SCOTTISH NATIONAL OBSTETRIC BRACHIAL PLEXUS INJURY SERVICE

ANNUAL REPORT 2016-17

Greater Glasgow & Clyde
Health Board

CONTENTS

The completed Annual Report should be sent electronically by 31 May to:

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Section A: Service/Programme

A2 Aim / Purpose / Mission Statement / Date of Designation

The Paediatric Brachial Plexus Injury Service is based at the Royal Hospital for Children in Glasgow and became a designated National Service in April 2006.

It provides an integrated multidisciplinary service for obstetric brachial plexus injury, traumatic brachial plexus injury and tumours involving the brachial plexus including:

- **Diagnosis** Clinical, MRI, Ultrasound, Neurophysiology.
- **Surgery** Early surgical exploration and nerve repair.
  Secondary reconstruction for shoulder and other deformities.
- **Physiotherapy**
- **Occupational Therapy**

A3 Description of Patient Pathway

A3 a) Target Group for Service or Programme

Children with obstetric brachial plexus injury are the main group managed by the service. When necessary, children with traumatic brachial plexus injury or tumours involving the brachial plexus are seen.

A3 b) Abbreviated Care Pathway for Service or Programme

This integrated multidisciplinary service receives referrals nationally from maternity units, paediatricians, orthopaedic services and plastic surgery services. Along with their parents, children with obstetric brachial plexus injury (OBPI) are assessed in the outpatient clinic by medical staff and therapists to confirm the diagnosis, exclude immediate complications (e.g. shoulder dislocation), counsel parents, ensure optimal parent-child bonding, address parental perceptions of the injury mechanism (and any related blame attribution), and to establish a likely prognosis. Some children are seen prior to this first clinical review by the specialist therapists and receive instruction on therapeutic exercises.

A management plan is formulated that includes parental counselling, physiotherapy (initial passive stretching to mitigate shoulder deformity, later active range exercises, post-operative therapy as required), occupational therapy (safe positioning & optimal handling, age-specific sensorimotor developmental assessments, activity-based interventions, provision of aids, fit-for-schooling assessment, school visits & educational liaison role), investigations when necessary (neurophysiology, imaging studies), and monitoring of progress (developmental milestones, school progression, body-image development, pain, psychosocial welfare, fit-for-life). Surgical decisions on nerve surgery and prophylactic shoulder interventions are made around 3 months of age and on secondary surgery (shoulder procedures, hand reanimation, functional muscle transfers) as necessary during growth into adulthood.

Interventions are carried out by the surgical team to:

- Optimise recovery from nerve injury: in a small percentage of children (more severe lesions with inadequate motor recovery at 3-6 months of age), exploration and microsurgical

reconstruction of the brachial plexus nerves may benefit recovery and enable prognostic stratification.

- Optimise growth trajectory: Early nerve surgery may reduce growth disturbance in more severe nerve injuries (detailed above). In these, and in other children with early shoulder subluxation/instability, conservative interventions (e.g. casting, Botox injections) can forestall more severe shoulder abnormalities.
- Correct functionally significant secondary deformity/functional impairment: joint releases, tendon transfers, bony procedures and free functional muscle transfers for upper limb deformities resulting from OBPI. These most commonly affect the shoulder.

Children with persisting deficit are followed up in outpatients at least until skeletal maturity.

Section B:

B1 Efficient

B1 a) Report of Actual v Planned activity

Statement of Activity 2016-17

		Total	*Agreed*
Number of patients assessed:			
Based on Dates First Seen	48		
- Adults with OBPI (See Adult report)	-2		
		46	*35*
Admissions for surgery:			
Nerve	[redacted]		
Other (Shoulder, elbow)	[redacted]		
		[redacted]	[redacted]
Ward bed days:			
HDU/ITU	[redacted]		
Nerve Surgery	15		
Other Surgery	6		
		[redacted]	
Outpatient follow-up appointments:			
Total as per database	222		
Less Young Adults New & Return *(see Adult report)*	-23		
		199	
NHS Board for admissions:			
Fife	[redacted]		
GGHB&Clyde	[redacted]		
Highland	[redacted]		
Northern Ireland	[redacted]		
		[redacted]	

NHS Board for referrals:

Ayrshire & Arran	
Borders	
Fife	
Forth Valley	
GGHB&Clyde	20
Grampian	
Highland	
Lanarkshire	8
Northern Ireland	
Western Isles	
	46

NHS Board for return appointments:

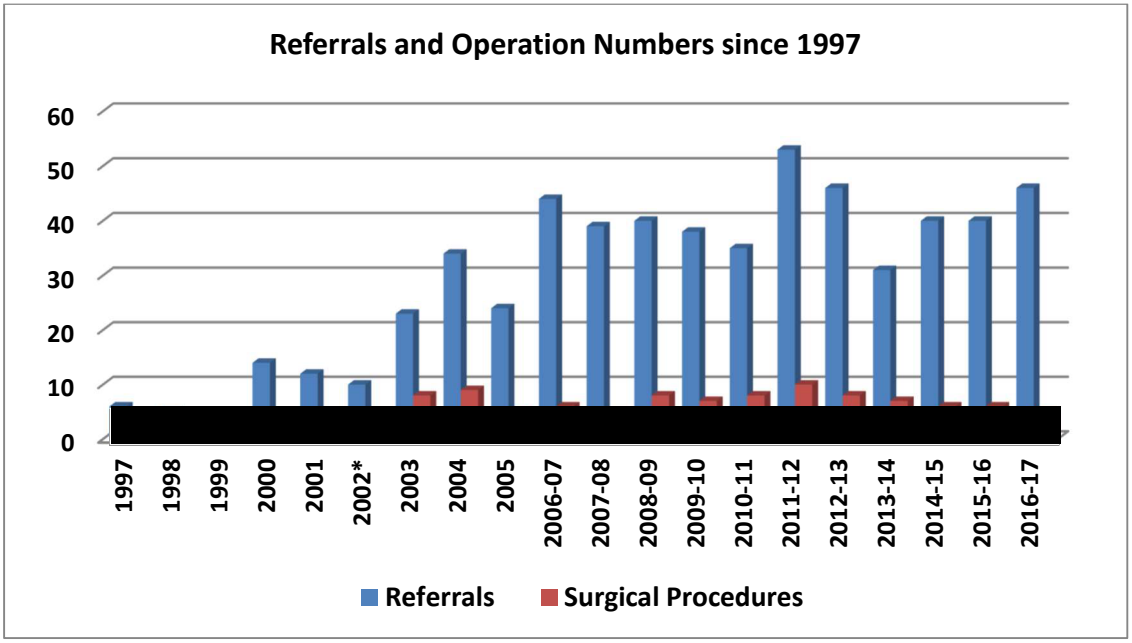
Ayrshire and Arran	6
Borders	
Dumfries & Galloway	
England & Wales	
Fife	14
Forth Valley	6
GGHB&Clyde	82
Grampian	14
Highland	10
Lanarkshire	24
Lothian	15
Northern Ireland	15
Orkney	
Tayside	
Western Isles	
	199

The activity for return appointments should be representative of children who have ongoing problems resulting from OBPI.

Referrals and Operation Numbers since 1997:

Year	Referrals	Surgical Procedures
1997	6	[redacted]
1998	[redacted]	[redacted]
1999	[redacted]	0
2000	14	[redacted]
2001	12	[redacted]
2002*	10	[redacted]
2003	23	8
2004	34	9
2005	24	[redacted]
2006-07	44	6
2007-08	39	[redacted]
2008-09	40	8
2009-10	38	7
2010-11	35	8
2011-12	53	10
2012-13	46	8
2013-14	31	7
2014-15	40	6
2015-16	40	6
2016-17	46	[redacted]
Total:	**583**	**107**

Activity Graph



B1 b) Resource use

Covered in other parts of the report.

B1 c) Finance and Workforce

NHS Greater Glasgow & Clyde, Women & Children's Directorate,

Obstetric Brachial Plexus, Twelve Month Report: 16/17

	Full Year Funded Value Of Agreement	Twelve Month Funded Value Of Agreement	Actual Outturn As At 31st March 2017	Variance	Projected Full Year Outturn
	£	£	£	£	£
FIXED					
Nursing/PAM	69,682	69,682	69,682	0	69,682
Medical	10,483	10,483	10,483	0	10,483
Other direct	31,738	31,738	31,738	0	31,738
Indirect	15,708	15,708	15,926	-218	15,926
Capital charges	58	58	58	0	58
Total Fixed	127,669	127,669	127,887	-218	127,887
VARIABLE					
Pharmacy	5,274	5,274	2,694	2,580	2,694
Travel & Training	2,209	2,209	1,128	1,081	1,128
Total Variable	7,483	7,483	3,822	3,661	3,822
TOTAL	**135,152**	**135,152**	**131,709**	**3,443**	**131,709**
SUMMARY					
Fixed			127,887		127,887
Variable (5 Cases)			3,822		3,822
TOTAL			**131,709**		**131,709**
LESS					
Variable Non Contract (1 Cases)			764		764
Fixed Costs			12,789		12,789
Final Total Owed By NSD			**118,156**		**118,156**

B1 d) Key Performance Indicators (KPIs) and HEAT targets

1. Time from referral to first physiotherapy assessment/intervention < 2 weeks.

   All babies referred to physio at RHC were seen within 2 weeks of referral and all before they were 4 weeks of age.

2. Time from referral to first clinic appointment being offered < 6 weeks.

   The mean wait between referral and the first outpatient appointment was **4** weeks and the median was **4** weeks (Range **0 – 20**. See below).

Time from Referral to Treatment (Monthly breakdown)

2016-17	Patients Seen	Ave. Wait (Weeks)	Max Wait (Weeks)
April		9	10
May		3	6
June	6	6	*20
July		4	9
August		5	7
Sept.		4	8
Oct.		6	7
Nov.	8	3	5
Dec.		5	11
Jan.		3	4
Feb.		1	2
March		4	7
Yearly Summary:	**46**	**4**	**20**

*Patient did not attend first two appointments in March and May. No telephone details on file. Family recently moved from overseas. Letter sent by Ms Murnaghan to family after second non-attendance. New appointment sent for June after contact made with family.

3. Age at first review: physiotherapy 4 weeks; clinic 8 weeks.

Age at First Review (Years)

	Minimum	Maximum	Average	Median
2016-17	0	15	2	0

The results above are affected by a few children who are referred for the first time at an older age. Most cases are seen before the age of 8 weeks. (0 value = less than 6 months of age).

4. Assessment and stratification for nerve surgery benefit by 4 months; nerve surgery by 6 months.

5. Clinic letters issued within 2 weeks.

   All clinic letters and operation notes are typed and checked within a few days.

6. OT review before commence schooling.

   Pre-school visits to children in GG&C are carried out by the specialist O.T., who also liaises with nursery/primary schools outwith GG&C, prior to the children attending primary school.

7. Service audit completion, including satisfaction survey, once every 3 years.

   See section B2a.

8. Educational talks with referring specialties, care providers and professional groups within and outwith NHS GG&C.

   During the 2016-17 period Brachial Plexus Injury (adult & obstetric) has been taught to medical students, occupational therapy students, general plastic and orthopaedic surgeons and neurophysiology trainees. *Also see Appendix*.

9. Review of surgical outcomes every 3 years, including Mallet shoulder scores.

   A review of outcomes from nerve repair surgery was included in the 2014-15 report.
   A study was also last completed in 2014-15 by an elective student Andrew McKean, under supervision of the consultant team. Results were presented at national and international meetings.

B2 Effective

B2 a) Clinical Audit Programme

B2 b) Clinical Outcomes/ complication rates / external benchmarking

Covered in other parts of the report.

B2 c) Service Improvement

Referral Process

As well as redesigning the SNBPIS website our referral form has now been updated and circulated to maternity units in Scotland.

The referral process has become more streamlined, with referrals vetted by CFM and then directed centrally to John McCrum, Administrator, who now has access to booking of the new patient appointments. Some referrals still arrive by letter, by e-vetting or by referral to our Children's Physiotherapy Service but they are all handled by the Service now, which is a more robust system that our previous method of involving the Central Medical Records department.

Communication

At the NSD meeting in September 2016 it was suggested that we should start to compile numbers of email/mail correspondence in addition to the new referrals seen at clinic. Each member of the team receives similar correspondence.

Patients who have been discussed directly with Claire Murnaghan:

- 11 emails of discussion with a view to refer to the Service.
- [redacted] from Lanarkshire ([redacted] generated an appointment; [redacted] further patient failed to attend and left the country).
- [redacted]from Northern Ireland ([redacted] generated appointments).
- [redacted] from Ayrshire ([redacted]).
- [redacted] from Fife ([redacted]).
- [redacted] from Inverness ([redacted]).

Physiotherapy

Role of the Physiotherapy in the OBPI Service

(Report by Heather Farish, Team Lead Paediatric Physiotherapist):

- I continue to be the first point of contact for families in Glasgow who have a baby born with OBPP. I assess, give advice and treat as appropriate and refer into the OBPP clinic if required.

- I liaise regularly with paediatric physiotherapists across Scotland and Northern Ireland regarding children with OBPP who attend the specialist clinic in Glasgow but are seen locally for physiotherapy. This includes telephone conversations, emails and receiving and providing reports before and after clinic appointments. I also receive referrals from local physiotherapists for children whom they would like seen at the specialist OBPP clinic.

- I work in conjunction with Occupational Therapy to see patients jointly if required which helps to minimise hospital appointments.

- I educate more junior staff and students at RHC on OBPP through in-service training, shadowing patients with OBPP and clinics. I have also had requests from local physiotherapists to observe clinics with me.

- I promote early physiotherapy intervention for OBPP through education with maternity unit staff, information on the Scottish Brachial Plexus website and communication to local areas.

Patient Numbers for 2016:-

At Clinic

New	Return
28	51

In Physiotherapy:-

New	Return
10	10

Developments

In conjunction with the service occupational therapist I am developing a therapy-led clinic which will be run by myself and the occupational therapist. These clinics will run one afternoon per month.

The aims of this clinic are:-

1. To reduce appointments at the consultant-led clinic by carrying our annual reviews at the therapy-led clinic for patients who do not require a medical review.
2. To offer joint Physiotherapy/Occupational Therapy appointments for patients who require it.
3. To offer additional appointments in between consultant-led clinics if required where Occupational Therapy and Physiotherapy are both present.

Occupational Therapy

During the past 12 months BPI Occupational Therapist Nicola Hart has continued to carry out the typical job requirements of the post, such as seeing patients in the paediatric multidisciplinary team clinic, continuing her role as facilitator between the clinic and professionals in the community and education settings throughout Scotland, and communication/education with other AHP colleagues regarding brachial plexus injuries in children. This year has lead to some other developments continued from last year's service developments.

Assisted Hand Assessment (AHA) – OT colleague (Claire Hedley) is trained in this assessment and will assess children with brachial plexus injuries. Currently Nicola Hart is unable to use this assessment due to lack of courses available in the UK. [redacted] has been fully assessed using the AHA, which has assisted the consultants to view the functional difficulties and make an accurate assessment for surgical intervention.

BOPOM – Brachial Plexus Outcome Measure is being more widely applied to children, and by next year a review of utility for service assessment, and as compared to other measures should be feasible.

Super Splint – the Orthotics Department in the Royal Hospital for Children is able to provide this splint for infants when indicated.

Therapy-Lead Clinic

This is a joint clinic with our Physiotherapy colleague which aims to provide specific Occupational Therapy and Physiotherapy intervention sessions when indicated. Patients can access the therapy-lead clinic in between the multidisciplinary clinics. The clinic is in its infancy and is planned to be developed.

Planned Family Study Day 3rd June

The plan is to attend and participate in this event to provide support and advice for families with children with brachial plexus injuries.

Other duties:

- Ongoing liaison with the Erb's Palsy Group and provision of Occupational Therapy advice.
- Continued liaison with Occupational Therapist in the adolescent and adult service regarding smooth transition of cases.

Links with Other Departments at RHC, Glasgow

Neurology

Dr Iain Horrocks (Consultant Neurologist) provides clinical assessment of some of our patients, along with Neurophysiology investigations, which is particularly useful in those who may require surgical intervention. The Neurology clinic runs in the Outpatient Department of the Children's Hospital, Glasgow on a Monday, which coincides with the Children's Brachial Plexus Clinic. Dr Horrocks also provides specialist intra-operative opinions to guide nerve surgery.

Radiology

In addition to the radiographs, CTs and MRIs obtained at the children's hospital we also have access to their ultrasound machines in order to facilitate CFM to perform imaging of shoulders in the young patients under the age of 1 year. CFM can perform this study when the child attends the Outpatient clinic in a "One Stop Shop" setting, rather than having to re-appoint them to an imaging slot.

Plaster team

Our specialist plaster technicians and nurses provide an invaluable role by providing pre-treatment information for the family by meeting them when they attend clinic. They are able to show photographs of various types of upper limb plasters used and the families have the opportunity to handle dolls with plaster spicae applied, in order to understand the challenges they may face once their child is in plaster. The plaster team attends theatre for safe application of casts and splints and liaises with the family and their local plaster team/hospital about on-going plaster care and potential problems.

Website

The SNPBIS website (www.brachialplexus.scot.nhs.uk) is hosted by NHS Services and was designed in-house as an easy to access and informative resource for both clinicians and patients. Referral forms are available on the website for quick referral to the service, along with detailed pages on all aspects of brachial plexus injury and obstetric brachial plexus injury. The website can also be accessed by all NHS GG&C staff via the StaffNet intranet site.

In light of upgrades in web browser software the website is frequently reviewed, and in some areas simplified, in order to be readable on as many platforms as possible. This represents a continuing challenge to the administration team with the website currently functioning on most web browsers satisfactorily. The intention is it to upgrade the website in the future to preserve functionality in line with future browser upgrades.

Administration

Administration is carried out by a sole service administrator. As the SNBPIS is a national service for Scotland it is run effectively as a separate sub-department within the Department of Orthopaedic Surgery.

The service administrator is based permanently at the New Victoria Hospital in Glasgow from where all aspects of administration for the SNBPIS are overseen. Over the past year the process of centralising organisation of clinics for both the adult and children's services from this location has been implemented. Adult and Young Adult clinics continue to take place at the New Victoria, with OBPI/Children's clinics taking place at the new Royal Hospital for Children (see OBPI report). Outreach clinics in Aberdeen are also organised by the administrator, normally twice per year.

The administrator continues to be the main point of contact for all referrals to both the adult and children's services ensuring that referrals are processed and vetted within twenty-four hours of receipt where possible. Referrals are received by post or increasingly via email (subject to the strictures of NHS GG&C Email Policy, i.e. sent from a secure NHS email address). Standard referral forms are available on the service's website and are updated regularly to facilitate electronic referral. Email referral has been highlighted to referrers as the speediest method. Referrals continue to be received from other areas including Northern Ireland and the north of England both of which lack equivalent local resources in the treatment of brachial plexus injury.

Data from all clinics is gathered and recorded on the service database for future clinical and reporting purposes. The administrator endeavours to gather this data within seventy-two hours of the clinic in order to keep clinical data as current as possible.

The administrator takes responsibility for all ancillary requirements of the service, e.g. the organisation of a service study day held at the New Victoria Hospital on 21st April 2017.

New Children's Hospital

The service moved the new Royal Hospital for Children co-located with the Queen Elizabeth University Hospital site in June 2015.

The team has adapted well to the changes and the outpatient clinic facilities represent an improvement on those in the old hospital. Co-location with the adult service administration has helped with organisation.

The New Royal Hospital for Children has been designed specifically with patients and families in mind.

Play

Play is an important element of a child's time in hospital. An outdoor play area at the side of the hospital has disabled-accessible installations. Play specialists are based in the indoor play zone area to work with children ahead of treatment or to keep them entertained. To entertain children whilst they wait for their outpatient appointment the atrium of the hospital has been fitted out with an array of interactive activities provided by the Glasgow Science Centre and funded by the Glasgow Children's Hospital Charity. These innovative "distraction therapy" installations provide a range of approaches that delight young patients or their siblings and while they engage in play in these areas the patients can be observed by healthcare professionals to see how they are functioning. Such observations of play can alleviate more stressful situations in clinic rooms where patients may not show their best abilities due to fear.

Management

Currently, we maintain management links with Mr Jamie Redfern, General Manager, Womens and Children, who has attended the last two annual reviews. We understand that further changes in structure of the management team may occur in the near future.

Young Adult Clinic

Patients who were previously seen in the Children's Brachial Plexus Clinic often require ongoing review upon reaching the age of 16. It was felt inappropriate to continue to see these patients in the children's clinics, therefore a new clinic for young adults was created, the first being held in April 2011.

The Young Adult Clinic is held twice-yearly at the New Victoria Hospital, Glasgow - the same location as the Adult Brachial Plexus Clinic. The clinical nurse specialist, occupational therapist and physiotherapist who work with the adult service are contributing.

Adults who have ongoing problems resulting from an OBPI are also occasionally referred to the service and are usually seen first at the Young Adult Clinic.

B2 d) Research

Tim Hems

Tim Hems with Terence Savaridas (Specialist registrar in Orthopaedics) have completed a project to quantify elbow flexion strength in children who have had obstetric brachial plexus injury (OBPI). Although it is known that elbow flexion usually recovers to a functionally useful level after OBPI this has not be formally quantified.

The study involved measuring elbow flexion strength in children over the age of 5 attending the outpatient clinic using a hand held dynamometer. Ethical approval was obtained.

Thirty-nine patients were recruited with a mean age of 12.6 years. Initial results show that the mean isometric force of elbow flexion was 63% of the unaffected side at the first measurement. A mean force of 8.7Kg suggests that patients have a sufficient strength of elbow flexion for most activities.

Analysis of the results has continued, including correlation of elbow flexion strength with the severity of the OBPI.

A paper has be written and accepted for publication in the Journal of Hand Surgery, European Volume.

Hems TEJ, Sherlock D, Savaridas T. The natural history of recovery of elbow flexion after obstetric brachial plexus injury managed without nerve repair. Journal of Hand Surgery, European Volume. In press.

Andy Hart

During the year 2016-17 Professor Hart has continued to be engaged in laboratory-based research work relevant to brachial plexus and peripheral nerve injury. Details have been included in the report on the adult brachial plexus service.

B3 Safe

B3 a) Risk Register

All healthcare professionals funded within the structure of the Obstetric Brachial Plexus Palsy Service meet Greater Glasgow & Clyde Trust requirements for vetting by Disclosure Scotland and registration with the Information Commissioner's Office.

Miss Claire Murnaghan has certified level 3 Child Protection training.

B3 b) Clinical Governance

Patients reviewed or treated at the RHC site fall under the hospital's own governance system, reinforced by internal audit within the Orthopaedic and the Plastic Surgery services. No significant governance issues have been identified through these mechanisms during 2016-2017.

B3 c) Healthcare Associated Infection (HAI) and Scottish Patient Safety Programme (SPSP)

The outpatient clinic has fully adopted recommendations on hand hygiene, dress code, and cleaning of equipment as recommended nationally. These measures are also in full implementation within the inpatient ward, and theatre complex used. Regular monitoring of compliance within the hospital is performed by assessors independent to the SNBPIS. No peri-operative bacterial infections occurred during the period 2015-2016.

B 3 d) Adverse Events

The service uses existing Greater Glasgow & Clyde thresholds for instigation of adverse event reporting and investigation, plus online reporting systems. No adverse events have been reported to occur during the period 2016-2017.

B 3 e) Complaints/Compliments

Complaints are handled by the Complaints Liaison Officer, as per the NHS Complaints Procedure. Information leaflets regarding the complaints policy are available from any member of staff at RHC.

The only complaints received over the past year have been those directed towards the Maternity Services in relation to the birth injury itself. In these 2 cases we were asked only about the nature and severity of the injury in each patient.

There have been no complaints received about the Children's Brachial Plexus Service per se.

B4 Timely (Access)

B4a) Waiting / Response Times

The mean time between referral and first clinic consultation offered was **3.8** weeks (Range **1** to **15** weeks). *See also section B1d.*

Referrals are sent in several ways such as by letter to Miss Murnaghan at RHC, by post to the administrator and physiotherapist using the pro forma available on the website, by email via the same pro forma, or via the electronic vetting system for those who are not directly referred by the maternity units but instead via their general practitioner.

Neonatal referrals from the maternity units are duplicated and sent to Heather Farish (Physiotherapist). Therefore, during periods of staff leave there is a system in place to ensure that new babies do not wait a longer time for their first appointment with a member of the team.

The urgency of the referral is graded when it is received. The response times have been appropriate to the condition of the patients.

B4b) Review of Clinical Pathway

(i) Review and Changes to Clinical Pathway

Formal in house discussions have been held around the indications for nerve exploration, and for nerve reconstruction, in light of discussions with international colleagues. Further pathway review will follow completion of the iPluto project that seeks to harmonise pathways in major centres across Europe / Northern America. In addition, as instigated by the Scottish service (AH) care pathways for OBPI will be presented at the 2017 UK-Scandinavian workshop, by all services in order to further facilitate pathway optimisation by the Scottish service, and harmonisation of standards across Northern Europe.

(ii) Improvements to Local Delivery of Care

Early in 2014 the referral guidelines were revised so that these are consistent for cases occurring throughout Scotland. Over recent years earlier referral to the service has been encouraged in the belief that earlier intervention with physiotherapy, provision of information to parents and selection of cases requiring surgery is beneficial.

The new guidelines are on the service website and appear to have been functioning well. In the future it is hoped that an on-line referral system can be developed.

B5 Person-Centred

B5 a) Patient Carer/Public Involvement

New and return patients are actively informed about the UK-based Erb's Palsy Group, which is a parent-run charity that provides a source of support and practical information for families dealing with Neonatal Brachial Plexus Injury.

B5 b) Better Together Programme Involvement

Patients and their families benefit from early review by a multidisciplinary team at the paediatric brachial plexus clinic and are given contact details for our named therapists in order to maintain a close relationship during their treatment. They are given the opportunity to ask questions and find out more information about their diagnosis and are actively involved in the care of the child, particularly through sharing of information and responsibility for exercises and therapy.

B5 c) User Surveys

B6 Equitable

B6 a) Fair for all: Equality & Diversity

The Scottish National Brachial Plexus Service complies with NHS rules on Equality & Diversity in the appointment of staff. Similar care is taken in providing equal care standards to patients and relatives. Appropriate use of interpreters and awareness of cultural, ethnic and religious practices in regard to examination and interaction with parents is facilitated.

B6 b) Geographical access

Outreach Clinics

In order to assess and follow-up patients from the north east of Scotland a clinic was held at Aberdeen's Woodend Hospital in March 2016 and February 2017. Clinics are held approximately every 6 months, depending on demand and seem well received by the patients.

Adult brachial plexus patients and children are seen in the same clinic.

The need for clinics in other locations is kept under review.

Section C:

Looking Ahead/Expected Change/Developments

Psychological Support

As previously reported to NSD, and worked up through past meetings, there was a clear need for psychology support to the parents of children with OBPI, and to the children later in life.. That need has been highlighted by the Erb's Palsy Association as a service weakness, and our provision compares poorly against certain other UK centres (e.g. Leeds). The Clinical Psychology Service developed a working model in conjunction with the Plexus service, similar to models for AHP service support to ensure equity geographical equity of provision would occur. The enthusiastic engagement of the psychology service is clearly evident.
A needs analysis and service proposal was presented and submitted to NSD in October 2014, a favourable, though inconclusive response was provided at the interim meeting. A formal response is awaited from NSD.

Patient Information

Information on OBPI for parents has been included in the new website. Availability of this information seems to have been well-received by the parents and we have decided to direct patients towards this valuable source of information rather than trying to produce a leaflet which could be distributed in the outpatient department.
Contact has been made with the Glasgow School of Art to begin preparing an animated patient, and a parent information media platform. This will be developed in further meetings with Dr. Brian McGeough, and patient / parental representation to a development group agreed by the Erb's Palsy Association.

Electronic Patient Record (EPR)

Introduction of an electronic patient record in NHS Greater Glasgow & Clyde has presented a challenge to the service. The EPR currently doesn't provide an equivalent method of recording information, including consecutive measurements, on brachial plexus patients to replace the paper records. The methods of documenting patient information, monitoring activity, assessing function, and recording outcomes for the brachial plexus service are under review.

We have met with the EPR development team and requested that specific E-forms for the service can be developed for inclusion in the EPR.

International Collaboration

Following the recent Narakas meeting in Barcelona, we plan to collaborate with other centres worldwide, for the **iPLUTO** project, (**i**nternational **PL**exus o**U**tcome s**T**udy gr**O**up), an initiative hosted by the plexus service in Leiden, Netherlands.

The goal of the iPLUTO study group is to define a universal dataset to evaluate upper limb function of children with a neonatal brachial plexus palsy, pooling results to enable multicentre studies. This study should help to create an international standard on how to evaluate the condition and express results of treatment. We have contributed details of our evaluation

system, which is regarded as very comprehensive, to the study the group designing the study, and responded to the online surveys regarding the outcome data which should be recorded.

After fitful attempts over the past years, a U.K.-Scandinavian Brachial Plexus Workshop was established, initially between the Scottish Service & the new Swedish National Service who's structuring featured input from the Scottish Service (AH). This grouping now involves the majority of major UK centres (Scotland, Leeds, Stanmore), and key Baltic nations (Norway, Denmark, Sweden, Finland, Lithuania). It should become a forum for case discussion, and service process optimisation, while also raising opportunities for CPD research, and training exchange. The inaugural meeting was held in May 2017, and future meetings will likely involve all staff.

Links with Other Centres, Nationally

TH and CFM recently followed a patient pathway from the Service here in Glasgow to a Service at RNOH, Stanmore (funded by NSD) in order to observe a complex operation performed there by the team who described the procedure. We were able to discuss their service delivery, operative and non-operative strategies for patients with similar problems and feel that we should be in a position to offer similar surgery here in Scotland in the near future.

AH maintains close links with the service in Leeds, regarding nerve surgery and secondary reconstruction.

Note that we have also established links with Mr Jim Ballard (Consultant Orthopaedic Surgeon at Musgrave Park Hospital and the Royal Belfast Hospital for Children) who is in the process of setting up an appropriate service of Paediatricians, Obstetricians and Therapists in Northern Ireland to ensure early capture of affected babies and their early assessment by skilled clinicians. This group includes members of parent support groups in the province as there has been no structured formal referral system in the past. Mr Ballard will play a pivotal role in establishing national guidelines for their pathway (with input and advice from CFM).

Section D:

Summary of Highlights (Celebration and Risk)

Strongly positive feedback has been received regarding the Scottish Service from the Erb's Palsy Group. A patient family day has been organised in conjunction with the Erb's Palsy Group at Glasgow Science Centre on Saturday 3rd June 2017. A full report on this event will be included in the 2017-18 report.

Appendix

Teaching and Training Activity

Tim Hems

6th March 2017; visit to the Royal National Orthopaedic Hospital, Stanmore:

- To see a glenoid osteotomy operation for shoulder deformity secondary to OBPI.

28th March 2017; Edinburgh Hand Surgery Course:

- "Principles of management of Peripheral Nerve Injury".
- "Management of Brachial Plexus Injuries".
- "Principles of Tendon Transfer".
- Small group teaching on clinical examination of upper limb neurology.

Andy Hart

Detailed in the Adult Service report.

Claire Murnaghan

Teaching

Cradle-to-Grave Event Beardmore Hotel, Glasgow 13/05/16 by CFM:
Target Audience: GPs in the west of Scotland. I addressed a group of GPs about Orthopaedic Conditions affecting babies and dedicated one section to an update on Neonatal Brachial Plexus Injuries and how to refer patients who may have missed being diagnosed at birth. Attendees were given the website address for further information.

Lanarkshire Teaching session at Wishaw General Hospital 01/12/16 by CFM:
Target audience: Neonatologists, Paediatricians, Midwives, Physiotherapists, Occupational Therapists. This teaching session took the form of an update on our service/referral pathway/ management, as well as advice about early useful information to be given to families by the referring unit.

Glasgow Teaching Session at Princess Royal Maternity Hospital, Glasgow 19/01/17:
Target audience: Neonatology Department. I had the opportunity to talk to the Consultants and Trainees about our Service and need for early referral/management, etc.