SCOTTISH NATIONAL OBSTETRIC BRACHIAL PLEXUS INJURY SERVICE

ANNUAL REPORT 2013-14

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, based at the Royal Hospital for Sick Children, 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

The service receives referrals from maternity units nationally, paediatricians and local orthopaedic 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), 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, ongoing physiotherapy, occupational therapy input (regarding positioning & handling, and sensorimotor development), investigations when necessary, and monitoring of progress. 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.

Surgery is carried out for:

- Exploration and surgical repair of the brachial plexus nerves, in a small number of children with more severe lesions who have inadequate motor recovery at 3 to 6 months of age.
- The prevention of more severe shoulder abnormalities by early conservative interventions (e.g. casting, botox injections).
- Joint releases, tendon transfers, bony procedures and free functioning 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.

B1 Efficient

B1 a) Report of Actual v Planned activity

Statement of Activity 2013-14

	Actual	Agreed
Assessment	31	35
Tertiary new outpatient referrals		25
Admission for surgery	7	[redacted]
ITU bed days	[redacted]	
HDU bed days	[redacted]	
Ward bed days	13	
Outpatient follow up appointments	162	

NHS Board of residence for referrals:	Fife	[redacted]
	Forth Valley	
	Greater Glasgow & Clyde	15
	Grampian	[redacted]
	Highland	
	Lanarkshire	
	Lothian	
	Tayside	
	Northern Ireland	
Total referrals:		31

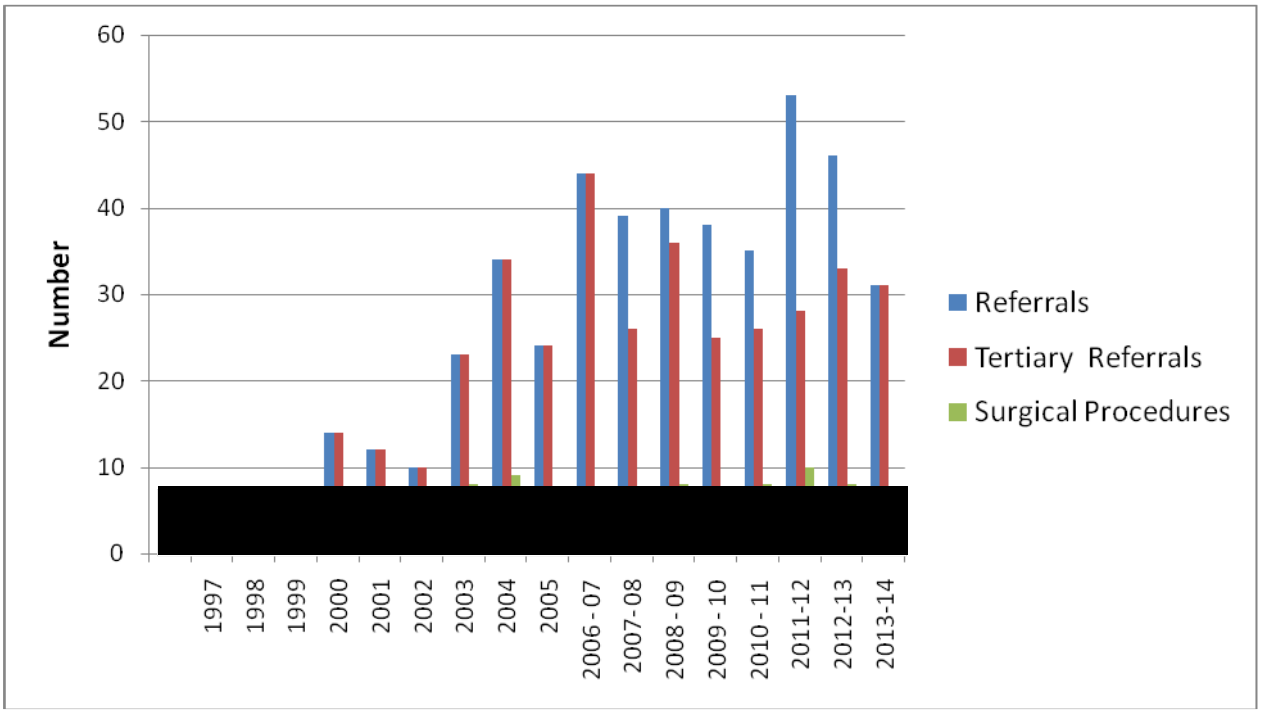
NHS Board of residence for admissions:	Lothian	[redacted]
	Tayside	
	Highland	
	Greater Glasgow & Clyde	
		7

NHS Board of residence for outpatient appointments:	Ayrshire and Arran	[redacted]
	Borders	[redacted]
	Dumfries and Galloway	[redacted]
	Fife	7
	Forth Valley	8
	Greater Glasgow & Clyde	79
	Grampian	9
	Highland	[redacted]
	Lanarkshire	18
	Lothian	23
	Tayside	[redacted]
	Other	[redacted]
	Total	162

Referrals and Operation Numbers since 1997:

Year	Referrals	Tertiary Referrals	Surgical Procedures
1997	6	6	[redacted]
1998	[redacted]	[redacted]	[redacted]
1999	[redacted]	[redacted]	0
2000	14	14	[redacted]
2001	12	12	[redacted]
2002*	10	10	[redacted]
2003	23	23	8
2004	34	34	9
2005	24	24	[redacted]
2006 - 07	44	44	6
2007- 08	39	26	[redacted]
2008 - 09	40	36	8
2009 - 10	38	25	7
2010 - 11	35	26	8
11-12	53	28	10
12-13	46	33	8
13-14	31	31	**7**
Total	**457**	**380**	**90**

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: 13/14

	Full year funded value of agreement £	Twelve Month funded value of agreement £	Actual outturn as at 31st March 2014 £	Variance £
FIXED				
Nursing/PAM	66,963	66,963	66,963	0
Medical	10,074	10,074	10,074	0
Other direct	30,500	30,500	30,500	0
Indirect	15,196	15,196	15,414	-218
Capital charges	58	58	58	0
Total Fixed	122,791	122,791	123,009	-218
VARIABLE				
Pharmacy	5,118	5,118	3,660	1,458
Travel & Training	2,144	2,144	1,533	611
Total Variable	7,262	7,262	5,193	2,069
TOTAL	**130,053**	**130,053**	**128,202**	**1,851**

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

No KPIs agreed.

B2 Effective

B2 a) Clinical Audit Programme

Physiotherapy

During the past year Heather Farish compiled a poster to highlight the importance of early physiotherapy intervention in OBPP and how she has managed to improve the referral rate from birth for these babies. She presented her poster at the Greater Glasgow and Clyde Physiotherapy Best Practice Day and hopes to submit it to an appropriate paediatric conference (See appendix).

She has also been asked to speak about early intervention at the 2014 Association of Paediatric Chartered Physiotherapists conference in November which is an excellent opportunity to promote physiotherapy in OBPP and the importance of early intervention, to a wider audience in Scotland and the rest of the UK

Trends in surgical procedures

There were 7 procedures carried out during the year, which break down as follows:

- [redacted] were explorations of the brachial plexus nerves with nerve grafting in [redacted] cases. The outcomes of nerve repair procedures continue to be closely audited but longer term follow-up is required.
- [redacted] had exploration of a nerve for traumatic injury.
- [redacted] had a wrist fusion for reconstruction after traumatic brachial plexus injury.
- [redacted] patients had late muscle transfers to improve movement at the shoulder.

As noted last year there has been a reduction in requirement for shoulder surgery for OBPI compared with previous years. The indications for the surgery have not substantially changed, so the reasons for this trend are not clear. It is possible that earlier physiotherapy/surgical intervention is reducing the number of children with shoulder contractures severe enough to warrant surgery.

B2 b) Clinical Outcomes/ complication rates / external benchmarking

Covered in other parts of the report.

B2 c) Service Improvement

Education/Continuing Professional Development

In May 2013 Claire Murnaghan, Professor Andy Hart and Nicky Hart (Service OT) attended the Narakas Club meeting held in Montreux, Switzerland. The Narakas Club is an International Meeting for worldwide experts on brachial plexus lesions to meet, become better informed, and discuss current concepts and treatment.

Such meetings are imperative for furthering our understanding of this rare but potentially devastating birth injury and for on-going development of the service. Therefore we will endeavour to ensure that representatives from our service attend each of these meetings which take place bi-annually.

Of particular interest was the opportunity to further our knowledge of the more global aspects of children with Neonatal Brachial Plexus Injury, such as motor delay, speech delay and behavioural

problems. This will allow us to place more emphasis on the assessment of each individual child at our clinics in relation to their motor milestones and general development. Led by our therapists, we are endeavouring to recognise those children needing referral on to local Child Development Centres for parallel care.

Prof. Hart also attended the Sunderland Society meeting in Leiden (an international grouping of opinion leaders in peripheral nerve surgery & related neurobiological research) to give two presentations (on the timing of nerve repair, and on research into the use of microtopography and electrical stimulation to direct nerve regeneration). He was invited to join the Society.

Occupational Therapy

Following agreement by NSD to fund 0.3 WTE for Occupational Therapy, Nicky Hart was recruited and works regularly in the paediatric service at Yorkhill hospital.

At the Narakas meeting the team heard presentations from Toronto about their progress with age-appropriate assessment tools for children with OBPI. As a result of our liaison with them, Nicky Hart is now adopting an additional assessment measure known as BPOM (Brachial Plexus Outcome Measure). It is being introduced into our regular therapy assessment and treatment sessions as well as at our outpatient clinics. The measure is suitable for patients of four years upwards. This has been useful to use with the patients as it is more engaging and purposeful especially for the younger patients. It breaks down patient therapist barriers and is a quick tool to use in an out-patient setting. The BPOM scores can be compared with existing measures as additional confirmation of patient progress / egress.

A E-Link upper limb assessment system has been purchased after an application for major capital funding in June 2013. Work is ongoing with IT to link it to the hospital computer network and to get it up and running for use in the clinic setting. The system can be used by therapists and the consultants for assessment and graded activities for the patients.

Since Nicky Hart have been attending the clinic she feels there is a need to provide short handouts for the parents regarding advice on dressing skills, encouraging sensory stimulation of the affected limb and bilateral hand skills. She plans to work on devising these for the clinic as soon as possible.

Physiotherapy

The specialist physiotherapist for the OBPP service, Heather Farish, continues to be the first point of contact at Yorkhill Children's Hospital for babies born with OBPP within Glasgow. She provides specialist assessment of the affected arm as well as their neck, provides advice to the parents, answers any questions regarding OBPP, and helps to alleviate parental anxieties. She provides close links into the specialist OBPP clinic and liaise with the other team members as required to ensure a combined approach to patient care.

Communication/Teaching

Heather has been asked to speak about early intervention at the 2014 Association of Paediatric Chartered Physiotherapists conference in November which is an excellent opportunity to promote physiotherapy in OBPP and the importance of early intervention, to a wider audience in Scotland and the rest of the UK

Heather communicates regularly with community physiotherapists from throughout Scotland and the Specialist OBPP team at Yorkhill Hospital and regarding their patients who attend clinic. She has established better communication links with the Glasgow maternity hospitals to ensure early referral to physiotherapy from birth. She provides teaching to the maternity hospitals physiotherapy staff to ensure they are up to date with current practice and referral guidelines for OBPP. She also educates the band 6 and rotational band 5 physiotherapy staff within the musculoskeletal team at Yorkhill ensuring they are aware of best practice in OBPP. They are able to attend the clinic with her and observe assessments and treatments of new babies with OBPP in the physiotherapy department.

Patient Numbers

During the year 2013 Heather saw 47 new patients and 171 return patients. These can be broken down into clinic time and physiotherapy time as shown in the table below.

	Clinic	Physiotherapy
New Patients	28	19
Return Patients	97	74

The physiotherapy numbers included [redacted] patients after nerve graft surgery who required an increased level of input including ongoing physiotherapy monitoring and intervention between clinic appointments.

Website

During the year a complete redesign of the brachial plexus service website has been undertaken by David McKay, administrator to improve the presentation of material, make it more attractive and user friendly. Information for patients and health care professionals has been expanded, including referral guidelines and guidance on physiotherapy and occupational therapy. The new referral guidelines are as follows:

Indications for Referral

All cases of Obstetric Brachial Plexus Injury (OBPI) should be referred immediately to a Paediatric Physiotherapist. Advice can also be obtained from the Physiotherapy at the Royal Hospital for Sick Children (See link to Physiotherapy page).

Regular clinical review is necessary until complete recovery or referral to the service.

We are happy to receive referrals of children as soon as the diagnosis of Obstetric Brachial Plexus Injury (OBPI) is suspected. Specialised multidisciplinary outpatient clinics are held once or twice per month. Children will normally be offered an appointment at the next clinic.

We would recommend that referral to the service is essential in the following situations:

ASAP: Persisting complete paralysis of the upper limb and/or Horner's Syndrome.

Age 2 months: Any persisting deficit in the upper limb

www.brachialplexus.scot.nhs.uk

Administration

Angela Cooper, who was working as Administrator for the Brachial Plexus Service, moved to a management post in August 2013. We thank her for her contribution to the service. The post was filled by David McKay, who had previously worked for the service. As well as providing efficient routine administration, he has undertaken significant development work on the website and databases. In February he left for a year's deployment for active service in the RAF reserve. This has put the service under considerable pressure. A temporary administrator has been recruited and should start before the end of May.

Young Adult Clinic

Some patients who are still followed up in the children's brachial plexus clinic are now age 16 or over. In addition some referrals are received for adults who have ongoing problems resulting from OBPI. It was felt inappropriate to continue to see these patients in the children's clinic. Therefore a new clinic for young adults has been started the first being held in April 2011. The clinic is at the New Victoria Hospital, Glasgow, the same location as the adult brachial plexus clinics. The clinical nurse specialist, occupational therapist, and physiotherapist who work with the adult service are contributing. The clinic is continuing on a twice yearly basis.

B2 d) Research

Andrew McKean

During summer 2013 a medical student, Andrew McKean, undertook an elective period working on a project to look at the long term functional outcome in children with obstetric brachial plexus injury in Scotland. He was supervised by Professor Andrew Hart and received an elective bursary from the Healing Foundation. The work analysed information collected on the service database, which was started in 2001 by David Sherlock and Tim Hems. His report was submitted to the Healing Foundation early in 2014 and received a very favourable review. He intends to continue the project to assess in greater detail aspects such as shoulder outcomes, nerve repair, and potential prognostic markers to aid parental and patient counselling. He will be giving a oral presentation at the European Society of Plastic Reconstructive & Aesthetic Surgeons (ESPRAS) meeting to be held in Edinburgh in July. His abstract is included in the Appendix.
Of most direct research relevance to the Plexus Service is the preparation of a report on the natural history of OBPI in Scotland, and work to refine the database structure.

Tim Hems

Tim Hems with Terence Savaridas (Specialist registrar in Orthopaedics) have continued 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 involves measuring elbow flexion strength in children over the age of 5 attending the outpatient clinic using a hand held dynamometer. Ethical approval has been obtained. Data collection has been completed and we are moving on to analysis.

Presentation

1st March 2014 The Oxford Hand Club. Inaugural Meeting.
The Nuffield Orthopaedic Centre.
"OBPI Shoulder deformity"

Andy Hart

During the year 2013-14 Prof. Hart has been engaged with the following research work of relevance to brachial plexus injury:
Summary: During 2013-14 I have administered two part-time surgical research fellows engaged in doctoral research, two PhD students engaged in preclinical science work, and with medical students on electives and Special Study modules. Research funding of >£1,000,000 has been recruited that is of direct relevance to the care of patients with Brachial plexus Injury.

1. University of Glasgow:
    a. "**Electro-active nano-patterned construct with integral solenoid activity for nerve reconstruction**" (Aug 2009 – Oct 2013, Stephen Forrest Trust, £200K) two linked PhD projects (Dr. Chris Martin - electronic engineer &Dr. Theo Dejardin -cell biologist) investigated the role of surface topography (micro- &nanoscale) and bioelectronic stimulation upon the regenerative profile of peripheral nerve repair constructs. The projects have been concluded, theses & viva exams completed, and PhDs awarded. The work has been presented internationally, and papers for peer review journals prepared. Spin-off projects for several MRes students, and a two follow on PhDsand a post-doctoral position have been generated.
    The work has demonstrated powerful effects to control the direction of neuronal growth from translationally-relevant surface-patterned polymers for nerve repair, and that a microscale stimulation/recording device can be incorporated into those repair constructs and used to deliver biologically active stimulation.
    b. **CrackItChallenge 9: DRGnet**(Phase 1 Dec 2012 – June 2013, MRC / NC3Rs £100K; Phase 1a Nov 2013-April 2014, £90K; surgical fellow – Mr. Thomas Reekie) this work has establishedthe first legal, ethical, and logistically viable system for the provision of human sensory neurons (from the dorsal root gangliaof transplant organ donors) scalable for Europe wide provision to researchers developing pain medications. Of greatest relevance to brachial plexus injury is the work to develop new classes of analgesics including those acting via Vanilloid receptors.
    Phase 2 funding (£750,000 over three years) has been recruited, against intense competition from a large group based in UCL and will generate doctoral research for 2-3 surgical trainees.
    c. **RCSEd Small Grant Award** (£10K): examining the intracellular effect upon regeneration associated gene activity of different polymer substrates & surfaces for use in nerve repair constructs. The work is now completed, and will be presented and pulished over the next year. It has been pivotal to the recruitment of an academic fellowship grant for a plastic surgical trainee (Miss Suzanne Thompson) from the Medical Research Council (MRC).

d. **Medical Research Council** (MRC): a 3-year MRC Clinical Research Training Fellowship has been recruited by Miss Suzanne Thompson under Prof. Hart's supervision. She will work between the Universities of Glasgow & Umea, undertaking aPhD to further investigate translationally important aspects of peripheral nerve repair using a patterned polymer construct. Funding includes provision for clinical training within the Plexus Service.

2. University of Strathclyde:
    a. One plastic surgical trainee (Mr. Mark Gorman) will finish a MD investigating the translational development of a filter-based system for the extraction of adipose-derived stem cells (ADSC) & stromal vascular fraction (SVF) for use in regenerative medicine/tissue engineering. These cells are widely employed in peripheral nerve regeneration research.
3. Collaborative research group
    a. Prof Hart maintains links with colleagues in the Universities of Umea (Sweden) & Manchester that focus on peripheral nerve repair (tissue engineering, neuronal protection, adjuvant pharmacotherapy, timing of nerve repair). A multicentre clinical trial of neuroprotective pharmacotherapy in major nerve injury has been protocolised, and funding sources are being pursued. Involvement in potential bids for European Grant funding is established. The group will soon extend to include Leeds University, allied to another of the UK's largest brachial plexus services.
    b. Previous output has included the first clinical studies to validate the use of volumetric MRI as a measure of nerve injury induced neuronal death, and to demonstrate the neuroprotective benefit of early nerve repair in major nerve injury.

Presentations of Direct Relevance to Brachial Plexus Service

1. "Advances in tissue engineered control of peripheral nerve regeneration" UmeåUniversitet, March 2014
2. "Controlling cell behaviour using devices, materials, and surface patterning" Riehle M et al TermStem, Portugal, 2013
3. "Neurobiological rationale for the early repair of major nerve injuries, including brachial plexus injury" Hart AM, Terenghi G &Wiberg M. Sunderland Society, Leiden, Sept 2013
4. "Development of an electroactive polymer conduit for peripheral nerve repair" Hart AM, Dejardin T, Martin C, Cummings D &Riehle M. Sunderland Society, Leiden, Sept 2013
5. C.Martin, T. Dejardin, A. Hart, M.O. Riehle, D. R. S. Cumming "Peripheral Nerve Repair Using Biodegradable Electronics" Royal Society Meeting, 2013
6. "Reconstruction of major peripheral nerve injury - clinical options and neurobiological research strategies" Glasgow Royal Infirmary Grand Round 24th April 2013

Publications of Direct Relevance to Brachial Plexus Service

1. Schavarien M. & Hart AM "Free muscle flaps for reconstruction of upper limb defects" Hand Clinics 2014 [*in process citation*]
2. Reid A., Terrenghi G., Wiberg M. & Hart A "Pharmacological Treatment as an Adjunct to Surgical Procedures in Nerve Injury" Federation of European Societies for Surgery of the Hand instructional course book 2013
3. C. Martin, T. Dejardin, A. Hart, M. O. Riehle, D. R. S. Cumming: "Directed Nerve Regeneration Enabled by Wirelessly Powered Electrodes Printed on a Biodegradable Polymer" Advanced Healthcare Materials, 2013 Dec 27; doi: 10.1002/adhm.201300481. [Epub ahead of print]

4. West C, Ljungberg C, Wiberg M, Hart AM "Sensory Neuron Death After Upper Limb Nerve Injury and Protective Effect of Repair: Clinical Evaluation Using Volumetric MRI of Dorsal Root Ganglia" Neurosurgery 2013 in process [I.F. 2.785]

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 RHSC Yorkhill 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 2013-2014.

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 Plexus Service. No peri-operative bacterial infections occurred during the period 2012-2013.

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 2013-2014.

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 RHSC.

B4 Timely (Access)

B4 a) Waiting / Response Times

The median time between referral and first consultation was 27 days (range 0 days to 155 days). The longer delays were accounted for by cases who did not, or were unable, to attend the first appointment offered. Two non-urgent patients from Aberdeen were offered appointments in the Aberdeen clinic.

Most referrals are sent centrally Miss Murnaghan at RHSC by letter, fax or via the electronic vetting system for those who are not directly referred by the maternity units.
The urgency of the referral is graded when it is received. The response times have been appropriate to the condition of the patients. The longer delays were as a result of patients not attending the first appointments offered to them.

B4 b) Review of Clinical Pathway

(i) Review and Changes to Clinical Pathway

Insert text here

(ii) Improvements to Local Delivery of Care

Early in 2014 the referral guidelines were revised as some 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 have been placed on the service website and are summarised below. In the future it is hoped that an on-line referral system can be developed.

B5 Person Centred

B5 a) Patient Carer/Public Involvement

Insert text here

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

Unstructured assessment was sought from the Erb's Palsy Association (the main patient support group in the U.K.). Feedback is positive on the direction of travel that the Scottish service has embarked upon, on the expansion of therapy support for patients and their families, and on the role of NSD funding in contrast to the situation in England & Wales. A need for Psychology input to support parents around the time of diagnosis, and surgical decision making was made apparent.

B6 Equitable

B6 a) Fair for all: Equality & Diversity

The 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 clinics was held at Woodend Hospital, Aberdeen in April 2013 and October 2013. 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

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. It is hoped that specific E-forms for the service can be developed for inclusion in the EPR.

Psychological Support

Meetings have been held with the Clinical Psychology Service to develop outline remits for how a Psychologist could be incorporated into the service, without compromising equity of service provision across Scotland. Increased referrals within GG&C have made clear the need for service provision, and the enthusiastic engagement of the psychology service is clearly evident. Over the next period further work will aim to quantify need, and what service support would be required for an equitable access national service provision, following the model of the successful physiotherapy and occupational therapy developments.

Patient Information

Information on OBPI for parents has been included in the new website.

Claire Murnaghan has continued to work on a revised printed booklet to be given to parents at the clinic. The draft Parent Information document has been target and peer-reviewed on many occasions. This has taken much longer to finalise that anticipated as it has been very difficult to get the correct balance of information/education with simplicity in such a technically difficult subject. The draft version is currently with the FILES committee for approval.

New Children's Hospital

The service will move with the opening of the new children's hospital for Glasgow in 2015. Expansion of the multidisciplinary team has currently lead to pressure on space during out-patient clinics. It is hoped that the new hospital will provide improved facilities but further planning is needed.

Section D : Summary of Highlights (Celebration and Risk)

During the last year important developments have been made in respect of occupational therapy, physiotherapy, the service website, patient information, and methods of assessment. There are new challenges ahead, in particular with the move to the new children's hospital.

The multidisciplinary team remains the basis of the success and ongoing development of the service. As well the work in the clinics, there has been considerable out-patient physiotherapy and occupational therapy activity. In addition to those already mentioned in the report operating theatre staff have given skilled assistance in surgical cases.

Appendix

Teaching and Training Activity

Claire Murnaghan

Claire continues to provide teaching to the local Maternity Units on a regular basis, particularly when they have a new intake of staff, informing them about our service, how to refer a patient and what steps we would expect in the initial perinatal period in order to keep uniform all dissemination of parental information, which should result in decreasing anxiety levels for parents and families.

She also spoke at a RHSC to the hospital community as a whole, on the subject of the Paediatric Brachial Plexus Unit: "Who are we and What do we do?"

On 16th December 2013 she taught our local radiographers in an educational setting, in relation to the timing of imaging required for these patients, difficulty positioning them and a more general overview of the injury.

21st February 2014: Lecture to a Orthopaedic Surgeons, Paediatricians, Neonatologists, Physiotherapists and Occupational Therapists in Belfast. Advised on organisation of service for OBPI in Northern Ireland coordinated by an interested therapist.

Tim Hems

14th May 2013 Edinburgh Hand Surgery Course.
"Management of Brachial Plexus Injuries" (Including OBPI).

18th March 2014 Edinburgh Hand Surgery Course.
"Management of Brachial Plexus Injuries" (Including OBPI).

Andy Hart

- 2013-14 Medical Student Electives (2) / Special Study Modules (3), focusing on brachial plexus reconstruction.
- Specialist registrar teaching on Brachial Plexus Reconstruction, and on peripheral nerve anatomy & the response to injury (regional teaching -Plastic Surgery Trainees)
- 2014 University of Glasgow Masters by Research in Cell Engineering – Tissue Engineering & Major Peripheral Nerve Injury

Abstract, Andrew McKean's Study:

Title: EPIDEMIOLOGICAL FACTORS & SHOULDER OUTCOME OF PATIENTS WITH UNILATERAL OBSTETRIC BRACHIAL PLEXUS INJURY IN SCOTTISH POPULATION

Author(s): McKean, Andrew R.1, Gorman, Mark2, Hems, Timothy E.J.3, Hart, Andrew M.2,3,4
Institute(s): 1University of Glasgow, United Kingdom, 2Canniesburn Plastic Surgery Unit, United Kingdom, 3Scottish National Obstetric Brachial Plexus Injury Service, United Kingdom, 4Stephen Forrest Professor of Plastic Surgery at University of Glasgow, United Kingdom.

INTRODUCTION AND AIMS
Reported incidence figures are lacking for obstetric brachial plexus injury (OBPI) in the UK, and the exact outcome for these patients remains inadequately defined at the population level. That impacts adversely upon patient & parental counselling and support, and creates difficulty in obtaining adequate, equitable service level funding within the NHS.
MATERIAL AND METHODS
The Scottish National Obstetric Brachial Plexus Injury Service prospectively records musculoskeletal and plexus injury specific outcomes. Records of patients presenting between March 2002 and June 2013 were retrospectively assessed (n=373; 127 excluded due to inadequate data, or incorrect diagnosis). Birth incidence was estimated, and outcomes related to Narakas grade and age at biceps function recovery were interrogated using SPSS.
RESULTS
OBPI incidence was >0.4 per 1000 live births. Discharge from the service within the first year of life, indicating spontaneous recovery, was achieved in >30% of all patients. Primary surgical intervention was performed in 26% of cases. Approximately 5% (n=13) of the total study population had nerve surgery, at mean age of 5.8 months (SD=2.4). Further procedures were required in 38% (n=5) of those who initially underwent nerve surgery. Narakas Grade, and age at recovery of biceps were confirmed as prognostic indices for future Mallet scores. The timecourse of shoulder recovery is described.
CONCLUSION(S)
Few units have managed to capture longitudinal data for such large numbers of patients in to adolescence. The longtermshoulder outcomes in patients undergoing nerve surgery were encouraging. Nerve surgery was of benefit in severe cases.

Heather Farish's Poster:

Title

The importance of early physiotherapy intervention for babies born with an obstetric brachial plexus palsy (OBPP) and how we have improved the physiotherapy service for this group.

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Background

At Yorkhill we hold the national service for OBPP in Scotland. In recent years physiotherapy input has become more structured with a named physiotherapist dedicated to the clinic seeing all babies born in Glasgow with OBPP. Service improvements have been made to raise awareness of the importance of early physiotherapy for OBPP.

Physiotherapy is usually the first point of contact for these families on discharge from the maternity hospitals. Physiotherapy therefore plays a major role in preventing secondary complications and alleviating parental anxieties.

The main early complication of OBPP is posterior shoulder dislocation which occurs secondary to a medial rotation contracture (1).

Picture 1: Typical presentation of a baby with OBPP

Aims

To highlight the importance of early physiotherapy in OBPP, ensuring all babies born in Glasgow with OBPP are referred to physiotherapy from the maternity hospitals allowing us to offer a physiotherapy appointment within 10 days of birth as per the APCP guidelines for the management of OBPP (2).

Methods

Referral guidelines were formalised and incorporated into the neonatal guidelines for Greater Glasgow and Clyde.

A presentation was delivered to the physiotherapy staff at the Glasgow maternity hospitals.

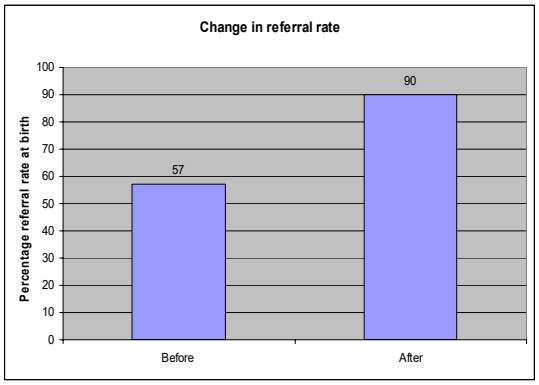
Physiotherapy information was put onto the OBPP service website.

Results

In the 9 months prior to the change 16 babies were born with OBPP of which we received 9 referrals from the maternity hospitals, equating to a referral rate of 57%.

In the 9 months after the change 20 babies were born in Glasgow with an OBPP of which we received 18 referrals from the maternity hospitals equating to a referral rate of 90%.

Graph 1: Showing change in referral rate.



Conclusion

By highlighting the importance of early physiotherapy in OBPP we have improved the referral rate at birth by 33% for these babies which allows us to offer a physiotherapy appointment within 10 days of birth.

References

1. Kambhampati, Birch, Cobellia, Chen. Posterior Subluxation and Dislocation of the Shoulder in Obstetric Brachial Plexus Palsy. Journal of Bone and Joint Surgery, 2006.

2. Association of Paediatric Physiotherapists – Obstetric Brachial Plexus Palsy: A Guide to Management. 2012.

NHS Greater Glasgow and Clyde