Are accident and emergency senior house officers getting slower?

You sometimes hear people saying that senior house officers (SHOs) in emergency departments are not what they used to be. We studied data collected over a five year period (1996–2001) on the number of patients seen by all SHOs who completed a six month post in our A&E department.

The 118 SHOs (62 male and 56 female) worked a full shift rota averaging 52 hours per week. The influence of the sex of the doctor on their future career plan on the number of patients they saw was also assessed.

The number of patients seen by each SHO in six months ranged from 1069 to 2659 (mean 1774, SD 346). On average the SHOs worked between August 1996 and January 1999 saw 154 more patients than those working between February 1999 and July 2001 (p = 0.015; unpaired t test). Male SHOs saw on average 217.5 patients (range 1121 to 2659) more than female SHOs (range 1069 to 2644) (p = 0.001; unpaired t test). The median number of patients seen by SHOs with a surgical interest was 1831 (interquartile range 1624 to 2024), and by those with a medical one was 1684 (interquartile range 1497 to 1847) (p = 0.002; Mann-Whitney U test).

We acknowledge that there have been changes in the delivery of emergency care over the time frame of this study. We did not study the quality of care given by the SHOs and it would be difficult to quantify this. It is possible that the slower SHOs were more thorough but our impression is that some SHOs (male or female) saw a lot of patients with a high standard of care. Our results show that A&E SHOs are seeing fewer patients than they used to. We need to be aware of this and consider the implications for the future of emergency care.

References

Authors’ reply

Howes’ concern about the term “relative analgesia” pertaining to our recent description of nitrous oxide analgesia in children is noted. This is actually a term that has been used to describe nitrous oxide for many years. It first appeared in the dental literature and was used originally to describe situations where continuous flow/variable concentration nitrous oxide was administered, often via a nasal mask. Other authors looking at the risk of aspiration using nitrous oxide analgesia used the term “relative...
analgesia” when studying 50% nitrous oxide/oxygen (Entonox).” The term does not appear to have been used in any of the emergency medical literature pertaining to nitrous oxide that we have seen.

The term continues to be used in contemporary literature “and in 2001 Lahoud et al. described relative analgesia as having the patient remaining conscious deliver 100% O₂ if needed. Certainly we found in our study that distraction techniques are easily done in conjunction with this method of analgesia and form an important part of it. We have used the term “relative analgesia” in our institution for many years, which is why it was included in our study. The term has also persisted in the name of the equipment used to administer continuous flow/variable concentration with the Quintflex RA machine originally manufactured by Cyprane, Keighley, England and now by Matrix Medical, New York.

We agree with Howes that there is enough confusion in the semantics of the literature on sedation/analgesic techniques without rejuvenating old terminology. However, perhaps the term “relative analgesia” may be useful in describing analgesia by inhalational techniques alone, which are becoming more common using agents such as nitrous oxide, methoxyflurane, and nitrous oxide/sevoflurane mixtures.

Nitrous oxide provides analgesia, anxiolysis, and mild amnesia when studying 50% nitrous oxide/oxygen mixtures.

We agree with Howes that there is enough evidence to justify the claim that “Welsh emergency vehicles examined exhibited an unacceptable level of bacterial contamination”. What is more, a press release from the editorial team to local newspapers led Madeline Brindley of the Western Mail to write, “Dirty ambulances infested with huge amounts of harmful bacteria are carrying seriously ill patients to hospital in Wales, according to a report published today. The new research discovered that even after they have been cleaned, ambulances are still home to “unacceptably” high levels of bacteria.”

The authors make no attempt to quantify levels of bacteria for organisms that are expected to be present in an environment occupied by people. Inevitably, steering wheels will be home to Staphylococcus epidermidis and viridans group streptococci, as they represent normal skin commensals. Bacillus sp are ubiquitous environmental organisms. Similar comments can be made for areas sampled throughout the ambulances.

The method used by Nigam and Cutter is suitable for a qualitative assessment and is normally used to identify specific pathogens. The only potential pathogen identified by the study is Staphylococcus aureus. A quantitative method should have been used for this type of study, if the conclusions were to be supported. Quantitative methods, such as those discussed by Roberts et al., take a measured area of a given surface and allow the number of bacteria to be counted per square centimetre. Such a technique allows for the assessment of reduction of bacterial load after a cleaning process.

Quite reasonably, the press will pick up on stories such as these when prompted by the editorial team. However, there is a responsibility on the editorial board of journals, their reviewers, and the researchers to ensure that study methods and the review process are rigorous. Only then can proper conclusions be drawn. Without that, fear can be instilled in the patient population and the NHS challenged inappropriately.

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References

Authors’ reply
We fully accept that the methods used were not rigorous enough to accurately quantify numbers of bacteria for any given measured area. However, our work was simply described as a preliminary investigation and this pilot study did identify shortfalls in cleaning practices in use at the time of the study. These included a lack of designated cleaning equipment for ambulances, insufficient time for thorough cleaning, and lack of suitable decontamination processes for medical equipment.

Most organisms identified in the study were unlikely to pose any threat of infection to patients or ambulance personnel. This was clearly stated in our article, but sadly was often ignored in the subsequent press reports, resulting in public concern.

Having identified that there were shortfalls in cleaning practices, action was required. The Welsh Ambulance Trust responded immediately to the results of the study and, supported by one of the authors (JC), took action to improve standards of cleanliness. This included the following:

- The Infection Control Committee and Regional Infection Control Teams continued to monitor cleanliness through regular environmental audits;
- Colour coded cleaning equipment has been introduced to prevent cross contamination during cleaning and standardisation of detergents and disinfectants has been completed;
- All vehicles have now been provided with “spillage kits” to absorb fluid spills;
- A chlorine releasing disinfectant is provided for each vehicle for prompt decontamination of blood and body fluids;
Children and mini-magnets: comments and suggestions

I read with interest “Children and mini-magnets: an almost fatal attraction.” The authors illustrate the difficulty of separating attracted magnets when avoiding further trauma to the entrapped tissue, as the usual methods—of sliding the magnets apart, or using standard instruments—cannot be used. It is possible to “short out” the effective strength of a magnet (in the same way that the soft iron keeper of a horseshoe magnet greatly diminishes its external attraction) by putting a high permeability material between the poles. One such material is “Permalloy,” and pieces and sheet can be formed around a magnet. (McCormick et al do not seem to list the magnetisation directions in the shape they encountered, so one cannot make any more specific suggestions.) Permalloy might be available in your friendly neighbourhood physics department. Another technique is to put a third similar magnet against one of the two problem ones.

Here in the USA, powerful magnets are used to hold ear “rings” or ear studs in place. A friend, who has given magnetic jewelled studs as science encouragement to pre-teen girls, has received thanks from their mothers: the mothers emphatically prefer the magnets to pierced ears.

I am curious about the origin of the Sheffield magnets: extremely powerful ones are found in discarded computer hard drives, but they have irregular shapes.

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References

Radiology in paediatric cervical spine injury

I read with interest the letter by Smart et al regarding the assessment of paediatric cervical spine injuries. It would certainly appear that many children in their cohort were radiographed unnecessarily according to current guidelines. However, I would hope that the practice in their institution has changed dramatically in the six years since the group attended.

Current guidelines on selection of patients for imaging are based primarily on adults. In the NEXUS group, only 30 children had a cervical spine injury,7 and in the Canadian c-spine group, there were no children at all. Extrapolating results to children who may be distressed or uncooperative should be performed with caution.

The low prevalence of cervical spine injuries in children makes guidelines difficult to create. In an 11 year analysis of the Trauma Audit Network Database, only 239 children (of 19 538 with major trauma) were identified as having a cervical spine fracture and 21 with spinal cord injury without radiological abnormality (unpublished data).

I am concerned that the authors feel that a single lateral projection should be adequate. The evidence for omitting the PEG view is based on small case series6 or questionnaires, and certainly the odontoid synchondrosis should be ossified by the age of 7.

Imaging of the paediatric cervical spine remains a difficult problem. As the authors confirm, there is no substitute for adequate clinical assessment, but where this is not possible, every effort should be made to rule out a potentially devastating injury.

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References

Emergency department investigation of deep vein thrombosis

Klirtoy et al should be commended for highlighting the difficulty of point of care (“near patient”) testing in general, and in emergency medicine in particular. They, however, failed to highlight some important points that may have been significant confounding variables in this study. Firstly, the authors quite rightly pointed out the qualitative nature of the SimplRED (DD) assay and the inherent possibility for interobserver variation. Although this is a “simple” assay and comparatively accurate in experienced hands, there is a learning curve in performing and interpreting the results that the authors failed to emphasise. How steep or otherwise was the learning curves of the doctors assessing the SimplRED test? The robustness of the data may be improved if interobserver reliability was measured, for example by k and weighted k statistics. Secondly, cut off points are critical in diagnostic testing because they determine the assay sensitivity and specificity. For example, if the DD cut off is set too low, then the test is too sensitive and not specific, so almost everyone ends up being positive and the test loses meaning. What was the cut off value for DVT diagnosis in this study? Was it based on receiver operator characteristic (ROC) curves (a scientifically valid method of determining diagnostic cut off values)? Differences in cut off values may explain the differences observed in the diagnostic performance of the assay in this study and Wells’ original data. Finally, to ensure good applicability, when choosing a DD assay it should be verified that the assay has been studied in a patient population similar to that in which it would be used. Did the authors extrapolate a cut off point for DVT diagnosis from the manufacturer of the assay? If so, was their study population similar to that of the manufacturer’s?

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References

Fractured clavicle and vascular complications

A 55 year old right handed man presented with a three month history of left arm pain and precordial chest discomfort. His symptoms had started three months previously after a heavy game of squash. Three years before the acute episode, he was involved in a motorcycle accident and had sustained a left mid-clavicular fracture.

On clinical examination he was in sinus rhythm and the supine blood pressure was 146/94 mm Hg in the right arm. He had a cold left arm with no recordable blood pressure. The left axillary, brachial, and radial pulses were absent. A bruist was audible over the left subclavian artery. The fasting total cholesterol was 4.4 mmol/l.

The chest radiograph showed non-union and displacement of the fragments of the left clavicle. Three dimensional contrast enhanced magnetic resonance angiography (CE-MRA) showed a small false aneurysm (diameter 1.5 cm) in the mid-portio of the left subclavian artery (see fig 1). In addition there was a stenosis of the left subclavian artery adjacent to the aneurysm with an intraluminal thrombus, immediately distal to the point of stenosis. The aneurysm probably resulted from insult to the subclavian artery by the clavicular fracture and aggravated by squish playing.

Percutaneous balloon angioplasty with stent deployment to the left subclavian artery was attempted. The procedure was complicated by acute thrombosis, after which an intra-arterial thrombolysis with streptokinase. Restoration of blood flow was achieved by a reverse vein graft bypass between thoraco-acromial and brachial arteries.

 Injury to the subclavian artery should be considered in all patients who complain of ischaemic symptoms in the arm after claviclar fracture. Furthermore, this case
This is because the benzodiazepines (for example, diazepam, lorazepam, and midazolam) are well tolerated, with a high therapeutic index, and are not implicated in any of the above reactions. They have proved safety and efficacy in animal experiments and widespread clinical use for sympathomimetic drug related agitation. They also possess dose dependent efficacy that is easily titratable, and have established seizure prophylaxis and seizure terminating activity. Benzodiazepines have no arrhythmogenic potential with therapeutic or toxic exposures, and antihypertensive and arrhythmia preventative activity in sympathomimetic drug toxicity, and proved efficacy (in a randomised, double blind, placebo controlled trial) in cocaine associated acute coronary syndromes. We question why one would want to put an already unstable patient at risk of further harm with the use of potentially dangerous atypical antipsychotics, when an established safe, efficacious, rapidly acting, cheap alternative (benzodiazepines) is readily available?

References


Nothing ever changes…

Readers may be interested in the following abstract from the Lancet of October 1869, “The Lancet investigation into the administration of the out-patient department of the London hospitals”.

On the morning in question, 120 patients were seen and dismissed in an hour and ten minutes, or at the rate of 35 seconds each. Who shall say what mistakes were made? None can tell...they are dismissed with a doubtful dose of physic, ordered almost at random, and poured out of a huge brown jug, as if the main object were to get rid of a set of troublesome customers, rather than to cure their ailments. A physician and surgeon have been appointed to stand inside the doors of the waiting room. They are to receive and examine the patients as they enter and distribute them amongst the various departments, according to their judgement. They are also authorised “to refuse treatment to any person who appears not to be a fit object of charity.” Naturally desirous of gaining all the experience possible, the house-surgeons have been in the habit of keeping all the interesting cases under their own care, and of sending the chronic and incurable to the out-patient room…

There are three articles in all, which make for a fascinating read. If the language used were updated slightly, they could easily have been written 150 years later.

Acknowledgements

I am grateful to Dr Sue Barnes for drawing these articles to my attention.

E Walker

E Walker

E Walker

Why am I writing a review of an e-book?

PDAs are small but immensely capable mobile computers with greater processing power than the desktop machines of five years ago. These handheld computers have matured from simple address books to devices that can word process, email, run presentations, manage databases, and (this is the best bit) switch on every television in my house.

Their basic memory varies from 8–64 megabytes but this may be expanded into the gigabyte range. This immense memory together with the ultra portability of the PDAs means that they can always be in your pocket offering near infinite text storage. A PDA may be the perfect way to carry your textbooks with you.

This toxicology program is supplied on a CD ROM together with nine other programs all from Lippincott Williams and Wilkins. The CD is compatible with Windows CE/PocketPC and PalmOS operating systems; this review used a Compaq iPAQ running PocketPC. The purchased program is the only one with unlimited access but all the others may be used up to 15 times on a trial basis. As the program is supplied on a CD it must be
downloaded via the computer used to synchro-
nise with the PDA rather than directly to the
device. Once the CD is inserted however the
conversion is straightforward. The entire
program is then transferred onto the PDA
when it is next connected.

The program must be activated for it to
permit unlimited use. This process requires
both internet access and some intuition. The
15 item alphanumeric code supplied with the
disc must be entered into the Lippincott
Williams and Wilkins’ web site together with
the unique code of the PDA. This generates
another code on the web site that then may
be used to unlock the program.

Once up and running, its appearance is
straightforward. Two narrow icon bars, one
at the top of the page and another down the
side, leave plenty of space for the text. The
text size is alterable from “quite hard to read”
and “enormous” and may be made to fit the
screen. Using the basic functions fortunately
did not require access to the scanty “help files”.

Access to the files is either via the main index
(including the ICD-9-CM index) or the
table of contents (TOC). Using the TOC
option is simpler although this has no search
option. Topics are divided into “General
approach”, “Patient presentations with
toxicological causes”, “Antidotes”, and
“Chemical and Biological agents”.

This is a 4 megabyte text only program.
There are lots of entries. Each entry has a
similar format, being divided up into “Smart
tabs” of Basics, Diagnosis, Treatment, Follow
up Indications, Contraindication and Adverse
Effects, Dosage and Method of Adminis-
tration, Pitfalls, and Miscellaneous. Sensibly
not all “Smart tabs” are available for each entry.
Some differences are seen between this
These include the recommendation for
induced emesis for decontamination or the
use of oral N-acetylcysteine in paracetamol
poisoning cases. The vast majority of the text,
however, reflects transatlantic agreement.

A facility for written and even spoken
notes exists and the entries are cross indexed.
If any other LWW programs are on the PDA,
these are also cross indexed. There is a
notes exists and the entries are cross indexed.
However, it may well have a

The author has clearly struggled with
considerations about what material to incor-
porate, but unfortunately has not resolved
this issue consistently. For example, the
airway chapter describes basic manoeuvres
and adjuncts in great detail but does not
mention the recovery position. Endotracheal
intubation is described at length, but inter-
mediate adjuncts such as the Combitube are
ignored. There is no explanation of how
deVICES for confirming endotracheal tube
placement are used; positioning of defibrilla-
tion pads/paddles and energy level selection
are not described; the pathophysiology of
infarction is not; neither aspirin nor throm-
bolytic agents are mentioned in the pharma-
cology chapter; and tPA is identified as a
treatment of stroke but not of myocardial
infarction. The limited number of arrhyth-
miias accompanied by illustrations suggests
the text is unlikely to facilitate the recogni-
tion of abnormal ECGs.

The language used is an odd mixture of
patronising simplicity (“Lidocaine is used to
lessen the pain of an irritable, hurting heart”) and
potentially impenetrable medical jargon (the
terms “half-life” and “fibrillation threshold” are
mentioned but not explained). Confusingly, the text alternates between the
perspective of an EMT observing a paramedic
and that of a paramedic undertaking a
procedure. This risks leaving readers with
the inappropriate impression that, for example,
a paramedic’s responsibility to correct
intubation of the oesophagus.

The book contains important errors. It
implies that the caraboles are level with the
angle of the jaw; that the kidneys remain
within the vascular compartment; that selec-
tion of the correct diameter of nasopharyn-
geal airway should be based on the patient’s
sex; and that “an unrecognised oesophageal
[ET] tube still works to isolate the lungs”. An
ECG purporting to show a prolonged p-r
interval is printed in reverse, rendering it
useless.

Sentence construction often renders the
text difficult to read and introduces the
potential for some entertaining misunder-
standings. For example, “Automated implan-
table cardiac defibrillators usually are placed
into patients with a history of a near-death
experience” and “The [defibrillation] current
that is delivered through the pads or paddles
of the machine while on the patient’s chest”.

Some ambulance technicians may feel that
this book should be subtitled “EMTs are
capable of much more than carrying the
paramedics’ kit”. As such, it has the potential
to fulfils an important unmet need. Sadly, it
does to fail so through poor attention to
detail and a lack of consistency in the level of
clinical information it seeks to deliver to its
target audience.

M Woollard

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Are accident and emergency senior house officers getting slower?

P Gilligan, R N Illingworth, S Crane and D Hegarty

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