurses CCG GP Prescription	Aquilant Critical Care Carefusion AirLife	NHS Supply chain code: FDD4490	X1, 1L bag per 8-24hrs hours
Catheter mount (Intersurgical 3521)	District nurses CCG	Intersurgical	NHS supply chain code: FDE148	1 per week
HME (Heat moisture exchange) (Intersurgical 1942)	District Nurses CCG	Intersurgical	NHS supply chain code: FTC048	2x weekly
Hard Ambu bag and mask (Intersurgical 7152)	On discharge	Intersurgical	NHS supply chain code: FDE658	1x yearly or PRN
Suction catheters Size	District Nurses CCG	GBUK Healthcare	NHS supply chain code:	1-2x box of 100/week
Suction tubing (Universal Hospital Supplies Ltd UN30026FFM)	District Nurses CCG	Universal Hospital Supplies Ltd	NHS Supply chain code: FWP425	X7 per week
Suction liners 1000mls Suction liners 2000mls			NHS CODE FSE013 NHS CODE FSE016	
Yankauer sucker (Medtronic MITG Argyle (Covidien) 1180501106)	District Nurses CCG	Medtronic MITG Argyle (Covidien)	NHS supply chain code: FWP501	3 per week

Tracheostomy Tube (actual size)				Monthly change
Tracheostomy Tube (size smaller than actual)				
Tracheostomy Cannula Cleaning Swabs TCS/900	District Nurses CCG	Insight Medical Products Ltd	NHS supply chain code: FDH420	Pack of 10 alternate days
Trache dressings (Lahmann metalline 23094 8x9cm)	District Nurses CCG	Activa Healthcare	NHS supply chain code: EJ1191	1 per day
Trache holders Insight Medical Products Ltd TH/100	District Nurses CCG	Insight Medical Products Ltd	NHS supply chain code: FTH000	2 per week
Gauze Swabs to clean trache site	District Nurses CCG	Any brand	NHS supplies EMI283	7 packs per week
Saline Ampoules 10mls	GP CCG	Any brand	Prescription	7 ampoules per week
Gloves	District Nurses CCG	Any brand	NHS supplies	
10 ml syringes	District Nurses CCG	BD UK	NHS supply chain code: 305959 FWC428	1 box per month

Evidence base

- A prospective multi-centre (32) registration and follow-up system for ALS patients
- Aims: 1.)To describe the outcome of TIV therapy, 2.)To clarify factors affecting the prognosis after TIV
- Prospectively followed-up pts with telephone calls and in person reviews
- Conducted from Feb 2006 – January 2018
- 274pts used TIV, 1093 did not
- 190 pts commenced TIV after registration and were included
- Control group: Non TIV group n=1093

Prognosis of amyotrophic lateral sclerosis patients undergoing tracheostomy invasive ventilation therapy in Japan

Naoki Hayashi,¹ Naoki Atsuta,¹ Daichi Yokoi,¹ Ryoichi Nakamura,¹ Masahiro Nakatochi ², Masahisa Katsuno,¹ Yuishin Izumi,³ Kazuaki Kanai,^{4,5} Nobutaka Hattori,⁴ Akira Taniguchi,⁶ Mitsuya Morita,⁷ Osamu Kano,⁸ Kazumoto Shibuya,⁹ Satoshi Kuwabara ⁹, Naoki Suzuki,¹⁰ Masashi Aoki,¹⁰ Ikuko Aiba,¹¹ Kouichi Mizoguchi,¹² Masaya Oda,¹³ Ryuji Kaji,³ Gen Sobue ^{14,15}

Results

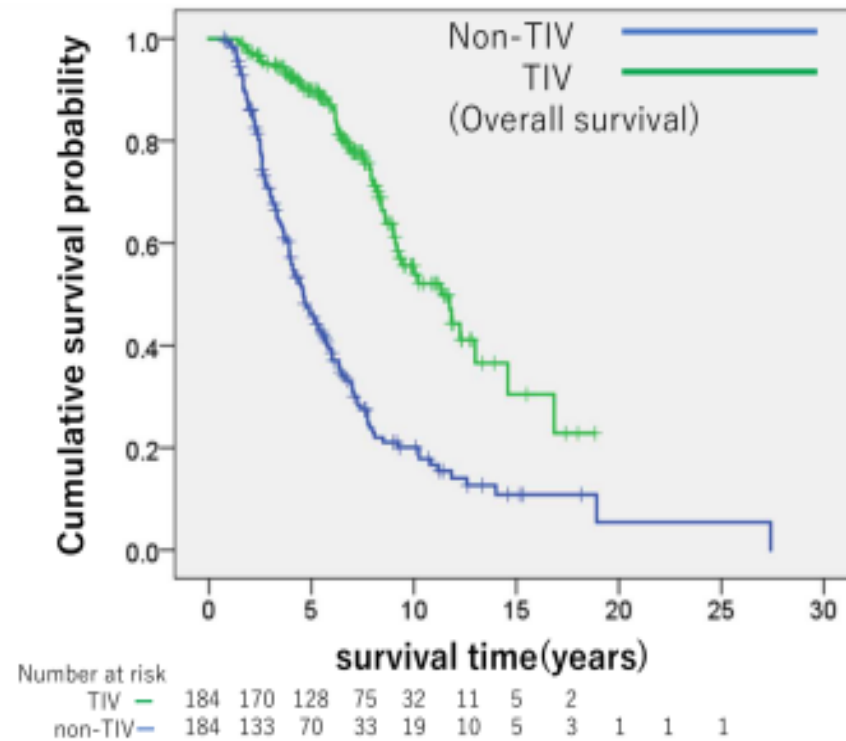


Figure 1 Comparison of overall survival time from onset. The TIV group and the non-TIV group were matched by propensity scores. TIV, tracheostomy invasive ventilation.

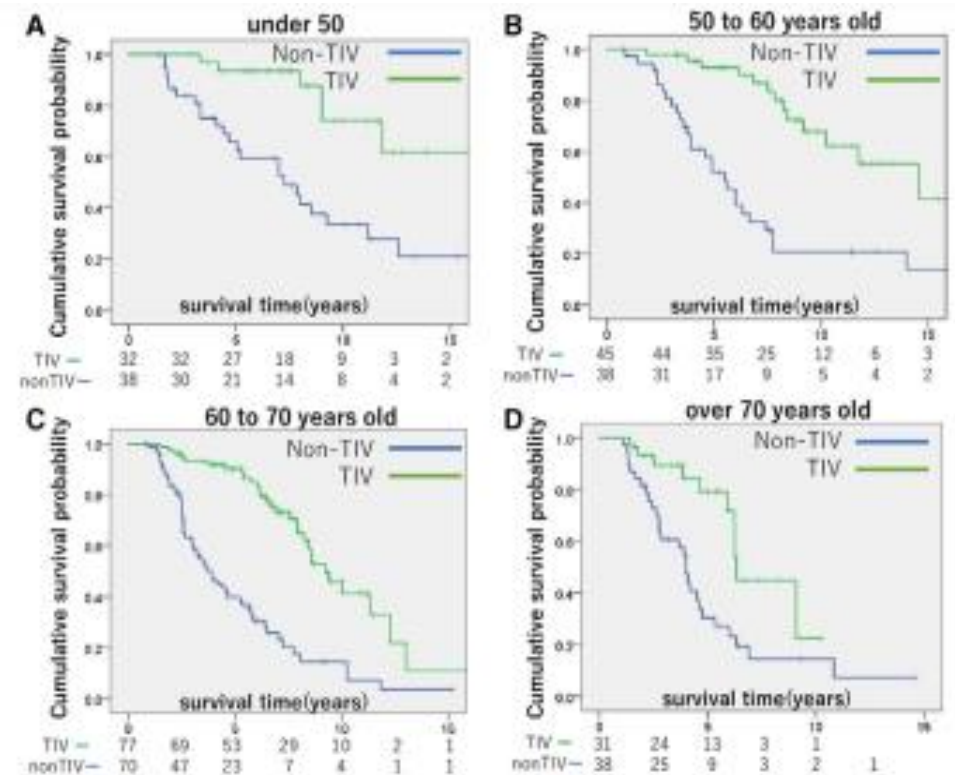


Figure 2 Comparison of overall survival time from onset in each onset age subgroup. TIV, tracheostomy invasive ventilation.

Home tracheotomy mechanical ventilation in patients with amyotrophic lateral sclerosis: causes, complications and 1-year survival

Jesús Sancho,^{1,2} Emilio Servera,^{1,2,3} José Luis Díaz,^{1,2,3} Pilar Bañuls,^{1,2} Julio Marín^{2,3}

- A prospective study carried out between 2001-2010
- 116 patients participated
- 76 patients required a tracheostomy
- 38 patients agreed to tracheostomy, 21 of those required it in an acute setting, 17 as a non-emergency procedure
- 1-year survival rate was 78.9%, mean survival of 10.39 months
- No statistical differences in survival between acute and non-acute TV

Table 2 Demographic data and clinical characteristics for patients with ALS with a tracheotomy performed during an acute episode and those with a non-urgent tracheotomy

	Acute (n = 21)	Non-acute (n = 17)	p Value
Sex (M/F)	8/13	8/9	0.578
Age (years)	63.52 ± 10.55	66.88 ± 6.92	0.267
BMI (kg/m ²)	27.17 ± 3.28	23.76 ± 2.77	0.052
Spinal/bulbar onset	11/10	8/9	0.744
Time from ALS onset to tracheotomy (months)	42.26 ± 47.95	39.75 ± 26.02	0.875
ALSFRS-R	10.95 ± 3.91	11.11 ± 4.32	0.902
NBS	11.76 ± 8.41	10.59 ± 9.09	0.682
FVC (l)	1.01 ± 0.59	0.96 ± 0.44	0.794
%FVC (%)	38.47 ± 19.77	41.20 ± 19.12	0.695
MIC (l)	1.16 ± 0.72	1.37 ± 0.58	0.373
PCF (l/s)	1.89 ± 1.00	2.40 ± 1.12	0.187
PCF _{MIC} (l/s)	2.15 ± 1.22	2.70 ± 1.15	0.206
PCF _{MIE} (l/s)	2.77 ± 0.87	3.51 ± 1.17	0.058
P _{lmax} (cm H ₂ O)	-29.28 ± 16.44	-27.78 ± 16.11	0.809
P _E max (cm H ₂ O)	42.57 ± 27.87	45.71 ± 23.38	0.749
Home NIV prior to tracheotomy (Y/N)	11/10	5/12	0.154
Home MAC prior to tracheotomy (Y/N)	13/8	8/9	0.360

Data are expressed as means ± SD for continuous variables and number for categorical variables.

ALS, amyotrophic lateral sclerosis; ALSFRS-R, revised amyotrophic lateral sclerosis functional rating scale; BMI, body mass index; FVC, forced vital capacity; %FVC, predicted FVC; MAC, mechanically assisted cough; MIC, maximum insufflation capacity; NBS, Norris bulbar subscore; NIV, non-invasive ventilation; PCF, peak cough flow; PCF_{MIC}, manually assisted PCF; PCF_{MIE}, mechanically assisted PCF; P_Emax, maximum expiratory pressure; P_{lmax}, maximum inspiratory pressure.

Tracheostomy ventilation in motor neurone disease: a snapshot of UK practice

Jonathan Palmer¹, Ben Messer², Michelle Ramsay³

- Retrospective 5-year UK audit of TV
- Twenty-four specialist HNV centres participated
- 68 patients initiated on TV
- 81% of those were an emergency insertion
- More than 1/3 undiagnosed at time of insertion
- 85% of the patients were male
- 54% were bulbar presentation
- Mean length of hospital stay was 136 days

Table 1. Patient characteristics of those receiving emergency or elective tracheostomy ventilation.

	All patients	Emergency TV	Elective TV
Number of patients (<i>n</i>)	68	55	13
Gender male (%)	75.3%	69.0%	85.7%
Mean age at intubation (years)	59.0 (32–82)	59.0 (32–82)	58.5 (33–75)
Time from diagnosis until NIV (months)	16.9 (0–65)	18.8 (0–65)	15.0 (1–34)
NIV use pre-TV (%)	49 (<i>n</i> = 34)	36 (<i>n</i> = 20)	100 (<i>n</i> = 14)
NIV usage pre-TV (months)	14.3 (0–59)	11.4 (0–59)	17.2 (4–51)
Time from diagnosis until intubation (months) (includes those diagnosed upon or post intubation)	15.8 (0–73)	14.3 (0–73)	24.9 (9–57)
Time from diagnosis until death (months) (if died before 31 March 2018)	26.6 (1–68)	23.76 (1–66)	37.6 (17–68)

NIV: noninvasive ventilation; TV: tracheostomy ventilation.
Results are reported as mean and full range.



Points to consider

Incidence of TV in MND varies amongst countries worldwide

NIV can almost invariably adequately ventilate a patient

Evidence available demonstrates no superiority between elective and emergency TV in terms of survival

Limited qualitative data : QoL , caregiver strain

Patients' perception is individual

Informed- shared decision making between patient and their consultant

Ensure timely ACP discussions

Thank you

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References

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