

## Systemic Anti-Cancer Therapy Future Service Delivery – Phase 1 Interim Report

### Executive Summary

There has been a year on year increase in demand for Systemic Anti-Cancer Therapy (SACT) due to increasing cancer incidence and the introduction of new, effective anti cancer medicines. Data demonstrates a 17% increase in total episodes of SACT delivered in the West of Scotland from 2013 to 2015. The impact of this on specialist medical, pharmacy and nursing resource at a Board level has been notable, with reports of an increase in waiting times for patients to be seen by oncologists to begin treatment in some Boards. Furthermore, mode of treatment delivery is changing with many new treatments given orally instead of, or often in addition to, the IV route. This evolution in mode of administration needs considered to determine the infrastructure required for treatment delivery, and will influence the configuration of the workforce.

Recognising the need to ensure safe and sustainable services while meeting an increasing demand for SACT services, a regional project was established in August 2015 to work towards identification of a sustainable model for safe delivery of SACT services. A two phased approach to the project was agreed to identify the short, medium and long term improvements and developments required to meet future demands on services. This interim report outlines the output of first phase of the project to date, which:

- Reviews the resource requirements for the safe delivery of SACT for the main tumour types, where treatment is delivered in outpatient or daycase settings requirements, considering how to optimise the current resource.
- Quantifies any existing gaps in service provision across the WoS Boards.
- Identifies possible options to address any gaps in service provision.

### Capacity Modelling

Capacity modelling was undertaken to consider the following areas: outpatient clinic, nursing, pharmacy, and physical resources. Modelling has provided further understanding of the current position, the challenges faced by services and identified areas where improvement and development are required. The following details key findings from capacity modelling.

#### Outpatient Clinic Appointments

- Initial review of consultant time available for clinics suggests that, if the service relies on consultant staff alone, there is insufficient time at present to complete pre-assessment and prescribe SACT.
- The current organisation in outpatient clinics results in inefficient workflow with bottlenecks and delays in the system.
- There is currently underutilisation of trained NMP (nursing and pharmacy) across Boards.
- There is significant variation in clinic appointments available by day of week with peaks in activity Monday to Wednesday, as well as a large variation between the minimum and maximum weekly activity which is more pronounced in the smallest units.
- Real time prescribing is recognised as best practice to ensure safe, high quality care however current clinic models often do not allow sufficient time for this.

### **Nursing Resource**

- There is currently a shortage of nursing staff across the majority of units delivering SACT.
- There is variation in the number and role of chemotherapy support workers across all units.
- Patient facing tasks take precedence for nursing staff therefore protected time for senior staff to undertake supporting professional activity, e.g. CEL 30 (2012) audit, is lost at times of peak activity.

### **Physical Resource**

- Scheduling of SACT treatments is not optimised across units. Many units are sharing facilities with non-cancer specialities causing additional challenges.
- Larger units have a greater ability to be flexible in scheduling thereby optimising chair utilisation.
- There is significant variation across the working week with peaks of activity Tuesday to Thursday.

### **Clinical Pharmacy Resource**

- Several units have a deficit in clinical pharmacy resource at certain times with direct patient care prioritised over supporting professional activities at present to cope with increasing demand.
- Inefficiencies in outpatient clinic organisation are resulting in prolonged times in clinic for clinical pharmacists, impacting on other duties.

### **Aseptic Pharmacy**

- Isolator capacity is currently sufficient however the age of most units is such that a capacity problem may occur due to failure of existing equipment
- There is variation in uptake of pre-filled products. Factors such as cost, critical mass required to make use cost effective and storage capacity influence range of products outsourced and usage.

### **Dispensing Services**

- There is an increase in workload for oral SACT within a backdrop of general dispensary pressures.
- Lack of review of routine supportive care medicines by prescribers was identified as an issue in some units. This results in inefficiencies with unnecessary dispensing and medicines wastage.

### **Conclusion**

The work completed to date identifies a range of areas where improvements could be made within current resource. The majority of these improvements apply across all Boards and are not only applicable to one or two units. Whilst responsibility for progressing these improvements is the remit of individual Boards there is merit in retaining a regional approach to addressing these issues, where appropriate, adopting similar methodologies and in maintaining momentum.

Notably, however, even with an increase in efficiency across units and the accompanying optimisation of resource, in the context of current and on-going growth in SACT the recommendations and actions noted below will not be sufficient and further change and investment will be required to support safe and sustainable SACT services.

The outputs of Phase 1 of this work, when completed, will underpin the further redesign of services and enable more detailed modelling work to be undertaken to identify and quantify future resource requirements.

## **Recommendations and Actions Required**

### **Short Term**

The following recommendations are made to optimise current resource by improving efficiency and consistency of SACT service delivery across WoSCAN. These recommendations are underpinned by detailed Board/Unit analysis that has been shared with Operational Managers and Clinical Leads.

- Review and redesign whole system patient flow, to maximise efficiency of the service and ease pressures by flattening out activity across the working week and optimising use of existing physical resource. This should include specifically:
  - outpatient clinic organisation and working practices;
  - pre-treatment blood testing procedures; and
  - maximising two stop model with scheduling of day case SACT.
- Review of skill mix to maximise existing nurse and pharmacy resource, including reviewing the utilisation of trained NMP. Thereby ensuring optimal use of specialist medical, nursing and pharmacy resource.
- Review current usage of pre-filled products across the Region and bring forward recommendations to maximise use to best support service delivery.

### **Medium Term**

Utilising the outputs from Phase 1 the following recommendation is proposed:

- Model and cost future service delivery options, including for example the consolidation of existing units within Boards.

### **Planned Next Steps**

#### **Completion of Phase 1**

- Undertake medical capacity modelling for prescribing. Initial analysis demonstrates a potentially significant deficit in consultant resource for prescribing. This requires to be considered alongside wider work around workforce redesign; and
- Progress and implement actions identified above.

#### **Initiate Phase 2**

- Model the predicted demand for SACT, based on available horizon scanning projections, and assess the associated impact on service provision;
- Investigate and recommend alternative models of SACT delivery; and
- Quantify additional investment required to meet demand in the medium term.

The Regional Planning Group are asked to note the significant progress described in this interim report and support progressing the short and medium term recommendations and actions with direction and input from the Regional SACT Executive Steering Group. This will be supported by dedicated clinical resource aligned to the project.

## Systemic Anti Cancer Therapy Future Service Delivery - Phase 1 Interim Report

### 1. Background

Since the West of Scotland Cancer Network (WoSCAN) Strategic Review of Chemotherapy Services was completed in April 2007, there have been significant changes in service requirements and delivery coupled with the introduction of novel diagnostic and treatment technologies.

There has been a year on year increase in demand for Systemic Anti-Cancer Therapy (SACT)<sup>1</sup> due to increasing cancer incidence and the introduction of new, effective anti cancer medicines. Data demonstrates a 17% increase in total episodes of SACT delivered in the West of Scotland from 2013 to 2015 as highlighted in figure 1, although this varies across Boards with NHS Lanarkshire and South Glasgow seeing around a 30% increase in activity. For some tumour types, e.g. skin cancer, haematology, and urological cancer, this increase is significantly higher (81%, 32% and 25% respectively over the same timeframe). The impact of this on specialist medical, pharmacy and nursing resource at a Board level has been notable, with reports of an increase in waiting times for patients to be seen by oncologists to begin treatment in some Boards.

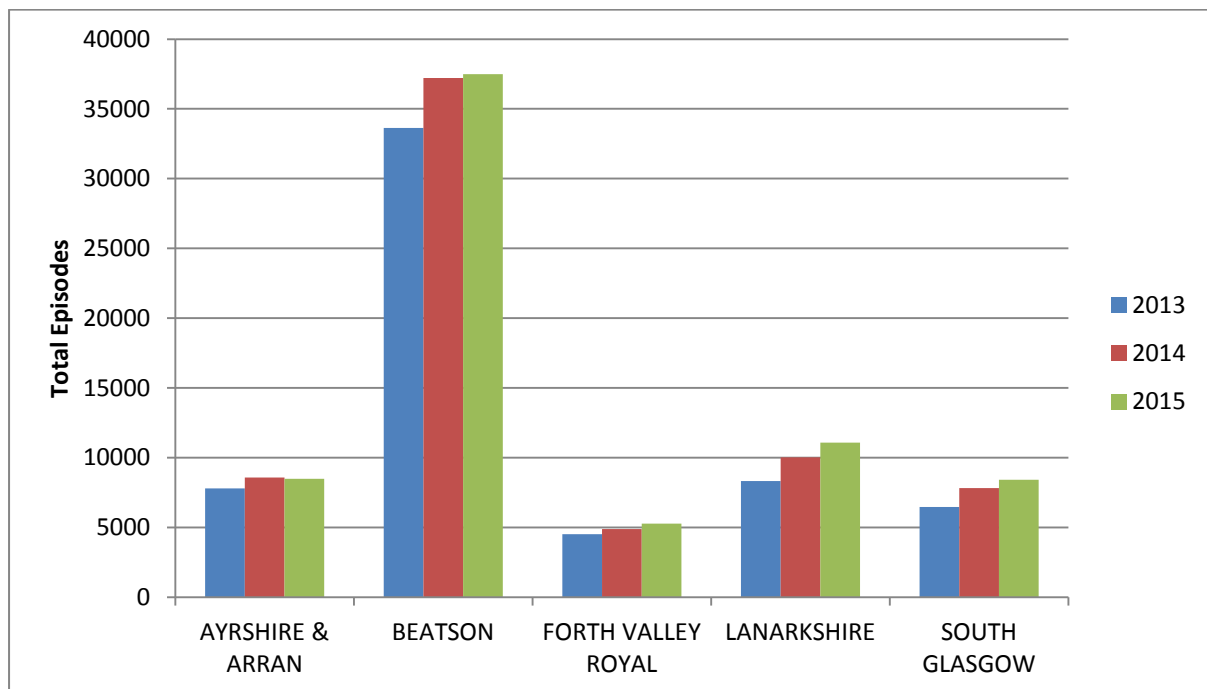


Figure 1: WoS SACT Activity Data (Daycase, Outpatient & Inpatient) 2013 to 2015

Furthermore, mode of treatment delivery is evolving with many new treatments given orally instead of, or often in addition to, the intravenous (IV) route. Across the West of Scotland there has been a 27% increase in the number of SACT episodes given as an out-patient (oral treatments) from 2013 to 2015, however there was no accompanying decrease in daycase activity. Day case activity has in fact risen by 17% over the same timeframe. This evolution in mode of administration will determine the infrastructure needed for treatment delivery, and influence the configuration of the workforce.

<sup>1</sup> As cancer is now treated with biological therapies and chemotherapy, treatment is now commonly referred to as Systemic Anti Cancer Therapy (SACT)

## **2. Project Overview**

### **2.1 Background**

Recognising the need to ensure safe and sustainable services for an increasing number of patients and available treatments, a regional project was proposed to work towards identification of a sustainable model for SACT services by the Regional SACT Executive Steering Group. This was supported by both West of Scotland (WoS) NHS Boards and the Regional Planning Group (RPG).

A two phased approach to the project was agreed by the RPG, to detail the short, medium and long term developments required to meet current and future demands on services.

A Short Life Working Group (SLWG) was established in August 2015 to provide strategic direction and leadership for the project (see appendix 1 for membership). Medical, pharmacy and nursing subgroups were also established to provide the operational support and expert clinical opinion to inform the strategic decisions made by the SLWG, ensuring wider inclusiveness of colleagues from across WoSCAN.

### **2.2 Purpose of Paper**

This interim report outlines capacity modelling work completed to date, a gap analysis and initial recommendations.

Work to date has focussed on the five main cancer types, where SACT is delivered locally in all four WoS Boards. These are: haemato-oncology, breast, lung, colorectal and urological (prostate and bladder) cancers. These cancer types account for approximately 80% of all SACT activity across the WoS and allow for comparison of delivery across Boards / units.

Initial capacity modelling has been undertaken to:

- Identify the resource requirements (nursing, physical capacity and pharmacy) to optimise safe delivery of SACT for main tumour types where treatment is delivered in outpatient and daycase settings.
- Quantify the existing gaps in service provision across WoS NHS Boards/units.
- Identify possible options to address the gaps identified in current service provision.

In order to complete the initial phase of the project, the following requires to be completed:

- Identify the medical workforce resource requirements to optimise safe delivery of SACT, in outpatient and daycase settings.
- Further examine future expected changes in demand and/or treatment delivery to model longer term future services.

### 3. Current Service Provision

#### 3.1 Service Delivery

For the tumour types included within the scope of the project (haemato-oncology, breast, lung, colorectal, prostate and bladder cancers) there are 11 sites delivering IV and oral SACT treatments across the region, with an additional two sites delivering only oral SACT treatment (haematology only), appendix 2 provides a summary of Board/unit services. NHS Lanarkshire also treats patients with upper gastrointestinal (GI) and hepato-pancreato-biliary (HPB) cancers locally. Patients with all other tumour types, regardless of Board of residence, attend Beatson West of Scotland Cancer Centre (BWoSCC) for treatment.

SACT treatment is usually initiated and prescribed in outpatient clinics. Oral SACT will be dispensed at time of prescribing with the patient self-administering at home. For intravenous treatments there are various models of service delivery utilised across the WoS units. The majority of treatment is delivered as day case treatment. Most units operate a 'two-stop model': patients attend clinic for review and return the following day to receive treatment. A small number are however treated on the same day where appropriate, for example patients from remote and rural areas. NHS Forth Valley utilises a solely one-stop model of delivery: patients attend clinic for review in the morning and receive treatment in the afternoon.

##### 3.1.1 Day Case Treatment Facilities

Across the WoS there are 166 chairs/beds designated to deliver day case SACT treatment, unit opening hours are, in the main, 8.30am – 6pm. Figure 2 below details breakdown of chairs/beds available by Board for day case treatment.

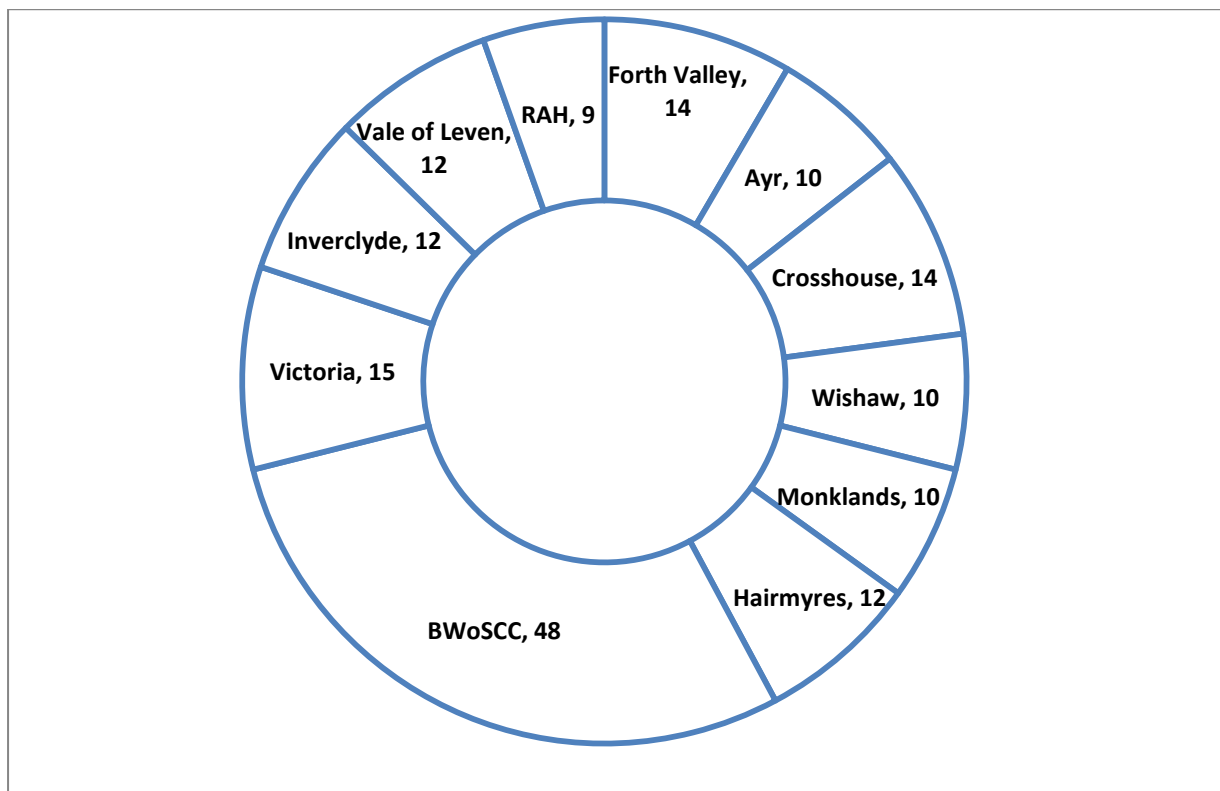


Figure 2: Chairs/Beds Available for SACT Delivery - WoS Units

### 3.2 SACT Activity

From 1<sup>st</sup> January to 30<sup>th</sup> June 2015, nearly 26,000 episodes of SACT (daycase and outpatient) were delivered for the main tumour types; table 1 provides a breakdown of activity by Board and tumour type. These data demonstrate some variation in treatment rates across tumour types / Boards, which merit further investigation.

	Haem-onc	Breast cancer	Colorectal cancer	Lung cancer	Urological cancer <sup>3</sup>	TOTAL
<b>BEATSON<sup>1</sup></b>	3186	3690	1608	939	920	<b>10343</b>
<b>FORTH VALLEY</b>	770	763	297	292	277	<b>2399</b>
<b>LANARKSHIRE</b>	1832	1643	825	496	250	<b>5046</b>
<b>AYRSHIRE &amp; ARRAN</b>	1568	1348	414	407	341	<b>4078</b>
<b>SOUTH GLASGOW<sup>2</sup></b>	2203	1207	66	222	237	<b>3935</b>
<b>WoS</b>	<b>9559</b>	<b>8651</b>	<b>3210</b>	<b>2356</b>	<b>2025</b>	<b>25801</b>

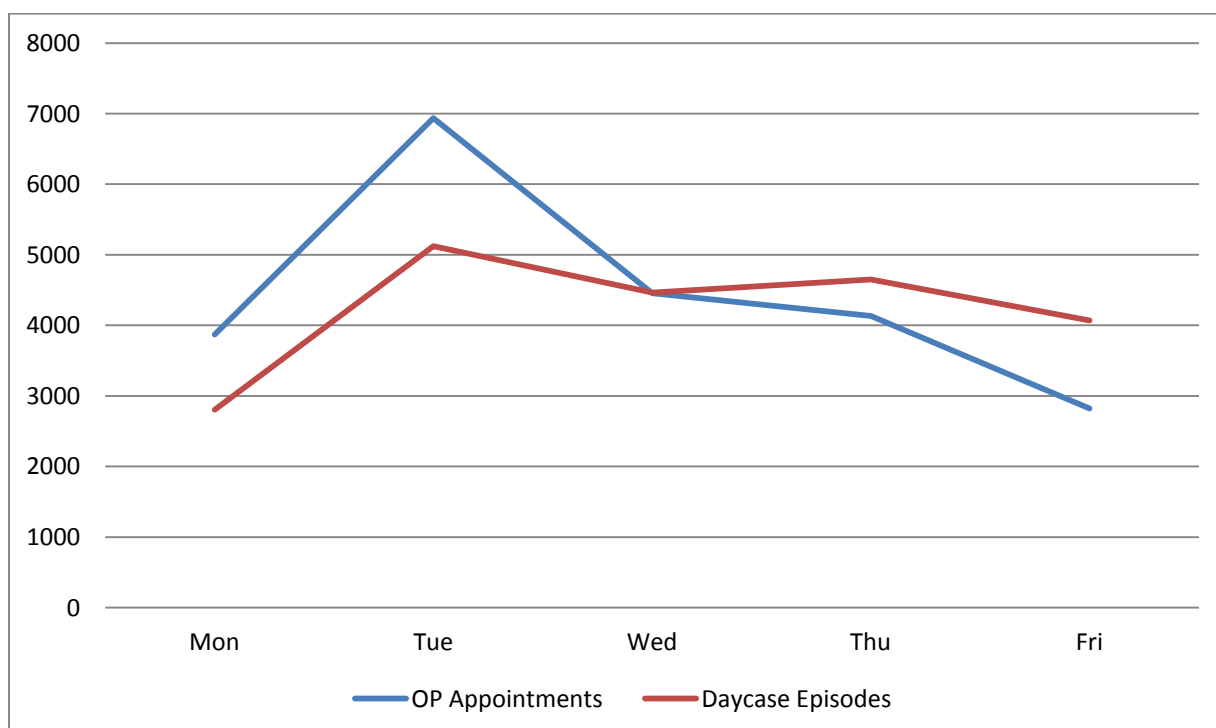
**Table 1: WoS SACT Episodes (day case & outpatient) 1st January to 30th June 2015**

<sup>1</sup>Beatson includes: Beatson WoS Cancer Centre, Inverclyde Royal Hospital, Stobhill, Glasgow Royal Infirmary, Vale of Leven

<sup>2</sup>South Glasgow includes: Victoria ACH, Royal Alexandra Hospital

<sup>3</sup>Urology includes only prostate and bladder cancer

There is considerable variance in activity across the week for both outpatient clinic appointments and day case episodes, with significant peaks of activity Tuesday to Thursday (see figures 3 and 4). It should be noted that other activity, for other specialities, is undertaken in some day case units on days where SACT activity is lower.



**Figure 3: SACT Outpatient Clinic Visits and Day Case Episodes Jan – Jun 2015 by Day of Week (WoS total)**

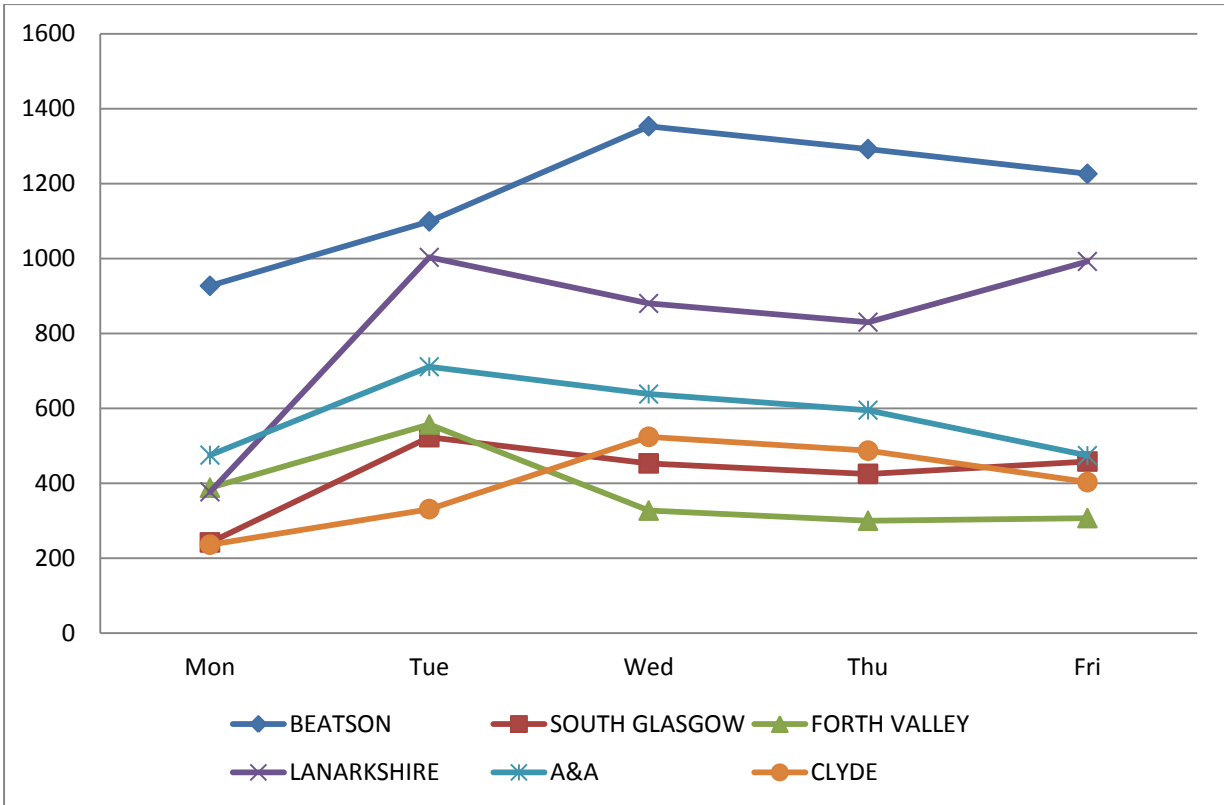


Figure 4: SACT Day Case Episodes Jan – Jun 2015 by Day of Week and Unit



### 3.3 Short Term Changes in Demand

Capacity modelling is based upon SACT activity from 1<sup>st</sup> January to 30<sup>th</sup> June 2015, full year data is however now available for 2015. This highlights that activity has increased by 8% in WoS overall in the second half of 2015, this varies across Boards and tumour types. South Glasgow, for example, has seen a 10% increase in activity in the second half of the year, as demonstrated in figure 5 below.

Colorectal cancer episodes have decreased by 6.4% over the West of Scotland; this is due in the main to the change in practice to an off label, evidence based two weekly cetuximab schedule. Activity for all other tumour types has increased overall, with the largest increase seen in urological cancer treatments (24%). This increase is not unexpected. With the introduction of the Patient and Clinician Engagement (PACE) there has been a significant increase in the number of cancer treatments accepted by Scottish Medicines Consortium (SMC). This includes a number of re-submissions previously not recommended by SMC.

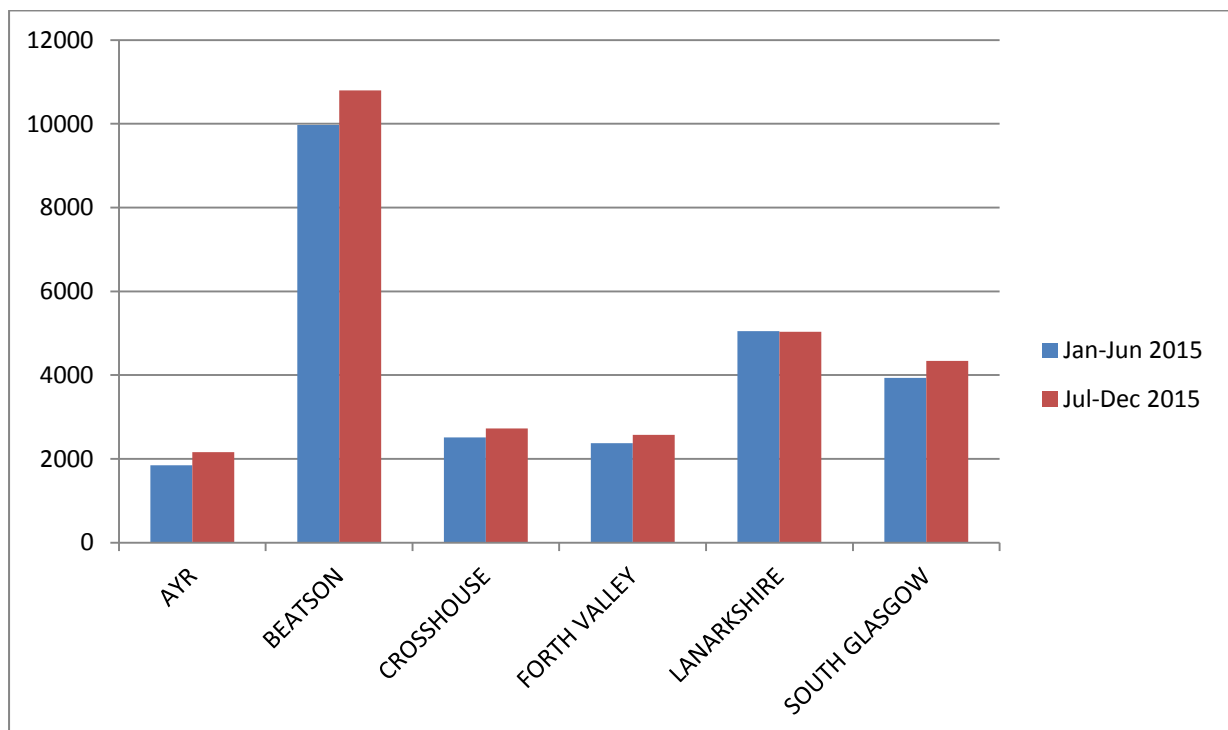


Figure 5: SACT Episodes for Main Cancer Types 6 Month Comparison 2015

## 4. Capacity Modelling

As a baseline exercise, current prescribing and scheduling activity data from the electronic prescribing and scheduling system ChemoCare, for January to June 2015, for each site delivering SACT has been analysed. Existing resource to deliver SACT services (nursing and pharmacy) across the four WoS Boards has been quantified following a baseline data gathering exercise.

Capacity models have now been developed and initial analysis undertaken to quantify outpatient clinic appointment (initiation and prescribing stage), nursing requirements and pharmacy requirements at a unit level based on current activity levels.

The following assumptions have been made in developing the capacity models:

- The model is developed based upon each unit working at 85% capacity; this is standard across planned care workforce models and allows for fluctuations in demand.
- A factor of 22.5% has been built into the capacity models to allow for annual leave, sick leave, mandatory training, maternity leave and other leave. This is standard across NHSScotland nursing workforce models.
- Only ChemoCare prescribed activity is included within the model, i.e. no paper prescription activity included apart from hydroxycarbamide for myeloproliferative disorders.
- Apart from bisphosphonates and denosumab, no other non SACT activity (for example blood transfusions, immunoglobulins) is included within the model.
- The mean of weekly activity has been utilised within the model. It should be noted that, particularly in smaller units, there is significant variance in number and type of treatments week to week.
- For the Beatson WoS Cancer Centre, models have been developed based on 50% of total resource to represent the proportion of activity of the tumour types included within the scope of the project.
- For NHS Lanarkshire the models have been developed based on 94% of total resource available to represent the proportion of activity of the tumour types included within the scope of the project.

### 4.1 Outpatient Clinic Appointments

As described earlier, SACT treatment is prescribed in outpatient clinics as part of a pre-treatment assessment appointment where fitness for treatment is assessed. Outpatient clinic workload, based on prescriptions on ChemoCare, has been quantified to determine the required number of outpatient SACT pre-treatment assessment appointment slots required to deliver current activity.

The medical subgroup was consulted to determine the appropriate duration of appointments for SACT pre-treatment assessment (see table 2). A 30 minute 'new treatment' appointment, to include patient consent, for each new regimen prescribed is also required. The impact of deferrals, i.e. where patients are seen in clinic however treatment itself is delayed, can be significant as there is a considerable amount of associated workload. This has not previously been considered within similar models however is included in this model (table 2).

	Breast Cancer	Colorectal Cancer	Haemato-oncology	Lung Cancer	Urological Cancer
<b>Appointment Duration</b>	20 mins	15 mins	20 mins	15 mins	15 mins
<b>Deferral Rate</b>	10%	10%	10%	20%	10%

**Table 2: Appointment Duration and Average Treatment Deferrals by Tumour Type**

The number of hours of outpatient clinic time required per week by tumour type was calculated. This is shown in Table 3. The intention was for the number of hours of outpatient clinic time required to be compared with current outpatient clinic capacity and workforce to quantify gaps. For the majority of units this has not been possible. This is because there is no distinction between pre-treatment assessment appointments for SACT or other appointments within clinic templates.

	Weekly Average Outpatient Clinic Time Required for SACT Pre-Treatment Assessment					
	Breast Cancer	Colorectal Cancer	Haemato-oncology	Lung Cancer	Urological Cancer	TOTAL
<b>NHS Ayrshire &amp; Arran</b>						
Ayr Hospital	8	n/a	11	4	6	<b>23</b>
Crosshouse Hospital	15	6	13	4	n/a	<b>38</b>
<b>NHS Forth Valley</b>						
Forth Valley Royal Hospital	14	5	14	6	6	<b>45</b>
<b>NHS Greater Glasgow and Clyde</b>						
Beatson WoS Cancer Centre	50	24	37	14	15	<b>140</b>
Victoria ACH	21	2	21	4	5	<b>53</b>
Inverclyde	5	1	3	1	1	<b>11</b>
Vale of Leven	5	0.5	5	1	n/a	<b>11</b>
Royal Alexandra Hospital	n/a	n/a	10	n/a	n/a	<b>10</b>
Stobhill ACH	n/a	n/a	4	n/a	n/a	<b>4</b>
Glasgow Royal Infirmary	n/a	n/a	4	n/a	n/a	<b>4</b>
<b>NHS Lanarkshire</b>						
Hairmyres	13	5	12	n/a	n/a	<b>30</b>
Monklands	n/a	10	13	11	n/a	<b>34</b>
Wishaw General Hospital	17	n/a	13	n/a	5	<b>35</b>

**Table 3: Weekly Average SACT Outpatient Clinic Hours Required for Pre-Treatment Assessment**

Please note: clinics for all tumour types are not held on each hospital site (see appendix 2 for detail)

It was noted that Boards reported current clinics frequently over run and prescribing of treatment is delayed until after clinic. Initial review of consultant time available for clinics suggests that, if the service relies on consultant staff alone, there is insufficient time at present to complete pre-assessment and prescribe SACT. For example, in NHS Lanarkshire there are currently 21 consultant hours available in breast cancer clinics for new patient, pre-treatment and follow up appointments. The capacity model demonstrates that 30 hours are required for breast cancer SACT pre-treatment assessment appointments alone (see table 3).

Alternative models of prescribing, for example, expansion in use of qualified non medical prescribers, and telephone assessment clinics, have been shown to provide efficiencies in increasing throughput of patients.

The majority of Boards highlighted that flow of outpatient clinic appointments and prescribing of SACT was significantly impacted by the current inefficiencies in the process due to challenges with

timely availability of pre-SACT blood tests, as well as current clinic set-up. This can delay prescribing, preparation of medicines and ultimately the patient receiving treatment.

## 4.2 Nursing Resource

A nursing model has been developed, in conjunction with the SACT nursing subgroup. This has been challenging given the variation in practice across units, specifically with regards to delivery of supportive care and treatments, and the difference in roles of some senior nursing staff. The model is based upon the existing resource template for each treatment regimen within ChemoCare which provides a nursing WTE for each regimen. These have been reviewed, validated and updated by the nursing subgroup.

For example, to deliver carboplatin a total of four 15 minute ‘slots’ are required, the nursing WTE is 1 for the first and last slot and 0.3 WTE for the remaining slots; thus resulting in 60 minutes of chair time per episode and 39 minutes of nursing resource.

SACT nursing resource is not solely for SACT administration. Additional tasks, such as writing up notes and patient phone calls are also undertaken by nursing staff. The nursing subgroup has therefore identified a standardised list of essential “non SACT administration” tasks and estimated time spent on each of these per day to determine the proportion of nursing time actually available to deliver SACT. It is these figures which have been incorporated into the calculations.

Table 4 details the output of modelling based on activity levels from 1<sup>st</sup> January to 30<sup>th</sup> June 2015. This highlights that for the majority of units there is a deficit in nursing resource. At present, some units are coping with the additional demand on services by utilising Clinical Nurse Specialists to help deliver SACT at times of peak activity.

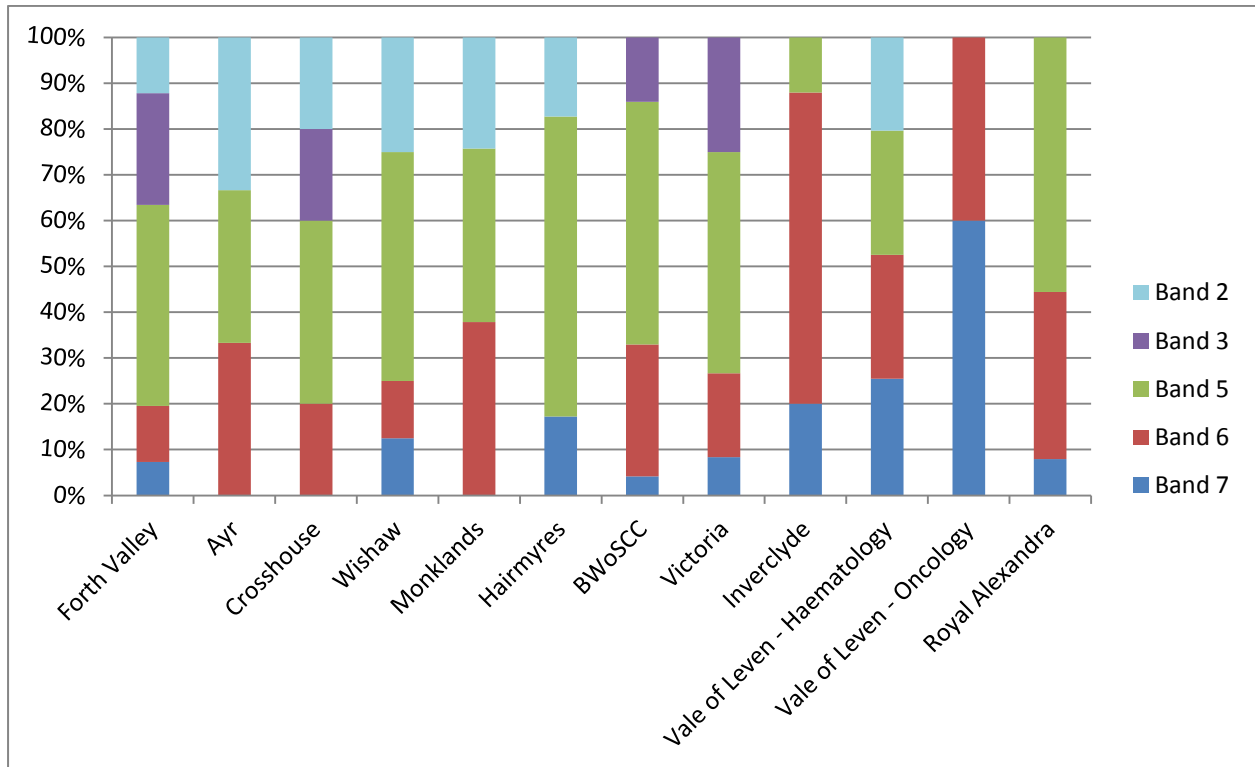
	Total Workforce Required (WTE)	Actual Workforce (WTE)	Difference / Gap (WTE)
<b>NHS Ayrshire &amp; Arran</b>			
Ayr Hospital	2.07	1.1	- 0.97
Crosshouse Hospital	3.17	1.51	- 1.66
<b>NHS Forth Valley</b>			
Forth Valley Royal Hospital	3.54	2.98	- 0.56
<b>NHS Greater Glasgow and Clyde</b>			
Beatson WoS Cancer Centre	11.37 (21.07)*	7.47 (15)*	- 3.91 (- 6.07)*
Victoria ACH	3	3.55	+ 0.16^
Inverclyde	1.43	1.9	+ 0.47
Vale of Leven – Haematology	0.65	0.11	- 0.55
Vale of Leven – Oncology	0.37	0.53	+ 0.16
Royal Alexandra Hospital	1	0.7	- 0.47^
<b>NHS Lanarkshire</b>			
Hairmyres	2.46	1.06	- 1.40
Monklands	2.42	0.45	- 1.97
Wishaw General Hospital	2.63	1.09	- 1.54

**Table 4: Nurse Capacity Modelling Output**

\* Figures in brackets denote resource requirements for all tumour types treated at Beatson WoS Cancer Centre.

^Please note: difference for Victoria ACH and Royal Alexandra Hospital does not tally with total workforce due to rounding artefact.

The Nursing Capacity Model only includes trained nursing staff resource (bands 5, 6 and 7). It is important to note that there is variation in both the amount of Chemotherapy Support Worker (CSW) resource across units and in the job roles of these staff. This is an important role and with the appropriate training can free up significant trained nursing resource. Figure 6 below provides an overview of total complement of nursing staff across units demonstrating both the variance in number and banding of chemotherapy support workers across the region.



**Figure 6: Unit level nursing complement to deliver SACT**

Many units utilise band 3 staff to undertake roles which were traditionally completed by trained staff. The following list provides an overview of some tasks undertaken by band 3 CSW across WoS units, thereby freeing up trained staff time to focus on specialist nursing tasks:

- Central venous access devices care/ maintenance
- Modified Early Warning Scoring (MEWS)
- Cannulation (non SACT)
- Venesection
- Scalp cooling
- Nutritional / hair care advice
- Vital signs
- Venepuncture

Direct patient care is only part of the overall responsibilities of senior nursing staff, but is prioritised over other activities in periods of increased activity. This currently results in there being insufficient resource for other non-patient facing roles. Senior nurses should have a job plan which recognises the time required for supporting professional activities including:

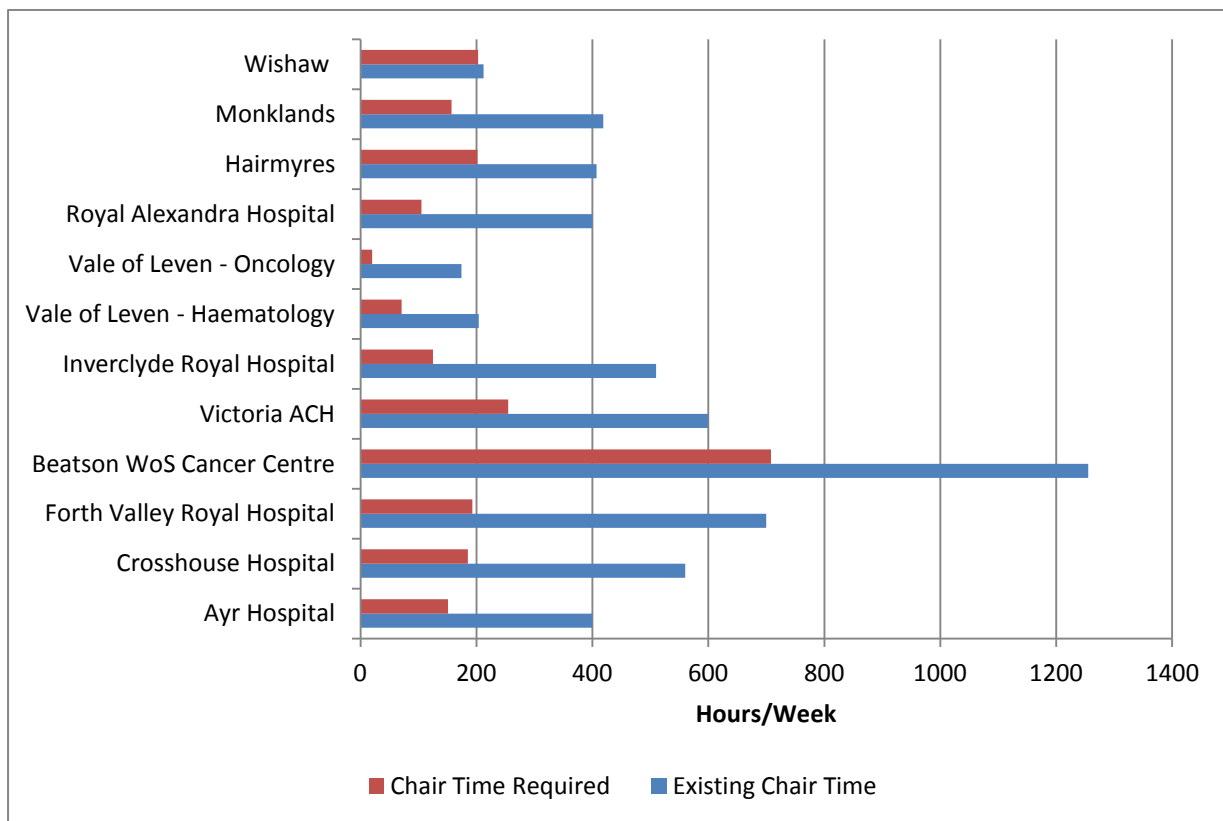
- Protocol / guideline development

- Staff updates/ training
- Audit – internal and regional (CEL 30 2012)
- Clinical trials

### 4.3 Physical Resource

ChemoCare has been utilised to determine chair time by regimen, this has been validated by the SACT nursing subgroup. These figures have been utilised to calculate chair time required in each unit for the current SACT activity in the agreed time period.

Chair time calculations only take into consideration ChemoCare prescribed activity<sup>2</sup> and blood transfusions and not any supportive treatments, e.g. venesection, immunoglobulins, which may account for a significant amount of chair time across the week in some units.



**Figure 7: Existing Physical Resource vs. Average Weekly Chair Time Required (from capacity model)**

The model demonstrates that sufficient physical capacity is available across units (see figure 7 and table 5) however the model is based on unit opening hours which does not reflect the hours that the unit is actually delivering SACT to patients. For example, a unit may be open from 8am to 6pm however SACT will only be scheduled between 9am and 5pm. This may be due to a number of factors, including medical cover, pharmacy opening hours, outpatient prescribing and associated time of treatments. For example, if actual treatment delivery hours are utilised the Beatson WoS Cancer Centre has an 82% chair utilisation rate rather than 56%. It should be noted that the majority of units will use shift patterns to ensure appropriate staffing across the day.

<sup>2</sup> ChemoCare prescribed activity includes both SACT and bisphosphonates.

	Total Chair Time Required (hours/week)	Existing Chair Time (hours/week)	Chair Utilisation Rate
<b>NHS Ayrshire &amp; Arran</b>			
Ayr Hospital	151	400	38%
Crosshouse Hospital	185	560	33%
<b>NHS Forth Valley</b>			
Forth Valley Royal Hospital	193	700	28%
<b>NHS Greater Glasgow and Clyde</b>			
Beatson WoS Cancer Centre*	708 (1434)	1255 (2510)	56% (57%)
Victoria ACH	255	600	43%
Inverclyde	125	510	25%
Vale of Leven – Haematology	71	204	35%
Vale of Leven – Oncology	20	174	11%
Royal Alexandra Hospital	105	400	26%
<b>NHS Lanarkshire</b>			
Hairmyres^	202	407	50%
Monklands	157	419	37%
Wishaw General Hospital^	203	212	96%

**Table 5: Physical Capacity Modelling Output**

\*Figures in brackets denote chair time and chair utilisation rate for all tumour types treated at Beatson WoS Cancer Centre.

^The day unit facilities in both Hairmyres Hospital and Wishaw General Hospital are shared with medical specialities.

Table 5 demonstrates that, in the main, the larger units have a higher chair utilisation rate. This is due to the flexibility provided by having more chairs available. Modelling also highlights that a two-stop model optimises the use of physical capacity as one-stop models result in under-use of chairs in the morning, whilst patients are being reviewed, treatments prescribed and prepared.

The ChemoCare scheduling function is utilised successfully by some, but not all, units. This electronic tool provides automatic scheduling of prescribed SACT and supports units in maximising chair time. It also allows other activities, such as blood transfusions, to be manually scheduled. It was noted that there is variation in the staff disciplines which undertake the scheduling role across Boards. In some units this task is undertaken by administrative staff (band 2), in others this role is taken on by senior nursing staff.

## 4.4 Pharmacy Services

### 4.4.1 Clinical Pharmacy

An existing validated capacity planning tool was reviewed and updated, in conjunction with the pharmacy subgroup. This determines the clinical pharmacist workforce required to support SACT services.

The model assumes that one pharmacist can deliver pharmaceutical care<sup>3</sup> for up to 10 patients per three hour session, including a mixture of new and returns. This includes 30 minutes liaison time per three hour session. It assumes that one pharmacist is required for the duration of a clinic where SACT is prescribed, irrespective of patient numbers. Deferral rate, as agreed for the outpatient model, has been applied to the model. See table 6 for model output.

It was observed that for Board areas that provide SACT over more than one site, clinical pharmacist cover is often cross-site and available time to deliver clinical care is reduced because of time required to travel between sites.

	Total Workforce Required (WTE)	Actual Workforce (WTE)	Difference / Gap (WTE)
<b>NHS Ayrshire &amp; Arran</b>			
Ayr Hospital	0.78	0.97	+0.19
Crosshouse Hospital	0.85	0.88	+ 0.3
<b>NHS Forth Valley</b>			
Forth Valley Royal Hospital	0.98	0.77	- 0.21
<b>NHS Lanarkshire</b>			
Hairmyres	0.68	0.45	- 0.23
Monklands	0.75	0.56	-0.19
Wishaw General Hospital	0.79	0.72	- 0.07
<b>NHS Greater Glasgow and Clyde</b>			
Beatson WoS Cancer Centre	3.2	0.95	- 2.25
Victoria ACH	1.22	1.17	- 0.05
Vale of Leven	0.25	0.31	+ 0.06
Royal Alexandra Hospital	0.23	Ad Hoc	
Stobhill ACH	0.1	0.08	- 0.02
Glasgow Royal Infirmary	0.13	0.11	- 0.02

**Table 6: Clinical Pharmacy Capacity Model Output**

Please note: it has not been possible to model clinical pharmacy capacity for Inverclyde Hospital due to local differences in model for prescribing.

Table 6 highlights that several units have a deficit in clinical pharmacy resource at certain times.

The calculations are based on the mean weekly workload. It has been observed that smaller units have a greater variation from the mean than larger units, which results in greater pressure during peaks in workload. For example, the weekly mean number of breast cancer patients requiring pharmaceutical care in Ayr is 17 but the maximum number during the period of analysis was 27.

<sup>3</sup> Pharmaceutical care involves review and verification of prescriptions, advising clinicians on medicine issues and educating patients on their medicines.



This means that even after adding the capacity factor, these values may underestimate the staff needed for peaks in workload.

Direct patient care is only part of the overall responsibilities of the cancer clinical pharmacist, but is prioritised over other activities in periods of increased activity. This currently results in there being insufficient resource for other non-patient facing roles. Cancer pharmacists should have a job plan which recognises the time required for supporting professional activities including:

- Co-ordination of Individual Patient Treatment Requests (IPTR)
- Administration and monitoring of Patient Access Schemes
- Implementation and monitoring uptake of SMC advice
- Support of SACT lead clinician
- CEL 30 (2012) audit and monitoring
- SACT protocol development and update
- Financial reporting

The majority of specialist cancer clinical pharmacists across the region are also qualified non-medical prescribers. The extent of their prescribing practice varies from unit to unit. Further discussion and assessment of this is included in the outpatient clinic section (4.1) of this report. If sessional input for non-medical prescribing is required, this should be recognised and included in job plans.

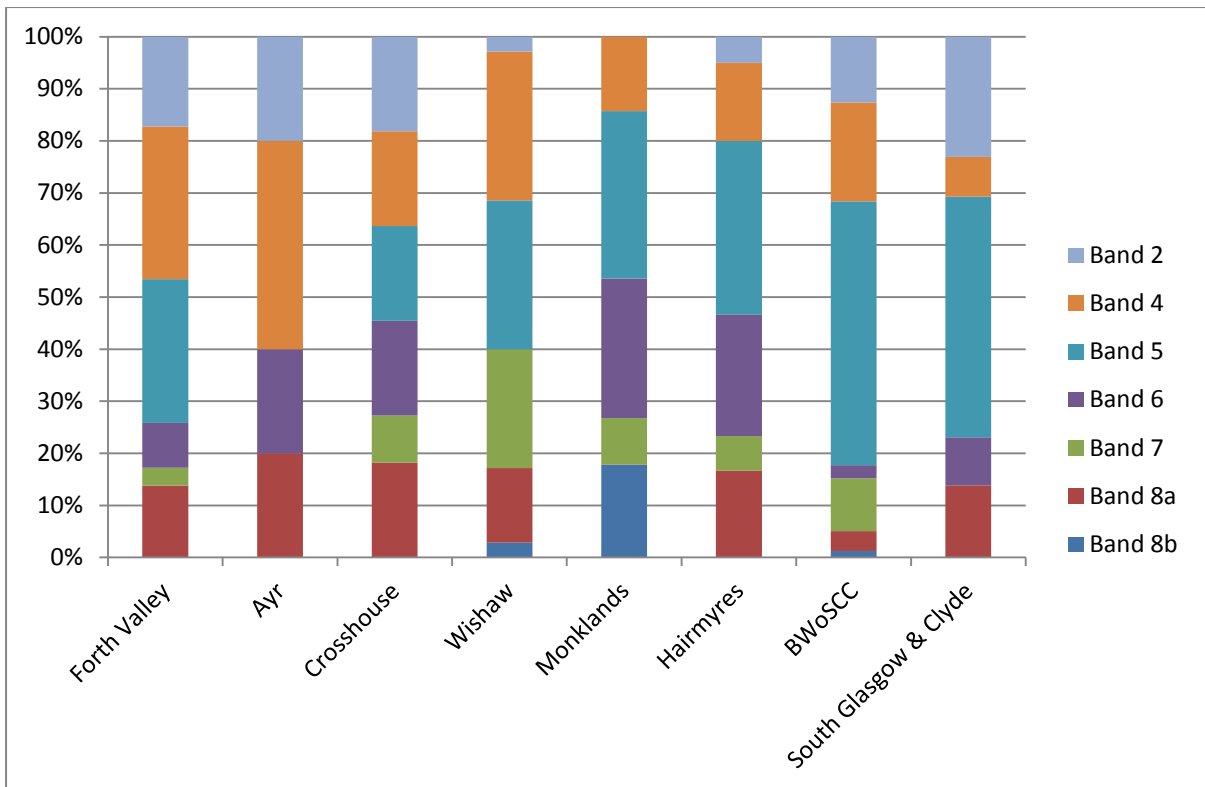
#### **4.4.2 Aseptic Pharmacy**

Accountable pharmacists from all aseptic units preparing SACT were interviewed to identify specific issues which impacted on quality of service delivery. Common themes were identified:

- **Isolator and Staffing Capacity**

All units reported that sufficient isolator space and adequate staffing is available to deliver the overall weekly workload. Timing of prescribing, however, results in significant pressure at certain points in the week. This is particularly true for sites operating a one stop model. For sites which operate a two stop model prescribing occurring late afternoon for administration the next day can also result in high peaks in demand for the service.

There is considerable variation in the skill mix of staff in aseptic units across the region (see figure 8).



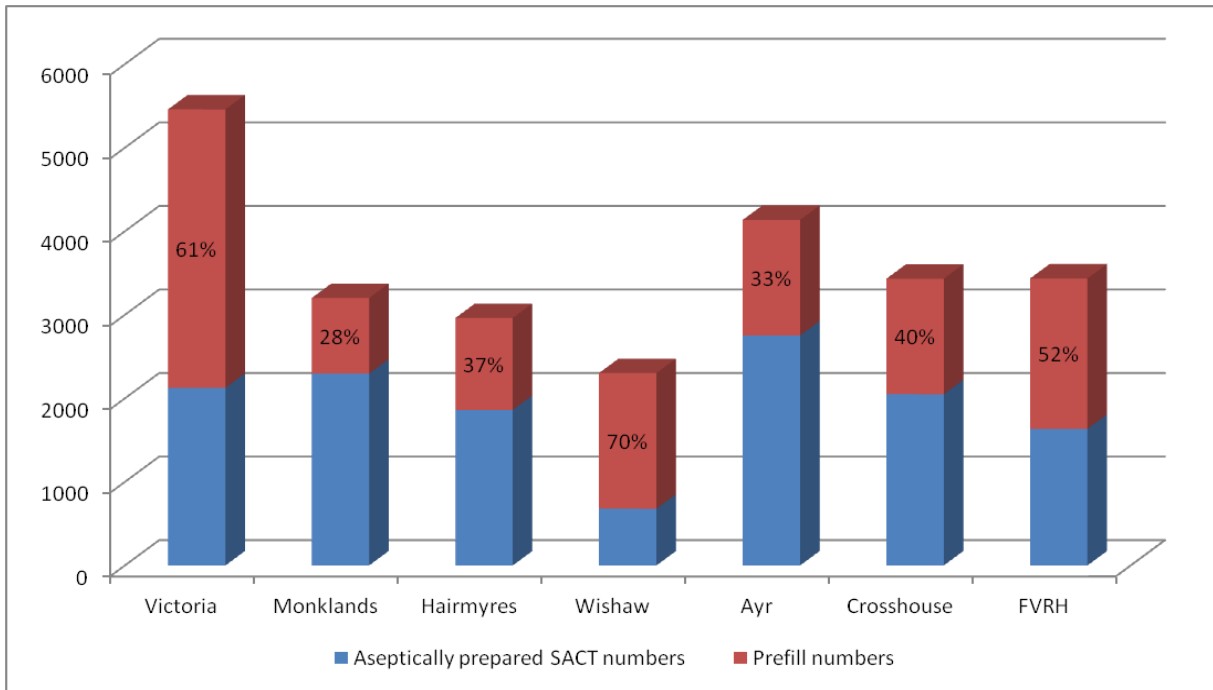
**Figure 8: Unit level aseptic complement to deliver SACT**

- **Age of Facilities**

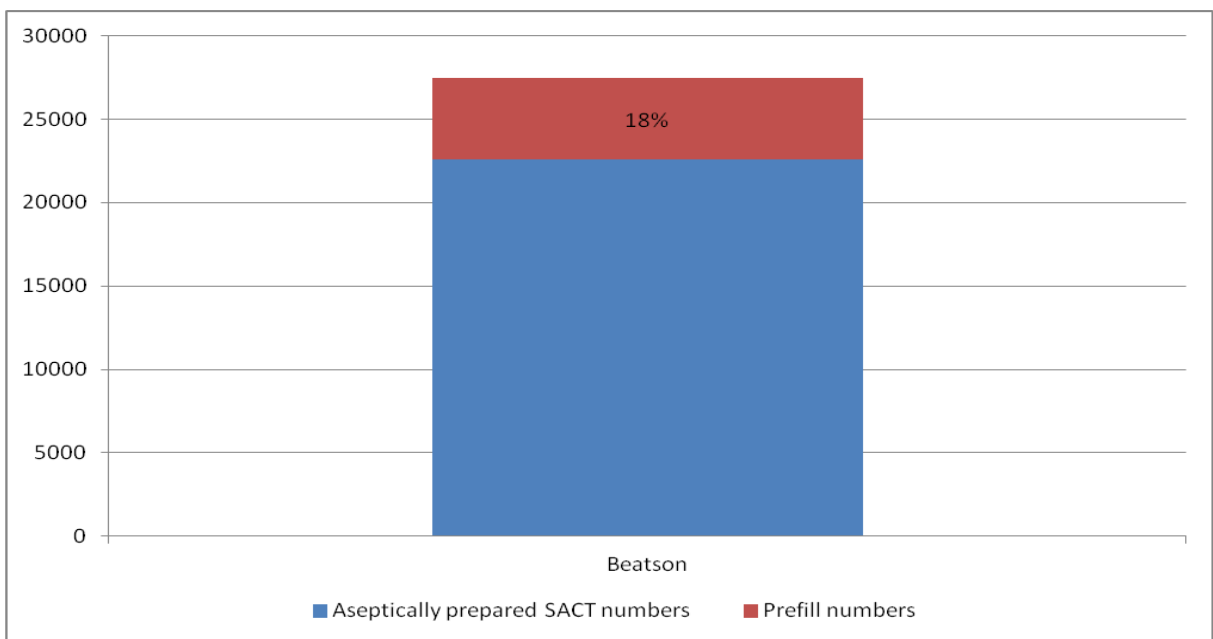
Apart from Forth Valley and the Victoria ACH, all sites have identified that the age of their isolators, some over 20 years old, are overdue for replacement (normal expected lifespan 10 years).

- **Use of Pre-filled Syringes/Bags**

All units are purchasing prefilled SACT products to help manage demand (see figures 9 and 10). These products free up isolator space and improve turnaround times. There are a wide range of products available to purchase. These products do however have a short expiry and it can be labour intensive balancing adequate stock control while minimising wastage and maintaining the necessary governance processes around these unlicensed medicines. There is variation in uptake of these products. Factors such as cost, critical mass that is required to make the process efficient and prevent wastage and storage capacity have been cited as reasons for not extending the range of prefills used. Further work is required to determine how these products can be best used to support service delivery.



**Figure 9: Number of Aseptically Prepared Items vs. Prefills by unit (Jan – Jun 2015)\***



**Figure 10: Number of Aseptically Prepared Items vs. Prefills – BWoSCC (Jan – Jun 2015)\***

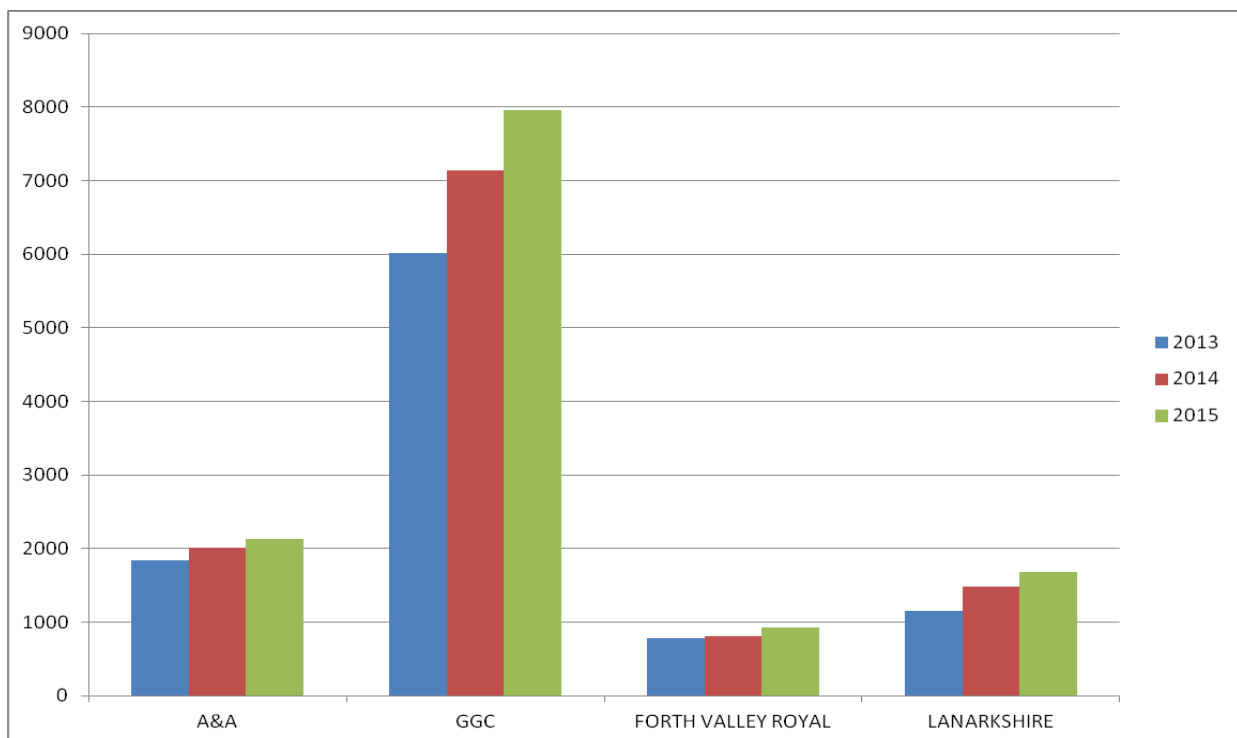
\* These figures include SACT for in-patients and daycase and across all tumour types treated by that site, therefore more than the scope of this project<sup>4</sup>.

<sup>4</sup> Please note: data included in figures 8 and 9 was supplied by local aseptic units.

### 4.4.3 Dispensing Services

Most hospitals in the Region have one pharmacy dispensary. The cancer outpatient workload is a small but significant part of this overall workload. Prescriptions are dispensed for oral SACT regimens (outpatient treatment) and supportive care (for example, anti-emetics) for day case intravenous regimens.

Prescribing of oral only SACT regimens has increased year on year (see figure 11). Recent SMC decisions and cancer horizon scanning indicates that there are a substantial number of oral therapies that will impact in the future. As oral only regimens tend to follow a one stop model meeting expected turnaround times is challenging for dispensaries.



**Figure 11: Prescriptions for Oral Only Regimens 2013 to 2015**

Pre-labelled packs of commonly prescribed anti-emetics and other supportive care items are used in some units. These are then dispensed against a prescription by trained nurses in the day unit. Whilst this eases the pressure on the dispensary, this shifts the workload onto the nursing staff and this has been noted as an issue for nurses in some units.

All units state that inefficient prescribing is adding to the pressure in the dispensary. This inefficiency is due to anti-emetics and other supportive medicines not always being removed from the prescription if they are no longer required by the patient. This results in these items being dispensed and then immediately being returned by the patient or taken home and not used, wasting resource in terms of staff time and financial medicines cost.

## 5. Gap Analysis and Issues

From initial capacity modelling, as described in section 4, and discussions with WoS Boards the following issues and gaps have been identified:

### 5.1 Out Patient Clinic Capacity

- Outpatient clinic format/organisation:
  - In a number of units pre-treatment assessment appointment slots are scattered throughout general clinics, and are not clearly identified by clinic templates.
  - This clinic format results in a number of logistical issues for SACT service delivery. These include: bottlenecks which create peaks in demand and patients waiting longer than necessary on the day of treatment.
  - Length of pre-treatment assessment outpatient clinic appointment slots varies across tumour types, units and by consultant. A realistic appointment length is crucial to ensure that clinics run effectively and all relevant activities are undertaken within the clinic itself.
  - There is significant variation in minimum and maximum weekly activity in many units, the effect of this is minimised in larger units.
- Variation in use of Non Medical Prescribing (NMP) workforce:
  - The use of nurse/pharmacy led clinics with qualified prescribers is not optimised across the region resulting in underutilisation of trained NMP.
  - Variation in the number of NMP across units and the number of nurse/ pharmacy led clinics in place.
  - Some nurse/pharmacy led clinics are utilised successfully across the Region to varying degrees, however it should be noted that the majority of these clinics do not run 52 weeks/year given there are no annual leave cover arrangements.

### 5.2 Nursing Capacity

- The majority of units have a deficit in trained nursing staff. Given the ongoing increases in demand demonstrated by the data, this is likely to increase.
- Chemotherapy support workers (CSW) are not included in the capacity modelling undertaken. Analysis of resource demonstrates that there is variation in the number and role of CSW across units.
- CSW could be better utilised to allow for nursing resource to be focussed on specialist nursing tasks.
- Patient facing tasks take precedence for nursing staff therefore protected time for senior staff to undertake supporting professional activity, e.g. CEL 30 (2012) audit, is lost at times of peak activity.
- Many senior nursing staff do not have agreed job plans in place detailing the split of the different aspects of their jobs, both patient facing and supporting professional activities.

### 5.3 Physical Capacity

- Additional chair time capacity is available across all units. This is largely due to the fact that unit opening hours are significantly different from scheduling hours, e.g. unit open 8am to 8pm

however treatments scheduled between 9am and 5pm. Many units are sharing facilities with non-cancer specialities causing additional challenges.

- Larger units have a greater ability to be flexible in scheduling thereby optimising chair utilisation.
- There is significant variation across the working week with peaks of activity Tuesday to Thursday.
- In order to optimise the use of physical resources staffing would require to be reviewed to ensure that appropriate medical, pharmacy and nursing cover is available to support safe delivery of treatment.
- Scheduling of SACT treatment is undertaken by various staff disciplines across Boards. In some units this task is undertaken by administrative staff (band 2), in others this role is taken on by senior nursing staff.

#### **5.4 Pharmacy Services**

- Several units have a deficit in clinical pharmacy resource at certain times. Given the ongoing increases in demand demonstrated by the data, this deficit is likely to increase.
- Further work needs to be done to review skill mix and determine if there is capacity that can be freed for prescription verification and pharmacist prescribing by utilising other pharmacy staff members for activities that do not need to be undertaken by a pharmacist.
- Clinical pharmacists do not have agreed job plans in place detailing the split of the different aspects of their jobs, both patient facing and supporting professional activities.
- Isolator capacity is currently sufficient across the region; however the age of certain isolators in all units, apart from the Victoria ACH and Forth Valley Royal Hospital, is such that a capacity problem may occur due to failure of existing equipment.
- A national approach to aseptic dispensing service delivery, including making best use of existing NHS Board facilities, is being taken forward as part of the shared services portfolio. Any local plans for development of aseptic services should align with this national approach.
- Issues with peaks in demand for aseptic services could be relieved by flattening workload at certain points in the day or week by reorganising outpatient clinics and subsequent treatment time scheduling. Minimising one stop appointments would also allow for better scheduling of workload and improve turnaround times.
- There is variation in uptake of pre-filled products. Factors such as cost, critical mass required to make use cost effective and storage capacity have been cited as reasons for not extending the range of prefills used.
- Increasing workload across all aspects of dispensing services is resulting in increased prescription waiting times for patients.
- Lack of review of routine supportive care medicines by prescribers was identified as an issue in some units. This results in inefficiencies with unnecessary dispensing and medicines wastage.

## 6. Conclusion

The work completed, to date, identifies a range of areas where improvements could be made within current resource. The majority of these improvements apply across all Boards and are not only applicable to one or two units. Whilst responsibility for progressing these improvements is the remit of individual Boards there is merit in retaining a regional approach to addressing these issues, where appropriate, adopting similar methodologies and in maintaining momentum.

Notably, however, even with an increase in efficiency across units and the accompanying optimisation of resource, in the context of current and on-going growth in SACT the recommendations and actions noted in section 7 will not be sufficient and further change and investment will be required to support safe and sustainable SACT services.

The outputs of Phase 1 of this work, when completed, will underpin the further redesign of services and enable more detailed modelling work to be undertaken to identify and quantify future resource requirements

## 7. Recommendations

### 7.1 Short Term

The following recommendations are made to optimise current resource by improving efficiency and consistency of SACT service delivery across WoSCAN. These recommendations are underpinned by detailed Board/Unit analysis that has been shared with Operational Managers and Clinical Leads.

- Review and redesign whole system patient flow, to maximise efficiency of the service and ease pressures by flattening out activity across the working week and optimising use of existing physical resource. This should include specifically:
  - outpatient clinic organisation and working practices;
  - pre-treatment blood testing procedures; and
  - maximising two stop model with scheduling of day case SACT.
- Review of skill mix to maximise existing nurse and pharmacy resource, including reviewing the utilisation of trained NMP. Thereby ensuring optimal use of specialist medical, nursing and pharmacy resource.
- Review current usage of pre-filled products across the Region and bring forward recommendations to maximise use to best support service delivery.

### 7.2 Medium Term

Utilising the outputs from Phase 1 the following recommendation and action is proposed:

- Model and cost future service delivery options, including for example the consolidation of existing units within Boards.

### **7.3 Planned Next Steps**

#### **7.3.1 Completion of Phase 1**

- Undertake medical capacity modelling for prescribing. Initial analysis demonstrates a potentially significant deficit in consultant resource for prescribing. This requires to be considered alongside wider work around workforce redesign; and
- Progress and implement actions identified above.

#### **7.3.2 Initiate Phase 2**

- Model the predicted demand for SACT, based on available horizon scanning projections, and assess the associated impact on service provision;
- Investigate and recommend alternative models of SACT delivery; and
- Quantify additional investment required to meet demand in the medium term.

The Regional Planning Group are asked to note the significant progress described in this interim report and support progressing the short and medium term recommendations and actions with direction and input from the Regional SACT Executive Steering Group. This will be supported by dedicated clinical resource aligned to the project.

Report prepared by:

Joanne Robinson, Lead Oncology Pharmacist, NHS Forth Valley  
Iona Scott, Quality and Service Improvement Manager, WoSCAN  
On behalf of Regional SACT Future Service Delivery Short Life Working Group



## Appendix 1: SACT Future Service Delivery SLWG Membership

Name	Title	Representing
Seamus Teahan	Clinical Lead for Cancer Services - Chair	NHS Forth Valley
Sharon Adamson	Director of Regional Planning	Regional Planning Group
Gail Caldwell	Director of Pharmacy / Chair -Regional SACT Executive Steering Group	Regional SACT Executive Steering Group
David Dodds	Clinical Director Specialist Oncology Services	NHS GGC
Rosalie Dunn (until January 2016)	Clinical Lead Primary Care Cancer Network	WoSCAN Primary Care Cancer Network
Katrina Farrell	Consultant Haematologist & SACT Lead Clinician	NHS Forth Valley
Maureen Grant	Lead Nurse Specialist Oncology Services	NHS GGC
Ans Khan	Associate Medical Director	NHS Lanarkshire
Mary Maclean	Regional Cancer Care Pharmacist	WoSCAN Pharmacy Group
Peter Maclean	Clinical Director Cancer Services	NHS Ayrshire and Arran
Melanie McColgan	General Manager Specialist Oncology Services & Clinical Haematology	NHS GGC
Alex McGuire	Assistant General Manager Cancer and Head & Neck Services	NHS Ayrshire and Arran
John Milne	Lead Pharmacist Oncology Services	NHS Lanarkshire
John Murphy	Consultant Haematologist & SACT Lead Clinician	NHS Lanarkshire
Ken O'Neill (from January 2016)	Clinical Lead Primary Care Cancer Network	WoSCAN Primary Care Cancer Network
Mary Orzel	Cancer and Ambulatory Services Service Manager	NHS Forth Valley
Judith Park	Director of Access	NHS Lanarkshire
Caroline Rennie	Cancer Nurse Consultant	WoSCAN Nurses Group
Joanne Robinson	Senior Pharmacist - Oncology	WoSCAN / Pharmacy
Iona Scott	Quality and Service Improvement Manager	WoSCAN
Evelyn Thomson	Regional Manager (Cancer)	WoSCAN

### Medical Subgroup Membership

Name	Title	Representing
Sophie Barrett	Consultant Oncologist	Breast Cancer Oncology Team
Carrie Featherstone	Consultant Oncologist	Lung Cancer Oncology Team
Hilary Glen	Consultant Oncologist	Urological Cancer Oncology Team
Alistair Hart	Consultant Haematologist	Haemato-oncology NHS GGC
Joanne Robinson	Senior Pharmacist - Oncology	WoSCAN / Pharmacy
Iona Scott	Quality and Service Improvement Manager	WoSCAN
Dawn Storey	Consultant Oncologist	Gastrointestinal Cancer Oncology Team
Ashita Waterston	Consultant Oncologist	Gastrointestinal Cancer Oncology Team
Jeff White	Consultant Oncologist & SACT Lead Clinician	NHS GGC

### Pharmacy Subgroup Membership (WoS Cancer Pharmacy Network)

Name	Title	Representing
Sarah Coulter	CEPAS Pharmacist	NHS Greater Glasgow and Clyde
Debi Dunn	Principal Pharmacist	NHS Ayrshire & Arran
Carla Forte	Lead Clinical Pharmacist Regional Services	NHS Greater Glasgow and Clyde
Fiona Maclean	Lead Clinical Pharmacist Regional Services	NHS Greater Glasgow and Clyde
Mary Maclean	Regional Cancer Care Pharmacist	WoSCAN Pharmacy Group
Karon McDowall	Lead Pharmacist - Paediatric Haematology and Oncology	NHS Greater Glasgow and Clyde
John Milne	Lead Pharmacist Oncology Services	NHS Lanarkshire
Joanne Robinson	Senior Pharmacist - Oncology	WoSCAN / Pharmacy
Iona Scott	Quality and Service Improvement Manager	WoSCAN
Gillian Wishart	Principal Pharmacist	NHS Ayrshire & Arran

## Nursing Subgroup Membership

Name	Title	Representing
Nicky Batty	Macmillan Practice Development Facilitator - Acute Cancer	NHS Ayrshire & Arran
Natasha Brown	Senior Charge Nurse	Victoria ACH
Val Browne	Senior Nurse (Chemotherapy)	Beatson WoS Cancer Centre
Fiona Galbraith	Chemotherapy Charge Nurse	NHS Forth Valley
Pamela Mackinnon	Senior Charge Nurse	Vale of Leven Hospital
Arlene Paterson	Chemotherapy Nurse	NHS Lanarkshire
Teresa Rennie	Macmillan Lead Haematology-Oncology Nurse	NHS Lanarkshire
Joanne Robinson	Senior Pharmacist - Oncology	WoSCAN / Pharmacy
Iona Scott	Quality and Service Improvement Manager	WoSCAN
Carol Stevenson	Senior Nurse (Chemotherapy)	Beatson WoS Cancer Centre

## Appendix 2: Current Service Provision

	Outpatient Clinics					Treatment Delivered (IV and/or oral)					Non Medical Prescribers		Scheduling Resource
	Breast	Lung	CRC	Haem	Uro	Breast	Lung	CRC	Haem	Uro	Nursing	Pharmacy	
<b>NHS Ayrshire &amp; Arran</b>													
Ayr Hospital	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	3	5	Admin staff with nurse guidance
Crosshouse Hospital	✓	✓	✓	✓	X	✓	✓	✓	✓	X	5	6	
<b>NHS Forth Valley</b>													
Forth Valley Royal Hospital	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5	3	Staff nurse
<b>NHS Lanarkshire</b>													
Hairmyres	✓	X	✓	✓	X	✓	✓	✓	✓	X	0	1	Staff nurse
Monklands	X	✓	✓	✓	X	✓	✓	✓	✓	X	0	0	
Wishaw General Hospital	✓	X	X	✓	X	✓	✓	X	✓	✓	0	2	
<b>NHS Greater Glasgow and Clyde</b>													
Beatson WoS Cancer Centre	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	9	Admin staff
Victoria ACH	✓	✓	✓	✓	✓	✓	✓	✓ <sup>O</sup>	✓	✓	6	2	Staff nurse
Inverclyde	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	1	Staff nurse
Vale of Leven	✓	✓	X	✓	X	✓	✓	X	✓	X	3	1	Staff nurse
Royal Alexandra Hospital	X	X	X	✓	X	X	X	X	✓	X	0	0	Staff nurse
Stobhill ACH	X	X	X	✓	X	X	X	X	✓ <sup>O</sup>	X	0	0	n/a
Glasgow Royal Infirmary	X	X	X	✓	X	X	X	X	✓ <sup>O</sup>	X	0	0	n/a

O = oral treatments only

CRC = Colorectal Cancer

Uro = Urological Cancer (Prostate and Bladder Cancers Only)