

A Survey of the Lower Limb Amputee Population in Scotland 2015 Full Report



SPARG
Scottish Physiotherapy Amputee
Research Group

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We wish to thank all physiotherapists, colleagues and amputees who are involved in the work of SPARG and without whose loyal, tireless and determined support this work would not have been accomplished.

The final draft of this report was reviewed by a national multidisciplinary group (see Appendix I) and we would like to thank each of them for taking the time to do this.

2 Executive Summary

This is the 23rd Annual Report on data collated from all major lower limb amputations in Scotland by the Scottish Physiotherapy Amputee Research Group (SPARG). All major amputations carried out in 2015 are included, that is, ankle disarticulation (AD), transtibial (TTA), knee disarticulation (KDA), transfemoral (TFA), hip disarticulation (HD), and transpelvic (TP). Patients having partial amputations of the feet and amputation of the toes are excluded. Amputations at the knee disarticulation (through knee) level are reported within the transfemoral amputation numbers due to their similar rehabilitation needs.

All data are entered locally onto the SPARG web-based Database. The Database has reporting facilities which allow for local data checking and analysis (see Appendix B for the reporting facilities).

National and individual hospital data are presented in this report. All outcomes are reported according to final level of amputation. Individual hospital data are summarised to facilitate comparison of outcomes and the benchmarking of services. The comparative data items or key performance indicators (KPIs) for each hospital were identified by a previous, multidisciplinary benchmarking exercise (Scott and Patel 2009). For the first time, the length of rehabilitation is reported in two parts for each centre. Firstly, the overall length of stay in the hospital setting and secondly, the overall rehabilitation period in the out-patient setting. Each of the larger centres' ($n \geq 10$) models of care have been described according to criteria identified in the benchmarking report and agreed following consultation with SPARG members. This information has been summarised in Section 6 (see also Appendix H).

National demographic data appear to be similar to 2014; any changes and trends are noted below. Where possible, comparisons are given in the body of the report for at least 6 years from 2010-2015.

Due to restrictions on data governance there are no descriptions of those patients who underwent an amputation in the Grampian region, though the final number of amputees and amputations does include them.

Results

In 2015, there were 802 amputees and 835 amputation procedures; some patients having had a re-amputation (to a higher level), or bilateral amputations during the same episode of care. However, due to Grampian patients being excluded ($n=93$) and 5 missing data sets this report will discuss results in reference to 704 amputees and 737 amputations.

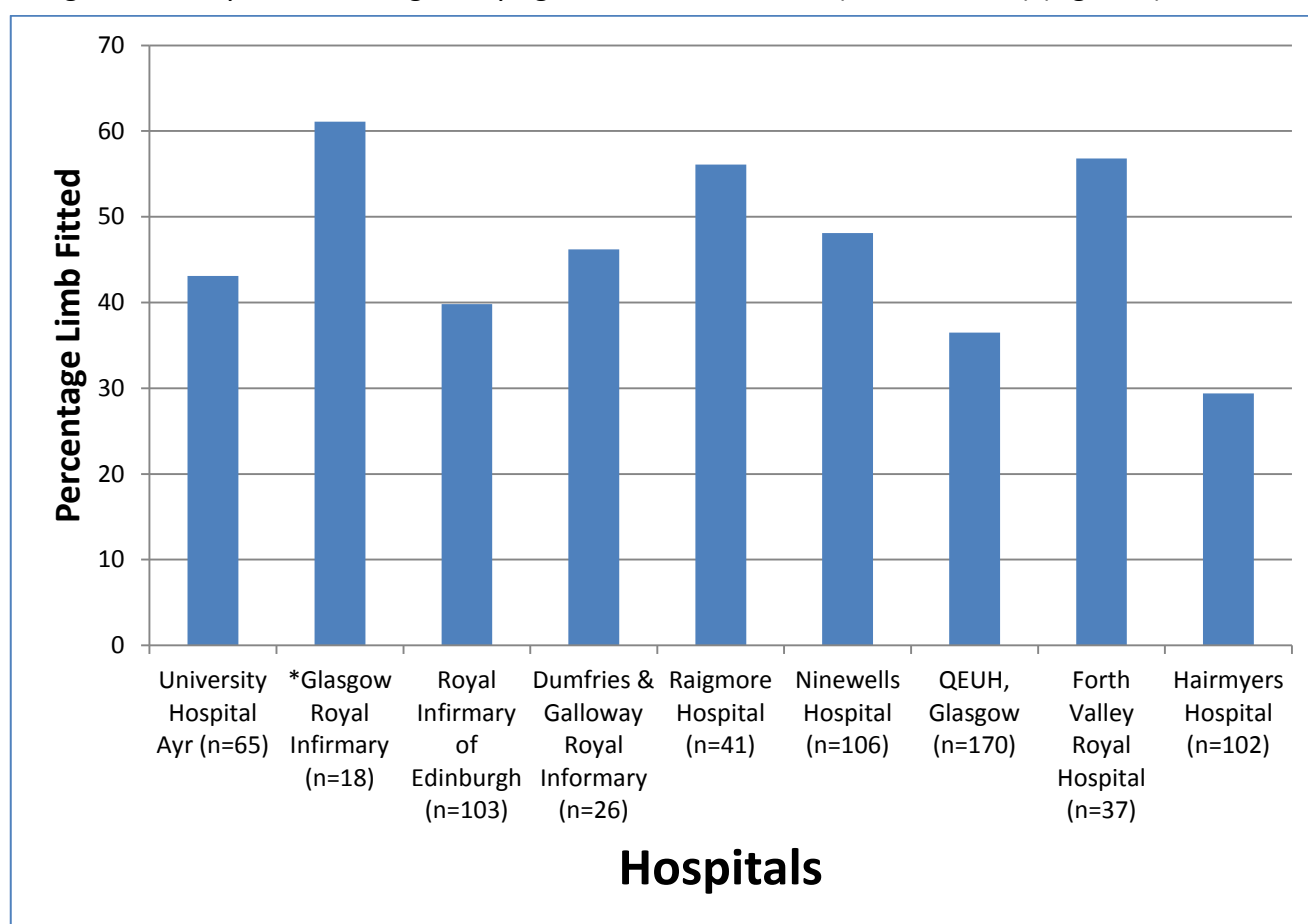
The quality management "data checking" system introduced in 2003 continues to be highly successful. The percentage of returned records which are complete in every respect is 97.2%.

The median age in 2015 was 68 years at time of amputation, which is slightly higher than 2014 (67 years). The population were 66.5% males and 33.5% females. Peripheral arterial disease (PAD) in the presence or absence of diabetes accounted for 85.4% of all amputations in this population.

The proportion of patients with diabetes was lower this year, 44.7%, and the age difference was larger. The mean age of the group with diabetes were 5 years younger than those with amputation due to PAD (without diabetes). There were almost three times the numbers of men in this group (male to female ratio, 2.6:1 compared to 1.6:1 in those with PAD).

The percentage of amputations carried out at a transtibial (TTA) level in 2015 was 51.2%, however individual hospital data (centres, n≥10) show significant variation, from 25% to 72.2% (Table 38).

The proportion of patients (all levels) fitted with a prosthesis is 41.6%. When examined by level, 68.0% of TTA and 23.9% of transfemoral (TFA) were fitted. There is still discrepancy between genders, with more men than women being fitted with a prosthesis (TTA, M=71.14% & F= 56.52%) (TFA, M=29.34% & F=17.54%). When individual hospital data are examined, the differences in proportions of patients being successfully fitted are large, varying from 29.4% to 61.1% (centres, n≥10) (Figure 1).



*No amputations for PAD (+/-DM)

Figure 1 Percentage of patients who were limb fitted in each of the hospitals (n>10)

Total number of patients with lower limb amputations at each hospital is shown in brackets

For the tenth year, the figures for prosthetic rehabilitation being abandoned during the rehabilitation period are reported (9.6% of all patients (n=32)). These were unilateral TTA=7.1% (n=13), unilateral TFA 21.7% (n=15) and bilateral 11.1% (n=4).

Inpatient length of stay (LoS) for TFA has risen to 48 days for limb fitted and 42 days for non limb fitted.

Discussion and conclusions

Service changes in 2015

The Queen Elizabeth University Hospital opened in May 2015 and the centralised vascular unit from the Western Infirmary moved into the new hospital.

Limitations of SPARG data set: -

1. Reporting of aetiology

SPARG reports diabetes as the underlying aetiology in all cases in which diabetes is an established diagnosis, unless the reason for amputation is tumour, trauma, burns or an orthopaedic condition.

2. Factors not currently accounted for in data analysis: -

- Pre-amputation vascular reconstructive surgery
- Incidence of palliative amputations, that is, life-improving surgery for patients who were previously and, in the long-term, immobile with no prospect of rehabilitation.
- Social deprivation
- Final outcome at a defined point in time after surgery and longer term follow up.

Key messages from the 2015 report are: -

1. The median age of the cohort of amputees in Scotland in 1996 when compared to 2015 differs by one year; however there were more amputees in the 60-80 years age range in 1996 compared to 2015 where there were more patients under 60 and over 80; overall there were 50 more patients in 2015.
2. There is a continued reduction in the use of rigid post-operative dressings for those with a TTA: 20% in 2014, 18% in 2015.
3. Outcomes and milestones continue to vary significantly between hospitals, most importantly, the proportion of amputations carried out at a TTA level and the proportion of all patients successfully limb fitted.
4. Proportionally, fewer females continue to be limb fitted compared to males and this varies between hospitals.
5. Median inpatient length of stay for TFA has risen by 13 days for those who were limb fitted and 11 days for those not limb fitted.
6. There was an increase in amputation due to Intra venous drug abuse (IVDA) and a reduction due to orthopaedic conditions in 2015.
7. Only 22% of TFA had compression therapy commenced within 10 days of amputation, a reduction from 58% in 2011.
8. Cast to delivery times remain varied from centre to centre (1-17.5 days).
9. More people with a bilateral TTA are limb fitted (67%) compared to those with a unilateral TFA (24%).

10. Limb fitted patients with bilateral TTA report a lower mobility change score (LCI-5= -7.5) indicative of an improved recovery compared to those with a unilateral TFA (LCI-5=-18)
11. Bilateral TTAs were younger than those with a unilateral TFA, and more are limb fitted and have diabetes.
12. There was an eight year age difference between those with a bilateral TTA (60 years) compared to those with either a bilateral TFA or a combination of TFA and TTA (68 years).
13. The models of care are varied in Scotland with some having only in-patient prosthetic rehabilitation and others with out-patient prosthetic rehabilitation. Therefore there is great variation in length of stay and as such these models of care do not necessarily indicate the final outcome achieved at the end of rehabilitation.

Points for further investigation/action: -

- The large variation in the proportion of amputees successfully limb fitted between centres continues to warrant further investigation by the local multidisciplinary teams.
- Reporting of aetiology has been revised to include more detail for people with diabetes and amputation for orthopaedic reasons (see Appendix D). This was implemented from 1.1.2016 and will enable clearer reporting of the immediate indication for amputation in the next report.
- Key aspects of services that appear to improve speed and outcomes of rehabilitation after lower limb amputation, in particular, impact on limb fitting outcomes of inpatient rehabilitation and reasons for variations in prosthetic fabrication times between centres.
- Reducing median age and increasing proportion of people with diabetes and amputation
- Increase in drug abuse as reason for amputation
- Poorer outcome for females and the variation in this between centres
- KPI data according to Health Boards in addition to amputating hospitals.
- Reducing use of rigid dressings
- Impact of standard sizes for TFA shrinker socks on time to starting compression therapy.
- Impact of change in pre-prosthetic assessment on the rate of abandonment for TFA
- Report limb fitting outcome by aetiology

MDT Advisory Group (see Appendix I), April 2018

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3 Results: Demographic Profiles

3.1 Introduction

National survey data are presented in this section. Where possible, comparisons are shown for 2006-2015. The total number of amputees for 2015 is 802 (835 amputations). Data is available for 704 of these amputees (737 amputations), therefore included in the analysis. Missing data includes all data sets from Grampian Health Board (n=93) and those forms not returned for data input (n=5).

3.2 Amputee Details

3.2.1 Age and Sex Distribution

The 2015 survey contains data from 704 amputees. The data for numbers of amputees from 2006-2015 by age and gender is shown in Table1, and a graphical depiction of the changing age of this population can be seen in Figure 2 and 3 when the years 1996 and 2015 are compared.

Table 1 Age and sex of amputee population, 2006- 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
No. of Amputees	704	699	741	746	740	700	708	809	819	803
No. of Amputee with Data	690	678	702	729	731	688	702	803	812	704
Age Lower Quartile	61	60	61	61	61	60	61	58	57	58
Age Median	69	69	70	70	70	70	70	69	67	68
Age Upper Quartile	78	77	79	77	78	77	78	78	76	76
Males %	67.49	64.16	62.09	64.50	67.03	65.94	66.38	66.50	71.85	66.5
Females %	32.51	35.84	37.91	35.50	32.97	34.06	33.62	33.50	28.15	33.5

3.2.2 Age Distribution Comparison of 1996 to 2015

The median age of the cohort of amputees in Scotland in 1996 when compared to 2015 differs by one year; however there were more amputees in the 60-80 year range in 1996 compared to 2015 where there were more patients under 60 and over 80: there were 50 more patients in 2015 (Figure 2 & 3).

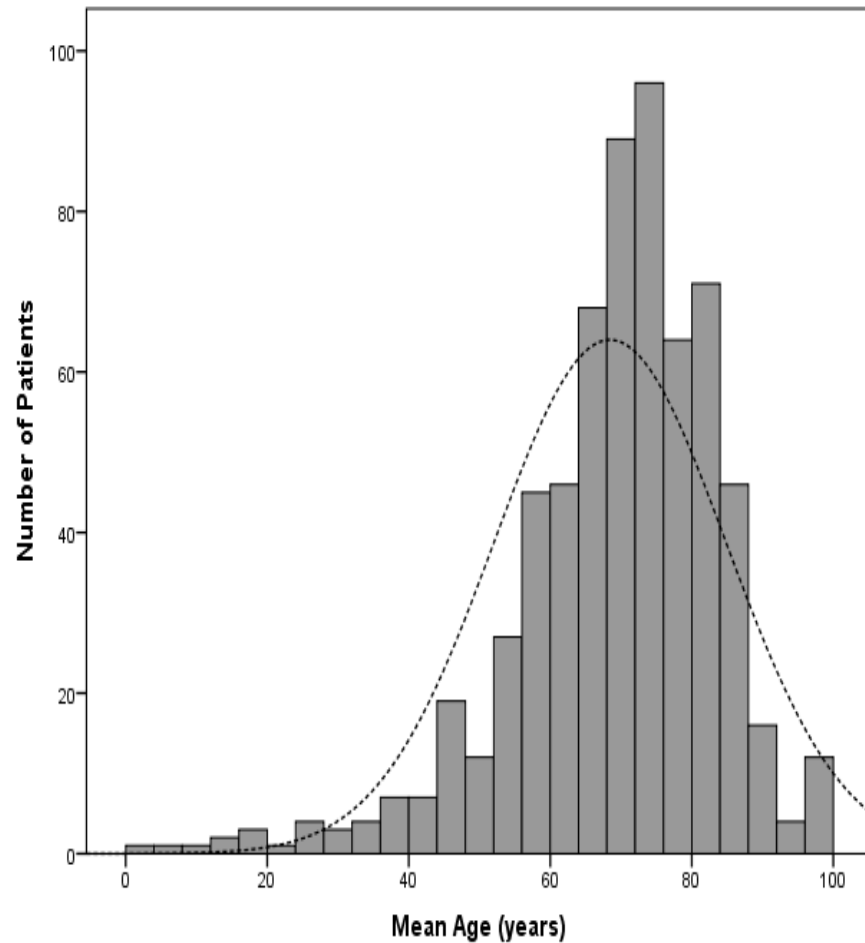


Figure 2 Age of cohort in 1996

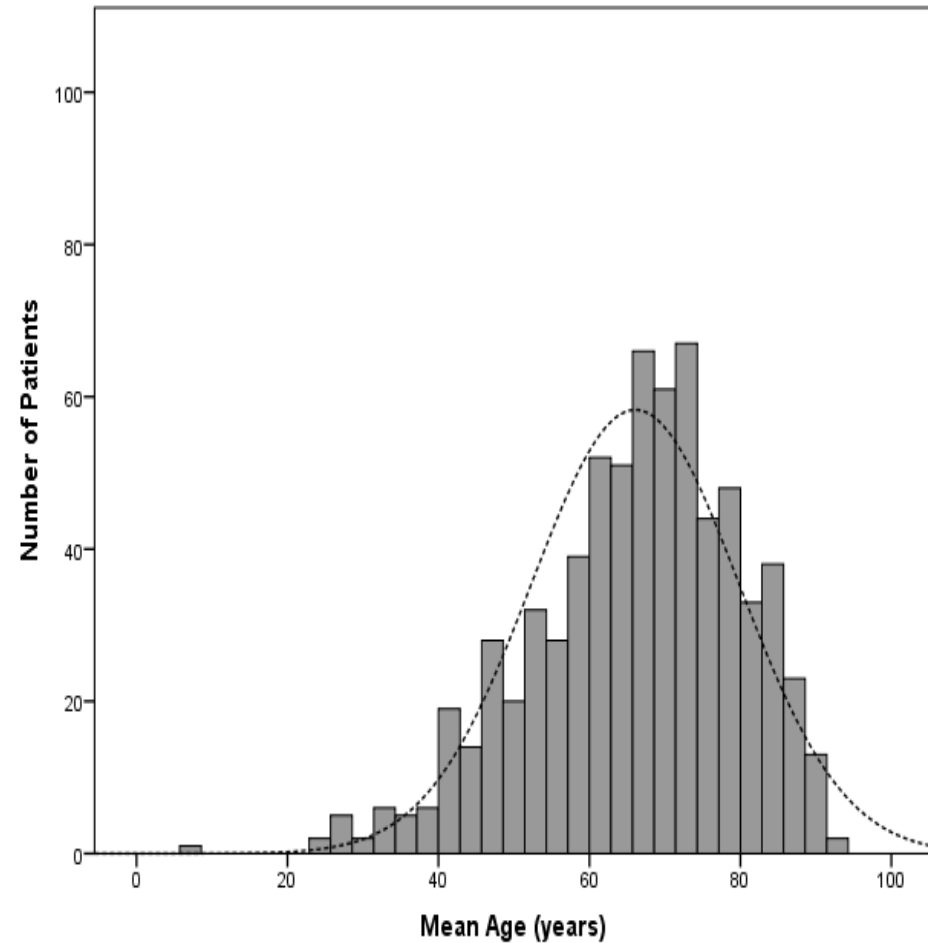


Figure 3 Age of Cohort in 2015

3.2.3 Diabetic Amputees

The following table summarises the age and sex of amputees with aetiology of PAD with Diabetes.

Table 2 Diabetic amputees, age and sex, 2014 & 2015

	2014		2015	
	Diabetes	PAD without Diabetes	Diabetes	PAD without Diabetes
Number of Amputees	377	319	315	286
Number with age available	376	319	315	286
Age Lower Quartile	58	62	57.79	63.46
Age Median	67	71	67.01	71.62
Age Upper Quartile	76	78	74.04	79.38
N Male	296	221	228	176
N Female	86	98	87	110
Males %	78.51%	69.28%	72.38%	61.54%
Females %	21.49%	30.72%	27.62%	38.46%

3.2.4 Aetiology of Amputation

The incidence of each aetiology recorded is shown in Table 3.

Table 3 Aetiology of amputation, 2010 – 2015

	2010		2011		2012		2013		2014		2015	
	N	%	N	%	N	%	N	%	N	%	N	%
PAD without diabetes	306	41.86	309	44.91	293	41.74	332	41.34	319	39.33	286	40.63
Diabetes	332	45.42	269	39.10	295	42.02	351	43.71	378	46.49	315	44.74
Trauma or Burns	11	1.50	11	1.60	19	2.71	13	1.62	17	2.10	14	1.99
Tumour	9	1.23	12	1.74	10	1.42	13	1.62	16	1.97	8	1.14
Congenital deformity	2	0.27	4	0.58	3	0.43	2	0.25	5	0.62	5	0.71
Drug abuse	5	0.68	10	1.45	12	1.71	13	1.62	14	1.73	17	2.41
Venous disease	10	1.37	9	1.31	14	1.99	10	1.25	0	0.00	5	0.71
Orthopaedic	28	3.83	40	5.81	26	3.70	39	4.86	45	5.55	24	3.41
Blood-borne infection	5	0.68	3	0.44	6	0.85	8	1.00	7	0.86	8	1.14
Renal Failure	5	0.68	5	0.73	7	1.00	4	0.50	1	0.12	2	0.28
Other	14	1.92	15	2.18	14	1.99	17	2.12	10	1.23	13	1.85
Not recorded	4	0.55	1	0.15	3	0.43	1	0.12	0	0.00	7	0.99
Total	731	100	688	100.0	702	100	803	100	812	100.0	704	100

3.2.5 Initial Level of Amputation

Table 4 shows the incidence of six levels of amputation for the years 2010-2015. For amputees who had bilateral amputations in the reported period, both amputations are included in the data. The number of levels recorded will therefore be greater than the number of amputees for any given year. The level indicates the initial level of the amputation.

Table 4 Amputation Level, 2010-2015

	2010		2011		2012		2013		2014		2015	
	N	%	N	%	N	%	N	%	N	%	N	%
Transtibial	383	50.20	406	56.62	399	53.49	477	56.25	432	51.06	377	51.15
Transfemoral	348	45.61	291	40.59	322	43.16	340	40.09	395	46.69	342	46.40
Transpelvic	2	0.26	0	0.00	3	0.40	1	0.12	0	0	1	0.14
Hip Disarticulation	11	1.44	8	1.12	8	1.07	11	1.30	6	0.71	5	0.68
Knee Disarticulation	19	2.49	12	1.67	13	1.74	17	2.0	13	1.54	12	1.63
Ankle Disarticulation	0	0.00	0	0.00	0	0.00	2	0.24	0	0.00	0	0
Other	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0
Not recorded	0	0.00	0	0.00	1	0.13	0	0.00	0	0.00	0	0
Total	763	100.0	717	100.0	746	100.0	848	100.0	846	100.0	737	100.0

3.2.6 Patients Fitted with a Prosthesis

The number of patients fitted with a prosthesis at final discharge is shown in Table 5. Unilateral patients limb-fitted are shown in Table 6, and bilateral patients are shown in Table 7. Table 8 gives more detail on bilateral patients fitted by their exact level of amputation. Table 9 shows the proportion of males and females who were fitted with a prosthesis. Those patients who have abandoned limb-fitting are not included in this "limb-fitted" patient group.

Table 5 Patients fitted with a prosthesis, all 2006 – 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of patients	690	678	702	729	731	688	702	803	812	704
Number fitted	289	312	297	301	315	288	286	322	338	293
Percentage fitted	41.88	44.64	42.31	41.29	43.09	41.86	40.74	40.10	41.63	41.61

Table 6 Proportion of patients with unilateral amputation fitted with a prosthesis by level (2006 – 2015)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
TTA (%)	64.63	63.11	68.18	67.69	69.67	67.37	66.78	64.45	63.84	68.00
TFA(%)	26.17	29.27	24.80	24.14	31.99	26.09	26.32	23.21	28.09	23.91
Other (%)	41.67	61.54	23.53	17.14	11.54	50.00	19.05	21.74	31.25	30.77

Abbreviations: TFA=transfemoral, TTA=transtibial

Table 7 Proportion of patients with bilateral amputation fitted with a prosthesis, bilateral (2006 – 2015)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bilateral (all levels %)	22.13	28.24	23.36	23.74	29.77	31.53	33.56	18.83	25.32	24.49

Table 8 Bilateral patients fitted with a prosthesis by level 2015

	Bilateral TTA (n=45)	Bilateral TFA (n=66)	TTA & TFA (n=36)
Limb Fitted % (n=36)	66.7% (n=30)	0.3% (n=1)	1.7% (n=5)

Abbreviations: TFA=transfemoral, TTA=transtibial

Table 9 Sex and limb fitting outcome, 2014 – 2015

	2014			2015		
	Unilateral TTA	Unilateral TFA	Bilateral	Unilateral TTA	Unilateral TFA	Bilateral
Total Males (n)	229	220	123	201	167	96
Total Females (n)	88	104	31	69	114	49
Males Limb Fitted (n)	157	71	32	143	49	27
Females Limb Fitted (n)	46	20	7	39	20	9
% of Males Limb Fitted	68.56	32.27	26.02	71.14	29.34	28.13
% of Females Limb Fitted	52.27	19.23	22.58	56.52	17.54	18.37

Abbreviations: TFA=transfemoral, TTA=transtibial

3.2.7 Prosthetic Rehabilitation Abandoned

There are a number of patients each year who are initially fitted with a prosthesis and start prosthetic rehabilitation but for whom prosthetic treatment is abandoned prior to their final discharge. The amputation level referred to in this section is the final level if re-amputation surgery has been carried out. Table 10 shows those people who have abandoned use of their prosthesis as a proportion of those initially fitted. Table 12 shows them as a proportion of all patients and they are included in the “not limb-fitted” group, as this is their final outcome on discharge.

Table 10 Prosthetic rehabilitation abandoned as a proportion of those initially fitted, 2010 – 2015

	2010		2011		2012		2013		2014		2015	
	N	%	N	%	N	%	N	%	N	%	N	%
All patients	15	4.25	23	6.59	29	8.38	22	6.4	23	6.37	32	9.6
Unilateral TTA	3	1.42	10	4.29	19	8.56	12	5.11	15	6.88	13	7.1
Unilateral TFA	10	10.31	8	11.76	7	10.45	7	9.72	3	3.19	15	21.7
Other	0	0.00	3	27.27	1	20.00	1	16.67	1	16.67	0	0
Bilateral	2	4.88	2	5.41	2	3.85	2	6.45	4	9.30	4*	11.1

Abbreviations: TFA=transfemoral, TTA=transtibial

*2 Bilateral TTA, 1 Bilateral TFA, 1TTA & TFA

3.2.8 Mortality

Table 11 shows the proportion of amputees who died within 30 days of their amputation, this is their last amputation level (see also 12 for overall)

Table 11 Mortality 2009 - 2015

	2009	2010	2011	2012	2013	2014	2015
Number of amputees	729	731	688	702	803	812	704
30 Day Mortality (N)	44	54	48	40	51	45	44
30 day mortality (%)	6.04%	7.39%	6.98%	5.70%	6.35%	5.54%	6.25%

3.2.9 Final Outcome Summary

Table 12 gives a summary of gross outcomes for all amputees at the time of final discharge from physiotherapy whether at in patient discharge or after a period of outpatient treatment in 2015. Non-Limb Fitted now includes those who abandoned prosthetic use as that was their final outcome.

Table 12 Final outcome summary, 2012 - 2015

	2012		2013		2014		2015	
	N	%	N	%	N	%	N	%
Limb-fitted	288	41.86	322	40.10	338	41.63	293	41.62
Not Limb-fitted	292	42.44	365	45.45	357	43.97	318	45.17
Deceased	100	14.53	111	13.82	115	14.16	92	13.07
Unknown	8	1.16	5	0.62	2	0.25	1	0.14

3.2.10 Bilateral Amputations in Same Episode of Care

The number and levels of bilateral amputations carried out in the same episode of care are shown in table 13 below for 2006-2015.

Table 13 Bilateral amputations, 2006-2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bilateral TTA	14	23	16	14	13	13	16	13	8	7
Bilateral TFA	13	6	12	13	12	12	22	25	20	21
TTA & TFA	9	8	2	4	5	2	6	5	6	2
Other	0	0	3	4	1	2	0	2	0	3
Total	36	37	33	35	31	29	44	45	34	33

Abbreviations: TFA=transfemoral, TTA=transtibial

3.2.11 Unilateral and Bilateral Amputees

The table 14 shows the number of unilateral and bilateral amputees for the years 2010-2015. In this table bilateral amputees includes all amputees who were bilateral in the reported year.

The bilateral amputees are defined in more detail in table 15 where there are 2 groups shown: those amputees who had a prior amputation; and those who were not previously amputees, that is, underwent bilateral amputations in the same episode of care.

Table 14 Unilateral and bilateral amputees, 2010 – 2015

	2010		2011		2012		2013		2014		2015	
	N	%	N	%	N	%	N	%	N	%	N	%
Number of amputees	731	100	688	100	702	100	803	100	812	100	704	100
Unilateral amputees	610	82.54	577	83.87	553	78.77	649	80.82	658	81.03	556	79
Bilateral amputees	129	17.46	111	16.13	149	21.23	154	19.18	154	18.97	148	21
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Table 15 Bilateral amputees, 2010- 2015

	2010		2011		2012		2013		2014		2015	
	N	%	N	%	N	%	N	%	N	%	N	%
Bilateral Total	129	100	111	100	149	100	154	100	154	100	148	100
Bilateral – prior amputation(s)	98	75.97	82	73.87	105	70.47	109	70.78	120	77.92	115	77.70
Bilateral – both in same episode	31	24.03	29	26.13	44	29.53	45	29.22	34	22.08	33	22.30

3.2.12 Revisions and Re-amputations

The number of amputees having revision or re-amputation surgery is shown in table 16. A revision is defined as further primary stump surgery which may involve bone, but does not change the level of amputation. A re-amputation is defined as further surgery of the primary stump which changes the level of amputation. Each revision and re-amputation is counted, therefore amputees who had a revision then a re-amputation would be included in both counts.

Re-amputations from the transtibial to the transfemoral level for 2010-2015 are shown in Table 17

Table 16 Revisions and re-amputations, 2010-2015

	2010		2011		2012		2013		2014		2015	
	N	%	N	%	N	%	N	%	N	%	N	%
Amputations	763	100	717	100	746	100	848	100	846	100	737	100
Revisions	21	2.75	28	3.91	16	2.14	37	4.36	27	3.19	9	1.22
Re-amputations	49	6.42	33	4.60	57	7.64	59	6.96	49	5.79	46	6.24
Total revisions + re-amputations	70	9.17	61	8.51	73	9.79	96	11.32	76	8.98	55	7.46

Table 17 Transtibial to transfemoral re-amputations, 2010-2015

	2010		2011		2012		2013		2014		2015	
	N	%	N	%	N	%	N	%	N	%	N	%
Initial TTA	425	100	406	100	399	100	477	100	432	100	378	100
Re-amputated to TFA	40	9.41	33	8.12	57	14.29	43	9.01	43	9.95	42	11.1

Abbreviations: TFA=transfemoral, TTA=transtibial

3.2.13 Bilateral Amputations

Demographic and final outcome data for all patients with bilateral amputation are shown below in Table 18

Table 18 Demographic profile and final outcome summary of patients with bilateral amputations at end of rehabilitation period

	Bilateral TTA	Bilateral TFA	TTA & TFA	Other
Number	44	66	36	1
Age (median, years)	60.10	68.74	68.01	N/A
Gender (Male) n, %	68.2% (30)	60.6% (40)	75% (27)	100% (1)
Aetiology				
PAD % (n)	20.5% (9)	50% (33)	30.6% (11)	100% (1)
PAD + DM % (n)	72.7% (32)	40.9% (27)	66.6% (24)	0
Other % (n)	6.8% (3)	9.1% (6)	2.8% (1)	0
Final Outcome				
Limb Fitted % (n)	68.2% (30)	1.5% (1)	13.8% (5)	0
Non Limb Fitted % (n)	20.5% (9)	78.8% (52)	52.8% (19)	100 (1)
Died % (n)	6.8% (3)	7.6% (5)	30.6% (11)	0
Abandoned % (n)	4.5% (2)	1.5% (1)	2.8% (1)	0
Missing	0	10.6% (7)	0	0

Abbreviations: TFA=transfemoral, TTA=transtibial, PAD=Peripheral Arterial Disease, DM=Diabetes

*Other=various combinations of amputation levels i.e. hip disarticulation and trans femoral etc.

3.2.14 Functional Co-morbidities Index

The Functional Co-morbidities Index (FCI) was incorporated into the data set from 2008 in an effort to account for the relatively high incidence of co-morbid disease in the lower limb amputee population (see Appendix F).

The FCI is completed by scoring 1 if a disease is present, that is, diagnosed and recorded in the medical notes of a patient, and 0 if not. A score of 0 indicates no co-morbid disease and a score of 18 the highest number of co-morbid illnesses.

Table 19 Functional Co-Morbidities by Level and Aetiology

	Number	Min	Lower Quartile	Median	Upper Quartile	Max	Mean
All Patients	704	0	2	3	4	8	3.09
Level of Amputation							
Unilateral TTA	269	0	2	3	4	8	3.10
Unilateral TFA	281	0	2	3	4	8	3.09
Other	7	0	1.25	2	3	6	0.75
All Bilateral	147	0	2	3	4	8	2.53
Bilateral TTA	45	0	2	3	5	6	3.42
Bilateral TFA	66	0	2	3	4	9	2.47
TTA & TFA	36	0	2	3	4	7	2.59
Aetiology							
PAD + Diabetes	378	1	3	3	5	8	3.59
PAD	319	0	2	3	3.5	8	2.84
Other	10	1	1	2.5	3	3	2.10

Abbreviations: TFA=transfemoral, TTA=transtibial, PAD=Peripheral Arterial Disease

Table 20 Functional Co-morbidities Mean Score, 2010 – 2015

	2010	2011	2012	2013	2014	2015
	Mean	Mean	Mean	Mean	Mean	Mean
All Patients	3.07	3.11	3.12	2.95	3.01	3.09
Unilateral TTA	3.17	3.13	3.25	2.93	3.01	3.10
Unilateral TFA	2.94	2.83	3.07	2.85	2.86	3.09
Other	2.88	2.53	2.28	2.30	2.50	0.75
All Bilateral	3.36	3.74	3.06	3.31	3.36	2.53
PAD + Diabetes	3.74	3.77	3.72	3.55	3.59	3.79
PAD	2.82	3.06	3.07	2.79	2.84	2.91

Abbreviations: TFA=transfemoral, TTA=transtibial, PAD=Peripheral Arterial Disease

4 Physiotherapy and Rehabilitation

4.1 Compression Therapy

Compression therapy of the residuum is widely used and figures for 2010-2015 are presented in table 21. These figures relate to the number of modalities used: if a single amputee received more than one type of therapy these would both appear in the table.

Table 21 Type of compression therapy used, 2010-2015

	2010		2011		2012		2013		2014		2015	
	N	%	N	%	N	%	N	%	N	%	N	%
Elset 'S' bandage	5	0.87	12	1.93	16	2.63	6	0.95	5	0.81	11	2.08
Flowtron	12	2.09	18	2.90	15	2.47	11	1.74	11	1.77	6	1.14
Plaster cast	89	15.51	132	21.76	143	23.52	156	24.72	123	19.81	96	18.22
Shrinker sock	392	68.29	371	59.74	380	62.50	414	65.61	428	68.92	370	70.21
Silicone Sleeve	8	1.39	12	1.93	9	1.48	10	1.58	18	2.90	12	2.28
Other	1	0.17	3	0.48	6	0.99	2	0.32	0	0.00	0	0
PPAM*	67	11.67	73	11.76	39	6.41	32	5.07	36	5.80	32	6.07
Total	574	100	621	100	607	100	631	100	621	100	527	100

Abbreviations= PPAM Aid= Pneumatic Post Amputation Mobility Aid

*inclusion of PPAM aid here indicates it has been used without the walking frame for compression therapy only

4.2 Early Walking Aids

The types of Early Walking Aids (EWA) used in 2010-2015 are shown in table 22. Note that these figures relate to the number of devices used: if a single amputee used more than one type of EWA, both would appear in the table.

Table 22 Type of EWA used, 2010-2015

	2010		2011		2012		2013		2014		2015	
	N	%	N	%	N	%	N	%	N	%	N	%
AMA	3	0.76	4	1.06	2	0.57	0	0	0	0	0	0
Femurett	47	11.90	42	11.17	59	16.71	59	15.13	81	20.05	65	18.47
PPAM	342	86.58	325	86.44	291	82.44	331	84.87	323	79.95	287	81.53
Other	3	0.76	1	0.27	1	0.28	0	0	0	0	0	0
Total	395	100	372	100	353	100	390	100	404	100	352	100

Abbreviations: PPAM= Pneumatic Post Amputation Mobility Aid, AMA=Amputee Mobility Aid

4.3 Mobility Outcomes: Locomotor Capabilities Index 5(LCI-5)

The LCI-5 is a widely used and validated self report tool that measures a lower limb amputee's locomotor capabilities with their prosthesis during and after rehabilitation (Condie et al 2006).

The LCI-5 is an amended version of the LCI in which the upper ordinal level is split into 2 according to the use or non use of walking aids to give maximum sub-scores of 28 and total score of 56 (Franchignoni et al 2007). The LCI-5 has been found to reduce the ceiling effect associated with the LCI by 50% (Franchignoni et al 2004, Franchignoni et al 2007). The higher the score of the LCI-5 the greater the capabilities of the amputee. The LCI-5 is completed retrospectively for the amputee patient's mobility six months prior to their amputation and prospectively on final discharge. The difference between these two scores is calculated for each patient to give a score for their change in mobility. A positive score indicates an improvement in mobility and a negative score deterioration. All Basic and Advanced values in the tables below are the **mean** values.

Table 23 Locomotor Capabilities Index by level, 2011 to 2015

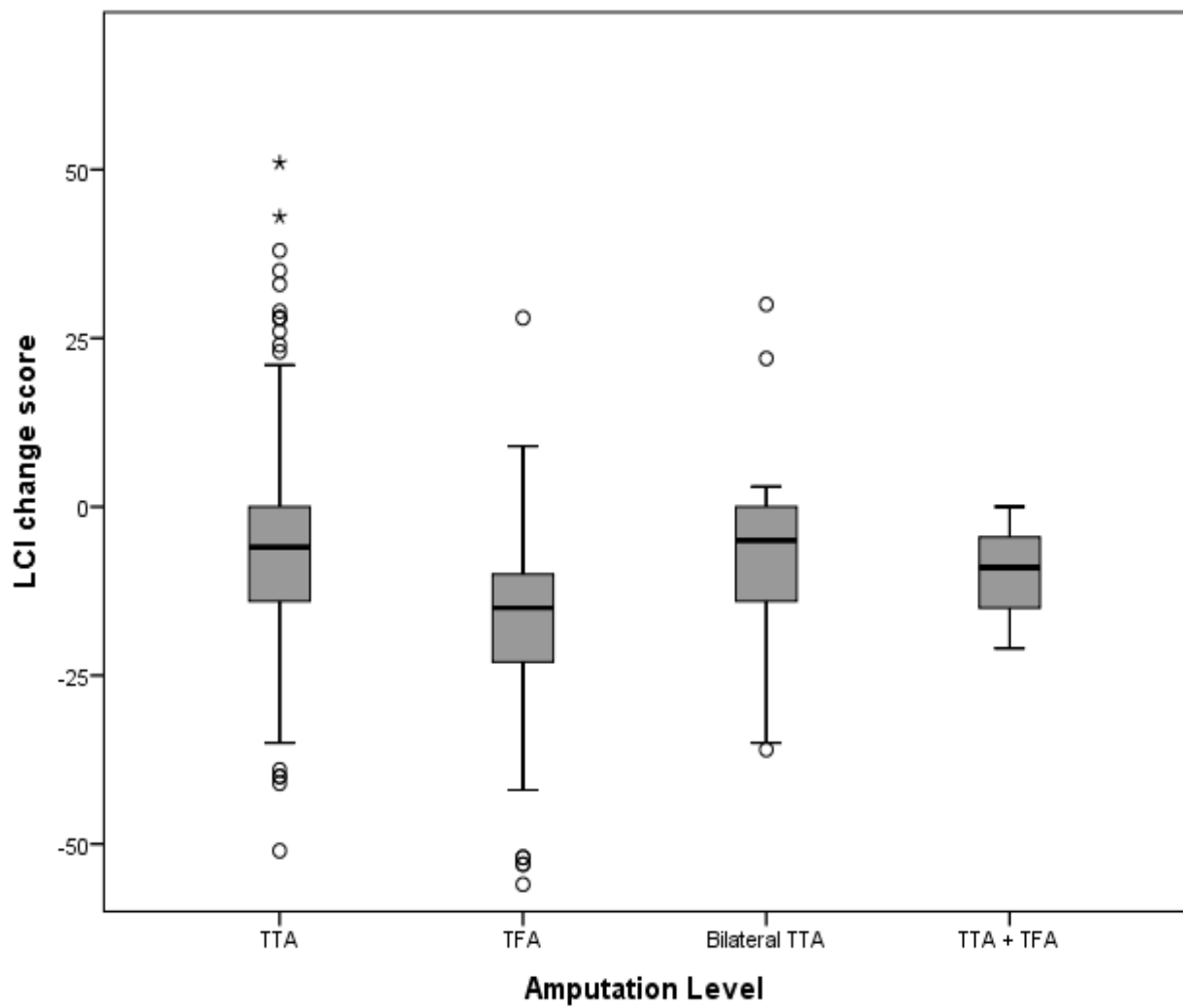
2011	6/12 Pre-amp			Final Outcome				
	Basic	Adv.	Total	Basic	Adv.	Total	Change	N
Transtibial	24	21	45	21	17	38	-7	200
Transfemoral	23	16	39	21	11	33	-17	59
Bilateral	21	18	39	16	11	27	-8	30

2012	6/12 Pre-amp			Final Outcome				
	Basic	Adv.	Total	Basic	Adv.	Total	Change	N
Transtibial	24	20	44	21	15	36	-10	186
Transfemoral	24	20	44	22	14	36	-12	53
Bilateral	22	17	39	17	10	27	-12	39

2013	6/12 Pre-amp			Final Outcome				
	Basic	Adv.	Total	Basic	Adv.	Total	Change	N
Transtibial	24	21	45	21	16	37	-8	233
Transfemoral	23	17	40	20	11	31	-16	54
Bilateral	21	18	39	17	13	30	-8	24

2014	6/12 Pre-amp			Final Outcome				
	Basic	Adv.	Total	Basic	Adv.	Total	Change	N
Transtibial	23	21	44	20	17	37	-6	203
Transfemoral	23	19	42	20	13	33	-12	78
Bilateral	22	15	37	17	11	28	-13	31

2015	6/12 Pre-amp			Final Outcome				
	Basic	Adv.	Total	Basic	Adv.	Total	Change	N
Transtibial	23	23	46	21	19	40	-5	182
Transfemoral	26	27	53	19	15	35	-18	70
Bilateral	21.23	20.3	41.62	19.54	14.62	34.15	-7.5	30
Transtibial & Transfemoral	21.33	17	38.33	16.33	12	28.33	-10	5



Abbreviations: TFA=transfemoral, TTA=transtibial, LCI-5=Locomotor Capabilities Index

Figure 4 LCI-5 Mean Change Score by Level of Amputation

5 Milestone Data

5.1 Statistics Presented

This section of the report deals with the statistical analysis of the rehabilitation milestones. The four rehabilitation milestones are shown in the table below:-

Milestones	Names by which milestones are referred to in this report
<i>Number of days from final amputation to casting for prosthesis</i>	<i>'days to casting'</i>
<i>Number of days from casting to delivery of prosthesis</i> where delivery is defined as the date at which the patient begins gait training with the prosthesis – finished or unfinished.	<i>'casting to delivery'</i>
<i>Number of days from primary amputation to inpatient discharge</i> (for patients having bilateral amputations and/or revision surgery see notes below)	<i>'days to inpatient discharge'</i> (length of stay)
<i>Number of days from inpatient discharge to discharge from outpatient physiotherapy</i>	<i>'days inpatient discharge to outpatient discharge'</i>

For each milestone, the following descriptive statistics are presented: the number of amputees included in the analysis, minimum, lower quartile, median, upper quartile, maximum days.

Only patients who were limb-fitted by inpatient or outpatient discharge are included in *days to casting* and *casting to delivery*.

Where patients have undergone revisions or re-amputations, the latest date of surgery is used as the date of amputation. The final level, in the case of re-amputations to higher levels, is used to group the patients for this milestone.

Days to inpatient discharge is the length of stay in hospital for each amputee calculated in days from the date of amputation. The length of stay for bilaterals amputated in same hospital admission is calculated from the date of first surgery.

The length of hospital stay for patients re-amputated to a higher level will be calculated from the date of their final amputation.

For each milestone, and each group, the statistics represent available data including data from patients who have died.

Groups with results prepared for all milestones	Additional groups for <i>days to inpatient discharge</i>
Tanstibial Unilateral Fitted	Tanstibial Unilateral Not Fitted
Transfemoral Unilateral Fitted	Transfemoral Unilateral Not Fitted
Bilateral* Fitted	Bilateral* Not Fitted

*Bilateral includes all those who underwent one amputation in the report period having had a prior amputation(s), and those who underwent bilateral amputations in the report period having had no prior amputations.

5.2 Days to Casting

Table 24 Days to casting milestone, descriptive statistics, 2015

	All Patients	Unilateral TTA	Unilateral TFA	Bilateral TTA	Bilateral TFA	TTA & TFA
Number Included	334	203	84	36	4	7
Minimum	5	8	17	5	41	17
Lower Quartile	32	28	34.5	38.5	41	23
Median	50	48	61	61.5	49	49
Upper Quartile	89	87	98	102	169	71
Maximum	498	459	498	369	281	88

Abbreviations: TFA=transfemoral, TTA=transtibial

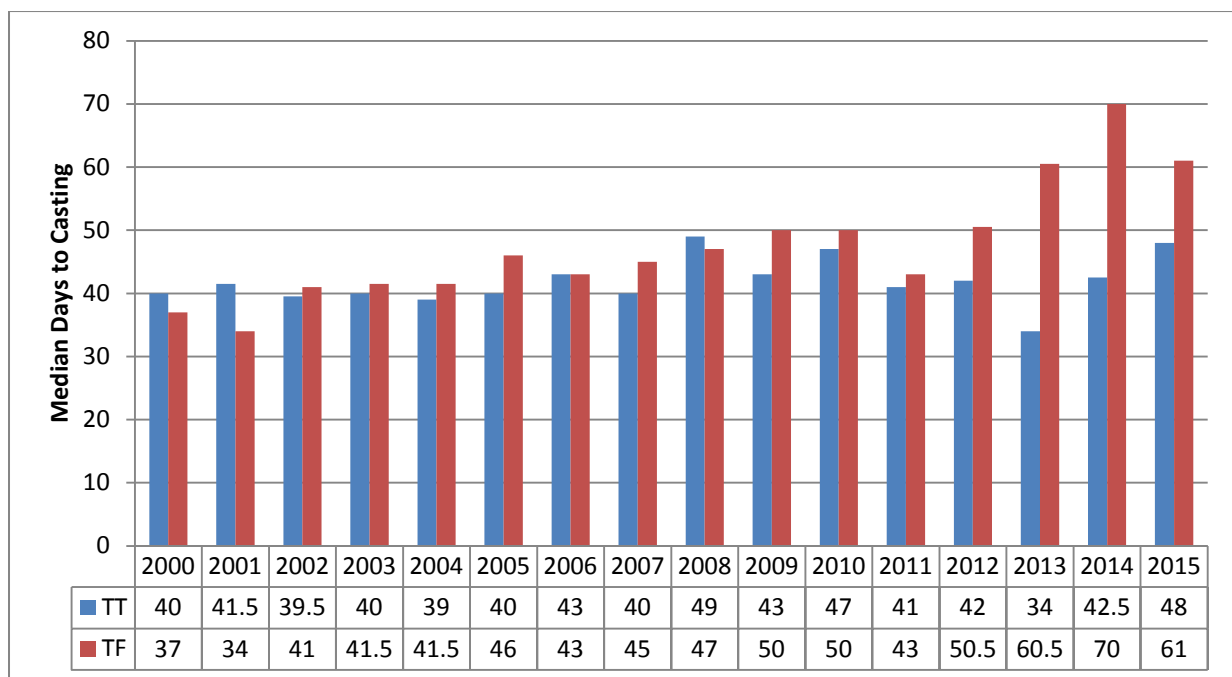


Figure 5 Median days to casting milestone, 2000-2015

5.3 Casting to Delivery

Table 25 Casting to delivery milestone, descriptive statistics, 2015

	All	Unilateral TTA	Unilateral TFA	Bilateral TTA	TTA & TFA
Number Included	325	200	82	36	7
Minimum	3	3	3	5	7
Lower Quartile	7	7	8	7.5	7
Median	11	9	14	10	14
Upper Quartile	18	17	20	14	21
Maximum	387	99	387	61	34

Abbreviations: TFA=transfemoral, TTA=transtibial

Table 26 Median casting to delivery milestone, 2001-2015

	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15
Transtibial	14	14	14	14	14	14	13	14	13	10	10	9	8	9	9
Transfemoral	22	15.5	14	14	14	15	14	15	15	15	14	14	13	15	14

5.4 Days to Inpatient Discharge: Fitted with a Prosthesis

Table 27 Days to inpatient discharge, patients fitted with a prosthesis, descriptive statistics

	Unilateral TTA	Unilateral TFA	Bilateral TTA	TTA & TFA
Number Included	194	82	33	6
Minimum	1	8	5	44
Lower Quartile	23	24	25	16
Median	43	48	60	72
Upper Quartile	80	72	87	77
Maximum	469	343	216	126

Table 28 Median days to inpatient discharge, patients fitted with a prosthesis, 2000-2015 (2001-2015 Unilateral Only)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
TTA	57	61	53	55	54	56	55	55	55	59	50	51.5	47.5	41.5	43
TFA	65.5	71	69	55.5	63.5	57	58	67.5	53	59	33	49.5	37	35	48

Abbreviations: TFA=transfemoral, TTA=transtibial

5.5 Days to Inpatient Discharge: Not Fitted with a Prosthesis

Table 29 Days to inpatient discharge, patients not fitted with a prosthesis, descriptive statistics, 2015

	Unilateral TTA	Unilateral TFA	Bilateral TTA	Bilateral TFA	TTA & TFA
Number Included	52	146	9	53	17
Minimum	3	4	8	0	4
Lower Quartile	25	30	22.5	12	17
Median	40	43	50	40	42
Upper Quartile	93	75	102	90.5	80
Maximum	456	302	129	859	318

Table 30 Median days to inpatient discharge, patients not fitted with a prosthesis, 2000-2015 (2001 – 2015– Unilateral Only)

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
TTA	47	43	50	37	52	51.5	66	60.5	62	61	45	53	64.5	45.5	42.5	40
TFA	40	42.5	48	41	42	47	52	46	47	51	41	34	36	32	34	43

The following tables describe outpatient treatment length; however, this does not take into account the frequency or type of rehabilitation treatment which will vary from hospital to hospital. The 3 tables show respectively: all amputees and limb-fitted

Table 31 Days from inpatient discharge to outpatient discharge, all amputees, 2015

	Unilateral TTA	Unilateral TFA	Bilateral TTA	TTA & TFA
Number included	270	279	45	36
Mean	97.21	59.39	104.49	23.03
Minimum	0	0	0	0
Lower Quartile	0	0	0	0
Median	59	0	0	0
Upper Quartile	147.5	57.5	210	0
Maximum	561.0	550.0	476.0	238.0

Table 32 Days from inpatient discharge to outpatient discharge, limb-fitted amputees, 2015

	Unilateral TTA	Unilateral TFA	Bilateral TTA	TTA & TFA
Number Included	183	69	30	5
Mean	115.71	160.59	126.88	127.8
Minimum	0	0	0	0
Lower Quartile	38.5	34	47	64
Median	99.5	107	116	113
Upper Quartile	163	268	308	224
Maximum	561	525	476	238

Table 33 Median Days from inpatient discharge to outpatient discharge, limb-fitted amputees 2015

	2010	2011	2012	2013	2014	2015
Transtibial	95	89.5	92	96.5	111	99.5
Transfemoral	128.5	154	139	221	164.5	107
Bilateral	111	109	100	68	148.5	69

6 Trends in Compression Therapy and Early Walking Aids (EWAs)

6.1 Statistics Presented

This chapter looks at trends in the use of compression therapy and Early Walking Aids (EWAs). All patients receiving compression therapy or EWA therapy are included in each analysis.

6.2 Trends in Compression Therapy

Of the patients receiving compression therapy, the percentage who received it within 10 days of amputation is shown in Table 33 for 2000-2015. A line chart representing this data is shown in Figure 6

Table 34 Patients receiving compression therapy within 10 days of amputation (%), 2000– 2015

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
TTA	61.3	69.8	66.2	67.8	65.5	54.4	47.5	52.8	55.7	51.1	55.3	73.5	66.9	68.6	62.2	63.7
TFA	58.1	53.7	49.3	63.8	55.3	49.5	43.6	41.6	45.2	40.2	39.1	47.2	57.8	37.2	35.5	22.1

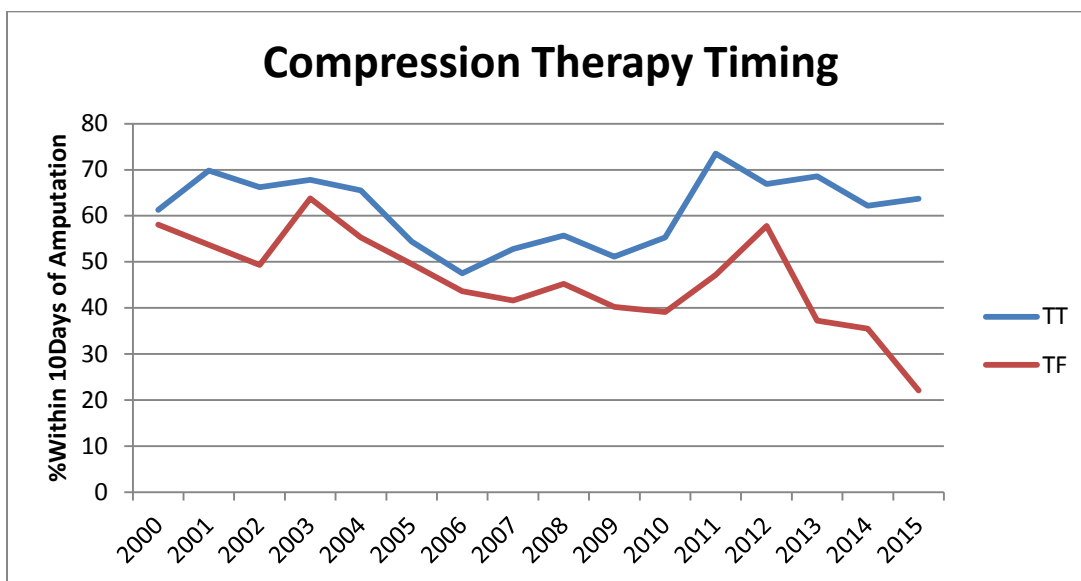


Figure 6 Percentage of transtibial and transfemoral amputees receiving compression therapy within 10 days of amputation surgery, 2000– 2015

6.3 Trends in Early Walking Aids

Of the patients receiving Early Walking Aids (EWA) therapy, 26.3% received it within 10 days of amputation in 2015 and this is shown in Table 34 for 2000-2015, categorised by level of amputation. A line chart representing this data is shown in Figure 7

Table 35 Patients using EWAs within 10 days of amputation (%), 2000– 2015

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
TTA	28.8	35.9	27.1	23.3	25.9	23.9	18.3	21.5	17.6	14.9	16.0	24.1	19.8	34.8	27.9	23.3
TFA	24.5	26.2	26.7	21.2	21.2	14.9	13.3	15.6	23.5	12.1	15.4	24.3	20.5	21.6	20.2	22.0

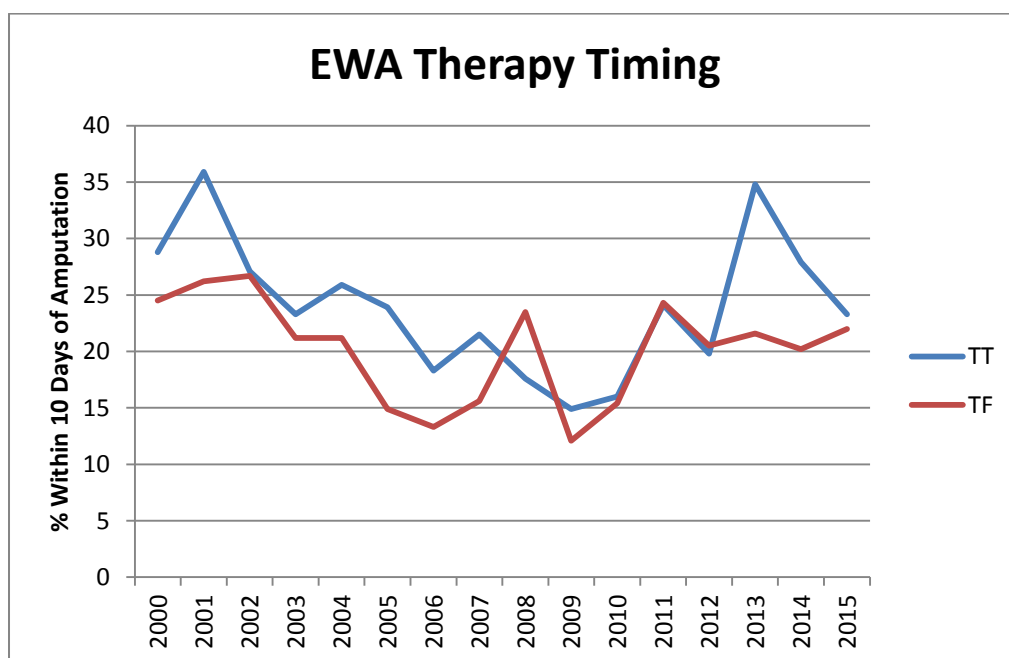


Figure 7 Percentage of transtibial and transfemoral amputees using EWAs within 10 days of amputation surgery, 2000- 2015

7 Individual Hospital Summaries for 2015 – Key Performance Indicators

7.1 Data Checking Summary

This section presents the national data broken down by amputating hospital, please refer to Appendix H on Models of Care

The number of amputees at each hospital and the data completeness are shown in Table 36.

Table 36 Data Checking Summary By Hospital

Hospital	Total number (n=802)	Number of Missing Forms (n=97)	Number Complete (n=684)	Number Incomplete (n=20)
Ayr University Hospital	65	0	65	0
Aberdeen Royal Infirmary	85	85	0	0
Balfour Hospital	0	0	0	0
Dumfries & Galloway Royal Infirmary	26	0	25	1
Forth Valley Royal Infirmary	37	0	37	0
Gartnavel General Hospital	0	0	0	0
Glasgow Royal Infirmary	18	0	16	2
Golden Jubilee	0	0	0	0
Hairmyres Hospital	103	1	102	0
Inverclyde Royal Hospital	3	0	3	0
Monklands Hospital	0	0	0	0
Ninewells Hospital	106	0	106	0
Raigmore Hospital	42	1	40	1
Royal Alexandria Hospital	4	0	4	0
Royal Infirmary of Edinburgh	103	0	103	0
Queen Elizabeth University Hospital	170	0	156	14
St John's Hospital At Howden	1	0	1	0
Victoria Hospital (Kirkcaldy)	25	1	24	0
Victoria Infirmary (Glasgow)	2	2	0	0
Wishaw General	2	0	2	0
Woodend General Hospital	8	8	0	0
Yorkhill Hospital	1	0	0	1
Outside Scottish Service	1	0	0	1

7.2 Key Performance Indicators

7.2.1 Final Outcome

Key Performance Indicators by Hospital are shown in Table 36

Table 37 Key Performance Indicators By Hospital

Hospital	LF % (n)	NLF % (n)	Aban % (n)	Died % (n)	Total
Ayr University Hospital	43.1% (28)	33.8% (22)	10.8% (7)	12.3% (8)	65
Dumfries & Galloway Royal Infirmary	46.2% (12)	46.2% (12)	3.8% (1)	3.8% (1)	26
Forth Valley Royal Infirmary	56.8% (21)	29.7% (11)	2.7% (1)	10.8% (4)	37
Glasgow Royal Infirmary	61.1% (11)	16.7% (3)	5.6% (1)	16.7% (3)	18
Hairmyres Hospital	29.4% (30)	53.9% (55)	3.9% (4)	12.7% (13)	102
Inverclyde Royal Hospital	0	66.7% (2)	0	33.3% (1)	3
Ninewells Hospital	48.1% (51)	36.8% (39)	1.9% (2)	13.2% (14)	106
Queen Elizabeth University Hospital	37.2% (45)	40.5% (49)	9.9% (12)	12.4% (15)	121
Raigmore Hospital	56.1% (23)	24.4% (10)		19.5% (8)	41
Royal Alexandria Hospital	50% (2)	25% (1)	25% (1)		4
Royal Infirmary of Edinburgh	39.8% (41)	47.6% (49)	0	12.6% (13)	103
St John's Hospital, Livingstone	0	100% (1)	0	0	1
Victoria Hospital (Kirkcaldy)	37.5% (9)	50% (12)	0	12.5% (3)	24
Wishaw General	100% (2)	0	0	0	2
Yorkhill Hospital	100% (1)	0	0	0	1
Outside Scottish Service	100% (1)	0	0	0	1

Abbreviations: LF=Limb Fitted, NLF=Non Limb fitted, Aban=Abandoned

7.2.2 Age, FCI, Abandonment

Table 38 Median Age, and FCI for all; Limb Fitting of Females by Hospital

Hospital	Median Age (years)	Mean FCI	% Females LF (n)
Ayr University Hospital	66.04	3.03	22% (5)
Dumfries & Galloway Royal Infirmary (D &G)	69.60	3.23	25% (2)
Forth Valley Royal Infirmary (FV)	62.95	3.03	35% (6)
Glasgow Royal Infirmary (GRI)	45.06	0.82	57% (4)
Hairmyres Hospital	69.74	3.72	10% (3)
Inverclyde Royal Hospital (IRH)	69.12	3.33	N/A
Ninewells Hospital	67.22	3.03	39% (12)
Queen Elizabeth University Hospital (QEUH)	65.87	3.33	30% (13)
Raigmore Hospital	66.41	2.93	30% (3)
Royal Alexandra Hospital (RAH)	59.59	3.75	50% (1)
Royal Infirmary of Edinburgh (ERI)	67.09	2.52	27% (10)
St John's Hospital , Livingstone	***	3.33	N/A
Victoria Hospital, Kircaldy	67.37	3.04	50% (5)
Wishaw General	39.98	2.50	N/A
Yorkhill Hospital	***	***	N/A
Outside Scottish Service	***	***	N/A
National	67.63	3.09	27.1% (64)

N/A:-No females had an amputation at IRH, St Johns Hospital and Wishaw General

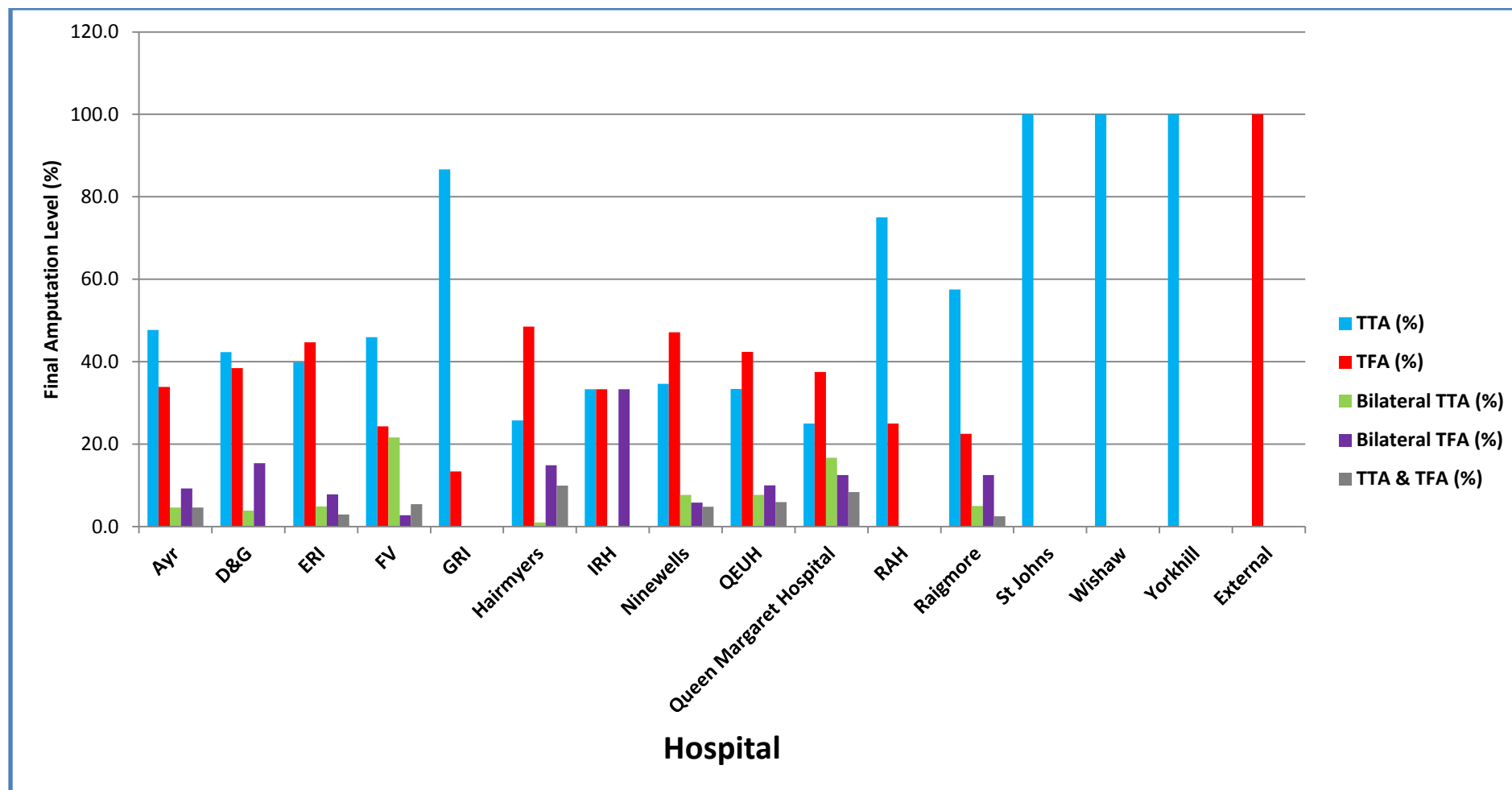
***:- Unable to give median age as n<2

7.2.3 Final Level of Amputation

The final level of Amputation that a patient has at the end of their rehabilitation period is recorded in Table 39

Table 39 Final level of Amputation at end of Rehabilitation by Hospital

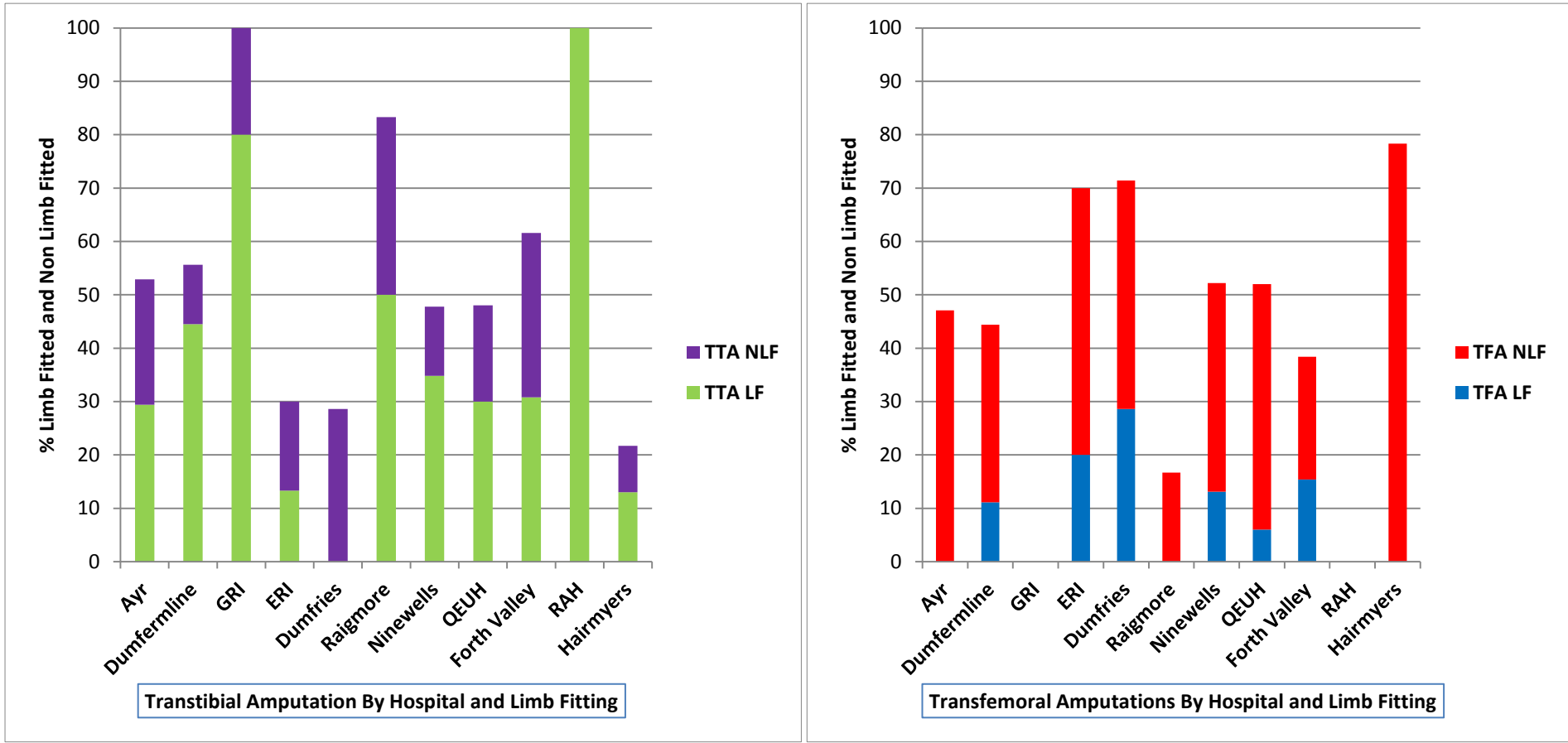
	Unilateral TTA	Unilateral TFA	Other	Bilateral TTA	Bilateral TFA	TTA & TFA	Other	Total
Ayr University Hospital	47.7% (31)	32.3% (21)	1.0% (1)	4.6% (3)	9.8% (6)	4.6% (3)	0% (0)	65
Dumfries & Galloway Royal Infirmary (D&G)	42.3% (11)	38.5 % (10)	0% (0)	3.8% (1)	15.3% (4)	0% (0)	0% (0)	26
Forth Valley Royal Infirmary (FV)	45.9% (17)	24.3% (9)	0% (0)	21.6% (8)	2.7% (1)	5.4% (2)	0% (0)	38
Glasgow Royal Infirmary (GRI)	72.2% (13)	11.1% (2)	16.7% (3)	0% (0)	0% (0)	0% (0)	0% (0)	18
Hairmyres Hospital	25.5% (26)	49.0% (50)	1% (1)	1% (1)	13.7% (14)	9.8% (10)	0% (0)	102
Inverclyde Royal Hospital (IRH)	33.3% (1)	33.3% (1)	0% (0)	0% (0)	33.3% (1)	0% (0)	0% (0)	3
Ninewells Hospital	33.9% (36)	46.2% (49)	1.0% (1)	7.5% (8)	5.7% (6)	4.7% (5)	1.0% (1)	106
Queen Elizabeth University Hospital (QEUH)	33.4% (55)	42.4% (72)	0.6% (1)	7.7% (13)	17% (17)	5.9% (10)	0% (0)	170
Raigmore Hospital	56.1% (23)	22.0% (9)	2.4% (1)	4.9% (2)	12.2% (5)	2.4% (1)	0% (0)	41
Royal Alexandria Hospital (RAH)	75% (3)	25% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	4
Royal Infirmary of Edinburgh (ERI)	39.8% (41)	44.7% (46)	0% (0)	4.8% (5)	7.8% (8)	2.9% (3)	0	103
St John's Hospital, Livingstone	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	1
Wishaw General	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	2
Victoria Hospital, Kircaldy	25% (6)	37.5% (9)	0% (0)	16.7% (4)	12.5% (3)	8.3% (2)	0% (0)	24
Yorkhill Hospital	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	1
Outside Scottish Service	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	1
Total	270	279	8	45	65	36	1	704



Abbreviations: TFA=transfemoral, TTA=transtibial

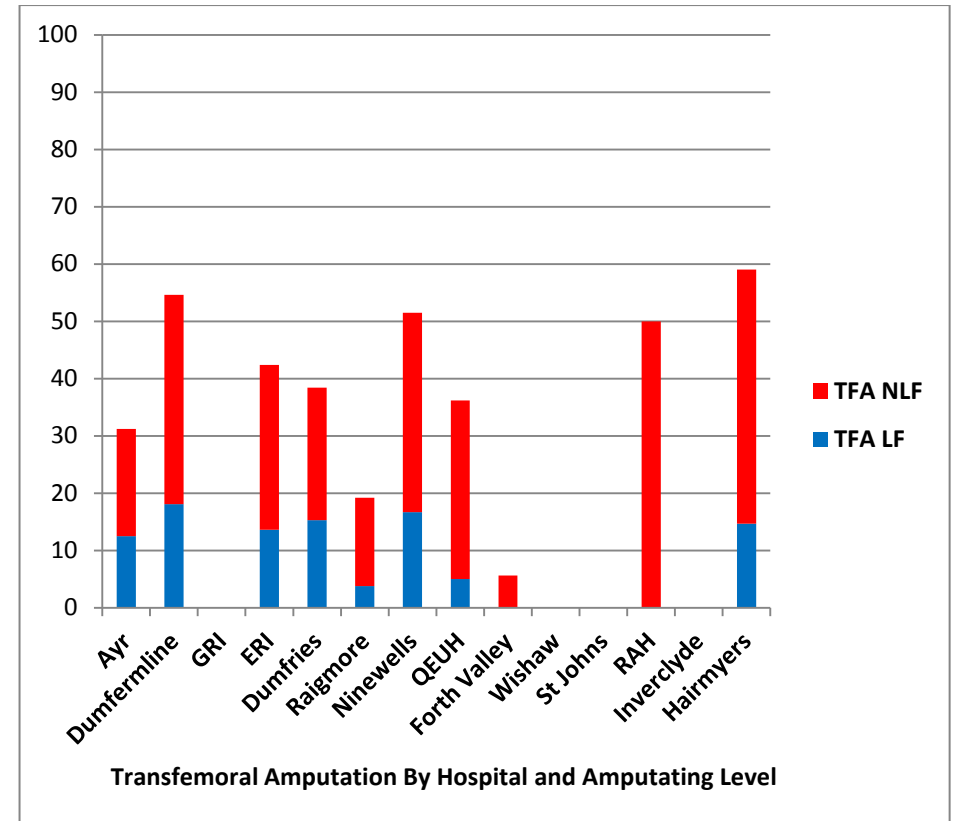
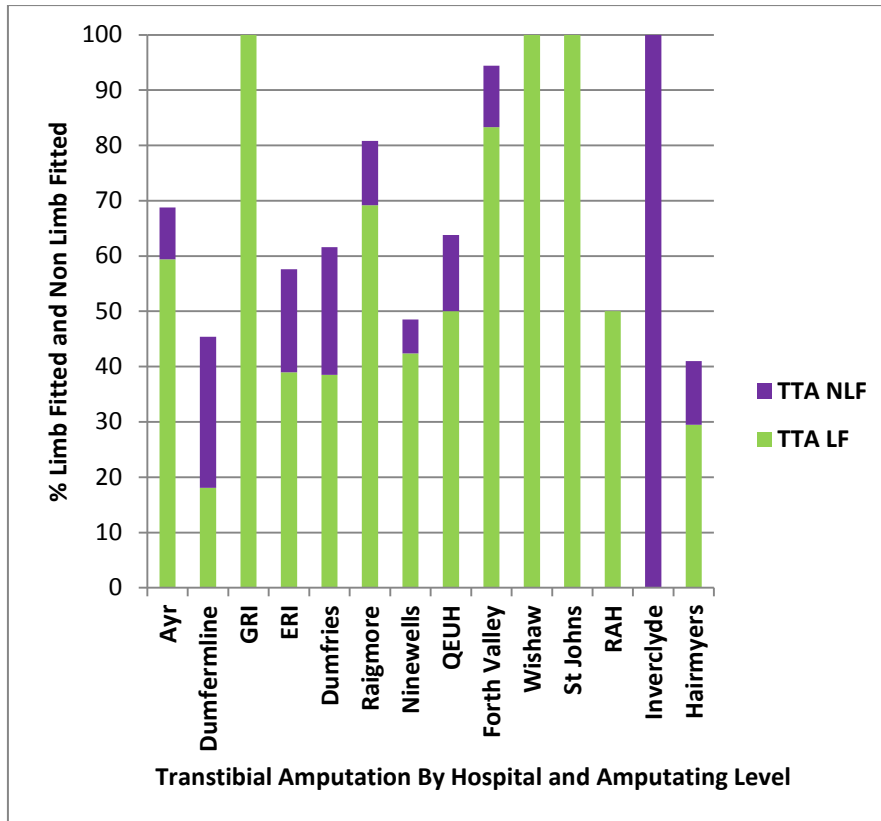
Figure 8 Final Level of Amputation by Hospital

The total number of people in each centre are categorised by sex, level of amputation and limb fitting status; Females in Figure 9 and Males in Figure 10.



Abbreviations: TFA=transfemoral, TTA=transtibial

Figure 9 Histograms of Females Limb Fitted and Not Limb Fitted by Level for Each Hospital



Abbreviations: TFA=transfemoral, TTA=transtibial

Figure 10 Histograms of Males Limb Fitted and Not Limb Fitted by Level for Each Hospital

7.3 Milestones (Unilateral transtibial amputees)

The number of, and milestones data for unilateral transtibial amputees are presented for each hospital in Table 39.

Table 40 Key Performance Indicators (milestones) by hospital, 2015

Hospital	Days to CT	Days to EWA	Days to Casting	Days casting to delivery	In Patient Stay	Overall Length of Rehab
Ayr University Hospital	26	29	66.5	14	46	155
Dumfries & Galloway Royal Infirmary	13	20	55	9	24	225
Forth Valley Royal Infirmary	9	9	39	14	62.5	170.5
Glasgow Royal Infirmary	20.5	31.5	65	14	8	161
Hairmyres Hospital	6	19	49	17.5	26	151
Inverclyde Royal Hospital*						
Ninewells Hospital	0	11	32	7	45	92
Queen Elizabeth University Hospital	7	10	47	13	31	189
Raigmore Hospital	0	10.5	41	1	62	121
Royal Alexandria Hospital	17	35	31	14.5	9	147
Royal Infirmary of Edinburgh	10	24	50	8	79	95
St John's Hospital, Livingstone *						
Wishaw General*						
Victoria Hospital (Kirkcaldy)	16	20	60.5	8	58	105
Yorkhill Hospital*						
Outside Scottish Service*						
National Median	7	16	46	9	65.8	199.7

**Only 1 person therefore unable to give median*

Definitions:

Days to CT	Median days from final surgery to start of compression therapy
Days to EWA	Median days from final surgery to start of early walking aid therapy e.g. PPAM aid.
Days to casting	Median days from final surgery to casting for prosthesis
Days casting to delivery	Median days from casting to delivery of prosthesis
In Patient Stay	Median days from amputation surgery to discharge from inpatient care
Overall Length of Rehab	Median days from amputation surgery to discharge from outpatient care

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- Smith DG, McFarland LV, Sangeorzan BJ, Reiber GE, Czernieki JM (2003) 'Postoperative dressing and management strategies for transtibial amputation: a critical review.' *J. of Rehabil. Res. and Devel.*, 40(3):213
- The 'MUST' Explanatory Booklet: A guide to the 'Malnutrition Universal Screening Tool' ('MUST'), Produced by Malnutrition Advisory Group, A standing committee of BAPEN, http://www.bapen.org.uk/pdfs/must/must_explan.pdf

9 Appendices

9.1 Appendix A Project work

Completed projects: -

Stuart W, Hussey K, Ross P and Smith F (2012) 'Indicators of poor outcome following major amputation.' (publication pending) Further information available from Mr Wesley Stuart, Consultant vascular Surgeon, Western Infirmary, Glasgow (wesley.stuart@ggc.scot.nhs.uk)

Hebenton J (2012) 'Has centralisation of the Vascular Service in Glasgow been successful? A physiotherapists perspective'. Local audit, Western Infirmary, Glasgow. Further information available from Mrs Joanne Hebenton, Specialist Physiotherapist, Westmarc, Glasgow (joanne.hebenton@ggc.scot.nhs.uk)

McNaughton M, Robertson F, Ross M, Smith F, Smith S and Whitehead L (2012) 'Exercise Intervention for the Treatment of Patients with Intermittent Claudication.' Scottish Physiotherapy Amputee Research Group, Glasgow.

(<http://www.knowledge.scot.nhs.uk/sparg.aspx>)

Davie-Smith F, Paul L, Nicholls N, Stuart WP, Kennon B (2016) The impact of gender, level of amputation and diabetes on prosthetic fit rates following major lower extremity amputation. Prosthet Orthot Int 0309364616628341, first published on February 5, 2016 as doi:10.1177/0309364616628341

PPAM aid Project

Joanne Hebenton completed work on the Chartered Society of Physiotherapy (CSP) Funded project 'How do models of care in Scotland impact on the use of the PPAM aid in Scotland?'. A final report was submitted to CSP in November 2015 and the results are now being written up for publication (see poster on website for results on timing of PPAM aid use <http://www.knowledge.scot.nhs.uk/sparg.aspx>). This was a collaborative project with NHS GG&C, SPARG and Caledonian University.

Orthopaedic Project

Joanne Hebenton completed work on the BACPAR Funded project 'Rehabilitation outcomes after lower limb amputation in Scotland - all aetiologies other than PAD and/or diabetes.' in November 2016. This has been written up as a poster and is available on SPARG website (<http://www.knowledge.scot.nhs.uk/sparg.aspx>).

9.2 Appendix B

List of SPARG Database reporting facilities

30 days mortality

Amputees fitted with a prosthesis and abandoned - by level (bilateral)

Amputees fitted with a prosthesis and abandoned - by level (unilateral only)

Amputees fitted with prosthesis for transfers only (bilateral)

Amputees fitted with prosthesis for transfers only (unilateral only)

Bilateral amputation surgery - by level

Check final outcome

Check important dates

Cognitive status - by aetiology

Cognitive status - by level

Compression therapy - by type

Days from casting to delivery

Days from final surgery to casting

Days from final surgery to compression therapy - by aetiology

Days from final surgery to compression therapy - by level (bilateral)

Days from final surgery to compression therapy - by level (unilateral only)

Days from final surgery to EWA - by aetiology

Days from final surgery to EWA - by level (bilateral)

Days from final surgery to EWA - by level (unilateral only)

Days from in-patient discharge to out-patient discharge - by aetiology

Days from in-patient discharge to out-patient discharge - by level (bilateral)

Days from in-patient discharge to out-patient discharge - by level (unilateral only)

Delayed healing - by aetiology

Delayed healing - by level (bilateral)

Delayed healing - by level (unilateral only)

Delayed in-patient discharge

EWAs - by type

Falls

Final outcome summary

Final outcome summary - by aetiology

Final outcome summary - by level (bilateral)

Final outcome summary - by level (unilateral only)

Functional co-morbidities index - by aetiology

Functional co-morbidities index - by level (bilateral)
Functional co-morbidities index - by level (unilateral only)
Gender and mean age
Gender and mean age - by aetiology
Gender and mean age - by level (bilateral)
Gender and mean age - by level (unilateral only)
Healthcare acquired infection (other)
Haemodialysis
Home circumstances
Interim discharge
Length of stay (days from final surgery to in-patient discharge) - limb fitted amputees by aetiology
Length of Stay (days from final surgery to in-patient discharge) - limb fitted amputees by level
Length of stay (days from final surgery to in-patient discharge) - non limb fitted amputees by aetiology
Length of Stay (days from final surgery to in-patient discharge) - non limb fitted amputees by level
Limb fitting - timing
Locomotor capabilities index 5 - by aetiology
Locomotor capabilities index 5 - by level
Overall summary - by aetiology
Overall summary - by level (bilateral)
Overall summary - by level (unilateral only)
Revisions and re-amputations in same episode
Wound infection - by aetiology
Wound infection - by level (bilateral)

9.3 Appendix C

SPARG Hospitals and Physiotherapists

Glasgow	Vascular Unit Queen Elizabeth University Hospital 1345 Govan Road, Glasgow G51 4TF	<u>Linsay Clark</u> linsay.clark@ggc.scot.nhs.uk <u>Damien McGovern</u> Damien.mcgovern@ggc.scot.nhs.uk <u>Ann Docherty, Therapy Assistant Practitioner</u> Ann.docherty@ggc.scot.nhs.uk <u>Alison Frith</u> <u>Renal Unit</u> Alison.Frith@ggc.scot.nhs.uk	0141 211 3000 Page 14636 Page 14662
	WestMARC, Queen Elizabeth University Hospital 1345 Govan Road, Glasgow G51 4TF	Helen Scott Helen.scott@ggc.scot.nhs.uk Joanne Heberton Joanne.heberton@ggc.scot.nhs.uk <u>Damien McGovern</u> Damien.mcgovern@ggc.scot.nhs.uk <u>Grace Ferguson</u> Grace.Ferguson@ggc.scot.nhs.uk (Nikki Porteous – mat leave from March 2018) ntaylor7@nhs.net <u>Generic email : -</u> Westmarc.physiotherapy@ggc.scot.nhs.uk	0141 201 2639 Fax: 0141 201 2649
	Canniesburn Plastic Surgery Unit, Jubilee Building, Glasgow Royal Infirmary, 84 Castle Street, Glasgow G4 0SF	Gillian Calder gillian.calder@ggc.scot.nhs.uk	0141 211 5612.

Glasgow	Glasgow Royal Infirmary Queen Elizabeth Building, 16 Alexandra Parade, Glasgow G31 2ER	Huda Alsafar H.alsafar@ggc.scot.nhs.uk	0141 211 4430
	Stobhill Hospital, Balornock Road, Glasgow G21 3UW	Sarah Wilson Sarah.wilson4@ggc.scot.nhs.uk	0141 355 1789 /1744
	Royal Alexandra Hospital, Corsebar Road, Paisley PA2 9JH	Kathryn Finlay Specialist Physiotherapist Kathryn.Finlay@ggc.scot.nhs.uk Isla Gray, TL ortho i.campbell2@nhs.net	0141 887 9111
	Inverclyde Royal Infirmary, Larkfield Road, Greenock PA16 OXN	Gerry Coffield Gerry.coffield@ggc.scot.nhs.uk	01475 633 777 Page 1132 or 01475 504 468
	Vale of Leven Hospital, Alexandria G83 0UA	Morna Millar (Surgical) Morna.millar@ggc.scot.nhs.uk	01389 754 121 Page 53096 01389 754 121 Ext 27532
	Royal Hospital for Children, 1345 Govan Road, Glasgow G51 4TF	Shona Simpson Shona.taylor@nhs.net Caroline Grant Caroline.grant@ggc.scot.nhs.uk Carolinegrant1@nhs.net	0141 201 0063

	Golden Jubilee Hospital, Beardmore Street, Clydebank	Sheelagh Brown Sheelagh.brown@gjnh.scot.nhs.uk Christine Divers Christine.Divers@gjnh.scot.nhs.uk	0141 951 5121 Page 33854
West & Central	Ayr Hospital, Dalmellington Road, Ayr KA6 6DX	Mary Kelso mary.kelso@aapct.scot.nhs.uk Geddes, Susan Susan.Geddes@aapct.scot.nhs.uk	01292 610 555 Ext 14860 Page #6314 Ext 14233
	Hairmyres Hospital, East Kilbride G75 8RD	Sally smith sally.smith@lanarkshire.scot.nhs.uk Colette Ramsay Colette.ramsay@lanarkshire.scot.nhs.uk	01355 585 326 (Surgical Physio) or 01355 585 420
	Monklands Hospital, Monkscourt Avenue, Airdrie ML6 OJS	Lorraine Senior lorraine.senior@lanarkshire.scot.nhs.uk	01236 748748 Page 129 M-Th 9.30 – 14.30
	Wishaw Hospital, 50 Netherton Sreet, Wishaw, ML2 0DP	Angela McCusker Angela.mccusker@lanarkshire.scot.nhs.uk Nicola Sinton (job share) Nicola.sinton@lanarkshire.scot.nhs.uk	01698 361 100 Page 246
	Forth Valley Royal Hospital, Stirling Rd Larbert FK5 4WR	Carol Grant Carolgrant2@nhs.net Caroline Meadley Caroline.meadley@nhs.net	01324 566000 Carol Page 1599 Caroline Page 1577
	St John's Hospital, Howden Road West, Livingston, West Lothian EH54 6PP	Lynn Spiers Lynn.Spiers@nhslothian.scot.nhs.uk	01506 419 666 or 01506 523 000 Page 694
West & Central			

Aberdeen	Aberdeen Royal Infirmary, Foresterhill Road, Aberdeen AB25 2ZN	Karen Duncan kduncan@nhs.net ascomphone 01224 554 684	Dept 01224 552 142 Fax 01224 553 916 ARI 08454 566 000 ext 52142 bleep 2207
	Woodend Hospital, MARS, Eday Road, Aberdeen AB15 6LS	Michelle Ord michelle.ord@nhs.net	01224 556 015
Borders	Borders General Hospital, Melrose, Roxburghshire TD6 9AL	No current contact	01896 826 000 Page 1603
Dumfries	Dumfries & Galloway Royal Infirmary, Bankend Road, Dumfries DG1 4AP	Helen Cannon hchalmers@nhs.net	01387 241 452 DIRECT: 01387 241826
Dundee	Ninewells Hospital, Amputee Therapy Dept., East Block Dundee DD1 9SY	Louise Whitehead lwhitehead@nhs.net	01382 660 111 Ext 36149 Page 4069
	Victoria Hospital Physiotherapy Dept Hayfield Road Kircaldy KY2 5AH	Kerry Murphy kerry.murphy1@nhs.net	01592 643355 Ext 21779
Edinburgh	Edinburgh Royal Infirmary, Ward 105, Little France, Edinburgh EH16 4SU	Ian Cornwall ian.cornwall@luht.scot.nhs.uk	0131 536 1000 page 5012 or 5137

	Astley Ainslie Hospital, Grange Loan, Edinburgh EH9 2HL	Catriona Mawdsley Catriona.mawdsley@nhslothian.scot.nhs.uk Katy Bryce katy.bryce@nhslothian.scot.nhs.uk Suzanne Howie suzanne.howie@nhslothian.scot.nhs.uk	0131 537 9166
	Royal Hospital for Sick Children, 9 Sciennes Road Edinburgh EH9 1LF	Ailsa White	0131 536 0000 Page 9116
Inverness	Raigmore Hospital, Old Perth Road, Inverness IV2 3UJ	Mairi Ross mairi.ross2@nhs.net	01463 704 000 Ext 5580 or Page 2003
Oban	Lorne & Islands District General Hospital, Glengallan Road, Oban PA34 4HH	Derek Laidler Derek.laidler@nhs.net	01631 567 500
	Mid Argyll Hospital, Blarbuie Road, Lochgilphead PA31 8JZ	Gillian Rennie Gillian.Rennie@nhs.net	01546 602 323
Western Isles	Physiotherapy Department Western Isles Hospital McCauley Road Stornoway Isle of Lewis HS21 2AP	Sheila Nicolson Sheila.nicolson@nhs.net	01851 548 704

Ports-mouth	Physiotherapy Department Portsmouth Enablement Centre St Mary's Community Health Campus Milton Road Portsmouth PO3 6AD	Erin Williams Erin.williams@porthosp.nhs.uk	02392680162
		Chantel Ostler Chantel.Ostler2@porthosp.nhs.uk	02392680162

Academic Advisor	WestMARC, Queen Elizabeth University Hospital 1345 Govan Road, Glasgow G51 4TF	Fiona Davie-Smith, Clinical Co-ordinator Specialist Prosthetics Service f.smith.3@research.gla.ac.uk Fiona.Smith6@ggc.scot.nhs.uk	0141 201 1881
BACPAR	Mary Jane Cole maryjrcole@aol.com		02088747103 07884232330
NCPO	National Centre Prosthetics and Orthotics Strathclyde University 131 St James Road Glasgow	Sarah Day Sarah.day@strath.ac.uk Tony McGarry Anthony.mcgarry@strath.ac.uk	0141 548 4034
Finding Your Feet Reg Charity SCO44572	Corinne Hutton cor@findingyourfeet.net Nicola nicola@findingyourfeet.net		07977 281 852
Murray Foundation	Keith Ferguson MF Co-ordinator infoatmf@btinternet.com Johan Graham (West of Scotland and SPARG rep)		0800 028 2822 07743 780 913 07843875437
Declared interest in amputee rehab.	Sarah Moran Sarah.Moran@ggc.scot.nhs.uk Abi Campbell Abi.Campbell@lanarkshire.scot.nhs.uk		

9.4 Appendix D Aetiology Mapping

Definition

If there are several factors contributing to the patient's need for an amputation, the main or root cause of the amputation will be selected here, other factors are included as co-morbidities using FCI.

- PAD – Peripheral Arterial Disease this terminology replaces the previously used “Peripheral Vascular Disease”.
- Diabetes. If patient is diabetic enter as aetiology unless tumour, trauma, burns, drug abuse or orthopaedic is the cause. The amputation may be the result of PAD and/or neuropathy and/or renal failure.
- Blood borne infection includes meningitis
- Renal Failure – only where diabetes is not present
- Other for any aetiology not listed.

Since 2016 ‘**immediate cause of amputation**’ has been included. This is either infection, ischaemia or a combination of both and will be secondary to aetiology. This section may not be applicable when amputation is due to trauma, tumour or congenital deformity in which case mark as not applicable.

Mapping

The list of aetiologies used in this report was revised and reduced in 2004 and revised again in 2016 in order to improve accuracy of recording and relevance of categories. The following shows the mapping of the previous list of aetiologies to the current list.

Previous category	New category 2004	2016
PAD – Arteriosclerosis	Unchanged	Unchanged
PAD – Diabetes	Diabetes	Unchanged
Trauma	Trauma or Burns	Unchanged
Burns		
Tumour	Unchanged	Unchanged
Congenital deformity	Unchanged	Unchanged
Drug abuse	Unchanged	Unchanged
Venous Problems	Venous disease	Unchanged
Non-union of fracture	Orthopaedic	Non-union of fracture
Failed joint replacement		Failed joint replacement
Acquired deformity		Acquired deformity
Septicaemia	Blood-borne infection	Unchanged
Renal Problems	Renal Failure	Unchanged
Other	Other	Chronic regional pain Syndrome
Local Infection		Acute vascular incident
Not recorded	Unchanged	Not recorded

9.5 Appendix E Locomotor Capabilities Index 5

Only fill this in for amputees who are using their prosthesis to WALK.

Please note: this assessment must be completed **with the amputee present or on the telephone** and the amputee **must be asked** how they think they can manage each activity. It is how the patient perceives their own performance that is being measured.

Put 0,1,2,3 or 4 in the appropriate boxes where: -

- 0. = No
- 1. = Yes, if someone helps
- 2. = Yes, if someone is near
- 3. = Yes, alone with walking aid(s)
- 4. = Yes, alone **without** walking aid

Activity	6 months pre-admission	Final Discharge
<i>Basic Activities</i>		
Get up from a chair		
Walk indoors		
Walk outside on even ground		
Go up the stairs with a hand-rail		
Go down the stairs with a hand-rail		
Step up a kerb		
Step down a kerb		
TOTAL		
<i>Advanced activities</i>		
Pick up an object from the floor when standing		
Get up from the floor (e.g. after a fall)		
Walk outside on uneven ground (e.g. grass, gravel, slope)		
Walk outside in bad weather (e.g. rain, wind, snow)		
Go up a few steps without a hand-rail		
Walk down without a hand-rail		
Walk while carrying an object		
TOTAL		
OVERALL TOTAL		
CHANGE of overall total from 6 months preadmission to final discharge		

9.6 Appendix F Functional Co-morbidities Index

Lower limb amputees are a predominantly elderly group with a relatively high incidence of co-morbid disease. This has not been previously accounted for in the SPARG data collection and analysis. The Functional Co-morbidities Index (FCI) was incorporated into the data set from 2008.

The FCI was developed and validated with physical function as the outcome (Groll et al 2005). The more commonly used indices predict mortality or administrative outcomes such as hospital length of stay. These indices tend to include conditions that are asymptomatic and impact on life expectancy but not physical function (for example, hypertension) and have been found not to correlate strongly with physical disability.

The FCI was developed using 2 different samples of adults: 1 group n= 9,423 'random Canadian adults'; 2nd group n = 28,349 'US adults seeking treatment for spinal ailments' using the physical subscale of the SF36 as the outcome.

The FCI is completed by scoring a 1 if a disease is present and 0 if it is not. A score of 0 indicates no co-morbid illness and a score of 18 indicates the highest number of co-morbid illnesses. The disease is only scored as present if it is diagnosed and documented in medical notes.

The BMI is calculated for each patient by dividing the patient's weight by their height in metres squared (weight / height ²). If neither height nor weight can not be measured or obtained, BMI can be estimated using the mid upper arm circumference (MUAC) ('Must' Explanatory Booklet). If MUAC is more than 32.0cm, BMI is likely to be more than 30kg/m² i.e. patient is likely to be obese.

Functional Co-morbidities Index

Arthritis (rheumatoid and osteoarthritis)	Yes	☐	No	☐
Osteoporosis	Yes	☐	No	☐
Asthma	Yes	☐	No	☐
Chronic Obstructive Pulmonary Disease, Acquired Respiratory Distress Syndrome, Emphysema	Yes	☐	No	☐
Angina	Yes	☐	No	☐
Congestive Heart Failure (or heart disease)	Yes	☐	No	☐
Heart Attack (myocardial infarction)	Yes	☐	No	☐
Neurological disease e.g. Multiple Sclerosis or Parkinson's	Yes	☐	No	☐
CVA or TIA	Yes	☐	No	☐
Peripheral Arterial Disease	Yes	☐	No	☐
Diabetes Type I and II	Yes	☐	No	☐
Upper gastrointestinal disease (ulcer, hernia, reflux)	Yes	☐	No	☐
Depression	Yes	☐	No	☐
Anxiety or panic disorders	Yes	☐	No	☐
Visual impairment (cataracts, glaucoma, macular degeneration)	Yes	☐	No	☐
Hearing impairment (very hard of hearing even with hearing aids)	Yes	☐	No	☐
Degenerative disc disease including, back disease, spinal stenosis or severe chronic back pain	Yes	☐	No	☐
Obesity and/or BMI > 30 (Pre-op weight in Kg/height in metres ²)	Yes	☐	No	☐
Weight (Kg)	Yes	☐	No	☐
Height (metres)				
BMI =				
Please see Guidance Notes		Score (Yes = 1, No = 0)		/ 18

9.7 Appendix G Data Cleaning Steps

- Remove records which are marked as missing
- Checked, flagged and fixed DOBs in current year and age >100
- Check, flagged and fix date of amputation
- Check Amputees with right and left amputations are marked as bilaterals
- Check milestones are calculated from final surgery
- Check if LF then final outcome is LF (1) or Abandoned (3).
- Where DOB, date of amputation, etc are left blank then these are flagged and marked as "Missing"

9.8 Appendix H Models of Care Summary for all major amputating centres in Scotland (n ≥ 10)

QUEEN ELIZABETH UNIVERSITY HOSPITAL (WESTERN INFIRMARY until May 2015), NHS GREATER GLASGOW & CLYDE: Vascular Unit

Following an amputation, patients at WI/QEUEH will receive treatment from a specialist physiotherapist. Rehabilitation will occur in their amputating bed. A post-operative rigid dressing is not routinely used. Multi-disciplinary team working is complemented by regular MDT meetings, with a discharge co-ordinator and MDT ward rounds.

As an in-patient, physiotherapy will be provided in one-to-one and group sessions, based on the ward and in a therapy gym. Patients will routinely receive one treatment session daily, Monday to Friday, with an average treatment session lasting 90-120 minutes. Patients who are appropriate for prosthetic input will be routinely discharged after casting for their prosthetic limb. However, if there are access difficulties at home some are kept in until they are mobilising with their. At QEUEH, there is an on-site prosthetic centre (Westmarc).

Patients who are appropriate for prosthetic input will have access to out-patient physiotherapy follow-up at WestMARC, their nearest limb-fitting centre. They will see a specialist physiotherapist twice a week.

Patients, who are not appropriate for prosthetics, will receive the same level of in-patient input, but do not routinely access physiotherapy on discharge.

QUEEN ELIZABETH UNIVERSITY HOSPITAL (SOUTHERN GENERAL HOSPITAL to May 2015), NHS GREATER GLASGOW & CLYDE: Orthopaedic Unit

Following an amputation, patients at QUEH/SGH(Ortho) will receive treatment from orthopaedic physiotherapist (whilst on Ward) and specialist amputee physiotherapist once they start GYM treatment. They will remain in their amputating bed during their inpatient rehabilitation. A post-operative rigid dressing is not routinely used. Multi-disciplinary team working is complemented by regular MDT meetings. These are not attended by a discharge co-ordinator.

As an in-patient, physiotherapy will be provided in one-to-one and group sessions, based on the ward and in a therapy gym. Patients will routinely receive two treatment sessions daily, Monday to Friday, with an average total treatment time of 180 minutes. Patients who are appropriate for prosthetic input will routinely be discharged after their first casting. At QEUEH/SGH, there is an onsite prosthetic centre; WestMARC.

Patients who are appropriate for prosthetic input will have access to out-patient physiotherapy follow-up at WestMARC, their onsite limb-fitting centre. They will see a specialist physiotherapist twice a week.

Patients, who are not appropriate for prosthetics, will receive the same level of in-patient input, but do not routinely access physiotherapy on discharge.

GLASGOW ROYAL INFIRMARY, NHS GREATER GLASGOW & CLYDE

Following an amputation, patients at GRI will receive treatment from a non-specialist physiotherapist. Rehabilitation will occur in their amputating bed. A post-operative rigid dressing is not routinely used. There is no formal Multi-disciplinary team (MDT) meetings/working.

As an in-patient, physiotherapy will take the form one-to-one sessions. These will take place on the ward. Patients will routinely receive one treatment session daily, Monday to Friday, with average treatment time lasting 30 minutes. There is provision for rehabilitation at the weekend as required. Patients who are appropriate for prosthetic input will routinely be discharged before their first casting. At GRI, there is no on-site prosthetic centre and subsequently they will be referred to their nearest site which is WestMARC.

Prosthetic candidates will have access to out-patient physiotherapy follow-up at WestMARC, their nearest limb-fitting centre. They will see a specialist physiotherapist twice a week.

Patients who are not appropriate for prosthetics will receive the same level of in-patient input, but do not routinely have access to out-patient physiotherapy follow-up unless required.

ROYAL ALEXANDRA HOSPITAL, NHS GREATER GLASGOW & CLYDE

Following an amputation, patients at RAH will receive treatment from a non-specialist physiotherapist. Rehabilitation commences in their amputating bed and, where appropriate, will continue in a slow-stream rehab bed. A post-operative rigid dressing is not routinely used. No formal multi-disciplinary team working occurs.

As an in-patient, physiotherapy will take the form of one-to-one, ward based sessions. Patients will routinely receive one treatment session daily, Monday to Friday, with an average treatment session lasting 30-45 minutes. Discharge timing will be planned on an individual basis. At RAH, there is no on-site prosthetic centre and subsequently they will be referred to their nearest site, which is WestMARC.

Patients who are appropriate for prosthetic input will have access to out-patient physiotherapy follow-up at WestMARC, their nearest limb-fitting centre. They will see a specialist physiotherapist twice a week.

Patients who are not appropriate for prosthetics will receive the same level of in-patient input, but do not routinely access physiotherapy on discharge.

INVERCLYDE ROYAL HOSPITAL, NHS GREATER GLASGOW & CLYDE

Following an amputation, patients at IRH will receive treatment from a specialist physiotherapist. Rehabilitation will occur in their amputating bed. A post-operative rigid dressing is routinely used post-operatively, usually for 14 days with a wound review at 7 days. Multi-disciplinary team working is complemented by regular MDT meetings. These are not attended by a discharge coordinator.

As an in-patient, physiotherapy will be provided in one-to-one and group sessions, based on the ward and in a gym. Patients proceeding with prosthetic fitting will routinely receive one treatment session daily, Monday to Friday, with an average treatment session lasting 30 minutes. Patients who are not prosthetic candidates will receive physiotherapy input three days a week.

Patients who are appropriate for prosthetic input will routinely be discharged after their first casting. At IRH, there is no on-site prosthetic centre and subsequently they will be referred to their nearest site which is WestMARC. Patients who are appropriate for prosthetic input will have access to out-patient physiotherapy follow-up at their acute hospital. They will see a specialist physiotherapist twice a week.

Patients, who are not appropriate for prosthetics, will receive the same level of in-patient input, but will only access physiotherapy on discharge as required. This will be provided via a domiciliary service

This service may be changing in 2017 with all patients being amputated at QUEH.

HAIRMYRES HOSPITAL, NHS LANARKSHIRE

Following an amputation, patients at Hairmyres Hospital will receive treatment from a specialist physiotherapist. Rehabilitation will occur in their amputating bed. A post-operative rigid dressing is routinely used post-operatively, usually for a ten day period. Multi-disciplinary team (MDT) working is complemented by regular MDT meetings and MDT ward rounds. These are not attended by a discharge co-ordinator.

As an in-patient, physiotherapy will be provided in one-to-one and group sessions, based on the ward and in a therapy gym. Patients will routinely receive one treatment session daily, Monday to Friday, with an average treatment session lasting 45 minutes. Patients who are appropriate for prosthetic-fitting will routinely be discharged before primary prosthetic review. At Hairmyres, there is no on-site prosthetic centre and subsequently they will be referred to their nearest site which is WestMARC.

Patients who are appropriate for prosthetic input will have access to out-patient physiotherapy follow-up at their nearest acute hospital. They will see a specialist physiotherapist twice a week.

Patients, who are not appropriate for prosthetics, will receive the same level of in-patient input, but will only access physiotherapy on discharge as required. This will be provided via a domiciliary service.

ROYAL INFIRMARY EDINBURGH / ASTLEY AINSLIE HOSPITAL, NHS Lothian

Following amputation, patients at RIE will receive treatment from a non-specialist physiotherapist. In RIE patients will be seen by the In-Reach team from Astley Ainslie Hospital and, if assessed as having rehabilitation potential will be transferred to an amputee rehabilitation bed at AAH. At AAH they will receive treatment from a specialist physiotherapist. A post-operative rigid dressing is not routinely used. Multidisciplinary team working is complemented by regular MDT meetings and MDT ward rounds. These are not attended by a discharge coordinator.

As an in-patient at AAH, physiotherapy will take the form of one-to-one and group sessions based mainly in a physiotherapy gym. Patients will receive up to two sessions daily, Monday to Friday, with an average total daily treatment time lasting 100 minutes.

At AAH there is an on-site prosthetic centre; SMART Centre. Patients will routinely be discharged after prosthetic fitting. If outpatient physiotherapy is required this will be arranged accordingly. All prosthetic patients will be reviewed in an MDT clinic 6 weeks after discharge.

Physiotherapy input for in-patients not proceeding with prosthetic fitting will be gauged in accordance with specific rehab goals. On discharge, these patients do not routinely have access to out-patient physiotherapy.

NINEWELLS HOSPITAL, NHS TAYSIDE

Following an amputation, patients at Ninewells Hospital will receive treatment from a specialist physiotherapist. Rehabilitation will commence in their amputating bed and, if suitable for prosthetic fitting, they will move to an amputee rehabilitation bed, of which there are ten. A post-operative rigid dressing is routinely used for up to 7 day period. Multi-disciplinary team working is complemented by regular MDT meetings and MDT ward rounds. These are not attended by a discharge co-ordinator.

As an in-patient, physiotherapy will take the form of one-to-one sessions, based mainly in the therapy gym. Patients will routinely receive one treatment sessions daily, Monday to Friday, increasing to two per day if for prosthetic fitting with an average total daily treatment time of 120 minutes. Patients will

routinely be discharged after prosthetic fitting. At Ninewells, there is an on-site prosthetic service - TORT Centre.

Prosthetic candidates do not routinely access out-patient physiotherapy follow-up. Patients will receive a phone call at three weeks post-discharge and, if out-patient physiotherapy is required, this will be arranged accordingly.

Patients, who are not appropriate for prosthetic fitting, will receive the same level of in-patient input, but do not routinely access physiotherapy on discharge.

FORTH VALLEY ROYAL HOSPITAL, NHS FORTH VALLEY

Following an amputation, patients at FVRH will receive treatment from a specialist physiotherapist. Patients who are for prosthetic fitting will receive it in their amputating bed. Rehabilitation for patients who are not for prosthetic fitting occurs in a slow-stream rehabilitation bed. A post-operative dressing is routinely used by 2/3 of surgeons. Multi-disciplinary team working is complemented by daily ward rounds. These are not attended by a discharge coordinator.

As an in-patient, physiotherapy will be provided in one-to-one and group sessions, based on the ward and in a therapy gym. Patients suitable for prosthetic fitting will routinely receive one treatment session daily, Monday to Friday. Patients not appropriate for prosthetic fitting will routinely receive daily treatment sessions three to five times a week. The average treatment session lasts 60 minutes.

Patients who are appropriate for prosthetic-fitting will routinely be discharged before primary prosthetic review. At FVRH, there is no on-site prosthetic centre and subsequently they will be referred to their nearest site which is the SMART Centre, Astley Ainslie Hospital. After in-patient discharge, prosthetic candidates will have access to physiotherapy after in-patient discharge at the acute hospital. They will see a specialist physiotherapist twice a week.

Patients who are not appropriate for prosthetics will receive the same level of in-patient input, but will only access physiotherapy on discharge as required. This will be provided via domiciliary services or at a day hospital.

RAIGMORE HOSPITAL, NHS HIGHLAND

Following an amputation, patients at Raigmore Hospital will receive treatment from a specialist physiotherapist. Rehabilitation will occur in their amputating bed. A post-operative rigid dressing is routinely used, for a 21 day period. Multi-disciplinary team (MDT) working is complemented by regular MDT meetings. These are not attended by a discharge co-ordinator.

As an in-patient, physiotherapy will take the form of both one-to-one and group sessions based on the ward and in a therapy gym. Patients will routinely receive one treatment session daily, Monday to Friday, with an average treatment session lasting 60 minutes. Patients who are appropriate for prosthetic-review will routinely be discharged after prosthetic fitting. At Raigmore, there is an on-site prosthetic centre.

Prosthetic candidates will have access to out-patient physiotherapy. Where geography allows, they will receive a weekly session at the acute hospital with a specialist physiotherapist. Where distance is an issue, they can attend non-specialist physiotherapy at their nearest community hospital.

Patients, who are not appropriate for prosthetics, will receive the same level of in-patient input, but do not routinely access physiotherapy on discharge.

VICTORIA HOSPITAL, KIRCALDY, NHS FIFE

Following an amputation, patients at VHK will receive treatment from a specialist physiotherapist. Rehabilitation will occur in their amputating bed. VHK also serves as a rehabilitation unit for amputees from other hospitals e.g. Ninewells Hospital. A post-operative rigid dressing is routinely used, usually for a ten day period. Multi-disciplinary team working is complemented by regular MDT meetings and MDT ward rounds. These are not attended by a discharge co-ordinator.

As an in-patient, physiotherapy will take the form of group based sessions, based mainly in the therapy gym. Patients will routinely receive one treatment session daily, Monday to Friday, with an average treatment session lasting 60 minutes. Patients who are appropriate for prosthetics review will routinely be transferred, as an in-patient, to Ninewells Hospital where there is on-site prosthetic input. In-patient rehab will continue at Ninewells until prosthetic-fitting. They will then follow the rehab pathway used at Ninewells.

Patients, who are not appropriate for prosthetics, will receive the same level of in-patient input, but will only access physiotherapy on discharge as required. This will be provided via a domiciliary service. When required, patients will receive daily non-specialist physiotherapy for two weeks via VHK Discharge team. After this, they will receive ongoing community physiotherapy as rehabilitation goals indicate.

AYR HOSPITAL, NHS AYSHIRE & ARRAN

Following an amputation on the vascular ward, patients at Ayr Hospital will receive treatment from a specialist physiotherapist. Rehabilitation will occur in their amputating bed. A post-operative rigid dressing is not routinely used. Multi-disciplinary team (MDT) working is complemented by regular MDT ward rounds. These are not attended by a discharge co-ordinator.

As an in-patient, physiotherapy will take the form of both one-to-one and group based sessions. Physiotherapy sessions will take place both on the ward and in the therapy gym. Patients will routinely receive two treatment sessions daily, Monday to Friday, with average treatment time lasting 60 minutes. Patients who are appropriate for prosthetic-review will routinely be discharged before their first casting. At Ayr, there is a satellite prosthetic service available to patients.

On occasion an amputation will occur under the orthopaedic team at Ayr or Crosshouse Hospitals. Those patients will receive daily physiotherapy from a non-specialist amputee physiotherapist with guidance from the specialist amputee physiotherapy team.

A patient requiring longer-term rehabilitation will be transferred to one of five downstream/community hospitals (Arran War Memorial Hospital, Ayrshire Central Hospital in Irvine, Biggart Hospital in Prestwick, East Ayrshire Community Hospital in Cumnock or Girvan Community Hospital). Those patients will receive regular physiotherapy from a non-specialist amputee physiotherapist with guidance from the specialist amputee physiotherapy team.

Once discharged from in-patient care, prosthetic candidates will have access to out-patient physiotherapy at one of two locations (Ayr Hospital or Ayrshire Central Hospital in Irvine). They will see a specialist physiotherapist twice a week.

Patients, who are not appropriate for prosthetics, will receive the same level of in-patient input, but do not routinely access physiotherapy on discharge unless required. When required, their physiotherapy input will occur via a domiciliary service.

DUMFRIES & GALLOWAY ROYAL INFIRMARY, NHS DUMFRIES & GALLOWAY

Following an amputation, patients at DGRI Hospital will receive treatment from a non-specialist physiotherapist. Rehabilitation will initially occur in their amputating bed. However, once surgically fit, dependent on rehab needs and discharge planning, patients may be transferred to a rehabilitation unit either in DGRI or a community hospital. Whilst there is provision for rehabilitation beds for amputees, their physiotherapy input remains non-specialist.

A post-operative rigid dressing is not routinely used. Multi-disciplinary team (MDT) working is complemented by regular MDT meetings. These are not attended by a discharge co-ordinator.

As an in-patient, physiotherapy will take the form of both one-to-one and group based sessions. Patients will routinely receive two treatment sessions daily, Monday to Friday, with an average treatment session lasting 60 minutes. There is no specific protocol/pathway for time of discharge in patients' hospital stay i.e. pre-cast, post-cast, after limb-fitting. At DGRI, there is no on-site prosthetic centre and subsequently they will be referred to their nearest site which is WestMARC.

Prosthetic candidates will have access to out-patient physiotherapy follow-up at their nearest acute hospital, DGRI or Galloway Community Hospital. They will see a non-specialist physiotherapist more than once a week.

Patients, who are not appropriate for prosthetics, will receive the same level of in-patient input, but do not routinely have access to out-patient physiotherapy follow-up.

ABERDEEN ROYAL INFIRMARY, NHS GRAMPIAN

Following an amputation, patients at ARI will receive treatment from a specialist physiotherapist. Rehabilitation will occur in their amputating bed. A post-operative rigid dressing is not routinely used. Multi-disciplinary team working is complemented by regular MDT meetings. These are not attended by a discharge co-ordinator.

As an in-patient appropriate for prosthetic input, physiotherapy will take the form of gym based sessions in both 1:1 and group sessions. Patients will routinely receive one treatment session four days a week, with an average treatment session lasting 45 minutes. Patients who are appropriate for prosthetic input will routinely be discharged after prosthetic fitting. At ARI, there is no on-site prosthetic centre and subsequently they will be referred to their nearest site which is M.A.R.S, Woodend Hospital.

Prosthetic candidates will have access to physiotherapy after discharge as required. The level of input is dependent on geography and ongoing rehab goals. Local patients may access specialist physiotherapist up to two times a week. When geography necessitates non-specialist physiotherapy input, the physiotherapist will be supported by the prosthetic centre.

Patients who are not appropriate for prosthetics will receive their physiotherapy in the form of both gym based and ward sessions. These will in both 1:1 and group settings. Patients will routinely receive one treatment session 2-3 days a week, with an average treatment session lasting 30 minutes. Access to physiotherapy on discharge will be provided as required – at ARI they will see a non-specialist physiotherapist via a domiciliary service.

9.9 Appendix I Multidisciplinary Advisory Group

Helen Scott, Team Lead Physiotherapist WestMARC, QEUH

Joanne Hebenton, Specialist Physiotherapist, WestMARC, QEUH

John Colvin, Clinical Service Manager and Clinical Scientist, Westmarc, Glasgow

David Morrison, Lead Prosthetist, Westmarc, Glasgow

Fiona Davie-Smith, Clinical Co-ordinator Specialist Prosthetics Service

Brian Kennon, Consultant Diabetologist, QEUH, Glasgow

Wesley Stuart, Consultant Vascular surgeon, QEUH, Glasgow

Francine McCafferty, Prosthetist, SMART Centre, Edinburgh

Lynn Hutton, Rehabilitation Consultant, SMART Centre, Edinburgh

Marjory Robertson, Specialist OT, Westmarc, Glasgow