



EVIDENCE CENTRE CRITICAL APPRAISAL

Are low ambient light levels and low sound levels beneficial
to premature infants in a neonatal intensive care unit?

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SUMMARY STATEMENT:

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REQUEST:

Are low ambient light levels and low sound levels beneficial to premature infants in a neonatal intensive care unit?

REQUESTED BY:

Ms Nerida Leeman, Physiotherapist – Neonatal Intensive Care Unit, Monash Medical Centre, Clayton.

METHODOLOGY

Search Strategy

The Centre for Clinical Effectiveness defines the 'best available evidence' as that research we can identify that is least susceptible to bias. We determine this according to pre-defined NHMRC criteria (see Appendix).

First we search for systematic reviews and randomised controlled trials. If we identify sound, relevant, material of this type the search stops. Otherwise, our search strategy broadens to include studies that are more prone to bias, less generalisable, or have other methodological difficulties. We include case-control and longitudinal cohort studies in our critical appraisal reports. While we cite observational and case series studies, and narrative reviews and consensus statements, in our reports we do not critically appraise them. Such studies can produce accurate results but they are generally too prone to bias to allow determination of their validity beyond their immediate setting.

Details Of Evidence Request

Patients neonates in an intensive care or special care nursery setting
Interventions low level ambient lighting and sound
Comparisons nil
Outcomes positive and/or negative impact of above mentioned interventions.

Search terms

Environmental terms: intensive care unit; intensive care unit-neonatal; environment; environmental impact.

Clinical terms: light; lighting; lighting/ae; noise; noise/ae; sound; illumination.

Patient terms: infant, premature; infant, low birth weight; infant, very low birth weight; infant, newborn.

Resources Searched

Cochrane Library CD-ROM
Best Evidence CD-ROM
Smart Search
Medline
National Library of Medicine (Pub Med)
CINAHL
OVID Biomedical Full Text Collection

Refinements, Searching & Reporting Constraints

We have included only English language articles published since 1970. Our electronic searching was performed on 10th September 1999.

An exhaustive search was undertaken to reveal only two studies (Zahr & Traversay 1995 and Mann et al 1986) that examined the impact of light and sound on premature infants in the neonatal intensive care unit and/or special care nursery. It is important to note that the Zahr and Traversay (1995) study utilised two experimental designs and therefore were treated as two separate reports. However, this did not confound the data analysis or the results.

One other randomised control trial by Grauer (1989) examining the impact of light and sound on salivary cortisol levels, was excluded because the subjects examined were newborns with a mean age of 12.96 hours.

Supplementing the critical appraisal is an extensive printout containing articles that were not assessed. Reasons for non-assessment included lack of available abstracts, lower levels of evidence, written in a foreign language or noted to be performed in the early 1970s.

Many of the articles will assist you in understanding the potential benefits and/or hazards that surround the utilization of illumination and/or noise in the neonatal intensive care unit. Guideline references have also been included from the American Academy of Pediatrics and the National American Association College of Obstetricians and Gynaecologists.

RESULTS:

From our sources we identified two articles which we categorised as follows:

Systematic reviews or meta-analyses	0
Evidence-based clinical practice guidelines	0
Randomised controlled trials	1
Controlled trials, cohort or case-control analytic studies	1
Descriptive case series	0
Consensus reports, non-evidence-based clinical practice guidelines	0
Narrative reviews	0
Not able to be determined due to poor database citation	0

We are reasonably confident these articles represent the most important findings published to date based on our refinements, searching and reporting constraints.

EVIDENCE SUMMARIES

Format

Evidence summaries are in the form of spreadsheets reproduced at the end of this report. Each spreadsheet contains the article citation, the study design with level of evidence available according to NHMRC guidelines (1998), patient description, scientific validity of the article, results and pertinent remarks from the authors and Centre for Clinical Effectiveness reviewer.

REFERENCES

Please refer to enclosed list citing author, title, source, MeSH subject heading and abstract.

ARTICLES CRITICALLY APPRAISED FOR THIS REPORT

Mann, N.P; Haddow, R; Stokes, L; Goodley, S; and Rutter, N. Effect of night and day on preterm infants in a newborn nursery, *British Medical Journal* 1986;293: 1265-1267.

Zahr, K.L and Traversay, J. Premature infant responses to noise reduction by earmuffs: effects on behavioural and physiologic measures, *Journal of Perinatology*: 15(6): 448-455.

APPENDIX

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Levels Of Evidence

As Defined By "A Guide To The Development, Implementation And Evaluation Of Clinical Practice Guidelines" (National Health & Medical Research Council, Canberra, 1998):

Level I

Evidence obtained from a systematic review or meta-analysis of all relevant randomised controlled trials.

Level II

Evidence obtained from at least one properly designed randomised controlled trials.

Level III-

1) Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method).

2) Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case control studies or interrupted time series with a control group.

3) Evidence obtained from comparative studies with historical control, two or more single-arm studies or interrupted time series without a parallel control group.

Level IV

Evidence obtained from case series (either post-test or pre-test and post-test), opinions of respected authorities (narrative reviews), descriptive studies, reports of expert (i.e. consensus) committees, case studies.

