Safety First

patient safety management on a surgical PICU

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Erasmus MC Sophia
Safety?
sPICU Erasmus MC Sophia
Patient Safety Management System

- 4 components
  - Voluntary incident reporting (Safety First reports)
  - Critical Nursing Situation Index (CNSI)
  - Complication registration (CR)
  - Crew Resource Management (CRM)
How did we start?

- **visit Toronto, Report form**
- **Team sessions forming multidisciplinary group**
- **Protocols updated**
- **Start pilot SF-reports Pilot complication registration**
- **Engage nurse specialist**
- **1e pilot CNSI-score, Contact airforce: CRM**
- **CRM-training definitive start CNSI**
- **2nd pilot compl. registration**
To err is human

C.N.S.I.: protocol based working

CRM-training

Voluntary incident reporting

Complication Registration

Blame Free culture
`Unintended and undesirable event or condition occurring during or after medical treatment, that warrants adjustment of the medical treatment or causes irreparable damage.`
Complication registration

2nd pilot results:

120 complications in 46 patients
25.4% of the patients ≥ 1 complication
8.0 complications / 100 nursing days
Top 5 complications:

1. Medication 33 (13%)
2. Hypoxia 26 (10%) (20 accid extubation)
3. Sepsis 22 (9%) (18 central line)
4. Lineproblem 18 (7%)
5. Atelectasis 16 (6%) (13 mech ventilation)
### Consequences of complications:

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment treatment</td>
<td>71%</td>
</tr>
<tr>
<td>Prolonged admission</td>
<td>17%</td>
</tr>
<tr>
<td>Other</td>
<td>6%</td>
</tr>
<tr>
<td>Operation</td>
<td>5%</td>
</tr>
<tr>
<td>Readmission</td>
<td>0.4%</td>
</tr>
<tr>
<td>Death</td>
<td>0.4%</td>
</tr>
</tbody>
</table>
To err is human

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Blame Free culture
Safety First reports

- start may 2004
- reporting of (near)incidents: “everything that was not as it was supposed to be“
- instead of FONA- reports (50-60/year)
- “blame free” culture essential
- based on the reports develop tailored interventions
Safety First reports
SF reports: top 5

Results 2005: 1600 reports

Top 5 reports:
1. medication 512 x (32%)
2. PDMS 339 x (21%)
3. Cath/lines/tubes 195 x (12%)
4. Equipment 192 x (12%)
5. Environment 144 x (9%)
SF reports: who reports?

- Nurses: 1600
- Doctors: 50
- Others: 0
Rapport R. Willems: ‘Hier werk je veilig of hier werk je niet’.

<table>
<thead>
<tr>
<th>Kans op optreden</th>
<th>Geen gevolgen patient</th>
<th>Minimaal letsel</th>
<th>Middelmatig letsel</th>
<th>Ernstig letsel</th>
<th>Nog onbekend</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrijwel zeker</td>
<td>2 geel</td>
<td>2 geel</td>
<td>3 oranje</td>
<td>4 rood</td>
<td>4 rood</td>
</tr>
<tr>
<td>waarschijnlijk</td>
<td>2 geel</td>
<td>2 geel</td>
<td>3 oranje</td>
<td>4 rood</td>
<td>4 rood</td>
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<tr>
<td>mogelijk</td>
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<td>2 geel</td>
<td>3 oranje</td>
<td>3 oranje</td>
<td>4 rood</td>
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<tr>
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<td>2 geel</td>
<td>3 oranje</td>
<td>4 rood</td>
</tr>
<tr>
<td>zeldzaam</td>
<td>1 groen</td>
<td>1 groen</td>
<td>2 geel</td>
<td>2 geel</td>
<td>3 oranje</td>
</tr>
</tbody>
</table>
**SF reports: analysis, example**

**Organigramtitel**

- **servo 300 verkeerd ingesteld**
  - mondeling alleen over freq verlagen gesproken
  - arts onbekend met noodzaak apart melden teugvolume
  - onvoldoende ervaring op deze afdeling
    - OM
  - onvoldoende kennis van beademings-machine
    - HRQ
  - verpleeg-kundige niet gevraagd naar TV
    - HRV
  - vergeten
    - HRI
  - geen tijd?
    - X
  - niet in PDMS af te spreken
    - systeem nog niet klaar
      - PDMS groep
      - HRC
  - geen alarm in te stellen op teugvolume
  - andere machine blijft TV hezelfde bij wijzigen frequentie
  - grote diversiteit machines
    - diversiteit patienten
    - innovatie afdeling
    - OM
    - OM
Patient gets overdose clonidine

No check on dose during next rounds

PDMS has no check on dose

Unclear supervision

Little known on oral pediatric dosage of clonidine

Recalculation of dose wrong

Pharmacist does not know indication for clonidine
To err is human

C.N.S.I.: protocol based working

CRM-training

Blame Free culture

Complication Registration

Voluntary incident reporting
A CNS is an observable situation that deviates from “good clinical practice” and that can lead to an adverse event


- Adjusted list of 192 items, tailored on surgical PICU, based on protocols
CNSI: results

1232 reported violations in 1 year

Top 5 of protocol violations:
1. insertion- and/or replacement date of central line/ i.v. systems
2. insertion- and/or replacement date of gastric-/duodenal tube
3. oral hygiene
4. transfusion form
5. settings and/or orders ventilation
Complication Registration
Voluntary incident reporting

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Blame Free culture
Crew Resource Management

- From the aviation industry
- Analysis of accidents and incidents: 70% of cases caused by insufficient communication and teamwork: “human factors”
- Awareness of this and team training results in significant improvement
Crew Resource Management

- Medical and nursing staff
- Subjects are:
  - human errors
  - effects of stress on action and perception
  - communication of teammembers
  - groupdynamics
  - leadership, responsibilities and authority
  - decision making
  - risk management
- Training in January 2005
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Complication registration
## Synthesis components PSMS

<table>
<thead>
<tr>
<th>Top 5</th>
<th>CR</th>
<th>SF</th>
<th>CNSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medication</td>
<td>Medication</td>
<td>Lines</td>
</tr>
<tr>
<td>2</td>
<td>Hypoxia</td>
<td>PDMS</td>
<td>Tubes</td>
</tr>
<tr>
<td>3</td>
<td>Sepsis</td>
<td>Lines/tubes/cath</td>
<td>Oral hygiene</td>
</tr>
<tr>
<td>4</td>
<td>Line problem</td>
<td>Equipment</td>
<td>Transfusion-form</td>
</tr>
<tr>
<td>5</td>
<td>Atelectasis</td>
<td>Environment</td>
<td>Ventilators</td>
</tr>
</tbody>
</table>
Incidents piramid

SF-REPORTS

CNSI

CR

†

4 / year

480 / year

1232 / year

1600 / year
Culture change

2003
PATHOLOGICAL

2006
INCREASING
INSIGHT

INCREASING
TRUST

PROACTIVE

CALCULATING

GENERATING

5 typen cultuur
CONCLUSIONS

- Implementing PSMS on ICU is possible
- Relationship shown between complications, protocol violations and (near-)incident-reports
Thanks to:

- All employees sPICU and...
- Medical technology
- Hospital pharmacists
- Laboratory unit
- Radiology unit
- Microbiology unit
- Hygienic services....