

<b>Title:</b>	Measurement of Systemic Anti-Cancer Therapy (SACT) workload		
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Date	Version	Author	Comments
January 2010	1.0	F Green	Final version issued
29 <sup>th</sup> September 2010	1.1	F Green	Minor changes – docetaxel new presentation
15 <sup>th</sup> March 2011	1.2	F Green	Minor change – removed band 4 option from bolus cyclophosphamide dose
7 <sup>th</sup> September 2011	1.3	F Green	Addition of bendamustine
30 <sup>th</sup> August 2013	1.4		Bands for oral agents individually specified. Agreed by NICaN Pharmacy group
April 2017	2.0	F Green	Review and update of oral SACT section agreed at NICaN meeting
September 2017	2.1	F Green	Lenalidomide amended, Lenvatinib added Eribulin added. Because of increased quality assurance requirements (quarantine/disposal) of commercially produced dose banded syringes/infusion the band is increased to 2.
January 2018	2.2	F Green	Clofarabine, mifamurtide, pegasparginase, pertuzumab, ramucirumide, afatinib, nintedanib, palbociclib and ribociclib added.

## **Measurement of SACT Workload**

### **Produced on behalf of the NICaN Pharmacy group**

#### **Introduction**

In early 1998, an inter Trust working group (chaired by Mrs M Waddell) was established by the Regional Medical Services Consortium (RMSC). In March 1999 it published its report in which it had developed a common unit of measurement for aseptic chemotherapy workload.

A unit of issue was defined as “any individually dispensed item.” A dose would consist of one or more units of issue. Each unit of issue would be assigned a pre-defined band. The numerical value of the band increased with the increased complexity of the unit of issue.

In April 2003, a further report “Pharmacy Resources for Oncology” was produced by the RMSC working group. In this report the G6 Oncology/Haematology Pharmacists subgroup had revised and updated the banding definitions.

In addition, in order to give a composite measure of workload which takes into account both complexity and the number of doses prepared, banding was taken a step further to give “units of work”.

The chemotherapy complexity band definitions below have been further developed to be reflective of current practices.

## SACT Complexity Band Definitions

### Band 1

**1.1 The unit of issue is provided as a liquid in a single ampoule, vial or multi dose bag.**

e.g. Methotrexate 50mg in 2ml or ready-to-use subcutaneous monoclonal antibody preparations.

### Band 2

**2.1 The unit of issue is provided as a liquid in a single ampoule or vial and required further dilution before administration.**

**2.2 The unit of issue is provided as a liquid in more than one ampoule or vial.**

Withdraw the liquid from the ampoules or vials into a syringe for bolus administration  
e.g. Doxorubicin 80mg in 40ml (from 25ml vials)

**2.3 The unit of issue is provided as a readily soluble powder for reconstitution, in a single ampoule or vial and withdrawn into a syringe for bolus administration.**

e.g. Bleomycin 15,000units in 5ml sodium chloride 0.9%

**2.4 The unit of issue is provided as a ready-to-administer injectable product.**

e.g. Dose banded syringe/infusion or ready prepared infusor. This will include pre prepared monoclonal antibody infusions or bolus injection.

### Band 3

**3.1 The unit of issue is provided as a liquid in more than one ampoule or vial and requires further dilution before administration.**

e.g. Carboplatin 650mg in 500ml 5% glucose

**3.2 The unit of issue consists of two drugs to be provided in a single infusion where each is supplied as a liquid in a single ampoule or vial.**

e.g. Doxorubicin 15mg in 7.5mls and vincristine 0.4mg in 0.4ml added to 1000ml 5% glucose

**3.3 The unit of issue is provided as a powder/concentrate for reconstitution in a single ampoule or vial and requires further dilution before infusion.**

e.g. Fludarabine 50mg reconstituted with 2ml water for injection and added to 50ml sodium chloride 0.9%

**3.4 The unit of issue is provided as a readily soluble powder for reconstitution in more than one ampoule or vial.**

e.g. Bleomycin 30,000units in 10ml sodium chloride 0.9%

**3.5 The unit of issue is provided as a slowly dissolving powder for reconstitution in a single ampoule or vial.**

e.g. Cyclophosphamide 500mg in 25ml

**Band 4**

**4.1 The unit of issue is provided as a slowly dissolving powder for reconstitution in more than one ampoule or vial.**

e.g. Cyclophosphamide 1200mg in 60mls

**4.2 The unit of issue consists of two drugs to be provided in a single infusion where each is supplied as a liquid in more than one ampoule or vial.**

e.g. Ifosfamide 1.2grams/m<sup>2</sup> with mesna 1.2grams/m<sup>2</sup> in 1000ml sodium chloride 0.9%

**4.3 The unit of issue is provided as a powder for reconstitution in more than one ampoule or vial and requires further dilution before infusion.**

e.g. Bleomycin 30,000iu in 100mls sodium chloride 0.9%

**4.4 The unit of issue is provided as a powder for reconstitution in a single ampoule or vial requiring more than one diluent to be added in sequence before further dilution prior to administration.**

e.g. Carmustine <math>\leq 100\text{mg}</math> in 500mls sodium chloride 0.9%

**4.5 The unit of issue consists of two drugs to be provided in a single infusion where one, or both is, supplied as a powder for reconstitution in single ampoules or vials.**

e.g. Cyclophosphamide/mesna infusion

## **Band 5**

**5.1 The unit of issue is provided as a concentrate which requires a minimum stand time after initial dilution and which requires further dilution before administration.**

e.g. Docetaxel infusion

**5.2 The unit of issue consists of two drugs to be provided in a single infusion where one, or both are, supplied as a powder for reconstitution in more than one ampoule or vial.**

e.g. Ifosfamide 2grams / Mesna 2grammes in 1000mls sodium chloride 0.9%

## **Band 6**

**6.1 All extemporaneously prepared monoclonal antibodies infusions/injections.**

e.g. Trastuzumab infusion

**6.2 All infusor devices which are prepared in aseptic pharmacy facilities.**

**6.3 Any bolus or infusion that requires isolator gloves to be changed after preparation.**

e.g. Amsacrine infusion

**6.4 Any preparation involving the use of blood products.**

e.g. Interleukin – 2 and human serum albumin infusion

**6.5 The unit of issue is provided as 2 or more vials, as a concentrate after initial dilution and which requires further dilution before administration.**

e.g. Carmustine infusion

**6.6 Any infusion where the dose is removed from 10 or more vials, and aseptically added to an empty PVC infusion bag of an empty ethyl vinyl acetate (EVA) infusion bag or glass container.**

e.g. Nelarabine infusion

**6.7 The unit of issue is provided as a viscous liquid in 5 or more vials, which has to be further diluted in an infusion bottle or bag.**

e.g. high dose paclitaxel infusion. A dose of paclitaxel 180mg or less is a band 4. Any paclitaxel dose exceeding 180mg is a band 6 regardless of number of vials used.

Band 6 is the maximum band that can be attributed to a preparation.

**Note: Volume withdrawal from infusion bags**

If a volume needs to be withdrawn from an infusion bag to facilitate the addition of the chemotherapy drug, this is an additional manipulation and the complexity band assigned should be increased as follows:

- If the volume withdrawn is less than or equal to 50mls, then the assigned band should be increased by 1.
- If the volume withdrawn is greater than or equal to 50mls, then the assigned band should be increased by 2.

**Risk sharing schemes / Patient access schemes**

If a 'risk sharing scheme/ Patient access scheme' applies to an infusion or bolus chemotherapy dose the allotted band will be increased by 1.

**Notes:**

The above band definitions are used to report workload at an individual Trust level and regionally through the "Regional Usage of Pharmacy Supplies" reporting mechanism. The Cancer Centre and the Cancer Units report all the aseptic chemotherapy, monoclonal and biologic therapies dispensed for oncology and haematology patients.

The cancer units (excluding BCH) also include the aseptic dispensing of calcium folinate infusions. Altnagelvin also attach the giving set to all infusions and prime the line, under aseptic conditions but for purposes of consistency reporting will not reflect this in the banding reported. Craigavon Area Hospital and the Ulster hospital include mesna infusions in their reporting.

## SACT Complexity bands for individual units of issue

The table below gives details of regionally agreed complexity bands for individual units of issue. It is anticipated that any new regimens or treatments that are commissioned will have complexity bands assigned and agreed through the NiCaN Pharmacy group. The bands assigned in the table are the bands agreed before adjustment is made for volume withdrawal from infusion bags.

DRUG	ROUTE	REGIONALLY AGREED BAND	COMMENTS
Alemtuzumab	Bolus	6	
Alemtuzumab	Infusion	6	
Amsacrine	Infusion	6	
Arsenic trioxide	Infusion	4	
Azacitidine	Bolus	2	
Azacitidine (Paeds)	Infusion	3	
Bendamustine	Infusion	5	
Bevacizumab	Infusion	6	
Bleomycin	Bolus	2/3	<15,000 units is a band 2, >15,000 units is a band 3.
Bleomycin	Infusion	3/4	<15,000 units is a band 3, >15,000 units is a band 4.
Blinatumomab	Infusion	6	
Bortezomib	Bolus	2	
Brentuximab	Infusion	6	
Busulfan	Infusion	6	
Cabazitaxel	Infusion	5	<p>Purchase must in accordance with the 'commercial access scheme' to avail of the discount &amp; comply with NICE TA 391 Sanofi facilitates the supply of cabazitaxel in 2 ways:</p> <ul style="list-style-type: none"> <li>-In a pre-prepared (compounded) intravenous infusion bag containing the number of milligrams needed for each individual patient (see sections <a href="#">3.20</a> and <a href="#">5.4</a>). This aspect of the arrangement was agreed before the guidance was published.</li> <li>-In vials, at a reduced price with a discount reflecting the average cost of waste per patient from part-used vials (this discount is in addition to the patient access scheme). The company will provide a rebate to NHS England equivalent to the cost of compounding per patient. The arrangement for supplying cabazitaxel in vials was agreed in August 2016, after guidance publication</li> </ul>

DRUG	ROUTE	REGIONALLY AGREED BAND	COMMENTS
Calcium folinate	Bolus	1/2	1 vial is a band 1, 2 vials is a band 2.
Calcium folinate	Infusion	2/3	Dependant on number of vials used.
Carboplatin	Infusion	2/3/4	Dependant on number of vials used.
Carfilzomib	Infusion	5	
Carmustine	Infusion	4/6	High dose Carmustine (350mg/m <sup>2</sup> ) is a band 6
Cetuximab	Infusion	6	
Cetuximab	Infusion	6	
Chlormethine (Mustine)	Bolus	2/3	
Cisplatin	Infusion	2/3/4	
Cladribine	Subcutaneous	1	
Cladribine	Infusion	2/3	
Clofarabine	Infusion	4	Intense stock management
Cyclophosphamide	Bolus	1/2/3/4	Band 1 if multi dose bags are used, band 2 if ready-to-administer dose banded product, band 3/4 if vials are used. Selection of multi dose bag or vials will depend on work schedule.
Cyclophosphamide	Infusion	2/3/4	Band 2 if multi dose bags are used, band 3/4 if vials are used. Selection of multi dose bag or vials will depend on work schedule
Cytarabine	Bolus	1/2	
Cytarabine	Infusion	2/3	
Dacarbazine	Infusion	3/4	
Dactinomycin	Bolus	3	
Daunorubicin	Bolus	4	
Daunorubicin	Infusion	5	
Daunorubicin liposomal	Infusion	4	
Daratumumab	Infusion	6	
Dexrazoxane infusion	Infusion	4	
Docetaxel	Infusion	2/3	Doses>80mg from 80mg vial = band 3 Doses<80mg from 80mg vial = band 2 Doses>160mg from 160mg vial = band 3 Doses< 160mg from 160mg vial = band 2
Doxorubicin	Bolus	1/2	Band 2 if ready-to-administer dose banded product
Doxorubicin	Infusion	3	
Doxorubicin liposomal	Infusion	3	
Epirubicin	Bolus	1/2	Band 2 if ready-to-administer dose banded product
Epirubicin	Infusion	2/3	



DRUG	ROUTE	REGIONALLY AGREED BAND	COMMENTS
Eribulin	Infusion	3	
Etoposide	Infusion	3	
Etoposide Phosphate	Bolus	2/3	
Etoposide Phosphate	Infusion	3/4	
Fludarabine	Infusion	3/4	
Fluorouracil	Bolus	1/2	Band 2 if ready-to-administer dose banded product
Fluorouracil	Infusion	2/3	
Fluorouracil	Pre-made infusor	1	
Fluorouracil	Infusor	6	
Gemcitabine	Infusion	3/4	
Gemcitabine	Pre-made infusion	1	
Gemtuzumab ozagamicin	Infusion	6	
Idarubicin	Bolus	2	
Ifosfamide	Infusion	2/3	Band 2 if using multi dose bag
Ifosfamide + mesna	Infusion	5	
Interleukin-2	Bolus	2	
Interleukin-2	Infusion	6	Multiple components
Ipilimumab	Infusion	6	
Irinotecan	Infusion	2/3	
Melphalan	Bolus	5	
Melphalan	Infusion	6	
Mesna	Bolus	1/2	
Mesna	Infusion	2/3	
Methotrexate	Bolus	1/2	Band 2 if ready-to-administer dose banded product
Methotrexate	Infusion	2/3	
Methotrexate	Intrathecal	1	
Mifamurtide	Infusion	6	Intensive stock management
Mitomycin	Bolus	2/3	
Mitomycin	Infusion	3	
Mitoxantrone	Infusion	2/3	
Nab-paclitaxel	Infusion	5	
Nelarabine	Infusion	6	
Nivolumab	Infusion	6	
Obinutuzumab	Infusion	6	
Ofatumumab	Infusion	6	
Oxaliplatin	Infusion	2/3	
Paclitaxel	Infusion	2/3/4/6	

DRUG	ROUTE	REGIONALLY AGREED BAND	COMMENTS
Panitumumab	Infusion	6	
Pembrolizumab	Infusion	6	
Pemetrexed	Infusion	3/4	
Pentostatin	Infusion	2/3	
Pegaspargase	Intramuscular/infusion	1	
Pertuzumab	Infusion	6	
Pixantrone	Infusion	4	
Ramucirumab	Infusion	6	
Rituximab	Infusion	6	
Rituxumab	subcutaneous	1	
Streptozocin	Infusion	2/3	
Thiotepa	Infusion	3	
Topotecan	Infusion	3	
Trabectedin	Infusion	4	
Trastuzumab	Infusion	6	
Trastuzumab	subcutaneous	1	
Trastuzumab emtansine	Infusion	6	
Vinblastine	Infusion	2/3	
Vinblastine (Paeds)	Bolus	1/2	
Vinblastine in sodium chloride 0.9% (Paeds)_	Bolus	3	
Vincristine	Infusion	2/3	
Vincristine (Paeds)	Bolus	1/2	
Vincristine in sodium chloride 0.9% (Paeds)_	Bolus	3	
Vincristine + Doxorubicin	Infusor	6	
Vindesine	Infusion	2/3	
Vinorelbine	Infusion	2/3	

## Band Work Units

<b>Band</b>	<b>Number of work units</b>
Band 1	One
Band 2	Two
Band 3	Three
Band 4	Four
Band 5	Five
Band 6	Six
Oral SACT– Band 1	One
Oral SACT– Band 2	Two
Oral SACT - Band 3	Three

In order to give a composite measure of workload which takes into account both complexity and the number of doses drawn up, banding was taken a step further to give “units of work” as detailed in the table above.

## **Oral SACT**

In the 'Pharmacy resources for Oncology April 2003' report, oral anti-cancer medicines were assigned 0.5 'work units'. It is the opinion of the NICaN Pharmacy group that 0.5 work units is not reflective of the work involved in dispensing oral SACT. The group proposes that oral SACT be assigned an appropriate band as follows:

- All oral SACT would be assigned band 1 unless an extra administrative step is required (e.g. Thalidomide).
- If two different strengths of an oral anti-cancer medicine are dispensed to supply the prescribed dose, then this will be counted as two band 1 items i.e. two units of work or two band 2 items i.e. four units of work.
- If a 'risk sharing scheme/patient access scheme (other than a straight discount)' applies to an oral anti-cancer medicine the allotted band will be increased by 1.
- If the oral SACT is an unlicensed medicine the allotted band will be increased by 1.
- If intensive stock management is required the allotted band will be increased by 1
- The NICaN Pharmacy group has agreed the following bands for specific oral anti-cancer agents.

It is proposed as new oral anti-cancer medicines are approved and funded for use within the Network that the NICaN Pharmacy group would agree and assign a complexity band.

Drug	Regionally Agreed Band	Comments
Abiraterone	1	
Afatinib	2	Intensive stock management required
Anagrelide	1	
Axitinib	2	Intensive stock management required
Bexarotene	1	
Bosutinib	2	Intensive stock management required
Busulfan	1	
Cabozantinib	2	Intensive stock management required
Capecitabine	1	If a patient is dispensed both strengths this will count as 2 x band 1.
Ceritinib	2	Intensive stock management required
Chlorambucil	1	
Crizotinib	2	Intensive stock management required
Cyclophosphamide	1	
Dabrafenib	1	
Dasatinib	1	
Erlotinib	1	
Estramustine	1	
Etoposide	1	
Everolimus	2	Intensive stock management required
Enzalutamide	1	
Fludarabine	1	
Gefitinib	2	Band 2 every cycle.
Hydroxycarbamide	1	
Ibrutinib	2	Intensive stock management required
Idelalisib	2	Intensive stock management required
Idarubicin	1	
Imatinib	1	
Ixazomib	3	Extra administrative step = EAMS Intensive stock management Unlicensed medicine
Lapatinib	1	
Lenalidomide	2/3	Cycle 1 to 26 inclusive = band 2 Oral + PPP = Band 2 Cycle 27 upwards = band 3 Oral +PAS + PPP =3
Lenvatinib	2	Intensive stock management required
Lomustine	1	
Lonsurf® (trifluridine/tipiracil)	2	Intensive stock management required
Melphalan	1	
Mercaptopurine	1	
Methotrexate	1	

Drug	Regionally Agreed Band	Comments
Mitotane	1	
Nintedanib	2	Intensive stock management required
Nilotinib	1	
Nintedanib	2	Intensive stock management required
Olaparib	2	Intensive stock management required
Panobinostat	2	Intensive stock management required
Palbociclib	1	
Pazopanib	2	Intensive stock management required
Pomalidomide	3	Oral +PAS + PPP =3
Ponatinib	2	Intensive stock management required
Procarbazine	1	
Ribociclib	1	
Regorafenib	2	Intensive stock management required
Ruxolitinib	2	Intensive stock management required
Sorafenib	1	
Sunitinib	1/2	Cycle 1 = band 2; Claim back cost of 1 <sup>st</sup> cycle Cycle 2 = band 1
Thalidomide	2	
Tegafur/uracil	1	
Temozolomide	1	
Thioguanine	1	
Trametinib	1	
Treosulphan	1	
Tretinoin	1	
Topotecan	1	
Vemurafenib	2	Intensive stock management required
Venetoclax	2	Intensive stock management required
Vinorelbine	1	

### References:

Pharmaceutical resources for Oncology. April 2003

Standardising the measurement of chemotherapy workload.

<http://hpssweb.n-i.uk/niccpharmacy/index.htm>

NPSA Rapid Response Report 'Risks of incorrect dosing of oral anti-cancer medicines (Reference:

NPSA/2008/RRR001 – issued on January 2008)