



A Regional Podiatry Audit of the Multidisciplinary Management of Rheumatological Foot Health Problems in Adults and Children in Northern Ireland

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Contents

| | |
|--|----|
| Summary | 3 |
| Introduction | 4 |
| The Regional Rheumatological Foot Disorder (RFD) Audit | 6 |
| Results | 8 |
| Discussion | 25 |
| Recommendations | 29 |
| Implementation Plan | 30 |
| Acknowledgements | 31 |
| References | 32 |

Summary

Trust Podiatry Managers in the Faculty of Management Northern Ireland Group (FOMNIG) recognised that there was an opportunity to collect baseline information in relation to both adults and children with rheumatological foot disorders in Northern Ireland (NI). This information was then used to map Podiatric clinical management in NI against recognised national guidelines.

Results of the audit showed that Rheumatoid Arthritis (RA) in adults and Juvenile Idiopathic Arthritis (JIA) were the most prevalent conditions. Podiatry assessment, risk assignment and orthotic provision were often provided too long after first diagnosis. However, general clinical examination, management of skin and nail pathologies and provision of one to one (1-1) advice scored well in the audit. Orthoses were provided to many adults and children for a variety of reasons, with foot pain being the most common. Most patients had a footwear assessment completed and the majority of patients wore retail footwear. Eight percent of adult patients presented with foot ulceration and/or surgical intervention and amputation, which was similar to the diabetes population. Twenty-eight percent of adults and 44% of children were managed using biologic therapy, thus significantly decreasing their risk of developing serious foot pathologies.

Results also highlighted the difficulty in obtaining accurate podiatry information from the variety of Trust Information Technology (IT) and coding systems in use and that there was some variation in the availability and quality of care provided to this patient group.

This audit provided important baseline information on patient care in Northern Ireland. The report recommends that Podiatry services collaborate to implement change that will ensure:

1. Podiatry referral at diagnosis of RA, Psoriatic Arthritis (PsA) for adults and JIA, Juvenile Psoriatic Arthritis (JPsA) for children
2. Standardisation of clinical assessment to include a general foot examination, assessment of neuropathy and foot pulses, examination of foot structure, assessment of nail and skin pathology and one-to-one advice
3. Assignment of risk based on the regional risk tool and clinical examination
4. Footwear assessment and orthoses management at diagnosis when indicated.
5. Extended scope of practice techniques such as Steroid Injection Therapy, and the use of Ultrasound Scanning are explored and developed within all Trusts.
6. A re-audit of the Regional Rheumatological Foot Disorder Audit should be carried out in 3-5 years' time.

Introduction

Arthritis is a complex condition and is the biggest cause of pain and physical disability in the UK.¹ Rheumatoid Arthritis (RA) is an auto-immune, systemic, inflammatory joint disease, with a chronic and often unpredictable course.² There are around 400,000 adults in the UK with RA and approximately 20,000 new cases are diagnosed every year.³ In the UK, approximately 15,000 children have Juvenile Idiopathic Arthritis (JIA). Foot pain (at diagnosis and later in the disease process) affects 90% of patients with RA^{4, 5, 6, 7} and 4 out of 10 working people with RA will stop working within five years of diagnosis.⁸ UK health related costs for arthritic conditions are estimated to be £0.8 - £1.3 billion.⁹

In a Northern Ireland population of 1.8 million, approximately 300,000 people are affected with arthritic conditions: 260,000 have osteoarthritis (OA) and 60,000 adults have RA or another inflammatory condition such as Psoriatic Arthritis (PsA).¹⁰ Approximately 600 children in total in Northern Ireland present with arthritic conditions including JIA. It is anticipated that this/ these will increase by 19% by 2020¹¹. Foot Health Services available to this group of people are often inadequate and lack integration.¹² Management strategies for RA should be aggressive, proactive and prompt.¹³ The Arthritis and Musculoskeletal Alliance¹⁴ recommended that all patients with suspected RA or another form of inflammatory arthritis, should have an early diagnosis (within 12 weeks) and have access to a multidisciplinary team (MDT) assessment, including specialist Podiatry intervention and orthoses management.^{14,13,11,15,16, 9}

Evidence shows that the prevalence of foot ulceration in patients with R A in the US, UK and Netherlands is between 10-13%.^{17, 18} In a UK survey¹⁸ of 1130 people with RA, the prevalence was reported as 10%. The study showed that the risk factors known to contribute to diabetes foot ulceration (peripheral arterial disease, neuropathy, raised plantar pressures, foot deformity and poor fitting footwear) were also recognised to be significant risk factors for foot ulceration in those with RA.^{19, 18, 20} Other contributing factors include pressure, ischaemia/ Peripheral Arterial Disease (PAD), venous disease, neuropathy and vasculitis.

A dedicated, specialist Podiatry service is essential for the successful diagnosis, assessment and clinical management of acute and chronic foot problems. This is supported by service user organisations (Arthritis Research UK, Arthritis Care, and the National Rheumatoid Arthritis Society). Within Northern Ireland, there is a lack of accurate data in relation to the regional multidisciplinary team (MDT) management of rheumatological foot conditions and professionals recognise that there is a variation in the availability and quality of care. The DAS 28 scoring system used by medical staff in their assessment does not include a foot examination and so must be considered as a contributory factor to variation in the quality of care. Research indicates that less than 50% of patients with rheumatic conditions were reviewed by a Podiatrist and there was poor access to footwear services.²¹

The foot health needs of people with rheumatic diseases range from basic foot care to expert management of painful and often ulcerated feet but interventions that really make a difference include:

- expert MDT assessment
- management of foot pain and deformity with orthoses
- wound care
- foot care
- extra depth footwear
- specialist interventions (steroid injections and ultrasound scanning)
- foot health education
- specialist interventions in Paediatric (children's) Rheumatology

This audit was led by the Regional Podiatry Managers Group in partnership with the five health and social care trusts (HSCTs) across Northern Ireland. The audit collected data to provide accurate information in relation to the referral, assessment, management and clinical outcomes of patients with RA, Psoriatic Arthritis (PsA) and JIA. It provided baseline information and will assist in the standardisation and improvement of multidisciplinary care provided for these complex patients.

A Regional Podiatry Audit of the Multidisciplinary Management of Rheumatological Foot Health Problems in Adults and Children in Northern Ireland

A Regional Rheumatological Foot Disorder (RFD) Audit proposal was agreed and funding was secured from the Regulation and Quality Improvement Authority (RQIA). The aim of the audit was to improve the podiatric and overall clinical management of patients presenting with RA, PsA and JIA in hospital and community sites in Northern Ireland.

The aims of the Regional RFD audit were to collect baseline information in relation to Podiatry service provision regionally and specifically in relation to the clinical management of adults and children presenting with rheumatological foot health problems 2015-2016.

The objectives of the audit were to:

1. Ascertain the number of patients presenting with RA, PsA (in adults) and JIA and JPsA (in children) within each Trust and on Podiatry caseloads
2. Assess referral pathways against national standards 9, 15.
3. Assess the availability of foot screening.
4. Assess clinical management against national standards in:
 - expert MDT assessment
 - assignment of risk
 - management of mechanical foot pain and deformity with orthotics, wound care
 - foot care
 - extra depth footwear
 - specialist interventions (steroid injections and ultrasound scanning), foot health educations
 - specialist interventions in Paediatric Rheumatology
5. Determine surgery/amputation rates.
6. Determine the prevalence and healing times in foot ulceration.
7. Ascertain access to and uptake of patient education programmes.

Methodology

The Audit Project Lead and the Regional Podiatry Managers Group led the audit. They were supported by the Regional Rheumatology Podiatry Group and a data collector (Specialist Podiatrist) within each Trust. The audit consisted of a retrospective evaluation of the Podiatry caseload, referral rates and current multidisciplinary clinical practice audited against recognised national clinical standards.

Information on the prevalence of RA, PsA, JIA and JPsA on Podiatry caseloads in all five Trusts was collected from a variety of sources (Trust IT systems and departments, Trust coding systems, Quality Outcomes Framework (QoF) 2015-16, Trust Business Plans).

Data were collected from a sample of patients with RA, PsA, JIA and JPsA (adults and children) on Podiatry caseloads per Trust in 2015-2016. The audit period included patients who presented with the above conditions for the period 1st April 2015 - 31st March 2016.

The audit also included a retrospective evaluation of current multidisciplinary clinical practice in patients with RA, PsA and JIA and JPsA. This included referral processes to Podiatry, and elements of clinical management:

- assessment
- assignment of risk
- management of mechanical foot pain and deformity with orthotics
- wound care
- foot care
- footwear
- steroid injections
- ultrasound scanning
- access to patient education programmes

Practice was assessed against the national standards.^{15, 9}

Sample Size: Adult and Children

It is estimated that 60,000 adults and 600 children under 16 years of age in Northern Ireland are affected with rheumatological conditions. Based on a population of 60,600 with a confidence level of 95%, and a margin of error of 10%, it was estimated that a sample size of 96 would be required. This adult sample was rounded up to 100 (20 per Trust) and included patients presenting with RA and PsA from all five Trusts. All children presenting with JIA and JPsA (n=34) attending the Belfast Health and Care (BHSCT) Regional Centre within the audit period were included in the audit.

Randomisation

In order to complete the randomisation process,²³ the number of patients diagnosed with RA and PsA in each Trust and on Podiatry caseloads (from hospital and community settings) in 2015-16 was identified. An electronic randomisation schedule

was then created and 20 adult patients were randomly selected from the lists in each Trust. The randomised sample did not identify any patients from the hospital service.

Data Collection

A data access agreement was already in place to fulfil all data governance obligations. A data collection form (Appendix 1) was designed and following randomisation, data were collected manually from podiatry charts, medical charts, IT databases, and coding departments. Information regarding service provision was accessed from previous Trust audits and Trust audit departments. The data were anonymised within each Trust and transferred to an Excel Spreadsheet in preparation for analysis. Data from each Trust were collated and analysed using descriptive statistics and results reported.

Information for the audit period 1st April 2015 - 31st March 2016 was collected in relation to the number of patients who:

- were referred to or were attending Podiatry.
- had a detailed foot assessment in the audit period.
- presented with foot ulceration and their time to healing (adults only).
- had surgical intervention (adults only).
- had foot pain and deformity managed with various types of orthoses.
- were managed on biologic therapy and who received advice on common foot problems while on this therapy.
- had a footwear assessment, footwear advice and type of footwear worn documented.
- had access to and attended structured education programmes.
- had steroid injection therapy.

Findings

Findings for this audit are presented in three key areas: Podiatry service provision regionally and the clinical management of both adults and children presenting with rheumatological foot health problems

Regional Service Provision

The prevalence of RA and PsA in adults in the UK is 0.6% and 0.3% respectively¹⁵. Results from the Quality and Outcomes Framework (QoF)²² involving 84 GP Practices showed that in a Northern Ireland population of 1,951,068, the number of adults registered with RA in 2015-16 was 11,899 (0.6%) (Table 1), which is a similar percentage to the UK.

Table 1: Numbers of patients with RA in NI Population 2015-16 (QoF 2015-16)

| Local Commissioning Group (LCG) | Combined List Size | Number of Patients registered with Rheumatoid Arthritis | % on Register |
|--|---------------------------|--|----------------------|
| Belfast Area | 435,757 | 2,560 | 0.6 |
| South Eastern Area | 321,210 | 2,142 | 0.7 |
| Northern Area | 460,846 | 3,287 | 0.7 |
| Southern Area | 407,165 | 1,955 | 0.5 |
| Western Area | 326,090 | 1,955 | 0.6 |
| Northern Ireland | 1,951,068 | 11,899 | 0.6% |

Within the five Trusts, the number of adult patients registered with RA and PsA was reported as 14,222 (0.7%) and 9,475 (0.5%) respectively. Results showed that the regional Podiatry caseload in 2015-16 was 134,344 (Table 2). Within that caseload, 4,214 adults (3%) had RA/ PsA (Table 2).

Children's data are not included in this analysis and are reported on separately.

Table 2: Prevalence of Adult RA and PsA by Trust and on Podiatry Caseloads 2015-16

| Trusts | Prevalence of RA per Trust | Prevalence of PsA per Trust | Total Podiatry Caseload | Prevalence and % of RA and PsA on Podiatry Caseloads |
|---------------|-----------------------------------|------------------------------------|--------------------------------|---|
| 1 | 2,560 | Not available | 15,277 | 298 (2%) |
| 2 | 3,930 | Not available | 44,625 | 1283 (3%) |
| 3 | 2142 | Not available | 33,040 | 1140 (3%) |
| 4 | 3,190 | Not available | 15,024 | 1228 (8%) |
| 5 | 2,400 | 900 | 26,312 | 265 (1%) |
| TOTAL | 14,222 (0.7%) | 9,475 (0.5%) | 134,344 | 4,214 (3%) |

This baseline information has informed Podiatry service delivery and workforce planning in the region. A baseline calculation estimated that of the 23,697 adults with RA and PsA, in Northern Ireland, only 4,214 (18%) are currently reviewed on Podiatry caseloads. These results demonstrate an unmet need for 19,483 people (82%) who require podiatry intervention for optimal management of their foot health (Table 2).

All patients on Podiatry caseloads in Northern Ireland can be stratified by their risk of developing serious foot pathologies and clinical need (Table 3):

Table 3: Risk Stratification and Podiatric Intervention in Podiatry Caseloads

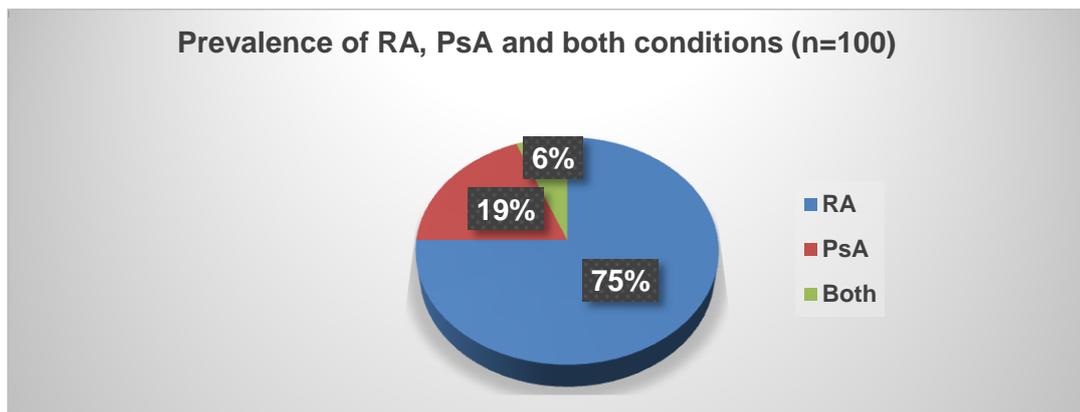
| Risk | Foot Pathology | Podiatric Intervention |
|-------------|--|---|
| Active | Foot ulceration and surgical wounds +/- biologic therapy | Intensive weekly review |
| High | Biologic therapy and foot pathology/ deformity (no wound) | Monthly review |
| Moderate | Significant foot pathology and deformity requiring episodic care to maintain foot function through successful orthotic and footwear management | 2-3 monthly review |
| Low/ No | Screening, assessment and education but no other Podiatric intervention | One assessment appointment followed by discharge and information on re-referral |

Clinical Findings (Adults)

Prevalence of RA, PsA and Both Conditions

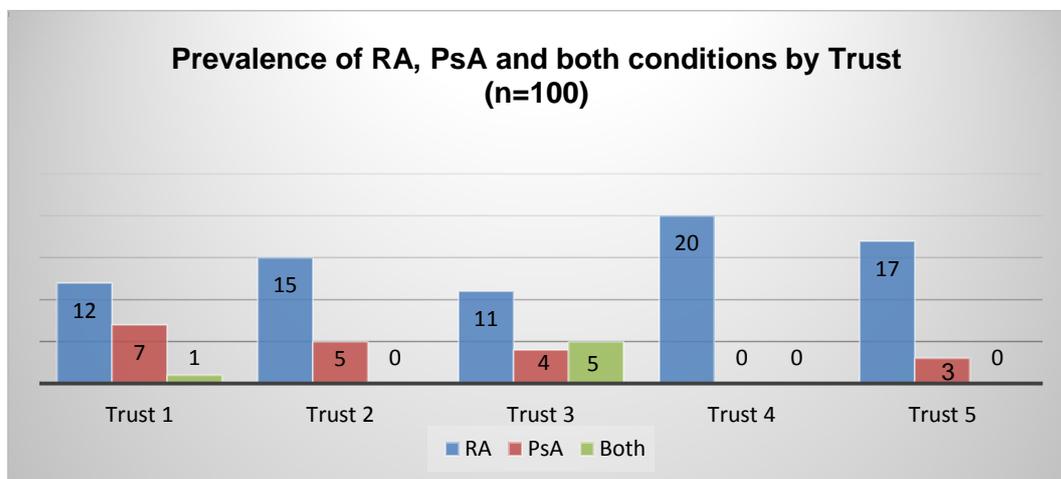
In the audit sample (n=100), 75 patients presented with RA alone, 19 with PsA alone and six with both conditions (Fig 1).

Fig 1: The prevalence of RA, PsA and both conditions, in Northern Ireland



The prevalence of RA, PsA and both conditions in each Trust is shown in Table 4. The percentage values equate to numbers as n=100.

Table 4: Prevalence of RA, PsA and both conditions, by HSC Trust



The prevalence of RA is greater in each Trust with the highest total evident in Trust 4. PsA was identified in Trusts 1, 2, 3 and 5 and absent in Trust 4. Patients with both conditions were evident in Trusts 1 and 3 (Table 4).

Duration of RA and PsA

The range of duration of RA and PsA in the audit sample was 0.5 – 48 years demonstrating the longevity and chronicity of these conditions. For the majority of patients (62%) the duration of their disease was 0-10 years. A further 22% had a disease duration of 11-20 years with 8% having a duration of 21-30 and 8% having a duration of over 31 years respectively Fig 2. As the data were not normally

distributed, the median value per Trust was calculated (Fig 3). Trusts 3, 4 and 5 had the greatest number of patients with a disease duration of under or equal to 10 years (Table 5).

Fig 2: Duration of RA and PsA

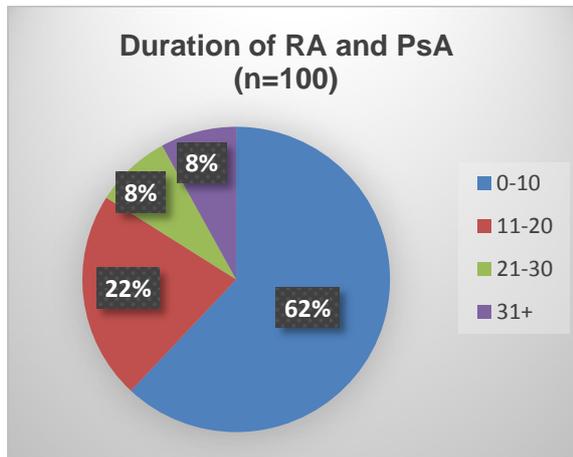


Fig 3: Median duration of RA and PsA by Trust (years)

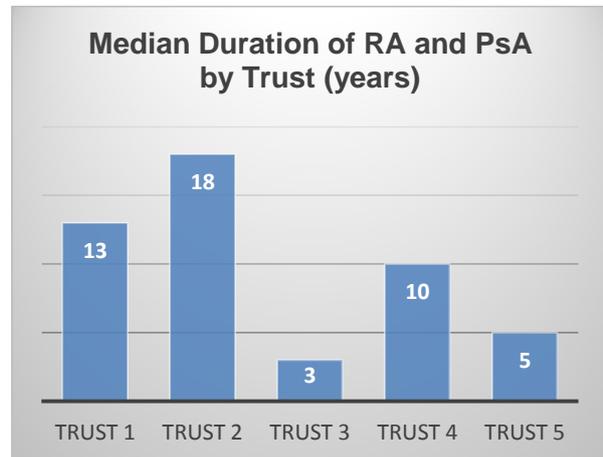
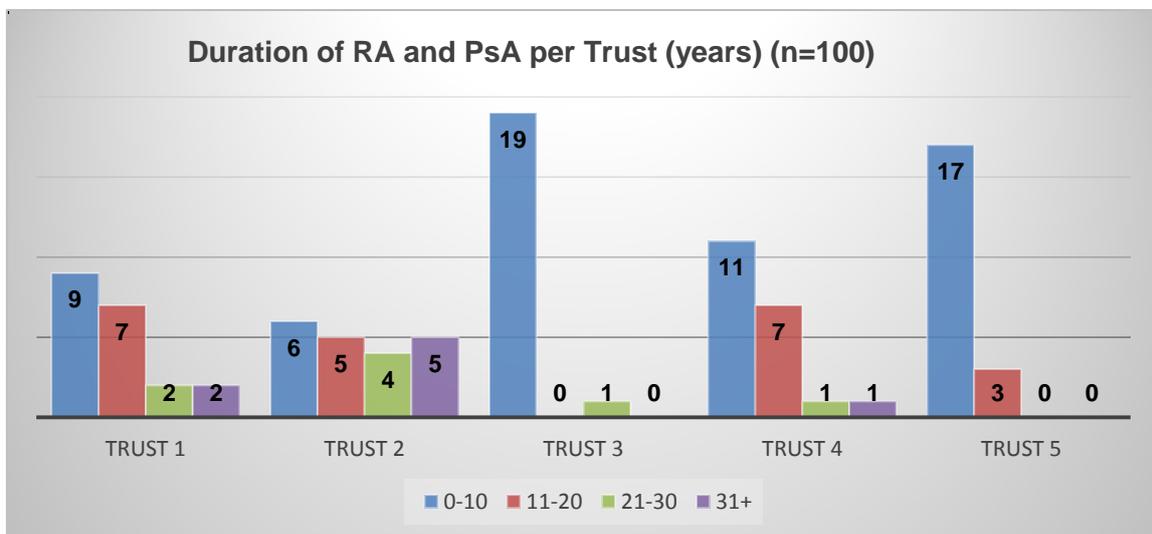


Table 5: Duration of RA and PsA per Trust (years)



Foot Assessment

Results showed that 29% of the adult audit sample had a foot assessment carried out by a health care professional within 3 months of diagnosis of RA or PsA (Fig 4).

Fig 4: Foot Assessment within 3 months of diagnosis of RA, PsA (n=100)

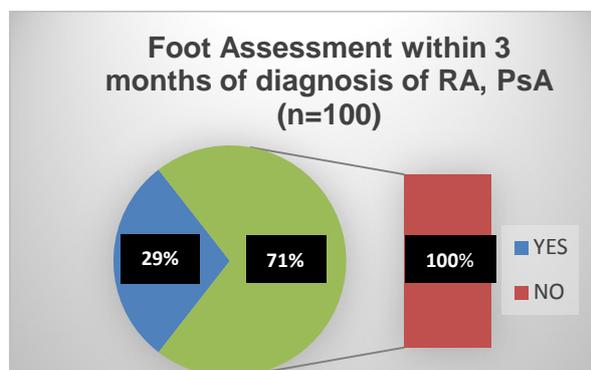
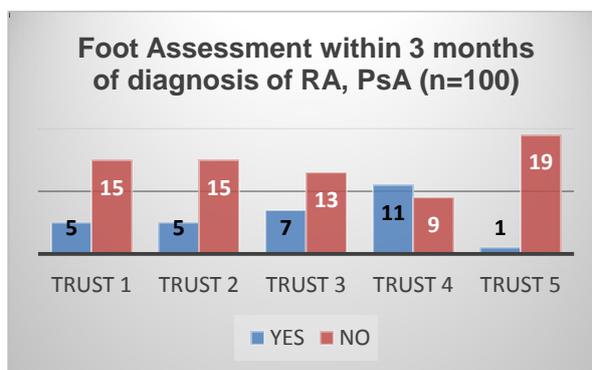


Table 6: Foot Assessment 3 within 3 months of diagnosis of RA, PsA by Trust

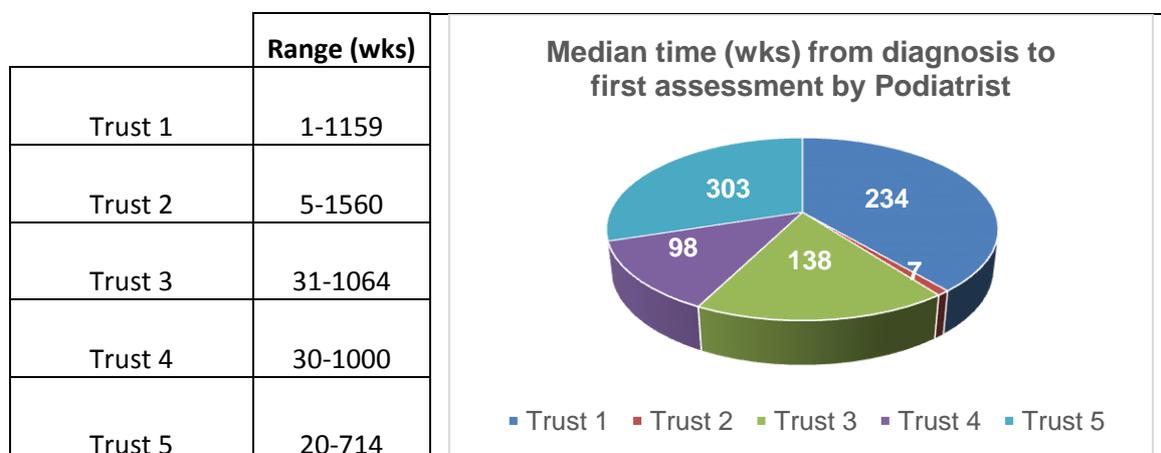


In the group of 29 that had a foot assessment, 17 (59%) were carried out by a Medical Consultant, three (10%) by a nurse, two (7%) by a GP and seven (24%) were not recorded. Results by Trust showed that Trust 4 completed the most foot assessments (11). Trust 3 completed seven foot assessments, Trusts 1 and 2 completed a similar number (5). Trust 5 completed the least number of foot assessments (1) (Table 6).

Access to and Assessment by a Podiatrist

All patients in the adult audit sample had access to Podiatry. However, the length of time from diagnosis of RA/PsA to first assessment by a Podiatrist varied greatly with lengthy waits in all Trusts ranging from 1-1159 weeks. As the data were not normally distributed, the median value per Trust was 7-303 weeks (Fig 5).

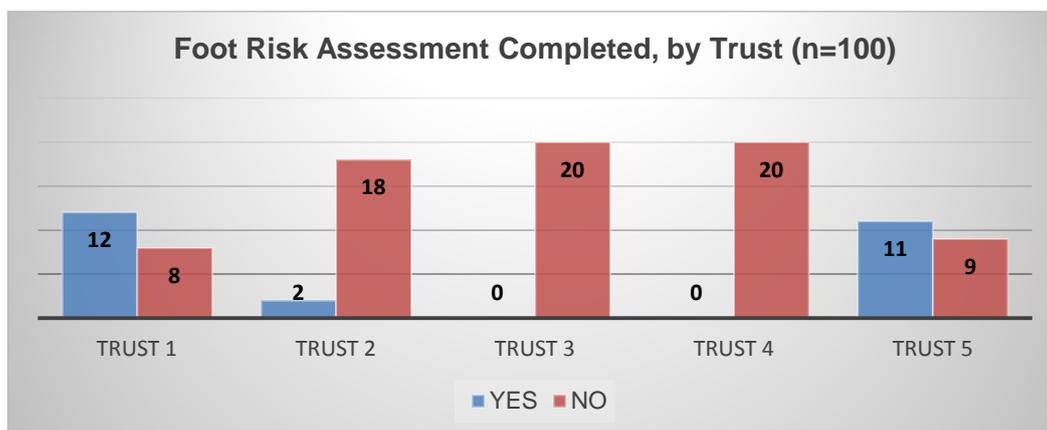
Fig 5: Median time (weeks) from diagnosis to first assessment by Podiatrist



Risk Assessment

An assessment of risk for serious foot pathologies (within the audit period) was completed in 25% of the audit sample. Results varied by Trust (Table 7). Trusts 1 and Trust 5 completed the most risk assessments (60% and 55% respectively) and Trust 2 completed 10%. No risk assessments were completed in Trusts 3 and 4. No risk assessments were completed in Trusts 3 and 4.

Table 7: Foot Risk Assessment Completed, by Trust

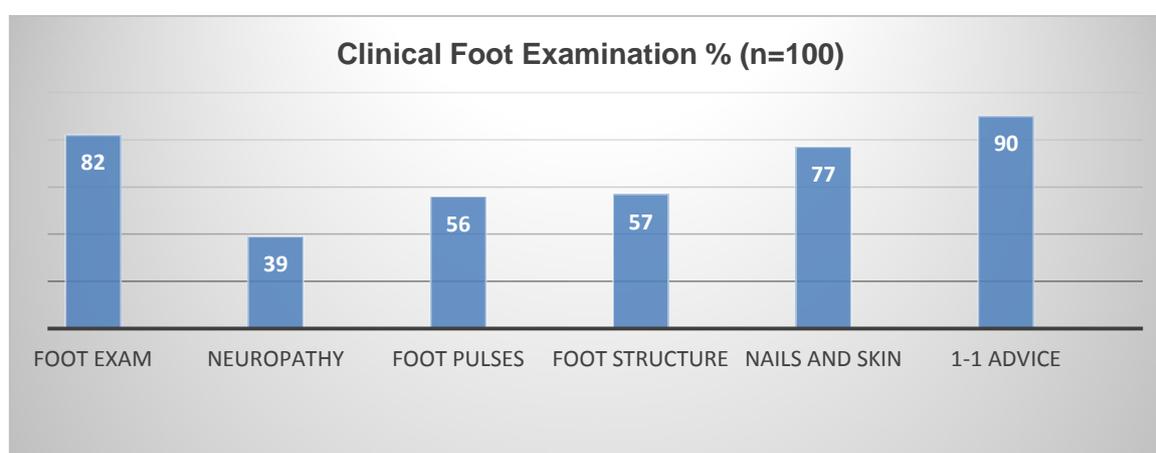


Clinical Foot Examination

The audit reported on six elements included in a clinical foot examination. These included a general foot examination, assessment for the presence of neuropathy and foot pulses, foot structure, the presence of nail and skin pathologies and if one-to-one advice was given to the patient by the Podiatrist.

Overall, results show one-to-one advice was provided to 90% of audit patients, a general foot examination to 82%, and an assessment of nail and skin pathologies to 77% (n=100). An assessment of foot structure was completed in 57%, pulses 56%, and neuropathy in 39% (Table 8).

Table 8: Clinical Foot Examination



Results in relation to the clinical foot examination by Trust are reported in Tables 9 and 10. Each Trust had the potential to achieve a maximum score of 120 if all six

elements were completed for all 20 patients. Results showed that Trust 1 completed the most elements (82%), followed by Trust 2 (80%), Trust 3 (70%), Trust 4 (63%) and Trust 5 (39%).

Table 9: Clinical Foot Examination by Trust

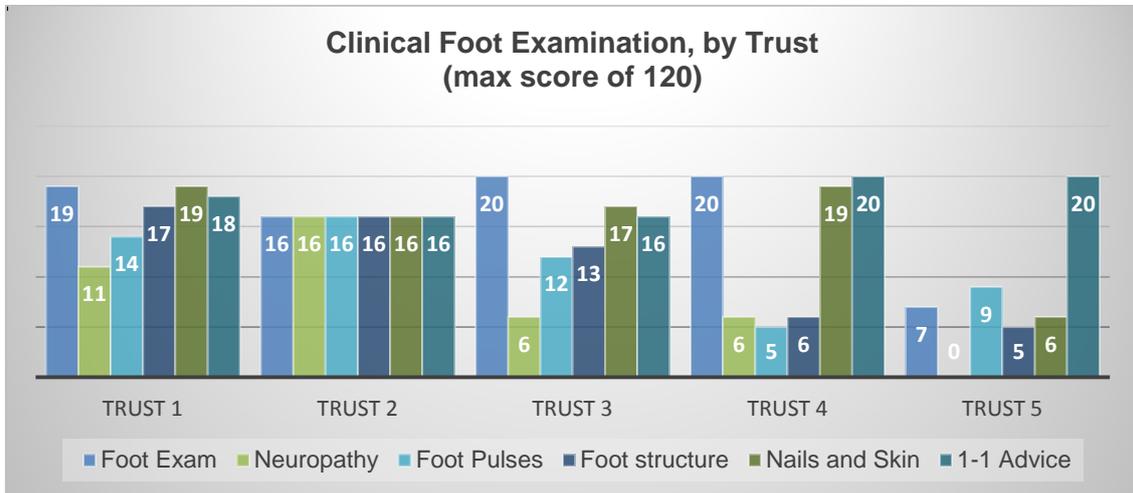
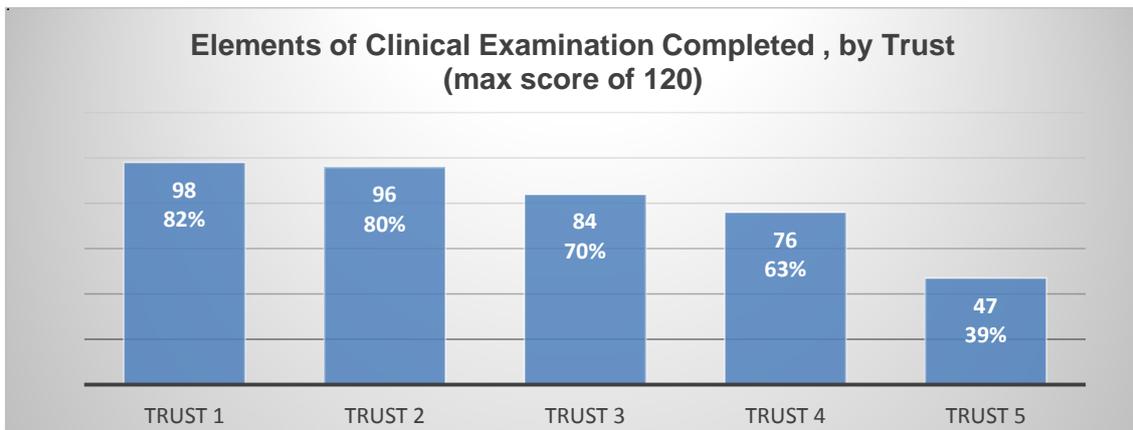


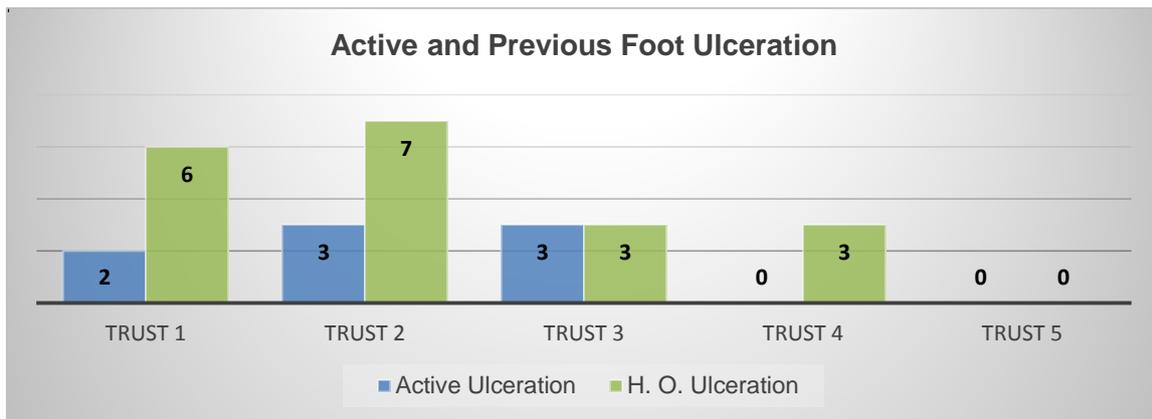
Table 10: Elements of Clinical Examination Completed, by Trust



Foot Ulceration, Healing, Surgery and Amputation

The chronicity of RA and PsA, medication, forefoot deformity and inappropriate footwear all contribute to the potential for foot ulceration, delayed healing and surgical intervention to correct foot deformity. In the audit sample (n=100) 8 patients, from Trusts 1 to 3 presented with active ulceration and 19 from Trusts 1 to 4 had a history of ulceration in the audit period (Table 11). There was no previous or active ulceration in Trust 5 in this sample. Results are similar to the UK prevalence of 10%.

Table 11: Active and Previous Foot Ulceration, n=100



As expected and similar to UK data, ulceration sites involved the first toe, lesser toes and the metatarsal heads. Ulcer duration (and therefore healing rate) was typically one to 11 weeks with two ulcers persisting for a period of one and three years respectively.

In the audit sample, six patients had a surgical procedure on the foot and ankle and four had amputations. As expected, the sites commonly involved the first toe, lesser toes and the metatarsal heads. One patient had heel surgery.

Orthotic Management

Issue and Type of Orthoses

An orthotic is a specially constructed insole worn inside the shoe to help improve foot function, accommodate foot deformity, reduce foot pain and improve foot pathologies. An orthotic can be “Casted” (custom made for each person based on an impression/ cast of their foot. It will often redistribute pressure, improve foot function and reduce pain) or “Non-casted” (a prefabricated insole is provided and specific modifications added for each person to cushion the foot and reduce pain).

Fifty patients in the audit sample (n=100) received orthoses as part of their clinical management plan. Ten (10%) of the patients received casted devices and the remaining 40 (40%) received a variety of non-casted devices (Fig 6). As expected, in all Trusts, non-casted devices were most commonly issued (Table 12). Half of the patients did not require orthotics.

Fig 6: Types of orthoses issued to patients

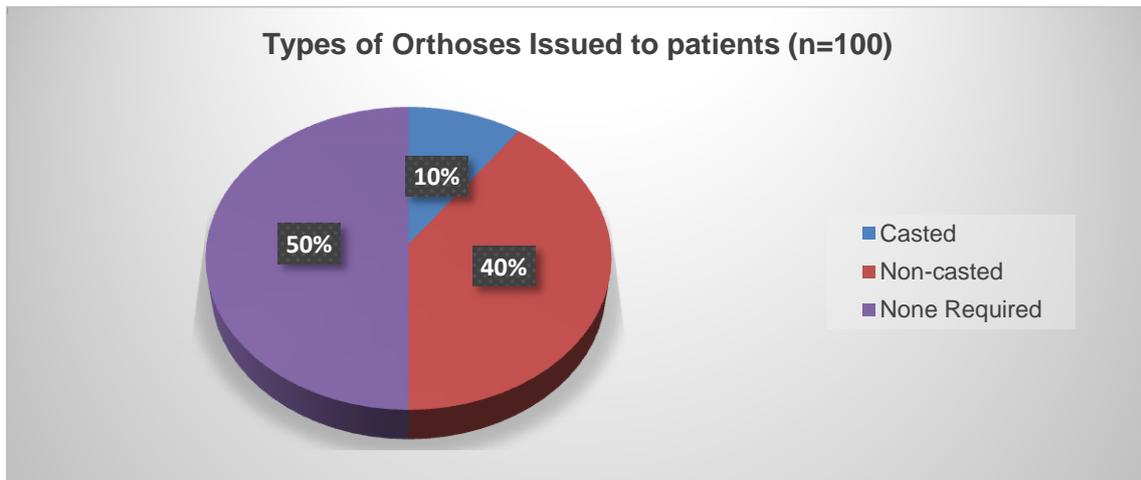
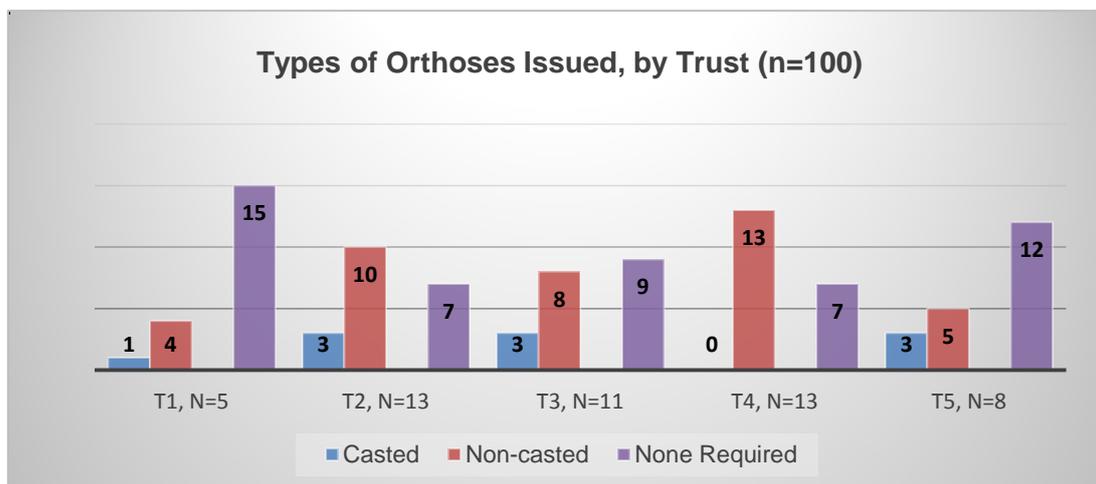


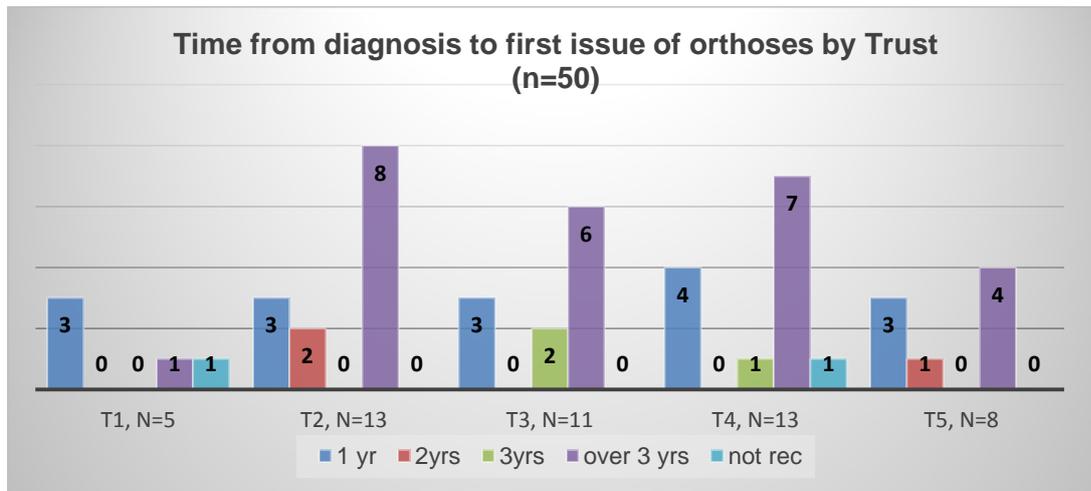
Table 12: Types of orthoses issued to patients, n=100



Time from Diagnosis of RA and PsA to Issue of Orthoses

The time from first diagnosis of RA and PsA to the issue of orthoses was variable and often lengthy in all Trusts. Of those patients managed with orthoses (n=50), 16 (32%) were issued with orthoses within one year of diagnosis, reflecting recent service development and the development of Specialist Podiatrist posts in Rheumatology. A small number of patients (5) received their devices within 2-3 years of diagnosis and 26 patients (52%) were issued with orthoses over 3 years post-diagnosis (Table 13). Information was not recorded for two patients.

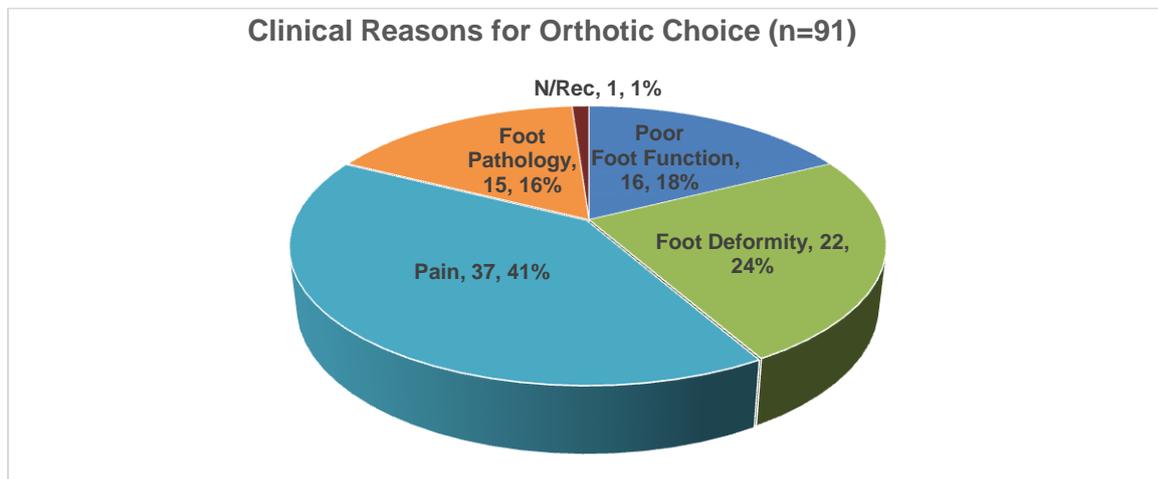
Table 13: Time from diagnosis to first issue of orthoses, by Trust



Clinical Reason for Type of Orthoses Issued

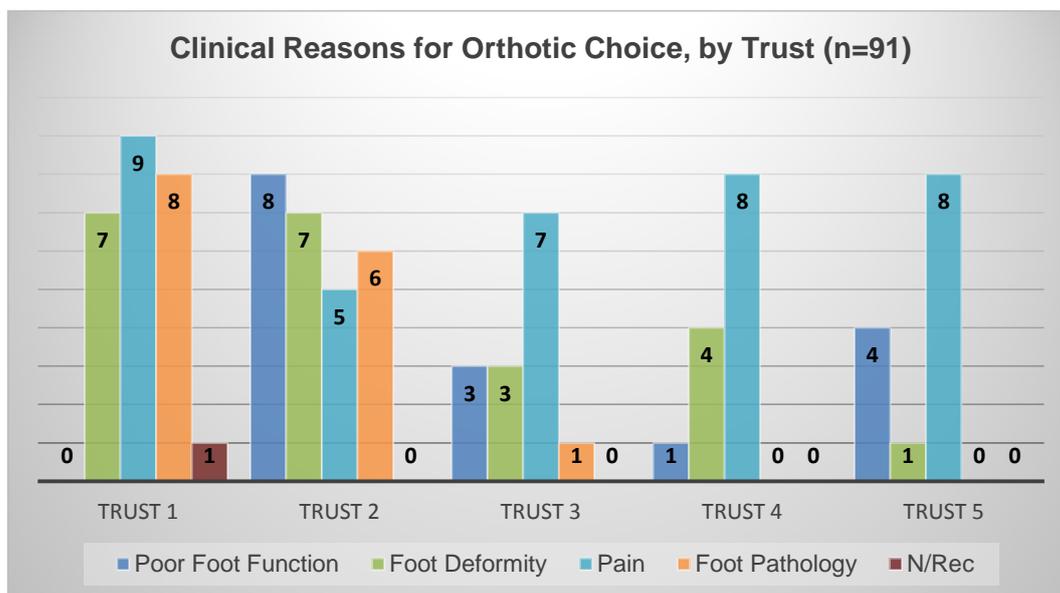
Podiatrists issued orthoses to patients for a variety of reasons including poor foot function, foot deformity, foot pain, and foot pathology. Overall, orthoses were issued to 50 patients (Fig 7). One response was not recorded. Results showed that 35 (62%) of these patients had more than one of the above reasons for orthotic issue (91 reasons were identified for the 50 patients). Pain was the most common reason for issue (41%).

Fig 7: Clinical Reasons for Orthotic Choice (n=91)



Clinical reasons for orthotic choice, by Trust, are shown in Table 14. Trusts 1, 3, 4 and 5 all reported pain as the most common reason. Trust 2 cited poor foot function followed by foot deformity, foot pathology and foot pain as the most common reasons.

Table 14: Clinical Reasons for Orthotic Choice by Trust (n=91)



Biologic Therapy

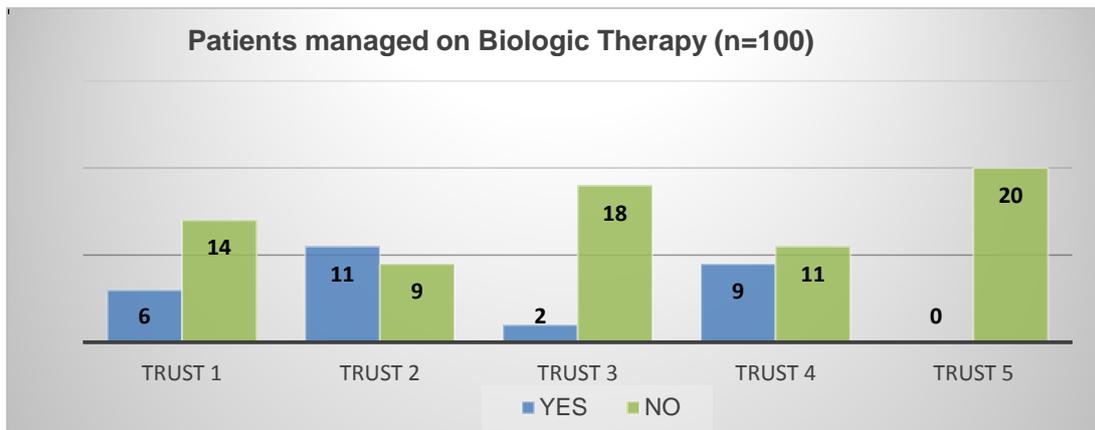
Biologic therapy has been available for around 15 years. The drugs used are anti-inflammatories that have revolutionised the treatment of many serious and chronic diseases such as RA. It is estimated that there are currently 5,260 adults and children with RA/ JIA in NI managed using biologic therapy (Table 15). This is likely to increase year on year.

Table 15: Number of patients currently prescribed Biologics Treatment for Rheumatoid Arthritis, Psoriatic Arthritis or Ankylosing Spondylitis at 30th September 2017
(Source: SDR5 Arthritis Return)

| Trust | Total No. of Patients on Treatment | | |
|-------------------------|------------------------------------|------------|--------------|
| | Adult | Paediatric | Total |
| Belfast HSC Trust | 2,227 | 87 | 2,314 |
| Northern HSC Trust | 1,049 | - | 1,049 |
| South Eastern HSC Trust | 528 | 32 | 560 |
| Southern HSC Trust | 666 | - | 666 |
| Western HSC Trust | 671 | - | 671 |
| Total | 5,141 | 119 | 5,260 |

In the audit sample for adults (n=100), 28 patients (28%) were managed on biologic therapy. Numbers of adults were highest in Trusts 2 and 4, at 11 and 9 respectively (Table 16).

Table 16: Patients managed on Biologic Therapy, by Trust



A small number of these 28 patients presented with common foot problems that were considered high risk because of the disease process and biologic therapy. These foot pathologies included in-growing nails (7), foot ulceration (5) and foot infection (3). Most were advised on their management of biologic therapy by consultant medical staff (12), nurse (1) and Specialist Podiatrists (2).

Footwear (Adult sample)

Overall, 76 patients in the audit sample had a footwear assessment documented and were given advice on appropriate style and type (Fig 8). Trusts 4, 3 and 2 completed this task in 95%, 90% and 85% of cases respectively. Trust 5 completed it in 60% of cases and Trust 1 in 50% (Fig 8).

Fig 8: Documented Footwear Assessment and Advice (n=100)

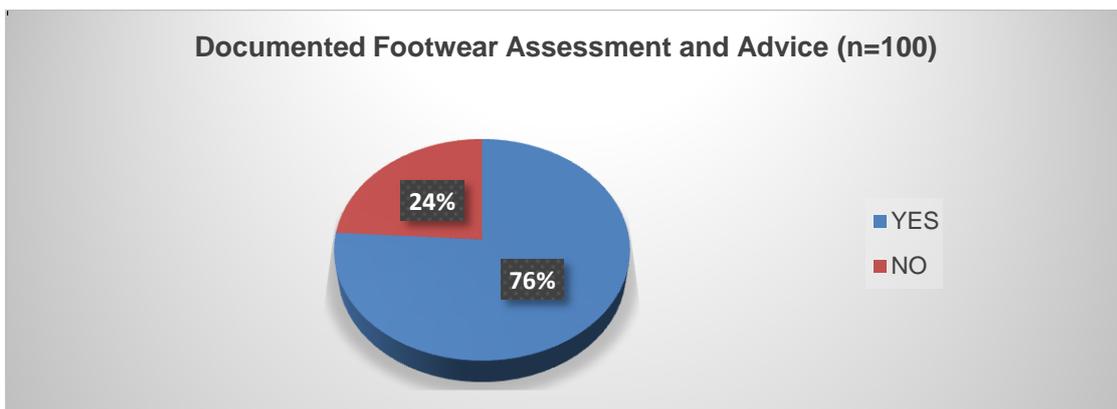
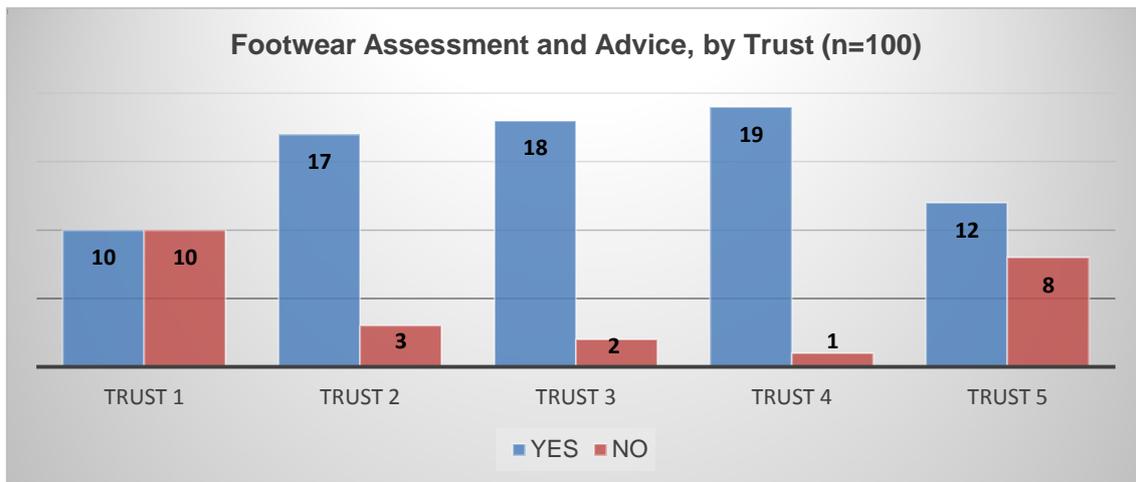
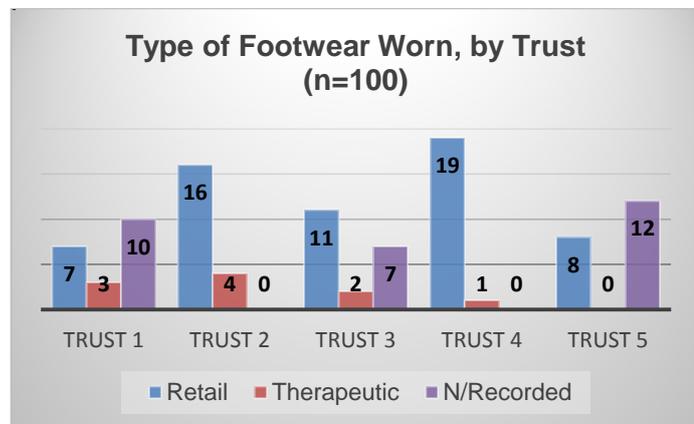


Table 17: Documented Footwear Assessment and Advice, by Trust (n=100)



Results showed that 61% of audit patients wore retail footwear and 10% wore therapeutic footwear. The type of footwear worn was “not documented” in 29% of patients (Fig 9). The majority of patients wore retail footwear in Trusts 2 and 4 and a small number wore therapeutic footwear in Trusts 1-4. Information was not documented in Trusts 1, 3 and 5 (Table 18).

Fig 9: Type of Footwear Worn **Table 18: Type of Footwear Worn, by Trust**



Patient Education Programmes

None of the adult patients had access to specific education programmes about the management of RA and PsA. Most relied upon one-to-one advice with professionals as part of their clinical assessment and review.

Steroid Injection Therapy

In the adult audit sample (n=100), eight patients received steroid injection therapy. This number is low and may not be reflective of the service provided across all Trusts. The number is likely to increase as the service expands.

Clinical Findings (Children)

In the audit period, 59 children with diagnosed JIA and JPsA were identified at Rheumatology clinics in Northern Ireland (43 BHSCT Regional Centre, nine SEHSCT and six NHSCT). A sample of 34 children was taken from the BHSCT Regional centre, as the remaining nine were not reviewed within the audit period from 1st April 2015 - 31st March 2016. General information was collected in relation to:

- Age
- Duration of JIA and Juvenile Psoriatic Arthritis (JPsA)
- General foot assessment
- Elements of clinical foot examination
- Assignment of risk
- Issue of orthoses
- Footwear assessment
- Biologic therapy
- Education programmes
- Steroid injection therapy

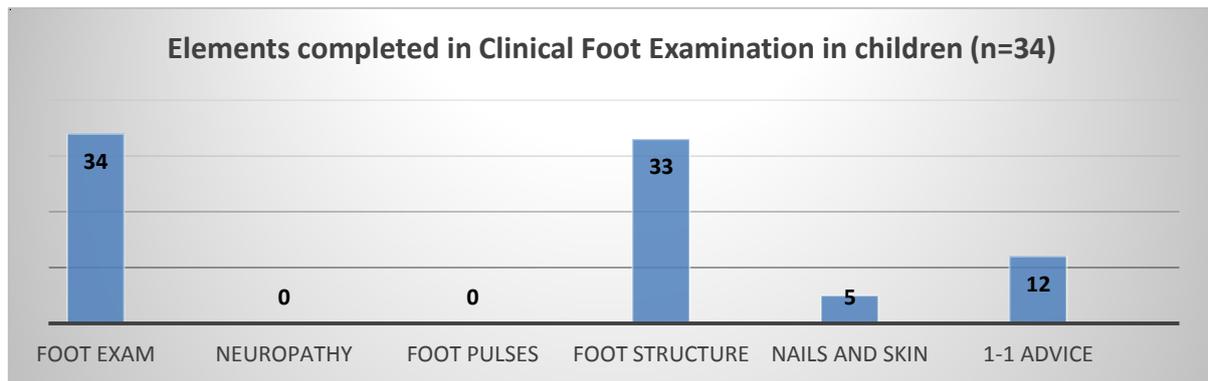
In the audit sample of 34 children attending BHSCT, 32 (94%) presented with JIA and two (6%) with JPsA. The duration of JIA and JPsA ranged between 1-13 years (median 3 years). The age at diagnosis for both ranged from 1-14 years (median 5 years).

All children audited had access to a Podiatrist and 10 children (29%) had a general foot assessment by a Podiatrist within 3 months of diagnosis. The time from diagnosis to first assessment by a Podiatrist varied. Two patients were assessed on the same day of diagnosis and one child was already an existing patient. The remaining 31 children had a Podiatry assessment between 0.2 and 12 years (median 0.75 years) from diagnosis.

Clinical Examination

In the audit sample (n=34), five children (15%) had a risk assessment for serious foot pathology completed. Results were reported in relation to six elements included in a clinical foot examination. These were a general foot examination, assessment for the presence of neuropathy and foot pulses, foot structure, the presence of nail and skin pathologies and if one-to-one advice was given to the patient by the Podiatrist (Table 19).

Table 19: Elements completed in clinical examination (children).

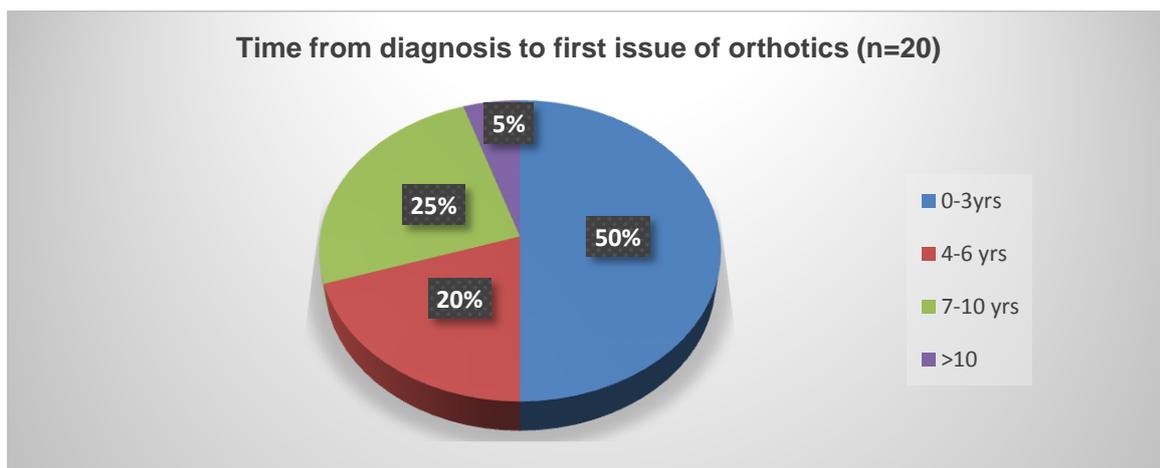


Overall, results show that a general foot examination including foot structure was completed in 34 and 33 children (100% and 97% respectively), an assessment of nail and skin pathologies was completed in 5 (15%) children and one-to-one advice was given in 12 (35%) children. Assessment of pulses and neuropathy were not completed in any children (Table 19).

Orthotic Management

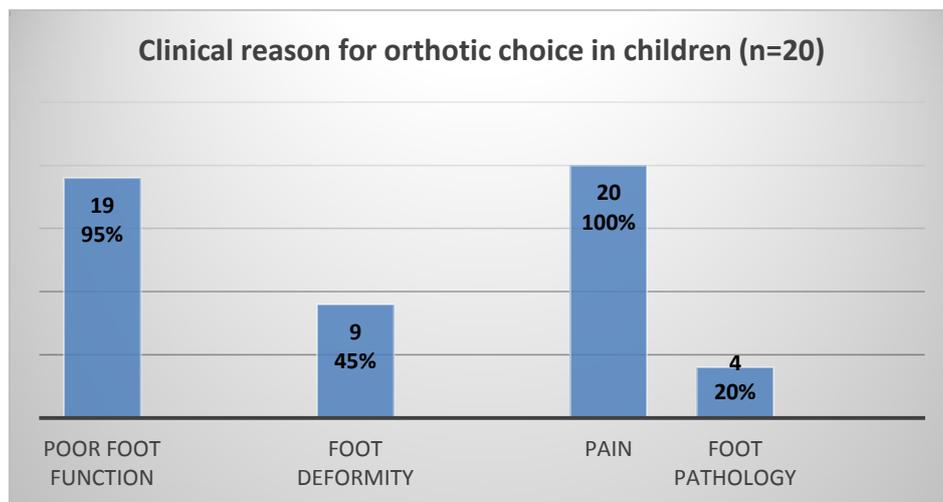
Twenty children (59%) in the audit sample (n=34) received orthoses as part of their clinical management plan. Eleven (55%) of these children received casted devices and the remaining nine (45%) received non-casted devices. The length of time from diagnosis of JIA and JPsA to receipt of orthotics varied. Ten children (50%) achieved this in 0-3 years, four children (20%) in 4-6 years, five children (25%) in 7-10 years and one child (5%) in over 10 years (Table 20).

Table 20: Time from diagnosis to first issue of orthotics



All children (n=20) who received orthoses presented with either poor foot function, foot deformity, foot pain or foot pathology alone or in combination. All 20 presented with foot pain (Table 21).

Table 21: Clinical reason for orthotic choice (n=20)



Biologic Therapy

Fifteen children (44%) (n=34) were treated with biologic therapy and no children in the audit presented with foot pathologies.

Footwear

Fifteen children (44%) had a footwear assessment and footwear advice documented. Thirteen children (38%) wore retail footwear and information on shoe type was unrecorded in the remainder.

Education Programmes

No children had access to specific education programmes.

Steroid Injection Therapy

In the audit period, seven children (21%) had steroid injection therapy carried out by a Medical Consultant.

Discussion

It is estimated that approximately 300,000 people have been diagnosed with arthritic conditions in Northern Ireland and this is likely to increase significantly by 2020.^{10, 11} Podiatry Service Managers recognised that, in Northern Ireland, there was a lack of accurate baseline data on the prevalence and Podiatric management of arthritic conditions, particularly RA. They raised concerns regarding the variation in, and the availability of care. As a result, funding was secured to carry out this regional audit in order to provide important baseline information in relation to how this complex group of patients was managed, mapped against national standards.^{15, 9} A previous regional audit demonstrated the feasibility of the audit methodology and the ability to collect data from relevant sources.¹⁹

The main sources of information on the prevalence of RA, PsA and JIA were Trust IT systems such as PCIS, LCID and the Electronic Care Record (ECR). Information from GP Practice Registers and from QoF²² was useful as were Trust, Medical and Podiatry Business Plans. The main challenge associated with data collection was that there was an absence of formal registers and coding systems to record the prevalence of RA, PsA and JIA in the Trusts. Whilst most GP practices did have patient registers, information was not available from all. It is essential that Trusts recognise the importance of having robust IT systems that interface with each other to provide reliable, timely and specific information on all aspects of the patient journey from referral through to discharge.

Audit results showed that the Podiatry caseload for all Trusts in total in 2015-16 was 134,344. Within that caseload, 4,522 adults (3%) and 59 children (0.04%) had RA/PsA and JIA/ JPsA respectively. In the analysis of information, a calculated assumption was made that the prevalence of RA and PsA in the NI population was 0.6 and 0.3% respectively in line with national data. Within the five Trusts, the number of patients registered with RA and PsA was comparable at 0.7% and 0.5% respectively. The number of patients with RA and PsA on Podiatry caseloads was reported as 1-8%.

The regional Podiatry caseload can be stratified based on the patients' risk of serious foot pathologies and clinical need. Work is ongoing in this area to refine what is required in terms of service capacity, staff competency, and in the development of care pathways for each group. Patients at highest risk (those with foot ulceration +/- biologic therapy) require intensive weekly intervention by the most experienced Podiatrists, whilst those at high or moderate risk require fewer interventions and the lowest risk patients may be discharged.

Overall, the majority of patients in the adult (n=100) and children samples (n=34) presented with RA/JIA alone (75% and 94%) compared to PsA/JPsA or both conditions. In the adult sample, the wide range of disease duration from 0.5-48 years illustrates the chronicity of RA and PsA and the link between the development of severe joint deformity and foot pathology.

All patients had access to Podiatry services. However, in adults, the time from diagnosis to first assessment by a Podiatrist was variable, often lengthy in all Trusts with dates often inadequately documented. This is partly due to the DAS 28 scoring

system as previously described but the absence of formal referral pathways to Podiatry must also be considered as a contributory factor. Historically, patients have been referred too late to Podiatry, often several years after diagnosis when they were in pain, had severe foot deformity, foot pathology or all three. In children, the time from diagnosis to first assessment by a Podiatrist was variable but shorter (median 0.74 years). However, it should be noted that in some cases, children are diagnosed with JIA at a very early age and Podiatry intervention is inappropriate in babies and toddlers. Access to Paediatric Rheumatology Podiatry has only been possible in recent years and this has improved the service to those more recently diagnosed. Overall, hospital and community Podiatry teams are developing and staff aspire to a more preventative approach to multidisciplinary clinical management for all patients.

An assessment of risk for serious foot pathologies was completed in 25% of the adult audit sample, mostly in Trusts 1 and 5, and in 14% of children. Historically, Podiatry services have focussed on recording and assigning risk in the diabetes population on Podiatry caseloads. Following the Regional Diabetes Foot Audit (2016),¹⁹ a regional risk tool was developed and agreed and all patients now have a risk assigned and formally documented regardless of medical history.

Clinical examination was variable across Trusts. Only 29% of adult patients had a foot assessment by a health care professional (mainly Consultant medical staff) within 3 months of diagnosis of RA and PsA as directed by NICE. There are a number of likely reasons for this. Resources are limited and there are few dedicated Podiatry posts. There are also long waiting times for hospital Consultant assessment and review. Currently, medical staff assess patients using the DAS 28 scoring system that does not include a foot review. Whilst this is very unlikely to change, a referral process must be developed to ensure referral to Podiatry for both adults and children, for early assessment and clinical intervention as required. This early intervention has the potential to have a significant impact on the prevention of foot pathologies and severe deformity in later life.

Information was recorded in relation to the clinical examination of patients in the adult sample. The examination included six elements: foot examination, neuropathy and foot pulses, foot structure, nail and skin pathologies and one-to-one advice. Overall, results showed that one-to-one advice, a general foot examination and an assessment of nail and skin pathologies were completed in over 77% of the audit patients (n=100). Assessment of foot structure, pulses and neuropathy fell below the expected standard of 100% at 39-57%. A possible reason for this is that all assessments had to be completed within the audit year. Some assessments were completed outside of this time-period, as current resources did not allow for an annual review in all Trusts.

In the children's sample, 97% of children had a general foot examination including foot structure and 34% received one-to-one advice. Podiatrists recognise that in practice, all children with JIA receive one-to-one advice and the low figure is likely to be because it was not recorded in patient records. Although assessment of pulses and neuropathy were not completed in any children, it should be noted that poor circulation and the presence of neuropathy are not normally childhood conditions and so were unlikely to be assessed and recorded.

Eight percent of the adult sample were affected by foot ulceration, surgical intervention and amputation, typically involving the forefoot and metatarsal heads. This is reflective of UK data and is as expected. Evidence shows that this patient group displays similarities to the diabetes population in the risk stratification and aetiology of foot ulceration. Early identification of PAD and neuropathy, coupled with off-loading to minimise plantar pressures is essential. It also illustrates the chronicity of rheumatological disease and the relationship between disease progression, pharmacology, the development of severe deformity and the style of footwear worn in this complex patient group.

Management of rheumatological foot conditions with casted and non-casted orthoses is recommended in the national guidance. In the adult audit sample, 50% of patients received orthoses (10% casted and 40% non-casted) as part of their clinical management plan. This was similar in all Trusts. However, this may not be reflective of those adults and children managed in hospital clinics. The randomised sample did not include adults from the hospital setting the majority of whom are managed with orthoses. Twenty children in the audit sample (n=34) received orthoses as part of their clinical management plan. Eleven (55%) of the children received casted devices and the remaining nine (45%) received non-casted devices. Four children did not require orthoses.

The time from first diagnosis of RA and PsA to the issue of orthoses was variable and often lengthy in all Trusts. Of those patients managed with orthoses (n=50), 32% were issued with orthoses within 1 year of diagnosis reflecting recent service development and the development of Specialist Podiatrist posts in Rheumatology. However, 52% were issued with orthoses over 3 years post-diagnosis, which would not be recommended in national guidance. The length of time from diagnosis of JIA and JPsA in children to receipt of orthotics also varied with 50% achieving this in 0-3 years and 20% in 4-6 years.

The most common reason for orthotic prescription in adults across four of the five Trusts and in all children was foot pain, often in combination with other factors such as poor foot function and deformity. Appropriate early intervention at diagnosis in both adults and children increases the potential of preventing foot deformity and preserving foot function in this complex group.

Overall, 76% of adult patients and 44% of children had a footwear assessment/ advice documented, with the majority of adults (61%) wearing retail footwear as expected. A number of children (38%) wore retail footwear and information on the remainder was unrecorded.

An increasing number of patients with rheumatological disease are managed successfully on biologic therapy (approximately 5,260 adults and children in Northern Ireland, 2017). In the audit sample, 28 adults (28%) and 15 children (44%) were managed in this way. These patients are considered to be at most risk of developing serious foot problems and often require intensive Podiatry intervention. The emergence of this group with increased risk and complexity will demand additional resource to manage their foot problems successfully over time. A significant number of patients are currently managed with disease-modifying anti-rheumatic drugs

(DMARDS). These patients are also at significant risk and require intensive Podiatry review. It is very likely that a significant number of those on DMARDS will eventually move on to biologic therapy putting further demands on the Podiatry service.

Results showed that overall, 90% of adult patients and 35% of children received one-to-one patient education by Podiatrists as part of their clinical examination. None of the patients had access to or attended specific Structured Patient Education Programmes. It was recognised by all that formal, multidisciplinary education programmes were under-resourced and under-developed in the region.

A small number of adults (8%) and 20% of children received Steroid Injection Therapy to the foot/ ankle in the audit sample. Management of patients using this method was low as it is largely a hospital-based service led by Consultant medical staff and there are often long waiting times to access the service, resulting in low numbers. Future audits involving the hospital Rheumatology service are likely to yield different results. This may also be the case as community RA services and teams develop with Specialist Podiatrists sharing care with Hospital MD Rheumatology teams.

Recommendations

The report recommends:

1. Trusts recognise the importance of having robust Information & Technology (IT) systems that interface with each other to provide reliable, timely and specific information on service and clinical management.
2. Services, processes and multidisciplinary teams managing rheumatological foot disorders in adults and children should be developed within community and hospital settings and a regional implementation plan agreed.
3. This audit provided important baseline information on patient care in Northern Ireland. Successful collaboration between Podiatry services will implement change that will ensure:
 - a. Podiatry referral at diagnosis of RA, PsA for adults and JIA, JPsA for children.
 - b. Standardisation of clinical assessment to include a general foot examination, assessment of neuropathy and foot pulses, examination of foot structure, assessment of nail and skin pathology and one-to-one advice.
 - c. Assignment of risk based on the regional risk tool and clinical examination.
 - d. Footwear assessment and orthoses management at diagnosis when indicated.
4. The development and delivery of Patient Education Programmes in Hospital and Community settings.
5. Explore and develop extended scope of practice techniques such as Steroid Injection Therapy, and the use of Ultrasound Scanning.
6. Further development of Regional Podiatry Supervision and Competency Frameworks supported by a regional training plan.
7. Service user involvement should be considered at all stages in this process.
8. Appropriate audit and research programmes should be developed.
9. A re-audit of the Regional RFD Audit should be planned 3-5 years ahead.

Implementation Plan

The implementation plan is based on the recommendations described in the previous section. The importance of the Podiatry services collaborating as a region with the Department of Health and the Public Health Authority/ Commissioners is key to the successful and timely implementation of these recommendations. An aspiration to work towards the availability of robust IT systems that interface successfully with each other in and between Trusts is essential.

The standardisation of clinical examination, assessment and the use of a dedicated regional risk tool and assignment of risk for each patient will result in early identification of potential for severe foot deformity and poor foot function. This will promote the development of dedicated care pathways for this patient group and ensure high quality safe clinical practice.

A timeline to prioritise these recommendations is presented in Table 22.

Table 22: Timeline for the implementation of recommendations made in the regional Rheumatological Foot Disorder Audit

| | April 2018 | April 2019 | April 2020 | April 2021 |
|---|---|------------|------------|------------|
| IT | Identify information needs, improve and develop system interfaces and processes to interrogate systems to extract meaningful data | | | |
| MD Team development in hospital and community | FOMNIG will reach regional agreement on this process. Identify and train staff | | | |
| Podiatry referral at Diagnosis | FOMNIG will reach regional agreement on process and resource. Agreement with relevant Consultant staff | | | |
| Standardisation of Clinical examination | Rheumatology Specialist Podiatry Group | | | |
| Assignment of risk | FOMNIG have agreed regional risk tool and RA Specialist Podiatry Group will lead training and implementation | | | |
| Develop and deliver Specialist Education Programmes | FOMNIG will reach a regional agreement and explore with Consultant Medical staff | | | |
| Podiatry Supervision and Competency Frameworks | FOMNIG are working towards regional implementation | | | |
| Service User Involvement | Service Users will be involved in all parts of this process | | | |
| Dissemination of results | FOMNIG, GAIN/ RQIA Conference, publication in peer reviewed journal | | | |
| Regional RFD Re-audit | 3-5 year plan, FOMNIG will reach a regional agreement | | | |

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| Name | Designation | Organisation |
|---|--|---|
| Regional Podiatry Managers Group | Podiatry Service Managers | All Trusts |
| Dr Julia Shaw | Project Lead | Belfast HSC Trust |
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| Data Collectors (Specialist Podiatrists) | Leanne McGennity | Belfast HSC Trust |
| | Jane McCoy | Northern HSC Trust |
| | Tara Crossey | South Eastern HSC Trust |
| | George McKelvey | Southern HSC Trust |
| | Helen McDowell Kerry Buchannan | Western HSC Trust |
| Siobhan Crilly | Clinical Audit Facilitator | Regulation and Quality Improvement (RQIA) |

| Podiatry Project - Expertise | | |
|--------------------------------------|-------------------------------|--------------------|
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| Elaine Wylie | Rheumatology Specialist Nurse | Southern HSC Trust |
| Paul Gawley | Orthotist | Belfast HSC Trust |
| Kate Fleck | NI Director, Arthritis Care | Arthritis Care |
| Regional Rheumatology Podiatry Group | Advanced Podiatrists | All Trusts |

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