The ability of A&E personnel to demonstrate inhaler technique

J O'Donnell, R Birkinshaw, V Burke, P A Driscoll

Abstract

Objective—To determine the ability of accident and emergency (A&E) personnel to demonstrate metered dose inhaler technique.

Methods—25 senior house officers and 25 nurses working in A&E were individually interviewed and assessed on their knowledge of inhaler technique and competence in demonstrating the correct use of a metered dose inhaler.

Results—Demonstration of inhaler technique was generally poor by the staff assessed. Although 22 (88%) of the senior house officers were aware of the British Thoracic Society guidelines, only 10 (40%) routinely checked inhaler technique when discharging asthmatic patients.

Conclusions—The A&E department offers an important opportunity for patient assessment and reinforcement of metered dose inhaler technique. Staff should be made aware of the British Thoracic Society guidelines and be competent at assessing and teaching inhaler technique.

Keywords: asthma; inhaler technique; accident and emergency department

Asthma is an important problem in the United Kingdom and a common presentation to accident and emergency (A&E) departments. In the majority of cases these patients are already using metered dose inhalers (MDI) as these allow a rapid, cost-effective, and safe method of delivering drugs directly to the lungs. In addition, they avoid many of the side effects associated with oral treatment. However, several surveys have shown that up to a quarter of patients using MDI have inadequate technique.1 2 Recently, many alternative devices have been produced, particularly for young children and patients with poor dexterity, in an attempt to improve inhaler efficacy. These include dry powder devices and “spacer” (aerochamber) devices. Nevertheless, studies have shown that the most important factor in many patients with poor technique is a lack of instruction in proper technique.3 Consequently, guidelines from the British Thoracic Society (BTS) advise that all asthmatic patients deemed fit for discharge from A&E should have their inhaler technique checked.4 The purpose of this study was to assess the knowledge and practical ability of A&E staff with regard to correct use of the MDI.

Methods

The study was carried out in the University Department of Emergency Medicine at Hope hospital, Salford. Twenty five senior house officers in emergency medicine and 25 nurses working in the A&E department were individually interviewed. Assessment was both theoretical, by responses to a questionnaire covering knowledge of inhaler technique, and practical, by showing competence in demonstrating the correct use of an MDI. All participants were blinded to the content of the study until the time of interview, and individual results remained confidential. The interview was carried out by two assessors and comprised two stages—a knowledge assessment and a demonstration assessment. The knowledge assessment section included a number of clinically relevant questions regarding inhaler use and efficacy (table 1). The demonstration assessment involved demonstrating 12 outlined steps using a placebo MDI when asked to instruct a patient on the proper use of an inhaler. These steps are outlined in table 2.

Results

Experience of the senior house officers who participated in the study ranged from postgraduate year 1 to year 5. The nursing staff experience varied from two to 30 years postqualification. Thirteen (52%) of the nursing staff stated that they learned their inhaler technique in nursing school, eight (32%) from observation, and three (12%) from information pamphlets. Of the medical staff, 18 (72%) said that they learned their inhaler technique by observation, 10 (40%) in medical school, and nine (36%) from information pamphlets. Twenty two (88%) of the medical staff said that they were aware of the BTS guidelines on the management of patients with asthma presenting to A&E. However, only 10 (40%) said that they routinely check inhaler
Table 2  Number of steps demonstrated properly

<table>
<thead>
<tr>
<th>SHOs (n=25)</th>
<th>Nurses (n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove cap</td>
<td>21</td>
</tr>
<tr>
<td>(2) Shake inhaler</td>
<td>21</td>
</tr>
<tr>
<td>(3) Hold inhaler upright</td>
<td>16</td>
</tr>
<tr>
<td>(4) Tilt head back or keep level</td>
<td>7</td>
</tr>
<tr>
<td>(5) Exhale to FRC or RV</td>
<td>16</td>
</tr>
<tr>
<td>(6) Either insert or keep mouthpiece 2-4 cm from mouth</td>
<td>21</td>
</tr>
<tr>
<td>(7) Activate inhaler at or near the start of inspiration</td>
<td>18</td>
</tr>
<tr>
<td>(8) Slow inhalation</td>
<td>7</td>
</tr>
<tr>
<td>(9) Continue to inhale after actuation</td>
<td>15</td>
</tr>
<tr>
<td>(10) Hold breath fro 5-10 seconds</td>
<td>19</td>
</tr>
<tr>
<td>(11) Breath out slowly</td>
<td>10</td>
</tr>
<tr>
<td>(12) Wait at least 30 seconds before next puff</td>
<td>14</td>
</tr>
</tbody>
</table>

FRC, functional residual capacity; RV, residual volume.

technique on asthmatic patients considered fit for discharge from A&E, having presented with asthma. Of the nurses questioned, only two (8%) were aware of the guidelines and only three (12%) said they routinely checked inhaler technique.

Table 1 shows that over half (52%) of those questioned, in both groups, felt that rapid inspiration was more correct than slow inspiration. Only 24% of the nurses were aware of the need to rinse the mouth out after using a steroid inhaler. When asked about how one can tell if the inhaler is empty, only 14 (56%) of the senior house officers answered “shake it”. Other suggestions were “the taste” (4%), “the smell” (4%), “the sound” (4%), and “don’t know” (20%). Nineteen (76%) of the nurses knew that they should shake the inhaler to test if it is empty.

The results of the demonstration assessment are seen in table 2. None of the nurses and only two of the senior house officers demonstrated all 12 steps correctly. The mean number of steps demonstrated correctly was 7.2 by the senior house officers, with a range of 4 to 12, and 5.1 by the nurses, with a range of 2 to 9. The steps most often omitted by the nurses were demonstration of a slow inhalation, continuing to inhale after actuation, breathing out slowly, and waiting at least 30 seconds before taking a second puff. The steps performed worst by senior house officers were demonstration of a proper head position, and slow inhalation.

Discussion

The use of the MDI is the commonest method of treatment for patients with reversible airway disease but optimum benefit depends on proper inhaler technique. Newman and Clarke emphasise the importance of proper initial instruction on correct inhaler technique and suggest this should be followed by regular checks, in order to improve patient technique. The BTS guidelines suggest the checking of inhaler technique by A&E staff when patients with asthma are discharged from the A&E department.

Our study documents major deficiencies in the knowledge and skills in the A&E staff with regard to the correct use of MDI. This deficiency has also been found in general medical nursing and medical staff.6 7

Our study also illustrates a lack of formal training in inhaler technique in nursing and medical school, with most staff relying on observation from patients as a means of learning how to use an inhaler. Greater emphasis must be placed on assessing and teaching correct inhaler use by the medical and nursing staff of the A&E department.

Although most of the senior house officers were aware of the BTS guidelines, less than half said that they routinely check inhaler technique. Very few of the nursing staff were aware of the guidelines.

We advocate that medical and nursing staff in the A&E department should be formally taught correct inhaler technique and should be competent in demonstrating the use of a MDI. The A&E department offers a important opportunity for patient assessment and reinforcement of MDI technique. Inhaler technique should always be checked before a patient is discharged from the A&E department. On the basis of the results of our study we have introduced instruction on MDI use at our senior house officer induction course, and the nursing staff have regular formal instruction from the asthma nurse specialist.

3 Frew AJ, Macfarlane JT. Poor inhaler technique may be perpetuated by clinical staff. Practitioner 1984;228:883.
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effective ways of changing practice in A&E departments. Alternative ways and means need to be evaluated to pass on information concerning vaccination in A&E in order to improve awareness and to change practice.

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2 Department of Health. Diphtheria in the former
USSR. (Professional letter: PL/CMO (93)9.)
3 British National Formulary, No. 28. London:
4 CMO's Update, 1995;5:1.
5 CMO's Update, 1996;6:3.

BOOK REVIEWS

Baillière's Clinical Neurology.
International Practice and Research,
volume 5, number 3. Critical Care.
Edited by C F Bolton and G B Young. (Pp
245; £30.00.) London: Baillière Tindall,

The book covers neuromuscular and the
major medical neurological emergencies. It
also provides information on the diagnosis
and investigation of neurological conditions
which arise in the ITU patient, such as the
"hard to wean" patient, critical illness
polyneuropathy, and iatrogenic seizures.
The chapter on CNS trauma gives a clear
review of current thought and practice in
the management of head injury. Unfortunately
the section on spinal trauma is too brief. This
is an important area and I would have liked to
see it treated in the same comprehensive man-
ner. In particular I feel more detail should
have been included on the acute monitoring
and management of the cardiorespiratory
complications in spinal trauma, and the later
presenting but potentially life threatening
autonomic dysreflexia syndrome.

Subarachnoid haemorrhage, stroke, sei-
zures, and Guillain-Barré syndrome are cov-
ered logically and with practical management
suggestions. The differential diagnosis of
encephalopathy is comprehensive, although
of necessity in a book of this size coverage of
the detailed management of specific conditions is
limited. In particular there is a good short sec-
on on hypoxic-ischaemic encephalopathy.

The last section covers ethics. It is clearly
written and covers such important areas as
withdrawal of care and euthanasia; however, it
is presented from a North American perspec-
tive and does not cover any of the recent Eng-
lish or Scottish case law.

Overall the book achieves an excellent
balance of relevant physiology and monitor-
ing, current practice, and the practical imple-
mentation of new research. There are sugges-
tions throughout of work in progress on new
therapeutic or neuroprotective agents, which
makes it a pleasantly optimistic read. I recom-
ent it to any trainee involved in the care of
neurologically injured or ill patients. Its
relevance to the A&E trainee comes from the
clear explanation of the principles of treat-
ment which form the basis for our emergency
room management.

JULIA HARRIS

London

Roberts' Practical Guide to Medical
Emergencies. By James R Roberts. (Pp 302;
£30.75.) Philadelphia: Lippincott-Raven,

Roberts's book constitutes part of the expo-
ential growth in texts on emergency medi-
cine. This book is a collection of essays written
by a single author from the American publi-
cation Emergency Medicine News. The
individual articles have been revised to bring
them up to date and grouped into themed
chapters. Many of the topics covered would
not be included in a British publication about
"medical" emergencies, such as fingertip inju-
ries, puncture wounds to the foot, and
sedation of children. The title does not accu-
rate the contents of the book, though the author undoubtedly presents a
practical guide based on personal practice,
supported by references to the medical liter-
ature. The views expressed are well reasoned
and highly readable in the main. However,
readers expecting a comprehensive "guide to
common medical emergencies" will be dis-
appointed. The small range of topics discussed
constitute a minor part of British A&E
practice.

Some of the topics covered have stimulated
considerable debate among my colleagues.
One particularly contentious example is the
recommendation for combined use of
intravenous fentanyl and midazolam by non-
anaesthetists to sedate children for painful
or unpleasant procedures in the emergency
department.

In this brave new world of evidence based
medicine, it is disappointing that this book is
in essence a collection of personal opinions.
While the individual articles are both interest-
ing and entertaining they lack the rigour of
systematic reviews and are not of great practi-
cal help in directing change in the manage-
ment of individual patients.

In summary the book provides an interest-
ing insight into the practice of a highly
respected North American emergency physi-
cian but many of the views expressed are not
readily applicable to the work of an A&E doc-
tor in Britain. Colleagues looking for a "prac-
tical guide to medical emergencies" are
advised to look elsewhere—perhaps closer to
home?

KEVIN REYNARD

Wakefield

Correction

In the paper by O'Donnell et al. in the May issue (volume 14, pages 163-4), some errors in table 1 were not corrected on
proof. The corrected section of the table is as follows (corrected figures in bold):

(4) It is important to rinse mouth out after steroid inhaler use. (True)
24/25 SHOs answered correctly
6/25 Nurses answered correctly

(5) How can you tell that the MDI is empty? (Shake it)
14/25 SHOs answered correctly
19/25 Nurses answered correctly