



Queen Elizabeth National Spinal Injuries Unit for Scotland

ANNUAL REPORT 2012-13



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Section A Introduction

A1: Queen Elizabeth National Spinal injuries Unit for Scotland

A2: Aim and Date of Designation of Service

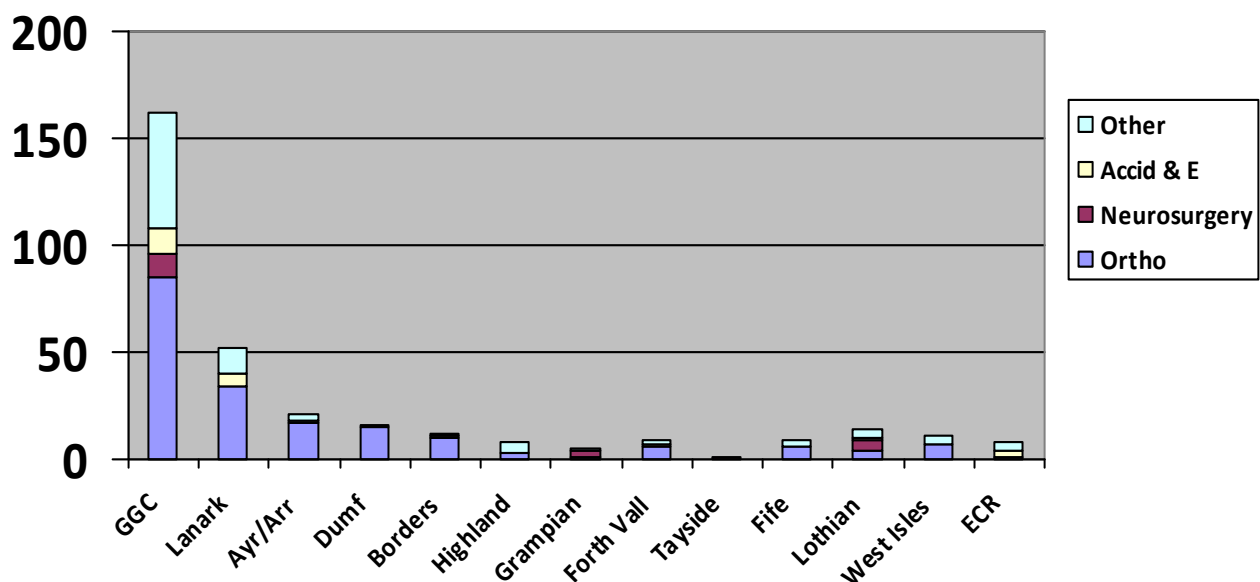
The Queen Elizabeth National Spinal Injuries Unit is responsible for the management of all patients in Scotland who have a traumatic injury to the spinal cord. Commissioned in 1992 it has continued to develop the management of the acute injury and life time care of all of its patients to maximise function and to prevent the complications of paralysis. Its facilities include a combined Admission Ward and HDU (Edanhall) and a Rehabilitation Ward (Philipshill). In addition there is a custom built Step-Down Unit and Research Mezzanine (GU). Clinical Services are provided at the Glasgow centre and appropriate outreach clinics or hospital wards as required.

This annual report and its associated appendices contain a comprehensive analysis of the Spinal Injury Unit's activity and the individual reports of each department or associated body.

A3: Description of Patient Pathways and Clinical Process

The unit accept all patients who are injured or domiciled in Scotland and are referred with a traumatic spinal cord injury. In addition complex fractures without neurological injury but who are at risk of neurological compromise or require expert assessment and treatment are admitted. 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.

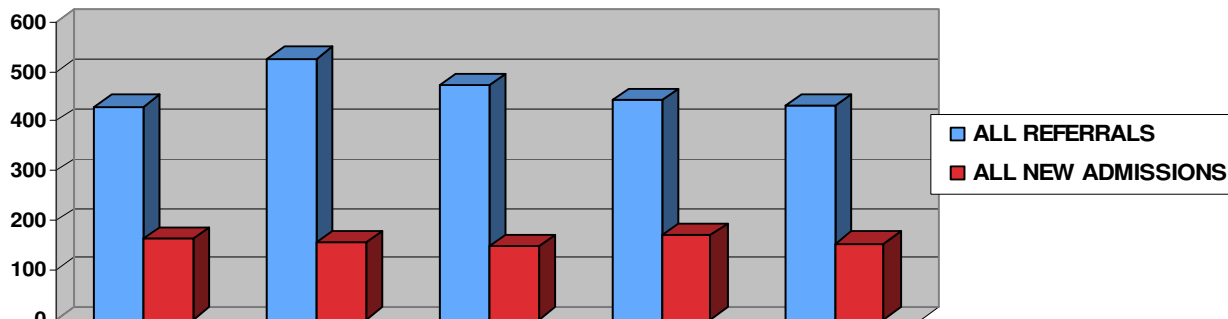
Fig One



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

Fig Two



prevent complications. Life expectancy without proper treatment is limited (36 months) but should approach normal with appropriate immediate care and life long follow up. All patients referred with a neurological injury (91) were admitted as soon as clinically indicated. The total number of patients (430) referred to the unit fell slightly, presumably following discussions, regarding the large number of referrals outside the target group, in previous years.

The number of neurological injured patients has remained stable over the last five years and is consistent with the population size. There was a further decrease in the number of non-neurological injured spinal fractures (62) admitted in line with a policy of managing such fractures local or at regional centres.

A small increase in the number of neurological injured patients significantly reduces the number of beds available for shorter stay patients. Two hundred and seventy seven non neurologically injured patients referred were not admitted and managed in the base hospital with appropriate advice and support from consultant medical staff and the Respiratory and Liaison Sisters.

Fig Three

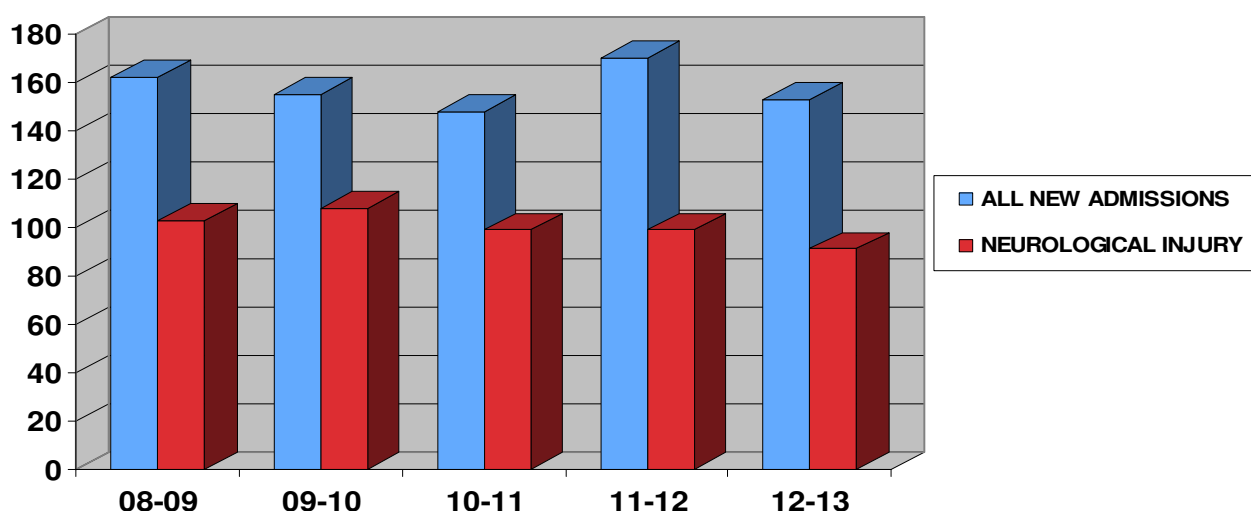


Table One

	08/09	09/10	10/11	11/12	12/13	92-13
ALL NEW ADMISSIONS	162	155	148	170	153	3314
Neurological	103	108	99	99	91	1716
Non-neurological	59	47	49	71	62	1598

The number of patients with a neurological deficit is stable (91-110 median 104). The number of referrals related to relatively minor spinal fractures without neurology continues cause concern. These patients are referred because of local bed pressures or a perceived difficulty in conservative management. The rationale for admitting all fractures is limited because of the distance involved, the lack of need for specialist care, the number of available beds and the varying case-mix amongst the neurological injuries.

Orthopaedic consultants or neuro-surgeons managed over two hundred and seventy seven patients without neurological deficit in the referral hospital. A number of patients were managed in the Neuro-surgical and Orthopaedic wards of the Southern General Hospital by the unit staff because of concomitant injuries or bed issues.

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 dependant. 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 Includes all patients with spinal fractures and incomplete or no paralysis. Many require significant input during their rehabilitation.

Fig Four: New Admissions by Case-Mix Complexity

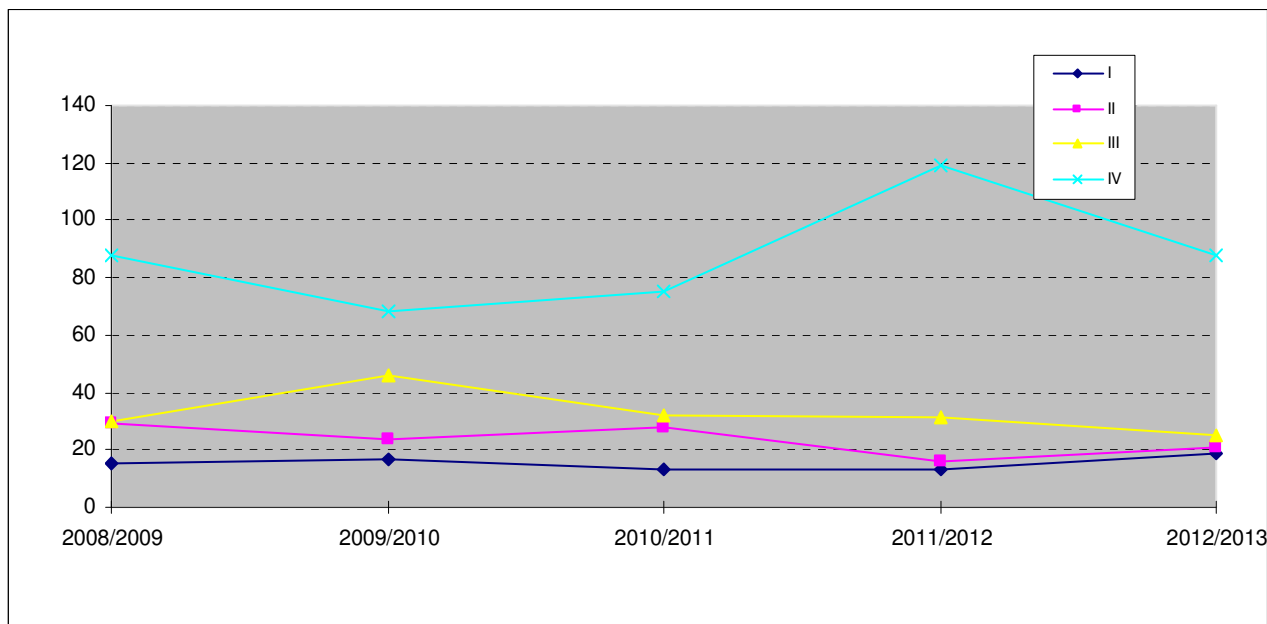


Table Two:

GROUP	08/09	09/10	10/11	11/12	12/13	92/13
I	15	17	13	13	19	254
II	29	24	28	16	21	519
III	30	46	32	31	25	725
IV	88	68	75	110	88	1816
Total	162	155	148	170	153	3314

The case mix varied within acceptable levels. There was a significant increase in the highly dependent groups I and II. The number of incomplete cervical injuries continues to rise. The variation in complexity in Group IV is better demonstrated by ASIA grades.

A3:A3 New Admissions by ASIA, Impairment Level.

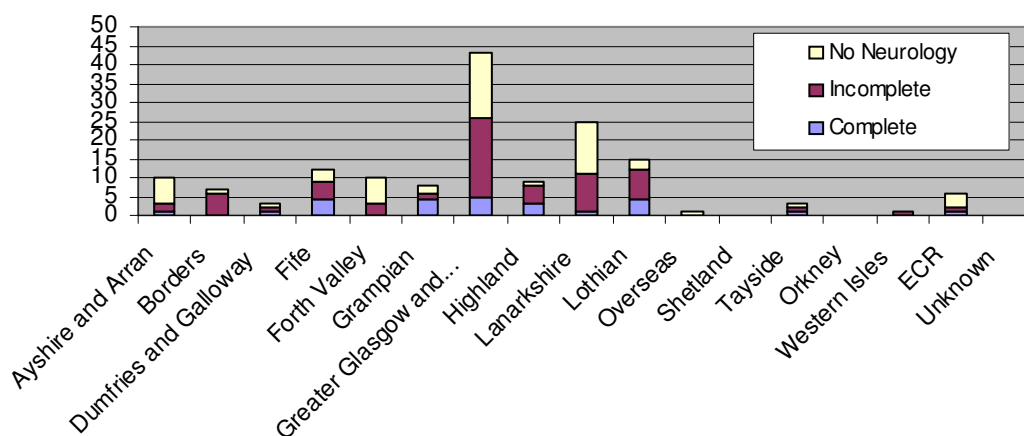
A	Complete: No motor or sensory function
B	Incomplete: Sensory but not motor function is preserved below the neurological level and includes S4-5
C	Incomplete: Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a motor grade less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

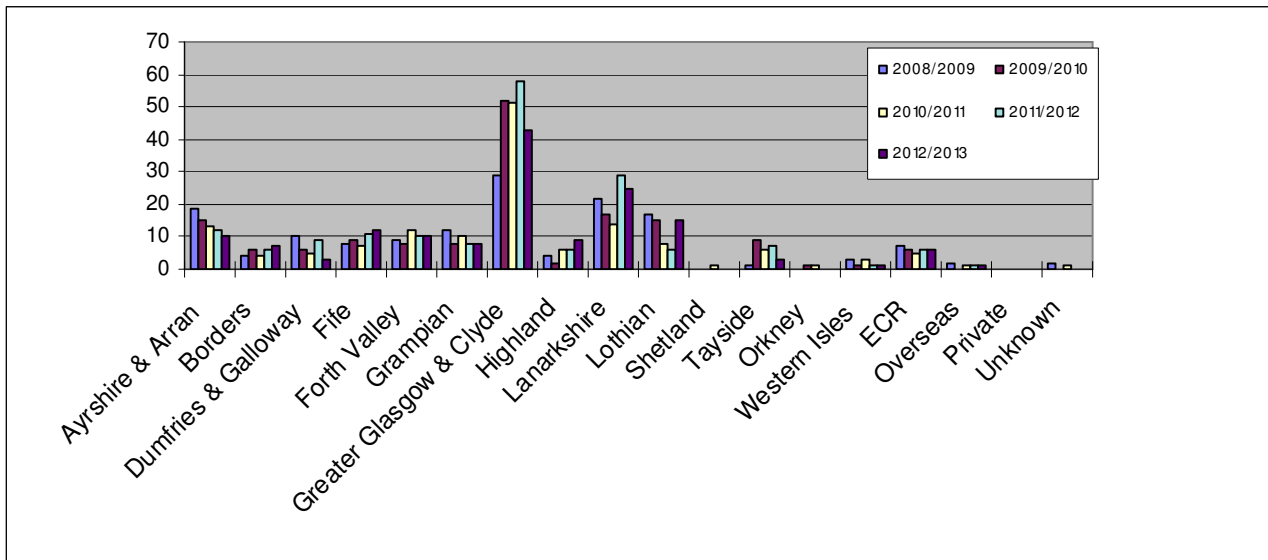
2012/2013	A	B	C	D	E	Total
Ayrshire & Arran	1	0	1	1	7	10
Borders	0	0	2	4	1	7
Dumfries & Galloway	1	0	0	1	1	3
Fife	4	0	4	2	2	12
Forth Valley	0	0	1	3	6	10
Grampian	4	0	1	1	2	8
Greater Glasgow Clyde	5	2	5	14	17	43
Highland	3	1	3	1	1	9
Lanarkshire	1	3	3	5	13	25
Lothian	4	1	4	3	3	15
Overseas	0	0	0	0	1	1
Shetland	0	0	0	0	0	0
Tayside	1	0	1	0	1	3
Orkney	0	0	0	0	0	0
Western Isles	0	0	1	0	0	1
ECR	1	0	0	1	4	6
Unknown	0	0	0	0	0	0
TOTAL	25	7	26	36	59	153

Fig Five: Admissions by Neurological Deficit and Health Board



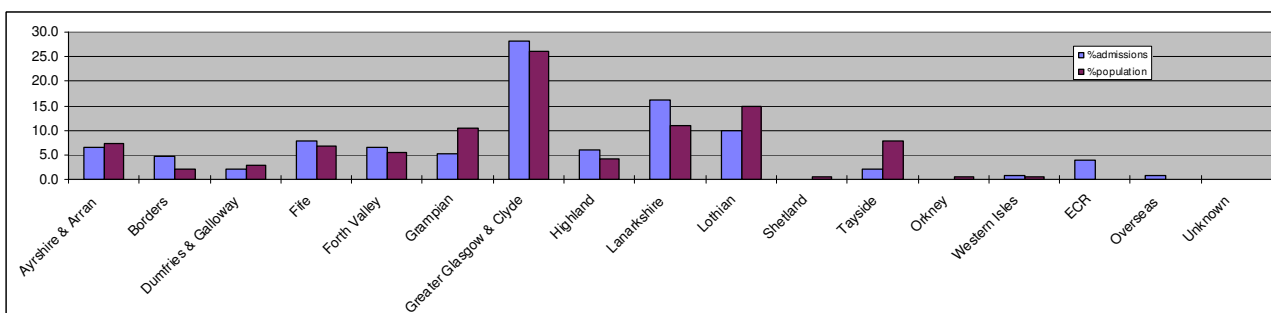
GGC is responsible for the largest number of complete and incomplete spinal cord injuries. The number of non-neurological injuries admitted from all regions and particularly from GGC has stabilised. The distribution of complete and incomplete injuries varies by year. All areas except Orkney and Shetland referred one or more patients with a neurological deficit. The distribution of admissions and the annual variation since the unit opened justifies the clinical and economic benefits of a national service.

Fig Six: New Admissions by Health Board of Residence 2008-2013



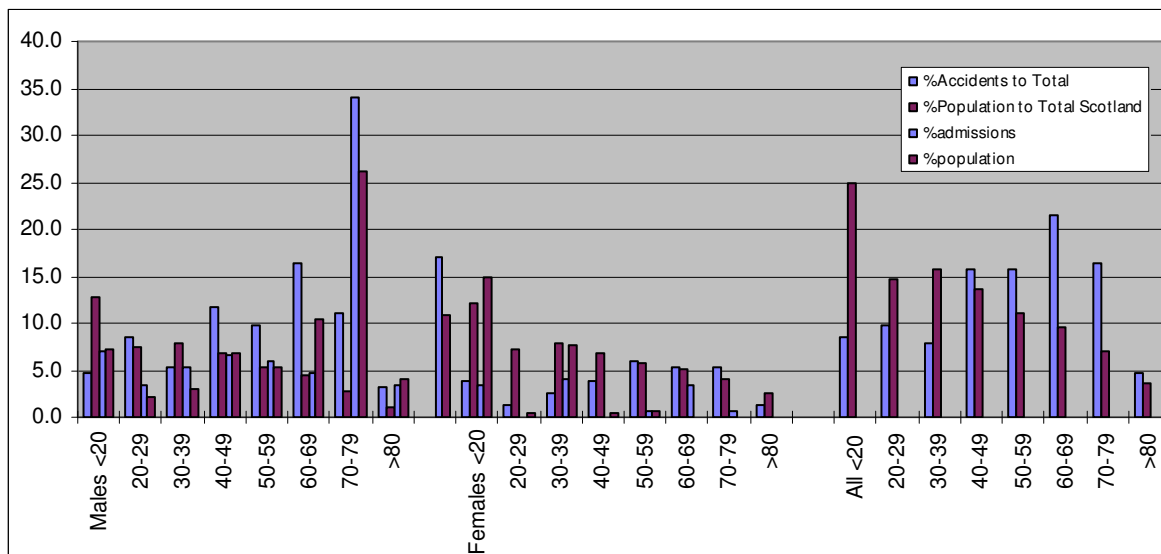
An increased referral pattern from some health boards reflects leisure-related accidents. Patients domiciled in Scotland but who are injured abroad are repatriated when clinically indicated and then recorded under their own health board.

Fig Seven: Admissions by Health Board compared with Population Size



There has been positive encouragement for consultant medical staff in Lothian, Tayside and Grampian to develop services for those patients with no neurological injury. This leads to a disproportionate number of admissions from other areas compared with population size who have no regional spinal service. Support is always available from the unit in the management of these patients.

Fig Eight: New Admissions by Age Group



The age distribution is as expected. There is a disproportionate preponderance of males in all age groups. The number of injuries in those under twenty remains low. The increase in age-related degenerative spinal fractures continues. The management of an increasing number of elderly patients with cervical injuries with no neurological deficit are managed as outpatients, and not reflected in admission figures but in the figures for referrals.

Fig Nine

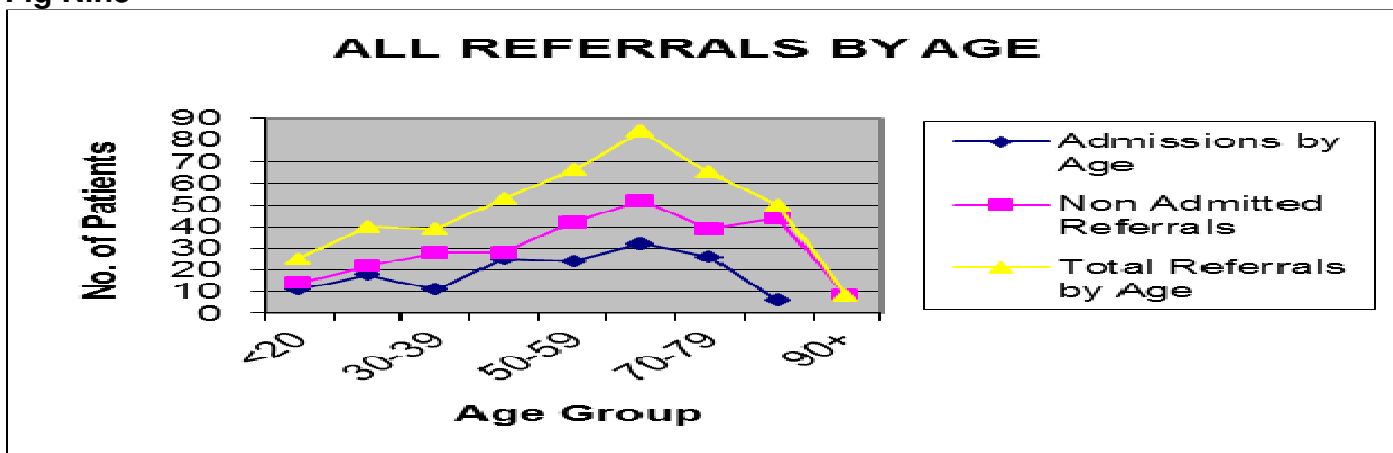
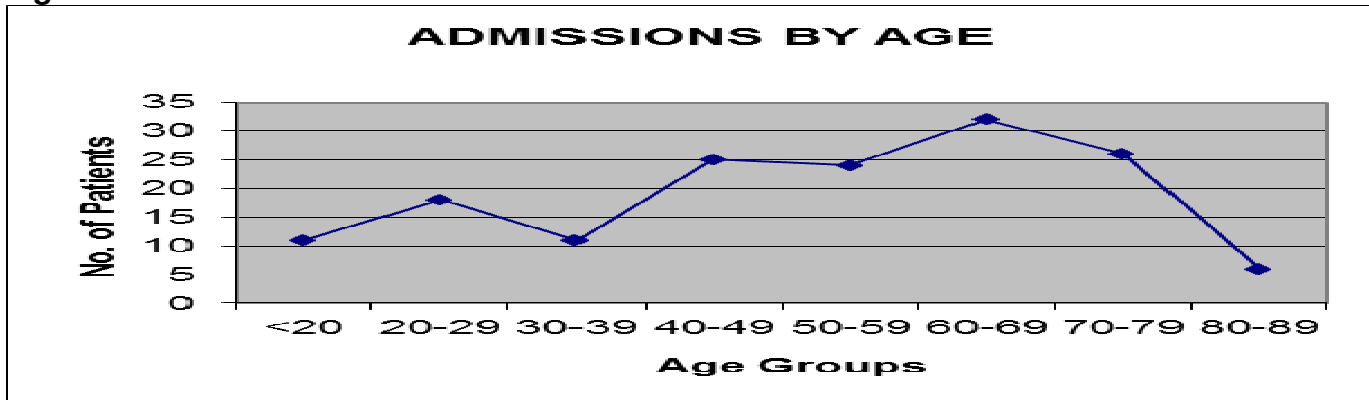


Fig Ten



In 2010 an audit demonstrated an increasing number of referrals from non-neurologically injured elderly cervical fractures. These are can be managed in the referral hospital but are resource hungry and ultimate placement is often problematic.

Table Four: Admissions by Anatomical Level and Severity

	Level	Complete	Incomplete	No Neurology	Total
<p>Vertebral Column (Right Lateral View)</p>	C 1	1	2	5	8
	2	1	2	6	9
	3	4	6	5	15
	4	3	15	2	20
	5	2	11	4	17
	6	2	6	4	12
	7	0	2	2	4
	8	0	0	0	0
	Sub-total	13	44	28	85
	T 1	0	0	2	2
	2	0	0	1	1
	3	0	1	1	2
	4	2	0	1	3
	5	0	0	1	1
	6	0	1	1	2
	7	3	1	0	4
	8	1	0	0	1
	9	1	0	1	2
	10	1	0	2	3
	11	0	2	2	4
	12	0	7	3	10
	Sub-total	8	12	15	35
	L 1	3	4	12	19
	2	0	2	3	5
	3	0	1	2	3
4	1	3	1	5	
5	0	0	1	1	
Sub-total	4	10	19	33	
S1-5	0	0	0	0	
Sub-total	0	0	0	0	
TOTAL	25	66	62	153	

Higher level counted in five multi level injuries

A3: B Care Pathway for Service or Programme

The unit is commissioned to care for all cases of traumatic spinal cord injury in Scotland. Immediate care, comprehensive rehabilitation and life-long care is provided at the centre in Glasgow and appropriate outreach clinics. If appropriate an integrated service is provided with local medical, nursing and paramedical 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 has a clearly defined target group based on need and specialisation. Some degree of filtering is inevitable and welcome to ensure that all appropriate need is met. Unrestricted demand or inappropriate referral can distort the system and increase the risk of appropriate care not being provided timeously. There is an increasing recognition of weaknesses in the provision of spinal orthopaedic services in Scotland and moves to rationalise the neurosurgical and orthopaedic components. A further pressure is the increasing referral of elderly patients with cervical fractures not requiring specialised acute management or rehabilitation. These lie out with the remit of the National Service and in many areas are managed extremely well locally, in close contact with their family. Many of these issues are illustrated in the patterns of referral seen in the last year.

Table Five: Health Board Referrals and Outcome

Referring Board	Total Referrals	Admissions	Not Admitted	% Admitted	Complex Advice Given
GGC	166	43	123	26%	35
Lanarkshire	84	25	59	30%	16
Ayr/Arran	40	10	30	25%	9
Dumfries	12	3	9	25%	3
Borders	8	7	1	88%	
Highland	15	9	6	60%	4
Grampian	9	8	1	89%	1
Forth Valley	35	10	25	29%	1
Tayside	4	3	1	75%	
Fife	13	12	1	92%	
Lothian	26	15	11	58%	7
Western Isles	9	1	8	11%	2
ECR	9	7	2	78%	1
Overseas					
Total	430	153	277	36%	79

The number of referral mirrors the population density and presence of local spinal services. All patients with a spinal cord injury are admitted as soon as practicable. All non-admissions had no significant neurology. The number of patients referred remains high and in (18%) cases detailed advice was given regarding management in the local hospital.

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

Referring Board	Level of Injury		Referring Speciality				Total
	Cervical	Thor/Lum	Ortho	Neurosurgery	A&E	Other	
GGC	69	54	68		16	36	123
Lanarkshire	31	28	30		15	14	59
Ayr/Arran	19	11	22		5	3	30
Dumfries	2	7	6		1	2	9
Borders	1		1				1
Highland	2	4	1			5	6
Grampian		1		1			1
Forth Valley	8	17	16		3	6	25
Tayside		1		1			1
Fife		1			1		1
Lothian	5	6	3	3		5	11
Western Isle	5	3	4		2	2	8
ECR		2				2	2
Overseas							
Total	142	135	151	8	43	75	277

These indicate the Health Board, Anatomical Area and Speciality Referring for those patients not admitted. Orthopaedics (55%) remains the principle user of the service. Neurosurgery (3%) and increasingly Accident and Emergency (16%) refer relatively small numbers (19%) but “Others” (27%) including Medicine, Neurology, Care of the Elderly etc. is an increasing user.

Section B: Quality Domains

B1 Efficiency

B1: A Actual v Planned activity

B1: A1 In-patient Activity: Table Seven A

	11-12	12-13
New admissions	170	153
New outpatients	188	232

B1: A2 Out-patient activity: Table Seven B

	08/09	09/10	10/11	11/12	12/13
Return	2182	2182	2193	2293	2243
New	307	192	229	188	232

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 Orthopaedics, Neurosurgery, Urology, Rehabilitation and Pain Management supplement the nurse led Annual Review Clinics for those patients with a neurological deficit. Increasingly efficient clinical management limits annual increases in return patients.

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

	08/09	09/10	10/11	11/12	12/13	%
Return	2182	2182	2193	2293	2243	
DNA Return	-	-	804	527	665	30%
New	307	192	229	188	232	
DNA New	0	0	0	33	49	21%

The number of return outpatients is stable and reflects the prevalence of the spinal cord injured population in Scotland. The DNA rate reflects the nature and length of follow up and the fragility of the population.

B1: A4 Out Patient Clinic Location and Frequency

Table Eight

Frequency	Location			
Weekly	QENSIU New, Skin Respiratory	QENSIU Return, Halo, Fertility	Orthopaedics, Neurosurgery Urology	
Monthly	Edinburgh			
Three Monthly	Aberdeen	Inverness		
Six Monthly	Dumfries	Borders	Arbroath	Huntly

Location and frequency of out-patient clinics and outreach services are based on the National Database that commenced in 1992. The outreach clinics are supervised by medical staff and are involve medical, nursing and paramedical staff. Spinal Injuries Scotland attend for peer group support.

B1: A5 New Out-Patient Activity by Health Board

Table Nine

	08/09	09/10	10/11	11/12	12/13
Ayrshire & Arran	20	18	21	15	16
Borders	3	3	1	2	2
Dumfries & Galloway	12	8	7	3	6
Fife	9	1	7	4	2
Forth Valley	20	16	17	14	4
Grampian	8	4	3	3	0
Greater Glasgow Clyde	160	91	136	105	154
Highland	4	2	4	4	0
Lanarkshire	49	32	20	27	35
Lothian	11	11	8	3	7
Shetland	0	0	1	0	0
Tayside	6	4	3	8	4
Orkney	0	0	0	0	0
Western Isles	4	1	0	0	1
ECR	0	1	1	0	1
Unknown	1	0	0	0	0
Total	307	192	229	188	232

B1: A6 Out -Patient Activity by Centre

Table 10:

	08/09	09/10	10/11	11/12	12/13	CHANGE YEAR	TOTAL 1992-2013
New QENSIU	307	192	229	188	232	+ 23%	2473
Return QENSIU	1830	1825	1861	1876	1878	+ 0.1%	31937
Edinburgh	169	168	162	174	148	(15%)	3337
Inverness	62	45	49	62	60	(3.2%)	848
Aberdeen	62	68	61	85	66	(22%)	808
Dumfries & Galloway	28	14	9	27	20	(26%)	245
Borders	9	36	19	15	26	+ 73%	209
Arbroath	22	26	14	31	26	(16%)	218
Huntly	0	0	18	23	19	(17%)	60
Total	2489	2374	2422	2481	2475	(0.2%)	40135

B1 A6 Outpatient Activity by Specialty at QENSIU

Table Eleven:

		08/09	09/10	10/11	11/12	12/13
Orthopaedics	DBA	107	128	126	163	144
Neurosurgery	LA	39	52	41	70	50
Neurosurgery	JB/ CM	50	53	46	25	24
Urology	GC/ VG	467	475	541	390	450
Skin Care		75	68	52	59	68
Pain / Spasm		26	29	19	16	13
Neuroprosthetics	TH/MF	19	23	22	32	21
Sexual Dysfunction		36	19	28	19	14
Respiratory		9	7	8	9	28
Fertility		0	8	3	11	3
Spinal Injury Annual Review	TOTAL	1002	963	975	1082	1063
	MEDICAL	632	638	595	690	680
	NURSING	370	325	380	392	383
Total		1830	1825	1861	1876	1878

The Consultant Clinics in Orthopaedics and Neurosurgery see new and return patients until they can be discharged or referred to the annual review clinics. The Spinal Injury Annual Review clinics are a large component of the commitment to life- long care. These are nurse led with only sixty three per cent of patients requiring medical input. There is an open door policy for patients and inevitable some activity remains under-reported. Urology clinics are available to investigate or treat bladder dysfunction at any stage. Neuro-prosthetics includes assessment and surgery for upper limb problems principally in tetraplegics.

B1: A7 Day Case Activity

Day case activity continues to offer an important service 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.

B1: A9 Waiting Times

B1: A10 Waiting Times Outpatient Clinics

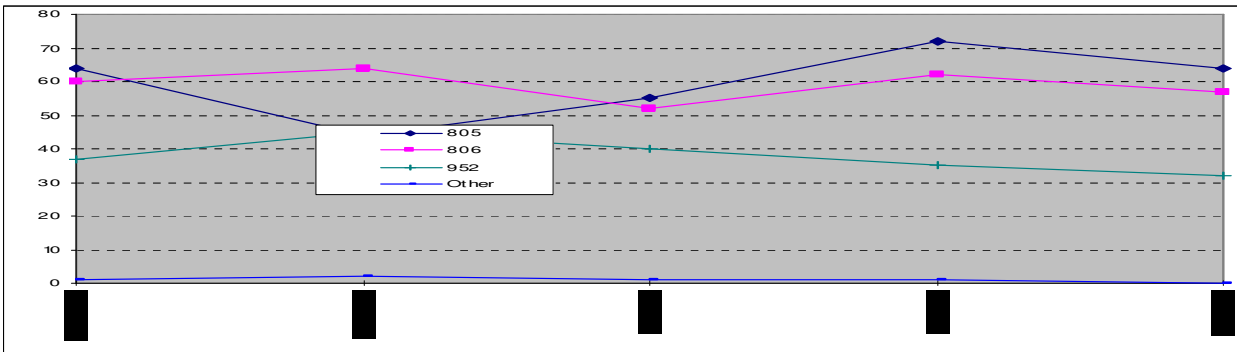
There is an open door policy to the Nurse Led Clinics. Medical advice is always available and was requested in thirty six per cent of patients. Patient satisfaction remains high with this team approach. The maximum waiting time for new elective outpatient appointments is four weeks.

B1: B1 Use of Resources

The unit admits on 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. The changing demands in acute care may result in shorter transfer times of bed occupancy allows. Bed availability is dependent on the case mix presenting over time and the length of stay of each patient. 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.

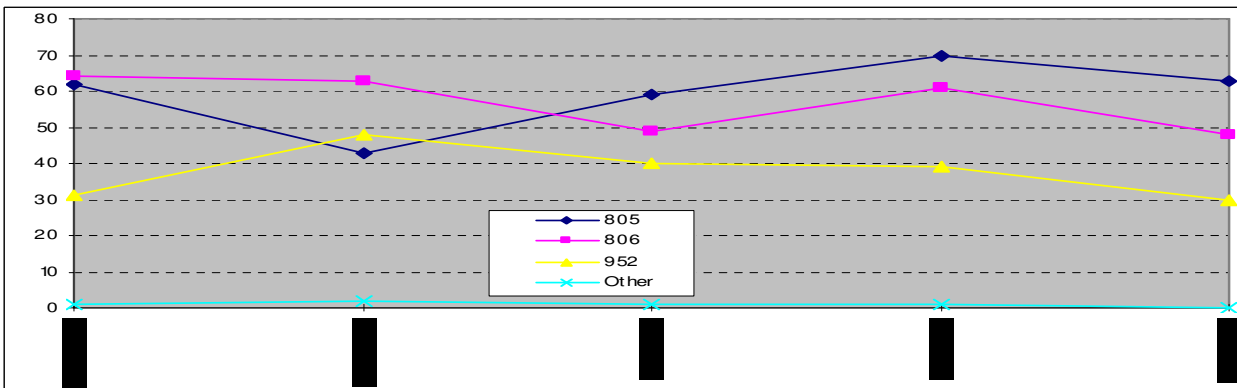
B1: B2 Admissions by Degree of Injury

Fig Twelve



B1: B3 Discharges by Degree of Injury

Fig Thirteen



B1: B4 Admissions and Discharges for Non Traumatic Spinal Cord Injury (ICD 9 Code 952)

This includes eligible admissions who do not sustain a bony traumatic injury and whose cord injury is non-progressive and suitable for rehabilitation.

Table Thirteen:

2012/2013	Admissions	Discharges
Central Cord Lesion	22	22
Infection	2	1
Vascular	5	5
Tumour	0	0
Surgical	1	0
Non-specific Lumbar Lesions	2	2
Penetrating Wounds gun/stab	0	0
Other	0	0
Total	32	30

B1: B5 Length of Stay by Level of Spinal Cord Injury

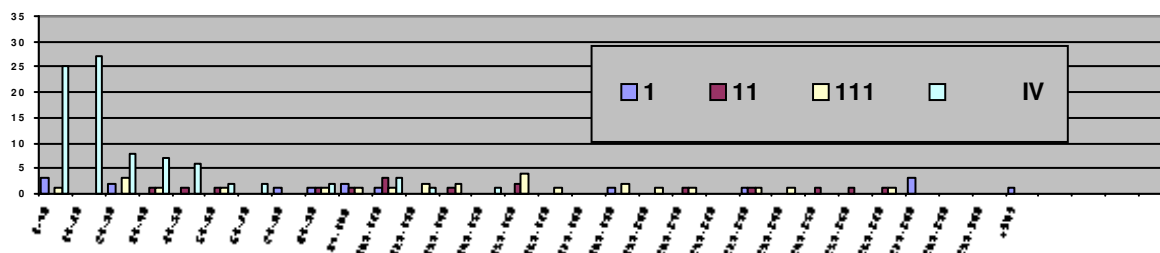
Table Fourteen

Case Mix	No.of Patients	Mean L.O.S.	Range of L.O.S.
I	16	135	1 - 414
II	16	142	34 - 262
III	25	131	1 - 269
IV	84	28	3 - 149
All	141	72	1 - 414

Throughout the last ten years there has been significant effort spent on reducing the mean length of stay within the unit. The wide variation of length of stay within each classification is indicative of the variation in the rehabilitation needs within each group.

There is a significant variation in the resources used by each group as has previously been demonstrated. The non-neurological group has a significant lower length of stay and lesser impact on the service.

Fig Fourteen:



Over seventy five per cent of Group iv (no neurology) were discharged within four weeks, fifty per cent within ten days. The distribution follows the predicted dependence and rehabilitation needs of the respective injuries.

B1: B6 Bed Utilisation

Table Fifteen:

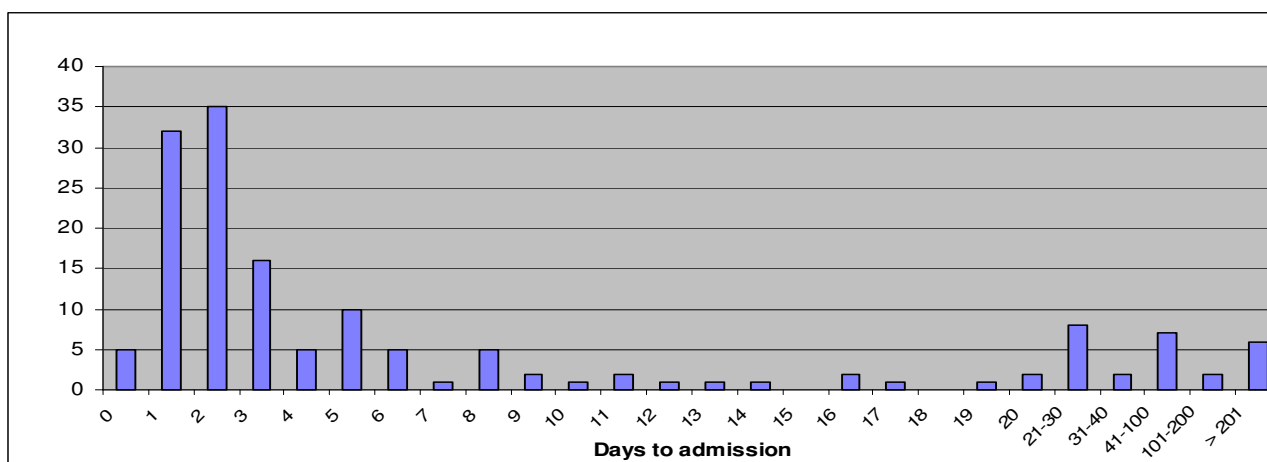
Spinal Injury Unit Edenhall HDU 12		Philipshill36							
Bed Comp	Alloc staffed	Borrowed	Lent	Temp	Available staffed	Total Occ Bed Days	Pats on Pass	Actual Occ Bed Days	% Occupied
48					17,505			14,313	81.7
Discharged									

B1: B7 Time to Admission, Length of Stay and Delay in Discharge

B1:B8 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 2012-13 24 per cent of patients were admitted within twenty-four hours of referral. Forty seven per cent were admitted within forty-eight hours and fifty seven per cent within four days. seventy per cent were admitted within one week. This time pattern is consistent with previous years and early admission was achieved wherever possible. This provides immediate support to the patient and family and prevents complications. A previous audit of acute admissions indicated that in only one third of patients the time of admission was related to bed issues with the rest related to severity of injury, transport difficulties or delay in diagnosis or presentation. The introduction of early intervention strategies will increase pressure for earlier admission.

Fig Sixteen A:



Early referral and co-operation between the staff in the Unit and the referral hospital ensures immediate admission if clinically indicated. Telephone advice is always available for those patients who are not immediately transferred. The referral proforma, transfer documentation and admission form continues to be successful in facilitating and auditing the process. It has been internationally recognised and copied.

Direct admission to orthopaedic or neurosurgical wards for surgical stabilisation may increase the time to admission but may be appropriate to reduce transfers of potentially unstable patients.

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

Most patients admitted after seven days have conditions that do not require immediate treatment or have additional co-morbidities that require medical intervention in the referring hospital prior to transfer. A few new patients have undergone initial rehabilitation in another centre and are admitted to the unit for reassessment or treatment of complications many months post injury.

Table Sixteen A: Days to Admission by Range

	No. of Patients	Mean Time (Days)	Range of Time
2008-2009	162	81	0 - 9582
2009-2010	155	15	0 - 265
2010-2011	148	258	0 - 19749
2011-2012	170	19	0 - 438
2012-2013	153	185	0 - 10598

* includes admissions years after injury managed elsewhere

Fig Sixteen B: Days to Admission by Grade

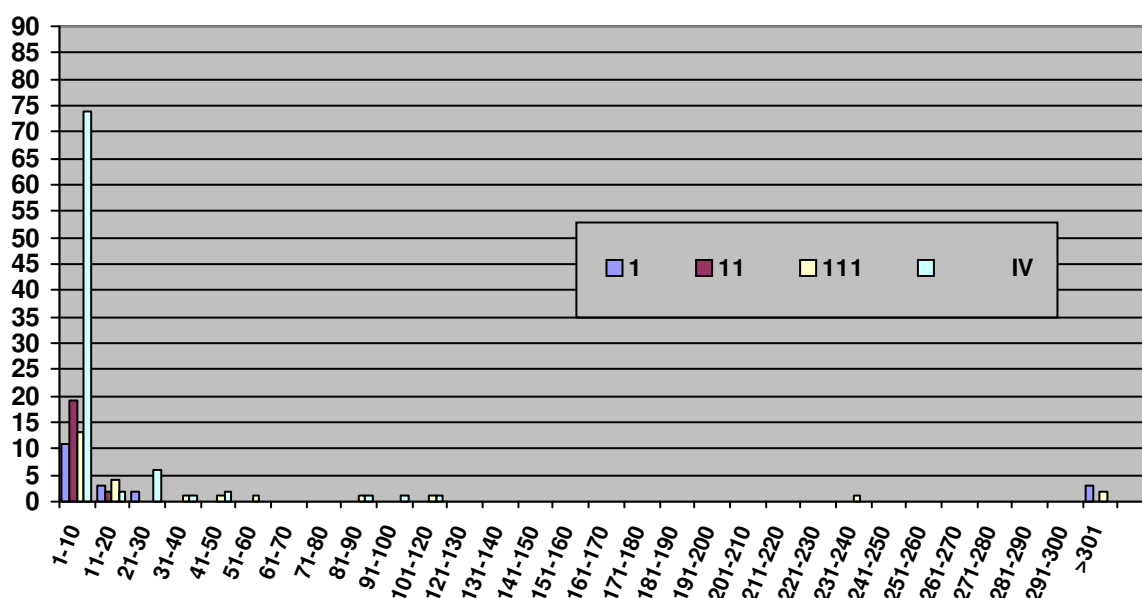


Table Seventeen: Delayed Discharge

	No. of Patients Discharged	No. of Patients Delayed	Mean delay (days)	Range of Delay (days)	NO DELAY
2008/2009	158	5	178	35 – 489	97%
2009/2010	156	3	92	29 – 151	98%
2010/2011	149	2	52	2 – 101	99%
2011/2012	171	2	37	35 - 38	98.8%
2012/2013	141	2	130	62 – 197	98.6%

The philosophy of the unit is to set, as early as possible, realistic targets for each patient in their rehabilitation. One such target is a discharge date.

B1: B9 Re-admissions to the unit

The majority of neurologically injured patients discharged from the unit never require re-admission. They attend annually or bi-annually as out-patients for lifelong follow up. In some ways readmission at any time must be regarded as a failure.

There were fifty six readmissions to the unit during the year, a significant shortfall on the contract estimate of two hundred readmissions, skin problems predominate.

B1: B10 Ventilated Bed Days

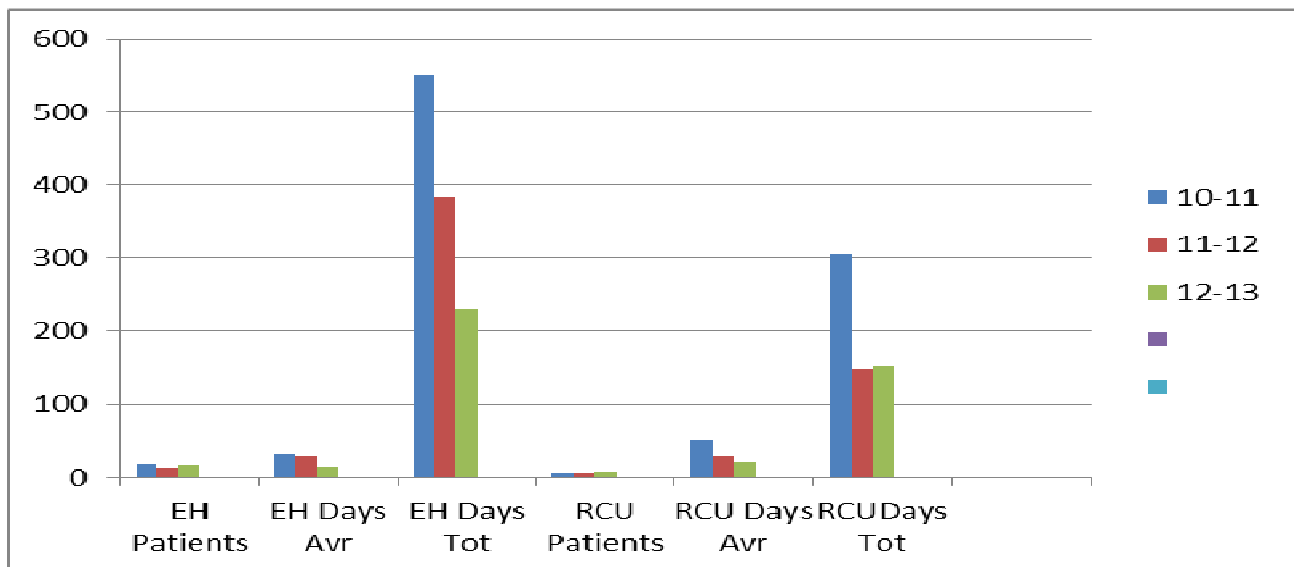
High-level spinal cord injury often requires temporary or permanent ventilator support. The Respiratory Care Team consists of a Consultant Respiratory Physician and a Respiratory Care Sister who work closely with the neuro-anaesthetic service providing in-patient care and a domiciliary ventilation service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

Table Eighteen:

		No. Patients	Ave. Ventilated Days	Total Ventilated Days
08-09	Edenhall	15	35	527
	RCU	5	127	635
09-10	Edenhall	19	30	572
	RCU	7	160	1117
10-11	Edenhall	17	32	551
	RCU	6	51	305
11-12	Edenhall	13	29	383
	RCU	5	29	146
12-13	Edenhall	16	14	229
	RCU	7	22	151

Each patient is counted only once but may be responsible for multiple episodes of care or inter ward transfers if their condition varies. The variable number of patients requiring ventilation and the increasing importance of RCU mirrors changes in the age and type of patient needing respiratory support. Case-mix and increasing expertise explains the decrease in the average and total ventilated bed days in the last two years.

Fig Seventeen: Ventilated Patients Bed Days and Trends



Evidence of increasingly rapid weaning from ventilation although no consideration taken of neurological level, severity or age.

B1: C1 Finance Report 2012-13

	AfC Band	WTE	Contract Value 2012/13 £	Budget YTD £	Actual YTD £	Variance YTD £	Year End Forecast £	Year End Forecast Variance
Dedicated Staff Costs								
Administrative	4	6.50	153,892	153,892	155,122	-1,230	155,122	-1,230
Administrative	3	0.14	3,134	3,134	3,253	-119	3,253	-119
Administrative	2	2.49	54,946	54,946	50,619	4,327	50,619	4,327
Medical		9.19	935,199	935,199	986,223	-51,024	986,223	-51,024
Senior Manager		0.50	34,258	34,258	51,317	-17,059	51,317	-17,059
Nursing	7	7.80	332,658	332,658	289,244	43,413	289,244	43,413
Nursing	6	9.36	415,064	415,064	421,570	-6,506	421,570	-6,506
Nursing	5	52.30	1,731,415	1,731,415	1,799,534	-68,119	1,799,534	-68,119
Nursing	2	23.88	531,856	531,856	507,706	24,150	507,706	24,150
Housekeepers	2	2.00	54,662	54,662	55,651	-988	55,651	-988
Psychologist	7	1.00	42,854	42,854	0	42,854	0	42,854
Paramedical	7	12.26	525,512	525,512	535,100	-9,588	535,100	-9,588
Total Staff		127.42	£ 4,815,450	£ 4,815,450	£ 4,855,338	- £ 39,888	£ 4,855,338	- £ 39,888
Supplies Costs								
Administrative			108,465	108,465	120,810	-12,345	120,810	-12,345
Medical			4,139	4,139	4,139	0	4,139	0
Nursing			11,771	11,771	16,088	-4,317	16,088	-4,317
Paramedical			18,802	18,802	19,087	-285	19,087	-285
Pharmacy			607,765	607,765	567,430	40,335	567,430	40,335
Surgical Appliances			104,541	104,541	155,624	-51,083	155,624	-51,083
Direct Supplies			£ 855,482	£ 855,482	£ 883,178	- £ 27,696	£ 883,178	- £ 27,696
Charges from other Health Boards								
Lothian Spinal Clinic			5,071	5,071	5,071	0	5,071	0
Charges from other Health Boards			£ 5,071	£ 5,071	£ 5,071	£ 0	£ 5,071	£ 0
Allocated Costs								
Medical Records			101,505	101,505	107,865	-6,360	107,865	-6,360
Building Costs			198,230	198,230	202,314	-4,084	202,314	-4,084
Domestic Services			66,367	66,367	70,526	-4,159	70,526	-4,159
Catering			182,600	182,600	194,043	-11,442	194,043	-11,442
Laundry			65,272	65,272	66,618	-1,346	66,618	-1,346
Neuroradiology			76,035	76,035	80,783	-4,748	80,783	-4,748
Laboratories			87,681	87,681	93,156	-5,475	93,156	-5,475
Anaesthetics			36,300	36,300	38,566	-2,267	38,566	-2,267
Portering			70,687	70,687	75,116	-4,429	75,116	-4,429
Phones			47,918	47,918	48,905	-988	48,905	-988
Scottish Ambulance Service			8,898	8,898	9,080	-182	9,080	-182
General Services			27,442	27,442	29,161	-1,719	29,161	-1,719
Allocated Costs			£ 968,936	£ 968,936	£ 1,016,134	- £ 47,199	£ 1,016,134	- £ 47,199
Total Supplies			£ 1,829,489	£ 1,829,489	£ 1,904,383	- £ 74,894	£ 1,904,383	- £ 74,894
Overhead Costs								
Fixed costs								
Rates			58,247	58,247	58,247	0	58,247	0
Capital Charge			435,774	435,774	435,774	0	435,774	0
Trust Overheads			148,525	148,525	148,525	0	148,525	0
Total Overheads			£ 642,546	£ 642,546	£ 642,546	£ 0	£ 642,546	£ 0
Total Expenditure		127.42	£ 7,287,485	£ 7,287,485	£ 7,402,267	- £ 114,783	£ 7,402,267	- £ 114,783
Postgraduate Dean Funding			-119,142	-119,142	-119,142	0	-119,142	0
Total Expenditure net of Postgraduate Dean Funding			£ 7,168,343	£ 7,168,343	£ 7,283,125	- £ 114,783	£ 7,283,125	- £ 114,783
Funding from Non Scottish Residents			0	0	-46,030	46,030	-46,030	46,030
Total Net Expenditure			£ 7,168,343	£ 7,168,343	£ 7,237,095	- £ 68,753	£ 7,237,095	-£ 68,753

B1: D1 Key Performance Indicators Summary

	10-11	11-12	12-13
New admissions	148	170	153
New outpatients	229	188	232

<i>Key Performance Indicators</i>			
Referrals			
All patients referred	472	441	430
Telephone advice ¹	324	271	277
Complex advice with support			79
New inpatient activity²			
All patients admitted with neurological injury	99	100	91
All patients admitted with non-neurological injury	49	70	62
Surgical stabilisations:			
- Thoraco lumbar fixations and removals	33	28	34+6
- Cervical fixations	23+	23+	20+
- Halo immobilizations	9	39	20
Spinal injury specific surgery:			
- Theatre lists	29	33	
- Individual procedures	55	46	39
- Surgical specialties	7	4	4
Implant pain control:			
- New pumps implanted	1	0	0
- Revision pumps	0	1	2
- Operational pumps	23	21	16
- Pump Refill QENSU	18	14	12
- Pump Refill Local	7	7	6
Step down unit:			
- Episodes of care	30	32	26
- Number of families/people	30	14 / 93	14 / 69
- Number of days (nights)	172	80	53
New inpatient occupied bed days			
Total Available (new & return)	17,447	17605	17,505
Actual	15,566	13610	14,313

¹Patients managed in referral hospital with non-neurological deficit

²To provide breakdown of: case complexity and new admissions by ASIA impairment level; admissions by neurological deficit; admissions by non-neurological deficit; reason for admission, population size; age group; and health board

Key Performance Indicators			
Bed Occupancy %	90%	78%	81.7%
Mean length of stay			
I	161	172	135
II	154	167	142
III	130	119	131
IV	24	31	28
All	84	74	80
median length of stay	MM	MM	72
Range of length of stay	1-355	1-434	1 - 414
Delays in discharge (actual v's intended)			
Number of patients discharged	149	171	141
Number of patients with delayed discharged	2	2	2
Length of delay (mean/mode)	52	37	130
% with no delay	98%	99%	98.6%
Re-admissions – Return inpatient activity			
by NHS Board of Residence			NA
by reason for admission			NA
Return inpatient occupied bed days			
Total Available (new & return)			NA
Available			NA
Bed Occupancy % (target >85%)			NA
mean length of stay			NA
median length of stay			NA
range of length of stay			NA
Day case			
by NHS Board of Residence			See Table
by reason for admission			See Table
Outpatient activity			
New Patient no's Southern General			See Table
Return Patient no's Southern General			See Table
New Patient Southern General (DNAs/ % attendance)			21%
Return Patient Southern General (DNAs/ % attendance)			30%
New Outreach Clinics by Centre			NA
Return Outreach Clinics by Centre			(See Tables)
Attendance at New Outreach Clinics by Centre (DNAs/ % attendance)			NA
Attendance at Return Outreach Clinics by Centre (DNAs/ % attendance)			See Table

<i>Key Performance Indicators</i>			
Outpatients discharged in period			NA
Number of patients discharged from the service			Life Long Care
Actual / Anticipated number of patients in service			
Allied Health Professionals activity ³			SEE APPENDICES
New Patient no's			A3 A
Return Patient no's			SEE TABLES
New Patient (DNAs/ % attendance)			SEE TABLES
Return Patient (DNAs/ % attendance)			SEE TABLES

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

There is a multidisciplinary audit programme overseen by senior medical and nursing staff. Meetings and presentations are held monthly. In the last year the Unit has completed 10 audits and also participates in the National Scottish Patient's Safety programme which requires continuing re-auditing of care. Publications of National Outcomes from this audit will allow us to benchmark ourselves against other Scottish wards.

Recent changes to practice resulting from audit include optimising time of referral to social work, reduction in skin marks and faster mobilisation of paralysed patients. Details are include in relevant sections.

³Report for each individual profession e.g. physiotherapy, OT, psychology etc.

B2: A2 Mechanism of Injury

The mechanism of injury of all admissions reflects changes seen in other areas of social activity and change. Medical causes, domestic and Para suicide remain stable. The number of sporting injuries has reduced but two rugby injuries required in-patient care and two out-patient care.

Table Nineteen :

	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013
Fall	73	77	72	93	73
RTA	40	40	34	36	43
Motor vehicle	27	19	22	21	21
Motorcyclist	8	12	6	7	9
Bicyclist	3	9	4	4	9
Pedestrian	2	0	2	4	4
Secondary to Medical Diagnosis	18	15	21	16	13
Industrial Injury	1	6	2	5	8
Assault	1	0	2	3	0
Penetrating Injuries	3	3	2	0	0
Sporting Injury	19	10	11	13	12
Domestic Injury	1	1	3	1	0
Self Harm	1	3	1	3	4
Other	5	0	0	0	0
Total	162	155	148	170	153

B2: A3 Clinical Governance

Senior medical and nursing staff meets quarterly with colleagues in the Health Board Clinical Governance programme. Outstanding items include Clinical Incident Review, Mortality Review, Risk Register and putting audit into practice. There have been no serious (category 4 or 5) clinical incidents in the past year. The Unit continues to adopt National Management Guidelines as appropriate. Some patients have sustained very severe trauma or complications of paralysis and it is not possible to prevent all deaths. All have been reviewed and no risk factors or adverse events identified.

B2: B Clinical Outcomes/complication rates / external benchmarking

The unit has provided outcome figures since 1998 in the annual report and in specialised ad hoc reviews. Substantive peer reviewed papers have been published in the literature on a number of topics. Details of publications and complication rate are outlined in Sections B1 and B3.

External Benchmarking is a identified goal in SCI management. The unit is the only UK contributor to the European EMSCI database. Last year the North of England and separate South of England database where launched and became partially active. Enrolling in the UK data set is currently premature. The Scottish database combines management and clinical information and enables good service management and development.

B2 C1 Service Improvement

The service is subject to continual review.

B2 D1 Research

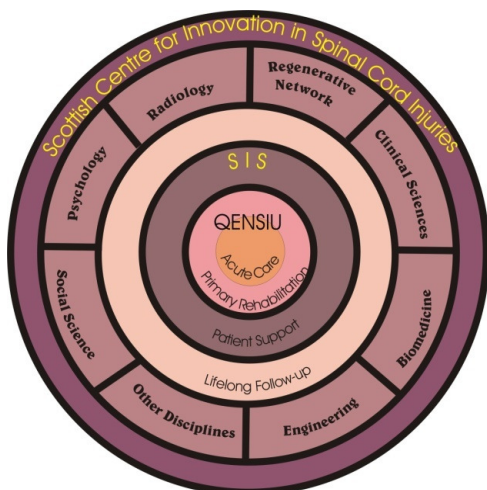
Morbidity and mortality following spinal cord injury was reduced dramatically following the introduction of specialised spinal cord injury units. Life expectancy has been increased from a few years to approaching normal and the complications of injury are routinely monitored for, treated or prevented. Three areas remain of concern. Mortality secondary to cardiovascular disease and suicide is unchanged and there has been no progress in developing primary treatments for spinal cord injury.

The unit has a portfolio of research ranging from olfactory stem cells, brain computer interfaces, robotic exercise, FES cycling and FES respiratory support.

A detailed research profile for the inauguration of the **Scottish Centre for Innovation In Spinal Cord Injury (SCI²)** Is available at www.http.scisci.org



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 have set up **SCI²**. The **Scottish Centre for Innovation in Spinal Cord Injury** 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 acts as a embedded research micro site within the NHS to promote research and provide access and stimulation

for clinicians, patients and researchers to work together. This year saw a research video with the RSA and a paper with the Glasgow School of Art. In the next year a design research fellow will be working for three years looking at innovative policies in rehabilitation. The unit will also be leading a multicentre trial in an early intervention drug for SCI.

Papers and Authorship

SCI² Oct 1999 - March 2012

Year	Papers	NHS	NHS G U	NHS S U	NHS C U	NHS Stir U	GU	SU	NHS SU GU	other
2013	9	1	4	1	0	0	0	0	0	3
2012	4	0	2	0	0	1	1	0	0	0
2011	10	3	2	2	1	0	1	0	1	0
2010	12	2	3	1	0	2	4	0	0	0
2009	14	1	7	0	0	0	4	2	0	0
2008	19	2	6	0	1	1	9	0	0	0
2007	10	2	4	1	0	0	2	1	0	0
2006	6	2	2	1	0	0	0	1	0	0
2005	5	2	1	0	0	0	1	1	0	0
2004	9	3	1	0	1	0	3	1	0	0
2003	4	2	1	0	0	0	1	0	0	0
2002	9	5	1	0	0	0	2	1	0	0
2001	6	1	1	0	0	0	3	1	0	0
2000	2	0	0	0	0	0	1	1	0	0

Only papers with direct involvement with mezzanine or SCI

NHS- National Health Service, GU-Glasgow University, SU -Strathclyde University, CU-Caledonian University, Stir U -Stirling University

A detailed explanation of **SCI²** is available @ SCISCI.ac.uk

Papers 2013

Galen S.S., Clarke C.J., Mclean, A.N., Allan D.B., Conway BA, "Changes in Muscle strength in key lower limb muscles following Robot Assisted Gait Training" In review

Dickson A, Duffy,L., Allan DB, . "Adjustment and coping in ventilator dependant patients following a traumatic spinal cord injury; an interpretive phenomenological analysis". J Health Psychology Completed 2013

Coupaud, S., MacLean A., Allan, D.B., "Patient-specific finite-element models to characterise effects of altered bone mineral density distribution in the tibia resulting from disuse" Journal of Biomechanics Submitted 2013

McLachlan, Angus J.; McLean, Alan N.; Allan, David B.; Gollee, H. "Changes in pulmonary function measures following a passive abdominal functional electrical stimulation training program"

Journal of Spinal Cord Medicine Volume: 36 Issue: 2 Pages: 97-103 Published: MAR 2013

Craven C.D., Gollee H., Coupaud S., Purcell M.,P., Allan, D.,B., "Investigation of robotic-assisted tilt-table therapy for early-stage spinal cord rehabilitation" J Rehabil Res Dev 2013;50(3):XXXX

Lindsay, S.L., Johnston, S.A., Mountford, J.C., Sheikh, S., Allan, D.B., Clark, L. and Barnett, S.C. 2013 "Human mesenchymal stem cells isolated from olfactory biopsies but not bone enhance CNS myelination in vitro" *Glia*, 61(3). pp368-382 ISSN 0894-1491 (doi:10.1002/glia.22440)

Macdonald, A.S. 2013 "The Inner Resource: enabling the designer within us all – a case study" *The Design Journal* Vol16, Issue 2 pp175-196

Campbell E., *Design and Rehabilitation* <<http://www.the.rsa.org/action-research-centre/enterprise-and-design/design/design-and-rehabilitation>. 2013

Anwar, F., Al-Khayer, A., El-Mahrouki, H., Purcell, M. "Gastrointestinal bleeding in spinal injuries: is prophylaxis essential?" *British Journal of Medical Practitioners* March 2013 Vol6 No1

Papers 2012

Coupaud, S.; McLean, A.; Allan, D.B. "Early identification of patients with rapid bone loss following spinal cord injury, using peripheral Quantitative Computed Tomography (pQCT)" *Osteoporosis International* Volume: 23 Supplement: 2 Pages: S179-S180 Published: MAR 2012

Berry H.R., Perret C., Kakebeeke T.H., Donaldson N. and Hunt K. "Energetics of paraplegic cycling: adaptations to 12 months of high volume training. *Technology and health care*" 2012, 20(2):73-84, January

Coupaud S. Mclean A.N., Lloyd S., Allan D.B., "Predicting patient specific rates of bone loss at fracture prone sites after spinal cord injury" *Disability Rehabil* 2012 Dec Vol 34 No 26 2242-2250

Dickson A, O'Brien G, Ward R, Flowers P, Allan DB, O'Carroll R. "Adjustment and coping in spousal caregivers following a traumatic spinal cord injury; an interpretive phenomenological analysis". *J Health Psychology* 2012 Mar; 17 (2):247-57 Epub 2011

Papers 2011

Fang J., Gollee H., Galen S., Allan D. B. Conway B.A. Vuckovic "Kinematic Modelling of a Robotic Gait Device for early rehabilitation of Walking" *J. Engineering in Medicine*: 2011 vol 255 no 12 1177-1187

Anderson J., Allan D.B., "Vertebral fractures secondary to suicide attempts: Demographic and patient outcomes in a Scottish Rehabilitation Unit" *J Spinal Cord Med* 2011; 34(4):380-7

Coulter E.H., Dall P.M., Rochester L., Hasler J.P., Granat M.H. "Development and Validation of a Physical Activity Monitor for use on a wheelchair" *Spinal Cord* 2011 Mar; 49(3):445-5

Jack, L.P., Purcell M.P., Allan D.B., Hunt K.J. "The metabolic cost of passive walking during robotics assisted treadmill exercise," *Technol. Health Care*, 2011, vol 19, no1, pp21-27

Ellaway PH, Kuppaswamy AV, Basasubramaniam R, Maksimovic R, Gall A, Craggs M, Mathias CJ, Bacon M, Prochazka A, Kowalczewski J, Conway BA, Galen S, Caton CJ, Allan DB, Curt A, Wirth B, van Hedel HJA. "Development of quantitative and sensitive assessments of physiological and functional outcome during recovery from spinal cord injury": A Clinical Initiative *Brain Res Bull.*, 2011, vol 84, no 4-5, pp 343-357

Anwar F, Al Khayer A., Joseph G., Fraser M.H., Jigajinni M.V., Allan D.B. "Delayed presentation and diagnosis of cervical spine injuries in long standing ankylosing spondylitis" Eur Spine J. 2011 Mar; 20(3):403-7

Gulati A. Yeo CY, Cooney A.D., McLean A., Fraser M.H., Allan D.B. "Functional outcome and discharge destination in elderly patients with spinal cord injuries". Spinal Cord 2011 vol 49, no 2, pp 215-218

Gawthrop P., Loram L., Lakie M., Gollee H., "Intermittant control: a computational theory of human control." Biol Cybern, 2011, vol 104, no 1-2 pp 31-51

Galen S. S., Catton CJ, Allan DB, Conway BA "A Portable assessment tool to assess changes in temporal gait parameters in SCI" Med. Eng. Phys., 2011, vol 33, no 5 pp 626-632

B3: A1 Safety Risk Register

The unit complies with all corporate, regional and local requirements and is actively involved in supporting and promulgating risk awareness and risk management.

B3: B1 Clinical Governance: Critical Incident 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 Eighteen Nineteen and Twenty:

Category	Number		Slips, Trips & Falls
Violence & Aggression	20	Fall from bed	6
Challenging Behaviours	2	Fall from Chair	26
Abscondment	2	Fall from level	11
Moving & Handling	9	Slip on Level	2
Building Faults	8	Suspected fall	1
Fire Alarm Activations	2	Other	2
Clinical – other	7	Total	48
Medication Incident	11		
Contact with or exposure to hazard	8		
Other	12	1- Negligible	74
Medical Devices & Equipment	3	2 – Minor	43
Slips, trips and Falls	48	3 – Moderate	49
Needlesticks / sharps injury	1	4 – Major	0
Pressure Ulcer Care	3	5 – Extreme	0
Total	137	Total	137

The unit maintains an active CI reporting system and has encountered no level four or above incidents in the year.

B3 C1 Scottish Patient Safety Programme (SPSP)

The Scottish Patient Safety Programme aims to improve the safety and reliability of hospital care throughout Scotland. This is achieved by using evidence based tools to improve the reliability and safety of everyday health care. The current aims are to:

- Reduce Hospital Acquired Infection
- Reduce adverse drug incidents
- Increase critical care outcomes]
- Increase organizational and leadership culture and safety
- Healthcare Associated Infection (HAI)

There are five workstreams, Edenhall Ward is within the Critical care/HDU work stream and Philipshill Ward is in the general work stream.

B3: C2 Hospital Acquired Infection- Sister Paterson

The problem of MRSA continues to be monitored within the Unit and every effort is made to try and reduce the periods in isolation. Periods in isolation significantly affect the rehabilitation timetable and every attempt is made to reduce this to a minimum.

Table Twenty:

	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/2013
Total patients req. Isolation	N/A	N/A	N/A	0	N/A
Salmonella	0	0	0	0	0
Clostridium Difficile	2	4	3	0	0
MRSA	24	15	11	4*	4
Streptococcus pyogenes	1	0	1	1	1
Scabies	0	0	0	0	0
TB	0	0	0	0	0
Varicella Zoster	0	0	0	0	0
Patient days in isolation	N/A	N/A	N/A	0	152+2
Ave. days in isolation	N/A	N/A	N/A	0	N/A

* Colonisation

Table Twenty- one:

2012-2013	MRSA	C.Diff	Other HIA
Edenhall	4	0	
Philipshill	0	0	Gp A Strep

The figures are gratifying, especially as Philipshill Ward had a full complement of beds throughout and includes long term ventilated patients. 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. It is unit policy to screen for MRSA prior to transfer but some patients require admission despite being possible MRSA positive. The low rates of infection are a tribute to the standard of nursing care and policies within the unit especially as regards bowel care

B3: C3 Clinical Quality Indicators- Education Sister Helena Richmond

Audit and Governance

Documentation Audit

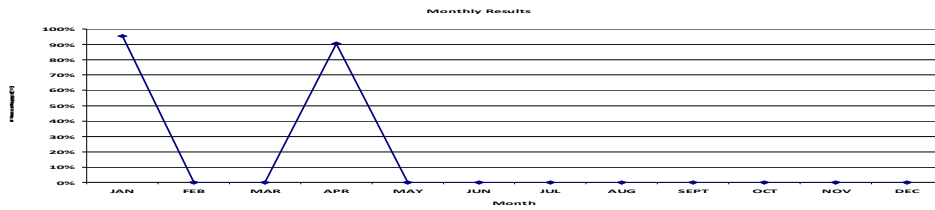
Audit is carried out every month by Education Sister (acting). Ten sets of profiles are chosen at random from Philipshill and Edenhall ward, a report is sent to Senior Charge Nurse who then records 3 x Highlights and 3 x Lowlights and cascades this to ward.

The unit aims to meet the principles of good record keeping by following the NHS GGC Professional Standards for Record Keeping Policy (2009). We ensure the documentary evidence from the healthcare professionals is safe, effective, and accurate.

There are a wide range of records utilised to demonstrate the delivery of care from the multi-disciplinary team to a patient. These include care plans, observation charts, profile notes, consultation notes, operation notes and others.

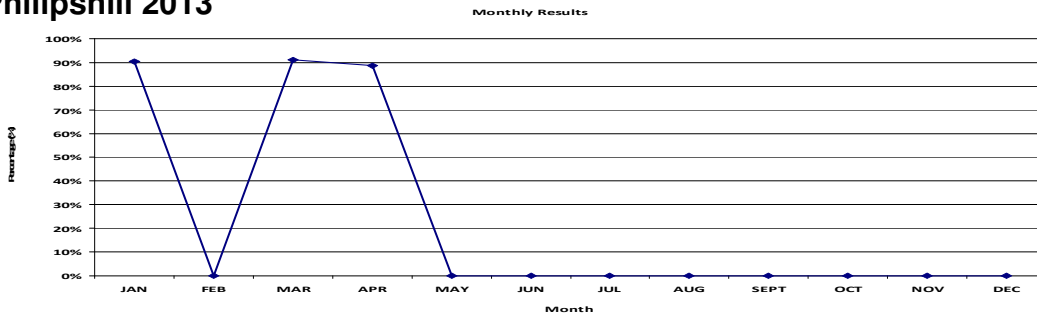
Question	Notes
1	Only tick 'Yes' if all pages are patient identified. If any are not, then the answer must be 'No' For a page to be patient identified, it must have the patient's name and CHI number. The case record number/unit number cannot be used as a substitute
2	Only tick 'Yes' if all entries are dated, time and signed. If any are not, then the answer must be 'No'
3	Check every nurse who has written in the record. Look for their first entry for that patient and check if they can be identified by printed name, signature and designation.
4	If no alterations made, tick N/A
5	If no alterations made, tick N/A
6	Check if there are any abbreviations which are not easily understood or are ambiguous
7	If any records are illegible, please give details in the comments.
8	Check if patient has each risk assessment document If the patient does have the document, check if it is up to date If patient doesn't have the document, tick N/A
9	Check if rationale for the plan of care is documented
10	If nursing records do not correspond to care plan entries, please give details in the comments
11	If no student nurse entries, tick N/A
12	Only tick 'Yes' if there is documented evidence that there has been communication with the patient with regards to Medicines Management, Discharge Planning, Diagnosis or Treatment
13	Only tick 'Yes' if there is documented evidence that there has been communication with the patient's relatives regarding the care of the patient.

Edenhall 2013



- Feb and March audit not carried out

Philipshill 2013



The unit maps within the overall compliance as well as colour coded to highlight areas with high/medium/low compliance; this is displayed on our notice board.

> = 90% COMPLIANCE	HIGH
70-89 % COMPLIANCE	MEDIUM
< 70% COMPLIANCE	LOW

These indicators were identified by NHS Scotland as clinical quality measures that would support quality, safety and reliability focussing on improvement rather than performance. We are currently monitoring three CQI'S: Food, Fluid and Nutrition, Falls and Pressure Ulcer Prevention. The system allows real time reporting and is an important tool for SCN's, highlighting areas that we are doing well and areas that require further work. Compliance rating in all areas should be maintained at 95% and above.

The unit follows all national guidelines and complies with local targets. Continual monitoring maintains standards. Helena Richmond

B3: C3 Hand Hygiene Compliance Scottish Patient Safety Programme

Hand washing is fundamental in reducing the risk of hospital acquired infection. Both wards complete monthly audits capturing 2 elements of hand washing (1) Hand washing compliance – how many staff have taken the opportunity to wash their hands at the appropriate times and (2) Hand washing standard – of the staff that did take the opportunity to wash their hands, did they meet hand washing standards.

SGH - PHILLIPSHILL	03 March	2013	20	20	100%	20	100%
SGH - EDENHALL	03 March	2013	20	20	100%	20	100%

In 2012 the average compliance with hand washing was 97.6% with the average compliance with hand washing standard 92%. The commonest reasons for not meeting the standard included turning the taps off with hands and not removing wrist watches. This is now rectified

B3: C4 Overall CQI Compliance Trends 2011-2012

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

B3: C KSF Targets

The unit is compliant with KSF (Knowledge, Skill Framework) targets. All nursing staff are up to date and have been reviewed in the last twelve months.

B 3 D Adverse Events

B3: D1 Pressure Sore Point Prevalence

Traditionally we have monitored point prevalence: **Table Twenty-Two:**

	No. of patients	No. of acquired sores	No. of admitted sores	Total number of sores	Point prevalence
2008/2009	42	2	11	13	30.95%
2009/2010	42	3	5	8	19%
2010/2011	36	1	8	9	25%
2011/2012	36	2	12	14	38.8%
2012/2013					

This tool is very useful at identifying trends in incidence of true pressure sores but has limitations as an independent assessment of the incidence of critical skin events of all types ranging from skin marks, sacral splits and full thickness skin sores.

B3: D2 Pressure sores The Future

The Red Flag system, for the identification and multi-disciplinary assessment of the cause of all new pressure sores developing in the Unit, continues. In this way factors contributing to the development of pressure sores are identified and problems resolved promptly. The number of pressure sores developing within the Spinal Injuries Unit continues to reduce.

In the one year period April 2011 to March 2012 66 new pressure sores were identified. In the year 2012/2013 58 new sores were identified.

Pressure sores are defined using the European Pressure Ulcer Advisory Panel classification. 30 of the 58 sores were Grade 1, 25 Grade II and 3 Grade III. There were no Grade IV sores identified in the last year.

Regular staff awareness and education sessions along with patient and relative education sessions specific to skin care are being held.

Regular audit of the management of all sores are performed and reviewed. The Skin Group continues to meet every four months and lead the improvement in practice which has resulted in a significant reduction in the number of pressure sores developing in this Unit.

In this last year 18 established spinal cord injured patients were admitted to the Unit for surgical management of their pressure sores. Their average length of stay was 95 days. Of these 18 patients 4 had complex pressure sores where infection had spread to bone or deep skin layers, patients required multiple surgeries performed by Plastic Surgery, Orthopaedic Surgery and General Surgery colleagues. 4 of the 18 patients became delayed discharges due to challenges re-establishing their care packages on discharge.

The "Red Flag Keeping your Skin Safe" system was presented at a Regional Clinical Governance Meeting where it was highly praised and won a prize It will be presented at Guttman 2013..

A Unit Wound Management Formulary is being produced at present following evidence and review of dressing products available on the GGC Formulary.

Regular staff awareness sessions along with patient and relative education sessions specific to skin care are being held.

Regular audits of the management of all sores are performed and reviewed. The Skin Group continues to meet every four months and lead the improvements in practice which have resulted in a significant reduction in the number of pressure sores developing within the Unit.

B3: D3 Occurrence of Pressure Sores QENSIU: A Review

In the years 2011 and 2012 there were 180 new patients admitted to the Unit with a spinal cord injury and 125 patients re-admitted.

Of the 180 new admissions 55 patients developed 125 sores (31% of new admissions developed a pressure sore in the Unit).

Of the 125 re-admissions, 10 patients developed 17 pressure sores (14% of re-admissions developed pressure sores).

In total 142 pressure sores were Red Flagged in this 24 month period.

Pressure sores were defined using the European Pressure Ulcer Advisory Panel (EPUAP) classification

Occurrence of pressure sores by grade

GRADE	NUMBER OF SORES	%
I	81	57
II	51	36
III	8	6
IV	2	1

Occurrence of pressure sores by location

LOCATION OF SORES	NUMBER OF SORES	%
Sacral	53	37
Ischium	36	25
Great trochanter	20	14
Ankle	4	3
Heel	9	6
Other areas	20	14

There was no clear association between the grade of the sore and its location.

Cause of pressure sores

CAUSE	NUMBER	%
Bed/mattress	26	18
Orthosis	16	11
Pyrexia/sweating	10	7
Faecal burning	12	8
Transferring	8	6
Spasms	4	3
Wheelchair/cushion/shower chair	10	7
No cause found	25	18
Other causes found e.g <i>clothing, dressings.</i>	35	25

The observed grade and location of pressure sores was not significantly different between new patients and re-admissions

Orthosis, pyrexia/sweating, and faecal burning were common causes of pressure sores in acute admissions (Edenhall).

Wheelchairs/cushions/shower chairs and beds/mattresses were common causes of pressure sores during rehabilitation (Philipshill Ward).

Benchmarking

These figures compare favourably with a recent paper published from 8 specialised SCI units in the Netherlands (1) where 76 of 193 (39%) new admissions developed pressure sores.

The proportion of patients developing more severe pressure sores is also lower in our patient group.

	%	EPUAP GRADE		%
Netherlands	33	I	Glasgow	57
	44	II		36
	17	III		6
	6	IV		1

The location of pressure sores in the two groups of patients are also significantly different with more patients in our group developing ischial and trochanter sores and more patient in the Dutch group developing sacral, heel and ankle sores.

Interestingly in the Dutch group having had a pressure sore during the acute rehabilitation phase was the strongest predictor of developing a sore during functional rehabilitation. This was not the case in our patient group.

Of note only patients between 18 and 65 years old were included in the Dutch group. In QENSIU, of our 65 patients who developed pressure sores in the unit, 1 patient was under 18 years and 31 patients were over 65 years.

References

- (1) JHM Verschueren et al. Occurrence and predictors of pressure ulcers during primary in-patient spinal cord injury Rehabilitation. Spinal Cord (2011)49,106-112

Dr Mariel Purcell

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 recorded two formal complaints which were fully investigated and proved useful in reviewing current practice. Assistance was given in advising regarding complaints involving management of patients out with the unit which also have relevance to in house treatment. A proactive approach is followed with Spinal Injuries Scotland, Aspire and Back Up to improve all aspects of our service.

B3: E2 Compliments.

The unit has been the subject of numerous newspaper, magazine and media comment, all favourable over the year. Of particular note is the long running Times column by a recent patient, which has informed, amused and provoked patients, staff and relatives. It has been of inestimable benefit in letting us see how we are perceived. 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

- 1) Waiting Times/Response Times Targets
The unit complies with its contract and details are available throughout the report.
- 2) Slippage: No slippage is recorded
- 3) Exceptional Circumstances Affecting Targets

The unit complies with all relevant targets.

B4 b) Review of Clinical Pathway

- (i) Review and Changes to Clinical Pathway
- (ii) Improvements to Local Delivery of Care

B5 Person Centred

B5 A Patient Carer/Public Involvement

The unit is fully committed to the development of integrated care and peer review. Regular patient focus groups are used and Relatives and Carers events are held in house and in cooperation with Spinal Injury Scotland (SIS). We comply fully with all national and local initiatives.

B5 B Example: Leading Better Care/Person Centred Care

“Leading Better Care“ enables Senior Charge Nurses, Team Leaders and other healthcare professionals to deliver better care in consistent, measurable evidence based ways.

All Senior Charge Nurses, Senior Charge Midwives and Team Leaders will be working in the context of the LBC components:

- To ensure safe and effective clinical practice
- To enhance the patients experience
- To manage and develop the performance of the team
- To ensure effective delivery of the organisations’ objectives

All Healthcare professionals will be able to demonstrate the contribution they make to the quality and experience of care that patients receive under the three themes

Safe, Effective and Person Centered

To ensure this was being met at a standard of high quality, Philipshill Ward became involved in a pilot for the **Caring Behaviors Assurance System (CBAS)** this involved 3 Quality Champions and Education Sister being a facilitator representing Regional Services.

The Caring Behaviours Assurance System (CBAS) is a way of exploring the perceptions of everyone involved in the delivery of healthcare with a view to enhancing understanding and co-operation, so that action can be put in place to assure greater satisfaction with the quality of care given and received.

The power of the system lies in the ownership of the quality expectations held by staff delivering direct care/service. The members of each team identify what is important about quality; *they* seek out information which reflects quality; *they* recognise and celebrate good quality of care or service; *they* decide what to do about areas that need improvement and then *they* take action and monitor progress, repeating the CBAS cycle when *they* believe it is necessary.

CBAS reflects ‘the Seven Cs’ identified in the Scottish Government’s Healthcare Quality Strategy (May 2010) which states:

People in Scotland have told us that they need and want the following things from the NHS and we have built this strategy around these priorities:

- **Caring** and **Compassionate** staff and services
- Clear **Communication** and explanation about conditions and treatment
- Effective **Collaboration** between clinicians, patients and others
- A **Clean** and safe care environment
- **Continuity** of care
- Clinical excellence

Philipshill Ward created their own PCQI (Person Centered Quality Instrument) which embraces quality in their ward this is displayed on the notice board and highlights what quality indicators are important in their ward to ensure person centred care is being met.

As a result of the Caring Behaviors Assurance System, good practice/service is recognised and celebrated. Subsequent collaboration between all involved will result in action which reflects a steady, incremental improvement towards the quality ambitions.

B5 C User Survey

The unit is fully committed to regularly obtaining feedback and responding to issues raised. Patient Stories satisfaction questionnaires are used and are included at appropriate sections of the report. **Questionnaires** are used as appropriate.

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-three: Out- patient Services:

	08/09	09/10	10/11	11/12	2012/ 2013
Return	2182	2182	2193	2293	2243
New	307	192	229	188	232

Table Twenty- four: Outpatient Clinic Location

Frequency	Location		
Weekly	QENSIU New x 3 QENSIU Return x4 Respiratory Care	Skin Halo Fertility	Orthopaedics Neurosurgery Urology
Monthly	Edinburgh		
Three Monthly	Aberdeen	Inverness	
Six Monthly	Dumfries	Borders	Arbroath Huntly

Table Twenty-five A: Activity: Out-Patient By Centre

	08/09	09/10	10/11	11/12	12/13	CHANGE YEAR	TOTAL 1992-2013
New QENSIU	307	192	229	188	232	+ 23%	2473
Return QENSIU	1830	1825	1861	1876	1878	+ 0.1%	31937
Edinburgh	169	168	162	174	148	(15%)	3337
Inverness	62	45	49	62	60	(3.2%)	848
Aberdeen	62	68	61	85	66	(22%)	808
Dumfries & Galloway	28	14	9	27	20	(26%)	245
Borders	9	36	19	15	26	+ 73%	209
Arbroath	22	26	14	31	26	(16%)	218
Huntly	0	0	18	23	19	(17%)	60
Total	2489	2374	2422	2481	2475	(0.2%)	40135

Table Twenty-five B: Number of patients on the Spinal Outreach clinic lists

Clinic	March 2011	April 2012	April 2013
Inverness	71	80	82
Aberdeen/ Huntly	107	117	118
Borders	28	35	36
Dumfries	24	27	29
Arbroath	28	35	37
Total	258	294	302

Table Twenty-six : Activity; New Out-patient Activity by Health Board

	08/09	09/10	10/11	11/12	12/13
Ayrshire & Arran	20	18	21	15	16
Borders	3	3	1	2	2
Dumfries & Galloway	12	8	7	3	6
Fife	9	1	7	4	2
Forth Valley	20	16	17	14	4
Grampian	8	4	3	3	0
Greater Glasgow Clyde	160	91	136	105	154
Highland	4	2	4	4	0

Lanarkshire	49	32	20	27	35
Lothian	11	11	8	3	7
Shetland	0	0	1	0	0
Tayside	6	4	3	8	4
Orkney	0	0	0	0	0
Western Isles	4	1	0	0	1
ECR	0	1	1	0	1
Unknown	1	0	0	0	0
Total	307	192	229	188	232

B6: B Geographical Access

B6: B1 Nationwide services

As a national service it is important to provide outpatient and domiciliary services throughout Scotland. These has resulted in the development of the liaison sister service and out-reach 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 carer. There is a continued demand for nurse specialists to provide important in-patient and outpatient rolls. As well as two Liaison Sisters there is an Education Sister, Respiratory Sister, and Discharge Planner. They all provide assistance to the Senior Nurse Manager. The Spinal Nurse Specialist team (Liasion Sisters) continue to visit patients where ever 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 10 -15 telephone calls per week.

Sister Prempeh 109 visits covering 7,931 miles.

Sister Woods 128 visits covering 9,185 miles.

Total numbers of visits, clinics and meetings carried out by the liaison nurses was 535 covering 17,116 miles.

Sister Duffy 98 visits covering 7923 miles

B6: B2 Table Twenty –seven: Attendance and Location Outreach Clinics

Location	% Attendance 11-12	% Attendance 12-13	Number of Clinics	Number of Patients
Aberdeen	91%	95%	5	64
Inverness	92%	95%	4	60
Dumfries	90%	95%	2	20
Arbroath	94%	90%	3	26
Borders	91%	85%	4	26
Huntly	100%	95%	1	19
Ave Rate	91%	92%	19	215

Annual Review Clinics are subject to a relative high DNA rate due to morbidities and co-morbidities.

B6: B3 Activity: Liaison Sisters Table Twenty-eight:

Sister Prempeh	Meetings	Clinics	Visits	Miles	External Teaching
APRIL	10	0	7	302	0
MAY	10	2	9	1108	0
JUNE	6	1	9	1183	11x1
JULY	3	0	0	0	13x1
AUG	9	0	11	861	13x1
SEPT	7	1	10	951	8
OCT	4	0	11	657	0
NOV	6	2	14	892	6
DE	7	1	12	523	5
JAN	8	1	10	520	4
FEB	6	2	12	584	7
MARCH	7	1	8	256	1
TOTAL	83	11	113	7837	68

Sister Woods	Meetings	Clinics	Visits	Miles	External Teaching
APRIL	7	2	7	578	0
MAY	14	4	9	401	4
JUNE	6	4	14	1342	4
JULY	9	0	8	882	0
AUG	8	1	13	1070	19x2
SEPT	11	2	11	905	0
OCT	7	2	7	460	0
NOV	10	2	12	1087	0
DEC	10	1	8	382	6
JAN	13	1	11	478	2
FEB	6	2	10	912	0
MARCH	12	3	9	658	0
TOTAL	113	27	119	9157	61

B6: B4 Activity: Respiratory Support Nurse: Table Twenty-seven:

The Respiratory Support Sister has been a tremendous success in coordinating in-patient and domiciliary ventilation. All patients requiring assisted ventilation at home have been visited during the year with 7923 road miles travelled and air trips to Shetland and Stornoway completed.

Sister Duffy	MEETINGS	CLINICS	VISITS	EXTERNAL TEACHING	Respiratory Referrals
APRIL	5		8		3
MAY	6	2	12	7 staff	0
JUNE		1	7	7 staff	0
JULY	1	2	11	12 staff	0
AUGUST	1	3	11		0
SEPTEMBER	1	1	6	20 staff	0

OCTOBER	2	2	8	10 staff	2
NOVEMBER	5	2	18	2 staff	0
DECEMBER	3	2	12		0
JANUARY	3	1	12	8 staff	1
FEBRUARY	2		11	8 staff	0
MARCH	5	2	10	5 staff	1
TOTAL	34	18	126	79	7

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

B6: B5 Activity Education Sister: Table Twenty eight

Sister Richmond	MEETINGS	CLINICS	INTERNAL TEACHING	EXTERNAL TEACHING	OUT-REACH CLINICS	PATIENT RELATIVES EDUCAT	AUDIT
APRIL	4		53			32	Documentation/Better Together
MAY	3	1	18	Implementation of CBAS 4 x Regional Wards	Aberdeen	31	Documentaion /Better Together
JUNE	3		20		Inverness		Documentation /Better Together
JULY			30	Teaching @ UWS 25 Nurses		20	Documentation /Better Together
AUG	4		20		Inverness	28	Documentaion /Better Together
SEPT	2	1	29		Aberdeen	27	Documentaion /Better Togeteher
OCT	2		16	PD Event Regional 94		24	Documentaion /Better Togeteher
NOV	2		14	CBAS RAH 20 staff		9 22	Documentaion /Better Togeteher
DEC	2	1	16		Aberdeen		Documentaion /Better Togeteher
JAN	1	1	6			20	Documentaion /Better Togeteher
FEB	3		10			30	Documentaion/ Better Togeteher
MAR	2	3	32	120 Caledonian U		21	Documentaion/ Better Togeteher
TOTAL	28	7	264	295	6	262	

B6: B4 Location of Lothian Outreach Clinic

The Lothian outreach clinic is now based at the SMART Centre within Astley Ainslie hospital. The clinics are held monthly and have proved popular with the patients in the region. Difficulties have been experienced in the drive towards E.P.R., Trakcare and PACs with outreach clinics as have all cross board services but these are being addressed.

Section C : Looking Ahead / Expected Change/Developments

The medical staff have roles in the International Spinal Cord Injury Clinical and Research Communities. The unit is involved with cutting edge research into basic science and clinical practice. Over the last twelve years they have positioned themselves to be at the forefront of anticipated translational research which will introduce interventional strategies to influence the final outcome in traumatic spinal cord injury. Changes in clinical practice are anticipated which will have a impact on the service from the roadside to the unit and will involve the ambulance service, paramedics and emergency medical staff. This will ensure that the patients will receive the best possible service. Nursing practice and deployment continues to evolve with the unit at the forefront of innovation.

The planned Phase One Early Intervention Study (Ausbio) commences later this year with QENSIU being the lead centre for three UK spinal Injury Units. The collaborative Project with The Glasgow School of Art and the appointment of a three year research fellow in design promises to reassess the current rehabilitation paradigms in light of patient choice and demographic change.

The unit anticipates challenges ahead and are proactively seeking solutions to cost and development pressures. We are engaged in the CRES savings assessment and have instituted a local Cost Containment Review.

Section D : Summary of Highlights(Celebration and Risk)

The original concept, funding and organisation of the care of spinal cord injury in Scotland have proved durable and flexible over the last twenty years. This is reinforced by international recognition, a successful track record in research and its influence in service planning in the UK. It is inevitable that with time the concept on which it was based needs to be constantly reinforced for the benefit of all the patients.

This year has seen peculiar challenges with the loss of Irene Clark who was the mainstay of the unit administration and the retirement of Carol Lazzarini medical secretary. Replacements are awaited. Illness has affected two other members of the secretarial staff. The reorganisation of secretarial services remains incomplete and it is generally recognised that the service is performing below par. Robust structure and significant flexibility has maintained a service but unless staffing numbers improve then the service will falter. We await appointments to the Senior Nurse Role, Psychology and the Chronic Pain Sessions. The introduction of Trakcare , National PACS and Electronic Paper Records has been a challenge throughout the health system and understandable was not executed with national services principle in mind. It continues to pose significant challenges to any service with a significant commitment to outreach clinics or cross board activity. The proactive approach of

certain health boards especially Borders proves that it can work but this need has to be recognised and appropriate services available.

The spinal cord injury rehabilitation service continues to develop and plans significant changes in the delivery of the medical care over the next two years in response to national priorities.

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

David B Allan FRCS
Director
Queen Elizabeth National Spinal Injuries Unit May 2013

Acknowledgement is made to Ana Bewick for producing the report and Alan Mclean, Mariel Purcell, Michele Paterson and Helena Richmond for their contributions to the main report. Many thanks are due to all of the team that assisted in the maintenance of the database. The Appendix is a huge testament to the work done by all in developing and supporting the unit.