Development of smart inpatient rooms using automation and preventing using restraints in suicidal patients

Remco de Winter
Wouter van Maanen
Arlette van Amerongen

WWW.SUICIDALITEIT.NL
No Conflict of Interest
Suicidal behaviour in society & MH

- Suicide........ too late for mental health
- 40% suicides treatment in mental health .... (Huisman et al 2010)

Mental health:
- Experts diagnosis & treatment of serious suicidal behaviour!
- Very very.. very serious...taxation & situation
- > admission...
  - Last resort....
  - And then....?
Suicides total, proportion suicides mental health

(IGZ 2017)
* x 0,1 %
Admission

- False sense of security?
- Iatrogenic?
- Last resort?

- Possible rapid treatment
- Observation
- Unburden support system
Risk taxation suicidal behaviour & closed wards

- Concentration of serious suicidal behaviour
- Increased risk suicide (>50-80 x)
- No specific guidelines for inpatients
- Specific Dutch setting?
- ? Open < > closed (Huber et al 2016)
Serious suicidal behaviour and acting “study design”

- Acting of mental health worker changes outcome......
- Randomised trial > serious lethal suicidal behaviour
  - Group 1 admission
  - Group 2 no admission

- Outcome suicide!
Suicidal behaviour and closed admission

- Suicidal behaviour 28.8% (368/1324) (Miedema ea 2016)

Development Phase plan 2007

- For every patient multidisciplinary risk taxation!
- Daily registration and taxation
- registration monitored on digiboard
- Clarity of taxation for all!
<table>
<thead>
<tr>
<th>Phase 1 (Blue)</th>
<th>discharge</th>
<th>Non-suicidal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 2 (Green)</td>
<td>Freedom</td>
<td></td>
</tr>
<tr>
<td>Phase 3 (yellow)</td>
<td>No freedom outside</td>
<td></td>
</tr>
<tr>
<td>Phase 4 (Orange)</td>
<td>Supervision (differentation)</td>
<td></td>
</tr>
<tr>
<td>Phase 5 (Red)</td>
<td>Continuous observation (seclusion during night)</td>
<td>Serious suicidal</td>
</tr>
</tbody>
</table>

Acute ward, phase plan (de Winter et al 2011)
A study of the connection between coercive measures used in a closed acute psychiatric ward and the socio-demographic and clinical characteristics of the patients involved

N. MIEDEMA, M.C. HAZEWINKEL, D. VAN HOEKEN, A.S VAN AMERONGEN, R.F.P. DE WINTER

TABEL 2  Klinische kenmerken in relatie tot dwangmaatregelen

<table>
<thead>
<tr>
<th>Klinisch kenmerk</th>
<th>Totaal</th>
<th>Dwangmaatregel</th>
<th>Noodmedicatie</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Separatie</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>Ja</td>
</tr>
<tr>
<td>Alle opnames</td>
<td>1283</td>
<td>100.0%</td>
<td>260</td>
</tr>
<tr>
<td>Opnamereden*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychotische decompenzatie</td>
<td>472</td>
<td>36.8%</td>
<td>127</td>
</tr>
<tr>
<td>Suicidaliteit</td>
<td>372</td>
<td>28.8%</td>
<td>173</td>
</tr>
<tr>
<td>Agressie</td>
<td>216</td>
<td>16.8%</td>
<td>78</td>
</tr>
</tbody>
</table>

suicidal

seclusion
Alternatives

- **Phase 5 permanent observation**
  - For 52 patients 4 nurses (23.00 - 7.30)
  - During nights seclusion ..........  

- **Seclusion and suicidal behaviour!**

- **Seclusion = detrimental**  
  (de Winter et al 2011)
Mission!

- No more use of seclusion rooms for suicidal patients!
Since 2007, development of alternatives!

Patients and staff prefer modern detection systems and separation (Hazewinkel et al. 2014).

Searching for alternatives with detection?

Learning detection systems/smart wrist application/smartphone application/rooming in etc..
Alternative for seclusion during nights

- finally

- Development of Automation rooms!
1. Smart sensor
2. Movement sensor
3. Movement sensor
4. Acoustic sensor
5. Door sensor
6. Smartglass
Acting after signal

- **Signal:**
  - 1. Sensor detection movement or otherwise in room.
  - 2. Signal notification on handsensor
  - 3. Watching Video fragment on pc
  - 4. Face to face contact patient
Questions

- Is there decrease in seclusion for serious suicidal patients in Phase 5?
- Characteristics for suicidal patients and still urgency for seclusion?
Automation room
Results

- Experience almost 3 years (end 2014-2017) 3 “rooms”
- All suicidal patients high risk > automation room > (night and hours with less observation)
- Depressive disorder most common

- 124 times usage automation room (96 individuals)
  - 7 patients 3 admissions, 14 patients 2 admission

- Total 1071 nights usage automation room
  - 255 nights > finally seclusion
But also.....

- One suicide.....
  - Notification Inspectorate

- Several times bugs in system (no figures)
Light in the darkness
Decrease in seclusions

- 76.2 %
  - in using seclusion rooms for suicidal patients.

- All seclusions < 4 % primary suicidal behaviour (was 17.3%)
<table>
<thead>
<tr>
<th>primary diagnosis</th>
<th>Total, N</th>
<th>$\chi^2$-test</th>
<th>% Seclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>47 (37.9)</td>
<td>$\chi^2$ = 7.078; <em>p</em> = 0.008</td>
<td>17.0%</td>
</tr>
<tr>
<td>Axis-II</td>
<td>38 (30.6)</td>
<td>$\chi^2$ = 4.098; <em>p</em> = 0.043</td>
<td>36.4%</td>
</tr>
<tr>
<td>“Psychotic” disorder (all)</td>
<td>34 (27.4)</td>
<td>$\chi^2$ = 2.647; <em>p</em> = 0.104</td>
<td>27.3%</td>
</tr>
<tr>
<td>(Psychotic depression)</td>
<td>(16) (12.9)</td>
<td>($\chi^2$ = 0.383; <em>p</em> = 0.759)</td>
<td>(18.7%)</td>
</tr>
<tr>
<td>other</td>
<td>5 (4.0)</td>
<td>$\chi^2$ = 1.678; <em>p</em> = 0.439</td>
<td>20.1%</td>
</tr>
<tr>
<td></td>
<td><strong>124</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Factors for failing usage of automation

- No relation with seclusion:
  - Gender
  - Age

- Relation with seclusion
  - Duration of admission $t = 2.207; \ df = 122; \ p = 0.029$
  - Unvoluntary admission $\chi^2 = 9.337; \ df = 1; \ p = 0.003$
Experiences of staff
Survey nursing staff N = 24

- Revealed that automation was used mainly at night.
- Automation is seen as an alternative for restraint methods during admission.
- Patients and staff trust the new technology. There is a strong desire for continuing the supplementary method.
Limitations

- Naturalistic design
- No control
- Unknown missing data
  - All automation rooms used?
  - Phase 5 <> differentiation of additional seclusion reasons
  - etc
- Etc........
Good clinical practice?

- No other studies?
  - No Pubmed/Google scholar findings

- Real life......

- Far away from academic reality??
Conclusions I

- Seclusion not anymore last resort for serious suicidality
- Long development over 11 years
- Automation rooms are save, staff is satisfied & hopeful
- Depressive disorder most common: less seclusion
- Axis 2: most failing of usage automation countertransferance
Conclusions II

- Seclusion more often longer admission duration/unvoluntary stay

- Male using automation > ↑psychotic disorder

- Female more often readmitted

- Automation rooms: 76.2% decrease of seclusion!
More clinical automation?

- Rotterdam
- Nijmegen
- Monster
- ...?
But not .....
Thank you audience........

- **Always welcome to visit the clinic!**
- **R.dewinter@parnassia.nl**
- **info@suicidaliteit.nl**

- **Thanks:**
• https://youtu.be/05HrZ6YnM1o
Suicidal behaviour 2009-2010

<table>
<thead>
<tr>
<th></th>
<th>All (n = 1284)</th>
<th>High risk (n = 137)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suicide</strong></td>
<td>n = 4 (0.3%)</td>
<td>n = 1 (0.7%)</td>
</tr>
<tr>
<td><strong>Suicide attempt</strong></td>
<td>n = 41 (3.2%)</td>
<td>n = 25 (18.2%) a</td>
</tr>
<tr>
<td>(lethal intent)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suicide attempt</strong></td>
<td>n = 78 (6.1%)</td>
<td>n = 33 (24.1%) a</td>
</tr>
<tr>
<td>(non-lethal intent)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suicidal tendencies</strong></td>
<td>n = 82 (6.4%)</td>
<td>n = 21 (15.3%) a</td>
</tr>
<tr>
<td><strong>Suicidal thoughts</strong></td>
<td>n = 213 (16.6%)</td>
<td>n = 28 (20.4%)</td>
</tr>
<tr>
<td></td>
<td>Acceptable (N = 1147)</td>
<td>High risk (N = 137)</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>CGI</td>
<td>5.2</td>
<td>5.7</td>
</tr>
<tr>
<td>GAF (categorised)</td>
<td>23.4</td>
<td>30.2</td>
</tr>
<tr>
<td>Female</td>
<td>42.6%</td>
<td>60.6%</td>
</tr>
<tr>
<td>Age</td>
<td>39.8</td>
<td>34.8</td>
</tr>
<tr>
<td>Married/living together</td>
<td>30%</td>
<td>39%</td>
</tr>
<tr>
<td>Having children</td>
<td>34.6%</td>
<td>36.5%</td>
</tr>
<tr>
<td>Voluntary</td>
<td>63.2%</td>
<td>49.6%</td>
</tr>
<tr>
<td>First admission (&lt;5 yrs)</td>
<td>42%</td>
<td>68%</td>
</tr>
<tr>
<td>Seclusion</td>
<td>25.3%</td>
<td>17.3%</td>
</tr>
<tr>
<td>jobless</td>
<td>70.5%</td>
<td>56%</td>
</tr>
<tr>
<td>ECT treatment</td>
<td>0.7%</td>
<td>8.7%</td>
</tr>
</tbody>
</table>