Queen Elizabeth National Spinal Injuries Unit for Scotland

1992-2017

ANNUAL REPORT 2017-18

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Section A Introduction

A1 Queen Elizabeth National Spinal injuries Unit for Scotland

A2 Aim and Date of Designation of Service

The Queen Elizabeth National Spinal Injuries Unit is responsible for the management of all patients in Scotland who have a traumatic injury to the spinal cord. Commissioned in 1992 it has continued to develop the management of the acute injury and life time care of all of its patients to maximise function and to prevent the complications of paralysis. Facilities include a combined Admission Ward and HDU (Edenhall) and a Rehabilitation Ward (Philipshill) with a Respiratory Care Unit. In addition there is a custom built Step-Down Unit for patients and relatives and Research Mezzanine (Glasgow University) which ensures that researchers are embedded in the Unit. Clinical services are provided at the Glasgow centre and outreach clinics throughout Scotland.

This annual report contains a comprehensive analysis of the Unit's activity.

A3 Description of Patient Pathways and Clinical Process

The Unit accepts all patients who are injured or domiciled in Scotland and are referred with a spinal cord injury. In addition it accepts some patients with complex fractures without neurological injury but who are at risk of neurological compromise and whose injuries exceed the capacity of the referring hospital. Multiple pathways exist for the differing aetiologies and source of referrals. Patients are primarily referred from Acute Orthopaedic Services but referrals are received from Accident and Emergency Medicine, General Medicine, Neurosurgical, Vascular and Cardiovascular units throughout Scotland.

A3 A1 Target Group

Traumatic spinal cord injury is relatively uncommon but can result in a devastating disability. It requires highly specialised multidisciplinary care to maximise the chances of recovery and reduce complications. Life expectancy outside specialised units is limited but should approach normal with appropriate immediate care and life long follow up.

Figure One

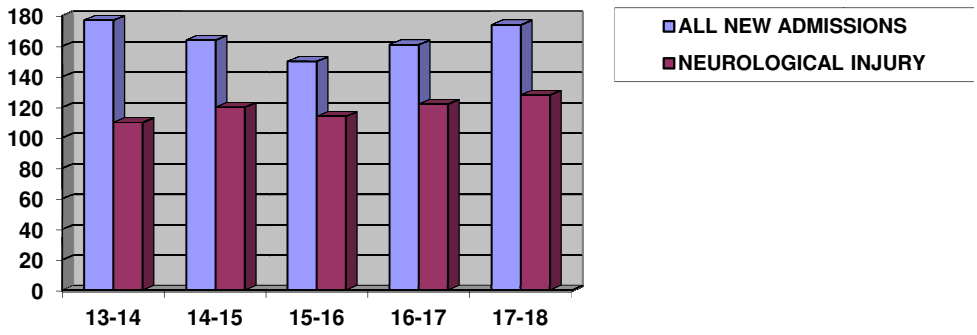


Table One

	13/14	14/15	15/16	16/17	17/18	92-18
ALL NEW ADMISSIONS	177	164	150	161	**174**	**4140**
Neurological	110	120	114	122	**128**	**2310**
Non-neurological	67	44	36	39	**46**	**1830**

All 128 patients referred with a neurological injury were admitted as soon as clinically indicated.

There continues to be a rise in the number of neurological injured patients since the Unit opened. There has been a reduction in the number of bed days available for patients without paralysis due to increased numbers of paralysed patients.

Four hundred and twenty patients were referred but not admitted as they fell outside the scope of the service and were not identified as being of a risk of neurological compromise. They were managed in the referral hospital with appropriate advice and support from consultant medical staff. (see section A3:B1)

A number of patients were seen by consultant staff both in the neurosurgical and orthopaedic wards of the Queen Elizabeth University Hospital (QEUH) and other hospitals. The QEUH continues to attract major trauma from a very wide area and this has led to increasing demands of consultants' time to see patients who would have previously merited telephone advice only.

A3 A2 New Admissions: Case Mix Complexity

The severity of a Spinal Cord Injury is dependent on the anatomical level of and the extent of neurological damage. This has considerable bearing on the type and extent of rehabilitation each patient requires. This case mix complexity has been classified as follows.

	Anatomy	Neurology
GROUP I	**Cervical Injury 1 - 4**	**High Tetraplegia**
GROUP II	**Cervical Injury 5 - 8**	**Low Tetraplegia**
GROUP III	**Thoracic, Lumbar and Sacral Injury**	**Paraplegia**
GROUP IV	**All levels of Injury with**	**Incomplete or no Paralysis**

Group I Patients with the most severe neurological injuries. They are the most dependent. The numbers are expected to vary considerably each year.

Group II and **Group III** Patients with a significant neurological loss and high dependency. They require the longest period of rehabilitation.

Group IV Patients with partial or no paralysis. Many have sustained major polytrauma with residual weakness and require significant input during their rehabilitation.

Fig Two New Admissions by Case-Mix Complexity

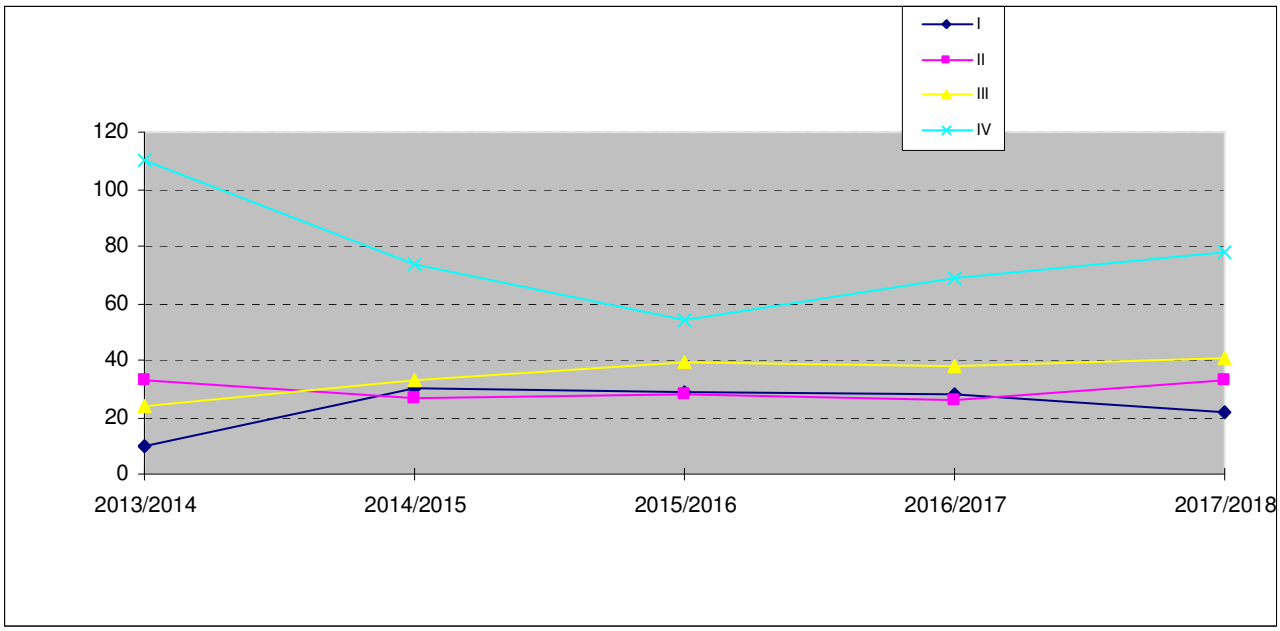


Table Two

GROUP	13/14	14/15	15/16	16/17	17/18	92/18
1	10	30	29	28	22	**373**
II	33	27	28	26	33	**666**
III	24	33	39	38	41	**900**
IV	110	74	54	69	78	**2201**
Total	177	164	150	161	174	**4140**

Numbers of Groups 1, the high tetraplegic patients, have dropped a little. These patients have injury levels from C1-C4 (above the shoulders) with severe paralysis on admission. These are the most clinically demanding group with the highest risk of ventilation and other medical problems. Numbers of low tetraplegic (C5-C8) and paraplegic patients are stable.

The overall number of tetraplegic patients remains high. These patients require high level medical and nursing care and almost constant attendance. It is hoped that this rise remains within normal variation but a twenty-five year review suggests that there is an established trend of increasing numbers of older, more severely paralysed patients.

A3 A3 New Admissions by ASIA Impairment Score Level

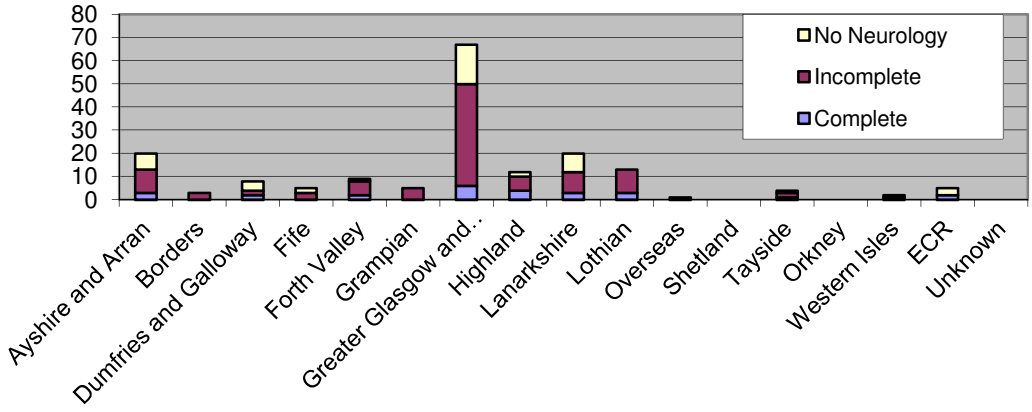
A	Complete: No motor or sensory function
B	Incomplete: Sensory but not motor function is preserved below the neurological level and includes S4-5
C	Incomplete: Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a motor grade less than three
D	Incomplete: Motor function is preserved below the neurological level, and at least half of the key muscles below the neurological level have a grade more than three
E	Normal: Motor and sensory function is normal

The ASIA grading system is recognised internationally as a measure of dependency and can be used to classify improvements over time.

Table Three - New Admissions by ASIA Impairment Level & Health Board

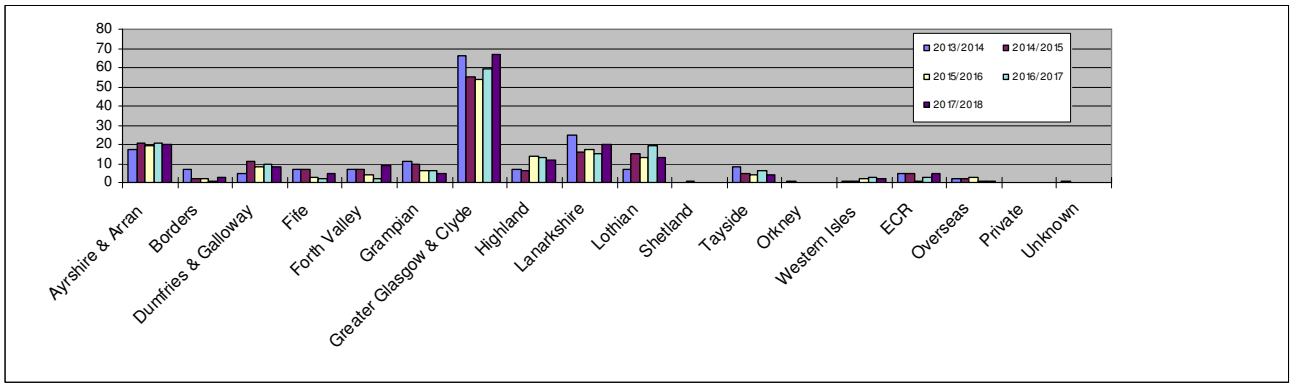
2017/2018	A	B	C	D	E	Total
Ayrshire & Arran	3	0	5	5	7	20
Borders	0	0	1	2	0	3
Dumfries & Galloway	2	0	0	2	4	8
Fife	0	0	1	2	2	5
Forth Valley	1	0	3	4	1	9
Grampian	2	2	1	0	0	5
Greater Glasgow Clyde	8	4	16	22	17	67
Highland	4	0	3	3	2	12
Lanarkshire	3	1	3	5	8	20
Lothian	4	0	6	3	0	13
Overseas	0	0	0	1	0	1
Shetland	0	0	0	0	0	0
Tayside	1	1	1	0	1	4
Orkney	0	0	0	0	0	0
Western Isles	0	0	0	1	1	2
ECR	2	0	0	0	3	5
Unknown	0	0	0	0	0	0
TOTAL	30	8	40	50	46	174

Fig Three Admissions by Neurological Deficit and Health Board



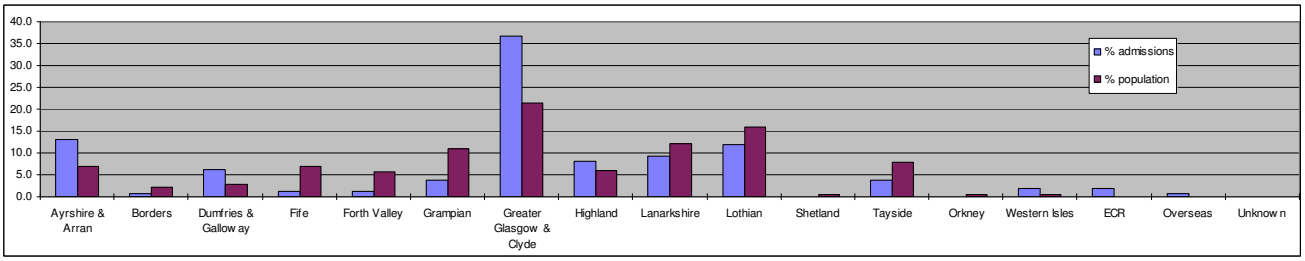
Admission patterns of paralysed patients by Health Board are stable. The Unit continues to admit patients from all areas of Scotland. The distribution of admission of paralysed patients and the annual variation since the Unit opened justifies the clinical and economic benefits of a national service. There was a reduction in GGC patients admitted without paralysis (Column E in Table 3). This is discussed further in A3:B1.

Fig Four New Admissions by Health Board of Residence 2012-2018



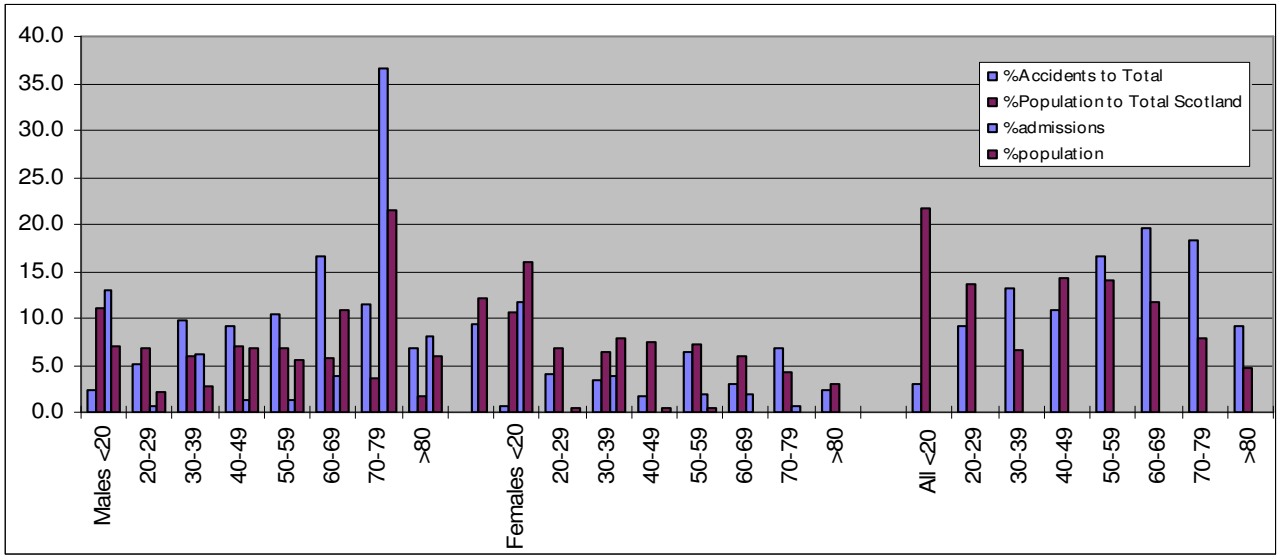
Six non-Scottish patients were admitted while students, on holiday or work in Scotland (ECR & Overseas) and were repatriated when their condition allowed. A small number of such patients is to be expected. The Unit did not admit any private patients.

Fig Five Admissions by Health Board compared with Population Size



The distribution of per-capita admissions within Health Boards is unchanged. As before both GGC and Ayrshire and Arran had admission numbers in excess of population size. Closer examination of figures would be needed to confirm if this was reasonable due to a higher number of paralysed patients or possibly due to issues in the local orthopaedic and neurosurgical services.

Fig Six New Admissions by Age Group



There was no further rise in middle-aged and older patients who are far frailer and find it much more difficult to cooperate with the therapy. The number of injuries in those under twenty remains low.

Fig Seven All Referrals by Age

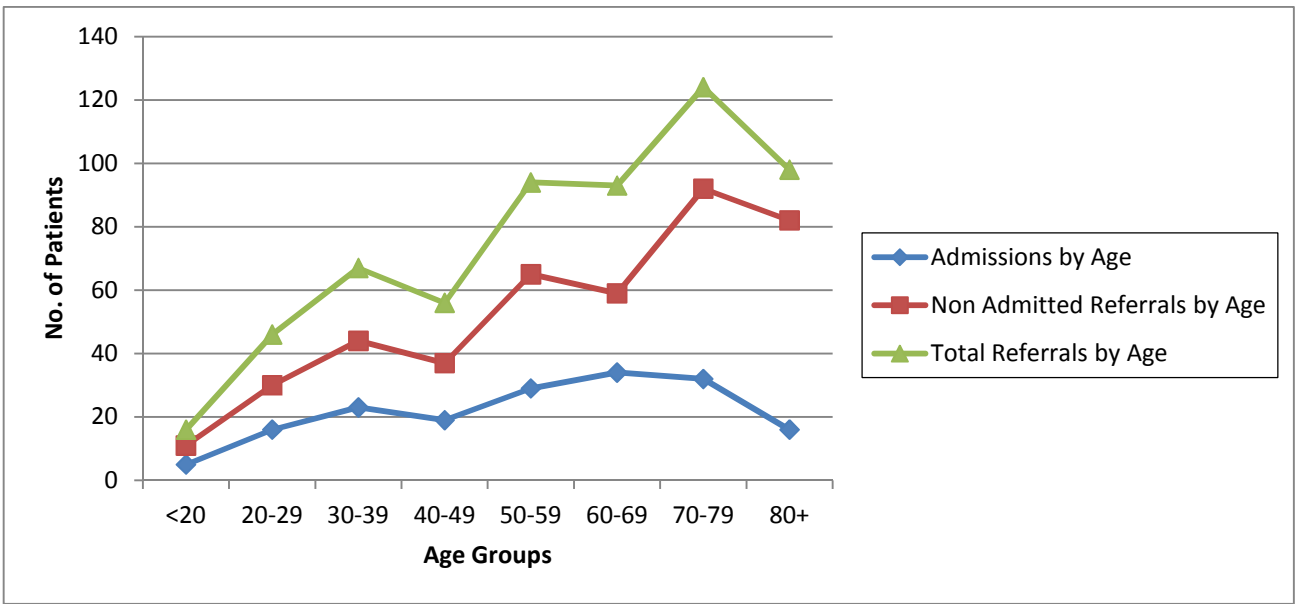


Fig Eight Admissions by Age

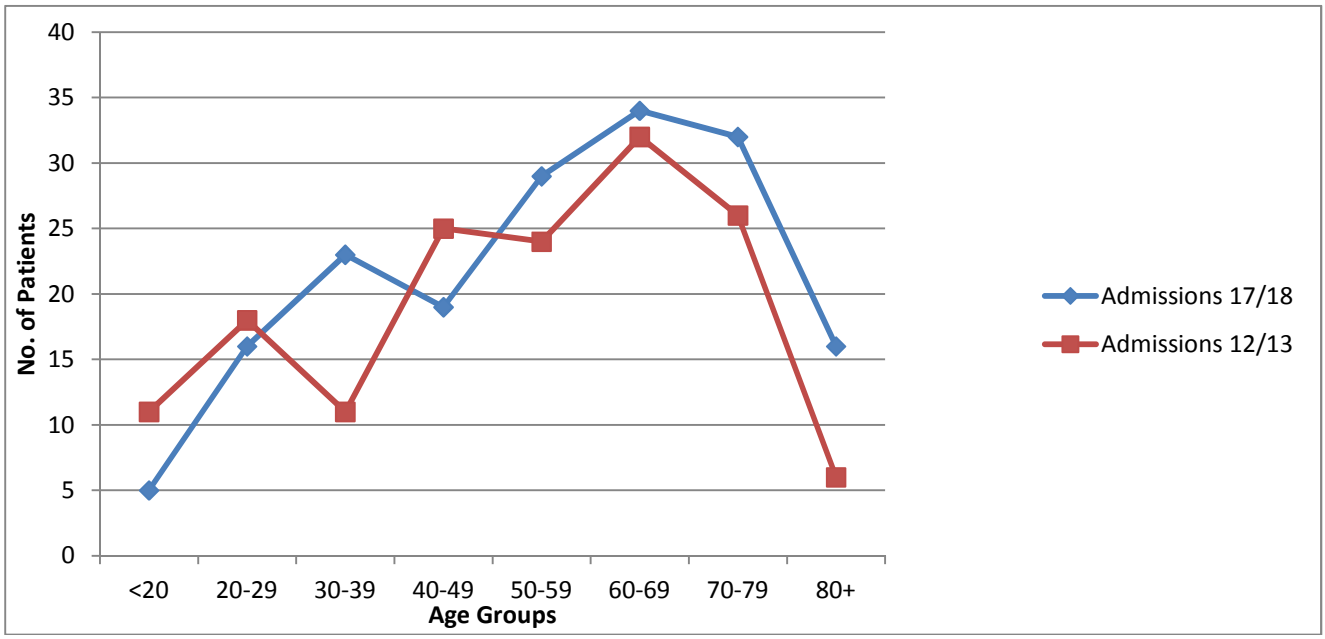
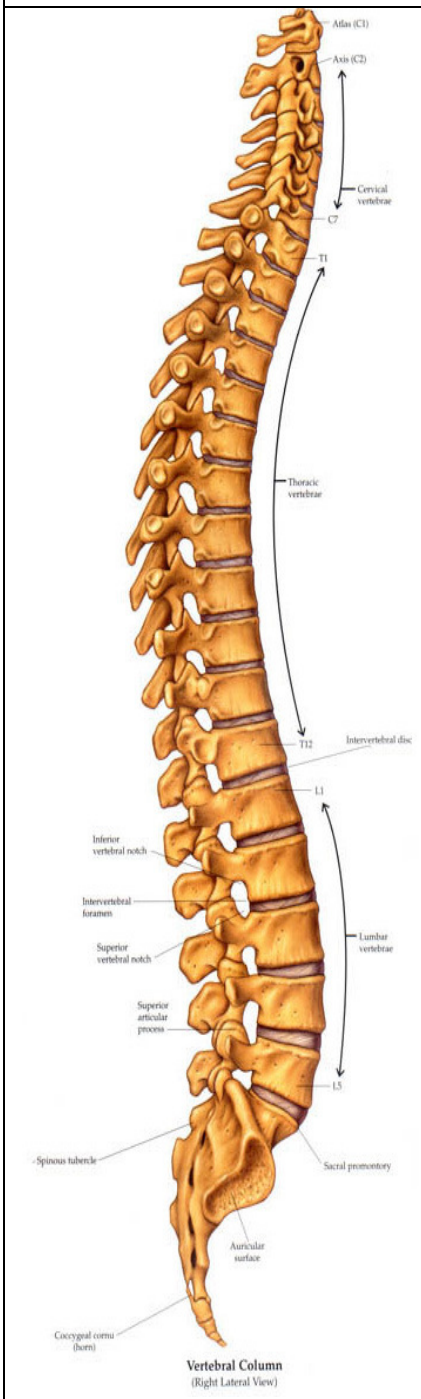


Figure eight shows the age admission profile in more detail overlaid with the historic profile from 2012/13. The increase in 50-80+ age groups can be seen.

Table Four - Admissions by Anatomical Level and Severity



Level	Complete	Incomplete	No Neurology	Total
C 1	1	2	6	9
2	1	2	6	9
3	2	9	1	12
4	1	18	3	22
5	3	21	3	27
6	2	11	5	18
7	1	7	2	10
8	0	0	0	0
Sub-total	11	70	26	107
T 1	0	1	0	1
2	0	0	0	0
3	1	2	0	3
4	1	2	0	3
5	1	0	0	1
6	2	2	1	5
7	2	3	0	5
8	1	3	2	6
9	1	1	2	4
10	0	4	0	4
11	1	3	1	5
12	2	2	3	7
Sub-total	12	23	9	44
L 1	2	5	6	13
2	0	1	2	3
3	1	1	3	5
4	0	1	0	1
5	0	1	0	1
Sub-total	3	9	11	23
S1-5	0	0	0	0
Sub-total	0	0	0	0
TOTAL	26	102	46	174

(Multi-level injuries were counted from the highest level)

Cervical (neck) injuries predominate. This is an established pattern and a change from the early days of the Unit when the split was 50:50 cervical:thoracolumbar. The overall preponderance of tetraplegic patients continues to put increasing demands on nursing and therapy time.

A3 B Care Pathway for Service or Programme

The Unit is commissioned to care for all cases of non-progressive spinal cord injury in Scotland. The majority of these are traumatic injuries. Immediate care, comprehensive rehabilitation and life-long care is provided at the centre in Glasgow and followed by visits at outreach clinics throughout the country. If appropriate an integrated service is provided with local medical, nursing and AHP services. Close cooperation is sought with social services and voluntary groups to ensure that the difficult transition to secondary care either at home or a care establishment is achieved.

A3 B1 Details of Referral and Admission by Region

The service is commissioned to take referrals for all patients with cord injury or complex fractures with risk of cord damage but there continue to be a large number of referrals for patients' outwith this group who do not require admission. The referral itself is not a neutral process and inappropriate referrals can lead to delays in management locally.

After many years of growth the total number of referrals has stabilised at 594. The national referral/admission ratio (RAR) is 29% but remains low at only 20% in Lanarkshire and 25% in Glasgow. The RAR in the early 2000's was around 70%. This means the vast majority of referrals are not paralysed and have sustained moderate injuries which previously would have fallen within the scope of the local orthopaedic or neurosurgical teams. This may reflect lack of confidence or training issues in orthopaedic and neurosurgical services in the WoS.

There are a large number of referrals for elderly patients, with cervical fractures who do not require specialised acute management or rehabilitation. These lie outwith the remit of the National Service and are managed locally.

Table Five - Health Board Referrals and Outcome

Referring Board	Total Referrals	Admissions	Not Admitted	% Admitted	Complex Advice Given
Greater Glasgow & Clyde	271	67	204	25%	39
Lanarkshire	100	20	80	20%	19
Ayrshire & Arran	77	20	57	26%	12
Dumfries	40	8	32	20%	6
Borders	5	3	2	60%	0
Highland	25	12	13	48%	2
Grampian	9	5	4	56%	2
Forth Valley	21	9	12	43%	2
Tayside	7	4	3	57%	1
Fife	5	5	0	100%	0
Lothian	22	13	9	59%	2
Western Isles	6	2	4	33%	0
ECR	5	5	0	100%	0
Overseas	1	1	0	100%	0
Total	594	174	420	29%	85

The number of patients not admitted but requiring complex advice has fallen (85 patients). In these cases the referring team will have contacted the Spinal Unit several times for advice. In occasional cases of complex but neurologically intact patients it remains appropriate for consultants to assist the local team but it is not possible or sensible for the National Spinal Injuries Unit staff to micromanage referrals which ordinarily should be under the care of the local orthopaedic or medical team. There remains an expectation amongst some referrers that the Unit has a responsibility for all spinal problems and such inappropriate referrals can lead to delays in management.

Table Six - Health Board Referrals and Referring Speciality: Non Admissions

Non Admitted referrals

Referring Board	Level of Injury		Referring Specialty				Total
	Cervical	Thor/Lum	Ortho	Neuro	A&E	Other	
Greater Glasgow & Clyde	91	113	103	6	24	71	204
Lanarkshire	34	46	37	0	20	23	80
Ayrshire & Arran	23	34	36	0	13	8	57
Dumfries	16	16	29	0	0	3	32
Borders	2	0	1	0	1	0	2
Highland	4	9	6	0	5	2	13
Grampian	3	1	0	3	0	1	4
Forth Valley	5	7	10	0	1	1	12
Tayside	1	2	0	1	0	2	3
Fife	0	0	0	0	0	0	0
Lothian	2	7	2	3	2	2	9
Western Isles	2	2	0	0	0	4	4
ECR	0	0	0	0	0	0	0
Overseas	0	0	0	0	0	0	0
Total	183	237	224	13	66	117	420

The number of GGC referrals fell after many years of rising and this may represent the bedding-in of the specialised (non-paralysed) spinal service in QEUH. Orthopaedics (53%) remains the principle user of the service. Accident and Emergency (16%) Neurosurgery (3%) provide smaller numbers and “Others” (28%) include Medicine, Neurology, Care of the Elderly etc. We have noted a rise in referrals for non-traumatic and progressive conditions and these are redirected appropriately.

Section B Quality Domains

B1 Efficiency

B1 A Actual v Planned Activity

B1 A1 Table Seven A - In-patient Activity

	13/14	14/15	15/16	16/17	17/18
New admissions	**177**	**164**	**150**	**161**	**174**
New outpatients	**271**	**290**	**170**	**91**	**50**

B1 A2 Table Seven B - Out-patient activity

	13/14	14/15	15/16	16/17	17/18
Return	2389	2378	2112	1943	**1704**
New	271	290	170	91	**50**

The out-patient activity of the Unit is focused on the post discharge management of acute injuries and lifelong, long term follow up. Dedicated clinics in Spinal Medicine, Neurosurgery and Urology supplement the nurse led Annual Review Clinics for those patients with a neurological deficit. Increasingly efficient clinical management limits annual increases in return patients. A further drop in new out-patients is noted due to changes in configuration of urology clinics. The current figures more accurately represent the spinal workload.

B1 A3 Table Seven C - Summary of Out-patient activity

	13/14	14/15	15/16	16/17	17/18	%
Return	2389	2378	2112	1943	**1704**	**N/A**
DNA Return	642	610	613	540	**383**	**22%**
New	271	290	170	91	**50**	**N/A**
DNA New	49	58	43	24	**14**	**28%**

The number of return outpatients has fallen a little further due to the retiral of Consultant Urologist, Mr Conn in July 2017 (see below). The DNA rate has improved which we suspect is due to the text reminder service for appointments.

B1 A4 Table Eight - Out-patient Clinic Location and Frequency

FREQUENCY	LOCATION - QENSIU
DAILY	**DROP IN**
WEEKLY	**NEW, RETURNS, SKIN, HALO, URODYNAMICS, SPASM, PUMP, ACUPUNCTURE, GENERAL SPINAL REVIEW NEUROSURGERY, UROLOGY finished in July 17***
BI MONTHLY	**FERTILITY, SEXUALITY, RESPIRATORY**
MONTHLY	**EDINBURGH**
THREE MONTHLY	**ABERDEEN, INVERNESS**
SIX MONTHLY	**DUMFRIES, BORDERS, ARBROATH**
ANNUALLY	**HUNTLY**

The location and frequency of out-patient clinics and outreach services are based on the demographic data held on the National Database. Medical, nursing and AHP staff attend the clinics accompanied by Spinal Injuries Scotland for peer group support.

Urology Clinic

We were sad to see the retiral of Mr Conn, Consultant Urologist, who had provided expert review of spinal patients almost since inception of the Unit. His contribution and experience will be missed. The long-standing weekly Urology Clinic has been temporarily suspended until a replacement can be identified within the Urology Department. In the meantime patients are treated appropriately by their local Urology Team.

B1 A5 Table Nine - New Out-patient Activity by Health Board

	13/14	14/15	15/16	16/17	17/18
Ayrshire & Arran	16	26	6	7	**6**
Borders	1	1	1	0	**0**
Dumfries & Galloway	6	5	2	3	**3**
Fife	2	4	1	0	**0**
Forth Valley	11	9	1	3	**1**
Grampian	2	0	2	1	**0**
Greater Glasgow Clyde	193	197	123	59	**24**
Highland	9	7	5	3	**6**
Lanarkshire	21	33	25	12	**8**
Lothian	8	6	3	2	**2**
Shetland	0	0	0	0	**0**
Tayside	0	1	0	1	**0**
Orkney	0	0	0	0	**0**
Western Isles	2	1	1	0	**0**
ECR	0	0	0	0	**0**
Unknown	0	0	0	0	**0**
Total	**271**	**290**	**170**	**91**	**50**

New out-patient attendances show further reduction in WoS activity due to the change in urology provision discussed above.

B1 A6 Table Ten - Out-patient Activity by Centre

	13/14	14/15	15/16	16/17	17/18	CHANGE YEAR	TOTAL 1992-2018
New QENSIU	271	290	170	91	**50**	(45.1%)	**3345**
Return QENSIU	2014	1995	1728	1565	**1345**	(14.1%)	**40584**
Edinburgh	154	157	155	148	**142**	(4.1%)	**4093**
Inverness	63	63	63	59	**63**	+6.8%	**1159**
Aberdeen	74	76	71	77	**60**	(22.1%)	**1166**
Dumfries & Galloway	17	19	24	11	**28**	+154.5%	**344**
Borders	24	25	29	42	**22**	(47.6%)	**351**
Arbroath	29	27	26	24	**26**	+8.3%	**350**
Huntly	14	16	16	17	**18**	+5.9%	**141**
Total	**2660**	**2668**	**2282**	**2034**	**1754**	**(13.8%)**	**51533**

There is expected year to year variation in out-patient attendances. The drop in QENSIU new patient attendances is due to reduction in new urology clinic patients. The apparent large changes in the smaller outreach clinics (D&G, Borders) is due to timing of bi-annual clinics which may not fall neatly within the reporting period.

B1 A7 Table Eleven - Out-patient Activity by Specialty at QENSIU

		13/14	14/15	15/16	16/17	17/18
Orthopaedics*		139	85	0	0	0
Thoracolumbar*		0	18	29	5	0
Neurosurgery	**LA / CM / CB**	94	148	187	204	171
Urology	**GC**	524	490	399	235	63
Skin Care		64	75	44	32	36
Pain / Spasm		17	20	13	9	7
Neuroprosthetics	**TH**	25	25	22	48	26
Sexual Dysfunction		22	22	12	11	6
Respiratory		21	15	13	18	17
Fertility		8	4	3	4	5
Spinal Injury Annual Review	**TOTAL**	1100	1093	1006	999	985
	MEDICAL	698	715	642	605	601
	NURSING	402	378	364	394	384
Total		2014	1995	1728	1565	1316

The Spinal Injury Annual Review clinics remain the core component of the outpatient activity and numbers remain stable. These are nurse led with only 61% of patients requiring medical input. There is an open door policy for patients and inevitably some activity remains under-reported from drop-in/ad hoc review. Urology returns continue to reduce for reasons discussed above. Neuro-prosthetics includes assessment and surgery for upper limb problems principally in tetraplegics. The orthopaedic and thoracolumbar clinic workloads have been entirely transferred to the neurosurgical clinics.

B1 A8 Table Twelve - Day Case Attendances by Reason

	13/14	14/15	15/16	16/17	17/18
Urology/Urodynamics	41	54	52	62	53
Halo Fixation	232	175	138	143	135
Skin	18	8	4	11	13
Orthopaedic/Neurosurgery	0	0	0	0	0
Acupuncture / Pain / Spasm	374	413	474	442	450
Sexual Dysfunction	2	3	4	3	6
Fertility	12	19	18	20	20
Other	1	5	4	4	4
Total	680	677	694	685	681

B1 A9 Day Case Activity

Day case numbers are stable and these services offer important care for minor surgical procedures, medical interventions and nursing care. The level of Day Case activity is self-limited due to the finite population of spinal injured patients. It is suspected that Sexual Dysfunction attendance is under-recorded due to difficult nature of consultations which take place outwith the standard clinic environment.

B1 A10 Day Case Attendances by Health Board

Day Case activity remains limited by geographical constraints and there is a natural tend towards seeing patients closer to Glasgow. Halo service attendance from WoS patients remains high. Some of these patients did not have a halo and were treated in a collar alone but still required weekly or fortnightly follow-up with x-rays and nursing/medical review. Some patients who could be managed as a day-case require in-patient stay due to difficulties in travelling. If indicated, procedures are arranged in the patients' local hospital either by staff from the Unit or appropriate specialists.

Fig Nine

Day Case Attendances by Health Board					
	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018
Ayrshire & Arran	80	52	66	56	**35**
Borders	8	6	5	6	**10**
Dumfries & Galloway	16	21	7	11	**1**
Fife	25	22	19	20	**21**
Forth Valley	78	45	48	35	**40**
Grampian	4	3	5	8	**1**
Greater Glasgow & Clyde	355	370	358	335	**359**
Highland	7	12	28	22	**15**
Lanarkshire	46	84	102	125	**136**
Lothian	43	49	41	52	**51**
Shetland	0	0	0	0	**0**
Tayside	17	12	9	5	**8**
Orkney	0	0	5	5	**1**
Western Isles	0	0	1	0	**1**
ECR	1	1	0	5	**1**
Unknown	0	0	0	0	**0**
Total	**680**	**677**	**694**	**685**	**680**

B1 A11 & A12 Waiting Times Out-patient Clinics

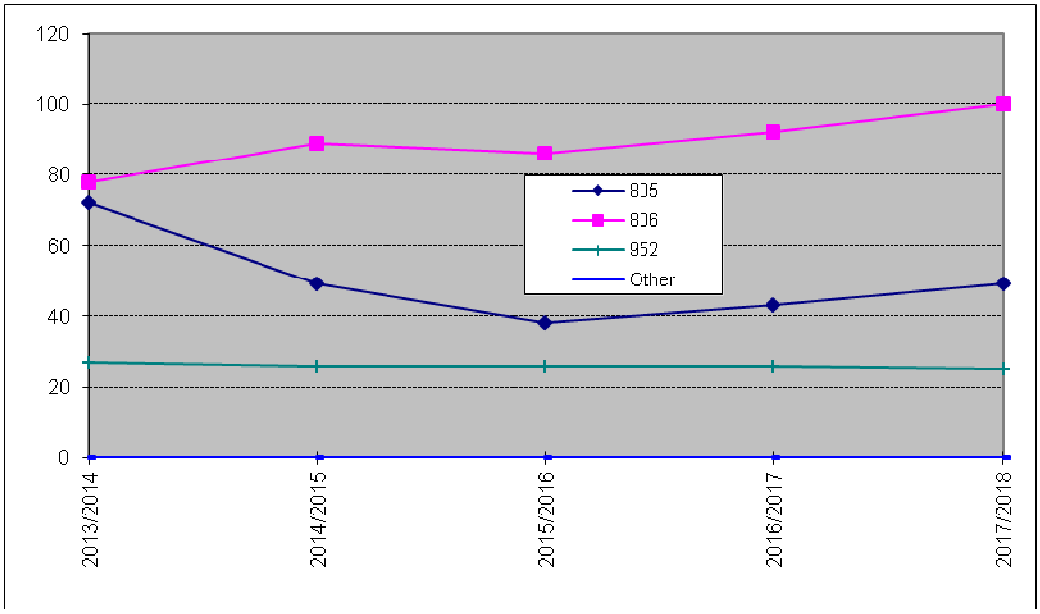
There is an open door policy to the Nurse Led Clinics. Medical advice is always available. A small number of patients with established paralysis move to Scotland every year and the maximum waiting time for these new elective outpatient appointments remains at four weeks.

B1 B1 Use of Resources

The Unit admits on grounds of clinical priority and safety of transfer. Appropriate support facilities are available in the majority of hospitals in Scotland but international and regional data support early transfer if possible. Current national policy is to transfer patients to QENSIU as soon as clinically stable and this has proved a robust admission policy over twenty-five years. Bed availability is dependent on the case mix presenting over time and the length of stay of each patient. **There were no delays in transfer due to lack of beds. All patients were transferred as soon as they were fit and transport was available.** The more severe injuries, but not the most severe, have the longest length of stay because of the complexity of their rehabilitation. The degree of injury is important in determining throughput. The sustained increase in the number of the most highly dependent patients (Groups 1 & 2) made extra demands on resources but time to admission was unaffected.

B1 B2 Admissions by Degree of Injury

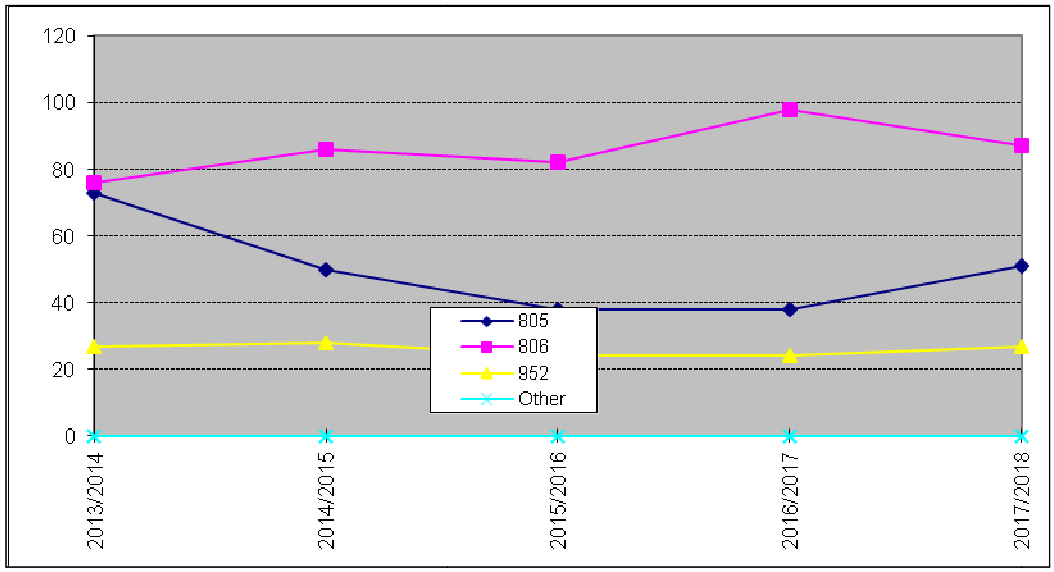
Fig Ten



806: patients with spinal fracture and paralysis
805: patients with spinal fracture but no paralysis
952: patients with paralysis but no fracture. This group includes patients with central cord syndrome (paralysis due to severe cord bruising) and patients with medical cause of paralysis such as stroke. Although these patients may not have fractures some are still very badly paralysed.

B1 B3 Discharges by Degree of Injury

Fig Eleven



B1 B4 Table Thirteen - Length of Stay by Level of Spinal Cord Injury

Discharged Patients 17-18

Case Mix	No. of Patients	Mean L.O.S.	Range of L.O.S.
I	20	125	1 - 422
II	27	114	3 - 402
III	41	113	4 - 434
IV	77	23	1 - 202
All	165	73	1 - 434

Numbers of the most severely paralysed patients (groups 1 & 2) remain high. They are the oldest group with grossly disordered pathophysiology and are the most ill group in the early part of their stay with high demands on medical and nursing resource. The rehabilitation goals are limited in this group.

B1 B5 Table Fourteen - Bed Utilisation

National Spinal Injuries Unit Edenhall HDU = 12 Beds — Philipshill = 36 Beds		
Bed Compliment	**Actual Occupied Bed Days**	**% Occupied**
48	13157	77%

Occupancy figures are stable and allow flexible and efficient use of beds.

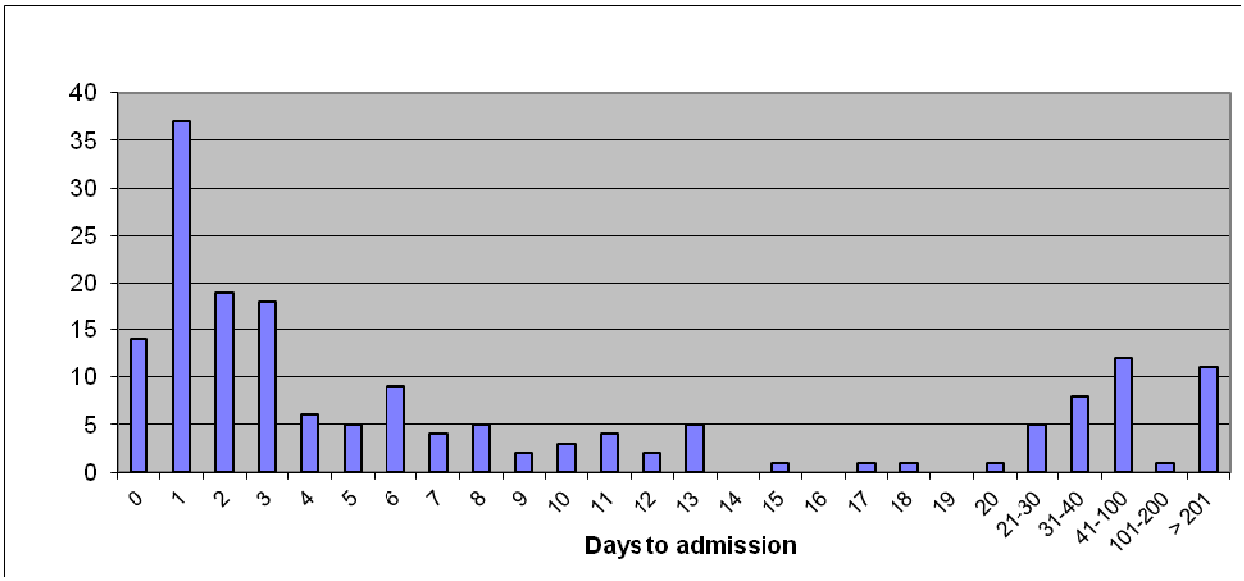
B1 B6 Time to Admission, Length of Stay and Delay in Discharge

B1 B7 Time from injury to Admission

The policy is of early admission for neurological injury with non-neurological injury admitted as beds became available. Most patients are referred within twenty-four hours of injury. Early referral is encouraged. In 2017-18 29% of patients were admitted within twenty-four hours of injury and 40% were admitted within forty-eight hours. 64% were admitted within one week. There is an increasing number of patients with non-traumatic injuries which tend to skew admission times to the right because the initial spinal damage is often not so obvious and their diagnosis and treatment of these patients is undertaken in neurological and medical units outwith the trauma system. They are referred and admitted much later than the trauma patients. Of the eighty-eight patients admitted within three days of injury only two had non-traumatic injuries. In the traumatic group alone 50% of patients were admitted within 48 hours and 77% were admitted within one week.

As usual a "long tail" of patients were admitted weeks and months following injury. This time pattern is consistent with previous years. The emphasis remains on early admission to provide immediate support to the patient and family and to prevent complications.

Fig Twelve



Early referral and co-operation between the staff in the Unit and the referral hospital ensures immediate admission if clinically indicated. Consultant telephone advice is available 24/7 for those patients who are not immediately transferred. The referral proforma, transfer documentation and admission form continue to be successful in facilitating and auditing the process. They have been internationally recognised and copied and are publicly available on www.spinalunit.scot.nhs.uk

Approximately twenty per cent of patients have associated orthopaedic injuries. Co-operation between ITU, the referring hospital and other specialised units can be required (Plastic Surgery, Burns Unit, Maxillofacial, Renal etc).

Table Fifteen - Days to Admission by Range

	No. of Patients	Mean Time (Days)	Range of Time
2013-2014	**177**	**151**	**0 - 8478**
2014-2015	**164**	**11**	**0 - 206**
2015-2016	**150**	**35**	**0 - 2117**
2016-2017	**161**	**38**	**0 - 2278**
2017-2018	**174**	**231**	**0 - 10688**

Table 15 shows mean time to admission for all first-time admissions. This includes some patients who were initially managed outside QENSIU and admitted years, sometimes decades, after injury for elective treatment. These patients are coded as "new injuries" and grossly skew the mean time to admission but these numbers are included for consistency and transparency. In 17-18 the median time to admission for all injuries was 3.5 days, but only 2 days for traumatic injuries). The median time is a better guide to acuity of admissions which will be included in future reports. Traumatic injuries remain the core group of patients.

Table Sixteen - Delayed Discharge

	No. of Patients Discharged	No. of Patients Delayed	Mean delay (days)	Range of Delay (days)	NO DELAY
2013/2014	175	7	34	1 - 91	96%
2014/2015	164	5	38	10 - 104	97%
2015/2016	144	7	26	6 - 61	95%
2016/2017	160	9	27	7 - 76	94%
2017/2018	**165**	**7**	**66**	**10 - 274**	**96%**

Despite discharge planning weeks or months ahead a small number of patients continue to have delays in discharge usually due to lack of suitable accommodation. If accommodation is unavailable patients are transferred back to the referring hospital once they have completed their rehabilitation. Staff at the Unit continues to work with local health teams, social work and housing organisations to minimise delays in return home. This makes increasing demands on nursing, occupational therapy and nursing time.

B1 B8 Re-admissions to the Unit

Most neurologically injured patients discharged from the Unit never require re-admission. They attend annually as out-patients for lifelong follow up. In some cases readmission must be regarded as a failure, most often due to skin problems and self neglect.
There were 66 readmissions to the Unit during the year, a significant shortfall on the contract estimate of two hundred readmissions, skin problems continue to predominate.

B1 B9 Table Seventeen - Ventilated Bed Days

High-level spinal cord injury often requires temporary or permanent ventilator support. The Respiratory Care Team consists of a Consultant Respiratory Physician and a Respiratory Care Sister who work closely with the neuro-anaesthetic service providing in-patient care and a domiciliary ventilation service throughout Scotland.

		No. Patients	Ave. Ventilated Days	Total Ventilated Days
13/14	**Edenhall**	21	25	529
	RCU	6	79	472
14/15	**Edenhall**	24	25	609
	RCU	5	66	331
15/16	**Edenhall**	23	21	491
	RCU	2	39	78
16/17	**Edenhall**	16	14	287
	RCU	2	121	242
17/18	**Edenhall**	**15**	**26**	**395**
	RCU	**2**	**21**	**41**

Each patient is counted only once but may be responsible for multiple episodes of care or inter ward transfers if their condition varies. RCU continues to prove its worth in continuing to provide step-down ventilation within the rehabilitation ward and freeing up acute ventilator beds in Edenhall Ward. The number of acutely ventilated patients in Edenhall Ward remains stable. The need for long-term ventilation fortunately remains rare and numbers are expected to vary widely year to year.

B1 C: Finance Report 2017-18

	AfC Banding		Contract Value 2017/18	Contract Value YTD	Actual YTD	Variance YTD	Year End Forecast	Year End Forecast Variance
		WTE	£	£	£	£	£	£
Dedicated Staff Costs								
Consultant		5.71	858,158	858,158	816,595	41,562	816,595	41,562
Specialty Doctor		1.00	80,748	80,748	91,718	-10,970	91,718	-10,970
Senior Medical		*6.71*	*938,906*	*938,906*	*908,314*	*30,592*	*908,314*	*30,592*
Junior Medical		*2.48*	144,727	144,727	144,727	0	144,727	0
		9.19	*1,083,633*	*1,083,633*	*1,053,041*	*30,592*	*1,053,041*	*30,592*
Administrative	4	6.50	163,359	163,359	160,266	3,093	160,266	3,093
Administrative	3	0.14	3,327	3,327	0	3,327	0	3,327
Administrative	*2*	2.49	58,326	58,326	*59,587*	*-1,261*	*59,587*	*-1,261*
		9.13	*225,012*	*225,012*	*219,853*	*5,159*	*219,853*	*5,159*
Senior Manager		0.50	36,366	36,366	30,968	5,397	30,968	5,397
Nursing	7	7.80	353,123	353,123	358,525	-5,403	358,525	-5,403
Nursing	6	9.36	440,598	440,598	433,971	6,627	433,971	6,627
Nursing	5	54.30	1,908,216	1,908,216	1,909,150	-934	1,909,150	-934
Nursing	2	23.88	564,576	564,576	638,386	-73,810	638,386	-73,810
Housekeepers	2	2.00	58,025	58,025	44,495	13,531	44,495	13,531
Phlebotomist	2	0.53	11,900	11,900	11,791	109	11,791	109
		98.37	*3,372,803*	*3,372,803*	*3,427,287*	*-54,483*	*3,427,287*	*-54,483*
Psychologist	8B	1.00	66,035	66,035	71,915	-5,880	71,915	-5,880
Orthotist	7	0.20	9,597	9,597	9,597	0	9,597	0
AHP	7	12.26	557,832	557,832	577,011	-19,179	577,011	-19,179
		13.46	*633,464*	*633,464*	*658,523*	*-25,059*	*658,523*	*-25,059*
Total Staff		**130.15**	**5,314,913**	**5,314,913**	**5,358,703**	**-43,791**	**5,358,703**	**-43,791**
Supplies Costs								
Drugs			167,650	167,650	208,466	-40,816	208,466	-40,816
Surgical Sundries			495,241	495,241	408,117	87,124	408,117	87,124
CSSD/Diagnostic Supplies			4,604	4,604	3,144	1,460	3,144	1,460
Other Therapeutic Supplies			114,341	114,341	124,912	-10,570	124,912	-10,570
Equipment/Other admin supplies			57,027	57,027	88,817	-31,790	88,817	-31,790
Hotel Services			41,759	41,759	40,099	1,660	40,099	1,660
Direct Supplies			**880,621**	**880,621**	**873,553**	**7,068**	**873,553**	**7,068**
Charges from other Health Boards								
Lothian Spinal Clinic			5,277	5,277	5,277	0	5,277	0
Charges from other Health Boards			**5,277**	**5,277**	**5,277**	**0**	**5,277**	**0**
Allocated Costs								
Medical Records			106,683	106,683	110,513	-3,830	110,513	-3,830
Building Costs			208,342	208,342	207,267	1,075	207,267	1,075
Domestic Services			70,450	70,450	72,257	-1,807	72,257	-1,807
Catering			191,915	191,915	198,806	-6,891	198,806	-6,891
Laundry			69,287	69,287	68,249	1,038	68,249	1,038
Neuroradiology			80,713	80,713	82,765	-2,053	82,765	-2,053
Laboratories			81,175	81,175	83,257	-2,081	83,257	-2,081
Anaesthetics			38,533	38,533	39,513	-980	39,513	-980
Portering			75,036	75,036	76,960	-1,924	76,960	-1,924
Phones			49,863	49,863	50,102	-239	50,102	-239
Scottish Ambulance Service			9,260	9,260	9,303	-43	9,303	-43
General Services			28,556	28,556	29,877	-1,321	29,877	-1,321
Allocated Costs			**1,009,813**	**1,009,813**	**1,028,869**	**-19,056**	**1,028,869**	**-19,056**
Total Supplies			**1,895,711**	**1,895,711**	**1,907,699**	**-11,988**	**1,907,699**	**-11,988**
Overhead Costs								
Fixed Costs								
Rates			60,612	60,612	60,612	0	60,612	0
Capital Charge			435,774	435,774	435,774	0	435,774	0
Overheads			154,556	154,556	154,556	0	154,556	0
Total Overheads			**650,942**	**650,942**	**650,942**	**0**	**650,942**	**0**
Total Expenditure		**130.15**	**7,861,566**	**7,861,566**	**7,917,345**	**-55,778**	**7,917,345**	**-55,778**
Post Graduate Dean Funding			-123,980	-123,980	-123,980	0	-123,980	0
Total Expenditure net of PGDF			**7,737,586**	**7,737,586**	**7,793,365**	**-55,778**	**7,793,365**	**-55,778**
Income from non-Scottish resident patients					-56,628	56,628	-56,628	56,628
Total Net Expenditure		**130.15**	**7,737,586**	**7,737,586**	**7,736,737**	**850**	**7,736,737**	**850**

B1 D Key Performance Indicators Summary

	14-15	15-16	16-17	17-18
New Admissions	164	150	161	**174**
New Outpatients	290	170	91	**50**
Key Performance Indicators				
Referrals				
All patients referred	586	564	598	**594**
Telephone advice	312	414	437	**420**
Complex advice with support/visit	110	84	153	**85**
New patient activity				
All patients admitted with neurological injury	120	114	122	**128**
All patients admitted with non-neurological injury	44	36	39	**46**
Surgical stabilisations:				
- Thoracolumbar fixations	28	45	32	**24**
- Elective removal of metalwork	3	5	9	**9**
- Cervical fixations	40	17	23	**23**
- Halo immobilizations	27	24	28	**23**
Spinal injury specific surgery:				
-Other	16	18	8	**5**
Implant spasm and pain control:				
- New pumps implanted	1	1	0	**0**
- Revision pumps	2	1	1	**0**
- Operational pumps	16	12	12	**11**
- Pump Refill QENSIU	9	8	8	**7**
- Pump Refill Local	7	4	4	**14**
Step down unit:				
- Episodes of care	44	47	51	**35**
- Number of families/people	19	32	51	**103**
- Number of days (nights)	78	108	135	**160**
- Relatives Room				
- Episodes of care	N/A	33	44	**49**
- Number of families / people	N/A	27	44	**61**
- Number of days (nights)	N/A	133	315	**286**
New inpatient occupied bed days				
Total Available (new & return)	17369	17428	16764	**17012**
Actual	14,354	14765	14834	**13157**
Bed Occupancy %	82.6%	85%	87%	**77%**
Mean length of stay				
I	98	131	145	**125**
II	129	125	113	**114**
III	118	124	102	**113**
IV	29	25	24	**23**
All	75	87	82	**73**

Range of length of stay	2 - 416	1 - 497	1 - 339	**1 - 434**
Delays in discharge (actual v's intended)				
Number of patients discharged	164	144	160	**165**
Number of patients with delayed discharged	5	7	9	**7**
Length of delay (mean/mode)	38	26	27	**66**
% with no delay	97%	95%	94%	**96%**
Day case				
by NHS Board of Residence	See Table	See Table B1/A10	See Table B1/A10	See Table B1/A10
by reason for admission	See Table	See Table B1/A8	See Table B1/A8	See Table B1/A8
Outpatient activity				
New Patient no's QENSIU	See Table	See Table B1/A2	See Table B1/A2	See Table B1/A2
Return Patient no's QENSIU	See Table	See Table B1/A2	See Table B1/A2	See Table B1/A2
New Patient QENSIU (DNAs/ % attendance)	20%	25%	26%	**28%**
Return Patient QENSIU (DNAs/ % attendance)	26%	29%	28%	**22%**
New Outreach Clinics by Centre	See Table	See Table B1/A5	See Table B1/A5	See Table B1/A5
Return Outreach Clinics by Centre	See Table	See Table B1/A6	See Table B1/A6	See Table B1/A6
Attendance at New Outreach Clinics by Centre (DNAs/ % attendance)				
Attendance at Return Outreach Clinics by Centre (DNAs/ % attendance)				
Outpatients discharged in period				
Number of patients discharged from the service	Life Long Care	Life Long Care	Life Long Care	Life Long Care
Actual / Anticipated number of patients in service				
Allied Health Professionals activity	See Appendices	See Appendices	See Appendices	See Appendices
New Patient (DNAs/ % attendance)	See Tables	See Table B1/A3	See Table B1/A3	See Table B1/A3
Return Patient (DNAs/ % attendance)	See Tables	See Table B1/A3	See Table B1/A3	See Table B1/A3

As a specialised national service we conform to current and past relevant HEAT targets. (Health Improvement, Efficiency, Access, Treatment Targets). These are incorporated wherever possible in the relevant sections of the report (B3: C).

B2 Effectiveness

B2 A1 Clinical Audit Program

Audit Meetings are held monthly in the National Spinal Injuries Unit. In the last year eight primary audits have been performed along with at least monthly re-audit.

Audits have been presented by all disciplines of the Multi-disciplinary Team and reflects the Team's constant desire to monitor and improve the overall service provided to patients. Examples of primary audits resulting in significant change in practice include:

a. Audit of referrals to occupational therapy from Outreach Clinics
b. Thoracolumbar fractures and spine brace duration

Staff also participate in national and corporate audits including infection control, skin care, antibiotic and anti-thrombosis programmes.

B2 A2 Table Eighteen - Mechanism of Injury

The mechanism of injury of all admissions reflects changes seen in other areas of social activity. Falls remain the predominant mechanism of injury. Medical causes have increased in recent years due predominantly to vascular (strokes) and infectious causes. No pattern is identified. These patients are usually initially treated outside the trauma system and are diagnosed and referred much later than the traumatic group.

	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018
Fall	104	95	74	89	**89**
RTA	**28**	**40**	**35**	**33**	**40**
Motor vehicle	19	18	18	17	21
Motorcyclist	4	7	8	9	7
Bicyclist	1	14	9	6	9
Pedestrian	4	1	0	1	3
Medical	16	11	24	23	**29**
Industrial Injury	4	4	5	7	**5**
Assault	0	1	1	0	**0**
Penetrating Injuries	0	0	0	0	**1**
Sporting Injury	14	8	7	4	**5**
Domestic Injury	0	0	0	0	**0**
Self Harm	11	5	4	2	**3**
Other	0	0	0	3	**2**
Total	**177**	**164**	**150**	**161**	**174**

B2 A3 Clinical Governance

Senior medical and nursing staff meet quarterly with colleagues in the Directorate Clinical Governance programme. Standing items include Clinical Incident Review, Mortality Review, Risk Register and putting audit into practice. There were two category 4 or 5 incidents in the Unit. The Unit continues to adopt National Management Guidelines as appropriate.

There were eight deaths in the Unit. This is a crude mortality rate of 5% and reflects the age and severity of paralysis of these patients. All cases were reviewed at Mortality Meetings. There were no avoidable deaths. The majority of patients were elderly and frail. Paralysis in this group may sometimes not be survivable but whenever clinically realistic the Unit will accept such patients for assessment and treatment.

B2 B Clinical Outcomes/complication rates / external benchmarking

The Unit has provided outcome and activity figures since 1998 in this Annual Report and in specialised reviews. Clinicians and researchers have published many papers in the literature on a number of topics. Details of publications and complication rate are outlined in Sections B1 and B3.

External benchmarking remains difficult. We are not aware of any other publicly funded spinal service which provides lifelong care to such a geographically distinct population. We believe that the acuity and level of care provided in Glasgow, and the detail in the twenty-five year old database are probably unique worldwide.

B2 C Service Improvement

The service is subject to continual review.

B2 D Research

Research in basic sciences, prevention and clinical treatment including translational approaches is a fundamental and embedded function of the Unit. The ultimate aim is to act as a host and supporter of all basic scientists who can have a positive impact on the care of the traumatic spinal cord injured. We set up **SCI** ².The **S**cottish **C**entre for **I**nnovation in **S**pinal **C**ord **I**njury as an umbrella to support translational research in a clinical setting. The Unit is principally supported by Glasgow University whose Centre for Rehabilitation Engineering is based in the GU funded Research Mezzanine.

The Unit has a portfolio of research ranging from pre clinical e.g. olfactory ensheathed cells and scaffolds to clinical e.g. acute intervention studies, osteoporosis, brain computer interface, vibration and biomechanical modelling.

Examples of studies in the next year include recruitment to the multicentre European database of cord-injured patients (EMSCI), a prospective randomised trial of a neuroprotective agent (anti no-go) in acute cord injury (NISCI) and analysis of spinal cord demographics in Scotland using the national eDRIS data held by ISD.

The Unit will host the annual conference of the International Spinal Research Trust in July 2018 attended by research teams from throughout the world.

Papers and Authorship
See Appendix for Research Profile

B3 A1 Safety Risk Register

The Unit complies with all corporate, regional and local requirements and supports risk awareness and risk management.

B3 B1 Clinical Governance: Critical Incidence Reporting

A formal Critical Incident Reporting system is in place with a Clinical Incident defined as a potential or actual danger to patients, which could have been prevented by a change in practice. The Unit is included in the Regional Services Directorate for reporting purposes.

Table Nineteen and Twenty – Incident Reporting Summary

Category	Number
Pressure ulcer care	16
Medication incident	21
Contact with object/exposure to hazard	10
Medical device & equipment	2
Abscondment	2
Slips, trips & falls	54
Other	13
Security	1
Moving & handling	6
Violence & aggression	23
Fire alarm actuation	5
Needlestick injury	6
Building fault	1
Challenging behaviour	4
IT operations	1
Staffing levels	2
Lost specimen	2
Treatment issues	5
Discharge/transfer issue	2
Health records	1
Transfusion incident	1
Self harm	1
Total	**179**

All category 4/5 clinical incidents are investigated according to GGC policy. During the year there were two category 4 incidents. One was due to patient self medicating outwith staff knowledge. The second was a grade 4 pressure ulcer inherited from another GGC hospital.

Slips, Trips and Falls	
Fall from bed	5
Fall from chair	29
Fall from level	6
Slip/trip on level	6
Controlled	1
Unwitnessed	7

Pressure ulcer care	16
Total inherited	8
Total hospital acquired	8

Overall	
1 - Negligible	57
2 - Minor	111
3 - Moderate	9
4 - Major	2
5 - Extreme	0
Total	**179**

B3 C1 Scottish Patient Safety Programme (SPSP)

The Unit has been participating in the SPSP programme for the past 4 years. Many of the work streams are now embedded into every day practice.

Sepsis 6

Sepsis 6 bundle is to ensure early identification and treatment of potential sepsis in a timely manner. QENSIU implemented the Sepsis 6 bundle in 2014 and adapted a sepsis 6 sticker to meet local needs. It is now established into every day practice and works in conjunction with the deteriorating patient work stream. This work stream focuses in a early warning score (NEWS) in early detection of the deteriorating patient. This work stream was introduced throughout the Unit in 2016. The aim is to score 95%+. Scores range from 75%-96%. The team are using PDSA cycles to improve performance.

SAB Surveillance

This is monitored and reported monthly by infection control. Two new developments to improve/facilitate SAB management:

1. In those patients with SAB who are clinically improving with source control, completion of IV antibiotic therapy through Outpatient Parenteral Antibiotic Therapy may be possible following referral via Trakcare and contacting Outpatient Parenteral Antibiotic Therapy at QEUH.
2. The infection prevention control team will also routinely place a SAB sticker in the patient's case notes to provide a prompt for appropriate management and to highlight guidance. This should be completed and dated by medical staff during treatment of the SAB.

   Only one SAB was reported and identified as a possible contaminant.

Pressure Ulcers

All grade 2-4 pressure ulcers are recorded on Datix. These are recorded as hospital acquired or inherited. Hospital acquired pressure sores are investigated by the Corporate Tissue Viability Team and deemed as avoidable or unavoidable. Please see table 23.
In addition to this the Spinal Unit conducts its own Red Flag investigation into all pressure marks including grade one. As a result of these local investigations the Unit has implemented the following:
Immediate removal of pads from patients on bed rest post bowel care.
Purchase of padded footplates for shower chairs.

Ventilator Associated Pneumonia (VAP). Only Edenhall submits data in relation to this bundle. No VAPs were recorded this year.

B3 C2 Table Twenty-one and Twenty-two - Hospital Acquired Infection

Monitoring of infection control practices is now being recorded using an electronic tool called Symbiotix. The audit tool will be looking at compliance with Standard Infection Control Precautions, Transmission based precautions and compliance with PVC, CVC and Urinary Catheter care plans. In 2017 Edenhall scored 95% (gold status) Philipshill scored 85% (green status) and outpatient department scored 95% (gold status).

	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018
Total patients req. Isolation	6	4	1	5
Salmonella	0	0	0	0
Clostridium Difficile	2	0	2	1
MRSA	5	4	0	2
Streptococcus pyogenes	0	0	0	1
Scabies/ TB /Varicella Zoster	0	0	0	1
MDR Acinetobacter	1	0	0	0
Patients treated in isolation	4	3	1	4
Patients not treated in isolation	4	1	0	1
Patients not suitable for isolation	3	1	0	0
No single room available	1	0	0	1

2017-2018	MRSA	C.Diff	MDR Acinetobacter
Edenhall	0	0	0
Philipshill	2	1	0

Edenhall Ward receives patients in the early stage after multiple trauma and many come from ITU or HDU areas and are a high risk group. The relatively low rates of infection continue to be a tribute to the standard of nursing care and policies within the Unit especially as regards bowel and bladder care.

B3 C3 Clinical Quality Indicators

Senior nursing staff monitor the following key quality indicators in accordance with GGC policy.

Both wards are maintaining green status (95% or above compliance) in Pressure Ulcer, Falls and Food, Fluid and Nutrition CQIs.

Care of Older People in Acute Care In support of the above standards the Unit has implemented “What matters to me” by introducing this question into the active patient care documentation. Redesign of patient care plans to ensure a more person centred approach. Roll out of TIME bundle in relation to delirium. There are three dementia champions between both wards.

Meal Time Bundle is a GGC initiative to monitor and improve patient meals and nutrition. Philipshill piloted a meal time coordinator. This is a member of nursing staff who for their shift do a sweep during meal times to ensure patients are happy with their meal and are

receiving appropriate assistance. This is now well established and the meal time coordinator can be identified by a green meal time coordinator badge.
Active Patient Care Active Care is a framework document which aims to embed person-centred care and to help prevent adverse events such as falls and pressure ulcers. Its aim is to be person centred using planned care timings based on clinical judgement to pre-empt the care needs of patients.

Caring Behaviours Assurance System Both wards have been involved in the CBAS programme, each area has designated champions and have created a PCQI (person centred quality instrument) for their area.

Care Assurance System (CAS) CAS has been developed to provide an assurance framework to support the delivery of safe, effective and person centred care across three West of Scotland Health Boards (NHSGGC, Ayrshire & Arran & Lanarkshire).

The framework which contains 13 professional care standards is based on a model used within Salford Royal NHS Foundation Trust. Each standard encompasses the 4 Leading Better Care Domains:

- Safe and effective patient care
- Enhancing the patients experience of care
- Leading, managing and developing the performance of the team
- Contributing to the organisation's objectives

CAS which was launched in NHSGGC in October 2015 also encompasses a number of the national drivers which the Spinal Unit has been actively involved in. This includes the Scottish Patient Safety Programme, Person Centred Health Care Collaborative, Older People in Acute Hospital Settings and HEI/HAI. Assurance visits to wards and departments will take place this year.

Of the 13 standards Edenhall have 10 green and 3 amber. Philipshill have 11 green and 2 amber.

B3 C4 Overall CQI Compliance Trends 2012-2018

As part of Leading Better Care 3 clinical quality indicators are assessed monthly providing real time data to the wards.

B3 C5 KSF Targets/TURAS

The Unit is compliant with KSF (Knowledge, Skill Framework) targets however in Jan 18 KSF was no longer available as NHSGGC transitioned to TURAS.

B3 D Adverse Events

B3 D1 Pressure Sore Prevalence

Table Twenty-three Overall Pressure Ulcer

Pressure Ulcer developed out with QENSIU =			Pressure Ulcer developed during stay in QENSIU =		
Grade 2 = 5	Grade 3 = 0	Grade 4 = 1	Grade 2 = 8	Grade 3 = 0	Grade 4 = 0

Two pressure ulcers were recorded as ungradable. One was inherited and one hospital acquired.

All pressure sores must be considered to be a failure of care to some extent. The best way of preventing sores outwith the Unit is to continue to admit new patients as soon as clinically safe to do so. The "red flag" system of Unit nursing and medical staff review every sore developing on the ward and make recommendations on any necessary changes in care.

B3 E Complaints / Compliments

B3 E1 Complaints

A formal complaint/suggestion system is in place at both Unit and hospital level. This has proved invaluable in monitoring quality and modifying the service. The management team recorded three formal complaints with none upheld and two informal complaints. Consultants and senior nursing staff continue to provide advice to the CLO regarding complaints involving management of patients outwith the Unit.

B3 E2 Compliments

Significant contributions are received from grateful patients, families and community groups to assist in purchasing items for patient treatment and comfort.

B4 Timely (Access)

B4 A Waiting / Response Times

QENSIU admits acutely injured spinal patients as soon as their condition allows. There is no waiting list for admission. In 2017-18 29% of patients were admitted within one day of injury and 64% within one week. The time to admission has been stable over several years. It remains difficult to decrease this time further; there is likely to be a cohort of polytrauma patients who will always require several days for resuscitation and treatment of life and limb-threatening injuries before they are fit for transfer. By comparison the mean admission times to some other UK units are two to three months. The gradual increase in numbers of patients paralysed by stroke or infection is likely to increase the average time to admission because these patients usually have a much more complicated pathway to diagnosis than the trauma group.

B4 B Review of Clinical Pathway

The national pathway to admission, designed twenty-five years ago has proven to be robust and provides a safe model for delivery of care to spinal-injured patients in Scotland. It has not been possible to obtain benchmarking figures from other UK centres but informal discussion with colleagues suggests that the Scottish figures would compare favourably against other centres.

B5 Person Centred

B5 A Patient Carer/Public Involvement

As a result of patient feedback the Unit has reviewed its education programme. Representatives from each of the charities Aspire, Back up and SIS met with Unit staff to discuss patient feedback and have introduced the following as a result: Amended posters introducing topic to make this more clear on what is being covered in session. Relatives invited to attend certain sessions. Peer support for practical workshops.

B5 B Leading Better Care/Person Centred Care
Caring Behaviours Assurance System (CBAS)

B5 C User Survey

The Unit continues to capture feedback from exit interviews which provides a rich source of qualitative data as well as quantitative data. Overall patients reported positive feedback regards their care experience stating staff were kind and compassionate in their care delivery. As a result of feedback we have introduced the following: After patient goal planning meetings a summary sheet of goals is kept at the patient's bedside for patients and families to sign when they feel goals have been achieved. Also used as an aide memoire to what was discussed. An area for development is clinical staff feedback to patients following investigations. Discussions with the team are held to look at how we take this forward.

The Unit has also been using the Corporate Universal Feedback Cards which we give to patients when they are leaving the ward. The feedback here reiterates what is being captured in the exit interviews. The ability to leave anonymous feedback has been welcomed by patients. Lack of choice or availability of meals was highlighted as an issue by one or two patients. This has now been addressed by the catering department.

B5 D Family Unit / Step Down Unit

Usage of this essential resource is rising. The step down facilities continue to support acute admissions, long stay and pre-discharge patients. 103 patients and their families have used the family suite on 35 occasions for a total of 160 nights. Evaluation of this facility has been positive with patients commenting it helps in the preparation for discharge. 61 families of acute admissions on 49 occasions have taken the opportunity to use the relatives' rooms in the first few days of admission totalling 286 days. Families have appreciated being so close during the early stages of injury.

B6 Equitable

B6 A Fair for all: Equality & Diversity

The Unit has developed to ensure equal access for all geographical areas of Scotland.

Table Twenty-four - Out-patient Services

	13/14	14/15	15/16	16/17	17/18
Return	2389	2378	2112	1943	**1704**
New	271	290	170	91	**50**

Table Twenty-five - Out-patient Clinic Location

FREQUENCY	LOCATION - QENSIU
DAILY	DROP IN
WEEKLY	NEW, RETURNS, SKIN, HALO, URODYNAMICS, SPASM, PUMP, ACUPUNCTURE, GENERAL SPINAL REVIEW, NEUROSURGERY, UROLOGY Awaiting new appointment
BI MONTHLY	FERTILITY, MDC/FDC, RESPIRATORY
MONTHLY	EDINBURGH
THREE MONTHLY	ABERDEEN, INVERNESS
SIX MONTHLY	DUMFRIES, BORDERS, ARBROATH
ANNUALLY	HUNTLY

Table Twenty-six - Out-patient By Centre

	13/14	14/15	15/16	16/17	17/18	CHANGE YEAR	TOTAL 1992-2018
New QENSIU	271	290	170	91	**50**	(45.1%)	**3345**
Return QENSIU	2014	1995	1728	1565	**1345**	(14.1%)	**40584**
Edinburgh	154	157	155	148	**142**	(4.1%)	**4093**
Inverness	63	63	63	59	**63**	+6.8%	**1159**
Aberdeen	74	76	71	77	**60**	(22.1%)	**1166**
Dumfries & Galloway	17	19	24	11	**28**	+154.5%	**344**
Borders	24	25	29	42	**22**	(47.6%)	**351**
Arbroath	29	27	26	24	**26**	+8.3%	**350**
Huntly	14	16	16	17	**18**	+5.9%	**141**
Total	**2660**	**2668**	**2282**	**2034**	**1754**	**(13.8%)**	**51533**

Table Twenty-seven - Number of patients on the Spinal Outreach clinic lists

Clinic	April 2014	April 2015	April 2016	April 2017	April 2018
Inverness	77	81	82	104	90
Aberdeen / Huntly	118	120	124	126	116
Borders	34	39	37	34	31
Dumfries	26	30	31	42	35
Arbroath	33	39	35	43	39
Edinburgh	142	134	155	157	159
Total	**430**	**443**	**464**	**506**	**470**

Table Twenty-eight - New Out-patient Activity by Health Board

	13/14	14/15	15/16	16/17	17/18
Ayrshire & Arran	16	26	6	7	**6**
Borders	1	1	1	0	**0**
Dumfries & Galloway	6	5	2	3	**3**
Fife	2	4	1	0	**0**
Forth Valley	11	9	1	3	**1**
Grampian	2	0	2	1	**0**
Greater Glasgow Clyde	193	197	123	59	**24**
Highland	9	7	5	3	**6**
Lanarkshire	21	33	25	12	**8**
Lothian	8	6	3	2	**2**
Shetland	0	0	0	0	**0**
Tayside	0	1	0	1	**0**
Orkney	0	0	0	0	**0**
Western Isles	2	1	1	0	**0**
ECR	0	0	0	0	**0**
Unknown	0	0	0	0	**0**
Total	**271**	**290**	**170**	**91**	**50**

B6 B Geographical Access

B6 B1 Nationwide services

As a national service it is important to provide outpatient and domiciliary services throughout Scotland. This has resulted in the development of the Liaison Sister service and outreach clinics in areas identified on our database as having a concentration of patients. All outreach clinics are now Medical Consultant led with Nursing and Occupational Therapy staff attending as required. Volunteers from SIS see and advise patients and carers. There is a continued demand for nurse specialists to provide important inpatient and outpatient advice to local care teams as well as patients themselves. As well as two Liaison Sisters there is an Education Sister, Respiratory Sister, and Discharge Planner. They all provide assistance to the Senior Nurse.

The Spinal Nurse Specialist team (Liaison Sisters) continue to visit patients wherever they are domiciled in Scotland. These visits may be post discharge visits, follow up visits or for education/training of families or carers. A telephone help and advice service continues to be maintained by the Spinal Nurse Specialist team taking approximately 15 - 20 telephone calls per day.

Sister Prempeh	95 visits covering	6,219 miles.
Sister Woods	94 visits covering	6,670 miles.
Sister Duffy	45 visits covering	3,696 miles.

Total numbers of visits, clinics and meetings carried out by the liaison nurses was 571 covering 16,585 miles.

B6 B2 Table Twenty-nine - Attendance and Location Outreach Clinics

Location	% Attendance 16-17	% Attendance 17-18	Number of Clinics	Number of Patients
Aberdeen	91%	**92%**	**5**	**60**
Inverness	92%	**94%**	**4**	**63**
Dumfries	100%	**96%**	**2**	**28**
Arbroath	89%	**87%**	**3**	**26**
Borders	100%	**100%**	**2**	**22**
Huntly	94%	**95%**	**1**	**18**
Edinburgh	90%	**92%**	**11**	**142**
Ave Rate	92%	**93%**	**28**	**359**

Outreach attendance remains high. Patients are contacted beforehand to confirm that the appointment is still convenient and appropriate.

Difficulties continue to be experienced in the drive towards electronic systems at outreach clinics. QENSIU staff often cannot access local e-systems to order tests or view results. Despite extensive discussion with IT colleagues the lack of national policy in this area is worrying and may affect our ability to provide care at outreach clinics. The situation is improving slowly.

B6 B3 Table Thirty - Annual Activity: Liaison Sisters

Name	Meetings	Clinics	Visits	Teaching Sessions	Miles
L. Woods	**122**	**16**	**94**	**6**	**6,670**
S. Prempeh	**119**	**15**	**95**	**8**	**6,219**

B6 B4 Table Thirty-one - Annual Activity: Respiratory Support Nurse

The Respiratory Support Sister remains very successful in co-ordinating inpatient and domiciliary ventilation. All patients requiring assisted ventilation at home have been visited during the year with 3696 road miles travelled.

Name	Meetings	Clinics	Visits	Teaching Sessions	Respiratory Referrals	Miles
L. Duffy	**49**	**16**	**45**	**30**	**18**	**3,696**

A major role has been coordinating discharge for those requiring assisted ventilation with social services and an appropriate care and training package.

B6 B5

Table Thirty-two - Annual Activity Education Sister: Helena Richmond

Name	Meetings	Clinics	Internal Teaching	External Teaching	Outreach Clinics	Patient Education	Relatives Day
M Hannah H Richmond	**41**	**0**	**259**	**164**	**1**	**497**	**2 (28 relatives)**

B6: B6 Location of Lothian Outreach Clinic

The Edinburgh outreach clinic has been at Astley Ainslie Hospital for several years. We still understand this hospital will close and have provisional plans to move the clinics to the Royal Edinburgh Hospital which is nearby and no disruption is expected to the service.

B6 B7 Table Thirty-three - Supporting Surgical Services

Multi-disciplinary medical rehabilitation is the keystone of the workload in Spinal Cord Injury. Surgical support is required from orthopaedics, neurosurgery and plastic surgery. Approximately twenty per cent of the patients have additional limb injuries.

Service	Clinics	Patients	Acute Spinal Operations	Elective Operations
Thoracolumbar 2 x Month	0	0	Thoracolumbar fixations 24	9
Neurosurgery LA, CM, CB 4 x Month	40	198	Cervical fixations 23	2
Skin Care/Other	31	41	0	3

Numbers of procedures have reduced. It seems likely that the orthopaedic spinal service at QEUH are operating appropriately on more of the neurologically intact patients All referrals and new admissions are discussed at the weekly team meeting with spinal and surgical consultants. This ensures a consensus approach to management for the benefit of the patients and mutual support of consultant staff for difficult clinical decisions. The team of neurosurgeons, Mr Mathieson, Mr Barrett and Mr Alakandy performed the spinal fixations and we also welcomed Mr Amato-Watkins, Consultant Neurosurgeon, to the team. Thanks are due to this surgical team for maintaining the thoracolumbar fixation service in the QEUH.

Mr Fraser continues to provide expert plastic and soft tissue surgery for complex pressure sores.

Section C Looking Ahead / Expected Change/Developments

Last year we noted the problems in accessing E-records across Health Board boundaries. We are encouraged by the gradual improvement in remote access of these records but until there is seamless national access we still must rely on paper records.

The Queen Elizabeth University Hospital continues to attract the most seriously ill and injured patients. The transformation to a Major Trauma Centre is likely to make even more demands on the acute spinal service and we are in discussion with the main hospital about the best way to look after such patients. Spinal injury consultants currently work 1:3 and

neither medical nor nursing staff have capacity or skills to regularly take acutely injured patients directly from the Emergency Department. We are exploring a combined rota with orthopaedics and neurosurgery which may make this feasible.

We are very grateful to the senior spinal doctor, Mr Fraser, who has continued to work part-time while his replacement was identified. We are very sorry that Mr Fraser will finally be leaving us at the end of June 2018 but are delighted to confirm the appointment of Mr Des Etages who will start as Consultant in Spinal Injuries in August 2018. Mr Des Etages is completing his Rehabilitation training in Edinburgh and has an extensive background in surgery and rehabilitation.

The existing Speciality Doctor post will eventually be converted to a consultant post which will ensure a consultant-led service in all aspects of the Unit and also give much more flexibility in job planning and rota coverage.

Horatio's Garden continues to flourish and is maturing into a beautiful oasis of nature in the midst of the Unit. The head Gardener, Sallie Sillars won Scotland's Gardener of the Year 2017. Thanks are due to Sallie's team for their care of both the Garden and the patients.

Section D Summary of Highlights (Celebration and Risk)

The Unit admitted its first patient in September 1992 and was officially opened by Her Majesty the Queen on 11th December 1992. The 25th anniversary of the opening was celebrated on 26th October 2017 (see Appendix). We were delighted to welcome old friends including Mr Edmond, the Unit founder, and Mr Allan, Director from 1999 to 2014. There was an evening of speeches and music. More importantly we were also delighted to welcome some patients admitted to the Unit in the first week of opening including our very first patient. Their survival must be due in part to the acute and long-term care provided by the Unit.

The model proposed by Mr Edmond remains robust. Despite an increase in numbers of paralysed patients, their age and severity of paralysis, the Unit continues to look after the majority of newly paralysed patients, in most cases, from the first week of injury through to lifelong care. Time from injury to admission matches or is better than any other Spinal Unit in the world and we believe that this model of prompt admission and treatment continues to provide the best possible long-term outcomes for patients.

The rehabilitation goal planning model remains efficient but needs constant review and senior staff have redesigned the pathway. We have introduced formal prognosis meetings with patients and used more focussed goals in the rehabilitation pathway.

The Unit is awaiting the final report of the (untriggered) major external review which we expect will provide a focus for future development.

Thanks must be given to the National Services Division and NHS Greater Glasgow and Clyde for their help and support in delivering the service.

Alan McLean FRCP
Lead Clinician
Queen Elizabeth National Spinal Injuries Unit

Acknowledgement is made to Leanne Wright and Irene McGonigle for producing the report and to Mariel Purcell and Michele Paterson for their contributions to the main report. Many thanks are due to all of the team that assisted in the maintenance of the database.

Appendix enclosed 25th Anniversary Booklet.

The front cover shows 25th Anniversary Celebration Evening 26th October 2017 with Mr Peter Edmond, the first Clinical Director of the Unit, Dr Alan McLean, the current Lead Clinician of the Unit and Mrs Michele Paterson the Unit's Lead Nurse.