

Managing Pain in Children

A Clinical Guide for Nurses
and Healthcare Professionals



Second Edition

Edited by

Alison Twycross

Stephanie Dowden

Jennifer Stinson

WILEY Blackwell

Managing Pain in Children

Managing Pain in Children

A Clinical Guide for Nurses and Healthcare Professionals

Second edition

Edited by

Alison Twycross

Head of Department, Children's Nursing;
Reader, Children's Pain Management,
London South Bank University, United Kingdom

Stephanie Dowden

Clinical Nurse Consultant, Paediatric Palliative Care
Princess Margaret Hospital for Children, Perth, Australia

and

Jennifer Stinson

Nurse Clinician Scientist and Nurse Practitioner, Chronic Pain
Programme, The Hospital for Sick Children;
Associate Professor of Nursing, Lawrence S. Bloomberg
Faculty of Nursing, University of Toronto, Toronto, Canada

WILEY Blackwell

This edition first published 2014 © 2014 by John Wiley & Sons, Ltd.
First edition published 2009, © Blackwell Publishing Ltd.

Registered office: John Wiley & Sons, Ltd, The Atrium, Southern Gate, Chichester, West Sussex,
PO19 8SQ, UK

Editorial offices: 9600 Garsington Road, Oxford, OX4 2DQ, UK
111 River Street, Hoboken, NJ 07030-5774, USA

For details of our global editorial offices, for customer services and for information about how to apply for permission to reuse the copyright material in this book please see our website at www.wiley.com/wiley-blackwell

The right of the author to be identified as the author of this work has been asserted in accordance with the UK Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, except as permitted by the UK Copyright, Designs and Patents Act 1988, without the prior permission of the publisher.

Designations used by companies to distinguish their products are often claimed as trademarks. All brand names and product names used in this book are trade names, service marks, trademarks or registered trademarks of their respective owners. The publisher is not associated with any product or vendor mentioned in this book. It is sold on the understanding that the publisher is not engaged in rendering professional services. If professional advice or other expert assistance is required, the services of a competent professional should be sought.

The contents of this work are intended to further general scientific research, understanding, and discussion only and are not intended and should not be relied upon as recommending or promoting a specific method, diagnosis, or treatment by health science practitioners for any particular patient. The publisher and the author make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation any implied warranties of fitness for a particular purpose. In view of ongoing research, equipment modifications, changes in governmental regulations, and the constant flow of information relating to the use of medicines, equipment, and devices, the reader is urged to review and evaluate the information provided in the package insert or instructions for each medicine, equipment, or device for, among other things, any changes in the instructions or indication of usage and for added warnings and precautions. Readers should consult with a specialist where appropriate. The fact that an organization or Website is referred to in this work as a citation and/or a potential source of further information does not mean that the author or the publisher endorses the information the organization or Website may provide or recommendations it may make. Further, readers should be aware that Internet Websites listed in this work may have changed or disappeared between when this work was written and when it is read. No warranty may be created or extended by any promotional statements for this work. Neither the publisher nor the author shall be liable for any damages arising herefrom.

Library of Congress Cataloging-in-Publication Data

Managing pain in children : a clinical guide for nurses and healthcare professionals / edited by Alison Twycross, Stephanie Dowden, and Jennifer Stinson. – 2nd edition.

p. ; cm.

Preceded by: Managing pain in children : a clinical guide / edited by Alison Twycross, Stephanie J. Dowden, and Elizabeth Bruce. 2009.

Includes bibliographical references and index.

ISBN 978-0-470-67054-5 (pbk.)

I. Twycross, Alison, editor of compilation. II. Dowden, Stephanie, editor of compilation. III. Stinson, Jennifer, 1963- editor of compilation. IV. Title.

[DNLM: 1. Child. 2. Pain Management—nursing. 3. Evidence-Based Nursing. WL 704.6]

RJ365

616'.0472083—dc23

2013025395

A catalogue record for this book is available from the British Library.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Cover image: Health Care & Children © Sean Warren, courtesy of iStock

Cover design by His and Hers Design (www.hisandhersdesign.co.uk)

Set in 10/11.5 pt Sabon by Toppan Best-set Premedia Limited

Contents

List of Contributors	vi
Foreword	vii
<i>Professor Patrick J McGrath</i>	
1 Why Managing Pain in Children Matters	1
<i>Alison Twycross and Anna Williams</i>	
2 Anatomy and Physiology of Pain	18
<i>Jackie Bentley</i>	
3 Pain: A Biopsychosocial Phenomenon	36
<i>Alison Twycross and Anna Williams</i>	
4 Pharmacology of Analgesic Drugs	48
<i>Stephanie Dowden</i>	
5 Physical and Psychological Methods of Pain Relief in Children	86
<i>Alison Twycross and Jennifer Stinson</i>	
6 Pain Assessment	112
<i>Jennifer Stinson and Lindsay Jibb</i>	
7 Managing Acute Pain in Children	140
<i>Sueann Penrose, Lori Palozzi and Stephanie Dowden</i>	
8 Chronic Pain in Children	179
<i>Jennifer Stinson and Kathy Reid</i>	
9 Palliative Care in Children	212
<i>Stephanie Dowden</i>	
10 Management of Painful Procedures	246
<i>Kathy Reid, Alison Twycross and Dianne Tuterra</i>	
11 Where To From Here?	272
<i>Alison Twycross and Jennifer Stinson</i>	
Index	292

List of Contributors

Alison Twycross, Head of Department for Children's Nursing and Reader in Children's Pain Management, London South Bank University, UK

Jennifer Stinson, Nurse Clinician Scientist and Nurse Practitioner, Chronic Pain Programme, The Hospital for Sick Children; Associate Professor of Nursing, Lawrence S. Bloomberg Faculty of Nursing, University of Toronto, Toronto, Canada

Stephanie Dowden, Clinical Nurse Consultant, Paediatric Palliative Care, Princess Margaret Hospital for Children, Roberts Road, Subiaco, Perth, WA 6008, Australia

Jackie Bentley, Senior Lecturer Child Health, University of Worcester, St John's Campus, Henwick Grove, Worcester, WR2 6AJ, United Kingdom

Lindsay Jibb, Registered Nurse, Division of Haematology/Oncology, Department of Pediatrics, The Hospital for Sick Children, 555 University Avenue, Toronto, Ontario, M5G 1X8, Canada

Lori Palozzi, Nurse Practitioner, Acute Pain Service, Department of Anesthesia and Pain Medicine, The Hospital for Sick Children, 555 University Avenue, Toronto ON, M5G 1X8, Canada

Sueann Penrose, Clinical Nurse Consultant, Children's Pain Management Service, Royal Children's Hospital, Flemington Road, Parkville, Victoria 3052, Australia

Kathy Reid, Nurse Practitioner, Paediatric Chronic Pain Program, Stollery Children's Hospital, Edmonton AB, T6G 2B7, Canada

Dianne Tuterra, Child Life Specialist, Stollery Children's Hospital, Edmonton AB, T6G 2B7, Canada

Anna Williams, Faculty of Health, Social Care and Education, Kingston University and St George's University of London, Cranmer Terrace, London, SW17 0RE, United Kingdom

Foreword

I am delighted to introduce you to *Managing Pain in Children: A Clinical Guide for Nurses and Healthcare Professionals* (2nd edition). The editors, Twycross, Dowden and Stinson, are each internationally known as clinicians and scientists in pain in children. I know their work well. Together they bring a profound commitment to excellence in nursing care and their extensive experience from three continents in helping children, their nurses and their parents overcome pain.

The first edition of this book was an overwhelming success as it ensured that the best evidence was combined with a practical approach that is lacking in most textbooks. The coverage is broad and detailed and includes helpful approaches to acute, chronic and procedure pain as well as the special problems of pain in palliative care.

The integration of theory, evidence and practice is evident in the very helpful case studies that enliven the text.

Managing Pain in Children will be used by nurses, psychologists, physicians and other healthcare professionals who are committed to helping children. It is more than a book; it encompasses the distilled wisdom of the best clinicians and scientists in the field. This text will serve as a trusted colleague in guiding your clinical practice. Keep it close; you will consult it often.

Patrick J McGrath OC, PhD, FRSC, FCAHS
Integrated Vice President Research and Innovation,
Capital District Health Authority and IWK Health Centre;
Professor of Psychology, Pediatrics and Psychiatry
Canada Research Chair, Dalhousie University
Halifax, Nova Scotia, Canada

CHAPTER 1

Why Managing Pain in Children Matters

Alison Twycross

Department for Children's Nursing and Children's Pain Management,
London South Bank University, United Kingdom

Anna Williams

Faculty of Health, Social Care and Education, Kingston University and
St George's University of London, United Kingdom

Introduction

Despite the evidence to guide clinical practice being readily available, the management of pain in children is often suboptimal. This chapter will start by providing a definition of pain and pain management and will highlight the consequences of unrelieved pain. Children's views about the effectiveness of their pain management will be discussed, and commonly held misconceptions about pain in children detailed. The factors thought to influence pain management practices will be outlined. Information about pain management standards published in several countries will be discussed. How well children's pain is currently managed will be considered alongside the issue of professional accountability. Finally, the ethical imperative for managing children's pain effectively will be examined.

What is Pain?

'Pain is whatever the experiencing person says it is, existing wherever they say it does' (McCaffery 1972).

'Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain is always subjective. Each individual learns the application of the word through experiences related to injury in early life' (International Association for the Study of Pain [IASP] 1979, p. 249).

These two definitions of pain illustrate that the experience of pain is both a subjective and an individual phenomenon. This is particularly clear in the IASP definition, which explains how the many facets of pain interrelate and affect pain perception. Although supporting the concept of pain as a subjective phenomenon, the original IASP definition fell short in relation to those unable to communicate verbally, including neonates and young children and cognitively impaired children. This was addressed in 2001 when the following amendment was made:

‘The inability to communicate in no way negates the possibility that an individual is experiencing pain and is in need of appropriate pain-relieving treatment’ (IASP 2001, p. 2).

Pain management means applying the stages of the nursing process – assessment, planning, implementation and evaluation – to the treatment of pain.

The cyclical basis of these stages is illustrated in Figure 1.1.

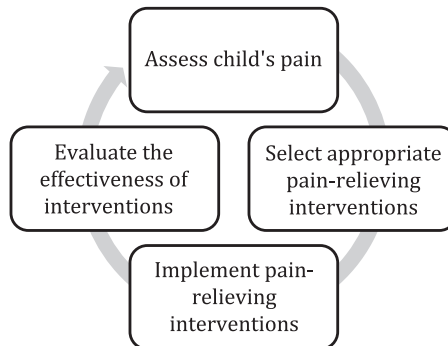


Figure 1.1 The stages of pain management.

Consequences of Unrelieved Pain

Pain has an important purpose, serving as a warning or protective mechanism, and people with congenital analgesia, who are unable to feel pain, often suffer extensive tissue damage (Melzack and Wall 1996). However, unrelieved pain has a number of undesirable physical and psychological consequences (Box 1.1). When these are considered, the need to manage children's pain effectively is clear. The results of studies demonstrating this are outlined in Box 1.2.

Children's memories of pain also influence subsequent pain experiences (Noel et al. 2012). Other consequences of unrelieved pain include:

- In a retrospective study with adults ($n = 147$), aged 17–21 years, childhood experiences of medical and dental pain were significant predictors of adults' medical pain (Pate et al. 1996).

BOX 1.1

Consequences of unrelieved pain

Physical effects

- Rapid, shallow, splinted breathing, which can lead to hypoxaemia and alkalosis
- Inadequate expansion of lungs and poor cough, which can lead to secretion retention and atelectasis
- Increased heart rate, blood pressure and myocardial oxygen requirements, which can lead to cardiac morbidity and ischaemia
- Increased stress hormones (e.g. cortisol, adrenaline, catecholamines), which in turn increase the metabolic rate, impede healing and decrease immune function
- Slowing or stasis of gut and urinary systems, which leads to nausea, vomiting, ileus and urinary retention
- Muscle tension, spasm and fatigue, which leads to reluctance to move spontaneously and refusal to ambulate, further delaying recovery

Psychological effects

- Anxiety, fear, distress, feelings of helplessness or hopelessness
- Avoidance of activity, avoidance of future medical procedures
- Sleep disturbances
- Loss of appetite

Other effects

- Prolonged hospital stays
- Increased rates of re-admission to hospital
- Increased outpatient visits

Source: WHO (1997)

BOX 1.2

Examples of research demonstrating the effects of poor management of acute pain

Taddio et al. (1997)

- Data from a clinical trial studying the use of EMLA® during routine vaccinations at 4 or 6 months was used to ascertain whether having had a circumcision impacted on boys' ($n = 87$) pain response.
- Boys who had been circumcised without anaesthesia as neonates were observed to react significantly more intensely to vaccinations than uncircumcised boys ($p < 0.001$).
- Supported findings from a previous study (Taddio et al. 1995).

Grunau et al. (1998)

- Examined the pain-related attitudes in two groups of children, aged 8–10 years: extremely low birthweight children ($n = 47$); full birthweight children ($n = 37$).
- The very low birthweight group of children had been exposed to painful procedures as neonates, the other group had not.
- Children were shown the *Pediatric Pain Inventory*, which comprises 24 line drawings, each depicting a potentially painful event (Lollar et al. 1982).

BOX 1.2 Continued

- The two groups of children did not differ in their overall perceptions of pain intensity. However, the very low birthweight children rated medical pain intensity significantly higher ($p < 0.004$) than psychosocial pain, suggesting that their early experiences affected their later perceptions of pain.

Saxe et al. (2001)

- Investigated the relationship between the dose of morphine administered during a child's hospitalisation for an acute burn and the course of post-traumatic stress disorder (PTSD) symptoms over the 6-month period following discharge.
- Children ($n = 24$) admitted to the hospital for an acute burn were assessed twice with the Child PTSD Reaction Index: while in the hospital and 6 months after discharge.
- The Colored Analogue Pain Scale was also administered during the hospitalisation. All patients received morphine while in the hospital. The mean dose of morphine (mg/kg/day) was calculated for each subject.
- There was a significant association between the dose of morphine received while in the hospital and a 6-month reduction in PTSD symptoms.
- Children receiving higher doses of morphine had a greater reduction in PTSD symptoms.

Rennick et al. (2002)

- A prospective cohort study of patients ($n = 120$) in paediatric intensive care units and medical-surgical wards.
- There were no differences between wards in terms of negative outcomes; however, children in the intensive care units received more analgesics and sedation.
- 17.5% of patients expressed significant medical fears 6 weeks after discharge.
- 14% continue to express these fears 6 months later.
- Children who underwent more invasive procedures had more medical fears, felt less in control of their own health, and exhibited more signs of post-traumatic stress for 6 months after discharge.

Taddio et al. (2002)

- A prospective cohort study of babies ($n = 21$) born to mothers with diabetes and babies ($n = 21$) born to mothers with an uneventful pregnancy.
- Infants of diabetic mothers had repeated heel-sticks in the first 24–36 hours of life.
- Babies of diabetic mothers demonstrated significantly greater pain behaviours at venepuncture for newborn blood screening ($p = 0.04$).

Grunau et al. (2009)

- Infants ($n = 137$ born preterm at 32 weeks gestation; $n = 74$ full-term controls) were followed prospectively.
- Infants with significant brain injury or major sensorineural impairments were excluded.
- At 8 and 18 months, poorer cognition and motor function were associated with a higher number of painful (skin-breaking) procedures.

- Distress associated with needle-stick procedures can develop into phobic reactions (Hamilton 1995), making completion of later procedures more difficult.
- Pain affects children's anxiety, mood and general quality of life (Schanberg et al. 2003; Martin et al. 2007).
- Pain and pain-related fear and anxiety affect children's functioning and can lead to deconditioning or avoidance of activity (Martin et al. 2007; Asmundson et al. 2012).

There is increasing evidence that acute (postoperative) pain can result in chronic pain:

- The incidence of chronic postsurgical pain is between 15% and 30% of (adult) patients (Gupta et al. 2011).
- 13% of children undergoing orthopaedic surgery developed chronic postoperative pain (Fortier et al. 2011).

Unrelieved pain has short- and long-term effects on children. It is important, therefore, to ensure that pain is managed effectively.

Children's Views about the Effectiveness of Pain Management

Pain is a biopsychosocial experience (Chapter 3) and this is why two people undergoing the same surgery or experiencing the same illness may report different pain experiences. When considering children's painful experiences it is, therefore, essential to explore children's views. Indeed the United Nations Convention on the Rights of the Child (1989) states that:

‘Children's views must be taken into account in all matters affecting them, subject to children's age and maturity.’

Children's views about how well their pain has been managed have been explored in four studies in the past decade (Box 1.3). It is evident that from the child's perspective there is a need to evaluate practices. (Further discussion about undertaking research with children can be found in Chapter 11).

Although these studies highlight the fact that children continue to experience moderate to severe pain, it is worth noting that this does not necessarily impact on satisfaction with care (Twycross and Collis 2012; Vincent et al. 2012; Twycross and Finley 2013). A study by Habich et al. (2012) found no changes in patient or family satisfaction with care despite improvements in pain assessment when evaluating the effectiveness of implementing evidence-based paediatric pain guidelines. These findings suggest that children, and their families, may expect to experience pain when in hospital and may see this pain as unavoidable. Children's perceptions of good pain management emphasise a holistic approach; valuing professional competence, communication, openness, and the invitation to participate in decision-making about pain management interventions (Nilsson et al. 2011).

Additional information

Further insight into children's experiences of pain in hospital can be found in: Kortessluoma, R.L. and Nikkonen, M. (2004) ‘I had this horrible pain’: The sources and causes of pain experiences in 4- to 11-year-old hospitalized children. *Journal of Child Health Care* **8**(3), 210–231.