

The background of the left side of the page is a grey, textured surface with several embossed faces of varying sizes and expressions. The faces are simple line drawings with large eyes and curved mouths. One face at the top left is crying, with two teardrops falling from its eyes. Another face in the middle is neutral. A third face at the bottom left is smiling broadly. The faces are arranged in a scattered pattern, with some partially cut off by the edges of the page.

clinical practice

G U I D E L I N E S

The recognition and assessment
of acute pain in children

Technical Report

*Guideline objectives and
methods of guideline development*

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Introduction

Most hospitalised children undergo procedures. These may range from venepunctures and insertions of intravenous catheters to more stressful procedures such as lumbar punctures, bone marrow aspirates and biopsies, chest tube insertions, cardiac catheterisations, operations, and dressing changes. Infants, children and adolescents can, and do, experience pain and often describe procedures and their associated anticipatory anxiety as the most distressing aspect of disease or hospitalisation (Broome, 1994; Jay *et al*, 1983).

Unrecognised pain can become established, severe and difficult to control (McQuay, 1989; Wall, 1988; Woolf & Wall, 1986). Unrelieved pain has negative physical and psychological consequences (Taddio *et al*, 1997) and may lead to extended lengths of hospitalised stay with resultant service and cost implications. Paediatric pain management has been recognised as inadequate (Beyer, 1983, 1990; Mather & Mackie, 1983). A contributing factor is children's difficulty in expressing their pain to those taking care of them, health professionals and parents, in a way that is recognised and clearly understood. There can be particular difficulties in inferring the sensory and emotional experience of pain in children, especially in neonates and young children. Even in adults, pain cannot be measured directly and must be inferred from self-report (McGrath, 1995).

Children vary greatly in their cognitive and emotional development, medical condition, response to painful interventions and to the experience of pain, as well as in their personal preferences for care. Health professionals and parents have a responsibility to learn the language of pain expression by children, to listen carefully to their self-reports of pain and to attend to behavioural cues. The detection of children's pain can be improved by strategies to facilitate their expression of pain in ways that are appropriate to their cognitive development and that can be understood by the adults caring for them.

The purpose of this clinical guideline is to present information about methods that can be used to improve the recognition and assessment of pain in children. This technical report is one of several reports presenting different aspects of the guideline and its development^{2,3&4}. It describes in detail the evidence model, the process for collating and reviewing the evidence and the strength of evidence for each of the guideline recommendations.

Aim of the guideline

The guideline was developed with the following aims:

- To identify the best method for recognising pain in children
- To identify reliable and valid measures of pain appropriate for use with children of differing age groups and levels of development

The guideline comprises two sections:

1. A philosophy of care for children and their families that makes recommendations for the environment within which care is delivered.
2. Evidence-linked recommendations for:
 - recognising and assessing acute pain in children
 - using pain assessment scales appropriate to the age and/or level of cognitive development of the child.

In the second part of the guideline, nine key recommendations are made for practice. These recommendations are designed to direct health care professionals to the most effective method of recognising and assessing acute pain in children, and to discourage practices which do not have convincing or sufficient evidence of effectiveness. Two of the nine key recommendations concern the role of parents, carers and families and the role of health care professionals in recognising and assessing pain in children. Four recommendations concern the use of tools and pain scales to recognise and assess pain in three groups of children: neonates and infants, young children, older children and adolescents.

² RCNI (1999) *Clinical Guidelines for the Recognition and Assessment of Acute Pain in Children. Recommendations*. London, RCN.

³ Doorbar & McClarey (1999) *Ouch! Sort It Out. Children's Experiences of Pain*. London, RCN. This report was commissioned to provide patient-based evidence to support the recommendations of the guideline.

⁴ RCNI (1999) *Clinical Guidelines for the Recognition and Assessment of Acute Pain in Children. Implementation Guide*. London, RCN. This guide will include a simple audit plan and examples of pain assessment scales.

What the guideline covers

The guideline covers the following key areas:

- When pain should be assessed
 - Indicators of pain
 - Individual differences
- Who should assess pain in children
 - Role of parents/carers and other family members
 - Role of nurses and other practitioners
 - Role of self-report by children
- The use of scales and other tools to assess children's pain
 - Assessment of pain in neonates and infants
 - Assessment of pain in children
 - Assessment of pain in adolescents and older children

Definitions

A full glossary of terms can be found in Appendix 7.

CHILD:

For the purposes of the clinical guideline a child means every human being below the age of 18 years unless (for instances when this guideline may be used in other countries) the law applicable to the child majority is attained earlier (United Nations, 1991).

NEONATE:

A neonate is an infant up to twenty eight days old (Oxford Concise Medical Dictionary, 1996). In clinical practice, infants up to 44 days old may be considered as neonates.

ACUTE PAIN:

Pain which subsides as healing takes place, i.e. it has a predictable end and is of brief duration (less than 3 months). Acute pain is commonly associated with surgical or other procedures (McCaffrey, 1994)

What the guideline does not cover

- Management of pain in children
- Assessment of burns or dental pain (although the recommendations may be useful for these)

- Organisational issues related to the management of pain
- Education of practitioners about techniques of pain management

The clinical guideline does not make recommendations on the pharmacological management of procedure related pain, because these can be obtained from other publications, for example, *Prevention and Control of Pain in Children - a Manual for Health Care Professionals* (Royal College of Paediatrics & Child Health [RCPCH], 1997).

Funding

Development of the guideline was funded by the National Health Service Executive.

Who the guideline is intended for

Although developed by the Royal College of Nursing, this guideline has been written for everyone involved in managing children's pain. Throughout this introduction, the term health professional is used rather than nurse, doctor or other member of the professions allied to medicine, unless the subject relates particularly to one professional group, because of the multi-professional nature of the guideline.

Identifying the scope and topic of the guideline

A group of experts on the topic of pain in children was convened to advise the development of a paediatric pain guideline. The expert group included health professionals, parents and researchers. Information about what parents think is important in the management of pain and a Parent Group was formed using names provided by Action for Sick Children as well as contacts through schools. Originally a focus group was planned to investigate parents' views. However, few parents were able to attend the group so a postal questionnaire was administered instead. As

well as parent's views, research findings and existing guidelines were considered in identifying the topic for the guideline. Review of the research literature was important to determine whether sufficient research was available from which to develop a guideline.

In 1992 the Agency for Health Care Policy and Research (AHCPR) published clinical practice guidelines entitled *Acute Pain Management: Operative or Medical Procedures and Trauma*. This extensive set of guidelines covers all acute pain management relating to operative or medical procedures as well as trauma, and includes a section devoted to the assessment and management of children's pain. The expert group used the Critical Appraisal Skills Programme (Oxford) criteria for guideline appraisal to critically review the children's part of *Acute Pain Management: Operative or Medical Procedures and Trauma* (AHCPR, 1992). On the basis of their review, the group discussed whether to update the AHCPR guideline or whether to 'start from scratch'. After considerable debate, the group decided on the first option and the AHCPR guidelines were used as the basis of the new guideline.

The group also brain-stormed what aspect of the management of acute pain in children should be the focus of the new guideline. It was decided that the guideline should focus on the recognition and assessment of acute pain for the following reasons:

- The quality of pain recognition and assessment determines the way in which pain is subsequently managed
- The topic was identified as one of concern to parents in the survey of parents' views about pain management
- Focusing on assessment requires health professionals to concentrate on children's experiences rather than the technicalities of care
- The recommendations would have a direct impact on care and require minimal resources for successful implementation
- There was sufficient available research evidence for development of a guideline to be feasible
- There were existing texts about the management of children's pain.

The evidence underpinning the recommendations of the AHCPR guideline came from a rigorous search of the research literature and from expert opinion (AHCPR, 1995). The most frequently evaluated outcomes in the AHCPR guidelines include behavioural indicators (anxiety/fear/upset) and physiological indicators (heart rate, blood

pressure, and transcutaneous oxygen). Five criteria were used to rate the quality of studies. These were:

1. Presence of a theoretical framework
2. Design appropriate for the question
3. Sample and method adequate and appropriate
4. Method of measuring outcomes appropriate
5. Evidence that outcome measures field tested and psychometric properties evaluated prior to use
6. Data analysis appropriate for study design and question, and properly executed.

Studies rated as 'poor' included those where the study design was not appropriate for the question and problems occurred with other criteria. Such studies were excluded.

Because of the rigorous nature of the inclusion criteria and search strategies used to identify the research evidence of the AHCPR guidelines, it was decided to build on their literature review and to search for new research evidence (published and unpublished) that had become available since 1990. The evidence tables and recommendations made within this guideline are supported by information from this new search (1990-1998).

Overview of clinical guideline development method

The guideline development process is based on both current 'gold standard' methodology (Eccles, 1996; Waddell, 1996; Woolf, 1991) and criteria used to appraise the robustness of national guidelines (Cluzeau *et al*, 1997). Figure 1 outlines the process by which the guideline was developed.

The recommendations for practice made by the guideline are based on two sources of evidence: the results of a systematic search and appraisal of the available research evidence, published and unpublished, between January 1990-August 1998, and expert opinion, including practitioners, parents and children.

Seven groups of people were involved in reviewing the research evidence and advising on various aspects of the guideline development process. They were:

- Evidence Review Group: 23 members
- Philosophy Group: 8 members



(The Expert Group who co-ordinated the work comprised the evidence review and philosophy groups, plus two additional members.)

- RCN Paediatric Special Interest Group: 9 members
- Additional Review Panel (including parents): 4 members
- Pain Audit Pilot Sites: 5 members.
- RCN Clinical Guidelines Advisory Group: 13 members
- RCN Clinical Guidelines Team: 4 members over 2 years due to staff changes

Members of the Expert Group were invited to contribute to the Philosophy Group or the Evidence Review Group. Additional contributors were then also sought for each group to ensure the professional team and parent/child views were

included in determining the Philosophy for Care and within the evidence base of the guideline. Members of the Evidence Review Group then completed a self-report questionnaire assessing their clinical and/or research expertise and a declaration of interests form. Responses to the questionnaire were used to split the Evidence Review Group into pairs in which one partner focused on the validity of the research evidence and the other considered its clinical relevance for inclusion in the guideline. Both partners had the skills to critically appraise the research to determine its quality.

A set of questions about the recognition and assessment of acute pain in children were used to guide the literature review. These Review Questions are listed within Appendix 1. The questions were identified because of their practical relevance to nurses and other health professionals, because they were identified as important by children and because they concerned areas of care that have the greatest impact on patient outcomes.

Evidence model

Following Woolf (1991), an evidence model was developed to represent the areas of care to be covered by the guideline and to demonstrate the possible linkages between each of the review questions. The model was developed by adapting the AHCPR (1992) Pain Treatment Flow Chart: Postoperative Phase. The flow chart in Figure 2 shows the sequence of activities for pain management and the points at which children's pain should be assessed and re-assessed.

The model presents the sequence of events undergone by a child during a surgical operation or some other intervention and points at which an assessment should be made of the pain experienced by the child. The following review questions are generated by the model which are addressed by the guideline:

- Question 1: When should pain be assessed in children
- Question 2: What is the most effective method for recognising and assessing pain in children?
- Question 3: Should the same or different methods of pain assessment be used for children from different age groups?
- Question 4: Who should assess pain in children?

Figure 2: Postoperative and post intervention pain management flow chart (adapted from AHCPR, 1992)

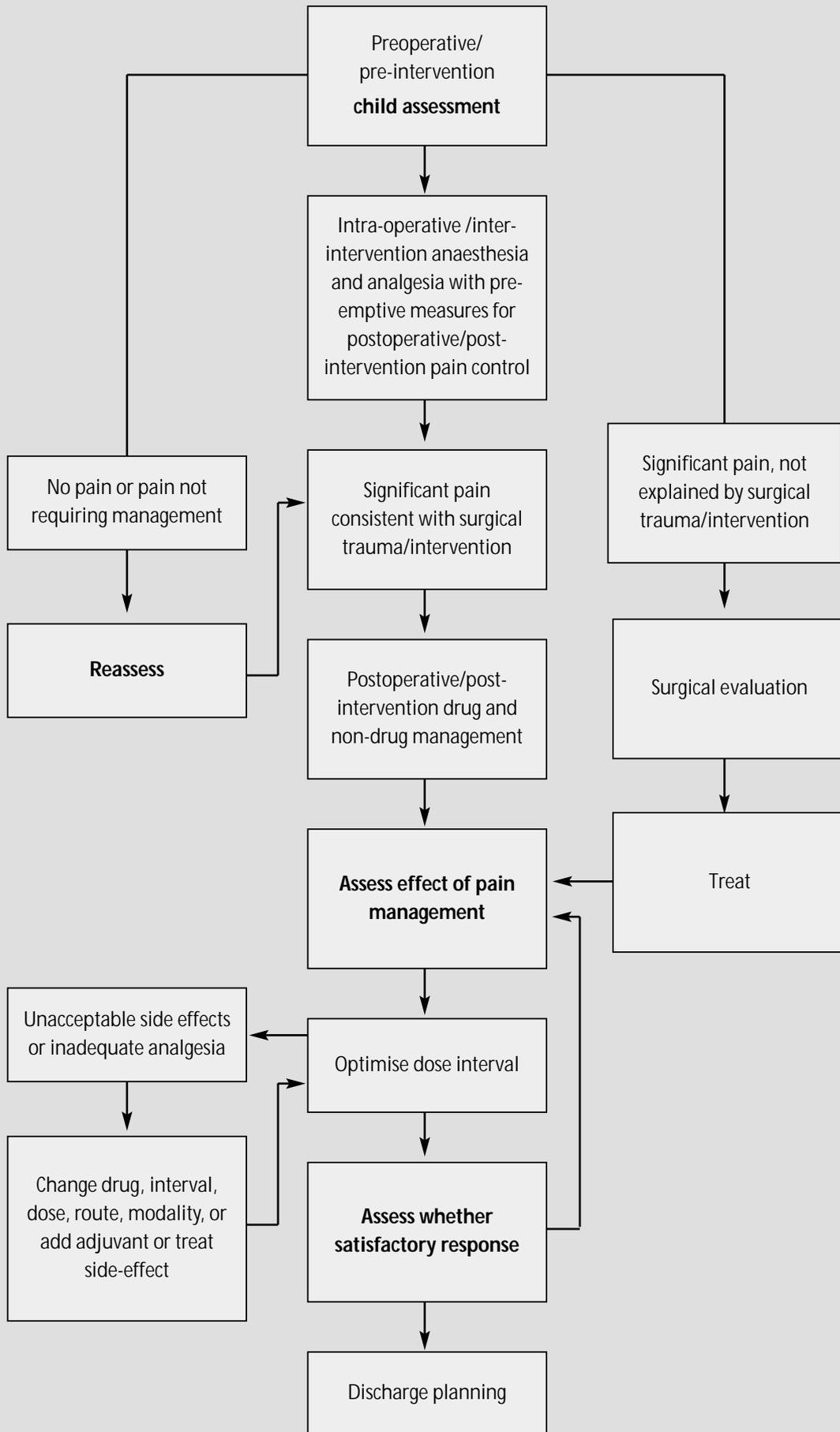


Table 1: Study design criteria by review question

Review question	Study design
Effectiveness in recognising and assessing pain in children; when and by whom, including comparative assessment in different age groups	Randomised controlled trials (RCTs), systematic reviews, cohort, cross-sectional
Scale development and validation	RCTs, systematic reviews, cohort, cross-sectional

The evidence base of the guideline

Research based evidence was sought for all the review questions according to pre-set criteria. The Evidence Review Group agreed a set of inclusion and exclusion criteria for material to be included in the evidence base of the guideline. The criteria were incorporated into search strategies for the literature review by a librarian with experience in searching for information to inform evidence based health care. The librarian used literature search strategies pertinent to each to search a number of data bases. Full details about the search and the methods by which it was conducted, the sifting and identifying of papers for critical appraisal and data extraction are presented in Appendices 1 and 2.

In general, because the studies identified by the literature search did not concern effectiveness of therapeutic treatments or interventions, it was not essential for them to be well-conducted randomised controlled trials (RCTs). The key requirement was that studies used the most appropriate design for the research question addressed and that they were conducted rigorously, with evidence that data obtained were valid and reliable. Table 1 outlines what are considered appropriate study designs according to review questions posed.

A particular issue for this study was the choice of study design for scale development and validation. Few writers on the topic of critical appraisal of research have identified a 'gold standard' study design for scale development. Instead, guidance was obtained from the psychometric literature and the technology established for the development and validation of patient-based outcome measures (McDowell & Jenkinson 1996; Streiner & Norman, 1995; Scientific Advisory Committee, 1995).

Where there was no research evidence available, or the evidence was weak, expert opinion formed the basis of the recommendation. This opinion was obtained from the groups outlined above which comprised 62 clinical or methodological experts as well as parents with experience of their children's pain. In addition, the guidelines were informed by a qualitative study of children's views and a children's conference at which over 100 children described through play, acting, drawing or

interview, their experiences of pain (Doorbar & McClarey, 1999).

The searches generated over 1000 papers. The abstracts of these papers were used to identify those which fulfilled the criteria for clinical relevance. More than 200 papers were retained. Once full copies of the papers were obtained, 80 of them were rejected because they were overviews, papers discussing pain in animals or adults or papers dealing with pain management rather than pain assessment.

Each of the remaining 120 papers was appraised for validity and relevance by the pairs of reviewers described above. Data were extracted independently by each reviewer using standardised data extraction forms (see Appendix 3 for examples of forms). Good quality data were recorded in evidence tables (see Appendix 4) to be used to develop the clinical guideline recommendations. Quality checks of every fifth paper were undertaken by the project officer using the evidence from the research literature. Where there was disagreement between reviewers about whether data from a study should be included in the guideline, a third expert reviewer conducted an independent appraisal of the paper and the results were discussed until an agreement was reached.

Two project officers working independently, used the evidence tables to review and up-date the AHCPR guidelines and to add any new recommendations for practice as indicated by the data. The guideline recommendations were graded to indicate the strength of the underpinning evidence. Any disagreements were again discussed until a consensus was reached. All recommendations were reviewed by each of the groups contributing to the guideline (including parents, children and patient representatives) and, finally, by an independent review panel. All those reviewing the guideline were provided with summaries of the evidence in narrative and numerical form.

For aspects of practice for which no research evidence was available members of the groups participating in developing the guideline were asked to indicate their agreement or otherwise with the recommendations made for practice. Specifically, the expert groups were asked to assess

whether the recommendations were clinically relevant and correct on the basis of their clinical expertise. Recommendations were then reviewed in the light of comments received. No-one disagreed with the recommendations made. Any alterations requested concerned the language of the recommendation.

Grading of evidence

The guideline is described as evidence-linked rather than evidence-based because a number of recommendations for practice were solely or partially based on expert consensus opinion (both published and unpublished). In particular, there is little research evidence to guide the choice of scale for use in measuring children's pain. Instead, a range of tools are presented with some indication as to their advantages and disadvantages. It was also agreed that the guideline should be underpinned by a philosophy for care.

Studies were graded on the basis of the appropriateness of the design for the research question and the quality with which they were conducted. The evidence thus graded was then used to generate recommendations for practice related to each of the review questions originally posed. Each recommendation made was then also graded to indicate the strength of evidence on which it was based.

The strength with which each recommendation is made is graded as I, II or III using a system adapted from Waddell et al. (1996) as follows:

Grade I

Generally consistent finding in a majority of multiple acceptable studies

Grade II

Either based on a single acceptable study, or a weak or inconsistent finding in multiple acceptable studies

Grade III

Limited scientific evidence which does not meet all the criteria of acceptable studies or absence of directly applicable studies of good quality. This includes published and unpublished expert opinion.

This evidence grading method was chosen because most of the existing methods for ranking levels of evidence relate to intervention studies (Canadian Task Force, 1979; Hadorn *et al.*, 1996). As not all of the topics covered in this guideline address questions of effectiveness, a uniform method of grading the evidence for all the reviews was

considered more appropriate. The method allows guideline developers to grade a variety of studies as well as expert opinion (Hayward *et al.*, 1995).

It can be seen from this grading system that the strength of each recommendation is determined by the quality of evidence that is available. Each recommendation was developed by reviewing the AHCPR guideline on the basis of the results of the critical appraisal of research studies or by expert opinion about the topic covered by the recommendation. The quality of each study was evaluated and is reflected in the strength with which each recommendation is made. Recommendations based on expert opinion are always distinguished from those derived from research studies.

The grading of recommendations was reviewed and confirmed by the members of the Evidence Review Group using a specially designed form (see Appendix 5), after data synthesis was completed. The evidence grade is presented as 'strength of evidence' for each recommendation. The grading was based on the number of 'gold standard' studies retrieved for each review question, the quality of evidence and the consistency and applicability of findings. In addition, each piece of evidence was reviewed by a multi-professional review group of expert clinicians and parents and only included if it was accepted by them as both clinically and methodologically sound.

The evidence informing the recommendations is summarised in a set of appended evidence tables (see Appendices 4 & 6). In addition, a narrative summary of the evidence for each recommendation is provided in the form of a rationale.

Multidisciplinary review and guideline development group

This national clinical guideline was developed by a multi-professional group, including representatives from the major professions providing health care for children. Children and their families were also asked for their views on what matters most in their care (Doorbar & McClarey, 1999), and their responses provide a valuable addition to the evidence on which the guideline is based.

The clinical guidelines were piloted for applicability, user-friendliness and comprehensiveness amongst a wide range of experts and users.

Where the guideline is applicable

This national clinical guideline is applicable in all acute care settings.

Updating of the guideline

Resources permitting, it is envisaged that the guideline will be updated every two years.

Audit

Evidence-based audit criteria will be developed, based on this guideline.

Disclaimer

Guideline users should be mindful that, as with any clinical guideline, recommendations may not be appropriate for use in all circumstances. Clearly, a limitation of any guideline is that it simplifies clinical decision-making processes and recommendations. Decisions to adopt any particular recommendation must be made by the practitioner in the light of available resources, local services, policies and protocols, the particular patient's circumstances and wishes, available personnel and equipment, clinical experience of the practitioner and knowledge of more recent research findings.

Philosophy of Care: Assessment and Recognition of Pain in Children

The philosophy describes the ideal background or context of care for the successful implementation of the clinical guideline recommendations. The successful implementation of the guideline depends on a variety of clinical and environmental attributes as follows:

1. Children are listened to and believed.
2. Children and their families are viewed as partners in care.
3. Care is family-centred.
4. Care is individualised and holistic.
5. A collaborative, multi-professional approach is provided by knowledgeable professionals.
6. Attention is paid to the organisational issues and systems that enable effective pain management to take place.

Listening to and believing children

Health professionals are advised to listen to children, attempt to understand their perspectives, opinions and feelings and acknowledge their right to privacy (RCN, 1992; The Children Act, 1989; The Children (Northern Ireland) Order, 1995; The Children (Scotland) Act, 1995). However, many health professionals still believe that children's descriptions of pain are unreliable (Collier, 1997). Whilst children who state they are pain free may be believed, self-reports of pain are sometimes ignored or disbelieved.

Children can accurately identify the location and severity of their pain when encouraged to do so (Atkinson, 1996; Carter, 1994; Craft & Denehy, 1990). However, they sometimes may be unable or unwilling to exhibit pain behaviour or to report pain because of their age, developmental stage, mental or physical capacity, severity or chronic state of illness, emotional state, language or culture or fear of needles etc. (Atkinson, 1996; McCrory, 1991; Schmidt *et al.*, 1994; Wilson, 1993).

Implications for the guideline

The guideline makes recommendations about how to assess children's pain and the use of age or cognitive development appropriate measures. The evidence underpinning the recommendations

includes children's descriptions of pain.

Parents and children should be aware of the clinical guideline and its recommendations, and of improvements made to care following its implementation through regular audit and feedback. The availability and use of the guideline can help promote a culture in which children's views are heard and respected. The guideline can be used by parents and health professionals and by children who are old enough, or at a sufficiently high level of cognitive development, to be able to use a pain scale.⁵

Viewing children and their families as partners in care

The rights of children and their families to be fully informed and to share in decision-making are stated in the United Nations convention on the rights of the child (United Nations, 1991), in government policy (DoH 1997; Scottish Office, 1997; Welsh Office, 1998) and in professional codes of conduct (DoH, 1996; RCN, 1992). Health professionals are expected to respect children's rights and to enable them to participate in decision-making about their care and, when appropriate, to care for themselves (Fradd, 1994; RCN, 1992). Enabling children to participate includes providing them with information about their care and their condition which is appropriate to their age and understanding; supporting and encouraging them, and their families during an illness, intervention or operation; and ensuring that their needs are met.

Families can be stressed, anxious and uncertain with an ill child at home or in hospital. Parents of ill children may feel vulnerable and dependent (Callery & Smith, 1991) and their confidence can diminish through loss of control and feelings of incompetence (RCN, 1992). Such feelings can threaten parental autonomy and ability to participate in decision-making (Lowe, 1996). Professionals can inadvertently increase parents' loss of confidence by, for example, bathing, feeding and dressing children without involving their parents or by not sharing information.

Implications for the guideline

The guideline can be used to provide information and to aid discussions about care between parents, children and health professionals. To develop partnerships with children and families, professionals must feel confident in their own knowledge and skills (Chavasse, 1992; Fradd, 1994). The guideline covers all aspects of

⁵ A children's version of the guidelines is currently in production.

assessment of children's pain and provides information that enhances existing knowledge, skills and confidence.

Family-centred care

In a culture in which children's right and those of their families are met, parents and professionals should view themselves as partners in the care of the child. Partnership between parents and professionals is fostered by encouraging family involvement in the care of children. Families should always be as involved in their children's care as they wish to be, unless the interests of a child indicate otherwise.

Actively welcoming and encouraging families to maintain their caring role as much as possible lessens children's anxieties and reduces the pain they experience (Ogilvie, 1990). Although children display or verbalise more distress in the presence of their parents (Craft, 1990), there is evidence that they usually find their parents' presence, particularly that of their main carer, to be a helpful contribution to pain management (Brain & Maclay, 1968; Frankl *et al.*, 1962; Kay, 1966; Mason, 1978; Schulman *et al.*, 1967; Thyer, 1992). In addition, because parents can often accurately judge their children's pain (Schneider & Biondo-Wood, 1992), their involvement in care can promote its early recognition and accurate assessment.

Differences within and between families in the amount to which they wish or are able to be involved in children's care should be recognised and respected (Muller *et al.*, 1994; Neilson, 1990). Some parents (and children) will want more control over decisions about care and to be more involved than others. Importantly, the parental role in care and pain assessment should be agreed with the child and should be made clear to everyone involved (RCN, 1992). Professionals should support parents in carrying out their changed parenting roles. Children also need support to cope with changes in their ability to self care. Providing individually tailored information at appropriate times is helpful (RCN, 1992).

Implications for the guideline

The guideline should not be used in isolation but should be used to facilitate discussion and decision-making between the family, child and health professional. The roles of professionals, parents and children in implementing the guideline recommendations should be sensitively negotiated and take into account children's views.

Individualised and holistic care

Each child is a unique, developing individual whose best interests must be paramount (RCN, 1992). To ensure that the care of each child focuses on his or her needs, the culture, background and environment of the child and his/her family must be taken into account before decisions are made about care, although care must be taken to avoid stereotyping. Focusing on children's pain without taking account of their backgrounds and considering the context in which they receive care and their clinical conditions can lead to wrong conclusions and management (McDonald, 1994). For example, the degree to which pain is vocalised is influenced by children's ethnicity (Tanube, 1995) which in turn can influence whether they receive pain relief (Todd *et al.*, 1993).

Parents, like children, are also individuals and their opinions vary about children's reactions to painful experiences, particularly those of their own child. Some parents encourage their children to openly report pain, while others encourage them to demonstrate self control and to be un-emotive (Schechter, 1989). Each child, should, therefore, be assessed individually. It is also important that health professionals understand their own values and beliefs about children's pain to reduce their influence on pain assessment or their behaviour with children and parents (Hamers *et al.*, 1998).

Implications for the guideline

More valid pain assessment can be achieved by taking contextual factors into account while analysing the cues and symptoms of children's pain than is possible using assessment tools in isolation.

A collaborative, multi-professional approach to care

Wherever possible, children's pain should be managed by a pain control service, (RCPCH, 1997). A pain control service is a team of health professionals who respect and understand each other's roles and who use a shared pain protocol. Shared pain protocols facilitate communication, shared care and shared responsibility for that care, leading to improved pain management. Within the team, it is usually nurses who assess children's pain, co-ordinate and implement pain management protocols and identify required changes to care (RCPCH, 1997).

Implications for the guideline

All members of the multi-professional team should be aware of the guideline and its recommendations.

Team members should also be aware of improvements to care following its implementation through regular feedback and audit.

Organisational issues

A number of organisational issues influence the quality of children's pain management in acute care settings. These include: health care professionals' education, the degree to which services focus on the needs of children and their families, the adequacy of information about interventions and outcomes for planning children's services, and organisation-wide strategies for clinical audit and quality improvement. Each of these issues can influence the degree to which care can be organised to facilitate implementation of the guideline in practice.

Hospitals, primary care groups and community trusts need to ensure that children in all clinical settings are being cared for by appropriately educated staff and that staffing levels and skill mix reflect their special needs.

The availability of education and training to ensure clinical staff are able to implement the guideline recommendations is an important requirement. The assessment and management of children's pain is one of the most complex tasks a nurse undertakes (Llewellyn, 1996). Training and education on pain assessment is, therefore, a prerequisite for all nurses working with children.

The efficacy of children's services is determined by the degree to which they are governed by children's specific needs (Audit Commission, 1993; DoH, 1991; House of Commons Health Committee, 1997). However, children's health services may be organised on the basis of custom and practice or by professional interests (DoH, 1991, 1996). Services may also be fragmented both within health care settings and between health care, social services and education. To overcome such difficulties, care agreed and contract specifications between commissioners and providers of children's health care services must be explicit and comply with DoH guidance and the recommendations arising from the forthcoming Clinical Services Advisory Group (CSAG) Report (DoH, 1991, 1996; CSAG, in preparation).

The information necessary for planning and providing child-centred, cost effective services is not always available. National and local data on health care interventions and outcomes, which incorporate the views of children and parents and of professionals working with children, is required. Such information can also be used to measure the effectiveness of pain management programmes.

Clinical audit of pain assessment and management practices should be carried out regularly and include evaluation of children's and parents' satisfaction with care (RCN, 1994).

Implications for the guideline

Successful implementation of the guideline depends on the availability of suitably qualified and knowledgeable health professionals, particularly nurses. In addition, the organisation of services should be child-centred and focused on individual needs if all children are to be heard, their families involved in care and their pain managed effectively.

Summary of recommendations for the recognition and assessment of acute pain in children

Recommendations	Grade
1. When children's pain should be assessed	
1.1 Be vigilant for any indications of pain	III
1.2 Assess and record pain at regular intervals	III
1.3 Unexpected intense pain, particularly if sudden or associated with altered vital signs such as hypotension, tachycardia, or fever, should be immediately evaluated	III
1.4 Assess children's pain when undertaking other routine assessments to avoid unnecessary distress or disturbance	III
2. Indicators of children's pain	
2.1 Note changes in children's behaviour, appearance, activity level and vital signs as these may indicate a change in the pain intensity	I
2.2 Use physiological measures (e.g. heart and respiratory rates) but only in addition to self-report and behavioural measures to determine whether children are in pain	II
3. Individual differences	
3.1 Obtain a pain history from each child and his/her parents at the time of admission and learn what word the child uses for pain (e.g. hurt, baddie, etc.)	II
3.2 Recognise the importance of and seek to identify cultural factors which may affect the assessment of pain	III
4. Pain assessment tools	
4.1 Pain assessment should include the use of a validated pain assessment tool. The tool should be used in conjunction with children's self-reports, with parents' assessments and health professionals' assessments of a child's pain	I
4.2 Self-report tools should be used whenever children are able to communicate	II
5. The recognition and assessment of pain in neonates and infants	
5.1 Recognise that it is possible to measure the level of pain in premature infants	II
5.2 Behavioural measures can reliably and validly indicate that infants are experiencing pain. These measures include: crying, facial expressions, motor responses, body posture, activity, undue quietness, restlessness and appearance	I
5.3 No pain assessment tools should be used in isolation; the overall status and gestational age of infants, parental views and the environment must be taken into account	II
6. How should pain in young children be recognised and assessed?	
6.1 Behavioural and/or self-report tools should be used to assess pain in young children. The tool used should be determined by the child's age, development and clinical condition	II
6.2 Behaviour should be observed for the following pain indicators: crying, facial expressions, motor responses, body posture, activity and appearance	III
6.3 Observation of behaviour should include and note blunted behaviour that may be due to severe pain in addition to depression, fatigue, extreme illness or the use of sedatives or hypnotics	III
6.4 Self-report tools are appropriate for most children 4 years and older and provide the most accurate measure of children's pain	II
6.5 Provide enough time for children to complete pain assessments	III
7. How should pain in older children and adolescents be recognised and assessed?	
7.1 Use a pain assessment tool appropriate for the child's developmental level, personality and condition	III
7.2 Older children and adolescents should be offered one of the recommended pain assessment tools and encouraged to use the one they feel is most appropriate	III
7.3 Provide enough time for older children and adolescents to complete pain assessments	III
8. Parents/carers/families	
8.1 Children's families should be encouraged to contribute to the assessment of their pain	II
8.2 Parents assessment of their child's pain should not over-ride the child's self-report. However, when children are unwilling or unable to give a self-report, family reports of pain should be used	II
8.3 Parents need adequate information to be able to contribute to the assessment of children's pain	II
8.4 Before discharge, methods for assessing pain and their effectiveness should be reviewed with the child and family and information provided about conducting pain assessments effectively at home	II
9. Health care professionals	
9.1 Health professionals should be trained to recognise and assess pain	II

Guideline Recommendations with Rationale and Strength of Evidence

1 When children's pain should be assessed

1.1 Be vigilant for any indications of pain

Rationale

Children often cannot or will not report pain to their health care providers. Studies have shown that children may use withdrawal and distancing as a means of protection rather than verbally stating their pain (Woodgate & Kristjanson, 1995) or be induced into a depression-like reaction (Gauvain-Piquard *et al.*, 1987). Thus, health care professionals must have a high degree of awareness of pain.

Strength of evidence (III)

The strength of evidence ascribed to this recommendation of III reflects the fact that it is derived from expert opinion and is supported by findings of two qualitative studies.

1.2 Assess and record pain at regular intervals

Rationale

This recommendation is made by the expert group of the AHCPR (1992). The research basis for the statement is not specified by them, although the AHCPR expert group do make some suggestions to illustrate what they mean by 'regular intervals'. They state for example, that assessment after major surgery should occur at least 2 hourly for the first 24 hours and every 4 hours thereafter with more frequent assessments if pain is poorly controlled. In support of the recommendation, the AHCPR expert group (1992) also note that routine assessment

increases the health professional's knowledge of the child which in turn optimises the assessment of pain and its subsequent management. Elander *et al.* (1993), suggest that pain assessment should be part of a systematic routine in post-surgical care.

Strength of evidence (III)

The strength of evidence ascribed to this recommendation of III reflects the fact that it is derived from one cross sectional study and expert opinion; the research basis of that opinion is unknown.

1.3 Unexpected intense pain, particularly if sudden or associated with altered vital signs such as hypotension, tachycardia, or fever, should be immediately evaluated

Rationale

This recommendation is made by the AHCPR expert group (1992). The use of research evidence in determining the recommendation is not specified.

Strength of evidence (III)

The strength of evidence ascribed to this recommendation of III reflects the fact that it is derived from expert opinion and the research basis of that opinion is unknown.

1.4 Assess children's pain when undertaking other routine assessments to avoid unnecessary distress or disturbance

Rationale

This recommendation is made by the AHCPR expert group (1992). The use of research evidence in determining the recommendation is not specified. Whilst not directly investigating the effects of disturbance on children's pain, some authors have remarked on this in the course of their research (Romsing & Walther-Larsen, 1996). Elander *et al.* (1993), suggest that pain management should include sensitive care practices which involve causing minimal disturbance to the child. Such practices help reduce a child's anticipatory anxiety, which has been shown to adversely affect postoperative pain (Palermo & Drotar, 1996).

Strength of evidence (III)

The strength of evidence ascribed to this recommendation of III reflects the fact that it is based on expert opinion, although it is supported by three related cross sectional studies.

2 Indicators of children's pain

2.1 Note changes in children's behaviour, appearance, activity level, and vital signs as these may indicate a change in the pain intensity

Rationale

Behaviour is a useful measure and indicator of pain in children (Goodenough *et al.*, 1997, 1998; McGrath, 1998; McGrath *et al.*, 1998) because children often cannot or will not report pain to their health care providers (Woodgate & Kristjanson, 1995). Pain behaviour can act as a proxy for self report in those children who are unable to communicate verbally. For example, facial reaction is shown to produce the largest observable pain related change, while verbal behaviour correlated least significantly with self-report measures (Goodenough *et al.*, 1997). In addition, children's behaviour has been found to influence the decision by parents and nurses to intervene and treat a child's pain (Hamers *et al.*, 1994, 1996, 1998).

Strength of evidence (I)

This recommendation was originally made by the expert group of the AHCPR (1992). Research evidence which supports the recommendation includes a randomised controlled trial (Hamers *et al.*, 1996) as well as cross-sectional studies demonstrating that children's behaviour can be a useful indicator of their pain. The recommendation is, therefore, graded I.

2.2 Use physiological measures (e.g. heart and respiratory rates) but only in addition to self-report and behavioural measures to determine whether children are in pain

Rationale

Changes in physiological variables are thought to be associated with pain (Coffman *et al.*, 1997;

Hester, 1993; Tyler *et al.*, 1993) and are, therefore, suggested as indicators of the presence of pain. Such variables include heart rate, vagal tone, respiratory rate, blood pressure, palmar sweating, oxygen saturation, transcutaneous oxygen tension, transcutaneous carbon dioxide tensions and intracranial pressure (Sweet & McGrath, 1998). However, there are dangers in relying solely on physiological indicators as they may vary in the degree to which change is detected. Van Cleve *et al.*, (1996), for example, noted a distinct change in pulse rate amongst toddlers during painful procedures, though little significant physiological differences in other signs. They are also too similar to the related feelings of fear and anxiety (Stein, 1995; Van Cleve *et al.*, 1996). In addition, the properties necessary to establish the usefulness of physiologic measures, such as reliability, validity, specificity, sensitivity and practicality (Stevens *et al.*, 1995; Zeltzer *et al.*, 1990) have not been established and the measures do not reliably estimate pain intensity in the postoperative period (Tyler *et al.*, 1993). Physiological measures should not, therefore, be used in isolation to assess children's pain but rather as part of a comprehensive approach, including valid and reliable subjective, behavioural and physiological measures (Bournaki, 1997).

Strength of evidence (II)

The recommendation was originally made by the expert group of the AHCPR (1992). The research evidence supporting the recommendation includes several cross sectional studies which is, therefore, graded II.

3 Individual differences in children's expression of pain

3.1 Obtain a pain history from each child and his/her parents at the time of admission and learn what word the child uses for pain (e.g. hurt, baddie, etc.)

Rationale

Children's expression of their pain experience is not only affected by chronological age or cognitive development, but also individual differences (Woodgate & Kristjanson, 1995, 1996).

Understanding different aspects of pain also occurs at different ages and is influenced by pain experienced by other members of their family (Harbeck & Peterson, 1992). A pain history should, therefore, be obtained for each child to establish his or her family's experience of pain (Harbeck & Peterson, 1992, Woodgate & Kristjanson, 1995) and to obtain a behavioural baseline which will assist in identifying the words the child uses to express his or her pain.

Children who have difficulty communicating their pain require particular attention. This includes pre-verbal children, children on ventilators, those who are cognitively impaired, psychotic, or severely emotionally disturbed; children who do not speak English, and children from families where the level of understanding or cultural background differs significantly from that of the health care team (AHCPR, 1992).

Strength of evidence (II)

This recommendation was originally made by the expert group of the AHCPR (1992). The recommendation is graded II because it derives from multiple cross-sectional studies.

3.2 Recognise the importance of cultural factors which may affect the assessment of pain

Rationale

Studies show that children's cultural backgrounds can influence the way they express their pain (Knott *et al.*, 1994).

Strength of evidence (III)

This recommendation was originally made by the expert group of the AHCPR (1992). The recommendation is graded III, reflecting the fact that it is derived from one cross sectional study and expert opinion; the research basis of which is unknown.

4 Pain assessment tools

4.1 Pain assessment should include the use of a validated pain tool. The tool should be used in conjunction with the children's self-reports, with parents' assessment and health professionals' assessments of a child's pain

Rationale

Studies have shown that nurses' assessments of children's pain especially of those under 10 years, correlated more closely with those of children's self-reported pain when nurses use a validated pain assessment tool (Colwell *et al.*, 1996; Manne *et al.*, 1992). Results of an RCT demonstrated that patients were in less severe pain, received more analgesics and were assessed more frequently than a control group when nurses used the assessment tool CMPPMS (Stevens, 1990).

There are concerns about the validity of relying solely on behavioural observations to assess pain as assessments based solely on behaviour may result in an underestimation of pain intensity (Beyer *et al.*, 1990). Children may be unable to conceptualise and communicate degrees of pain intensity (Sinkin-Feldman *et al.*, 1997) and consequently both behavioural measurements of pain and children's self-reports should be used concurrently (Beyer 1990; Sinkin-Feldman 1997). Further support for using a variety of tools in assessing pain is provided by findings that young children tend to choose extremes when presented with multiple response options (Goodenough *et al.*, 1997, 1998). However, Harbeck & Peterson (1992) suggest that given developmentally appropriate questions, older children can provide rich descriptions of their pain and children as young as three are capable of providing descriptive information.

Although the distinction between distress and pain is often unclear, it is important to note that there is a high correlation between the two which was shown in a study of children having needle punctures (Fradet *et al.*, 1990). The study suggests that in such situations there is no difference between anticipatory anxiety, pain self-report and pain behaviour.

Strength of evidence (I)

The recommendation is evidence-based and is graded I as one of the studies is a randomised controlled trial. It is also supported by a quasi-experimental study and a number of cross sectional studies.

4.2 Self-report tools should be used whenever children are able to communicate

Rationale

Palermo & Drotar (1996) found that children's self-reports provide information on which health care professionals may reliably predict postoperative pain. Children may often not speak about their pain unless they are specifically asked (Romsing *et al.*, 1996a).

Self-report tools, the 'gold standard' for assessing children's pain (McGrath *et al.*, 1996), are appropriate for most children 4 years and older and provide the most accurate measure of children's pain. Children over the age of 7 or 8 who understand the concept of order and number can use a numerical rating scale or a horizontal word-graphic rating scale (AHCPR, 1992). School-aged children are capable of providing graphic descriptions of their pain (Gafney & Dunne, 1986; Savedra *et al.*, 1993) and are able to communicate their feelings and strategies they use to alleviate their pain (Ely, 1992). There is still no clear indication as to the role preference plays in completing self-report pain scales (Tesler *et al.*, 1991).

Strength of evidence (II)

The recommendation is supported by numerous cross sectional studies and is, therefore, graded II.

5 The recognition and assessment of pain in neonates and infants

5.1 Recognise that it is possible to measure the level of pain in premature infants

Rationale

Studies have shown that very low birth weight premature infants are capable of demonstrating a

multidimensional response to pain with the responses differing according to gestational age (Elander *et al.*, 1993; Johnston *et al.*, 1995; Lindh *et al.*, 1997; Stevens *et al.*, 1993). Pain needs to be promptly assessed as untreated pain may lead to sustained changes in the central neural system, similar to post-traumatic stress disorder (Taddio *et al.*, 1997). Morton (1998) suggests that care needs to be taken in assessing pain in younger, less mature, critically ill, sedated or paralysed neonates as they may be incapable of showing the same pain behaviour as older or healthier babies.

Strength of evidence (II)

This recommendation is graded II to reflect the evidence from a cohort study and several cross sectional studies.

5.2 Behavioural measures can validly indicate that infants are experiencing pain. These measures include: crying, facial expressions, motor responses, body posture, activity, undue quietness, restlessness and appearance

Rationale

A number of studies demonstrate that infants display behavioural responses to painful stimuli (Fuller & Conner, 1995; Grunau *et al.*, 1990; Rushforth *et al.*, 1994; Taddio *et al.*, 1995) and that nurses use behavioural cues to help them identify when children are in pain (Fuller & Conner, 1996). Three cross sectional studies (Fuller *et al.*, 1995; Grunau *et al.*, 1990; Rushforth *et al.*, 1994) and one randomised controlled trial (Taddio *et al.*, 1995) have enabled key indicators of children's pain to be identified including: square, angular mouth shapes, chin quiver, closed eyes, funnel concave tongue, lips parted and stretched (Grunau *et al.*, 1990); brow bulge, eye squeeze, nasolabial furrow and open mouth (Fuller & Conner, 1995). Behavioural indicators have in common changes in a child's behaviour such as crying, facial expressions, motor responses, body posture, activity, undue quietness, restlessness and appearance.

A number of researchers have attempted to develop tools on the basis of these behavioural indicators (Ambuel *et al.*, 1992; Horgan & Choonara 1996; Lawrence *et al.*, 1993). The Liverpool Infant Distress Scale (LIDS) is a scoring measure developed from analysing videotaped pain behaviours (Horgan & Choonara 1996). Work is currently underway to further develop the LIDS to enable it to be used as a tool for health professionals.

The NIPS (Lawrence *et al.*, 1993) is based on the measurement of facial expression, cry, breathing patterns and state of arousal. The NIPS is an objective and replicable tool for use in assessing pain or pain elicited distress in infants.

Expert opinion particularly recommends the use of behavioural observation as the primary pain assessment method for the non-verbal child (AHCPR, 1992). Johnston *et al.* (1995) however, caution against relying solely on behavioural responses with neonates because they may be physically incapable of crying or body movement and their stillness may not indicate that they are pain free.

Strength of evidence (I)

This recommendation is graded I because the evidence upon which it is based comes from a randomised controlled trial and several cross sectional studies.

5.3 No pain assessment tools should be used in isolation; the overall status and gestational age of infants, parental views and the environment must be taken into account

Rationale

There are seven dimensions of pain which affect the accurate assessment of pain; cognitive, physiological, sensory, behavioural, affective, sociocultural and environmental factors (Morton, 1997). A uni-dimensional approach to assessing pain is particularly difficult with neonates and infants as self-report is not possible (Stevens, 1997). In addition, neonates and infants in highly charged, potentially noisy and disruptive environments of hospitals may be distressed, particularly as they have little comprehension of events, little contact with family members, and an inability or reduced ability to communicate (Ambuel *et al.*, 1992).

Strength of evidence (II)

This recommendation is graded II because the evidence upon which it is based comes from several cross sectional studies.

6 How should pain in young children be recognised and assessed?

6.1 Behavioural and/or self-report tools should be used to assess pain in young children. The tool used depends on the child's age, development and clinical condition

Rationale

Studies have demonstrated that using scales, such as visual analogue scales (VAS), to assess pain in young children is less useful or reliable than in older children or adults (Fradet *et al.*, 1990, Tyler *et al.*, 1993). However, there are a number of scales that assess pain in children in this age range: TPPPS (Tarbell *et al.*, 1992), DEGR (Gauvain-Piquard *et al.*, 1987) and CHEOPS (McGrath *et al.*, 1985a) are examples of such scales.

Tesler *et al.* (1991) demonstrate that whatever scale is used, it is important to ensure that it is appropriate for the cognitive development of the child.

Strength of evidence (II)

The recommendation is graded II to reflect the fact that it is derived from several cross sectional studies.

6.2 Behaviour should be observed for the following pain indicators: crying, facial expressions, motor responses, body posture, activity and appearance

Rationale

It is important to observe a variety of behavioural factors to ensure that a child's individual cultural and experiential context is taken into account because children respond differently to pain. The assessment tool FLACC, is an example of a tool which takes into account at a range of indications: face, legs, activity, cry and consolability (Merkel *et al.*, 1997).

Strength of evidence (III)

This recommendation is graded III as it is derived from expert opinion and is supported by one cross sectional study.

6.3 Observation of behaviour should include and note blunted behaviour that may be due to severe pain in addition to depression, fatigue, extreme illness or the use of sedatives or hypnotics

Rationale

Broome *et al.* (1994) demonstrate the relationship between medical fears, acute pain and coping strategies, which include passive as well as active behaviour. They found no significant differences between pain perception and passive or active behaviour.

Strength of Evidence (III)

The strength of evidence ascribed to this recommendation of III reflects the fact that it is derived from expert opinion and one cross sectional study.

6.4 Self-report tools are appropriate for most children 4 years and older and provide the most accurate measure of children's pain

Rationale

In studies it has been found that children as young as 3 years old were capable of making and communicating judgements about pain (Romsing *et al.*, 1996a, 1996b), and that 4-7 year old children were able to use a body outline tool to report the location and extent of pain (Van Cleve & Savedra, 1993).

Age alone cannot determine whether it is more appropriate to use a behavioural scale, self-report or physiological indicators of pain. A child's development, illness and any restrictions caused by the clinical procedure e.g. artificial ventilation, should all be taken into consideration when choosing an appropriate tool.

Strength of evidence (II)

The evidence for this recommendation is graded II as it is derived from a number of cross sectional studies.

6.5 Provide enough time for children to complete pain assessments accurately

Rationale

Children sometimes do not have sufficient time to complete pain assessments accurately. This may be

due to the timing of the admission procedure (Savedra *et al.*, 1993).

Strength of Evidence (III)

The recommendation is graded III as it is derived from expert opinion and one cross sectional study.

7 Assessment of pain in older children and adolescents

7.1 Use a pain assessment tool appropriate for the child's developmental level, personality and condition

Rationale

The physiological, psychological and experiential components of pain are influenced by a child's growth and development (Stevens *et al.*, 1987). Children and adolescents are able to use analogue scales and self-report measures.

Strength of evidence (III)

The evidence for this recommendation is derived from expert opinion and a cross sectional study.

7.2 Older children and adolescents should be offered one of the recommended range of pain assessment tools and encouraged to use the one they feel is most appropriate

Rationale

It is often difficult for clinicians to avoid relying on their subjective clinical assessment of pain. In addition, older children's behaviour may bear no relation to the intensity of pain felt. It is, therefore, recommended that multidimensional pain assessment tools are used for this age group (Vetter & Heiner 1996).

Strength of Evidence (III)

The evidence is derived from expert opinion and one cross sectional study.

7.3 Provide enough time for older children and adolescents to complete pain assessments

Rationale

Children sometimes do not have sufficient time to complete pain assessments accurately. This may be due to the timing of the admission procedure (Savedra *et al.*, 1993).

Strength of Evidence (III)

The recommendation is graded III as it is derived from expert opinion and one cross sectional study.

8 Parents/Carers/Families

8.1 Children's families should be encouraged to contribute to the assessment of their pain

Rationale

Studies show that parents can identify children's pain behaviours (Chambers *et al.*, 1996; Finley *et al.*, 1996; Fradet *et al.*, 1990; Reid *et al.*, 1995; Watt-Watson *et al.*, 1990; Wilson *et al.*, 1996). Stein (1995) showed a positive correlation between mother's perception of pain, and the behavioural and physiological responses of the child to a painful stimuli. Where fear is present, behavioural indicators are often misinterpreted by health care professionals and family members may be better able to interpret children's behaviour (Coffman *et al.*, 1997).

Strength of evidence (II)

The recommendation is graded II to reflect the type and quality of the studies from which the evidence is drawn: 3 cross-section studies, 1 cohort and 2 qualitative studies.

8.2 Parents' assessments of their child's pain should not over-ride the child's self-report. However, where children are unwilling or unable to give a self-report, family reports of pain should be used

Rationale

Children's estimates of pain often differ from their parents (Jylli & Olsson, 1995; Palermo & Drotar,

1996) and while parents can be as effective as clinical staff they are not as accurate as the child (Wilson *et al.*, 1996). For example, Jylli & Olsson (1995) found that children's estimates of their pain are invariably higher than either those of their parents or nurses. In addition, children's predictions about pain tend to be more accurate than their parents' (Palermo & Drotar, 1996). Reasons for the discrepancy include parents' lack of awareness about available treatments, low expectations of pain relief, gratitude for any attention received and an acceptance of the inevitability of pain (Jylli & Olsson, 1995). Parents' ratings of their children's pain may also reflect their own anxiety (Manne *et al.*, 1992).

The subjective nature of pain means that the person in pain assesses their pain more accurately than others. Pain is, therefore, best understood when directly reported by a child using self-report methods (Savedra *et al.*, 1993).

Strength of Evidence (II)

This recommendation is graded II as it is derived from several cross sectional studies.

8.3 Parents need adequate information to be able to contribute to the assessment of children's pain

Rationale

Parents need adequate information about the procedure their child is undergoing, specifically its duration, and the role they are expected to take in comforting their child if they are to assist health care professionals in their child's pain experience (Finley *et al.*, 1996; Sikich *et al.*, 1997; Watt-Watson, *et al.*, 1990). One study showed where parents are kept informed and assist, children suffer less pain (Kristensson-Hallstrom *et al.*, 1997).

Information sheets should include details about ways in which pain can be recognised and assessed, the child and parents' roles in pain assessment, and the importance of informing the nurse if the child is experiencing pain.

The Postoperative Pain Measure for Parents (Chambers *et al.*, 1996) is a tool which assists parents in assessing pain in their child's post surgery period.

Strength of evidence (II)

The recommendation is graded II to reflect the type and quality of the studies from which the evidence is drawn: 1 cohort study, 1 cross-section study, 1 two-group experimental design study and 1 qualitative study.

8.4 Before discharge, methods for assessing pain and their effectiveness should be reviewed with the child and family and information provided about conducting pain assessments effectively at home

Rationale

Parents express concern about their ability to assess and manage their child's pain at home (Kokki & Ahonen, 1997; Romsing *et al.*, 1996b & 1996c; Sikich *et al.*, 1997).

Strength of evidence (II)

The strength of evidence for this recommendation reflects the fact that the question is not one about the effectiveness of a recommendation but concerns parents' feelings. The recommendation is based on 2 qualitative studies examining parents' confidence in assessing and managing their child's pain at home.

children's pain.

Strength of evidence (II)

The recommendation is graded II to reflect the type and quality of the studies from which the evidence is drawn: three cross sectional studies and one survey of occupational therapists.

A selection of assessment tools is summarised on the following pages. The selection is not comprehensive, nor are the tools necessarily recommended as the most suitable for use.

Material for this summary has been taken with thanks from Morton, N (1998). Additional sources: Stevens, B (1997) and Hain RDW (1997).

9 Health care professionals

9.1 Health professionals should be trained to recognise and assess pain

Rationale

Health care professionals often rely on a select number of pain-related behaviours on which they base subjective opinions about pain intensity (Vetter & Heiner 1996). Understanding pain assessment enables health care professionals to recognise patterns and causes of pain responses according to children's ages (Beyer *et al.*, 1990). Health care professionals need to be trained to question children sensitively, and to provide them with time and sufficient chances to respond to questions (Harbeck & Peterson, 1992). They also need to be trained to observe self-initiated coping strategies in order to recognise their use as an indication that the child is experiencing pain (Woodgate & Kristjanson, 1995). Studies show that nurses who have received education about the management of pain in children identify more indicators of pain (Coffman *et al.*, 1997), use more pain management strategies (McCain *et al.*, 1995) and give more narcotics (Page *et al.*, 1991) than those who have not. The results of one study (Fuller & Conner, 1997) suggest that education may increase nurses' awareness of dependable or less dependable cues of pain for use when assessing

Summary of assessment tools

Neonates (0-1 month): Behavioural and physiological signs of pain and distress

Tool and reference	Validated	Indicators	Advantages/disadvantages
OPS (Objective Pain Scale) Hannallah <i>et al.</i> , 1987; Broadman <i>et al.</i> , 1988; Norden <i>et al.</i> , 1991a,b	✓ against CHEOPS and FACES	Blood pressure, crying, movement, agitation, verbal evaluation/body language	Advantages: ● easy to use ● 5 categories ● reliable between observers ● tracks pain over time and scores decrease with analgesia Disadvantages: ● BP measurements may upset neonates ● cannot use in intubated paralysed babies ● 3 out of 5 categories are similar
NFCS Neonatal Facial Coding System Grunau, 1990	✓	Bulging brow, eyes squeezed tightly shut, deepening of nasolabial furrow, open lips, mouth stretched, taut tongue	● anatomically based system for assessing facial expression
CRIS (Crying, Requires O2 for saturation above 95, Increased vital signs, Expression and Sleeplessness) Krechel & Bildner, 1995	✓	Cries, oxygen saturation, heart rate/blood pressure, expression, sleeplessness	Advantages: ● easy to remember and use ● valid and reliable down to 32 weeks gestational age ● reliable between observers ● tracks pain and the effect of analgesics Disadvantages: ● uses oxygenation as a measure which can be affected by many other factors ● BP measurements may upset babies
NIPS (Neonatal Infant Pain Scale) Lawrence <i>et al.</i> , 1993	✓	Facial expression, cry, breathing patterns, arms, legs, state of arousal	Disadvantages: ● uses 6 categories, 2 of which are similar ● hard to remember ● cannot be used in intubated or paralysed patients
COMFORT Ambuel <i>et al.</i> , 1992	✓	Alertness, calmness/agitation, respiratory response, physical movement, blood pressure, heart rate, muscle tone, facial tension	Disadvantages: ● complicated ● 8 categories and many sub-categories ● cannot be used in intubated or paralysed patients
CHEOPS (Children's Hospital of Eastern Ontario Pain Scale) McGrath <i>et al.</i> , 1985a Barrier <i>et al.</i> , 1989	✓	Alertness, calmness/agitation, respiratory response, physical movement, blood pressure, heart rate, muscle tone, facial tension	Disadvantages: ● complicated behavioural scale ● may not track post-operative pain well in 3-7 year olds as pain behaviour inhibited ● 10 categories, 4 of which are similar ● confusing (high score = low pain) ● cannot be used in intubated or paralysed patients
LIDS (Liverpool Infant Distress Score) Horgan <i>et al.</i> , 1996	✓	Spontaneous movements, spontaneous excitability, flexion of fingers and toes, tone, facial expression, quantity of crying, sleep pattern and amount	Advantages: ● assesses post-operative pain ● 0 - 5 point scale
PIPP (Premature Infant Pain Profile) Stevens <i>et al.</i> , 1996	✓	Gestational age, behavioural state, heart rate, oxygen saturation, brow bulge, eye squeeze, nasolabial furrow	Advantages: ● each indicator evaluated on a 4 point scale ● total score dependant on infant's gestational age Disadvantages: ● 7 indicator pain measures

Summary of assessment tools

Infants and toddlers (1 month - 3 years): Behavioural and physiological signs of pain and distress

Tool and reference	Validated	Indicators	Advantages/disadvantages
OPS	see previous page		
COMFORT	see previous page		
CHEOPS	see previous page		
TPPPS (The Toddler/Pre-Schooler Post Operative Pain Tool) Tarbell <i>et al.</i> , 1992	✓	Verbal pain, complaint/cry, groan/moan/grunt, scream, open mouth, squint, brow bulge, restless motor behaviour, rub/touch	Advantages: <ul style="list-style-type: none"> ● suitable for age 1-5 years ● tracks pain relief and effects of analgesia ● correlates with nurse and parental pain assessments Disadvantages: <ul style="list-style-type: none"> ● 7 categories to score
Nurse observations Manne <i>et al.</i> , 1992			Advantages: <ul style="list-style-type: none"> ● easy to incorporate into routine observations ● experienced nurse usually accurate Disadvantages: <ul style="list-style-type: none"> ● observer bias ● lack of training leads to inaccuracy
Parental observations Manne <i>et al.</i> , 1992 McGrath <i>et al.</i> , 1994			Advantages: <ul style="list-style-type: none"> ● parental observations are often helpful and accurate

Summary of assessment tools

Children (3-7 years): Behavioural and physiological signs of pain and distress

Tool and reference	Validated	Indicators	Notes
OPS	see p. 47		
COMFORT	see p. 47		
CHEOPS	see p. 47		
TPPPS	see p. 48		
FACES McGrath <i>et al.</i> , 1985b Manuksela <i>et al.</i> , 1987 Whaley & Wong, 1987 Bieri <i>et al.</i> , 1990	✓	set of cartoon style faces in various stages of pain no of faces ranges 4-6	<ul style="list-style-type: none"> ● simple and quick ● younger children tend to choose extremes ● best with 4 choices ● some children confuse with happiness measure
Poker Chip Tool Hester, 1990 Beyer & Wells, 1989	✓	4 red chips or 4 red and 1 white chip (no pain). Chips represent 'pieces of hurt'	<ul style="list-style-type: none"> ● useful for children 4 - 13 years old
Colour Scales Eland, 1981 Beyer & Wells, 1989	✓	child chooses pens or crayons and colours the outline of a child's body	<ul style="list-style-type: none"> ● quickly engages child's interest ● fun ● colours allow expression of other aspects of pain ● child describes exact site of pain
OUCHER Beyer, 1984 Beyer & Aradine, 1986; 1987 Aradine <i>et al.</i> , 1988 Beyer & Wells, 1989	✓	photographs of children in 6 stages of distress aligned to a vertical scale marked rating the degree of pain	<ul style="list-style-type: none"> ● can use either or both scales to fit child's comprehension/preference ● self-report ● 3 multi-ethnic versions available
Horizontal Linear Analogue Beyer & Wells, 1989	no details available		
VAS Vertical Analogue Scale Scott & Huskisson, 1979	✓	verbal or horizontal line with verbal, facial or numerical anchors on a continuum of pain intensity	<ul style="list-style-type: none"> ● reliable and versatile ● children must understand concept of proportionality ● intervals may not be equal from a child's perspective
CAS Coloured Analogue Scale McGrath <i>et al.</i> , 1996	✓	use sliding indicator on triangular-shaped scale varying in shape and colour	<ul style="list-style-type: none"> ● assesses pain intensity ● age 5 years + ● very easy to use
Adjectival Self-Report Morton, 1993			<ul style="list-style-type: none"> ● easy to use ● 4 categories sensitive enough to track pain and effect of analgesics ● use language that the child can understand
FLACC (Face, Legs, Activity, Cry, Consolability) Merkel <i>et al.</i> , 1997	✓		<ul style="list-style-type: none"> ● behavioural scale ● post operative pain

Summary of assessment tools

Children (7 years +): Self-reporting

Tool and reference	Validated	Indicators	Notes
Coloured Analogue Scale	see previous page		
Horizontal Linear Analogue	see previous page		
Adjectival Self-Report	see previous page		
APPT (Adolescent Pediatric Pain Tool) Savedra <i>et al.</i> , 1990, 1993 Tesler <i>et al.</i> , 1991	✓	assesses 3 dimensions of pain: location, intensity and quality	<ul style="list-style-type: none"> ● multi-dimensional tool ● includes word graphic rating scale, visual analogue scale (VAS), graded graphic numerical and colour scale
Ladder Scale Beyer & Wells, 1989	not in children	higher intensities of pain represented by higher rungs on ladder	<ul style="list-style-type: none"> ● used by wide range of ages

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