

10.13 Costs used in the York model

Each of the industry models presents different resource use assumptions and unit costs which are used to cost drug treatment and administration and monitoring of patients. Different assumptions are used regarding the dosing of drugs and resource use for administration and monitoring (see Section 6.3). The current York model sought to generate appropriate costs for each of the treatment options using clinical advice and BSR guidelines to determine the resource use associated with administering drugs and monitoring patients. These items are valued using recently published unit costs and prices. The following sections describe the assumptions made in costing, the associated resource use assumptions, unit costs and cost inputs for the decision model.

Resource use

The current York model assumes that infliximab vials cannot be shared and adopts separate scenarios regarding the use of 3 or 4 vials per patient. Infliximab is given at 0, 2 and 6 weeks followed by every 8 weeks (1.65 every 3-months). Six and a half vials of adalimumab are given in every 3-month cycle. Twenty six vials of etanercept are given in every 3-month cycle. These assumptions were made in consultation with an expert pharmacist (personal communication Carolyn Davies).

The York model also assumes a ½ day in-patient hospital cost for each infusion of infliximab. A single outpatient (OP) visit is assumed for etanercept and adalimumab in the initial 3-month period, followed by a review visit between 3 and 6 months and every 6 months thereafter.

In the York model it is assumed that, at baseline (in the initial 3-month period), patients will require a Full Blood Count (FBC), Erythrocyte Sedimentation Rate (ESR), Liver Function Test (LFT), Urea and Electrolytes (U&E), chest X-Ray, Tuberculosis (TB) Heaf test, antinuclear antibody (ANA) and a double-stranded (ds) DNA test. All of these resource use assumptions are taken from the previous York model following the BSR guidelines for the use of biologics.

The resource use assumed as part of drug use, administration and monitoring for the various treatment options are shown in Table 10.13.1. All resource use was validated by clinical input.

Table 10.13.1: Resource use associated with drug administration and monitoring

0-3 months	Drugs		Administration		Monitoring							
	Vials per visit	Doses	OP visit	Infusion cost	FBC	ESR	LFT	U&E	Chest X Ray	TB HEAF test	ANA	ds DNA
Etanercept	1	26	1	0	2	2	2	2	1	1	1	1
Adalimumab	1	6.5	1	0	2	2	2	2	1	1	1	1
Infliximab (4 vials)	4	3	0	3	2	2	2	2	1	1	1	1
Infliximab (3 vials)	3	3	0	3	2	2	2	2	1	1	1	1
3-6 months	Drugs		Administration		Monitoring							
	Vials per visit	Doses	OP visit	Infusion cost	FBC	ESR	LFT	U&E	Chest X Ray	TB HEAF test	ANA	ds DNA
Etanercept	1	26	1	0	0.5	0.5	0.5	0.5	0	0	0	0
Adalimumab	1	6.5	1	0	0.5	0.5	0.5	0.5	0	0	0	0
Infliximab (4 vials)	4	1.625	0	1.625	0.5	0.5	0.5	0.5	0	0	0	0
Infliximab (3 vials)	3	1.625	0	1.625	0.5	0.5	0.5	0.5	0	0	0	0
6 months + (3-monthly)	Drugs		Administration		Monitoring							
	Vials per visit	Doses	OP visit	Infusion cost	FBC	ESR	LFT	U&E	Chest X Ray	TB HEAF test	ANA	ds DNA
Etanercept	1	26	0.5	0	0.5	0.5	0.5	0.5	0	0	0	0
Adalimumab	1	6.5	0.5	0	0.5	0.5	0.5	0.5	0	0	0	0
Infliximab (4 vials)	4	1.625	0	1.625	0.5	0.5	0.5	0.5	0	0	0	0
Infliximab (3 vials)	3	1.625	0	1.625	0.5	0.5	0.5	0.5	0	0	0	0

* assuming no vial sharing, 5mg/kg and patient weight of 70-80kg ** assuming no vial sharing, 5mg/kg and patient weight of 60kg

Unit costs

All drug costs were taken from the recent version of the BNF¹⁷⁸. The costs of inpatient hospital visits were taken from the 2007/2008 NHS reference costs²³¹ and is for an elective excess bed day for inflammatory Spine, Joint or Connective Tissue Disorders without complications. An in-patient day is assigned a cost of £144 per ½ day. The cost of an outpatient visit is also taken from NHS reference costs and is for a follow up visit in rheumatology. Each outpatient visit costs £116. Costs associated with laboratory tests relating to the monitoring of patents, were taken from the previous York model¹⁷² updated to reflect 2009 prices. All unit costs used in the current York model are shown below in Table 10.13.2.

Table 10.13.2: Unit costs used in the York model

	£(2009)	Source
Drugs		
Infliximab (100mg vial)	419.62	BNF 58
Etanercept (25mg syringe)	89.38	BNF 58
Adalimumab (40mg syringe)	357.5	BNF 58
Hospital costs		
½ Inpatient day	£144	NHS reference costs 2007/2008 – elective inpatient excess bed day for inflammatory Spine, Joint or Connective Tissue Disorders without complications
Outpatient rheumatology, first attendance	£205	NHS reference costs 2007/2008 - Rheumatology outpatient first attendance
Outpatient rheumatology, follow-up attendance	£116	NHS reference costs 2007/2008- Rheumatology outpatient follow up
Laboratory tests		
Full Blood Count (FBC)	£2.74	York NHS Trust – 2005 costs updated to 2009
Erythrocyte Sedimentation Rate (ESR)	£2.71	
Liver Function Test (LFT)	£0.69	
Urea and Electrolytes (U&E)	£1.27	
Chest-X ray	£24.04	
TB Heaf test	£8.01	NHS Reference costs 2003 updated to 2009
Antinuclear antibodies (ANA)	£4.27	York NHS Trust – 2005 costs updated to 2009
DNA binding (ds DNA)	£4.27	

Costs used in the current York model

The resource use items presented in Table 1 were multiplied by the unit costs in Table 2 to generate cost inputs for the decision model. Costs were calculated for the initial 3-month period, 3-6 month period and all subsequent 3-month periods. These costs are presented below in Table 10.13.3.

Table 10.13.3: Costs used in the York model

0-3 months	<i>Drugs</i>	<i>Administration</i>	<i>Monitoring</i>	<i>Total</i>
Etanercept	2323.88	116.00	55.43	2495.31
Adalimumab	2323.75	116.00	55.43	2495.18
Infliximab (4 vials)	5035.44	432.00	55.43	5522.87
Infliximab (3 vials)	3776.58	432.00	55.43	4264.01
3-6 months				
	<i>Drugs</i>	<i>Administration</i>	<i>Monitoring</i>	<i>Total</i>
Etanercept	2323.88	116.00	3.71	2443.59
Adalimumab	2323.75	116.00	3.71	2443.46
Infliximab (4 vials)	2727.53	234.00	3.71	2965.24
Infliximab (3 vials)	2045.65	234.00	3.71	2283.36
6 months +				
	<i>Drugs</i>	<i>Administration</i>	<i>Monitoring</i>	<i>Total</i>
Etanercept	2323.88	58.00	3.71	2385.59
Adalimumab	2323.75	58.00	3.71	2385.46
Infliximab (4 vials)	2727.53	234.00	3.71	2965.24
Infliximab (3 vials)	2045.65	234.00	3.71	2283.36