

Evolution of the Role 4 UK Military Pain Service

L Devonport¹, D Edwards², C Edwards³, DJ Aldington⁴, PF Mahoney⁵, PR Wood⁶

¹Royal Centre for Defence Medicine. ²Consultant Nurse, Queen Elizabeth Hospital Birmingham, UHB NHS Foundation Trust. ³Consultant Anaesthetist, Royal Centre for Defence Medicine, ⁴Consultant in Pain Medicine, DMRC Headley Court, ⁵Defence Professor Anaesthesia, Department of Military Anaesthesia, ⁶Consultant Anaesthetist, Queen Elizabeth Hospital Birmingham, UHB NHS Foundation Trust.

Abstract

The early development of the UK Role 4 pain service has already been described. This article will describe developments up to October 2010, and present the results of projects used in assessing the effect of this service.

Introduction

The Royal Centre for Defence Medicine (RCDM), based at University Hospital Birmingham NHS Foundation Trust (UHB) has been the primary Role 4 receiving unit for British military casualties since 2001 and the early development of the UK Role 4 Pain service has already been described [1]. Although many of the staff are military, they are embedded in a new tertiary referral teaching hospital (Queen Elizabeth Hospital Birmingham, QEHB) that is currently undergoing accreditation as a Level 1 Trauma centre. Prior to the opening of QEHB in June 2010 the patients were treated by the same Defence Medical Services and civilian personnel at Selly Oak Hospital (SOH), which was also part of the UHB Trust.

Patient Numbers

The number of military casualties has varied over the past nine years, as have their injury patterns. Table 1 indicates admission rates for physical injury to both RCDM and the Defence Medical Rehabilitation Centre (DMRC) at Headley Court [2]. Table 2 gives numbers of amputees that have been received [3]. Together, these tables reveal the work load has increased significantly in both the number of cases and complexity.

Developments

Personnel

Key to improving the service was the development of a Military Pain Team (MPT) on the military ward. The core of this team has been 3 military nurses who spend at least 80% of their time with the Pain Team during their attachment. They are led by a civilian Consultant Nurse who also leads the hospital critical care outreach team and the team has daily consultant anaesthetic support. Each week there is a multidisciplinary pain ward round. This multidisciplinary group is made up of the MPT, a senior physiotherapist and the ward pharmacist, often with the military's Subject Matter Expert (SME) in Pain to help ensure integration with the other echelons.

During the ward round every patient is asked about their pain, their sleep pattern and about side effects from pain medications. It must be stressed that every patient is interviewed and not only those requiring risk management because they have epidurals

Corresponding Author: Dr Paul Wood, Consultant Anaesthetist, Queen Elizabeth Hospital Birmingham, Mindelsohn Way, Edgbaston, Birmingham. B15 2WB
Tel: 0121 627 2000 Email: paul.wood@uhb.nhs.uk

	2007	2008	2009	2010
	from 08 Oct 07			to 30 June 10
Op Telic	104	198	131	67
Op Herrick	148	432	736	643

Table 1: Casualty admissions to RCDM and DMRC Headley Court [2]

		2006	2007	2008	2009	2010
		from 01 Apr 06				to 30 June 10
Op Telic	Amputees	6	10	<5	0	0
	Significant Multiple Amputees	0	0	0	0	0
Op Herrick	Amputees	7	12	30	55	19
	Significant Multiple Amputees	<5	<5	6	26	

Table 2: Amputee Numbers [3]

or catheters in situ. Following the ward round the MPT have a group meeting to discuss clinical, audit, research and educational developments. At this point they are joined by a Consultant Anaesthetist who attended the multidisciplinary military clinical care conference held on the same morning. This arrangement ensures that members of the MPT have an integrated role with the other specialties involved in the care of the patients. Finally, members of the MPT attend quarterly Military Pain Special Interest Group meetings that examine issues and developments in pain management from the point of wounding through to established rehabilitation.

The relationship of the MPT to other essential clinical teams can be illustrated by a hub and spoke model (Figure 1).

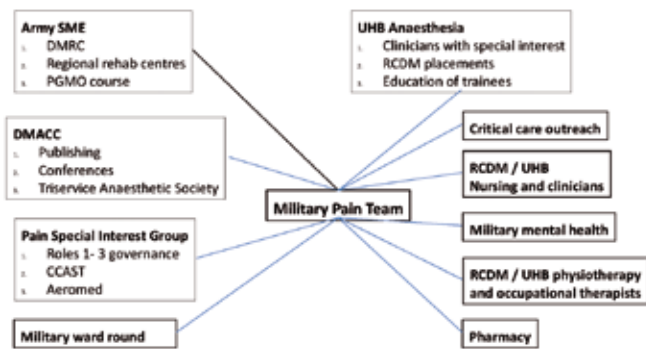


Figure 1. Relationship of MPT to RCDM / UHB clinical teams

Medication - the Military Standard Operating Procedure

All patients admitted to the military ward are prescribed a standard analgesic regime with a minimum of regular paracetamol and a non-steroidal anti-inflammatory, together with codeine or tramadol [1]. The details are described in a ward analgesic document which is made available to all the ward junior doctors and military and anaesthetic registrars. A paper copy is kept on the ward and an electronic version resides on the Trust's intranet. Medication is prescribed electronically on the Patient Information and Communication System (PICS), which is a Trust development. This electronic tool is invaluable in tracking and auditing medication use. In tandem with the introduction of the PICS prescribing system the ability of nurses to prescribe regular oral morphine has been facilitated since March 2010 by the introduction of a Single Nurse Check Analgesia protocol.

As a result of the mechanisms of injury, many of the patients are expected to have a neuropathic component to their pain, some, such as traumatic amputations, more than others; thus there is a low threshold for the early use of anti-neuropathic pain agents, particularly pregabalin and amitriptyline. A recent survey (Table 3 study V) showed 66% of the ward's 25 patients were on a combination of these, with half prescribed the maximum pregabalin dose.

Regional Anaesthesia

Regional anaesthetic techniques are encouraged. Their use at the Role 3 Hospital has been described [4, 5]. In Birmingham it was noted that the number of patients returning with regional catheters in situ increased during Operation HERRICK 9B in early 2009. To date approximately 66% of the catheters have been initiated in the deployed field hospital (Table 3 Study VI) and will have been used to provide analgesia for the repatriation, a development anticipated in an earlier paper [6].

There have been concerns about the use of regional catheters in limb injuries delaying diagnosis of compartment syndrome and its management [7]. A consensus meeting was undertaken at the Birmingham Research Park to examine this issue in June 2009 and a subsequent editorial offered guidance on this issue [8].

Managing Peripheral Nerve and Epidural Blocks

When casualties arrive at RCDM, receiving clinicians know not to remove the catheters but to leave them in place. If there is any doubt about the neurological status of the limb the infusion is stopped. Once the degree of function has been confirmed, the infusion can be restarted and analgesia restored. With the excellent support provided by the anaesthetic department at UHB, re-

siting or de novo placement of both continuous peripheral nerve and epidural catheters can be facilitated with little delay.

The duration that the peripheral nerve infusions are maintained is of interest. Our surveillance data of 133 cases show that our longest is 17 days, with approximately one quarter in place for a week or longer (Table 3, Study VI). It is also clear that the geographical location of insertion does not influence duration of use. The most common technique (41%) in both Afghanistan and Iraq was a lumbar epidural, followed by femoral and then sciatic nerve blocks (Table 3, Study VI).

The concerns surrounding the use of epidurals in the current conflict are mentioned in a review of field hospital analgesia [4]. It has been standard practice for all catheter tips to be sent for microscopy, culture and sensitivity testing after removal (Table 3, Study VII). We have been supported in this venture by the UHB microbiology department. While a number of the cultures have returned "positive" none have been of clinical significance; this data includes that for catheters for continuous peripheral nerve blockade (Table 3, Study VII). Another concern is the development of an epidural haematoma, particularly in patients who may be at greater risk following the coagulopathy associated with significant polytrauma [9]. Traditional signs of limb weakness rely on the existence of lower limbs; in the case of some of our patients this is not possible. Other signs and symptoms that could be proxy measures are also difficult to use given the frequency of perineal injury and urinary catheterisation. Instead we have developed our "4 and No More Rule" supported by the neuroradiologists as required [10].

Practical procedures

The ability to perform regional anaesthesia, changes of dressings and similar tasks often undertaken in theatre has been facilitated by equipping a room on the military ward exclusively for such tasks. This innovation has several advantages:

- it allows the provision of appropriate sedation, analgesia (which may include the use of ketamine), and monitoring;
- it has a consequent reduction in demand on scarce operating theatre resources;
- it provides rapid access with minimal transit time
- it maintains continuity of nursing care
- it enhances the education of both military medical and nursing staff in appropriate pain management

Mental Health and psychosocial issues

The importance of psychological support was emphasized in the earlier article [1], and the broader issues and complexities of forces mental health have been the subject of a recent Journal of the Royal Army Medical Corps Special edition [11]. The interface between pain, analgesia and mental health issues can be convoluted [12] and this fact is respected in liaison with the mental health team.

After RCDM - Discharge Care

Their stay at RCDM is just one phase of a patient's rehabilitation and the importance of what will happen to the patients when they leave RCDM is addressed. Most will go on a period of leave before posting to either DMRC or one of the Regional Rehabilitation Units. Prior to leaving RCDM patients are provided with several leaflets about their analgesia together with a telephone contact number should they have any concerns about their medication. There are military consultants in pain medicine at DMRC some of whom also attend RCDM with the intention of ensuring this

Serial	Topic	Dates	Aim / Description	Patient numbers	Outcome & Comment
I	Duration of Stay	April – June 2009	To record the mean duration of stay on the military ward	35	During the 3 month snap shot the mean duration reduced from 19 to 9 days. This study predated an increase in more seriously injured casualties during the second half of 2009
II	Surgical activity	April 2008 –January 2009	To quantify the number of operations casualties undergo	144	Maximum 15. Averages 2. 64% one operation only. 8% experience more than 3.
III	Opioid use	May 2010	To survey the use of opioids by interrogation of PICS	21	All taking opioids. 70% on more than one opioid. 30% are on 3 or more. 60% codeine, 55% oramorph, 45% tramadol, 10% PCA (morphine), 25% Morphine SR, 5% oxycontin Multiple concurrent opioid prescriptions are common (rare in NHS practice)
IV	Bowel Function	February - April 2010	To establish the prevalence of problems with bowel function given the opiate load some patients require	All patients	All inpatients assessed weekly Routine prescription of aperients maintains acceptable bowel function
V	Anti -neuropathic Analgesic	October 2009	To record how many of the patients on the military ward were prescribed medication for neuropathic pain	25	66% taking amitriptyline and pregabalin; 33% on max. pregabalin dose. This is a very important departure from normal NHS practice.
VI	Regional analgesia techniques	January - April 2010	Where sited, geographically and anatomically, plus duration	133	In both locations, epidurals were the most common technique used. Femoral and sciatic catheters were more common in Camp Bastion while axillary were sited in RCDM but not Camp Bastion
VII	Surveillance of Regional Anaesthetic + Epidural Catheter Infections	January 2008 - present	To establish whether or not infection of catheters is a clinical issue.	153	This data is continually reviewed - no significant issues to date
VIII	Ward Pain Scores	February – March 2010	A record of pain scores as measured twice daily over a 5 week period	All patients	Less than 10% experience moderate and severe pain -compared with 20-80% severe pain expected from other studies.
IX	S4 (SOH) Military ward Take home medication	April to June 2009	Establish the discharge medication profile at SOH	35	75% on paracetamol became 86%. NSAID use increased from 60 - 76%, of these diclofenac accounted for 2/3. Codeine increased from 25 to 50%, while tramadol decreased from 55% to 39%. Amitriptyline, gabapentin and pregabalin all reduced: 30% to 8%, 35 to 11% and 30 to 8%. MST reduced 25 to 3% The reduction in neuropathic medication reflected the injury patterns (see I above)
X	Trauma Pain Recollection Surveillance	February 2010 - on going	To survey patient's recollection of pain management from point of wounding to discharge from UHB	All patients	Monthly review of all data. Excellent results to date.
XI	Patients experience of pain management	September 2010	Examines patients concerns with pain and interaction with medical staff (interview questionnaire)	All patients	Overall satisfaction with pain management - 69%
XII	Opiate Use in Amputees at DMRC	Oct 2008 and Feb 2010	Establish whether long term opiate use occurs in military amputees.	49 + 50	Two iterations. No evidence of problem with opiate use.

Table 3 List of audit and survey activity conducted by MPT from January 2008. Principle researchers for all studies were Cpl L Gofton RAF, Sgt L Devonport QARANC, Mrs D Edwards and Sqn Ldr C Flutter RAF except Study XII (Col S Jagdish L/RAMC (October 2008) & Capt B.Coghill RAMC (February 2010))

continuity of care. Steps are currently being taken to provide this military consultant support to the Regional Rehabilitation Units as well. The first joint clinics with consultants from DMRC were initiated in April 2010 and have already successfully been undertaken in Edinburgh, and Catterick. Going forward the plan is to also introduce them in Tidworth and Plymouth, with the intention of Colchester, Halton and Lichfield being supported in due course.

Prior to leaving, Birmingham the casualties complete an audit questionnaire asking about their analgesia from point of wounding to discharge from RCDM. Despite efforts to educate otherwise the use of opioid analgesics, is still associated with a fear of "addiction". Two completed surveys of amputees undertaken at DMRC have shown that there is no evidence of this being an issue within our population (Table 3; Study XII).

The Evidence

It is suggested that 30-80% of post-operative patients experience moderate to severe pain [13, 14]. A collection of the twice daily ward pain scores was undertaken during a five week period (Table 3, Study VIII). These scores are recorded routinely by the nursing staff but were later collected by the MPT for analysis. The results indicated that less than 10% of the casualties reported pain scores of 2 or 3 on our 4 point scale; this approximately equates to pain scores of 4/10 or more, or moderate and severe pain.

Discussion

The population we are treating often have complex pain issues. We are also dealing with mechanisms of injury that are not routinely seen except in a few centres around the world. To what extent these various injuries create their own patterns of pain is impossible to quantify.

In an attempt to support our approaches we have tried to look for evidence but have had to rely on fairly "weak" levels of evidence. This is because, fortunately, the actual numbers of individuals coming through our system are so small as to make high quality prospective double blind randomised control trials impossible. Instead we have relied on a number of surveillance projects, surveys and a few audit results and the more important of these are mentioned in this text and are highlighted in Table 3.

It is important to be clear that no one intervention is responsible for these results. They derive from a combination of effects. Most importantly we would argue it is the change in attitude towards "pain", and recognition by all healthcare workers, particularly the ward nursing staff, that pain is not an acceptable experience. We also know to look at the wider aspects of a patient's experience and not just focus on the medical aspects. We try to develop a patient's sense of control as early as we can. It is their pain, their problem, and when they are discharged they will need to know how to manage it.

Finally, we are clear that what occurs here must link with what has gone before and what will follow. The service's name, the Military Pain Team, makes no reference to acute pain. This is because we see the service not as an isolated "acute" pain service but as one step in the continuum of care that may extend many miles and years from point of wounding to leaving the Service; the 30 year, 13,000 mile pain service.

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