“Efficient” Operating Room Management

“by use of balanced scorecards to control and guide operating room management”

Cathy S.I. De Deyne MD, PhD
Dept of Anesthesia and Critical Care
Ziekenhuis Oost-Limburg - Genk
1. European – US difference in operating room management

- Arrangement literature: US ++++
- “OR Manager”: [www.ormanager.com](http://www.ormanager.com)
- Franklin Dexter (Iowa): [www.franklindexter.net](http://www.franklindexter.net)
- American Association of Clinical Directors: [www.aacdhq.org](http://www.aacdhq.org)
- Economics of Operating Room Utilization

- Impact of technical advances < changes in health care economics
  - Current medico-economic environment
    - Failure of government policy
    - Widespread development and implementation of latest technology
  - Role of physicians: evidence-based practice ??
    - To determine where health cared dollars could be best spent
    - Medical education: little, if any, cost containment or accountability training
  - Society: unrealistic expectations regarding health care
    - “all diseases can be cured” and “all outcomes should be good”
Cost analysis: Terminology
- Direct costs (fixed / variable)
- Indirect costs (fixed / variable)
- Intangible costs

Cost analysis: Models
- Cost identification (+++)
  - Actual cost of providing a service
- Cost – benefit (-)
  - Outcome: valued in economic terms
  - objective: minimize the cost to achieve a benefit goal defined “a priori”
- Cost – effectiveness (++)
  - “how to best allocate limited resources”
## Categories of OR costs

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>Costs incurred regardless of volume</td>
<td>Buildings</td>
</tr>
<tr>
<td>Variable</td>
<td>Costs incurred at rate directly related to volume</td>
<td>OR Supplies, Anesthetic drugs</td>
</tr>
<tr>
<td>Semivariable</td>
<td>Costs with both fixed and variable characteristics</td>
<td>OR nurses</td>
</tr>
</tbody>
</table>

*OR time is OR money* …
- Wake Forest University Outpatient Surgical Center (F. Dexter)
  - 50 working weeks a year
  - 14,000 OR hours available (based on 8 hours a day)
  - Or 840,000 OR minutes available for surgery
  - Actual utilization rate: 78%

- When all costs are allocated, total cost per minute of OR time: 14.28 $ a minute
“Total OR activity costs”

F. Dexter

- Every minute of OR time used or un-used is the main determinator

- Every available minute of OR time should be optimally utilized in order to guarantee optimal OR utilization

Efficient use of OR time is the major factor of total OR activity costs
2. Characteristics of the “OR”

- Multidisciplinarity ++++
- “Protected” environment
  
  “The OR suite seems to be an inner sanctum to itself adhering to its own rules”
  
  WR Hopper 2003
- Important investments ++++
  
  up to 20% of total hospital budget
- Important financial source for total hospital
- Structure of direction of the OR???
  
  historical allocation of OR to the surgeon
- Definition of objectives to be obtained???
- Conflict of different interests
3. “Rules” for daily OR Management

- OR board of directors
  with hospital direction
  representatives of “all” different parties responsible for OR “protocol”
  resolution of conflicts/issues
  balanced scorecards

- OR protocol
  allocation of OR suites
  issues of holidays
  rules for urgent / semi-urgent procedures…

- Clear structure of OR organization… for “all” parties
- OR board of directors
- OR protocol
- Clear structure of OR organization…
  who should be the “OR Manager”? medical issues / nursing issues
  balanced scorecards – objectives
  open communication
4. Pivotal role of information systems

OR information systems

- optimal OR efficiency by optimal utilization of every available OR time
  - Electronic scheduling of OR procedures
  - Daily management of OR activity
  - Posthoc evaluation of OR activity by analysis of all registered data in balanced scorecards
OR Information Systems

- electronic scheduling of all OR procedures
  = “getting the schedule done”
  1. Create a realistic elective schedule
     open versus block booking
     block release time
     real-time-based schedule
     accurate listing of procedures
  2. Getting the schedule done = planning the day before

- Benchmarking the peri-operative process …
  What have we learned ???
  Procedural Times Glossary (Association Anesthesia Clinical Directors)

Case Time = time from start of room set-up to completion of room clean-up
Resource Hours = total number of hours scheduled to be available for procedures
Room Ready = time when room is cleaned and all supplies are present
Start Time = patient in room
Turnover Time = time from previous patient out of room to succeeding patient in
Introduction of an OR Information Management System

- Operating Room Scheduling and Management Information System
  - Since January 2001
  - ZOL: 17 operating theatres / 3 different locations
  - Operation Room: part of the Yuse Matrix Box = integrated cross-department software package for hospital’s primary care processes
- Yuse Operation Room: 3 major parts
  - Centralized electronic scheduling of all OR procedures
  - Daily management of all OR activity
  - Posthoc balanced scorecards
Introduction of ORM-m in ZOL

- Scheduling of OR procedures
- User friendly
- Fast and accurate data entry and access
  unique patient identification
- Allows block scheduling
  = scheduling of OR cases within predictable availability of the OR
dead-line for scheduling?
what about emergencies?
--- combination of block and “open” scheduling
with deadline 36 hours before
after deadline: not-scheduled interventions + urgent interventions
- Has a visual grid of OR time allocation
  visualization of total OR availability
  holidays, 100% or 75% availability?
  Planning day before surgery ...
  by OR manager

- Uses and processes historical data (case time)
  registration of case time for OR procedures
  case time = from start of room set-up to completion
  of clean-up
  .... from patient IN room to patient OUT room ??? ....
  local OR organisation?
  not for pts with postoperative referral to ICU?
  .... What about
  case time vs surgical time?
  .... What about
  turnaround times?
Introduction of ORM-m in ZOL

- Balanced Scorecards
  - block utilization (%)
  - room utilization (%)
  - case (procedure) time (/surgeon)
  - real vs estimated case time
- overall OR times:
  - between call and arrival in OR
  - between arrival and room IN
  - turnaround times
  - cancellations
  - OR activity inducing extra staffing costs
  - emergencies / non scheduled procedures

Balanced Scorecards
- block utilization

YUSE

Block-Occupation (realized) ZG 2001-1
mean occupation : 95.7%
Example of use of balanced scorecards:

- Comparison of “performance” or “efficiency” of all OR activity for elective daycase abdominal surgery for 2000-1 to 2001-1

- No urgent or semi-urgent procedures: only scheduled procedures

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Available OR Time</th>
<th>Operative Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>805h</td>
<td>764</td>
</tr>
<tr>
<td>2001</td>
<td>805h</td>
<td>815</td>
</tr>
</tbody>
</table>

- 6.6% increase in number of performed procedures

At what expenses???
<table>
<thead>
<tr>
<th>Year</th>
<th>Total Available OR Time (h)</th>
<th>Operative Procedures (count)</th>
<th>Total Duration of OR Procedures (h:m)</th>
<th>Total Excess Time (h:m)</th>
<th>Total Unused Time (h:m)</th>
<th>Excess OR Time (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>805</td>
<td>764</td>
<td>1044:50</td>
<td>147:20</td>
<td>46:45</td>
<td>-16.3%*</td>
</tr>
<tr>
<td>2001</td>
<td>805</td>
<td>815</td>
<td>1127:35*</td>
<td>123:04</td>
<td>35:21</td>
<td></td>
</tr>
</tbody>
</table>

Excess time defined as realized OR time exceeding the normal limits of OR activity, and inducing extra costs for nursing staff.

Normal OR time at our institution: 8.00 AM to 4.30 PM
Excess time: OR time > 4.30 PM
• OR activity for elective abdominal surgery for 2001-1
  ▪ 6.6% increase in number of performed procedures

At what expenses ???
  ▪ -16.3*% excess OR time
  ▪ -23% unused OR time

unused OR time defined as OR time during normal activity hours without any procedure performed

INCOME >> EXPENSES

increased OR performance

• How to explain ???
-23%* unused OR time
  - significant reduction in turnover time
    (time between patient OUT and next patient IN)

2000  m12.3min  2001  m7.8min*

possibly due to a reduction in arrival time to OR?
2000  m21.3min
2001  m14.1min*
Conclusion: introduction of ORM-m in ZOL

- Balanced Scorecards with objective, readily available information on:
  - block utilization
  - room utilization
  - case (procedure) time (/surgeon)
  - real vs estimated case time
  - overall OR times:
    - between call and arrival in OR
    - between arrival and room IN
    - turnaround times
    - Cancellations
    - OR activity inducing extra staffing costs
    - emergencies / non scheduled procedures