Return on investment: workload, complexity and value of the CNS

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Abstract
The rheumatology nurse specialist (RNS) has become an integral and vital part of the multidisciplinary team and is valued by patients. Yet, a number of challenges regularly face all clinical nurse specialists (CNS) in the UK. The perception that CNS are an expensive and poorly defined nursing resource results in regular threats to their sustainability, particularly that of the RNS. This study examined return on investment of the RNS. Method: An interrelational Structured Query Language (SQL) database collected data on the day-to-day activities of the RNS based on previous models of CNS and RNS work, and qualitative narrative data were then subjected to data mining. Results: The RNS represented an excellent return on investment, in terms of income/savings to an employing NHS Trust. This figure is likely to be an underestimation, as calculations on reduction in bed days in hospital have not been included.

Key words: Rheumatology nurse specialist ■ Workload ■ Value ■ Activity ■ Data collection ■ Vigilance ■ CNS ■ Long-term conditions

The rheumatology nurse specialist (RNS) has become an integral and vital part of the multidisciplinary team and is valued by patients. However, there are a number of challenges facing all clinical nurse specialists (CNS) in the UK. These challenges relate to being seen as an expensive and poorly defined resource within the nursing workforce. As a result, the sustainability of the RNS, and CNS in general, has been subject to regular threats, particularly under the current financial constraints of the NHS. In nursing terms, the diversity of the work of the CNS, variations in academic qualifications, level of competencies, responsibilities, and the limited data capture and coding to achieve financial reimbursement compounds the problem in demonstrating the value of the role.

The CNS role was introduced in the UK in the 1970s and provided formal recognition of advance nursing practice, extending knowledge and expertise while enabling nurses to stay within a chosen field of practice (Castledine, 2003). The work of CNS posts in the UK is often described as a combination of four elements: clinical, education, research and consultation (Hamric and Spross, 1989; Ball, 2005), and was even described this way by the Information Services of NHS Scotland (ISD Scotland) (2004) until the definition was recently revised (ISD Scotland, 2010). Nonetheless, such oversimplified descriptors remain prevalent and fail to describe the complex dimensions of the role or articulate the breadth of hidden work that CNS perform (Leary et al, 2008a).

In addition to the observable performance of tasks, these nurses undertake clinical rescue work (Silber et al, 1992), brokering and care coordination for the patient to ensure appropriate timely care (Leary et al, 2008a). In recent years, CNS work has included leadership roles, business planning or service redesign; however, in essence, the CNS role develops according to the need of the specialist service. A significant driver in the development of all CNS posts was the recognition that the CNS could provide a cost-effective resource to bolster the shortage in junior doctors and support the clinical workload of the physician.

The RNS role evolved from the research nurse or metrologist undertaking joint examinations; patients valued the additional information, and it was a natural next step for nurses to undertake blood monitoring support for patients treated with disease modifying anti-rheumatic drugs (DMARDs) (Hill, 2007). Patient education about the risks and benefits of treatment and advice on medications management quickly followed.

The NHS currently faces significant financial challenges and must optimize a cost-effective workforce. A limited understanding of the CNS role means these roles are under threat. In the present healthcare environment, recognition that the CNS is an important contributor to daily clinical activity is not enough; a greater impetus must be given to identifying the unique characteristics of the CNS and how they contribute to fiscal and qualitative benefits to patient outcomes.

With an awareness of these challenges, the Royal College of Nursing (R.C.N) Rheumatology Nursing Forum published the results of a rheumatology nurse survey (Hill et al, 2010; RCN, 2009) and, in addition, supported a 1-year project exploring the clinical activities undertaken by the RNS working in the UK. This paper set out the evidence to demonstrate the true return on investment of the RNS to the NHS. The data represented the findings from a 1-year project
which recorded the detailed complex activity over a 10-month period of a national group of RNS’. A validated Structured Query Language (SQL) database designed to capture the complexity of RNS work was used and the data was then subsequently mined (Oliver and Leary, 2010).

Materials and methods
An iterative process previously used to model the work of CNS across England, Scotland and Wales in various specialities was used as previously described in other work (Leary et al, 2008a). The result of this was the building of a specialist interrelational SQL database called Pandora (Leary et al, 2008a). The Pandora database has been used to collect data on the dimensions of specialist nursing across different medical specialities including metastatic breast cancer and lung cancer (Leary et al, 2008b; Secondary Breast Cancer Taskforce, 2008).

The work of CNS’ is recorded in Pandora as a series of events and each event has eight dimensions. The first dimension is the event number; this is merely a natural number from 0 to infinity. Pandora does not record patient numbers because much of the work of CNS is not related to an individual patient. The other dimensions recorded are date, context, temporal, the intervention, the form that the event has taken, the outcome and the emotional effort of the event. There is also an opportunity to record, for each event, a narrative which fully describes the event in more detail and could be subject to qualitative analysis.

In addition to the standard dataset, some rheumatology-specific items were added to the data fields, such as specific assessment or treatment pathways. The database was then mined to look at the complexity of the CNS role in eight dimensions, including how time is spent and in what context (e.g. clinical work on the telephone or in the outpatient clinic, administration work or service development). Data mining (Fayyad et al, 1996) enables large amounts of data to be analysed for patterns and relationships using specified search parameters and can also describe the multidimensional work empirically.

Participants were initially invited to take part in this study from the RCN membership, but the criteria was widened to all rheumatology specialist nurses interested in participating if they were computer literate, had expressed an interest in participating and completed the web-based registration form. From March to December 2009, Pandora was used by 99 nurses across the UK to examine the complex work of CNS in the field of rheumatology. Data collection represented a total of 3324 events and 101 nursing days of activity. Nurses were asked to input in-depth data for three representative working days every month. In addition to reporting empirical interrelational data, Pandora captured narrative statements. These were subjected to content analysis (Krippendorff, 2004) to add depth to the quantitative data (Leary et al 2008a).

Results
A total of 3324 events were recorded across the different strategic health authorities and countries. The mean and median events per day were 33 (range 15–52) and there were 101 nursing days collected.

In all, 99 accounts were issued and were subject to in-depth scrutiny. From these 99 accounts, 48 participants provided the majority (84%) of the overall data. The demographic of the sample is primarily made up of CNS/nurse specialists/specialist nurses, 2 lead nurses and a senior nurse. The majority who entered data (34) were employed full-time and 9 were independent prescribers.

The majority of the interventions were clinical (n=2227) (67%), however, administration accounted for 21% (698 events) of the workload (Figure 1). This represents 6.25 hours per whole time equivalent (WTE) RNS spent on administration; the majority of this work was non-clinical and could be performed by a clerical worker allowing for a more effective use of nursing time. There were regional variations (range 12-38%) with some regions showing up to 38% of work as administration. These findings are also reflected in the rheumatology nursing survey (RCN, 2009), which demonstrated that 48% CNS in rheumatology carried the burden of administration for their services, particularly in non-clinical administrative work. Research and consultation work remained at 6% in all regions showing consistency with other groups of specialist nurses that have used Pandora (Breast Cancer Care, 2008; Leary et al, 2008a).

Clinical work
The clinical work (n=2227 events), which represented 67% of the workload, was divided into clinical domains and subdomains of specialist nursing work (Figure 2) (Oliver and Leary, 2010). Overall, 44% of the total clinical work (1470 events) undertaken by the RNS fell into the interventions categorized as ‘clinical-physical domain’. The following section examines the results in more detail.

Clinical-physical domain
Specialist musculoskeletal examination made up 23% of clinical-physical assessment (Hill, 2006; Hill and Pollard, 2004) which required the application of vigilance (Meyer and Lavin, 2005); a form of proactive monitoring. Clinical

Figure 1. Breakdown (%) of workload of the rheumatology specialist nurse n=3324 interventions over 101 nursing days
acumen, beyond case management and brokering (Kanter, 1989), was also a feature of RNS work. Within this clinical physical domain, 22% of RNS activities required specialist knowledge and assessment skills to enhance self-management principles and manage unresolved symptoms. Medication management constituted 27% of this work. Broken into component parts, this represents the screening and assessment of patients being considered for DMARDS, biologic therapies, titration of drug doses, management of toxicity and the fail-safe and rescue work of iatrogenic events.

Rescue work was largely related to the management of medication. For example:

‘GP prescribed drug dosage was wrong’ (Specialist nurse narrative)

Psychological-clinical dimension of RNS work
The psychological subdomain (Figure 2) was made of 401 events. The largest subset within the clinical psychological subdomain was the management of anxiety and distress. Correlation with narratives demonstrates much of this distress was caused by diagnosis, a sense of loss, a perceived future loss of function and biographical disruption experienced at the time of new diagnosis (Bury, 1982), as well as fear of the unknown in terms of effect and risks of the drugs being prescribed (Cox et al, 2004).

‘A patient was struggling to come to terms with their diagnosis and suffering from loss of appetite, insomnia and low mood affecting family life. They were unable to focus and felt loss of personal identity and self-worth. Coping mechanisms were discussed and the issues explored with the patient. SSRI [selective serotonin reuptake inhibitor] treatment discussed as a short-term intervention and the identification of support systems’ (Specialist nurse narrative)

‘...patient started therapy became distressed by the side effects of drug therapy and needed reassurance as to its safety and mode of monitoring adverse effects’ (Specialist nurse narrative)

Use of vigilance and patient safety
An emerging theme from the narratives (both rescue and non-rescue) was that of vigilance. Vigilance was described by Nightingale (1860) as an essential part of nursing work and is still thought, by some authors, to be the essence of nursing (Kanter, 1989); was also a feature of RNS work. Within this clinical physical domain, 22% of RNS activities required specialist knowledge and assessment skills to enhance self-management principles and manage unresolved symptoms. Medication management constituted 27% of this work. Broken into component parts, this represents the screening and assessment of patients being considered for DMARDS, biologic therapies, titration of drug doses, management of toxicity and the fail-safe and rescue work of iatrogenic events.

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- Attention to and identification of clinically-significant observations/signals/cues
- Calculation of risk inherent in nursing practice situations
- Readiness to act appropriately and efficiently to minimize risks and respond to threats.

Vigilance would appear to be a fundamental activity of specialist rheumatology nursing work and a precursor to ‘rescue’ work. There were many instances of vigilance, particularly in relation to monitoring of immunosuppressant drug therapies (DMARDS), which were used to control inflammatory joint diseases, e.g methotrexate. The management of DMARDS frequently result in communication with a physician (either GP or consultant) or a review of the patient and investigations (e.g. repeat blood tests, use of assessment tools or imaging).

Nursing activity and return of investment
The nature of the data capture is interrelational allowing recording of the context of activity undertaken (e.g., telephone work or clinics). These data demonstrated that 32% (n=1064) of this work was on the telephone (most notably as advice line support for patients). In the RCN survey (2009), nurses reported that they ran telephone support advice between 3–10 hours per week. Hughes et al (2002) demonstrated the value and cost-effectiveness of telephone advice for patients in rheumatology: Both Hughes et al (2002) and the National Rheumatoid Arthritis Society (NRAS) (2007) demonstrated that, if 60% of patients did not have access to specialist nursing advice on the telephone, they would have requested either a GP or hospital appointment. In the Pandora group, 879 clinical phone calls were made. Based on the work of Hughes et al (2002), the figure of 60% would represent 526 events in which patients would have sought advice from the GP; the consequence of this would be an increased need for GP appointments. The average cost for a GP appointment is £60 (National Audit Office (NAO), 2009; Curtis and Netten, 2005); based on the costs and calculations outlined in the Hughes paper (2002), this represents (in this sample size alone) a cost saving to primary care services of £31 560, equating to £72 588 per nurse per WTE. An important strand in global strategies within the Department of Health (DH) emphasizes the need to enhance chronic disease self-management principles (DH, 2008a) and importantly represents a valued quality indicator for patient care as highlighted in the NRAS survey (2007).

The largest activity was outpatient clinic work (51% of total workload). The vast majority of this work is outpatient follow-up. If this work were coded under Health Resource Group 4 (HRG4) (DH, 2008b), it would represent £72 128 per annum (pa) per nurse WTE based on a
46-week year. In terms of releasing slots for new patients to be seen by a consultant, using the same calculation based on HRG4 (DH, 2008b), this represents £175 168 pa per nurse WTE. Nursing activity is often not coded or included as part of the lead consultant activity. To compound the limited coding issue, rheumatology nursing, unlike cancer nursing, has no activity-based targets to measure outcomes or quality indicators related to pathways of care.

Outcomes of clinical work
The most common outcomes for the RNS group were alleviation of physical suffering through assessment and specialist symptom management (21%), assessing and meeting information needs (19%), rescue work, particularly in drug therapy (14%), alleviation of psychological suffering (11%), and acting as key contact/access service/accessible knowledgeable professional or brokering rapid access to other professionals (i.e. rheumatologists) (11%).

Discussion
The complex work performed by RNS demonstrates a good return on investment. This can be shown fiscally, as cost of an RNS WTE annually is approximately £30,000, compared to savings to the health economy of £225,000 in terms of GP and consultant time and new follow-up activity. The RNS also plays a pivotal role in ensuring safety and high quality care, essentially in the application of vigilance for patients managed in the community. As the health economy continues to encourage a reduction in cost savings in terms of prevention of unscheduled care and quality indicators, cost-effective hospital-based outpatient care and the role of vigilance will be increasingly important. Increasingly, the RNS provides a vital knowledgeable and accessible resource for clinicians and patients in all care settings.

RNS have developed skills in musculoskeletal examination techniques and undertake high level complex screening and monitoring of patients for specific treatment plans, intra-articular injections and nurse-led clinics (Hill, 1985; Rauch et al, 2009; RCN, 2009). The introduction of expensive and effective treatments, such as biologic therapies, has encouraged wider collaboration with other specialist fields who also treat patients with immune mediated conditions with biologic therapies (e.g. Crohn's disease and psoriasis) (Palmer and Miedany, 2010).

These findings support those of other studies, in that the RNS provides equivalent accuracy in diagnostic triage to that of a GP trained in early inflammatory arthritis triage (Gormley et al, 2003), improves patients' perception of coping while attending blood monitoring clinics (Ryan et al, 2006), provides safe and effective care equivalent to a junior doctor in nurse-led clinics for inflammatory joint diseases and osteoarthritis (Hill, 1997; Hill et al, 2003; Hill et al, 2009), and provides a cost-effective use of telephone advice line (Hughes et al, 2002).

The most powerful advocate of the RNS role has been the patient. The RNS role is a vital component of the rheumatology multiprofessional team and is greatly valued by patients (NRAS, 2007; NAO, 2009). The role is perceived as one that enables a greater focus on a patient-centred approach to care, and patients welcome the RNS contribution, particularly continuity of care and rapid access for specialist advice via telephone support (King's Fund, 2009; NAO, 2009). Evidence of the benefits to care have been demonstrated since the early 1980s (Hill, 1985) and this includes cost benefits in European studies (van den Hout et al, 2003). The rheumatology workforce in the UK is well developed and yet the inability of many organizations to comprehend the varying dimensions of the CNS/RNS role is a constant challenge.

Despite a long history in the UK, the role of the CNS has evolved in an unstructured and unplanned way (Trevatt and Leary, 2010), often driven by the needs of the specialist services within which they work. This approach has resulted in a diverse nursing group, in terms of academic qualifications, delivering the knowledge skills and competencies that truly reflect the complex dimensions of the role. This diversity has resulted in the increased scrutiny and vulnerability of the role and justifiably is now subject to work focusing on advanced nursing practice (DH, 2010). The activities of the RNS may be invisible to organizations, particularly when coding and activity analysis is not linked to reimbursement for the organization in which they are based (McCabe et al, 2000; Taylor, 2009; Oliver and Leary, 2010). Senior healthcare managers review CNS/RNS costs without a clear balance of fiscal and patient care benefits and, when fiscal pressures bite, elect to redeploy the CNS/RNS to ward-based activities assuming their clinical outpatient workload is dispensable.

Conclusion
The CNS represents a vulnerable group of nurses when financial constraints hit the healthcare system (Hill, 2006). This is particularly pertinent in the UK where CNS and, more specifically, RNS posts have frequently been cut or targeted at a time of spending cuts.

The value of the role of specialist nurses in rheumatology has come under scrutiny in recent years, with doubts raised around the cost benefit and contribution to efficiency. These assumptions are largely false, but evidence is poorly documented. The CNS working in rheumatology represents a good return on investment by NHS Trusts. They are also highly valued by patients as they are considered knowledgeable and easily accessible specialists providing continuity of care for individuals with long-term conditions.

The Pandora database system has provided an initial step in defining the activity of the RNS and has been able to demonstrate the complex dimensions of their work and the RCN survey (2009) has provided a richer insight into the value of the RNS role. The Pandora database recorded that RNS undertake a high level of vigilance and broker across professional and organizational boundaries to enhance patient outcomes. Further research should explore these concepts in rheumatology case management and more widely, for other CNS posts caring for patients with long-term conditions. Capturing the detailed workload of the CNS/RNS provides greater insights into the value of the role and NHS Trusts should consider capturing data that truly reflects the role of the CNS/RNS within their organizations, reflecting the advanced roles that nurses have undertaken in the last decades.
Despite the current challenges and variability in the advancement of the CNS/RNS role, developing and sustaining the nurse specialist workforce should be a priority. Yet, it has not been recognized that the time to train a specialist nurse is significant and the current RNS workforce is an aging one (mean age of 48 years) (RCN, 2009). It is, therefore, essential to translate the role into terms of quality and financial benefits to an employing Trust. The aim of this study and that of the RCN survey (2009) was to provide a greater insight into the role of the specialist nurse, demonstrate the complexity of the role and provide some context for it through empirical data. Although evidence has demonstrated the value of RNS roles in patient outcomes and shown the safety level at which they practice to be equivalent to that of a junior doctor, evidence remains limited and further research is urgently needed.

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**KEY POINTS**

- The value of the CNS is under constant scrutiny in the UK with the contraction in public spending
- The work of the CNS is complex and requires skill, experience, clinical acumen and education
- Specialist nurses offer good quality, safe and effective services
- The RNS represents an excellent return on investment

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**References**

- Nightingale F (1860) *Notes on nursing What it is, and what it is not*. D Appleton and Company, New York
- Taylor J (2009) Payment by results: Get under the skin of nursing’s real costs. *Health Serv J* 119(6171): 20–1