NHS

Midlands and Lancashire
Commissioning Support Unit
The Strategy Unit

Modelling the Activity Implications
of the Future Fit Clinical Model

Provisional Results

Background

Background

The Strategy Unit[†] were commissioned to support the health economy in Shropshire and Telford to develop a range of models to estimate future activity levels in the local health economy as part of the NHS Future Fit Programme.

This document provides the results of the second stage of the activity modelling process and assesses the activity consequences of the Future Fit Clinical Model.

This report should be read in conjunction with the *Models of Care* report produced by the Clinical Design Workstream of NHS Future Fit.

The objectives of the NHS Future Fit programme are;

- to agree the best model of care for excellent and sustainable acute and community hospital services that meet the needs of the urban and rural communities in Shropshire, Telford and Wrekin, and Mid Wales;

- to prepare all business cases required to support any proposed service and capital infrastructure changes;

- to secure all necessary approvals for any proposed changes; and

- to implement all agreed changes

Phase 1 Modelling

This work builds upon an earlier phase of activity modelling that took place between November 2013 and May 2014.

The phase 1 modelling estimated the levels of activity that Shropshire and Telford acute hospitals and the Shropshire community hospitals might be expected to manage in 2018/19 taking into account demographic change (two scenarios were considered), a range of commissioner activity avoidance schemes and provider efficiency schemes.

Whilst these activity models were produced by the Strategy Unit, the

components of change and the change parameters (see appendix 8) were agreed by a reference group of clinical and managerial representatives from the local CCGs and provider trusts.

The outputs of this first phase of activity modelling are summarised in two documents;

- *Modelling Future Activity Levels Shrewsbury & Telford Hospital NHS Trust* &
- *Modelling Future Community Hospital Provision in Shropshire and Telford*

The NHS Future Fit Clinical Model

The NHS Future Fit Clinical Model, published in May 2014, sets out the clinical vision for locally sustainable acute and community hospital services for the next 20 years. The work is lead by Dr Bill Gowans (NHS Shropshire CCG), Dr Mike Innes (NHS Telford and Wrekin CCG), Dr Edwin Borman (Shrewsbury and Telford Hospital NHS Trust) and Dr Alastair Neale (Shropshire Community Health NHS Trust) in conjunction with a Clinical Reference Group of 90 local clinicians and the wider clinical community.

Although the scope of the Future Fit programme is confined to the future of acute and community hospital services, the clinical design work stream was required to consider the health and social care economy as a whole and establish models of care which fully integrate all services within it.

The subgroups were established to develop three complimentary aspects of the clinical model;
- acute and episodic care
- long term conditions and or frailty
- planned care

Planned Care

Planned Care

The planned care model suggests that 67% of the planned care activity in 2018/19 would take place in Local Planned Care Centres, 29% at a Diagnostic and Treatment Centre and 4% in an Emergency Centre.

Approximately 35,000 follow-up outpatient attendances managed by the local planned care centres could take place virtually.

The following overview of the methods used to allocate planned care activity to each of the three settings and the level and nature of work that might be carried out in each setting.

Planned Care – Allocation of Activity (Bed Days) - Summary

2012/13

2018/19

Phase 1 Model

Local Planned Care Centres

SaTH Outpatient Attendances

365,188
(0)

368,445
(0)

303,593*
(0)

*of which 34,821 virtual

SaTH Elective Admissions

79,334
(20,453)

83,628
(23,875)

Diagnostic and Treatment Centre

129,765
(6,228)

Emergency Centre

Other Elective Admissions

200
(144)

215
(151)

18,930
(17,798)

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Planned Care – Allocation of Activity - Algorithm

Local Planned Care Centre — 303.593

Diagnostic and Treatment Centre — 129,676

Co-located with Emergency Centre — 18,931

Follow-Up — 114,208
Single Professional & No Scans — 67,150
Multi Professional or Scans — 7,144
1,943
Face to Face — 68,345
Diagnostic (no scan) — 25,478
52,847
Low Volume / Expensive Kit — 19,127
Child — 12,205
Regular Day / Night Attender — 36,766
4,110
Day Case — 34,010
1 night — 2,232
2+ nights — 3,319
1,824
1,583

Attendance · High Volume Specialty · Low Volume / Expensive Kit · First · Telephone · Outpatient Activity · Procedure · Adult · Operative Or Scan · High Volume Specialty · Child · Elective Inpatient Activity · Breast Surgery Or T&O · Adult · Overnight Stay · Cardiology · Ordinary or Day Case Admission

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Planned Care Activity at the Emergency Centre

Clinical Commissioning Grp	Activity	Bed Days
Shropshire	9,721	9,444
Telford & Wrekin	7,512	5,325
Other	1,697	3,029

Point of Delivery		
First Outpatient Attendance	0	0
Follow-up OP Attendance	0	0
Regular Day/Night Attender	0	0
Outapatient Procedure	12,205	0
Day case	2,727	0
Ordinary Elective Admission	3,999	17,798

Age Group		
0 to 4	2,668	165
5 to 14	7,720	272
15 to 34	3,799	721
35 to 49	606	1,974
50 to 64	1,482	4,482
65 to 84	2,465	9,358
85+	186	806

Treatment Specialty	Activity	Bed Days
Trauma & Orthopaedics	1,185	0
Ophthalmology	150	26
Urology	734	2,559
Gastroenterology	84	405
Clinical Oncology	377	1,486
Oral Surgery	339	133
Clinical Haematology	212	1,703
Breast Surgery	9	0
Medical Oncology	51	218
General Surgery	562	2,497
Gynaecology	597	1,473
Maxillo-Facial Surgery	206	101
ENT	3,105	802
Pain Management	0	0
General Medicine	12	87
Colorectal Surgery	496	4,059
Upper GI Surgery	174	678
Vascular Surgery	118	547
Cardiology	1,593	427
Paediatrics	1,201	243
Nephrology	33	204
other	7,692	150

Planned Care Activity at the Diagnostic and Treatment Centre

Clinical Commissioning Grp	Activity	Bed Days
Shropshire	70,322	2,616
Telford & Wrekin	45,376	3,101
Other	14,068	511

Point of Delivery	Activity	Bed Days
First Outpatient Attendance	24,777	0
Follow-up OP Attendance	45,510	0
Regular Day/Night Attender	0	0
Outapatient Procedure	19,127	0
Day case	36,483	0
Ordinary Elective Admission	3,868	6,228

Age Group	Activity	Bed Days
0 to 4	3,016	0
5 to 14	6,660	12
15 to 34	11,934	395
35 to 49	17,019	704
50 to 64	30,887	1,624
65 to 84	53,012	3,139
85+	7,215	341

Treatment Specialty	Activity	Bed Days
Trauma & Orthopaedics	3,601	3,736
Ophthalmology	33,996	18
Urology	16,644	295
Gastroenterology	14,297	50
Clinical Oncology	10,468	147
Oral Surgery	9,251	36
Clinical Haematology	4,240	37
Breast Surgery	2,948	789
Medical Oncology	2,538	12
General Surgery	2,229	244
Gynaecology	1,762	146
Maxillo-Facial Surgery	1,208	60
ENT	1,463	320
Pain Management	916	1
General Medicine	842	17
Colorectal Surgery	479	84
Upper GI Surgery	462	143
Vascular Surgery	301	86
Cardiology	22	0
Paediatrics	21	0
Nephrology	9	4
other	22,068	0

Planned Care Activity at the Local Planned Care Centre (Total)

Clinical Commissioning Grp	Activity	Bed Days
Shropshire	161,108	0
Telford & Wrekin	116,337	0
Other	26,148	0

Point of Delivery	Activity	Bed Days
First Outpatient Attendance	67,150	0
Follow-up OP Attendance	121,352	0
Regular Day/Night Attender	28,337	0
Outapatient Procedure	78,325	0
Day case	8,430	0
Ordinary Elective Admission	0	0

Age Group	Activity	Bed Days
0 to 4	9,304	0
5 to 14	14,080	0
15 to 34	48,031	0
35 to 49	48,075	0
50 to 64	68,244	0
65 to 84	103,141	0
85+	12,718	0

Treatment Specialty	Activity	Bed Days
Trauma & Orthopaedics	36,213	0
Ophthalmology	10,705	0
Urology	1,026	0
Gastroenterology	6,753	0
Clinical Oncology	8,932	0
Oral Surgery	0	0
Clinical Haematology	9,598	0
Breast Surgery	11,495	0
Medical Oncology	223	0
General Surgery	4,227	0
Gynaecology	12,872	0
Maxillo-Facial Surgery	0	0
ENT	20,642	0
Pain Management	2,908	0
General Medicine	6,816	0
Colorectal Surgery	7,583	0
Upper GI Surgery	3,240	0
Vascular Surgery	5,129	0
Cardiology	19,441	0
Paediatrics	9,719	0
Nephrology	31,876	0
other	94,195	0

Planned Care Activity at the Local Planned Care Centre (Face to Face)

Clinical Commissioning Grp	Activity	Bed Days
Shropshire	143,764	0
Telford & Wrekin	101,807	0
Other	23,201	0

Point of Delivery	Activity	Bed Days
First Outpatient Attendance	67,150	0
Follow-up OP Attendance	86,531	0
Regular Day/Night Attender	28,337	0
Outapatient Procedure	78,325	0
Day case	8,430	0
Ordinary Elective Admission	0	0

Age Group	Activity	Bed Days
0 to 4	8,211	0
5 to 14	11,957	0
15 to 34	44,166	0
35 to 49	42,775	0
50 to 64	59,827	0
65 to 84	90,584	0
85+	11,251	0

Treatment Specialty	Activity	Bed Days
Trauma & Orthopaedics	28,738	0
Ophthalmology	6,853	0
Urology	34	0
Gastroenterology	6,753	0
Clinical Oncology	6,542	0
Oral Surgery	0	0
Clinical Haematology	6,916	0
Breast Surgery	8,254	0
Medical Oncology	223	0
General Surgery	4,227	0
Gynaecology	12,050	0
Maxillo-Facial Surgery	0	0
ENT	15,737	0
Pain Management	2,908	0
General Medicine	4,478	0
Colorectal Surgery	7,583	0
Upper GI Surgery	3,240	0
Vascular Surgery	5,129	0
Cardiology	17,555	0
Paediatrics	8,153	0
Nephrology	31,441	0
other	91,957	0

Planned Care Activity at the Local Planned Care Centre (Virtual)

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Clinical Commissioning Grp	Activity	Bed Days
Shropshire	17,344	0
Telford & Wrekin	14,530	0
Other	2,947	0

Point of Delivery	Activity	Bed Days
First Outpatient Attendance	0	0
Follow-up OP Attendance	34,821	0
Regular Day/Night Attender	0	0
Outapatient Procedure	0	0
Day case	0	0
Ordinary Elective Admission	0	0

Age Group	Activity	Bed Days
0 to 4	1,092	0
5 to 14	2,123	0
15 to 34	3,865	0
35 to 49	5,299	0
50 to 64	8,418	0
65 to 84	12,557	0
85+	1,467	0

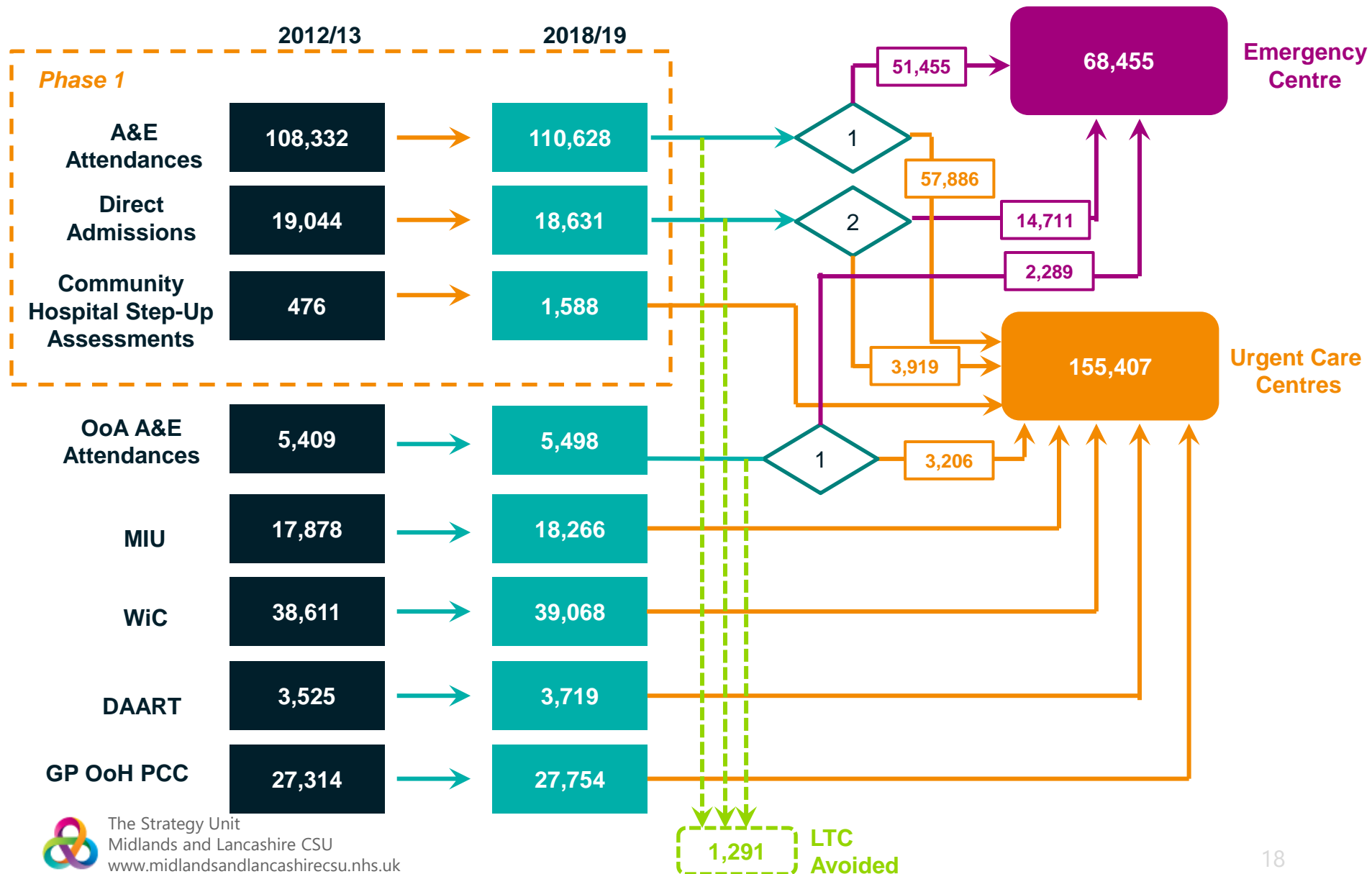| Treatment Specialty	Activity	Bed Days
Trauma & Orthopaedics	7,474	0
Ophthalmology	3,852	0
Urology	992	0
Gastroenterology	0	0
Clinical Oncology	2,390	0
Oral Surgery	0	0
Clinical Haematology	2,682	0
Breast Surgery	3,241	0
Medical Oncology	0	0
General Surgery	0	0
Gynaecology	822	0
Maxillo-Facial Surgery	0	0
ENT	4,905	0
Pain Management	0	0
General Medicine	2,337	0
Colorectal Surgery	0	0
Upper GI Surgery	0	0
Vascular Surgery	0	0
Cardiology	1,886	0
Paediatrics	1,566	0
Nephrology	436	0
other	2,238	0

Acute and Episodic Care

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Acute and Episodic Care

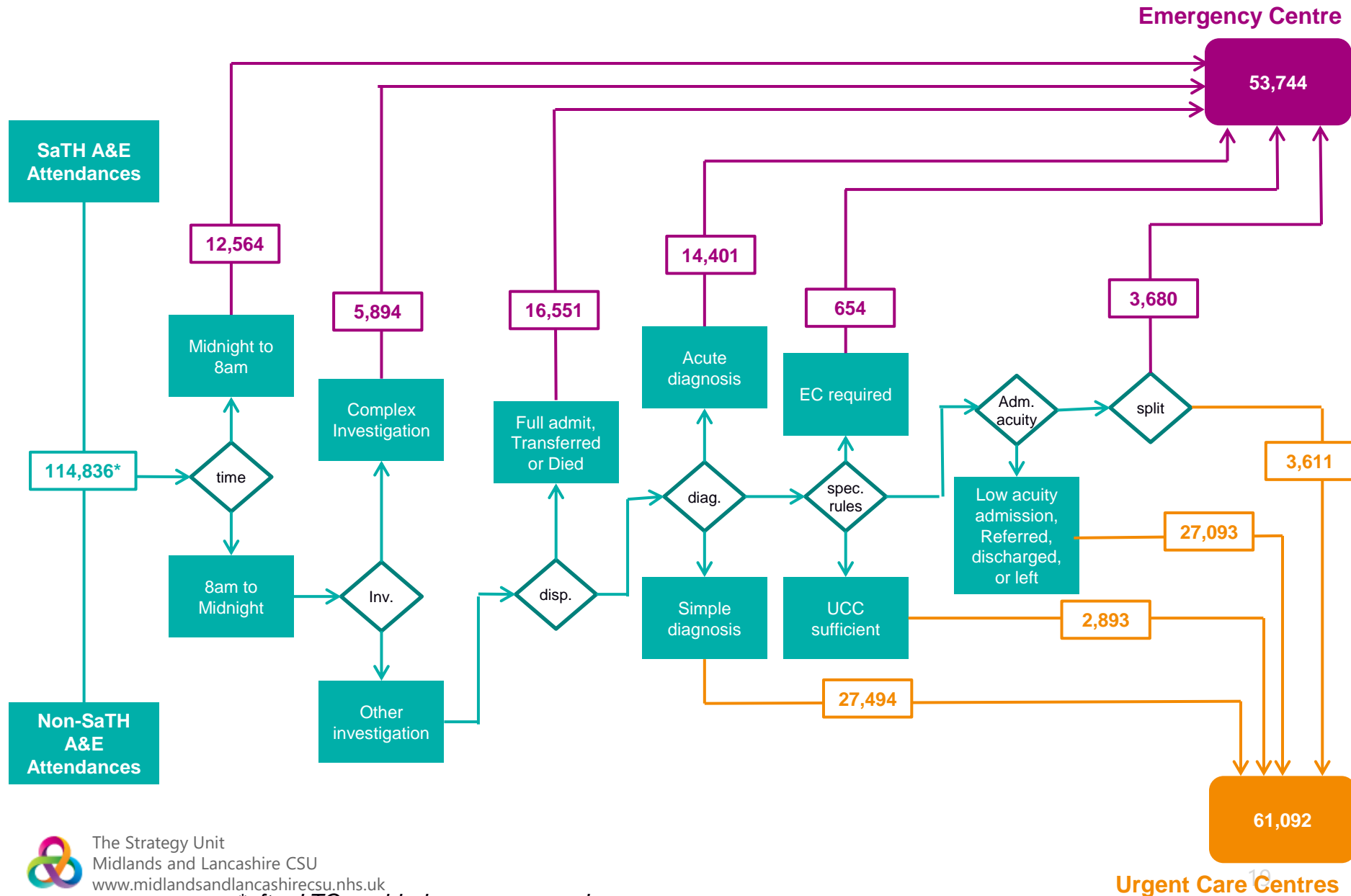The acute and episodic care model suggests that 69% of front door urgent care activity (incorporating activity current managed in ED, direct GP admissions community hospital step-up admissions, MIU and WIC attendances, DAART assessments and GP OoH PCC contacts) could be managed at an urgent care centre, with the remaining 31% (c 68,000 attendances) requiring the emergency centre.

75% of the activity being managed by the urgent care centres will take the form of minor injuries or ailments, 12% as ambulatory emergency care, 8% as frailty management with 5% taking other forms.
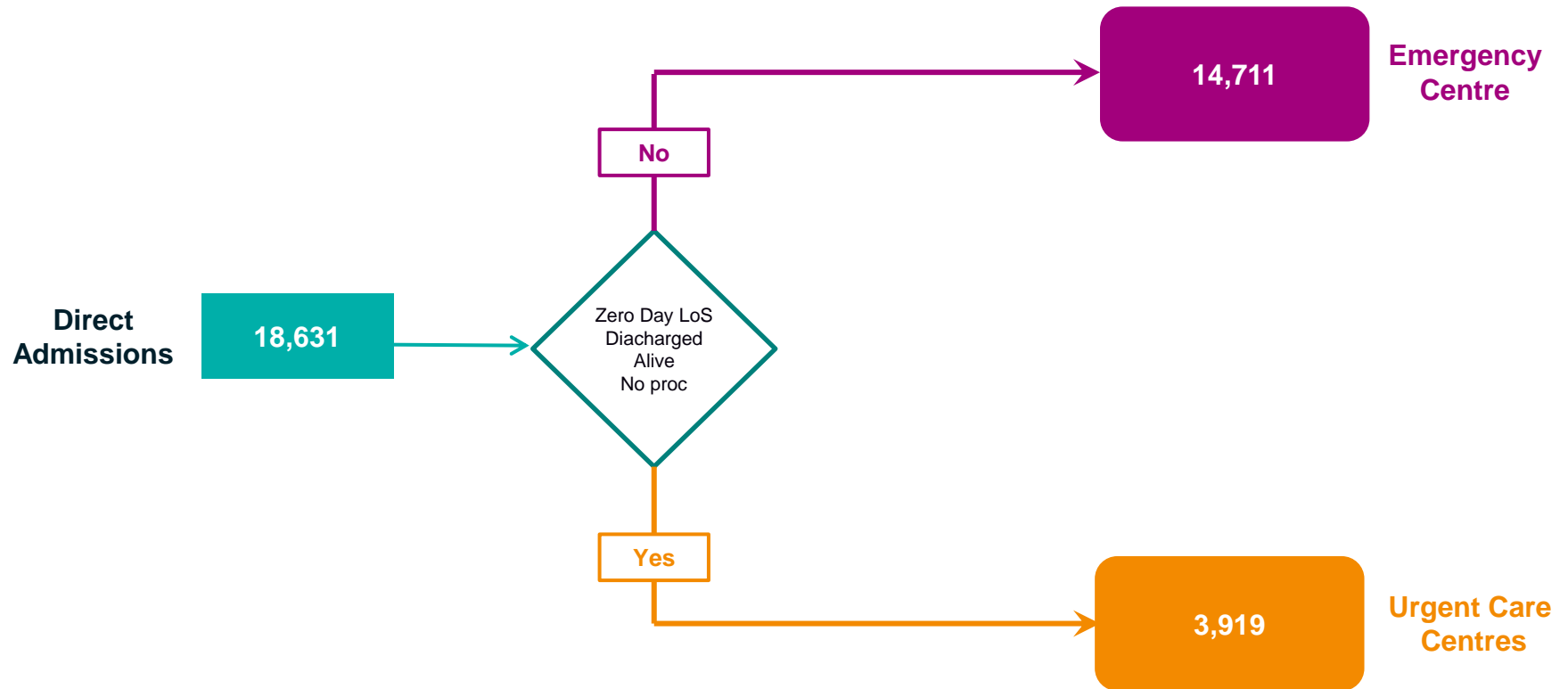
The following overview of the methods used to allocate acute and episodic care to an emergency centre or an urgent care centre and the level and nature of work that might be carried out in each setting.

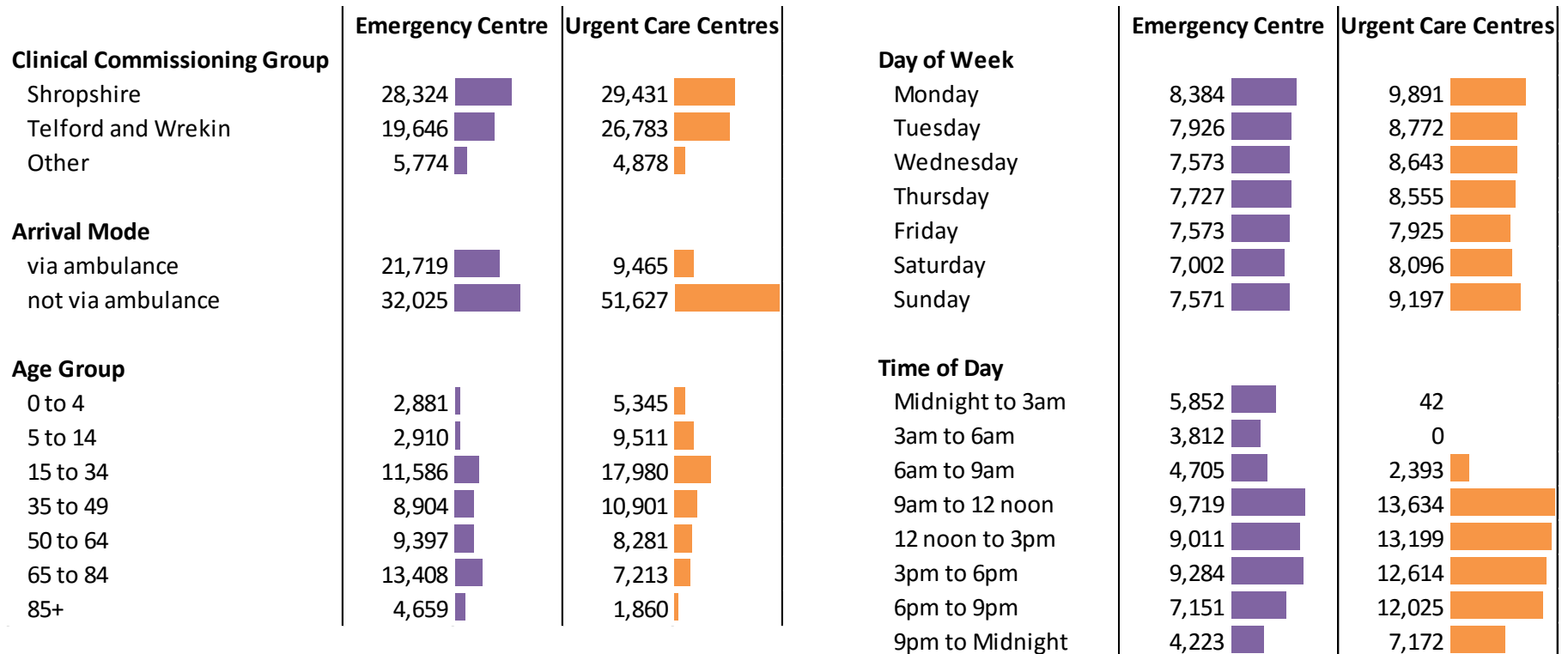# Acute and Episodic Care – Allocation of Activity - Summary

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Allocation of A&E Attendances – EC/UCC Algorithm 1

Emergency Centre

53,744

SaTH A&E Attendances

12,564

Midnight to 8am

5,894

Complex Investigation

16,551

Full admit, Transferred or Died

14,401

Acute diagnosis

654

EC required

3,680

114,836*

time

8am to Midnight

Inv.

Other investigation

disp.

diag.

Simple diagnosis

spec. rules

UCC sufficient

Adm. acuity

split

Low acuity admission, Referred, discharged, or left

3,611

27,093

2,893

27,494

Non-SaTH A&E Attendances

61,092

Urgent Care Centres

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after LTC avoided cases removed

19

Allocation of GP Direct Admissions – EC/UCC Algorithm 2

Direct Admissions 18,631

Zero Day LoS Diacharged Alive No proc

No → 14,711 **Emergency Centre**

Yes → 3,919 **Urgent Care Centres**

Allocation of A&E Attendances – Subgroup Analysis (1)

Clinical Commissioning Group	Emergency Centre	Urgent Care Centres
Shropshire	28,324	29,431
Telford and Wrekin	19,646	26,783
Other	5,774	4,878

Arrival Mode	Emergency Centre	Urgent Care Centres
via ambulance	21,719	9,465
not via ambulance	32,025	51,627

Age Group	Emergency Centre	Urgent Care Centres
0 to 4	2,881	5,345
5 to 14	2,910	9,511
15 to 34	11,586	17,980
35 to 49	8,904	10,901
50 to 64	9,397	8,281
65 to 84	13,408	7,213
85+	4,659	1,860

Day of Week	Emergency Centre	Urgent Care Centres
Monday	8,384	9,891
Tuesday	7,926	8,772
Wednesday	7,573	8,643
Thursday	7,727	8,555
Friday	7,573	7,925
Saturday	7,002	8,096
Sunday	7,571	9,197

Time of Day	Emergency Centre	Urgent Care Centres
Midnight to 3am	5,852	42
3am to 6am	3,812	0
6am to 9am	4,705	2,393
9am to 12 noon	9,719	13,634
12 noon to 3pm	9,011	13,199
3pm to 6pm	9,284	12,614
6pm to 9pm	7,151	12,025
9pm to Midnight	4,223	7,172

Allocation of A&E Attendances – Subgroup Analysis (2)

Primary Diagnosis	Emergency Centre	Urgent Care Centres
Allergy (including anaphylaxis)	708	0
Bites/stings	95	550
Burns and scalds	157	682
Cardiac conditions	4,082	1,976
Central nervous system	3,006	2,675
Cerebro-vascular conditions	1,690	0
Contusion/abrasion	584	5,673
Dermatological conditions	87	242
Diabetes and other endocrinological conditions	241	138
Diagnosis not classifiable	158	210
Dislocation/fracture/joint injury/amputation	5,216	4,685
Electric shock	32	0
ENT conditions	1,777	2,411
Facio-maxillary conditions	1,185	0
Foreign body	118	401
Gastrointestinal conditions	3,626	2,812
Gynaecological conditions	1,237	0
Haematological conditions	297	0
Head injury	1,383	3,078
Infectious disease	195	194

Primary Diagnosis	Emergency Centre	Urgent Care Centres
Laceration	1,545	7,297
Local infection	353	844
Muscle/tendon injury	881	4,459
Near drowning	7	0
Nerve injury	1	0
Nothing abnormal detected	20	55
Obstetric conditions	163	0
Ophthalmological conditions	11,583	0
Other vascular conditions	370	0
Poisoning (including overdose)	2,630	0
Psychiatric conditions	334	463
Respiratory conditions	3,587	2,107
Septicaemia	343	0
Social problem	149	111
Soft tissue inflammation	112	464
Sprain/ligament injury	1,628	14,119
Urological conditions	1,320	1,447
Vascular injury	2	0
Visceral injury	11	0
No diagnoses	2,831	3,991

Investigation	Emergency Centre	Urgent Care Centres
Arterial/capillary blood gas	4,389	642
Bacteriology	1,193	501
Biochemistry	29,371	10,624
Blood culture	1,348	136
Cardiac enzymes	2,775	1,382
Clotting studies	6,853	2,032
Computerised Tomography (excludes genitourinary contrast ex	4,492	0
Cross match blood/group and save serum for later cross match	2,340	0
Dental investigation	22	0
Electrocardiogram	19,241	7,926
Genitourinary contrast examination/tomography	16	0
Haematology	26,386	9,235
Histology	21	3
Immunology	10	2
Magnetic Resonance Imaging	225	0
None	20,164	26,067
Other	6,751	2,606
Pregnancy test	1,564	1,095
Refraction, orthoptic tests and computerised visual fields	1,082	0
Serology	0	2
Toxicology	178	0
Ultrasound	1,228	257
Urinalysis	8,277	5,087
X-ray plain film	27,799	33,285

Patients Accessing the Emergency Centre via a UCC

The Clinical Model dictates that patients can access the emergency centre only via ambulance, GP or an urgent care centre. Analysis indicates that c 32,000 patients will self-convey to an urgent care centre, but require treatment at the Emergency Centre.

Clinical Commissioning Group	Self-Conveyed Requiring EC
Shropshire	17,009
Telford and Wrekin	12,030
Other	2,985

Age Group	Self-Conveyed Requiring EC
0 to 4	2,247
5 to 14	2,540
15 to 34	8,469
35 to 49	6,296
50 to 64	6,076
65 to 84	5,587
85+	811

Day of Week	Self-Conveyed Requiring EC
Monday	5,095
Tuesday	4,817
Wednesday	4,599
Thursday	4,729
Friday	4,596
Saturday	3,991
Sunday	4,198

Time of Day	Self-Conveyed Requiring EC
Midnight to 3am	2,721
3am to 6am	1,629
6am to 9am	2,965
9am to 12 noon	6,803
12 noon to 3pm	5,885
3pm to 6pm	5,971
6pm to 9pm	4,147
9pm to Midnight	1,904

Self-Conveyed patients Requiring Emergency Centre Treatment

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Primary Diagnosis	Self-Conveyed Requiring EC	Primary Diagnosis	Self-Conveyed Requiring EC
Allergy (including anaphylaxis)	564	Laceration	980
Bites/stings	86	Local infection	289
Burns and scalds	133	Muscle/tendon injury	676
Cardiac conditions	902	Near drowning	6
Central Nervous System conditions	803	Nerve injury	1
Cerebro-vascular conditions	441	Nothing abnormal detected	8
Contusion/abrasion	357	Obstetric conditions	131
Dermatological conditions	77	Ophthalmological conditions	11,497
Diabetes and other endocrinological conditions	41	Other vascular conditions	148
Diagnosis not classifiable	68	Poisoning (including overdose)	888
Dislocation/fracture/joint injury/amputation	3,403	Psychiatric conditions	100
Electric shock	27	Respiratory conditions	1,088
ENT conditions	1,469	Septicaemia	67
Facio-maxillary conditions	1,104	Social problem	17
Foreign body	111	Soft tissue inflammation	64
Gastrointestinal conditions	1,628	Sprain/ligament injury	950
Gynaecological conditions	968	Urological conditions	631
Haematological conditions	140	Vascular injury	1
Head injury	609	Visceral injury	7
Infectious disease	102	No diagnoses	1,445

Types of Urgent Care Centre Activity

For the purposes of workforce planning and financial planning, Urgent Care Centre activity has been grouped into four categories;
- Minor injuries and ailments
- Ambulatory emergency care
- Management of frail older patients
- Other

The table estimates the scale of these activity subgroups in 2018/19. Note that these figures exclude GP Out of Hours PCC activity.

UCC Activity Type	Activity
Minor Injuries and Ailments	95,295 (75%)
Ambulatory Emergency Care	15,411 (12%)
Frailty Management	9,915 (8%)
Other	7,019 (5%)

Activity in the 'other' category contains patients attending with psychiatric and social problems (including alcoholism and homelessness) and patients with no or uncertain diagnosis.

Long Term Conditions or Frailty Results

Long Term Conditions and Frailty

There were approximately 10,000 emergency admissions associated with either frailty or long term conditions in 2012/13. The phase 1 models suggested these admissions could fall by 8% by 2018/19 largely as a consequence of improvements in primary care management and through better use of community hospitals. The phase 2 models suggests that a further 24% could be avoided by reducing the prevalence of the key risk factors that give rise to LTCs (e.g. smoking, cholesterol, blood pressure) and through greater integration of community and primary care.

Overview of LTC & Frailty Model

Prevalence

Emergency Admissions

Change Components LTC & Frailty Model

Reduce Prevalence

…by reducing lifestyle risks.

Separate parameters for
- Cardiovascular conditions and diabetes
- Cancer, dementia and respiratory conditions
- Shropshire and Telford & Wrekin CCG

+

Reduce Prevalent Case Admission Rate

…by improving care coordination.

Separate parameters for
- Shropshire and Telford & Wrekin CCG

Fewer Emergency LTC & Frailty Admissions

Long Term Conditions – Emergency Admissions and Bed Days

	Baseline 2012/13	After Phase 1 Modelling	UCC Avoided	Reduced Prevalance	ICS Avoided	Final 2018/19
Circulatory	4,115	4,174	125	856	406	2,787
Diabetes	365	331	7	64	27	233
Cancer	1,133	1,165	2	130	153	880
Dementia	65	44	0	5	13	27
Respiratory	1,486	1,521	45	163	186	1,126
Other LTC	747	744	26		77	641
Frailty	2,044	1,207	18		159	1,030

Emergency Centre Activity
(Emergency, Planned and Maternity)

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Emergency Centre Admissions and Bed Days

The following slides show the planned and emergency activity that an emergency centre may have to accommodate. Note that these slides relate only to activity that Shropshire and Telford Hospitals NHS Trust would deliver if market shares for emergency centre type activity remain unchanged.

Point of Delivery	Admissions		Bed Days	
Ordinary Elective	3,999		17,798	
Elective Day Case	2,727		0	
Outpatient_Procedure	12,205		0	
Emergency	37,650		179,060	
Maternity	6,613		15,820	
Other	2,460		12,331	
Total	**65,654**		**225,009**	

Emergency Centre Spells – Subgroup Analysis

Clinical Commissioning Group	Elective	Emergnecy	Maternity	Other
Shropshire CCG	9,721	19,497	3,240	1,277
T&W CCG	7,512	13,955	2,789	948
OtherCCG	1,697	4,198	584	236
Age Group				
0 to 4	2,668	3,868	101	1,999
5 to 14	7,720	2,178	1	15
15 to 34	3,799	4,923	5,197	19
35 to 49	606	4,598	1,312	44
50 to 64	1,482	6,337	2	122
65 to 84	2,469	11,610	0	211
85+	186	4,136	0	50

Emergency Centre Spells – Subgroup Analysis (2)

Treatment Specialty	Elective	Emergnecy	Maternity	Other
General Medicine	12	18,085	0	136
Paediatrics	1,201	5,832	100	2,011
Obstetrics	296	27	6,511	7
General Surgery	562	4,979	0	18
Trauma & Orthopaedics	1,185	3,030	0	13
Orthodontics	3,873	0	0	0
Ent	3,105	575	0	0
Cardiology	1,593	684	0	245
Other Specialty	1,603	857	0	7
Gynaecology	597	1,207	2	4
Urology	734	647	0	6
Gastroenterology	84	1,182	0	11
Audiological Medicine	999	0	0	0
Clinical Physiology	569	0	0	0
Colorectal Surgery	496	62	0	0
Clinical Oncology	377	82	0	2
Oral Surgery	339	72	0	0
Clinical Haematology	212	183	0	0
Accident & Emergency	309	23	0	0
Maxillo-Facial Surgery	206	111	0	1
Dermatology	290	5	0	0
Paediatric Clinical Immunolo	287	5	0	0

Emergency Centre Beds Days – Subgroup Analysis

Clinical Commissioning Group	Elective	Emergnecy	Maternity	Other
Shropshire CCG	9,444	93,974	8,049	6,757
T&W CCG	5,325	64,320	6,301	4,017
OtherCCG	3,029	20,766	1,470	1,558
Age Group				
0 to 4	165	5,087	201	9,374
5 to 14	272	2,802	1	63
15 to 34	721	8,919	12,018	61
35 to 49	1,974	13,599	3,583	444
50 to 64	4,482	26,799	16	622
65 to 84	9,379	80,745	0	1,336
85+	806	41,109	0	431

Emergency Centre Beds Days – Subgroup Analysis (2)

Treatment Specialty	Elective	Emergnecy	Maternity	Other
Accident & Emergency	0	84	0	0
Audiological Medicine	0	0	0	0
Cardiology	427	6,311	0	584
Clinical Haematology	1,703	1,202	0	0
Clinical Oncology	1,486	403	0	18
Clinical Physiology	0	0	0	0
Colorectal Surgery	4,059	946	0	0
Dermatology	3	52	0	0
Ent	802	1,400	0	0
Gastroenterology	405	13,294	0	246
General Medicine	87	93,045	0	1,171
General Surgery	2,497	19,856	0	292
Gynaecology	1,473	1,053	6	6
Maxillo-Facial Surgery	101	165	0	1
Obstetrics	0	54	15,615	13
Oral Surgery	133	117	0	0
Orthodontics	0	0	0	0
Paediatric Clinical Immunolo	2	0	0	0
Paediatrics	243	7,704	199	9,429
Trauma & Orthopaedics	0	21,219	0	406
Urology	2,559	2,626	0	57
Other Specialty	1,817	9,529	0	107

Beds and Bed Days

Bed Days and Beds

Bringing together the results of the three models, it is estimated that there would be approximately 66,000 admissions and 225,000 bed days used at the emergency centre 2018/19. Emergency admissions would make up the majority of the admissions and bed days at the emergency centre.

However, analysis of current bed usage at Shrewsbury and Telford Hospitals NHS Trust indicates that a sizeable proportion of patients occupying acute hospitals beds no longer require medical input, but instead require intensive rehabilitation.

Taking account of these factors, and assuming 85% occupancy rates, it is estimated that 656 beds would be required in a Emergency Centre, a further 20 at the Diagnostic and Treatment Centre and 63 beds for intensive rehabilitation.

Bed Days – Components of Change

	RTT Adjustment	Admission Avoidance	LoS Reduction	Demographics	Interaction	Repatriate PCI	Reduced LTC Prevalnce	ICS Avoided	
				Phase 1				Phase 2	
Baseline 12/13									Final 18/19

Values shown on chart:
- 102,048 (Telford)
- 902 (Other Sites)
- 160,135 (Shrewsbury)
- 4,478 (RTT Adjustment)
- -23,507 (Admission Avoidance)
- -11,951 (LoS Reduction)
- 12,615 (Demographics)
- -2,790 (Interaction)
- 1,253 (Repatriate PCI)
- -5,059 (Reduced LTC Prevalnce)
- -6,900 (ICS Avoided)
- 19,458 (Intensive Rehab)
- 6,228 (DTC)
- 205,551 (Emergency Centre)

Legend:
- Intensive Rehab
- DTC
- Emergency Centre
- Telford
- Other Sites
- Shrewsbury

Beds – Components of Change

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Diagnostics Activity

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Diagnostics Activity

All forms of diagnostic imaging will be available at the Emergency Centre and Diagnostic Treatment Centre. Plain film x-ray and diagnostic ultrasound will be available at the Local Planned Care Centres and Urgent Care Centres. The table below shows estimates of diagnostics by setting and modality in 2018/19.

	Planned			Unplanned			Total		
	EC	DTC	LPC/UCC	EC	DTC	LPC/UCC	EC	DTC	LPC/UCC
CT Scans	80	11,343		12,250			12,330	11,343	
MRI Scans	93	8,118		2,070			2,164	8,118	
Diagnostic Ultrasound	226	8,099	26,129	7,462		257	7,688	8,099	26,385
Plain X-rays	689	9,255	27,384	48,168		33,285	48,857	9,255	60,669

Further Work and Next Steps

Further work is planned over the coming weeks to refine the model to ;

– incorporate Telford and Wrekin Council's local population projections (the model currently uses the ONS 2012-based subnational population projections)

– refine the assumptions made about the impact of improvement primary prevention in Telford and Wrekin on the prevalence of LTCs

Further analysis is being carried out to determine the likely distribution of activity to specific sites under a range of long-listed configuration options being considered by the Future Fit Programme Board. This analysis will also estimate the impact of any reconfiguration on patient travel times to receive care.

Appendix 1
Planned Care Allocation Algorithm

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Planned Care Allocation Algorithm

Step	Rule
a Outpatient attendance or procedure	HRGcode WF01 or WF02 and Procedure1 not in one of the following; Y981 U131 U132 U133 U214 U216' U183' U212' U211 U012 Y973 U011 **>> Outpatient attendance** Otherwise **>> Outpatient procedure**
b Regular day / night attender or Ordinary/day case admission	Admission method code = 1* and patient classification code 3 or 4 **>> Regular Day and Night Attender** Admission method code = 1* and patient classification code 1 or 2 **>> Ordinary/day case admission**

Planned Care Allocation Algorithm cont.....

Step	Rule
c / k High Volume specialty Or Low Volume specialty / expensive kit	Trauma and Orthopeadics main specialty excluding consultants specialising in bone tumours Or Anaesthetics main specialty excluding consultants specialising in pre-operative assessments Or General Medicine main specialty excluding those consultants specialising in hepatology or acute medicine Or Paediatrics main specialty and treatment specialty Or Paediatrics main specialty and consultants specialising in paediatrics trauma and orthopeadics or ophthalmology Or Nurse or AHP main speciality and physiotherapy, clinical physiology or other high volume treatment specialty Or Main specialty in one of the following 314, 320, 502, 330,340,120,100,410,303,301,302',304,361,710,430,143,170,501,560 >> **High Volume specialty** Otherwise >> **Low Volume specialty / expensive kit**
d Adult Or Child	Age >= 18 **>> Adult** Age < 18 **>> Child**

Planned Care Allocation Algorithm cont.....

Step	Rule
e Adult Or Child	Age on admission >= 18 **>> Adult** Age on admission < 18 **>> Child**
f First attendance or Follow-up attendance	First Attendance Code = 1 or 3 >> **First Attendance** First Attendance Code = 2 or 4 >> **Follow-Up Attendance**

Planned Care Allocation Algorithm cont.....

Step	Rule
g Telephone or Face to Face	16.4% in 101 treatment specialty 45.6% in 103 treatment specialty 41.7% in 110 treatment specialty 63.6% in 120 treatment specialty 17.2% in 130 treatment specialty 43.3% in 300 treatment specialty 40.6% in 303 treatment specialty 14.8% in 320 treatment specialty 5.0% in 330 treatment specialty 18.0% in 361 treatment specialty 12.7% in 400 treatment specialty 30.0% in 420 treatment specialty 32.4% in 501 treatment specialty 18.2% in 502 treatment specialty 24.1% in 800 treatment specialty **>> telephone** Otherwise **>> Face to face**
h Diagnostic Or Procedure	HRG Code = AA32Z,AA33C,AA33D,DZ07A,DZ31Z,DZ32Z,DZ37A,DZ38Z,EA47Z,FZ13Z,FZ51Z,FZ52Z,FZ54Z,FZ55Z,FZ57Z,FZ60Z,FZ61Z,FZ62Z,FZ64Z or JC09Z >> **Diagnostic** HRG Code <> WF01, WF02, AA32Z, AA33C,AA33D,DZ07A,DZ31Z,DZ32Z,DZ37A,DZ38Z,EA47Z,FZ13Z,FZ51Z,FZ52Z,FZ54Z,FZ55Z,FZ57Z,FZ60Z,FZ61Z,FZ62Z,FZ64Z or JC09Z >> **Procedure**

Planned Care Allocation Algorithm cont…..

NHS

Step	Rule
i Day case Or Ordinary admission	Patient Classification Code = 1 >> **Ordinary Admission** Patient Classification Code = 2 >> **Day Case Admission**
j Multi-professional or scan Or Single professional and no scan	Procedure1 = Y981,U131,U132,U133,U214,U216,U183,U212,U211,U012,Y973,U011 Or HRG Code = WF02 >> **Multi-Professional or Scan** Procedure1 <> Y981,U131,U132,U133,U214,U216,U183,U212,U211,U012,Y973,U011 And HRG Code = WF01 >> **Single Professional - No Scan**
l 0 /1 nights Or 2+ nights	Discharge Date – Admission Date < 2 >> **0 or 1 Night** Discharge Date – Admission Date >= 2 >> **2+ Nights**

Appendix 2
Acute and Episodic Care Allocation Algorithm 1

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NHS

Appendix 2 - Acute and Episodic Care Allocation Algorithm 1

Step	Rule
Time	Arrival time between Midnight and 8am >> **Emergency Centre**
Inv.	Incudes one of more of the following investigations >> **Emergency Centre** • x-match blood grp • MRI Scan • CT Scan • GU contrast exam / tomography • Toxicology • Dental Exam • Refraction, orthoptic tests etc
Adm. Acuity	Admitted and discharged alive the same day and no procedure >> **Urgent Care Centres**
Disp.	Disposal code one of >> **Emergency Centre** • Admitted • Transferred • Died in Department Disposal code one of >> **Urgent Care Centre** • Discharged for GP follow-up • Discharged no follow-up • Referred to Outpatient Clinic • Referred to healthcare professional • Left before being seen • Left refused treatment

Step	Rule
Diag.	Primary Diagnosis in one of the following >> **Emergency Centre** • Nerve inj. • Vascular inj. • Electric Shock • Poisoning (inc OD) • Near Drowning • Septicaemia • Cerebro-Vascular • Other vascular conditions • Haematological • Obstetric • Gynaecological • Allergy (inc anaphylaxis) • Facio-maxillary • Ophthalmic Primary Diagnosis in one of the following >> **Urgent Care Centres** • Contusion / abrasion • Soft tissue inflammation • Sprain / ligament • CNS (exc stroke) • Respiratory • Urological • Diabetes & Endo • Dermatological • Psychiatric • Social • Nothing abnormal

Step	Rule
Spec. Rules	Primary diagnosis ENT Conditions and any treatment >> **Emergency Centre** Primary diagnosis Bites/Stings and any secondary diagnosis Allergy (inc anaphalaxis) >> **Emergency Centre** Primary diagnosis cardiac conditions and any investigation cardiac enzymes and disposal not in one of the following >> **Urgent Care Centre** • Admitted • Transferred • Died in Department Primary diagnosis ENT conditions and no treatment >> **Urgent Care Centre**
Split	Randomly allocate on an equal probability basis >> **Emergency Centre/Urgent Care Centre**
Conv.	Non-ambulance conveyed activity allocated to the Emergency Centre from one of the rules above should be routed trough an Urgent care Centre

Appendix 3
Acute and Episodic Care Allocation Algorithm 2

The Strategy Unit

Acute and Episodic Care Allocation Algorithm 2

Step	Rule
Adm. Acuity	Admitted and discharged alive the same day and no procedure >> **Urgent Care Centres** Otherwise >> **Emergency Centre**

Appendix 4
Interaction between LTC/Frailty and Acute and Episodic Care Models

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Interaction between LTC/Frailty and Acute and Episodic Care Models

For each emergency admissions avoided through reduced LTC prevalence and improved LTC management in the LTC / Frailty model, the preceding A&E attendance has also been removed from the Acute and Episodic Care model.

Appendix 5
Estimating Long Term Condition Prevalence

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Estimating Long Term Condition Prevalence – Sources

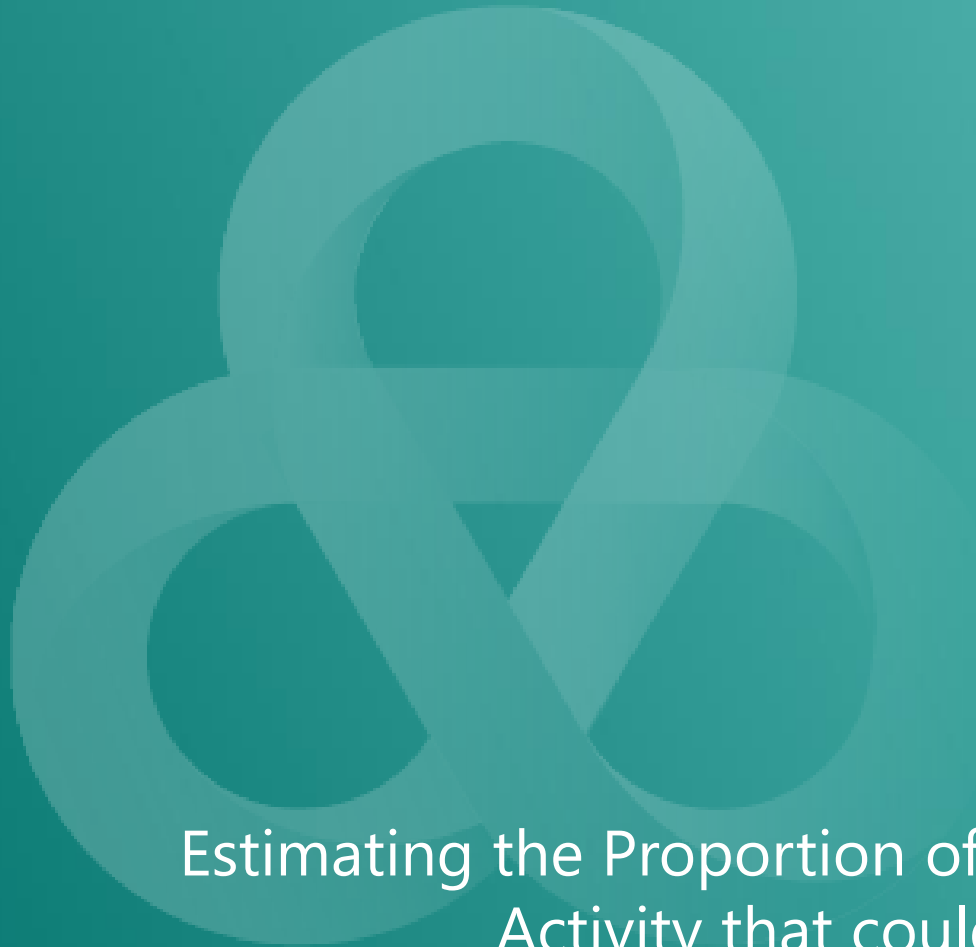|	ICD-10	Ref
Hypertension	I10-I13, I15	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Asthma	J45	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Drug & Alcohol Addiction	F11-F14, F16, F18-F19	http://www.hscic.gov.uk/catalogue/PUB02931/adul-psyc-morb-res-hou-sur-eng-2007-rep.pdf
Chronic Kidney Disease	N18	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Depression	F32-F33	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Diabetes, Type 2	E11	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Coronary Heart Disease	I20-I25	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Hypothyroidism	E02-E03	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Cancers	C00-C98	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Atrial Fibrillation	I48	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Chronic Obstructive Pulmonary Disease	J40-J44, J47	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Bipolar Disorder	F31	http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0075362
Transient Ischaemic Attack	G45	http://www.bhf.org.uk/publications/view-publication.aspx?ps=1001548
Stroke	I61-I64	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Rheumatoid Arthritis	M05-M06	http://www.arthritisresearchuk.org/arthritis-information/data-and-statistics/rheumatoid-arthritis.aspx
Heart Failure	I50	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Dementia	F00-F03, G30-G31	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Epilepsy	G40-G41	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Diabetes, Type 1	E10	http://www.diabetes.org.uk/Documents/Reports/Diabetes_in_the_UK_2010.pdf
Schizophrenia	F20	http://www.rcpsych.ac.uk/files/samplechapter/niceschizupedsc.pdf
Congenital heart defects	Q20-Q24	http://www.bhf.org.uk/publications/view-publication.aspx?ps=1001403
Parkinsons	G20-G22	http://www.edinburghparkinsons.org/wp-content/uploads/import/ParkinsonsprevalenceUK.pdf
Ulcerative Colitis	K51	http://www.nice.org.uk/nicemedia/live/14189/64229/64229.pdf
Multiple Sclerosis	G35	http://jnnp.bmj.com/content/early/2013/09/19/jnnp-2013-305450.full.pdf+html
Crohns Disease	K50	http://cks.nice.org.uk/crohns-disease#!backgroundsub:3
Osteoarthritis	M15-M19, M47	http://www.hscic.gov.uk/catalogue/PUB12262/qof-12-13-data-tab-ccg.zip
Downs syndrome	Q90	http://www.nhs.uk/news/2008/11November/Pages/DownssyndromeQA.aspx
Spinal Cord Injuries	S140-S141, S221, S240-S242, S340-S341, S343, T093, T913	http://www.rcplondon.ac.uk/sites/default/files/concise-chronic-spinal-cord-injury-2008.pdf
Sickle-cell & Thalassaemia	D56-D57	http://www.gpnotebook.co.uk/simplepage.cfm?ID=x20080401134502225450
Spina Bifida	Q05	http://news.bbc.co.uk/1/hi/health/217939.stm
Motor Neurone Disease	G122	http://www.nice.org.uk/nicemedia/live/13057/49914/49914.pdf

Appendix 6
The Whitfield Model

The Strategy Unit

The Whitfield Model

The Whitfield model estimates the number of heart attacks, strokes, heart failure events and kidney failure events for a given population. The calculation is based upon the number, age and sex of the people in the population and the mean levels of risk factors including systolic blood pressure, mean body mass index, cholesterol levels and smoking status. The predictive accuracy of the estimation is then tested by comparing the predicted number of acute events with the actual number of acute events by HRG code. The estimates are based upon modified risk equations from the US

Framingham study, with adjustments for the higher risk of diabetes patients. The result of the study is to estimate the order of impact that a program aimed at reducing population level body mass index, blood pressure levels, cholesterol levels and smoking rates could achieve. The results are expressed in terms of acute hospital admissions avoided, premature deaths avoided and potential revenue cost savings.

Appendix 7
Estimating the Proportion of Follow-Up Outpatient
Activity that could be delivered virtually

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Estimating the Proportion of Follow-Up Outpatient Activity that could be delivered virtually

Please refer to separate paper;

Analysis of Face-to-Face and
Telephone Outpatient Follow-ups for
Shrewsbury and Telford Hospitals

Experience Counts

Appendix 8
Phase 1 Modelling Change Parameters

Agreed Inpatient Strategy Parameters (1)

Admission Avoidance	Agreed parameter
Ambulatory care sensitive acute	Reduce 0 and 1 day LOS admissions for J03 and J06 at Telford by 20%
Ambulatory care sensitive Chronic	No change
Medicines related - Diuretics	No change
Medicines related - benzodiazepine	No change
Medicines related - Anti diabetics	No change
Medicines related - NSAIDS	No change
Self Harm related	No change
Falls related	20% reduction
Vaccine preventable	Remove 15% of total including all 0 LOS episodes
Alcohol related wholly	Switch proportions of day cases and inpatients for F10 and K70
Alcohol related somewhat	Remove 20% of 65+ non elective spells. Convert 50% of these to elective spells
Alcohol related marginal	Apply long term trend
Smoking related largely	Reduce to 0.5% across both sites
Smoking related somewhat	15-20% reduction of short stay R07 episodes
Obesity related -wholly	15% increase
Obesity related somewhat	Base parameter on age specific increases in obesity from foresight report
Obesity related marginal	Base parameter on age specific increases in obesity from foresight report
End of Life Care <2days	20% reduction
End of Life Care 3-14 days	20% reduction
End of Life Care 14+	No change
Medically unexplained symptoms	No change
Zero Day LoS, no procedure, discharged alive - Adults	Defer
Zero Day LoS, no procedure, discharged alive - Children	Defer
Cancelled operations	Maintain at 2.2% until 18/19 when 1% achieved
Procedures of limited clinical value – relatively ineffective	Reduce to 0.6%
Procedures of limited clinical value - potentially Cosmetic	No change
Procedures of limited clinical value close benefit-harm	No change
Procedures of limited clinical value cost effective alternatives	No change

Agreed Inpatient Strategy Parameters (2)

Admission Avoidance	Agreed parameter
Community Hospital Step-Up (frail elderly group 1)	80% reduction at Royal Shrewsbury
Community Hospital Step-Up (frail elderly group 1)	45.5% reduction at Royal Shrewsbury
Psychiatric Liaison - A&E	No change
Readmissions	No change

Length of Stay Reduction	Agreed parameter
BADS mainly Day Case	Move 50% of Q17 DCs at Shrewsbury to OP
BADS mainly OP procedure	No change
BADS mainly Day Case or OP procedure	Move 60 Q18 cases at Shrewsbury from DC to OP
BADS Occasionally Day Case	Increase J18 cases to achieve 80% DC Increase B27 cases to achieve 15% DC Increase M65 cases to achieve 20% DC Increase P23 cases to achieve 12.5% DC
Enhanced recovery - Hips	Down to 5.5 days
Enhanced recovery - Colectomy	Down to 5 days
Enhanced recovery - Excision of rectum	Down to 6.7 days
Enhanced recovery - Knees	Down to 5.2 days
Enhanced recovery - Bladder	No change
Enhanced recovery - Prostate	Down to 2.3 days
Enhanced recovery - Hysterectomy	Down to 2.5 days
Elective Excess bed days	No change
Emergency Excess bed days	No change
Psychiatric Liaison - Inpatient	No change
Stroke Early Supported Discharge	Down to 7 days
Ambulatory emergency care - Low	Achieve Mid Staffs levels 9% 0LOS
Ambulatory emergency care - Moderate	Achieve WAH level 39% 0LOS
Ambulatory emergency care - High	40% 0LOS
Ambulatory emergency care - Very High	Achieve mid staffs levels 27% 0LOS
Pre op LOS	Bring down Telford to 0.9
Community Hospital Step-down	63.8% reduction for 16.9% of cases

Agreed Outpatient and A&E Parameters

A&E	Agreed parameter
Patient attending lives close to A&E	No change
Patient left A&E before being treated	No change
Low cost attendances – referred to GP or discharged	Defer
Frequent Attendees	Not set (additional information required)
Number of Investigations	Remove investigations of the following types to achieve waiting time ambition – haematology, clotting studies, biochemistry, x-ray (plain film)
Length of time from being seen to departure	Achieve 97% < 4 hrs
Emergency ambulance conveyances	Not set

outpatients	Agreed parameter
GP Referred 1st Attendances – Trauma & Orthopaedics	Achieve average
GP Referred 1st Attendances – Cardiology	Telford down to regional average, RSH down to 0.5
GP Referred 1st Attendances – Ophthalmology	Defer
GP Referred 1st Attendances – All Other Specialties (children)	Achieve average
GP Referred 1st Attendances – All Other Medical Specialties	Achieve average plus rate of change
GP Referred 1st Attendances – All Other Surgical Specialties	Not set (additional information required)
New to Follow-Up Ratio – Medical Specialties	Move to 2.5
New to Follow-Up Ratio – Surgical Specialties (General)	No change
New to Follow-Up Ratio – Surgical Specialties (Ophthalmology)	No change
New to Follow-Up Ratio – Surgical Specialties (T&O)	Telford down to regional average
Consultant to Consultant Referrals	Achieve regional average