

## Evaluation of Staffing Levels in CSSD

Presented by  
 Terry McAuley  
 Sterilisation & Infection Control  
 Consultant

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## Outcomes

- Examine the factors that impact on CSSD workloads
- Identify factors that contribute to CSSD efficiency
- Discuss various methods for calculating staffing levels in a CSSD

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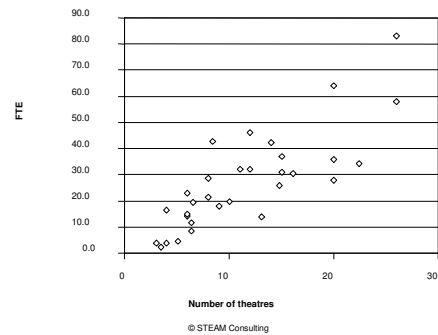
## The issue....

- It is commonly reported amongst CSSD managers that there is no easy or accurate method available to calculate actual FTE required to provide a safe, effective and efficient sterilising service.
- The majority of managers report that FTE is calculated according to workloads, operating minutes or patient dependency.

» (Radke, 2004).

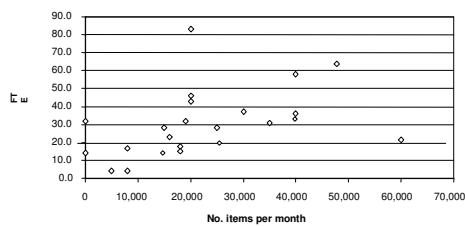
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## FTE vs No. Theatres



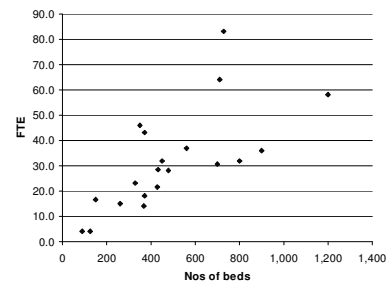
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## FTE vs Items sterilised / month



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## FTE vs Number of beds



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## How can staffing levels be calculated?

First - examine factors that impact on workload

Second - look at factors that contribute to efficiency

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### What factors impact on CSSD workloads?

- Hospital beds
- Outpatient clinics
  - External customers?
- Clinical diagnostic and treatment units
  - Respiratory, diagnostic imaging, podiatry, dental
- Accident & Emergency
- Intensive Care Unit
- Endoscopy Unit

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### What factors impact on CSSD workloads?

- Day Surgery Unit
  - Fast turnover of cases
- Operating Suite
  - Number of theatres
  - Surgical specialties
    - Orthopaedic, Cardiac, Neurosurgery, Gynaecology, ENT, Urology, Vascular, Plastics, General, Renal, Paediatric, Trauma

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### What factors impact on CSSD workloads?

- Instrument inventory management
  - Tracking systems
  - “fast tracking”
- Range of instrument tray types
  - Complexity of instruments within sets
- Number of instruments per set
  - Are all the instruments routinely used?
- Number of single packaged items
  - Are too many of these opened per procedure?
- Preparation of basic sets
  - Catheter trays, minor procedure or dressing trays, bowls and kidney dishes

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### What factors impact on CSSD workloads?

- Access to suitable equipment and consumable resources
  - Mechanical vs manual cleaning
  - Breakdowns, repairs and reworking
  - Delays to lack of resource availability
- Access to experienced and qualified personnel
  - Ratio of skilled to unskilled personnel

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- The configuration of human resources in terms of allocated duties, seniority, skill mix and qualifications will ultimately have an impact on the productivity of a department.
- Qualified, senior personnel on average will be more productive than inexperienced, unqualified staff. A workforce of inexperienced staff as well as being less productive consumes more resources in terms of materials from correcting errors and senior staff time in terms of increased levels of supervision and coaching being necessary.

» Radke, 2004, Reichert, 1999.

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### What factors impact on CSSD workloads?

- Lack of communication
- Lack of access to management data

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### Factors contributing to efficiency

- Good communication
  - Forward planning allows better utilisation of available resources
  - Assists in identifying and eliminating possible problems before they arise
- Access to management data
  - Tracking systems
  - Production statistics
  - Workload analysis

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### Factors contributing to efficiency

- Improve the quality of staff employed
  - More experience and qualifications often equals improved productivity
    - More autonomous
    - Faster
    - Less errors
  - Invest in staff orientation, training and performance management / competency assessment programs

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### Factors contributing to efficiency

- Develop sound Quality Management Systems
  - Clear, well designed policies and work instructions guide work practices, assist in decreasing errors and facilitate staff training

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### Factors contributing to efficiency

- Automate processes as far as possible
  - Minimise double handling wherever practicable
  - Can machines be programmed to turn on automatically or select the appropriate cycle without operator interaction?

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### Factors contributing to efficiency

- Maintain reasonable inventory levels so that fast track reprocessing is not required
  - The greater the demand for "fast tracking" the more staff are required to service the requirements
- Aggressively manage the surgical instrumentation requirements in terms of tray contents and single packed items
  - The more trays and single items used in each procedure, result in increased levels of reprocessing required

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### How do you calculate staffing levels?

- No clear, accurate or generic CSSD staffing level calculation tools reported in the literature
  - Calculations are often based on
    - Traditional or historical methods
    - Nursing models
    - Number of work stations
    - Number of theatres & beds or operations performed
    - Number of trays processed
    - Any combination of the above

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### Hypothetical CSSD

- St Elsewhere's Hospital
  - 10 operating rooms
  - 2 Endoscopy procedure rooms
  - 370 acute inpatient beds
  - Produces 20,000 items per month
  - Performs 9,000 surgical procedures per annum
  - Performs 5,000 endoscopy procedures per annum

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### Models based on theatres & beds

- One Australian hospital has used a staffing formula that allows
  - 1 FTE per 25 acute beds, 0.5 FTE per 25 sub-acute beds and 1 FTE per theatre/endoscopy suite.

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### St Elsewhere's staffing levels

- 1 FTE per 25 acute beds (375/25)  
= 15
- 1 FTE per Theatre & procedure room  
= 12
- Total FTE = 27
- Doesn't take into account:
  - Staff leave, staff training, hours of department operation, manager or supervisor roles, instrument complexity

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### Using shift allocation model

- The Australian College of Operating Room Nurses suggests a model that is used for staffing operating theatres
  - Assumes number of staff required to service a theatre
    - Per shift, 24 hours a day, 7 days per week
  - Makes calculations based on these assumptions

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### Model based on shifts required to service theatres

- So, if we have a theoretical hospital with:
  - 10 operating rooms and 2 procedure rooms (12 total) that work Monday to Friday 0800 – 1800,
  - 2 emergency theatres open from 1800 – 2400 Monday to Friday
  - and 1 emergency theatre open on weekends from 0800-1600
  - and 40% of the total workload is from the other clinical units, but only during the morning shift Monday to Fridays
  - The calculation would look like this:

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### Morning shift

- No. Rooms : 12
- No. Hours: 11 (allow one hour to set up the machines)
- No. Days = 251 (this is the number of available weekdays minus 10 public holidays – this may change for your purposes)
- Assume a rostered shift is 8 hours duration and one person is required to service 1 operating room

$$\frac{251 \text{ (days)} \times 12 \text{ (rooms)} \times 11 \text{ (hours)} \times 1 \text{ (person)}}{251 \text{ (days)} \times 8 \text{ (hour shift)}}$$

$$= \frac{33,132}{2008}$$

**=16.5 FTE (Operating Rooms) + 6.5 FTE (clinical units)\***

\*For this example the clinical units contribute to 40% of the total workload during the morning shift Monday to Friday.

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### Afternoon shift

- No. Rooms : 2
- No. Hours: 7 (allow one extra hour to finish the machines)
- No. Days = 251
- $\frac{251 \text{ (days)} \times 2 \text{ (rooms)} \times 7 \text{ (hours)} \times 1 \text{ (person)}}{251 \text{ (days)} \times 8 \text{ (hour shift)}}$

$$= \frac{3514}{2008} = 1.75 \text{ FTE}$$

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### Weekends

- 104 days
- No. Rooms : 2
- No. Hours: 10 (allow two extra hours to start and finish up the machines)
- No. Days = 104 (this is the number of available weekend days)
- $\frac{104 \text{ (days)} \times 1 \text{ (room)} \times 10 \text{ (hours)} \times 1 \text{ (person)}}{104 \text{ (days)} \times 8 \text{ (hour shift)}}$

$$= \frac{1040}{832} = 1.25 \text{ FTE}$$

So, we have three figures to add together – 16.5 + 6.5 + 1.75 + 1.25 = 26 FTE

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### Non-productive hours

- **FTE x Non-productive weeks**
- 52 (weeks) - No. of non-productive weeks
- Assume that the number of non-productive weeks is 6 weeks per year.
- Thus
- $\frac{26 \times 6}{46 \text{ weeks}} = \frac{156}{46} = 3.39$

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- This makes a total of 29.39 FTE
- This method doesn't account for: manager or supervisor roles, variation in instrument complexity
- It does cover all shifts and non-productive hours

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### Model based on number of operative procedures

- As reported by Wim Renders (WFHSS) a method was developed by the Belgians for calculating staff numbers based on the number of operative procedures performed, taking into account the impact of workload from other clinical units and factoring in a contingency for staff training and absenteeism.
  - This formula was arrived at after a year long study looking at workload and productivity in sterilising departments in 1991.

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### St Elsewhere's staffing levels

- Number of operative procedures per annum / 1520 (number of hrs person works per year) x 1 hour (to attend to work generated per procedure)  
 $14,000 / 1520 \times 1 = 9.2$  FTE
- OR usually consumes 60% workload thus to account for this  
 $(9.2 \times 100) / 60 = 15.3$  FTE
- Allow for staff absences of 20%  
 $15.3 \times 1.25 = 19.1$  FTE
- Doesn't account for:
  - Manager or supervisor roles, instrument complexity

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### Evaluation of staffing models

- The first two models results mirror each other closely – 27 versus 29.39 FTE
- The Belgian model differed by 10FTE
- Which model is correct?
- A hospital with a similar profile has an actual FTE of 43

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### A possible tool?

- An instrument weighting tool was developed in Australia
  - Allocates “weights” to instruments based on degree of difficulty in cleaning / complexity
    - 10 levels
  - Instrument sets can then be given a combined “weight”
    - Used for estimating reprocessing time and for costing purposes

» Grainger & Ison

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### A possible tool?

- An unpublished study has shown that on average 1 FTE can reprocess an average of 20 Operating Room procedures per week
  - Depends on instrument complexity
  - Model developed assumes 1 FTE per OR per shift plus allowances for additional activities

» Joyce Kenyon

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### Using this model...

14,000 procedures per annum =  
approx 270 procedures per week

270 divided by 20 = 13.5 FTE

- Doesn't account for manager, supervisor, load from clinical areas, absenteeism, annual leave

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### Workload Indicators of Staffing Needs

- WISN methodology is based on activity measurement and calculation of staffing needs based on this data  
» Ozcan & Hornby, 1999
- Data obtained by
  - Direct observation (time & motion studies)
  - Self reporting (staff log book / diary)
  - Staff questionnaire or interview
  - Expert opinion

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## Advantages of WISN

- Examines the actual work load as it is experienced and under actual workload conditions for the organisation
- Can identify opportunities for efficiency gains or recognise excessive workload demands

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## The practical reality...

- Each hospital must undertake its own analysis of workloads in order to determine the staffing levels required
  - There is significant variation between hospitals in terms of instrumentation, inventory levels, equipment and staff skill levels that means benchmarking can be very difficult

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