



Trachy Tracey Toolkit

A guide to the implementation of low-fidelity bedside tracheostomy emergency training



Rosie Macfadyen, Oliver Robinson and Michael Wild
Western General Hospital
Edinburgh

October 2014

Contact: rosie.macfadyen@nhs.net

Contents

| | |
|---|---------|
| Introduction | Page 3 |
| Background | Page 3 |
| Baseline Measurement | Page 4 |
| Intervention | Page 4 |
| Measurement of Reliability | Page 5 |
| Conclusions | Page 6 |
| Acknowledgements | Page 7 |
| Appendix 1 - Tracheostomy Survey | Page 8 |
| Appendix 2 - Tracheostomy Bedhead Sign | Page 9 |
| Appendix 3 - Unit Posters | Page 10 |
| Appendix 4 - How to make your own Trachy Tracey | Page 16 |
| Appendix 5 - Post-training Survey | Page 17 |
| Appendix 6 - Laryngectomy Bedhead Sign | Page 18 |

Introduction

We designed this Tracheostomy Safety Toolkit to allow other ICUs to implement a bedside training intervention to improve implementation of the National Tracheostomy Safety Project algorithm for management of the blocked or obstructed tracheostomy.

Background

NAP 4, the fourth National Audit project of the Royal College of Anaesthetists (<http://www.rcoa.ac.uk/nap4>), reported on incidents involving tracheostomies that resulted in serious harm or death.

Displacement of tracheostomies led to several deaths. Displacement occurred during movement or routine care. There were 14 cases of accidental dislodgement of tracheostomies reported, all in the ICU, with 7 patient deaths and four patients left with hypoxic brain injury. The use of capnography was clearly lacking in at least six of these cases. A plan for the management of tracheostomy displacement was clearly lacking in at least six of these cases.

Review of cases showed that when patients were accidentally decannulated there was an evident lack of a systematic approach, highlighting the importance of training and education of all staff attending these patients.

The authors of the tracheostomy chapter concluded that while effort should be made to minimise the risk of tracheostomy displacement, the greatest benefit would likely come from early detection (nursing awareness, use of capnography) and prompt management of displacement (protocols that trainees and nursing staff are familiar with and for which the necessary equipment and skills are available). Algorithms must be available for all staff for management of accidental decannulation of the trachea, emphasising a step-wise approach to the management of the compromised airway.

The more recent NCEPOD report, “On The Right Trach” studied patients who underwent a new tracheostomy insertion or a laryngectomy between 25th Feb-12th May 2013 in England and Wales (<http://www.ncepod.org.uk/2014tc.htm>). Only 63.7% (135/212) of hospitals reported a stated level of competency expected for staff caring for a tracheostomy. Principal recommendations of the report included:

- Bedside staff caring for tracheostomy patients must be competent in recognizing and managing common airway complications, including tube obstruction and displacement as described by the National Tracheostomy Safety Project algorithms.
- Training programmes in blocked/displaced tubes/airways and difficult tube changes should be delivered in accordance with clinical consensus guidelines as stated by the NTSP (<http://www.tracheostomy.org.uk>) and the Intensive Care Society (<http://www.ics.ac.uk>).

Our organisation has formal study days for nursing staff on tracheostomy care including management of the blocked or obstructed tracheostomy. This course requires a day's study leave, which limits the number of staff who can attend. We felt that introducing bedside teaching of the NTSP 'Primary Responder' algorithm would be a more effective way to deliver training to nursing staff on the ICU, and would lead to a measurable improvement in the knowledge of this algorithm amongst our staff.

In response to the recommendations of the reports discussed above, we measured knowledge of the NTSP algorithm for management of the blocked or obstructed tracheostomy whilst implementing a simple bedside tutorial using a Girl's World™ mannequin.

Baseline Measurement

We measured the knowledge of our nursing staff on several key points of tracheostomy safety (see appendix 1). We did this over a 2 month period, sampling approximately ⅓ of our staff.

Intervention

Our Tracheostomy Safety initiative consisted of:

- Introduction of bedhead signs based on the NTSP bedhead signs (see appendix 2). These were placed in the bedspace of every patient with a tracheostomy in situ.
- A poster campaign within the unit (see appendix 3) This involved placing brightly-coloured, illustrated posters, detailing each step of the

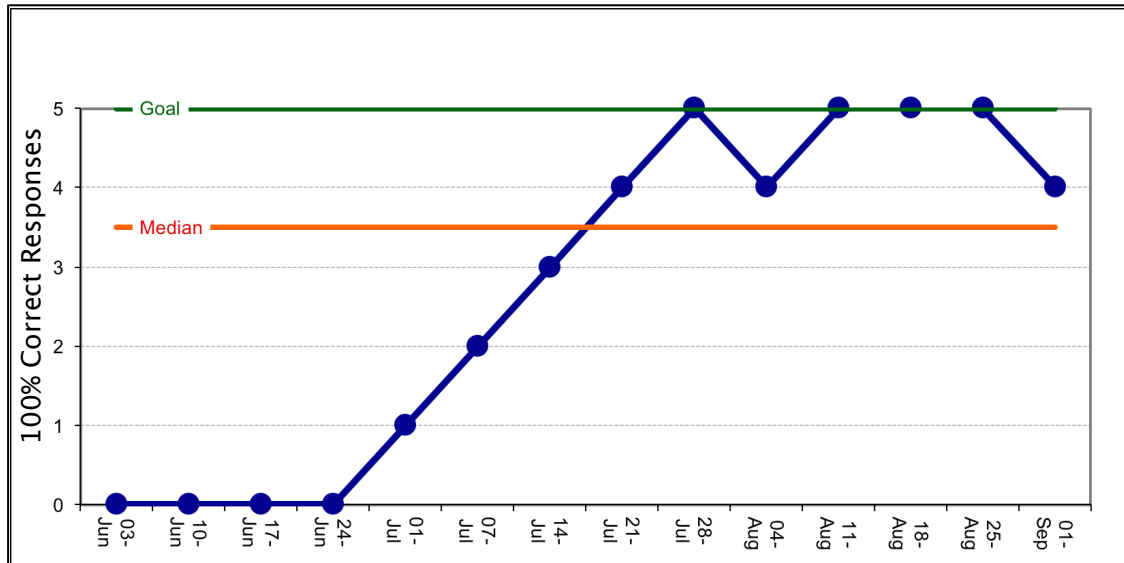
NTSP algorithm, in several key places in the unit (changing rooms, doctors room, beside the gas machine).

- A bedside teaching tutorial using Trachy Tracey, our modified Girl's World™ doll (see appendix 4 for details on how to make your own Trachy Tracey). This tutorial consisted of a ten minute PowerPoint presentation delivered on a tablet computer (although printed slides in a folder would be equally effective) covering the difference between tracheostomies and laryngectomies, tracheostomy 'red flags' and what to do about them, and the primary responder algorithm for management of the blocked or displaced tracheostomy (a PDF version of the presentation we used is attached as a separate file). During this tutorial we could physically go through the steps of the algorithm on Trachy Tracey, and ask the nursing staff to do the same to consolidate their knowledge at the end of the teaching session.

We were able to train 75% of our nursing staff within a three-month period. This meant that in any given nursing shift the majority of nurses were 'Trachy Tracey Trained'.

Measure of Reliability

To measure the reliability of our intervention at achieving the outcome we desired, we questioned 5 nurses, picked at random, every week. We asked them where they would expect to find guidance on the management of the blocked or obstructed tracheostomy (the bedhead sign) and what were the first three things they would do if faced with an acutely deteriorating patient with a blocked or obstructed tracheostomy (call for help, give oxygen to the face, give oxygen through the tracheostomy). We chose this as a means of assessing the reliability of the process as it was quick and easy to do, and also pragmatically tested the essential knowledge and first steps we would expect of those who had undergone the teaching. The run chart showing the measure of reliability (number of nurses/5 nurses questioned getting all these questions correct) is below. The questionnaire can be found in Appendix 5.



Conclusion

We have designed and executed a low-cost and effective intervention to improve implementation of the NTSP primary responder algorithm for management of the blocked or obstructed tracheostomy.

Benefits of our approach compared to training on day release courses include the ability to train large numbers of nursing staff in a short period of time within their working environment. Compared to conventional airway training manikins, Trachy Tracey is small, lightweight and portable and can easily be used within a clinical bedspace area. We focused on management of 'mouth breather' tracheostomy emergencies, but the teaching material can easily be modified to include 'neck breather' laryngectomy emergencies (see appendix 6 for the corresponding bedhead sign).

This toolkit contains all the information required to implement this intervention, but should you have any questions, or would like us to manufacture a Trachy Tracey for you, please do get in contact.

Acknowledgements

Thank you to:

Dr Karen Watson, Consultant Anaesthetist, St John's Hospital Livingston for permission to reproduce the NHS Lothian Bedhead sign.

Dr David Falzon and Dr Fleur Harding, Specialty Trainees in Anaesthesia, SE Scotland, for permission to use their tracheostomy questionnaires.

Dr Ross Paterson, Consultant Intensivist, Western General Hospital Edinburgh, for guidance in conducting this project.

Tracheostomy Survey: Short Version

Job Title:

.....

(1) Are you aware of any guidelines regarding the management of tracheostomy/laryngectomy airway emergencies? Yes or No

(2) If you do know of guidelines, where can you find them?

(3) Do you have any dedicated emergency equipment for dealing with emergencies in patients with tracheostomies? Yes or No

If so, can you tell me where it is located?

(4) Where will you find information recorded regarding the date of tracheostomy formation/type/size?

(5) What would you do if a tracheostomy became dislodged/obstructed?
Please state the first 3 things:

This patient has had a TRACHEOSTOMY

**In Emergency:
CALL FOR HELP
Call 2222 for Emergency Team**

Surgical / Percutaneous:

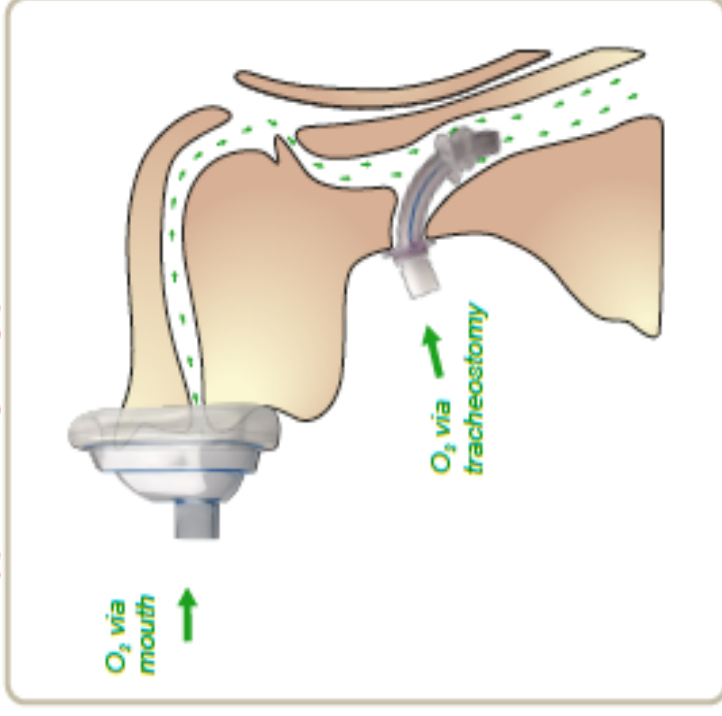
Performed on:

Tracheostomy tube size:

(Note: The upper airway may provide an intact airway)

Give oxygen via BOTH stoma & mouth

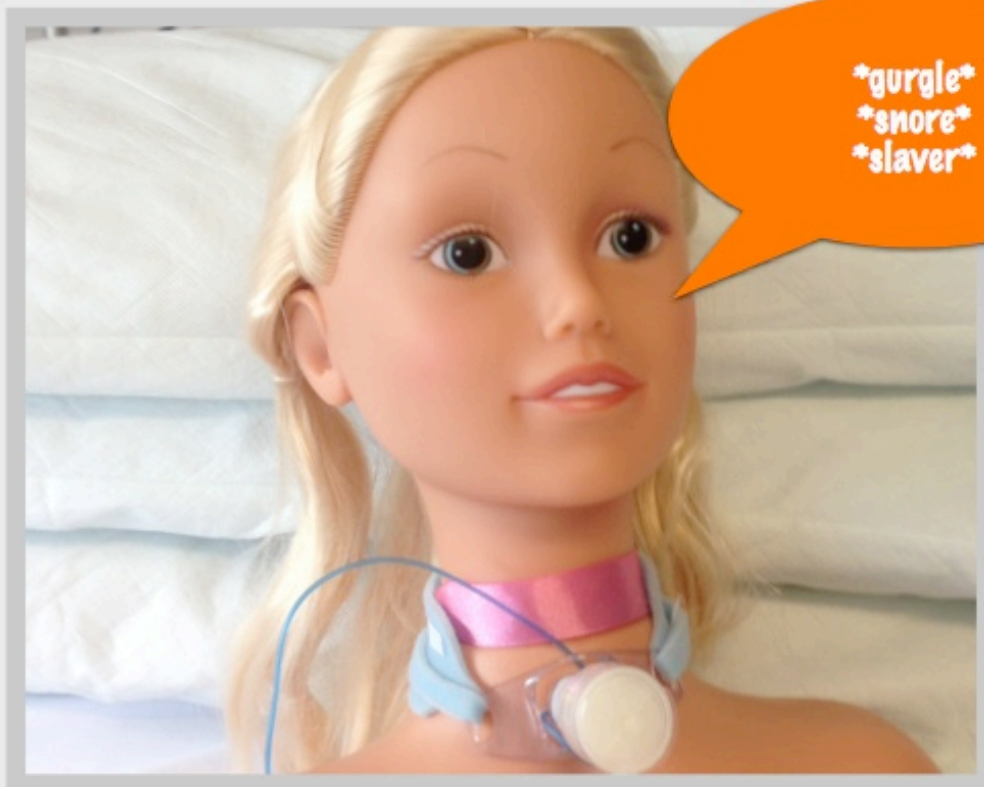
- Oxygen to face & stoma
- Remove cap/inner tube
- Pass a suction catheter
- Deflate cuff/remove tube
- Consider ventilation via upper airway or stoma using a mask or tube
(If ventilating via mouth occlude stoma site)



STEP ONE

Tracey has a trachy. Tracey suddenly becomes distressed, tachypnoeic and begins to desaturate.

Can you save Trachy Tracey?



CALL FOR HELP.

STEP TWO



Look, listen and feel at mouth and tracheostomy.
Look at capnograph trace



APPLY HIGH FLOW OXYGEN TO BOTH FACE AND TRACHEOSTOMY.

Think: how will I do this in my bedspace?

- By increasing FiO_2 on the ventilator?
- By attaching a C-circuit?
- Do I have a facemask to hand?

STEP THREE

Assess trachy tube patency.



Remove speaking valve or cap if present.
Remove inner tube.
Try to pass suction catheter.

If you can pass a suction catheter, the trachy tube is patent and it is safe to bag the patient if required.

If you can't pass a suction catheter, the trachy tube is blocked. The next step involves trying to get oxygen *around* the trachy tube...by letting the cuff down...

STEP FOUR



DEFLATE CUFF

Look listen and feel for airflow at mouth and trachy.

Use capnography - look for a normal ETCO₂

IF THE CAPNOGRAPH TRACE IS ABSENT OR ABNORMAL - IT IS SAFER TO ASSUME THE TRACHY TUBE IS NOT IN THE TRACHEA.

'BAGGING' THROUGH A DISPLACED TRACHEOSTOMY CAN CAUSE LIFE-THREATENING SURGICAL EMPHYSEMA!

Before you 'bag' think - What evidence do I have that the trachy tube is in the trachea? Suction catheter passing ? Capnograph trace normal?

STEP FIVE



If Tracey hasn't improved with Steps 1-4 and oxygen saturations are $<88\%$:

REMOVE THE TRACHY TUBE!

RE-APPLY OXYGEN TO FACE. COVER STOMA WITH SWABS/HAND.

Use standard oral airway manoeuvres to maintain oxygenation until help arrives.

TRACHY TRACEY'S TAKE-HOME MESSAGES!!!!



You saved
me!!!
Mwah  xx

Oxygenation is
our main
priority

*If you can't pass a suction
catheter it is safer to assume
the trachy tube is not in the
trachea.*

*If you can't see $ETCO_2$ with every breath it is
safer to assume that the tracheostomy tube
is not in the trachea*

*Do not give assisted breaths via the C-
circuit unless you have evidence that the
trachy tube is in the trachea ie $ETCO_2$
trace with every breath.*

How to make your own Trachy Tracey mannequin

What you need:

- A Girls World™ doll
- Drill (either an electric drill or hand drill will work fine)
- 11mm Brad-point type drill bit (see picture)
- Size 7 cuffed tracheostomy tube and tie
- 10ml syringe
- Lubricant



Manufacturing:



- Secure the doll in a vice or in such a manner that she will not move upon drilling.
- Position the drill in the required tracheostomy position. Approximately 1.5-2cm below the neck joint works well.
- Drill the hole in a single movement. Be gentle to avoid cracking the plastic.
- Clean up the edge of the hole with a wood file or some fine sandpaper to remove any spurs.
- Lubricate the cuff well and insert the tracheostomy tube. This will give a snug fit for a Size 7 Portex tube.
- Tie in position.

Tracheostomy Post-Training Survey

WEEK BEGINNING:

Where would you find the guideline to deal with the blocked / obstructed tracheostomy?

BEDHEAD SIGN

What would you do if a tracheostomy became dislodged/obstructed? Please state the first 3 things:

Call for help

Oxygen to mouth

Oxygen to stoma

This patient has had a LARYNGECTOMY

In Emergency:
CALL FOR HELP
Call 2222 for Emergency Team

Performed on:

Tracheostomy tube size:

(Note: there is **NO** connection between the trachea and the mouth/nose)

DO NOT give oxygen via mouth!

- Apply Oxygen to stoma
- Remove cap/inner tube
- Pass a suction catheter
- Deflate cuff/remove tube
- Consider ventilation via stoma using a mask or tube

