NORTON OR BRADEN FOR PRESSURE ULCER RISK ASSESSMENT: A REFLECTION

Prof. dr. Dimitri Beeckman

DEPARTMENT OF PUBLIC HEALTH UNIVERSITY CENTRE FOR NURSING AND MIDWIFERY SKIN INTEGRITY RESEARCH GROUP (SKINT)

RISK ASSESSMENT

Why?
- To identify individuals at risk of developing a pressure ulcer
- To identify those individuals who are at risk (sensitivity), as well as those not at risk (specificity) - and do this consistently (reliability)

How?
- Numeric scales are recommended in international pressure ulcer prevention guidelines (e.g. Braden, Waterlow, Norton)
- Clinical judgment based on knowledge of risk factors
- Head to toe skin inspection

Problems?
- More than 40 risk assessment scales available but still there is ongoing debate about their usefulness
- Clinical judgment: validity and reliability issues
- Skin inspection: low reliability and damage at the cellular level is invisible to the naked eye


RISK ASSESSMENT SCALES

CAUSAL FACTORS + RISK FACTORS

PREVENTION

PRESSURE ULCER
Different from a diagnostic screening test
Not intended to identify the existence of a certain condition, but the risk that a certain condition may develop
Probability of a patient to develop a condition does not remain constant over time
Sensitivity and specificity will alter over time
Sensitivity/specificity to indicate validity?
Only appropriate if the condition does not change over time and is not affected by intermediate measures (such as prevention)


RISK ASSESSMENT SCALES

BRADEN SCALE

Sensitivity and Specificity are associated with time point of outcome assessment and cut-off point

Specificity: the proportion of actual negative cases which are correctly identified
Sensitivity: the proportion of actual positive cases which are correctly identified

<table>
<thead>
<tr>
<th>Risk Assessment Scales</th>
</tr>
</thead>
</table>

**BEGG Scale**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Risk of Incontinence</th>
<th>Redness</th>
<th>Necrosis</th>
<th>Impression</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>12</td>
</tr>
</tbody>
</table>

**Norton Scale**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Risk of Incontinence</th>
<th>Redness</th>
<th>Necrosis</th>
<th>Impression</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>8</td>
</tr>
</tbody>
</table>

**Waterlow Scale**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Risk of Incontinence</th>
<th>Redness</th>
<th>Necrosis</th>
<th>Impression</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>12</td>
</tr>
</tbody>
</table>
Is it feasible to design an RCT to study the effectiveness of pressure ulcer risk assessment scales?

- Cluster trial (unit level): Between 62,000 – 286,000 patients (depending on intra-cluster correlation coefficient)
- Single patient randomisation: > 20,000 patients are needed (power 90%, two-sided significance level of 0.05)


---

What patient characteristics guide nurses’ clinical judgment on pressure ulcer risk?

- Mixed methods study
- Nurses’ clinical judgment draws on well-known etiological factors, and tends to expand conditions covered by risk assessment scales
- Patients’ care dependency and self-care abilities seem to be core concepts for nurses’ risk assessment


---

Does a risk assessment scale (Braden) reduce nosocomial pressure ulcers?

- Pretest-posttest comparison (n= 719)
- Clinical judgment may be as effective as employing a risk assessment scale to assess the risk of pressure ulcers

ULCER Trial (Webster et al. 2011)

- What is the effectiveness of two pressure ulcer screening tools (Waterlow and Ramstedt scales) against clinical judgment in preventing pressure ulcers?
- Single blind randomized controlled trial (n= 1,220)
- No evidence that two common pressure ulcer risk-assessment tools are superior to clinical judgment to prevent pressure ulcer
HEAD TO TOE SKIN INSPECTION

HOW?

• Visual inspection
• Plastic disk or pressing with finger
• Signs of redness
• Include for localized health
• Edema
• In duration (hardness), especially in individuals with darkly pigmented skin

Beeckman D., Schoonhoven L., European Pressure Ulcer Advisory Panel. PuClas3 e Learning Module. University Centre for Nursing & Midwifery and European Pressure Ulcer Advisory Panel. 2015

HEAD TO TOE SKIN INSPECTION

Skin inspection is an essential element in pressure ulcer risk assessment, but:

• Complex skill for nurses: low inter- and intra-rater reliability
• Damage at the cellular level is invisible to the naked eye

Beeckman et al. 2008

Sample: 1422 nurses from five European countries
Respondents classified 20 validated photographs as normal skin, blanchable erythema, pressure ulcers, IAD or PU/IAD
Pressure ulcers were often classified erroneously (kappa = 0.33) and only a minority of nurses reached a substantial level of agreement
Non-blanchable erythema was frequently assessed incorrectly as blanchable erythema

Vanderwee et al. 2007

Sample: 1617 patients in surgical, internal and geriatric units
Randomly assigned to experimental group (n = 826) and control group (n = 791)
• Experiment: prevention started when non-blanchable erythema appeared
• Control: prevention was started when Braden score <17 or when non-blanchable erythema appeared
Both groups: identical prevention
Results:
• Experiment: 16% of patients received prevention, PU Cat. II-IV = 6.8%
• Control: 32% of patients received prevention, PU Cat. II-IV = 6.7%

CONCLUSIONS

- There is a causal relationship between immobility/inactivity and PU development; many other risk factors differ between populations.
- There is no sound evidence base that supports superior clinical effectiveness of one PU risk assessment scale over another.
- Skin assessment is an essential element in PU risk assessment screening, but damage at the cellular level is invisible to the naked eye.
- We urgently need accurate tools to assess early tissue damage to allow more timely and appropriately targeted interventions.

Prof. dr. Dimitri Beeckman
Professor of Skin Integrity and Clinical Nursing
University Centre for Nursing and Midwifery
DEPARTMENT OF PUBLIC HEALTH
E Dimitri.Beeckman@UGent.be
T +32 9 332 83 48
www.UGent.be