



SCORECARDS FOR EVIDENCE BASED-DESIGN

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Just as medicine has increasingly moved toward “evidence-based medicine,” where clinical choices are informed by research, healthcare design is increasingly guided by rigorous research linking the physical environment of hospitals to patients and staff outcomes and is moving toward “evidence-based design” (Hamilton, 2003). A large evidence base exists linking the physical environment with patient and staff outcomes. In a recent report to The Center for Health Design in a project funded by the Robert Wood Johnson Foundation, researchers from Georgia Tech and Texas A&M combed through several thousand scientific articles and identified more than 700 studies—most in top peer-reviewed journals—that establish how hospital design can impact clinical outcomes.

The team found scientific studies that document the impact of a range of design characteristics, such as single-rooms versus multi-bed rooms, reduced noise, improved lighting, better ventilation, better ergonomic designs, supportive workplaces and improved layout that can help reduce errors, reduce stress, improve sleep, reduce pain and drugs, and improve other outcomes. The team discovered that, not only is there a very large body of evidence to guide hospital design, but a very strong one.

Presented below is a summary of the strength of the evidence base in four main outcome areas:

1. Reduce staff stress and fatigue and increase effectiveness in delivering care
2. Improve patient safety
3. Reduce stress and improve outcomes
4. Improve overall healthcare quality

Within each outcome area, factors that contribute to the outcome are identified. For example, patient stress would be reduced by reducing noise stress, reducing spatial disorientation and so on. Next to each topical area are stars that indicate the strength of the evidence in that area.



Topics with 4 or 5 stars are those where the researchers found many good studies linking environmental factors with the outcome or fewer strong studies that provided convergent evidence linking the environmental factor with the outcome. These are considered high action areas.



Topics with 3 stars are those which have relatively fewer studies associated with them. However, these are high importance outcome areas and ones in which additional research is needed.



Topics with one or two stars (e.g. reducing staff turnover, increasing handwashing compliance among staff) have few studies associated with them or few studies that conclusively provide a link between environmental factors and the outcome. These are important areas where there is need for additional research.



PATIENT STRESS SCORECARD

**Reduce stress, improve quality of life and healing
for patients and families**

Reduce noise stress	★ ★ ★ ★
Reduce spatial disorientation	★ ★ ★ ★
Improve sleep	★ ★ ★ ★
Increase social support	★ ★ ★ ★
Reduce depression	★ ★ ★
Improve circadian rhythms	★ ★ ★
Reduce pain (intake of pain drugs, and reported pain)	★ ★
Reduce helplessness and empower patients & families	★ ★ ★
Provide positive distraction	★ ★ ★
Patient stress (emotional duress, anxiety, depression)	★ ★ ★ ★

STAFF STRESS SCORECARD

**Reduce staff stress/fatigue, increase
effectiveness in delivering care**

Reduce noise stress	★ ★ ★ ★
Improve medication processing and delivery times	★ ★ ★
Improve workplace, job satisfaction	★ ★
Reduce turnover	★
Reduce fatigue	★ ★
Work effectiveness; patient care time per shift	★ ★ ★
Improve satisfaction	★ ★ ★



PATIENT SAFETY SCORECARD

Improve patient safety and quality of care

- Reduce nosocomial infection (*airborne*) ★★★★★
- (*contact*) ★★★★★
- Reduce medication errors ★
- Reduce patient falls ★★
- Improve quality of communication (*patient* → *staff*) ★★
- (*staff* → *staff*) ★
- (*staff* → *patient*) ★★★
- (*patient* → *family*) ★★
- Increase hand washing compliance by staff ★
- Improve confidentiality of patient information ★★

QUALITY SCORECARD

Improve overall healthcare quality and reduce cost

- Reduce length of patient stay ★★
- Reduce drugs (see patient safety) ★★
- Patient room transfers: number and costs ★★★★★
- Re-hospitalization or readmission rates ★
- Staff work effectiveness; patient care time per shift ★★
- Patient satisfaction with quality of care ★★★★★
- Patient satisfaction with staff quality ★★