

The Tube and Epidural Database (TEPID) —installation notes for Linux users*

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October 2008

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*<http://www.nickalls.org/dick/papers/xenon/tepid/tepid-linux.pdf>

1 Introduction

Over the years I have collected double-lumen Tube and EPIdural Data from thoracic and emergency lists. As this data has increased I have found that it serves as an accurate predictor of tube size & length and midline epidural depth for particular patients. The result is TEPID—a searchable database—for use with search programs written in Perl.

In order to make the data easily available I have put the database on a CD together with some Perl search tools. In short—everything you need is on the CD—just follow the instructions.

Preliminaries

The files on the CD are organised into the following directory structure.

```
TEPIDdatabaseLINUX/
-----/perl-modules/
-----/readme/
-----/TEPID/
```

The TEPID package consists of the database file (`tepid.dat`) and a few supporting files in the directory `TEPIDdatabaseLINUX/TEPID/`.

2 Installation

Copy the `TEPIDdatabaseLINUX/TEPID/` directory and contents from the CD to your filesystem on the hard-drive. The filenames and functions are as follows.

<code>launcher.pl</code>	Perl program which creates the widget
<code>perlcamel.gif</code>	Perl camel logo
<code>tdata.txt</code>	last instance of the TEPID output file
<code>tepid.sh</code>	BASH file to launch the widget from any directory
<code>tepid.dat</code>	TEPID database
<code>tepid.pl</code>	Perl program for searching the database
<code>tepidhwr.pl</code>	Perl program for writing the TEPID output file

User permissions

In order to run the perl programs it is likely that you may have to modify the user permissions for all the files. Since the main file actually creates a file and writes data to it then the USER needs at least WRITE and EXECUTE access. For example, to give yourself READ, WRITE and EXECUTE access (`rwxr--r---`) then type the following command (as ROOT).

```
chmod 744 <filename>
```

or, for an entire directory, then use

```
chown dick /home/dick/.../<filename>
chmod -R 744 /home/dick/.../directory
```

To just add, say, EXECUTE access, then type

```
chmod +x <filename>
```

3 The TEPID program

The TEPID program was written in Perl 5.8.1 on a Linux Mandrake 9.2 platform. The program asks for patient gender (M/F), weight (kg), height (cms or inches), and range (enter a suitable positive value; default is ± 7.5 kg ± 7.5 cms). It then selects and averages all data within the specified range, and writes the results to the screen. The screen results are saved as an ASCII file called `tdata.txt`, and all the specific data used in compiling the results is saved as an ASCII file called `tepid.log`. These can then of course be viewed, edited, and printed as necessary. The TEPID database is a simple ASCII file called `tepid.dat`¹. The results as presented are constrained as follows.

- Paramedian data is not processed

Although the TEPID database does contain paramedian data, only the midline epidural data is processed by the search program. This is because it was found quite early on that the paramedian data was too variable and hence had little or no predictive value.

- Search range

For convenience the value entered is used for both weight and height. So, if you enter a value of 5, then the database will search only for values within the range $wt \pm 5$ kg and $ht \pm 5$ cms.

- The epidural data is pooled (male + female)

This is because the mean male & female data for a given weight and height were not significantly different.

- Tube length & size

The mean male & female data for a given weight and height are significantly different. However, some of this difference probably reflects some selection bias in view of the tendency for anaesthetists to start with a 39F for female patients and a 41F for male patients.

- Estimated carina position

This is estimated from the mean position of the tracheal orifice of the double-lumen tubes, by adding 1.5 cm (a typical side-hole—carina distance). This may be a useful guide for avoiding inadvertent endobronchial intubation in short fat patients (Mackenzie M and MacLeod K (2003). Repeated inadvertent endobronchial intubation during laparoscopy. *Br. J. Anaesthesia*, 91, 297–298).

¹A spare copy of this file—named `tepid.data`—is kept in the top directory (just in case!). If you do need to replace the original file remember to rename its filename extension `.data` \rightarrow `.dat`

A typical output (for Male / 76 kg / 177 cms / range ± 7.5) is shown below

```
*****
**                                     **
**          TEPID                       **
**          A TUBE AND EPIDURAL DATABASE **
**          Mon Feb 28 15:53:14 2005    **
**                                     **
*****
```

Male, Wt 76 kg, Ht 177 cm (69.6 inches) [BMI = 24.2]
[wt/ht range: +- 7.5 cm, 7.5 kg]

RESULTS midline data: (male + female combined)

```
-----
BS(-1) [T6-7]   mean midline depth = 5.75 (n=1)
BS( 0) [T7-8]   mean midline depth = 5.68 (4.5 -- 6.5) n=17 SD=0.58
BS(+1) [T8-9]   mean midline depth = 5.47 (4.75 -- 6.5) n=9 SD=0.51
BS(+2) [T9-10]  mean midline depth = 5.06 (4 -- 6.5) n=5 SD=1.1
BS(+3) [T10-11] mean midline depth = 4.41 (4 -- 5) n=6 SD=0.37
BS(+5) [T12-L1] mean midline depth = 4 (n=1)
```

RESULTS Double-lumen tube data: (Male)

```
-----
41L mean length = 30.02 (range 28 -- 32) n=52
39L mean length = 29 (n=1)
37L ----
35L ----
41R mean length = 29.1 (range 28 -- 30) n=5
39R mean length = 28.16 (range 27.5 -- 29.5) n=3
37R ----
35R ----
```

RESULTS estimated carina position: (Male)

```
-----
mean DL side-hole position = 24.19 (range 21 -- 26.5) n=61
estimated mean carina distance = 25.69 (range 22.5 -- 28) n=61
```

database numbers

```
---total no of entries in database: n = 528
---midline epidural entries in database
      (male + female combined): n = 285
---(tube + Male) entries in database: n = 256
-----
```

4 Running TEPID

There are several different ways of running TEPID as follows:

- Using the command-line locally

Open a terminal window and move to the /TEPID/ directory. Now type the command `perl tepid.pl`, and Perl will run the TEPID program as described above; the program writes its output to the terminal window and automatically saves the data to the file `tdata.txt` (overwriting the previous instance of this file).

- Using the TEPID widget

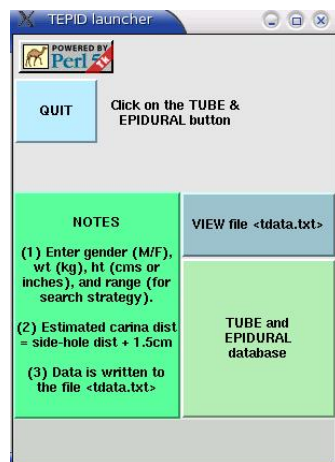


Figure 1: The TEPID widget as it appears on the screen. Click on the ‘tube and epidural’ button to run the TEPID search program. Note that the blue ‘view’ button is disabled in the Linux version.

Open a terminal window and move to the /TEPID/ directory. Now type the following command.

```
perl launcher.pl -geometry 300x400-550-200
```

This command will launch the TEPID widget as shown in Figure 1. Click on the green ‘tube and epidural’ button; the widget will disappear and Perl will start the TEPID program (output is written to the terminal window and saved to the file `tdata.txt`). If you now press P to print the output file `tdata.txt` is directed to the line printer (uses the command `lpr tdata.txt`) and the widget reappears as the program closes. Alternatively, just press Q to quit and the widget will reappear.

As currently set up the TEPID widget will appear to the left of the screen as shown in Figure 2. The screen location of the widget (depends on the resolution of your screen) can be customised by adjusting the last two values `-700-200` of the `-geometry` command; the first of these (`-700`) is the number of horizontal pixels from the right-hand side of the screen, while the final value (`-200`) value is the number of vertical pixels from the bottom of the screen.

- Using the BASH file `tepid.sh` from any directory

If you are in the /TEPID/ directory, then typing the command `bash tepid.sh` will also launch the widget as before. If the file `tepid.sh` is placed where the

Linux shell can find it (usually the directory `usr/local/bin`) then this command will work from any directory.

More conveniently, if the BASH file is renamed to `tepid` and made executable (e.g. by the command `chmod 755 tepid`), and placed where the shell can find it (say, in the directory `usr/local/bin`), then simply typing the command `tepid` from any directory will then launch the widget.

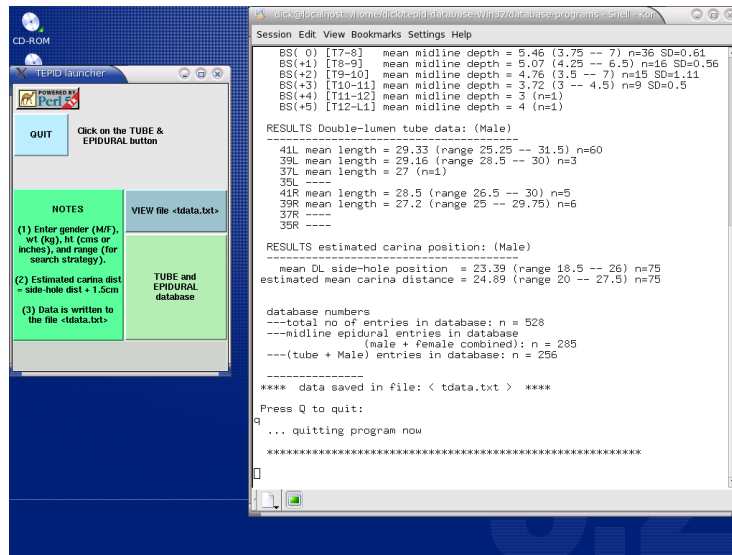


Figure 2: A screenshot showing the widget and the terminal window after running the TEPID search program. To print the output type `lpr tdata.txt` at the command-line.