SCOTTISH NATIONAL OBSTETRIC BRACHIAL PLEXUS INJURY SERVICE

Annual Report 2018/19

NHS Greater Glasgow & Clyde

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Please refer to Guidance Notes for completion of the Annual Report prior to submission

The completed Annual Report should be sent electronically by 31 May to:
Email: [redacted]@nhs.net

Executive Summary

The Children's Brachial Plexus Injury Service is based at the Royal Hospital for Children (surgery and clinics) and the New Victoria Hospital (administration) within NHS Greater Glasgow & Clyde.

The Children's Service became a designated National Service for Scotland in April 2006.

The brachial plexus is a complicated network of nerves which controls the muscles in the shoulder, arm, elbow, wrist, hand and fingers as well as providing them with feeling.

In children brachial plexus injury usually occurs during birth. It can also occur as a result of traumatic brachial plexus injury (e.g. falls, road traffic accidents, sporting accidents) or tumours involving the brachial plexus.

Children are referred from throughout Scotland by maternity units, paediatricians, orthopaedic surgeons or plastic surgeons who have carried out initial assessment.

The service provides assessment, intervention, treatment and outpatient follow-up care for patients through an integrated multidisciplinary service for obstetric brachial plexus injury, traumatic brachial plexus injury and tumours involving the brachial plexus including:-

- Diagnosis: clinical examination, MRI, ultrasound, neurophysiology.
- Surgery: early surgical exploration and nerve repair; secondary reconstruction for shoulder and other deformities.
- Physiotherapy.
- Occupational therapy.
- Psychological support.

The Children's Brachial Plexus Injury Service is the primary care centre for patients suffering from obstetric brachial plexus injury in Scotland. Referrals are also accepted from Northern Ireland and occasionally from the north of England.

In 2018/19 the service undertook the following activity for patients from across Scotland:

- **52** assessments.
- [redacted] procedures (including [redacted] primary operations such as nerve explorations and nerve reconstructions and [redacted] secondary operations such as tendon transfers).
- **169** follow-up appointments.

Further details can be found on the dedicated website at **https://www.brachialplexus.scot.nhs.uk** .

Contact details:

Lead Clinician:
Mr Timothy Hems, Consultant Hand & Orthopaedic Surgeon

Address:
Z1.01 Office Block
Queen Elizabeth University Hospital
1345 Govan Road
GLASGOW
G51 4TF

1. Service Delivery

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

- Diagnosis: clinical examination, MRI, ultrasound, neurophysiology.
- Surgery: early surgical exploration and nerve repair; secondary reconstruction for shoulder and other deformities.
- Physiotherapy.
- Occupational Therapy.
- Psychological support.

Target Patient Group

Children with obstetric brachial plexus injury are the main group managed by the service.

Patients with traumatic brachial plexus injury or benign or malignant tumours involving or arising from the brachial plexus are also seen.

Patients are typically referred by neurologists, paediatricians, orthopaedic surgeons or plastic surgeons.

In the year 2018/19 a total of **52** children with suspected obstetric brachial plexus injury were referred to the service. Most were referred from within Scotland, with [redacted] patients referred from Northern Ireland.

[redacted] patients were given advice or referred back to local services as being outwith the remit of the Obstetric Brachial Plexus Injury Service.

Referral Process

Referral forms are available on the service website and can be emailed or posted to us. Referral letters are also accepted. Occasionally patients are referred by their general practitioners via the electronic GP Gateway.

Patients are usually referred by paediatricians, orthopaedic surgeons or plastic surgeons who have carried out initial assessment, after which the Children's Brachial Plexus Injury Service provides assessment, intervention or treatment and outpatient follow-up care for patients.

Description of Service/Care Pathway

Clinical Assessment

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.

Care Plan

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 and optimal handling, age-specific sensorimotor developmental assessments, activity-based interventions, provision of aids, fit-for-schooling assessment, school visits and educational liaison role), psychological optimisation (screening assessment, to arrange therapeutic intervention where appropriate, primarily addressed at the parents needs during infancy, and the child's needs during later development), investigations when necessary (neurophysiology, imaging studies), and monitoring of progress (developmental milestones, school progression, body-image development, pain, psychosocial welfare, fit-for-life).

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Clinical Psychology

A clinical psychologist was appointed to the service in summer of 2018 and is contributing to the above. The clinical psychologist undertakes screening assessment and therapeutic support both during clinics and outwith clinic times (either on an on-one basis or with telephone consultations), and can liaise with local services where capacity is available.

Surgical Intervention

Surgical decisions on nerve surgery and prophylactic shoulder interventions are made at 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 to 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.

Continuation of Care

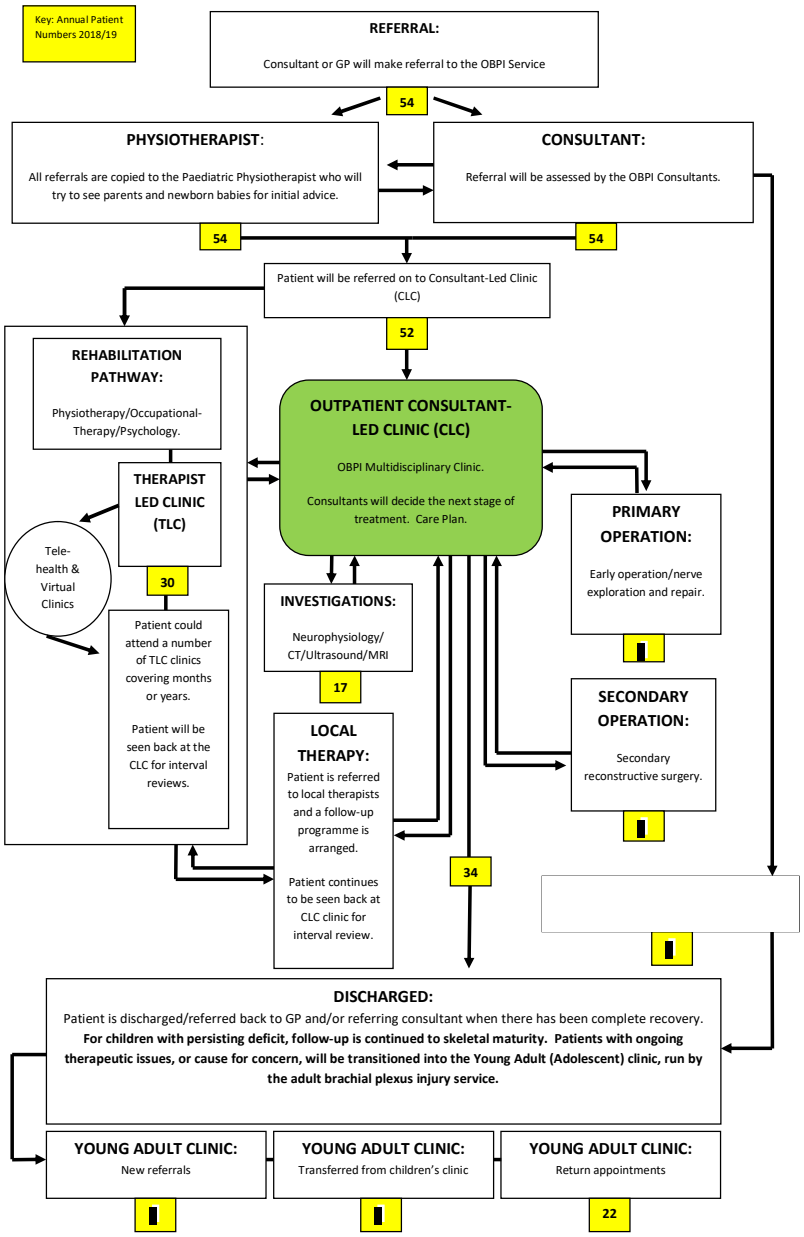
Children with persisting deficit are followed up in outpatients at least until skeletal maturity.

Patients who live in the north of Scotland can be seen for a review appointment at outreach clinics held at Woodend Hospital in Aberdeen up to twice per year.

Patients can be transitioned into the Young Adult Clinic once they are deemed to have reached an appropriate level of physical and cognitive development, and if they have ongoing issues best addressed through adult services.

(See flowchart on next page)

Obstetric Brachial Plexus Injury (OBPI) - Patient Pathway



2. Activity Levels

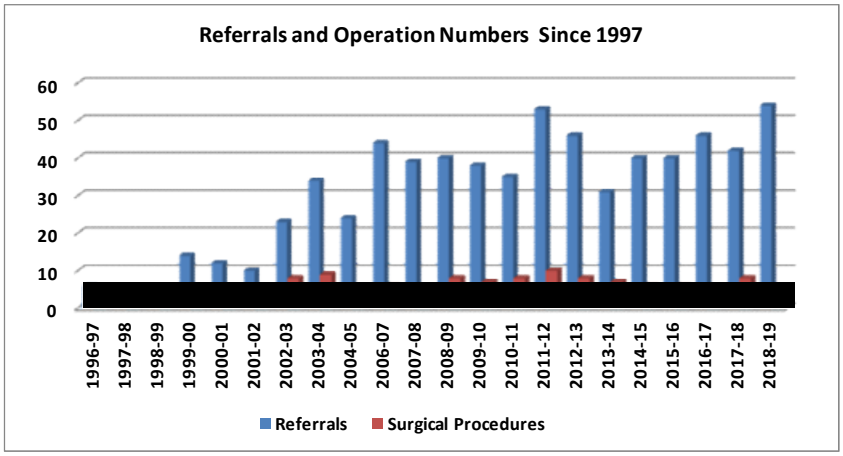
Referrals and Interventions

Referrals and Interventions				
	SA Level	**2018/19**	**2017/18**	**2016/17**
New patient referrals				
Referrals received	*40*	**54**	**45**	**48**
Referral does not meet criteria				
Assessments				
Accepted for treatment by service	*30*	**52**	**42**	**46**
Did not attend (DNA)		**0**		**7**
Discharged following first assessment		**30**	**25**	**18**
Discharged from treatment		**34**	**36**	**34**
Outpatient Follow-Up Appointments	*190*	**169**	**161**	**153**
Intervention /procedures				
Nerve				
Other (shoulder/elbow)				
Total Procedures:	*7*		**8**	
Ward Bed Days				
HDU/ITU				
Nerve Surgery		**10**	**22**	**12**
Other Surgery		**9**		**6**
Total Ward Bed Days		**20**	**31**	**21**
Day Cases		**0**		
Average length of stay for inpatients (days)				

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

Trends in Activity

Referrals and Operation Numbers Since 1997		
Year	Referrals	Surgical Procedures
1996-97	6	
1997-98		
1998-99		0
1999-00	14	
2000-01	12	
2001-02	10	
2002-03	23	8
2003-04	34	9
2004-05	24	
2006-07	44	6
2007-08	39	
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	
2017-18	42	8
2018-19	54	
Total:	679	120



Diagnostics

Neurology/Neurophysiology

A consultant neurologist provides clinical assessment for some of our patients along with neurophysiology investigations which is particularly useful in those who may require surgical intervention.

New Dedicated OBPI/Neurology Slot

In 2018-19, in response to feedback from the consultant neurologist regarding difficulties arranging appointments at short notice for urgent obstetric brachial plexus patients, a dedicated OBPI/Neurology appointment slot was created to coincide with the children's consultant-led clinics held on a Monday afternoon about once per month.

With OBPI/Neurology referrals averaging about one per clinic, this arrangement has proven to be very beneficial to the service and means that referrals to Neurology can be expedited via the appointments office without affecting the consultant neurologist's pre-existing neurology patients.

Location of Children's Neurology

The Neurology clinics are held in the outpatient department of the Royal Hospital for Children in Glasgow on a Monday.

Neurophysiology Activity (within NHS GG&C)			
	2018/19	2017/18	2016/17
Neurology/Neurophysiology			
Patients Referred	12	13	6
Maximim Wait (Weeks)	11	14	12
Minimum Wait (Weeks)	0	0	0
Average Wait	[redacted]	7	[redacted]
Did not attend (DNA)	0	[redacted]	0
Assessed outwith NHS GG&C	[redacted]	0	[redacted]

[redacted] patients were either seen by Neurology on the same day as their first OBPI assessment, or seen by Neurology prior to being reviewed in the OBPI clinic. This would explain the **0** figure for Minimum Wait.

For patients travelling from Northern Ireland or outlying areas of Scotland a neurology appointment was arranged to coincide with their OBPI clinic review to minimise travel, resulting in a Maximum Wait of **11** weeks.

Imaging / Radiology

X-Ray, CT, MRI and Ultrasound

In addition to radiographs, CTs and MRIs obtained at the children's hospital, we also have access to the hospital's ultrasound machines in order to facilitate CFM to perform imaging of shoulders in 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.

Radiology Activity (within NHS GG&C)			
	2018/19	2017/18	2016/17
Referred for MRI/CT/Ultrasound			
MRI	[redacted]	*	*
CT scan	[redacted]	*	*
**Ultrasound	[redacted]	[redacted]	[redacted]
Total Imaging	8	*	*
Arranged outwith NHS GG&C	[redacted]	*	*

*Imaging activity figures were not previously routinely recorded on the children's service database.

The database was redesigned in 2018 in order to incorporate detailed recording of imaging activity. The intention is to provide comparative figures from 2018/19 onwards. X-rays continue to be routinely provided at clinic when necessary and are outwith the scope of the above table.

**Ultrasound activity provided by Miss C Murnaghan (CFM) from her own records.

3. Performance and Clinical Outcomes

3.1 Equitable

NHS Board for Referrals

NHS Board for Referrals						
	2018/19	% of total	2017/18	% of total	2016/17	% of total
NHS Board for Referrals						
Ayrshire and Arran	0	0	0	0		
Borders	0	0	0	0		
Dumfries and Galloway	0	0	0	0	0	0
England	0	0			0	0
Fife						
Forth Valley						
Grampian						
GG&CHB	30	56	18	43	20	43
Highland	0	0				
Lanarkshire	11	20	8	19	8	17
Lothian					0	0
Northern Ireland						
Orkney	0	0			0	0
Shetland	0	0	0	0	0	0
Tayside					0	0
Western Isles	0	0	0	0		
Total:	54		42		46	

Distribution of Referrals

Referrals remain well distributed from around Scotland. The referrals from Greater Glasgow and Clyde were thought to be appropriate for the Obstetric Brachial Plexus Injury Service.

Travelling to Clinics

In the year 2018-19 information on how to claim Travel Expenses was issued to new patients with their first appointment letter and highlighted on the redesigned website, to enable patients from outlying areas to attend clinics in Glasgow without encountering prohibitive financial constraints.

NHS Board for Inpatient Procedures

NHS Board for Admissions						
	2018/19	% of total	2017/18	% of total	2016/17	% of total
NHS Board for Inpatients						
Ayrshire and Arran	0	0	0	0	0	0
Borders	0	0	0	0	0	0
Dumfries and Galloway	0	0	0	0	0	0
England	0	0	0	0	0	0
Fife	[redacted]	[redacted]	0	0	[redacted]	[redacted]
Forth Valley	0	0	0	0	0	0
Grampian	0	0	0	0	0	0
GG&CHB	0	0	[redacted]	[redacted]	[redacted]	[redacted]
Highland	0	0	0	0	[redacted]	[redacted]
Lanarkshire	0	0	[redacted]	[redacted]	0	0
Lothian	[redacted]	[redacted]	[redacted]	[redacted]	0	0
Northern Ireland	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Orkney	0	0	0	0	0	0
Shetland	0	0	0	0	0	0
Tayside	0	0	0	0	0	0
Western Isles	0	0	0	0	0	0
Total:	[redacted]		8		[redacted]	

Outreach Clinics

Outreach clinics were held in Aberdeen in January and November 2018 in order to improve assessment and follow-up for patients in North East Scotland. Utilisation of the clinics is variable. Children and adults are seen at the clinics. The need for outreach clinics is kept under review according to the numbers of patients in each area. The next clinic is planned for October 2019.

3.2 Efficient

Efficient

a) Actual v Planned Activity

See Section 2: Activity Levels

b) Resource Use

See other parts of the report.

c) Finance & Workforce

See Section 6: Financial report and workforce

d) Targets (Referral to appointment to treatment)

See Section 3.3: Timely

3.2.1 Cost efficiencies

Not applicable.

3.3 Timely

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

   All babies referred to physiotherapy 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 **3.8** weeks and the median was **3.6** weeks (range **0** to **12** weeks).

Time from Referral to Treatment			
	2018/19	2017/18	2016/17
Waiting time to 1st assessment			
% within target	85	79	80
Maximum Wait (Weeks)	12.0	13.6	19.9
Mean Wait (Weeks)	3.8	4.3	4.3

NOTE: [redacted] seen at 12 weeks from referral – older child with historic injury, originally treated outside the U.K. Not urgent.

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

Age at First Review (Weeks)				
	SA Level	2018/19	2017/18	2016/17
Maximum Age	*8*	704.9	669.0	782.6
Minimum Age		0.3	1.3	0.9
Median Age		7.4	8.9	12.9
Mean/Average Age		107.1	72.0	108.2

The results above are affected by a [redacted] who are referred for the first time at an older age. Most cases are seen before the age of 8 weeks.

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

   All nerve surgery cases were carried out by age 6 months during 2018-19. Prompt theatre access remains difficult within RHC, although senior management support has been of critical assistance when needed, and is greatly appreciated.

5. **Clinic letters issued within 2 weeks**.

   All clinic letters and operation notes were typed and checked within a few days of dictation.

6. **OT review before commence schooling**.

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

3.4 Effectiveness

A full report on OBPP Nerve Exploration/Repair Cases 2004 to 2017 was carried out in 2017-18.

(Please see section B2 a) of the 2017-18 report)

3.5 Safe

Staff Vetting

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

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 2018-2019.

Compliance

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 2018-19.

Child Protection

Child protection level 1 LearnPro was completed by all staff.

Child Protection level 2, risk assessment, maltreatment in infants LearnPro was completed by Prof. Hart & Miss Murnaghan.

Miss Murnaghan has Child Protection training to Level 3 and has completed all mandatory Paediatric training modules on NES and LearnPro, plus she is registered with the Royal College of Paediatrics and Child Health.

Safe Transfusion Practice for Paediatrics completed by Prof. Hart & Miss Murnaghan.

3.6 Person centred

Patient Satisfaction Survey

A patient satisfaction survey was carried out in 2017-18.

(See section B5 c) of the 2017-18 report)

Young Adult Clinic

Patients who were previously seen in the children's obstetric 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. A robust pathway is therefore in place for patients to transition from children's to adult care.

The young adult clinic is held twice per year at the New Victoria Hospital, Glasgow, which is 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 referred to the service and are usually seen first at the young adult clinic.

4. Quality and Service Improvement

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

During the 2018-19 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*)

Physiotherapy

Annual Report prepared by the Specialist Paediatric Physiotherapist

Role of Physiotherapy

- Attend consultant and therapy-led clinics.
- Assess new babies/children referred to physiotherapy with concerns of OBPP.
- Liaise with physiotherapists across Scotland and Northern Ireland regarding children with OBPP.
- Promoting early intervention of babies born with OBPP by ensuring early referral to physiotherapy from the maternity hospitals.
- Continue to educate junior physiotherapy staff and students in the role of physiotherapy in OBPP.
- Over this year the specialist paediatric physiotherapist has also had telephone contact in between clinic appointments with two families who reside in Northern Ireland and have children with more severe injuries to reassure them regarding local management.

Patient Numbers

The following table shows the patient numbers seen by physiotherapy during the year 2018-19.

Number of Patients Seen by Physiotherapy			
	Consultant Clinic	Physiotherapy	Therapy Clinic
New	22	14	0
Return	51	25	23

Therapy-Led Clinic

The therapy-led clinic continues to run well. This clinic allows longer appointment times for additional assessment/management strategies to be discussed with families. It also allows joint working between physiotherapy, occupational therapy and psychology.

Update letters for all patients attending the therapy-led clinic are sent to GPs and uploaded to the clinical portal along with the assessments that are carried out to ensure communication is maintained.

Occupational Therapy

Annual Report prepared by the Specialist Paediatric Occupational Therapist

Over the past twelve months the Specialist Paediatric Occupational Therapist has continued to perform the requirements of the OBPI specialist post as outlined in previous reports.

A new development since last year's report is the therapy-led clinic run jointly with the Specialist Paediatric Physiotherapist and the newly appointed Paediatric Clinical Psychologist. This clinic has continued to develop since last year.

Nine clinics were held over the year April 2018 to March 2019.

Attendance at Therapy-Led Clinic (Age v Number Attended)	
Under 5 years	
5 to 10 years	12
10 to 16 years	8
Did not attend (DNA)	7

This clinic is offered to all patients attending the OBPI service for annual review and can assist with pre-nursery assessment, pre- school assessment, transition to secondary school, individual therapy and advice to patients and their families.

The brachial plexus outcome measure (BPOM) is routinely used for review of functional issues at this clinic. This outcome measure is due to be reviewed at the Brachial Plexus Injury Collaboration Meeting on 6th September 2019. Both the Specialist Paediatric Occupational Therapist and the adult service Specialist Physiotherapist will be hosting this one day networking meeting, with therapists invited from England, Sweden and Denmark.

Clinical Psychology

Dr Helen Lowther, Principal Clinical Psychologist

Clinical Psychology input into the Obstetric Brachial Plexus Injury service began in July 2018 as a 0.2 WTE (one day per week) NSS funded resource dedicated to and ring-fenced for the OBPI service. Planning for the Clinical Psychologist's role in the service was outlined in the Annual Report 2017-18. Dr Helen Lowther has been inducted to the post and the team, and has been scoping out the service and the deliverables noted in that report.

During the first 8 months in post the emphasis has been on becoming embedded in the team, familiarisation with the patient group, team processes, service pathways, management and the Scottish service model. There has been focus on attending medical clinics alongside other MDT members in order to develop an understanding of the patient group and their presenting issues in terms of psychological need and emotional distress.

Quantitative Data

Patients seen at either the consultant led or therapy led clinic August 2018 – March 2019:-

- Under 5 years of age = 24
- 6 to 10 years of age = 17
- 11 to 16 years of age = 13

Scoping the service

Attending the half-day clinics has been invaluable in becoming familiar with the patient group's social, surgical and physical therapy needs and, in particular, gaining an understanding of the psychological needs of the population within the context of the medical demands. Observations and work so far suggest that the population has multifaceted needs, primarily driven by the variety of challenges brought forward by the different ages and developmental stages. There are key areas of vulnerability for some groups, with demonstrated clear psychological need; parents of newborn babies with particular emphasis on maternal mental health and attachment/bonding, decision-making around, and preparing for surgery at any stage, peer interactions and body image concerns.

In addition, it has been important to begin linking with the professional network of psychologists working with the population group across the UK. Liaison with local services has been key, particularly in relation to neurodevelopmental issues that present in clinic and / or speech and language difficulties.

Psychology tasks so far (first 8 months of post)

Attending weekly medical-led and therapy (AHP)-led clinics to date has been invaluable in terms of getting to know the patient group, but also providing in vivo support and advice to families.

Some examples of this are:-

- Providing brief, targeted input around treatment adherence.
- Providing psychological input into preoperative assessments.
- Follow up phone calls to parents of newly diagnosed babies.
- Liaison with Scottish / Northern Irish mental health services to ensure ongoing support for families.
- Liaison with the Health Visiting service to raise concerns and share information around maternal mental health and support.
- Design of referral pathway from clinic to outpatient psychology appointments for more severe / complex psychological presentations.

As outlined in the previous annual report, the limited psychology resource available is insufficient to achieve one-to-one assessment and therapeutic intervention for the majority of patients. Therefore in order to achieve the largest care impact on the patient group , it was proposed that there would be key deliverables at different phases.

Early phase psychology work

a) Linking with Professional Network: It is important to share knowledge, resources and insight with similar professional groups in the same field. As such, contact has been made with the Leeds Psychology service, and we have shared ideas on future collaboration in terms of research.
b) Development of Screening tools: Much thought has gone into screening tools to use across various different ages and presenting issues. There are key benefits to using a general, non standardised measure of distress which would be possible for all members of the team to administer. This would be a straightforward, user friendly and quick measure which would suit the setting of a medical clinic. It would highlight which children, young people and families are coping, and those who need targeted psychological help. A measure such as the 'Distress Thermometer' (already utilised across Oncology clinics), could be adapted for the OBPI population as a useful way of opening up conversations and directing psychological care. As a first step to introducing standardised screening using validated questionnaires, all families who are under review by the clinic are being invited to fill out a family quality of life measure (Paediatric Quality of Life Inventory – Family Functioning module). This data will provide a broad profile of the psychosocial care needs of the patient group and will hopefully highlight the vulnerable groups in terms of age, thus informing the team as to which more targeted measures may be important to administer more formally going forward. The data could also provide a baseline against which to measure service impact in future years.

c) Information Leaflet for families: In order to reduce stigma and barriers to accessing Psychological therapy, a leaflet explaining this part of the service has been devised and is currently being reviewed with the plan of sending this out to all new patients attending clinic. This will help explain the role of Psychology to patients before they come to clinic, so they can attend expecting a holistic assessment of their child's physical and mental wellbeing. Additionally, an outline of the role of the Psychologist within the MDT has been added to the OBPI team website.

Interim phase developments

a) Screening measures: Implementing screening measures within clinic settings is important for several factors. Screening measures would i) support the development of referral pathways and referral criteria for psychology provision, ii). assist in outcome reporting, iii) build a picture of the psychological welfare of patients and families and allow monitoring of care need, and iv) work toward equity of provision across Scotland.

b) Ongoing work on service provision: When thinking about developing the therapeutic aspect of the role, particular attention should be paid to vulnerable groups such as parents in the post natal period.

c) Teaching and training: It may also be useful to think about sharing information and skills with medical and AHP colleagues within the Brachial Plexus team to enhance their skills and confidence in discussing mental health issues with families within a clinic setting, in order to ensure the mental health needs of all patients are continually recognised.

d) Research: Undertaking formal research would be beneficial in a number of key areas. For example: considering the rates of anxiety and depression in the post natal period for mothers of children with a birth injury, compared to population norms; social phobia in adolescents with Brachial Plexus Injury; teenage experiences of living with a visible difference.

Administration

New Service Website (www.brachialplexus.scot.nhs.uk)

In 2018-19 the service administrator redesigned and replaced the old outdated website with a more modern version.

It had been noted by both patients and clinicians that although the existing website was a good resource it lacked the features of a modern site which would make it easy to navigate and display correctly on modern browsers and phones. With this in mind a new version was designed and tested in-house.

The new site went live in winter 2018 and the response so far has been overwhelmingly positive.

The new site features:-

- A drop-down navigation menu at the top of each page.
- A redesigned home page with clear menus signposting patients and medical professionals to information relevant to their needs.
- Fully responsive elements which resize and stack for viewing on smaller devices such as smart phones.
- New pages including a file directory and a clinic diary.
- Existing MS Word attachments incorporated into the relevant web page or converted into PDF files for easy opening.
- A revised colour palette designed to look professional and in line with NHS corporate branding.

The site continues to be kept under review and is maintained on a weekly basis. The intention is to keep developing it in line with service requirements and patient feedback.

Although the site is still under development the feedback received from patients in clinics is that it is a very useful and well structured resource for information on brachial plexus injury and contacts for the service.

Clinicians are also using the site to access referral forms and referral guidelines. Again the feedback so far has been positive.

General Administration

Administration continues to be overseen by the service administrator at the New Victoria Hospital, with access to offices and clinics at the Queen Elizabeth University Hospital and Royal Hospital for Children when required.

Adult and young adult clinics which take place at the New Victoria, along with OBPI/children's clinics which take place at the new Royal Hospital for Children, are set up and administered by the service administrator. Outreach clinics in Aberdeen encompassing both the adult and children's services are organised by the administrator, normally twice per year.

Referrals

The service administrator is the main point of contact for all referrals to 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, email and occasionally via the electronic GP Gateway. The generic brachial.plexus email address is forwarded to other members of the team in the administrator's absence to ensure constant monitoring of referrals. Standard referral forms are available on the service's updated website. Email referral has been highlighted to referrers as the speediest method.

Database

The adult service database is maintained by both the administrator and the lead consultant and is under constant revision to facilitate reporting and service developments.

Data from all clinics is gathered and recorded in the EPR and 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 information as current as possible.

Other Duties

The administrator takes responsibility for all other administrative requirements of the service such as typing and mailing of clinical notes and correspondence, setting up future clinics on the TrakCare system, liaising with other departments and hospitals as required, appointing new and return patients and speaking to patients by telephone or email where necessary.

5. Governance and Regulation

5.1 Clinical Governance

The brachial plexus team holds regular multidisciplinary meetings after clinics to discuss developments and any problems with the service.

Local governance reports for the Paediatric Orthopaedic Service are submitted monthly; incidents are reported, investigated and reviewed. Information is then passed to the quarterly Paediatric Orthopaedic GG&C Clinical Governance meetings and relevant information then passed to the GG&C groups attended by senior management.

Patients treated at the Canniesburn site also fall under that unit's own monthly governance and internal audit system.

No significant governance issues have been identified through these mechanisms during 2018-19.

5.2 Risks and Issues

No adverse events arose during 2018-19.

5.3 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 2018-2019.

5.4 Complaints and Compliments

The GG&C policy on complaint handling is followed. There have been no complaints relating to the Children's Brachial Plexus Injury Service during 2018-19. Compliments are directed specifically to the service providers.

5.5 Equality

The Scottish National Brachial Plexus Injury 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.

Staff have completed required LearnPro modules, as set by NHS GG&C (Module 004: Equality, Diversity & Human Rights).

6. Financial reporting and workforce

NHS Greater Glasgow & Clyde
Women & Children's Directorate
Obstetric Brachial Plexus
Twelve Month Report: 18/19

Actual Activity	5
Contract Activity	10

	Full Year Funded Value Of Agreement £	Twelve Month Funded Value Of Agreement £	Actual Outturn As At 31st March 2019 £	Variance £
FIXED				
Nursing/PAM	72,490	72,490	72,490	0
Medical	10,748	10,748	10,748	0
Other direct	45,043	45,043	45,043	0
Indirect	16,130	16,130	16,348	-218
Capital charges	58	58	58	0
Total Fixed	144,469	144,469	144,687	-218
VARIABLE				
Pharmacy	5,380	5,380	2,748	2,632
Travel & Training	2,253	2,253	1,151	1,102
Total Variable	7,633	7,633	3,899	3,734
TOTAL	**152,102**	**152,102**	**148,586**	**3,516**

Summary	
Fixed Costs	144,687
Variable Costs (5 Cases)	3,899
Total	148,586
Less	
Variable Costs of Non Contract Cases (2 Cases)	1,559
Fixed Costs of Non Contract Caes (2 Cases)	28,937
Final Total Cost For NSD Funded Activity	**118,089**

7. Audit & Clinical Research / publications

Tim Hems

Natural history of elbow flexion contracture and restriction of forearm rotation after obstetric brachial plexus injury.

Flexion contracture of the elbow and limitation of forearm rotation are common deformities after OBPI. A study has been started to investigate the severity of these deformities and how they progress during childhood, using the service database. The project has received approval from the research ethics committee

An abstract with the initial results for the elbow flexion contracture has been submitted for presentation at an International meeting.

Andy Hart

Publications:

Tim Hems, Andrew Hart. Chapter. Principles of nerve injuries and their management. In: Rockwood, Green and Wilkins' Fractures in Adults, 9th edition. Edited by Paul Tornetta III, William M. Ricci, Margaret M. McQueen, Charles M. Court-Brown, and Michael D. McKee. 2019, Lippincott Williams and Wilkins, Philadelphia.

Appointments:

Professor of Plastic Surgery Research, The University of Glasgow, since 2010.
Editor-in-Chief, Journal Plastic Reconstructive & Aesthetic Surgery, since 2016.
Clinical Lead, Find a Better Way / EPSRC bone regeneration research programme, since 2016.

8. Looking ahead

Staffing

The service welcomed a specialist clinical psychologist in summer 2018. She is settling in well and already making a valuable contribution to the quality of care offered to patients. Maintenance of expertise to provide a highly specialised service requires forward planning of staffing. Distribution of duties within the current team and future requirements will be reviewed, in order to make plans for succession. This will need to take account of the needs of the adult service.

Electronic Patient Record (EPR)

Introduction of an electronic patient record in NHS Greater Glasgow & Clyde has continued to present 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 and recording outcomes for the brachial plexus service are under review.

The EPR development team has been approached and asked to provide specific E-forms for the service for inclusion in the EPR. Work is now in progress on forms for the children's brachial plexus service and it hoped these will be introduced during the next few months.

National and International Interactions

Following the Narakas meeting in Barcelona in 2016 the iPLUTO project (International Plexus Outcome Study Group) was set up 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 contributed details of our evaluation system, which is regarded as very comprehensive, to the group designing the study, and responded to the online surveys regarding the outcome data which should be recorded.

A recent publication from the study group has defined an agreed minimum set of measurements of passive and active movements of upper limb joints, together with the Mallet shoulder score, which should be recorded at ages 1, 3, 5 and 7. We are already recording most of these measurements. In designing our E-forms, we have checked that all recommended measurement can be recorded.

Tim Hems recently attended and contributed to the Narakas Meeting held in Leiden, The Netherlands. This is an international symposium on brachial plexus surgery which is held every 2 to 3 years. Team members have attended previous meetings. An expression of interest was submitted to hold a future meeting. We were unsuccessful on this occasion, but will develop our proposals and resubmit a bid to hold the meeting, probably in 2023-24.

Members of the team continue to meet and cooperate with other units in the UK and abroad. A meeting of the UK brachial plexus therapist specialist interest group will be hosted in Glasgow in September 2019.

Appendices

Teaching and Education

Tim Hems

Teaching

7th August 2018	Canniesburn Plastic Surgery Unit, FRCS (Plastics) revision course. Brachial plexus injuries: Early management and referral. Obstetric brachial plexus injury.
26th February 2019	Edinburgh Hand Surgery Course. "Principles of management of peripheral nerve injury" "Management of Brachial Plexus Injuries" Small group teaching on clinical examination of upper limb neurology.

Meetings Attended

13/06/18 to 16/06/18	Federation of European Societies for Surgery of the Hand, Annual Congress, Copenhagen.
11/10/18 to 12/10/18	British Society for Surgery of the Hand Autumn Scientific Meeting, London.

Claire Murnaghan

Teaching

10/01/19	PRMH, Glasgow, Department of Neonatology.

Meetings Attended

07/03/19 to 08/03/19	British Society for Children's Orthopaedic Surgery, Norwich.

Andy Hart

Teaching

25th October 2018	Visiting Consultant, Basel University Hospital, to demonstrate obturator nerve reconstruction in a post-gynaecological cancer resection patient.
16th November 2018	Brachial Plexus Service annual study day.
30th November 2018	External examiner UCL, PhD thesis “Investigating small molecule therapeutics to improve regeneration and functional recovery following peripheral nerve damage"
January 2019	University of Glasgow MSc Tissue engineering module: “Peripheral nerve injury & Tissue engineering solutions”
21-25th January 2019	Course organiser & hand/nerve surgery lead Canniesburn FRCS (Plast) exam course.
February 2019	University of Glasgow Bioengineering Masters: reconstructive surgical opportunities for bioengineering solutions.
	PLASTA (UK plastic surgery trainee’s association) Webinar teaching on Brachial Plexus Surgery: this 3 hour interactive webcast included PowerPoint based didactic teaching on the neurobiology of peripheral nerve injury, adult brachial plexus injury, obstetric brachial plexus injury, and thoracic outlet syndrome, followed by interactive questions and answer and discussion. Attendance included ~80 individuals around the UK, in Europe and North America.
February 2019	NICE expert advisor (on behalf of BAPRAS) regarding use of phrenic nerve transfer for adult brachial plexus injury.
Additional:	Regional teaching in plastic surgery on nerve injury, brachial plexus, and limb reanimation. January & August (annually) Canniesburn FRCS-Plast exam preparation course: adult & obstetric brachial plexus injury.
May 2019	BAPRAS representative on interview panel for BSSH / BAPRAS / RCS appointed Surgical Specialty Lead for surgical trials networks.
2018 to 2019	Clinical / translational liaison for successful LifeTIME Centre for Doctoral Training Centre bid by University of Glasgow to the EPSRC.

Meetings attended

23/05/19 to 25/05/19	European Association for Plastic Surgery (EURAPS).
06/03/19 to 08/03/19	Alpine Club.
14/06/18	British Association of Plastic Reconstructive & Aesthetic Surgeons Summer Scientific Meeting.