Royal College of Physicians

Setting higher standards

The UK inflammatory bowel disease audit: interim report of the biological therapy audit

June 2012

Interim national report

Prepared by the UK IBD Audit Steering Group on behalf of:

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Section 1: Executive summary

Background

The purpose of this audit is to measure the efficacy, safety and appropriate use of biologics therapies (Infliximab and Adalimumab) in patients with inflammatory bowel disease in the UK. This is an interim data quality report for the IBD community and Chief Executives of Health Boards and Trusts throughout the UK to inform of the ongoing progress and development of the biologics audit along with a view of engagement to date. The audit opened for data entry on Monday 12 September 2011 and these interim findings are based on data that have been submitted to the audit up to and including 29 February 2012, providing a 6 month snapshot of data entry and progress report. Data contained within this interim report has been reported from locked submissions only. This report outlines the processes through which the biologics audit has been and continues to be developed through feedback obtained from the IBD community.

The aims of the biologics audit at its onset were to assess nationally:

- the appropriate use/prescribing of biological therapies (Adalimumab and Infliximab)
- the efficacy of biological therapies
- the safety of biological therapies
- patients views on their quality of life at defined intervals throughout their use of biological drug therapies

The aims of this report are to:

- outline the process through which the biologics audit has been and continues to be developed
- provide a status report on participation and engagement as at 29 February 2012
- encourage further participation through engagement with the IBD community
- share information on the updated capabilities and functionality available on the biologics audit web tool
- provide feedback of national averages for all data items from cases entered by 29 February 2012

Participation in the biologics audit provides local IBD teams with the means to meet Standard A6 of the IBD Standards [1]Quality Care: Service Standards for the People that have IBD (arrangements for use of immunosuppressive and biological therapies) which state that 'outcomes of biological therapy and the patients receiving biological therapy should be reviewed regularly' and 'local practice of both immunomodulator and biological therapy should be audited'. Teams are also provided with the opportunity, through participation in this audit to fulfil the National Institute of Health and Clinical Excellence (NICE) technology appraisal guidance on anti-TNFα treatment for Crohn's disease[2] for establishing a biologics register.

Capabilities of the biologics audit

The biologics audit system was designed to be a full record of patients receiving biological therapies. It is easy to use and has the potential for local IBD teams to:

- Monitor the disease activity of patients over the course of their biological treatment
- Monitor at both a patient and service level, data on adverse events, dose escalation and treatment regimes
- Capture the views of the local patients on their quality of life at defined intervals throughout their treatment with biological therapy
- Make real time comparisons between local and national level data
- Set up prompts, for example for a 12 month review of treatment in line with best practice recommendations

[1] IBD Standards Group. *Quality Care Service standards for the healthcare of people who have Inflammatory Bowel Disease (ibd).* IBD Standards Group, 2009 [http://www.ibdstandards.org.uk/uploaded_files/IBDstandards.pdf accessed 2 April 2012]

[2] National Institute for Health and Clinical Excellence. *TA187 Crohn's disease - Infliximab (review) and Adalimumab (review of TA40): guidance.* London: NICE. 2011

- Generate individual patient summaries
- Generate letters to general practitioners detailing treatment plans

Overall summary

The evidence to date suggests that the vast majority of biological therapy is being used in accordance with NICE recommendations. Efficacy is very good and safety appears excellent although the numbers of patients are relatively low and further ongoing prospective data collection is required to assess longer-term outcomes.

As at 29 February 2012 there were 853 individual patient demographics submissions entered to the web tool, these data have been entered by a total of 94 adult and 15 paediatric sites.
There were 104 locked IBD disease details submissions; 204 locked initial treatment submissions (151 Infliximab and 53 Adalimumab); 229 locked follow up treatment submissions (195 Infliximab and 34 Adalimumab); and details of 335 IBD related surgical procedures.

Actions

- Health departments in England, Northern Ireland, Scotland and Wales must support future rounds of the UK IBD audit to ensure that quality improvement in IBD care is continued
    - In particular, support for the ongoing biologics audit to ensure the capture of long-term data on the safety and efficacy of these therapies, as well as patient reported outcome measures to compliment other clinical data
- All NHS Trusts/Health Boards should review their local audit results in relation to the recognised standards and guidelines and take any necessary action to continue improving their IBD Service
    - Sites are able to produce their own 'site level reports' in real time via the biologics audit web tool. Exports of raw data entered to the system in Excel format can also be downloaded when required for local review
- Eligible but non-participating sites should contact the UK IBD Audit team to enrol in the biologics audit and seek support to begin data collection
- The UK IBD audit team will encourage sites to continue to collect these data for all relevant IBD patients and will engage in discussion with those sites that have yet to enter data to understand any specific issues which they may be facing

Key results

Please note that the data provided below are extracted from the full national audit data tables available in Appendix 1 of this interim report. This data should be reviewed in light of the number of overall cases entered to the web tool at the time of export and used with caution when interpreting findings, it is provided only as an early insight into current trends within the national averages reported to date.

Table 1: Key results by disease type (ulcerative colitis, Crohn's disease and IBD type unspecified)

The key results detailed below in Table 1 show national data by disease type for those patients newly-started on biological therapy (Infliximab or Adalimumab) in the treatment of their IBD.

Table 1

Crohn's disease		
	Infliximab	Adalimumab
Number of patients newly started on biological therapy	90	39
Indication for treatment		
Severe perianal Crohn's disease	21 (23%)	3 (8%)
Active luminal Crohn's disease	65 (72%)	36 (92%)
Other/Not known	4 (4%)	0 (%)
Median (IQR) disease activity score at initial infusion	HBI 5 (0, 8) (N=38) PCDAI 20 (5, 35) (N=11)	HBI 4 (0, 10) (N=23) PCDAI NA
Median (IQR) disease activity score at follow up infusion	HBI 0 (0, 3) (N=90) PCDAI 0 (0, 0) (N=11)	HBI 5 (2, 6) (N=22) PCDAI NA
Acute infusion/injection reactions at initial infusion	2 (2%)	0 (0%)
Acute infusion/injection reactions at follow up infusion	3 (2%)	1 (4%)
Ulcerative colitis		
	Infliximab	Adalimumab
Number of patients newly started on biological therapy	8	0
Indication for treatment		
Acute severe ulcerative colitis	4 (50%)	0
Chronic refractory ulcerative colitis	4 (50%)	0
Median (IQR) disease activity score at initial infusion:	SCCAI 6 (3, 9) (N=2) PUCAI 45 (45, 45) (N=1)	NA
Median (IQR) disease activity score at follow up infusion:	SCCAI 7 (4, 7) (N=2) PUCAI 0 (0, 0) (N=2)	NA
Acute infusion/injection reactions at initial infusion	0 (0%)	NA
Acute infusion/injection reactions at follow up infusion	0 (0%)	NA
IBD type unspecified		
	Infliximab	Adalimumab
Number of patients newly started on biological therapy	5	5
Indication for treatment		
Acute severe IBD type unspecified	3 (60%)	3 (60%)
Chronic refractory IBD type unspecified	2 (40%)	2 (40%)
Median (IQR) disease activity score at initial infusion:	SCCAI 10 (8, 12) (N=2) PUCAI NA	SCCAI 7 (7, 7) (N=1) PUCAI NA
Median (IQR) disease activity score at follow up infusion:	SCCAI 6 (6, 6) (N=1) PUCAI NA	SCCAI NA PUCAI NA
Acute infusion/injection reactions at initial infusion	0 (0%)	0 (0%)
Acute infusion/injection reactions at follow up infusion	0 (0%)	0 (0%)

Table 2: Key results by treatment type (Infliximab and Adalimumab)

The key results detailed in table 2 show national level data by treatment type for those patients of all disease types (ulcerative colitis, Crohn's disease or IBD type unspecified)

Table 2			
Infliximab			
	CD	UC	IBD-U
Was informed consent taken prior to initiating therapy?	84/90 (93%)	7/8 (88%)	5/5 (100%)
Was there a delay in starting therapy? etc	44/90 (49%)	3/8 (37.5%)	4/5 (80%)
Were the any acute infusion reactions at initiation	2/90 (2%)	0/8 (0%)	0/5 (0%)
Were any concomitant therapies being prescribed at initiation	76/90 (84%)	6/8 (75%)	5/5 (100%)
Number of patients being prescribed 5ASA as a concomitant therapy at initiation	25/76 (33%)	4/6 (67%)	3/5 (60%)
Were there any adverse events recorded at follow up	10/127 (8%)	1/9 (11%)	0/4 (0%)
Was infection recorded as an adverse event at follow up	2/10 (20%)	1/1 (100%)	NA
Adalimumab			
	CD	UC	IBD-U
Was informed consent taken prior to initiating therapy	35/39 (90%)	NA	5/5 (100%)
Were any concomitant therapies being prescribed at initiation	28/39 (72%)	NA	4/5 (80%)
Number of patients being prescribed Azathioprine as a concomitant therapy	18/28 (64%)	NA	1/4 (25%)
Were there any adverse events recorded at follow up	2/27 (7%)	NA	0/5 (0%)
Was compliance with treatment confirmed by the patient	25/27 (93%)	NA	3/5 (60%)

Key findings

1. The steadily increasing number of sites engaging with the biologics audit is very encouraging
2. There remains significant progress to be made in terms of participation from all relevant teams
3. Improvements in the functionality of the web tool used to collect the data has had, and is expected to continue to have, a very positive effect on participation
4. The development of further reporting functionality alongside costing models for the provision of biological therapies will be of great benefit to participating sites and their commissioners
5. The biologics audit is the primary method for collecting national long-term data on the efficacy, safety and appropriateness of the use of biologics in the UK
6. Efficacy of the medications looks very encouraging at this early stage
7. Both drugs are being prescribed in line with NICE recommendations
8. Use in ulcerative colitis patients remains low
9. The medications appear to be having the desired effect when pre and post disease severity scoring is considered
10. Very few adverse events are being reported so far but the numbers but the number of cases with follow up details are low

Recommendations

1. Ongoing data collection is required to continue to assess and monitor the use of biological therapies in the UK. As more patients are entered into the system the full benefits of the web tool, will be realised by participating sites
2. A concentrated communication plan needs to be developed and implemented by the UK IBD audit team to drive participation and an understanding of the benefits of the collection of data
3. The exploration of integration with existing systems on to which biologics data may currently be collected is key in avoiding the potential for duplication of effort
4. A mapping exercise is being undertaken by the UK IBD audit team to establish how many hospitals in the UK provide biological therapy treatment to their IBD patients. This is will allow for precise participation figures in a future full national report

Section 2: Background information and introduction

The burden of inflammatory bowel disease

The Inflammatory Bowel Diseases, ulcerative colitis (UC) and Crohn's disease (CD) are common causes of gastrointestinal morbidity in the western world. The incidence of IBD has risen dramatically in recent decades with a combined incidence now of over 400/100,000. It is estimated that up to 0.5% of European and North American populations are affected. IBD most commonly first presents in the second and third decade but much of the recent increase has been observed in childhood, notably with CD in children increasing 3 fold in 30 years. IBD is not curable; UC and CD are lifelong conditions following an unpredictable relapsing and remitting course. 25% of UC patients will require colectomy and approximately 80% of CD patients require surgery over their lifetime. The main symptoms are diarrhoea, abdominal pain and an overwhelming sense of fatigue but associated features such as arthritis, anal disease, fistulae, abscess and skin problems can also contribute to a poor quality of life. In addition, there are wide ranging effects on growth and pubertal development, psychological health, education and employment, family life and pregnancy and fertility. Effective multidisciplinary care can attenuate relapse, prolong remission, treat complications and improve quality of life.

UK IBD audit aims

The UK IBD audit seeks to improve the quality and safety of care for all IBD patients in hospitals throughout the UK by auditing individual patient care and the provision and organisation of IBD service resources.

This inaugural interim report of the biologics element enables each participating site to compare or benchmark their performance against interim national data. All data should be considered within the context of the fact that there is not yet full national participation in the audit and the data are therefore not statistically representative to date.

The specific aims of the audit set out at the inception of the project were to:

1. Assess processes and outcomes of care delivery (inpatient and outpatient) in IBD
2. Enable Health Boards/Trusts to compare their performance against national standards
3. Identify resource and organisational factors that may account for observed variations in care
4. Facilitate, develop and institute an intervention strategy to improve quality of care
5. Repeat the audit to prove that change has occurred
6. Establish measures for healthcare services to use to compare quality of IBD services
7. Develop a sustainability programme to maintain quality of care.

Further information on the work of the UK IBD audit project can be accessed via the Clinical Effectiveness & Evaluation Unit section of the Royal College of Physicians website.

Availability of audit results in the public domain

Full and executive summary copies of the interim national report of the results for the biologics audit of the UK IBD audit – round 3 will be available in the public domain via the Royal College of Physicians, London website: http://www.rcplondon.ac.uk/resources/inflammatory-bowel-disease-audit . The national report of results will be made available to the Department of Health in England, NHS Healthcare Improvement Scotland, NHS Wales Health & Social Care Department and the Department of Health, Social Services and Public Safety in Northern Ireland. It is not intended that any site level data will be made available in the public domain until such a time that there is representative national participation in the audit.

Participating sites will be able to benchmark their own performance against the national findings of this report by downloading their 'site report' from the online biologics audit web tool at: www.ibdbiologicsaudit.org. This functionality is available for local staff to use at any time.

Section 3: The biologics audit

What is the role of biological therapy in the treatment of IBD?

The use of biological therapy is a relatively new therapeutic advance in inflammatory bowel disease. Clinical trials have demonstrated efficacy but these can be life changing drugs for some patients who have failed to respond to standard treatments, many of whom will have already had surgery. There are however adverse events, some of which are serious and there remain a number of unanswered questions regarding the use of these drugs in IBD. These include the timing and duration of therapy. Most data regarding biologic treatments comes from specialist units and prior to this report there were no national data regarding the level of use, efficacy or safety in the United Kingdom. These are also very costly drugs with a year of treatment for one patient in the region of £10,000. This cost has been rising rapidly with year on year increases in use.

Infliximab

Infliximab (IFX) (Remicade) is a chimeric anti-TNF monoclonal antibody with potent anti-inflammatory effects, possibly dependent on apoptosis of inflammatory cells. Controlled trials have demonstrated efficacy in both active and fistulating CD. Typically IFX is administered via an intravenous infusion during an outpatient clinic appointment at an infusion centre by a suitably qualified health professional.

Adalimumab

Adalimumab (Humira™) is a recombinant human immunoglobulin (IgG1) monoclonal antibody containing only human peptide sequences. Typically Adalimumab is provided via a self-administered injection. Patients are provided with a home supply of the medication and following close monitoring are able to manage their own treatment with regular medical follow up.

Infliximab and Adalimumab are licensed for treatment of moderately to severely active Crohn's disease, in adult patients who have not responded despite a full and adequate course of therapy with a corticosteroid and/or an immunosuppressant; or who are intolerant to or have medical contraindications for such therapies. Infliximab is also licensed for the treatment of active fistulating Crohn's disease; for the treatment of severe, active Crohn's disease in children and adolescents aged 6-17 years and for the treatment of moderately to severely active ulcerative colitis in adults. More recently (March 2012) a licence has been granted for treatment of UC in children, currently this licence covers those with severely active UC only.

NICE recommends that Infliximab and Adalimumab are used within their licensed indications as treatment options for adults with severe active Crohn's disease whose disease has not responded to conventional therapy (including immunosuppressive and/or corticosteroid treatments). They have recommended that Infliximab and Adalimumab should be given as planned course of treatment until treatment failure (including the need for surgery) or until 12 months after the start of treatment, whichever is shorter. Patients should then have their disease reassessed to determine whether ongoing treatment is still clinically appropriate.

NICE has also recommended Infliximab as an option for the treatment of acute exacerbations of severely active ulcerative colitis only in patients in whom Ciclosporin is contraindicated or clinically inappropriate. They have not however recommended use for the maintenance of remission of ulcerative colitis.

The biological therapies are relatively new treatments for IBD. There is however relatively little long term data regarding efficacy and safety and there is no national data regarding how often the drugs are used, what the long term safety and efficacy are in general day to day care. The biological agents are expensive drugs and their increasing use has proved a financial challenge for many Trusts and Health Boards.

It is therefore of value to know why the drug is being used, what the effects are and what the long-term safety profile is.

Data entry to the biologics audit web tool

Data entry takes places in the form of 'submissions'. A submission refers to data entered in any of the following categories: patient demographics, IBD disease details, initial anti-TNF treatment, follow up anti-TNF treatment and IBD related surgery. Once all mandatory fields are completed within a submission the data is locked and then suitable for inclusion in national findings. Only locked submissions can be viewed by the UK IBD audit project team.

Patient demographics

Patients are identified prospectively when the decision to treat using biological therapies is made by a clinician. The demographic details of this patient are entered to the web tool; this includes a number of patient identifiers that are pseudonymised at the point of data entry and are only ever visible to the participating site. Details of the patient's consultant and general practitioner can also be entered at this point.

IBD disease details

This section requires sites to provide detail of the IBD history of a patient, including the extent of their disease, any related comorbid conditions and details of any surgical procedures undertaken prior to the initiation of biological therapies.

Initial Anti-TNF treatment

Here the details of the initial or baseline Anti-TNF treatment are provided. The user indicates whether the patient has been initiated on either Adalimumab or Infliximab and the system generates the appropriate questions for either option. Information is collected with regard to pre-treatment investigations and screening up to the point of the completion or abandonment of the treatment, with detail of any treatment reactions that may occur.

Follow up Anti-TNF treatment

Each follow-up treatment submission must relate to a previously entered initial Anti-TNF treatment submission. An unlimited number of follow-up submissions can be created to allow continuous data entry as the patient continues to be treated with biological therapies. The outcome of each follow-up treatment must be provided to state whether treatment will continue or be stopped. Details of any adverse events are recorded for each follow up treatment

IBD related surgery

Details of IBD related surgery can be added to the web tool at any time; a prompt to update this section of the web tool appears at the conclusion of all initial and follow up Anti-TNF treatment submissions. This allows for identification of any escalation of treatment that is required while a patient is being provided biological therapy.

PROM (Patient Reported Outcome Measures)

PROM data are collected at baseline (initial anti-TNF treatment) and then again at 3, 6 and 12 months following initiation of biological therapy. This report is being written 6 months after the biologics audit web tool became 'live' for data entry and therefore PROM data are shown only for those with it recorded at baseline, along with a smaller number of patients that had their 3 month PROM data recorded. More detailed PROM data will be available when a sufficient number of patients have been provided with their biological therapy for a longer period of time.

The continued development of the biologics audit web tool

The biologics audit web-tool is being updated and developed in line with the needs, requirements and feedback by its users. The fluidity and adaptability of the web-tool will be the key feature of its success, the changes below summarise some examples of the adaptations made to date.

Existing patients

One of the first adaptations of the system was to allow for the submission of data for patients who are already established on biological therapy, in addition to those that are newly started on these medications. This allowed users to begin to build their own local registers of patients being treated with biological therapies.

Reporting functions

Sites can produce both patient and treatment summaries when required.

The 'patient summary report' provides a printable summary of all treatment provided for a specific patient over time, detail of any adverse events, infusion/injection reactions and relevant surgery are listed. A graphical display of the patient's disease severity scoring over time allows for a simple visual representation of the success/failure of treatment, to encourage action when required. The patient summary can be filed in patient's case notes or provided with an accompanying letter to a patient's general practitioner. An example of such a report is provided in appendix 5 for reference.

The 'treatment summary report' provides a printable summary of any particular initial or follow up treatment, again this can be filed in the case notes to avoid duplication of effort and also included in correspondence with a general practitioner to inform them of the treatment provided to their patient.
The 'site report' function enables participants to access real time benchmarking of their service against national averages for all data points included within the biologics audit web tool.
Additionally all sites have access to their own data in easy-to-use Microsoft Excel format, this allows for instant review and manipulation of local data for instant local audit.

System security of the biologics audit web tool

The 'UK IBD audit biologics audit system and hosted server security details' document (Appendix 7) outlines the system security information provided to all sites upon invitation to participate in the audit. The document gives an overview of the security measures in place, while providing assurance that security procedures designed by Microsoft and other industry standard bodies have been followed. The contracted system developer also implemented the recommended procedures contained within the NHS 'Securing web infrastructure and supporting services good practice guideline'.

Further detail can be found on the following: physical data centre (location, security, admission control, climatisation, electricity and fire protection), operating system (version, user access, security, encryption, updates and patches and backups) database software (version, user access and encryption) and application software (source control, user access and encryption).

The purpose of collecting identifiable patient data was to make the system useful for staff at a local IBD team level and to enable full monitoring and interpretation of the data for the purpose of service improvement and patient care. Patient identifiable data can only be seen by the registered members of the local team who will have been approved access to the site via the local clinical lead (nearly always a consultant gastroenterologist). Users cannot see data from other sites, only national aggregate data for comparison. The UK IBD audit team have administrative control to analyse anonymised data and are not able to see any patient identifiable information.

It is recommended that patients are informed of the uses of their data by sites, by means of information leaflets and posters provided by the UK IBD audit team in line with the principles of the Data Protection Act.

Integration with existing and future system developments in the IBD community

The requirements for a biologics audit for IBD and related data content and structure of the web tool were established through consultation with a multidisciplinary information group and with support from the

Centre for Health Information, Research and Evaluation (CHIRAL) at Swansea University under Professor John Williams.
His teams are working with a number of sites to incorporate these requirements into a sustainable clinical management system for IBD. There will be a faculty to transfer biologics data from these sites with no need for double data entry. The possibilities of direct transfer of data from other systems that might be in common use for capturing data on biologics such as Rotherham or Infoflex are also being explored to avoid the potential for double data entry by any participating sites.

Appendix

Appendix 1: Full national audit results tables

Patient demographics

The patient demographic details of 853 separate patients were entered to the biologics audit web tool. These patient demographic details were entered by a total of 109 individual sites.

IBD disease details

A total of 104 locked IBD disease details submissions were entered to the biologics audit web-tool. These submissions were entered by a total of 24 individual sites, giving a median of 3 (range 1-21) IBD disease detail submissions per site.

IBD disease details	National results N (%)		
Diagnosis	Crohn's disease (n=92)	Ulcerative colitis (n=6)	IBD type unspecified (n=6)
Maximal disease distribution at the time of decision to initiate biological therapy defined by the Montreal Classification			
Proctitis (E1)		2 (33%)	2 (33%)
Left sided (E2)		2 (33%)	1 (17%)
Extensive (E3)		2 (33%)	3 (50%)
Terminal ileum (L1)	19 (21%)		
Ileocolonic (L2)	11 (12%)		
Colonic (L3)	22 (24%)		
Upper GI (L4)	0 (0%)		
Upper GI plus L1, 2, or 3	12 (13%)		
Perianal involvement	28 (30%)		
Pattern of Crohn's disease			
Inflammatory	48 (52%)		
Stricturing	23 (25%)		
Fistulating	21 (23%)		
Date of diagnosis			
<1 year ago	15 (16%)	0 (0%)	2 (33%)
1-5 years ago	41 (45%)	4 (67%)	3 (50%)
6-10 year ago	13 (14%)	1 (17%)	0 (0%)
>10 years ago	23 (25%)	1 (17%)	1 (17%)
Weight at diagnosis			
Median (IQR)	55 (36, 64)	70 (52, 88)	65 (64, 74)
Height at diagnosis			
Median (IQR)	160 (149, 172)	131 (131, 131)	168 (168, 168)
Pubertal status			
Adult patient	54 (59%)	6 (100%)	5 (83%)
Tanner stage 1	6 (7%)	0 (0%)	0 (0%)
Tanner stage 2	1 (1%)	0 (0%)	0 (0%)
Tanner stage 3	1 (1%)	0 (0%)	0 (0%)
Tanner stage 4	4 (4%)	0 (0%)	0 (0%)
Tanner stage 5	0 (0%)	0 (0%)	0 (0%)
Not recorded	26 (28%)	0 (0%)	1 (17%)
Smoking status			
Current smoker	23 (25%)	0 (0%)	0 (0%)
Ex-smoker	13 (14%)	0 (0%)	3 (50%)
Never smoked	42 (46%)	4 (67%)	2 (33%)
Not known	14 (15%)	2 (33%)	1 (17%)

IBD disease details IBD related surgery	National results N (%)		
	Crohn's disease (n=92)	Ulcerative colitis (n=6)	IBD type unspecified (n=6)
The number of Examinations Under Anaesthetic (EUAs) in the year before the decision to start Anti TNF treatment			
0	76 (83%)	6 (100%)	6 (100%)
1-5	15 (16%)	0 (0%)	0 (0%)
6-10	0 (0%)	0 (0%)	0 (0%)
>10	1 (1%)	0 (0%)	0 (0%)
IBD disease details **Extra-intestinal manifestations of IBD**	**National results N (%)**		
	Crohn's disease (n=92)	**Ulcerative colitis (n=6)**	**IBD type unspecified (n=6)**
Does the patient have any bone and joint disorders (multiple options may have been selected)			
Ankylosing spondylitis	2 (2%)	0 (0%)	1 (17%)
Peripheral arthritis	1 (1%)	0 (0%)	1 (17%)
Large joint arthritis	3 (3%)	1 (17%)	0 (0%)
Sacroilitis	0 (0%)	0 (0%)	0 (0%)
Other	2 (2%)	1 (17%)	0 (0%)
Hepatobiliary disorders (multiple options may have been selected)			
Primary sclerosing cholangitis	0 (0%)	0 (0%)	1 (17%)
Abnormal liver blood tests	2 (2%)	0 (0%)	1 (17%)
Other	5 (5%)	0 (0%)	0 (0%)
Renal disorders (multiple options may have been selected)			
Glomerulopathy	0 (0%)	1 (17%)	0 (0%)
Other	1 (1%)	0 (0%)	0 (0%)
Skin / mucosal disorders (multiple options may have been selected)			
Erythema nodosum	3 (3%)	0 (0%)	0 (0%)
Pyoderma gangreosum	0 (0%)	0 (0%)	0 (0%)
Aphthous ulcers	1 (1%)	0 (0%)	0 (0%)
Other	2 (2%)	2 (33%)	1 (17%)
IBD related growth disorders			
Yes	4 (4%)	0 (0%)	0 (0%)
Ophthalmic disorders (multiple options may have been selected)			
Episcleritis	0 (0%)	0 (0%)	0 (0%)
Iritis / uvetis	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)
IBD disease details **Non IBD comorbidities**	**National results N (%)**		
	Crohn's disease (n=92)	**Ulcerative colitis (n=6)**	**IBD type unspecified (n=6)**
Does the patient have any non-IBD comorbidities			
Yes	3 (3%)	0 (0%)	0 (0%)
If yes, complete the Charleson Index			
Median score (IQR)	0 (0, 0)	0 (0, 0)	1 (0, 2)

Initial treatment – Infliximab

There were a total of 151 locked Infliximab initial treatment submissions entered on to the biologics audit web tool. These submissions were entered by 23 individual sites, giving a median of 6 (range 1-27) Infliximab initial treatment submissions per site. For the purposes of this analysis only submissions for patients that were new starters that identified the patients disease type (UC/CD/IBDU) were included, which meant that 48 submissions were excluded (10 had no disease type recorded and 38 were patients already established on biological therapy).

Initial infusion – Infliximab Consent	National results N (%)		
	Crohn's disease (n=90)	Ulcerative colitis (n=8)	IBD type unspecified (n=5)
Was informed consent to receive Anti-TNF treatment taken from this patient			
Yes	84 (93%)	7 (88%)	5 (100%)
No	2 (2%)	0 (0%)	0 (0%)
Not recorded	4 (4%)	1 (13%)	0 (0%)
If yes, was this written or verbal			
Written	69 (82%)	5 (71%)	5 (100%)
Verbal	15 (18%)	2 (29%)	0 (0%)
Initial infusion – Infliximab **Treatment details**	**National results N (%)**		
	Crohn's disease (n=90)	**Ulcerative colitis (n=8)**	**IBD type unspecified (n=5)**
Time between date of decision to start and date of initial treatment (first loading dose)			
Median (IQR) in days	13 (7, 22)	5 (1, 31)	18 (2, 24)
If there was a delay of 2 weeks or more between the date of decision to start and the initial treatment, what was the reason(s) for the delay			
Funding authorisation	7 (16%)	0 (0%)	0 (0%)
Delay in consent	0 (0%)	0 (0%)	0 (0%)
Pharmacy reason	1 (2%)	0 (0%)	0 (0%)
Wait for next available clinic appointment	13 (30%)	2 (67%)	2 (67%)
Other	23 (52%)	1 (33%)	2 (67%)
Did you have to apply for funding for this Anti TNF treatment			
Yes	25 (28%)	1 (13%)	0 (0%)
What was the clinical indication for this treatment			
Acute severe ulcerative colitis		4 (50%)	
Chronic refractory ulcerative colitis		4 (50%)	
Acute severe IBD type unspecified			3 (60%)
Chronic refractory IBD type unspecified			2 (40%)
Severe perianal Crohn's disease	21 (23%)		
Active luminal Crohn's disease	65 (72%)		
Other clinical information	2 (2%)		
Not known	2 (2%)	0 (0%)	0 (0%)
Weight at the time of this treatment (kg)			
Median (IQR)	60 (50, 73)	89 (65, 95)	80 (64, 80)
Height at the time of this treatment (cm)			
Median (IQR)	163 (154, 173)	165 (157, 173)	168 (168, 168)
Pubertal status			
Adult patient	60 (67%)	4 (50%)	4 (80%)
Tanner stage 1	3 (3%)	0 (0%)	0 (0%)
Tanner stage 2	0 (0%)	0 (0%)	0 (0%)
Tanner stage 3	3 (3%)	0 (0%)	0 (0%)
Tanner stage 4	4 (4%)	1 (13%)	0 (0%)
Tanner stage 5	1 (1%)	0 (0%)	0 (0%)
Not recorded	19 (21%)	3 (38%)	1 (20%)

Hydrocortisone cover given at this treatment			
Yes	37 (41%)	4 (50%)	2 (40%)
No	50 (56%)	4 (50%)	3 (60%)
Not recorded	3 (3%)	0 (0%)	0 (0%)
Antihistamine cover given at this treatment			
Yes	18 (20%)	2 (25%)	1 (20%)
No	69 (77%)	6 (75%)	4 (80%)
Not recorded	3 (3%)	0 (0%)	0 (0%)
Dose given at this infusion (mg/kg)			
5mg/kg	87 (97%)	8 (100%)	5 (100%)
10mg/kg	0 (0%)	0 (0%)	0 (0%)
Other (mg/kg)	0 (0%)	0 (0%)	0 (0%)
Not recorded	3 (3%)	0 (0%)	0 (0%)
Duration of infusion			
1 hour	0 (0%)	0 (0%)	0 (0%)
2 hours	85 (94%)	8 (100%)	5 (100%)
Other duration (in minutes)	3 (3%)	0 (0%)	0 (0%)
Not recorded	2 (2%)	0 (0%)	0 (0%)
Were any acute infusion reaction recorded for this treatment			
Yes	2 (2%)	0 (0%)	0 (0%)
If yes, which acute reactions			
Angio-oedema of upper airway	0 (0%)	NA	NA
Bronchospasm (cough/wheeze/dsypnoea)	1 (50%)	NA	NA
Chills	1 (50%)	NA	NA
Dizziness	0 (0%)	NA	NA
Fatigue	0 (0%)	NA	NA
Fever	1 (50%)	NA	NA
Flushing	1 (50%)	NA	NA
Headache	0 (0%)	NA	NA
Hypotension	0 (0%)	NA	NA
Itching	1 (50%)	NA	NA
Nausea	0 (0%)	NA	NA
Rash	1 (50%)	NA	NA
Urtcaria	0 (0%)	NA	NA
Panic attacks	1 (50%)	NA	NA
Other	0 (0%)	NA	NA
Infusion completion outcome			
Completed successfully at prescribed rate	85 (94%)	8 (100%)	5 (100%)
Completed successfully at lower rate	2 (2%)	0 (0%)	0 (0%)
Repeat infusion at lower rate and discontinued	0 (0%)	0 (0%)	0 (0%)
Infusion discontinued and not restarted	2 (2%)	0 (0%)	0 (0%)
Other	1 (1%)	0 (0%)	0 (0%)
Is the patient receiving any concomitant therapies for the management of IBD at the time of this treatment			
Yes	76 (84%)	6 (75%)	5 (100%)
If yes, indicate which concomitant therapies			
Immunosuppressive – Azathioprine	66 (87%)	3 (50%)	1 (20%)
Immunosuppressive – Mercaptopurine	4 (5%)	1 (17%)	1 (20%)
Immunosuppressive – Methotrexate	0 (0%)	0 (0%)	0 (0%)
Steroid – Prednisolone	10 (13%)	3 (50%)	4 (80%)
If Prednisolone, what is the current dose (mg/day) Median (IQR)	30 (20, 30)	30 (25, 40)	35 (20, 40)
Steroid – Budesonide	1 (1%)	0 (0%)	0 (0%)
If Budesonide, what is the current dose (mg/day) Median (IQR)	6 (6, 6)	NA	NA

Antibiotics	4 (5%)	0 (0%)	0 (0%)
5ASA	25 (33%)	4 (67%)	3 (60%)
Dietary therapy	4 (5%)	0 (0%)	0 (0%)
Other	3 (4%)	0 (0%)	0 (0%)
Any previous discontinued therapies prior to the decision to start Anti-TNF treatment			
Yes	15 (17%)	1 (13%)	2 (40%)
If yes, indicate which previous therapies (more than one therapy may have been selected)			
Immunosuppressive – Azathioprine	4 (27%)	1 (100%)	0 (0%)
Immunosuppressive – Mercaptopurine	1 (7%)	0 (0%)	1 (50%)
Immunosuppressive – Methotrexate	2 (13%)	1 (100%)	0 (0%)
Steroid – Prednisolone	3 (20%)	0 (0%)	0 (0%)
Steroid – Budesonide	2 (13%)	0 (0%)	0 (0%)
Adalimumab	1 (7%)	0 (0%)	0 (0%)
Infliximab	2 (13%)	0 (0%)	0 (0%)
5ASA	2 (13%)	0 (0%)	1 (50%)
Dietary therapy	1 (7%)	0 (0%)	0 (0%)
Other	1 (7%)	0 (0%)	0 (0%)
If any previous therapies indicate the reason for stopping (The results below are the combined reasons for discontinuing previous therapies, for all therapy types indicated above)			
Treatment effective and discontinued	2/19	0/2	1
No response	5/19	1/2	1
Loss of effect	1/19	0/2	0
Intolerant	7/19	1/2	0
Dependency	0/19	0/2	0
Patient choice	0/19	0/2	0
Other	4/19	0/2	0

Initial infusion – Infliximab **Pre-treatment screening in relation to initiation of Anti TNF therapy**	**National results N (%)**		
	Crohn's disease (n=90)	**Ulcerative colitis (n=8)**	**IBD type unspecified (n=5)**
Chest x-ray			
Yes	80 (89%)	8 (100%)	5 (100%)
No	10 (11%)	0 (0%)	0 (0%)
Not indicated	0 (0%)	0 (0%)	0 (0%)
Mantoux screen			
Yes	3 (3%)	0 (0%)	0 (0%)
No	58 (64%)	2 (25%)	2 (40%)
Not indicated	29 (32%)	6 (75%)	3 (60%)
BCG given			
Yes	11 (12%)	1 (13%)	1 (20%)
No	42 (47%)	2 (25%)	3 (60%)
Not indicated	37 (41%)	5 (63%)	1 (20%)
Gamma interferon TB screen			
Yes	17 (19%)	1 (13%)	1 (20%)
No	46 (51%)	4 (50%)	3 (60%)
Not indicated	27 (30%)	3 (38%)	1 (20%)
Stool culture / test			
Yes	47 (52%)	5 (63%)	2 (40%)
No	24 (27%)	3 (38%)	2 (40%)
Not indicated	19 (21%)	0 (0%)	1 (20%)
Hepatitis B serology			
Yes	52 (58%)	4 (50%)	3 (60%)
No	37 (41%)	3 (38%)	2 (40%)
Not indicated	1 (1%)	1 (13%)	0 (0%)
Hepatitis C serology			
Yes	48 (53%)	3 (38%)	3 (60%)

No	41 (46%)	4 (50%)	2 (40%)
Not indicated	1 (1%)	1 (13%)	0 (0%)
HIV screen			
Yes	15 (17%)	2 (25%)	3 (60%)
No	55 (61%)	4 (50%)	2 (40%)
Not indicated	20 (22%)	2 (25%)	0 (0%)
Varicella screen			
Yes	44 (49%)	6 (75%)	2 (40%)
No	41 (46%)	2 (25%)	2 (40%)
Not indicated	5 (6%)	0 (0%)	1 (20%)
CRP			
Yes	89 (99%)	8 (100%)	4 (80%)
No	1 (1%)	0 (0%)	1 (20%)
Not indicated	0 (0%)	0 (0%)	0 (0%)
FBC			
Yes	90 (100%)	8 (100%)	4 (80%)
No	0 (0%)	0 (0%)	1 (20%)
Not indicated	0 (0%)	0 (0%)	0 (0%)
MRI pelvis			
Yes	30 (33%)	0 (0%)	0 (0%)
No	36 (40%)	1 (13%)	2 (40%)
Not indicated	24 (27%)	7 (88%)	3 (60%)

Initial infusion – Infliximab **PROM completion at this encounter**	**National results N (%)**		
	Crohn's disease (n=90)	**Ulcerative colitis (n=8)**	**IBD type unspecified (n=5)**
Has a PROM been completed at this encounter			
Yes, IBD PROM	13 (14%)	4 (50%)	5 (100%)
Yes, IMPACT III	9 (10%)	1 (13%)	0 (0%)
No, PROM not completed at this encounter	42 (47%)	2 (25%)	0 (0%)
Not recorded	26 (29%)	1 (13%)	0 (0%)

Initial infusion – Infliximab **Disease severity score**	**National results N (%)**		
	Crohn's disease (n=90)	**Ulcerative colitis (n=8)**	**IBD type unspecified (n=5)**
If the patient's diagnosis is Crohn's disease, the Harvey Bradshaw Index (HBI) or the Paediatric Crohn's Disease Activity Index (PCDAI) is completed			
HBI – Median (IQR)	5 (0, 8) (N=38)	NA	NA
PCDAI – Median (IQR)	20 (5, 35) (N=11)	NA	NA
If the patient's diagnosis is ulcerative colitis, the Simple Clinical Colitis Activity Index (SCCAI) or the Paediatric Ulcerative Colitis Activity Index (PUCAI) is completed			
SCCAI – Median (IQR)	NA	6 (3, 9) (N=2)	10 (8, 12) (N=2)
PUCAI – Median (IQR)	NA	45 (45, 45) (N=1)	NA

Follow up treatment – Infliximab

There were a total of 195 locked Infliximab follow up treatment submissions entered on to the biologics audit web tool, for 103 separate patients. These submissions were entered by 21 individual sites, giving a median of 4 (range 1-43) Infliximab follow up treatment submissions per site. For the purposes of this analysis only submissions for patients that were new starters and that had a locked initial Infliximab infusion submission were included, which meant that 55 submissions were excluded (32 had no related locked initial infusion submission and 23 were patients already established on biological therapy).

Follow up infusion – Infliximab Treatment selection	National results N (%)		
	Crohn's disease (n=127)	Ulcerative colitis (n=9)	IBD type unspecified (n=4)
Time between date of initial treatment and date of this Infliximab infusion			
Median (IQR) in days	44 (14, 98)	14 (11, 22)	16 (14, 42)
Current Infliximab dose number			
1-5	114 (90%)	7 (78%)	4 (100%)
6-10	10 (8%)	0 (0%)	0 (0%)
<10	3 (2%)	2 (22%)	0 (0%)
Infliximab dose given at this treatment (mg/kg)			
5mg/kg	127 (100%)	9 (100%)	4 (100%)
10mg/kg	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)
Hydrocortisone cover given			
Yes	37 (29%)	5 (56%)	2 (50%)
Antihistamine cover given			
Yes	19 (15%)	3 (33%)	2 (50%)
Were there any acute infusion reactions			
Yes	3 (2%)	0 (0%)	0 (0%)
If yes, which acute reactions			
Angio-oedema of upper airway	0 (0%)	NA	NA
Bronchospasm (cough/wheeze/dsypnoea)	2 (67%)	NA	NA
Chills	1 (33%)	NA	NA
Dizziness	0 (0%)	NA	NA
Fatigue	1 (33%)	NA	NA
Fever	1 (33%)	NA	NA
Flushing	3 (100%)	NA	NA
Headache	0 (0%)	NA	NA
Hypotension	1 (33%)	NA	NA
Itching	0 (0%)	NA	NA
Nausea	1 (33%)	NA	NA
Rash	0 (0%)	NA	NA
Urtcaria	0 (0%)	NA	NA
Panic attacks	0 (0%)	NA	NA
Other	0 (0%)	NA	NA
Infusion completion outcome			
Completed successfully at prescribed rate	120 (94%)	9 (100%)	4 (100%)
Completed successfully at lower rate	1 (1%)	0 (0%)	0 (0%)
Repeat infusion at lower rate and discontinued	0 (0%)	0 (0%)	0 (0%)
Infusion discontinued and not restarted	3 (2%)	0 (0%)	0 (0%)
Other	1 (1%)	0 (0%)	0 (0%)
Not recorded	2 (2%)	0 (0%)	0 (0%)
Continued Infliximab treatment plan			
Continue treatment	121 (95%)	8 (89%)	3 (75%)
Stop treatment	6 (5%)	1 (11%)	1 (25%)

If treatment stopped, what were the reasons for stopping			
Treatment effective and discontinued	0 (0%)	0 (0%)	0 (0%)
Loss of response	0 (0%)	0 (0%)	0 (0%)
Poor response	1 (17%)	0 (0%)	1 (100%)
Side effects / adverse events	3 (50%)	1 (100%)	0 (0%)
Patient pregnant since initiation of treatment	1 (17%)	0 (0%)	0 (0%)
Patient choice	1 (17%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)
Is the patient currently receiving any other therapies for the management of IBD			
Yes	104 (82%)	6 (67%)	4 (100%)
If yes, indicate which other therapies			
Immunosuppressive – Azathioprine	95 (91%)	4 (67%)	1 (25%)
Immunosuppressive – Mercaptopurine	0 (0%)	1 (17%)	0 (0%)
Immunosuppressive – Methotrexate	0 (0%)	0 (0%)	0 (0%)
Steroid – Prednisolone	6 (6%)	3 (50%)	4 (100%)
If Prednisolone, what is the current dose (mg/day) Median (IQR)	15 (10, 30)	40 (25, 40)	23 (20, 25)
Steroid – Budesonide	2 (2%)	0 (0%)	0 (0%)
If Budesonide, what is the current dose (mg/day) Median (IQR)	6 (3, 6)	NA	NA
5ASA	16 (15%)	4 (67%)	4 (100%)
Antibiotics	3 (3%)	0 (0%)	0 (0%)
Dietary therapy	0 (0%)	0 (0%)	0 (0%)
Other	1 (1%)	0 (0%)	0 (0%)
Were there any adverse events since last review			
Yes	10 (8%)	1 (11%)	0 (0%)
If yes, what adverse events			
Death	0 (0%)	0 (0%)	NA
Malignancy	0 (0%)	0 (0%)	NA
Serum sickness-like reaction	0 (0%)	0 (0%)	NA
Infection	2 (20%)	1 (100%)	NA
Suspected demyelination	0 (0%)	0 (0%)	NA
Confirmed demyelination	0 (0%)	0 (0%)	NA
Drug-induced lupus	0 (0%)	0 (0%)	NA
Other	8 (80%)	0 (0%)	NA
Weight at the time of this treatment (kg)			
Median (IQR)	53 (41, 62)	76 (62, 100)	64 (64, 64)
Height at the time of this treatment (cm)			
Median (IQR)	157 (150, 167)	155 (155, 175)	163 (163, 163)
Pubertal status			
Adult patient	59 (46%)	6 (67%)	4 (100%)
Tanner stage 1	2 (2%)	0 (0%)	0 (0%)
Tanner stage 2	1 (1%)	0 (0%)	0 (0%)
Tanner stage 3	1 (1%)	0 (0%)	0 (0%)
Tanner stage 4	4 (3%)	2 (22%)	0 (0%)
Tanner stage 5	1 (1%)	0 (0%)	0 (0%)
Not recorded	59 (46%)	1 (11%)	0 (0%)

Follow up infusion – Infliximab	**National results N (%)**		
PROM completion at this encounter	**Crohn's disease (n=127)**	**Ulcerative colitis (n=9)**	**IBD type unspecified (n=4)**
Has a PROM been completed at this encounter			
Yes, IBD PROM	14 (11%)	2 (22%)	0 (0%)
Yes, IMPACT III	5 (4%)	1 (11%)	0 (0%)
No, PROM not completed at this encounter	100 (79%)	4 (44%)	4 (100%)
Not recorded	8 (6%)	2 (22%)	0 (0%)

Follow up infusion – Infliximab Disease severity score	National results N (%)		
	Crohn's disease (n=127)	Ulcerative colitis (n=9)	IBD type unspecified (n=4)
If the patient's diagnosis is Crohn's disease, the Harvey Bradshaw Index (HBI) or the Paediatric Crohn's Disease Activity Index (PCDAI) is completed			
HBI – Median (IQR)	0 (0, 3) (N=90)	NA	NA
PCDAI – Median (IQR)	0 (0, 0) (N=11)	NA	NA
If the patient's diagnosis is ulcerative colitis, the Simple Clinical Colitis Activity Index (SCCAI) or the Paediatric Ulcerative Colitis Activity Index (PUCAI) is completed			
SCCAI – Median (IQR)	NA	7 (4, 7) (N=2)	6 (6, 6) (N=1)
PUCAI – Median (IQR)	NA	0 (0, 0) (N=2)	NA

Initial treatment – Adalimumab

There were a total of 53 Adalimumab initial treatment submissions entered on to the biologics audit web tool. These submissions were entered by 14 individual sites, giving a median of 3 (range 1-14) Adalimumab initial treatment submissions per site. For the purposes of this analysis, only submissions for patients that were new starters and that identified the patients disease type (UC/CD/IBDU) were included, which meant that 9 submissions were excluded (4 had no disease type recorded and 5 were patients already established on biological therapy).

Initial treatment – Adalimumab Consent	National results N (%)		
	Crohn's disease (n=39)	Ulcerative colitis (n=0)	IBD type unspecified (n=5)
Was informed consent to receive Anti-TNF treatment taken from this patient			
Yes	35 (90%)		5 (100%)
No	0 (0%)		0 (0%)
Not recorded	4 (10%)		0 (0%)
If yes, was this written or verbal			
Written	32 (82%)		5 (100%)
Verbal	3 (8%)		0 (0%)

Initial treatment – Adalimumab Treatment details	National results N (%)		
	Crohn's disease (n=39)	Ulcerative colitis (n=0)	IBD type unspecified (n=5)
Time between date of decision to start and date of initial treatment			
Median (IQR) in days	17 (5, 35)		4 (3, 4)
If there was a delay of 2 weeks or more between the date of decision to start and the initial treatment, what was the reason(s) for the delay			
Funding authorisation	5 (13%)		NA
Delay in consent	2 (5%)		NA
Pharmacy reason	1 (3%)		NA
Wait for next available clinic appointment	2 (5%)		NA
Other	14 (36%)		NA
Did you have to apply for funding for this Anti TNF treatment			
Yes	11 (28%)		0 (0%)
What was the clinical indication for this treatment			
Acute severe ulcerative colitis			
Chronic refractory ulcerative colitis			
Acute severe IBD type unspecified			3 (60%)
Chronic refractory IBD type unspecified			2 (40%)
Severe perianal Crohn's disease	3 (8%)		
Active luminal Crohn's disease	36 (92%)		
Other clinical information	0 (0%)		0 (0%)
Not known	0 (0%)		0 (0%)
Weight at the time of this treatment (kg)			
Median (IQR)	66 (57, 80)		69 (52, 78)
Height at the time of this treatment (cm)			
Median (IQR)	165 (160, 173)		NA
Pubertal status			
Adult patient	29 (74%)		4 (80%)
Tanner stage 1	0 (0%)		0 (0%)
Tanner stage 2	0 (0%)		0 (0%)
Tanner stage 3	0 (0%)		0 (0%)
Tanner stage 4	0 (0%)		0 (0%)
Tanner stage 5	0 (0%)		0 (0%)
Not recorded	10 (26%)		1 (20%)

Is the patient receiving any concomitant therapies for the management of IBD at the time of this treatment			
Yes	28 (72%)		4 (80%)
If yes, indicate which concomitant therapies			
Immunosuppressive – Azathioprine	18 (64%)		1 (25%)
Immunosuppressive – Mercaptopurine	2 (7%)		1 (25%)
Immunosuppressive – Methotrexate	3 (11%)		0 (0%)
Steroid – Prednisolone	6 (21%)		2 (50%)
If Prednisolone, what is the current dose (mg/day) Median (IQR)	23 (20, 25)		20 (20, 20)
Steroid – Budesonide	1 (4%)		0 (0%)
If Budesonide, what is the current dose (mg/day) Median (IQR)	9 (9, 9)		NA
5ASA	8 (29%)		3 (75%)
Antibiotics	3 (11%)		0 (0%)
Dietary therapy	2 (7%)		0 (0%)
Other	1 (4%)		0 (0%)
Any previous discontinued therapies prior to the decision to start Anti-TNF treatment			
Yes	16 (41%)		4 (80%)
If yes, indicate which previous therapies (multiple therapies may have been chosen)			
Immunosuppressive – Azathioprine	8 (50%)		1 (25%)
Immunosuppressive – Mercaptopurine	2 (13%)		0 (0%)
Immunosuppressive – Methotrexate	3 (19%)		0 (0%)
Steroid – Prednisolone	0 (0%)		1 (25%)
Steroid – Budesonide	2 (13%)		0 (0%)
Adalimumab	1 (6%)		0 (0%)
Infliximab	8 (50%)		4 (100%)
5ASA	2 (13%)		0 (0%)
Dietary therapy	0 (0%)		0 (0%)
Other	0 (0%)		0 (0%)
If any previous therapies indicate the reason for stopping (The results below are the combined reasons for discontinuing previous therapies, for all therapy types indicated above)			
Treatment effective and discontinued	1/26		0/6
No response	5/26		1/6
Loss of effect	8/26		3/6
Intolerant	9/26		1/6
Dependency	1/26		1/6
Patient choice	1/26		0/6
Other	1/26		0/6

Initial treatment – Adalimumab	**National results N (%)**		
Treatment details	**Crohn's disease (n=39)**	**Ulcerative colitis (n=0)**	**IBD type unspecified (n=5)**
Induction dose			
160/80mg	20 (51%)		0 (0%)
80/40mg	19 (49%)		5 (100%)
Planned maintenance dose			
40mg every other week	38 (97%)		5 (100%)
40mg every week	1 (3%)		0 (0%)
Other	0 (0%)		0 (0%)
Any acute reactions to injections during induction regime			
Yes	0 (0%)		0 (0%)
No	36 (92%)		5 (100%)
Not recorded	3 (8%)		0 (0%)

Initial treatment – Adalimumab Pre-treatment screening in relation to initiation of Anti TNF therapy	National results N (%)		
	Crohn's disease (n=39)	Ulcerative colitis (n=0)	IBD type unspecified (n=5)
Chest x-ray			
Yes	36 (92%)		5 (100%)
No	2 (5%)		0 (0%)
Not indicated	1 (3%)		0 (0%)
Mantoux screen			
Yes	1 (3%)		0 (0%)
No	29 (74%)		2 (40%)
Not indicated	9 (23%)		3 (60%)
BCG given			
Yes	6 (15%)		0 (0%)
No	27 (69%)		2 (40%)
Not indicated	6 (15%)		3 (60%)
Gamma interferon TB screen			
Yes	13 (33%)		1 (20%)
No	19 (49%)		3 (60%)
Not indicated	7 (18%)		1 (20%)
Stool culture / test			
Yes	28 (72%)		3 (60%)
No	7 (18%)		1 (20%)
Not indicated	4 (10%)		1 (20%)
Hepatitis B serology			
Yes	35 (90%)		4 (80%)
No	4 (10%)		1 (20%)
Not indicated	0 (0%)		0 (0%)
Hepatitis C serology			
Yes	34 (87%)		4 (80%)
No	5 (13%)		1 (20%)
Not indicated	0 (0%)		0 (0%)
HIV screen			
Yes	16 (41%)		1 (20%)
No	22 (56%)		3 (60%)
Not indicated	1 (3%)		1 (20%)
Varicella screen			
Yes	30 (77%)		0 (0%)
No	8 (21%)		4 (80%)
Not indicated	1 (3%)		1 (20%)
CRP			
Yes	37 (95%)		5 (100%)
No	2 (5%)		0 (0%)
Not indicated	0 (0%)		0 (0%)
FBC			
Yes	36 (92%)		5 (100%)
No	3 (8%)		0 (0%)
Not indicated	0 (0%)		0 (0%)
MRI pelvis			
Yes	9 (23%)		0 (0%)
No	21 (54%)		3 (60%)
Not indicated	9 (23%)		2 (40%)

Initial treatment – Adalimumab PROM completion at this encounter	National results N (%)		
	Crohn's disease (n=39)	Ulcerative colitis (n=0)	IBD type unspecified (n=5)
Has a PROM been completed at this encounter			
Yes, IBD PROM	11 (28%)		3 (60%)
Yes, IMPACT III	0 (0%)		0 (0%)
No, PROM not completed at this encounter	14 (36%)		1 (20%)

Initial treatment – Adalimumab Disease severity score	National results N (%)		
	Crohn's disease (n=39)	Ulcerative colitis (n=0)	IBD type unspecified (n=5)
If the patient's diagnosis is Crohn's disease, the Harvey Bradshaw Index (HBI) or the Paediatric Crohn's Disease Activity Index (PCDAI) is completed			
HBI – Median (IQR)	4 (0, 10) (N=23)		NA
PCDAI – Median (IQR)	NA		NA
If the patient's diagnosis is ulcerative colitis, the Simple Clinical Colitis Activity Index (SCCAI) or the Paediatric Ulcerative Colitis Activity Index (PUCAI) is completed			
SCCAI – Median (IQR)	NA		7 (7, 7) (N=1)
PUCAI – Median (IQR)	NA		NA

Follow up treatment – Adalimumab

The details of 34 Adalimumab follow up treatments were entered to the biologics audit web tool, these related to 21 separate patients. The submissions were entered by 7 individual sites giving a median of 2 (range 1-18) follow up treatments per site. For the purposes of this analysis, only submissions for patients that were new starters and that identified the patients disease type (UC/CD/IBDU) were included, which meant that 2 submissions were excluded (2 had no related locked initial infusion submission)

Follow up treatment – Adalimumab Treatment selection	National results N (%) Crohn's disease (n=27)	 Ulcerative colitis (n=0)	 IBD type unspecified (n=5)
Time between date of initial treatment and date of Adalimumab review			
Median (IQR) in days	72 (14, 133)		42 (28, 90)
Did the patient report any acute reactions to injections			
Yes	1 (4%)		0 (0%)
If yes, which acute reactions			
Angio-oedema of upper airway	0 (0%)		NA
Bronchospasm (cough/wheeze/dsypnoea)	0 (0%)		NA
Chills	0 (0%)		NA
Dizziness	0 (0%)		NA
Fatigue	1 (100%)		NA
Fever	0 (0%)		NA
Flushing	0 (0%)		NA
Headache	0 (0%)		NA
Hypotension	0 (0%)		NA
Itching	0 (0%)		NA
Nausea	0 (0%)		NA
Rash	0 (0%)		NA
Urtcaria	0 (0%)		NA
Other	0 (0%)		NA
Review of Adalimumab treatment plan			
Continue treatment with Adalimumab	27 (100%)		5 (100%)
Stop treatment with Adalimumab	0 (0%)		0 (0%)
If continue treatment, what is the planned continued treatment frequency			
Every week	4 (15%)		0 (0%)
Every other week	23 (85%)		5 (100%)
If continue treatment, what is the planned continued treatment dose (mg)			
80mg	0 (0%)		0 (0%)
40mg	27 (100%)		5 (100%)
Is the patient currently receiving any other therapies for the management of IBD			
Yes	14 (52%)		5 (100%)
If yes, indicate which other therapies			
Immunosuppressive – Azathioprine	5 (36%)		2 (40%)
Immunosuppressive – Mercaptopurine	2 (14%)		1 (20%)
Immunosuppressive – Methotrexate	1 (7%)		0 (0%)
Steroid – Prednisolone	5 (36%)		1 (20%)
If Prednisolone, what is the current dose (mg/day) Median (IQR)	15 (7, 30)		10 (10, 10)
Steroid – Budesonide	0 (0%)		0 (0%)
5ASA	3 (21%)		3 (60%)
Antibiotics	2 (14%)		0 (0%)
Dietary therapy	0 (0%)		0 (0%)
Other	0 (0%)		0 (0%)
Were there any adverse events since last review			
Yes	2 (7%)		0 (0%)

If yes, what adverse events			
Death	0 (0%)		NA
Malignancy	0 (0%)		NA
Serum sickness-like reaction	0 (0%)		NA
Infection	0 (0%)		NA
Suspected demyelination	0 (0%)		NA
Confirmed demyelination	0 (0%)		NA
Drug-induced lupus	0 (0%)		NA
Other	2 (100%)		NA
Weight at the time of this treatment (kg)			
Median (IQR)	64 (62, 67)		NA
Height at the time of this treatment (cm)			
Median (IQR)	155 (145, 175)		NA
Pubertal status			
Adult patient	22 (81%)		2 (40%)
Tanner stage 1	0 (0%)		0 (0%)
Tanner stage 2	0 (0%)		0 (0%)
Tanner stage 3	0 (0%)		0 (0%)
Tanner stage 4	0 (0%)		0 (0%)
Tanner stage 5	0 (0%)		0 (0%)
Not recorded	5 (19%)		3 (60%)
Follow up treatment – Adalimumab	**National results N (%)**		
Patient compliance since last review	**Crohn's disease (n=27)**	**Ulcerative colitis (n=0)**	**IBD type unspecified (n=5)**
Has the patient reported compliance with the planned maintenance regime since the previous review			
Yes	25 (93%)		3 (60%)
No	2 (7%)		0 (0%)
Not recorded	0 (0%)		2 (40%)
If incomplete compliance			
Number of missed doses	0 (0%)		NA
Increased interval between doses	2 (100%)		NA
Patient missed out some treatment weeks	0 (0%)		NA
Patient stopped treatment	0 (0%)		NA
Other compliance difference	0 (0%)		NA
Follow up treatment – Adalimumab	**National results N (%)**		
PROM completion at this encounter	**Crohn's disease (n=27)**	**Ulcerative colitis (n=0)**	**IBD type unspecified (n=5)**
Has a PROM been completed at this encounter			
Yes, IBD PROM	1 (4%)		2 (40%)
Yes, IMPACT III	0 (0%)		0 (0%)
No, PROM not completed at this encounter	24 (89%)		3 (60%)
Not recorded	2 (7%)		0 (0%)
Follow up treatment – Adalimumab	**National results N (%)**		
Disease severity score	**Crohn's disease (n=27)**	**Ulcerative colitis (n=0)**	**IBD type unspecified (n=5)**
If the patient's diagnosis is Crohn's disease, the Harvey Bradshaw Index (HBI) or the Paediatric Crohn's Disease Activity Index (PCDAI) is completed			
HBI – Median (IQR)	5 (2, 6) (N=22)		NA
PCDAI – Median (IQR)	NA		NA
If the patient's diagnosis is ulcerative colitis, the Simple Clinical Colitis Activity Index (SCCAI) or the Paediatric Ulcerative Colitis Activity Index (PUCAI) is completed			
SCCAI – Median (IQR)	NA		NA
PUCAI – Median (IQR)	NA		NA

IBD related surgery

In total there were details of 335 IBD related surgical procedures entered to the biologics web tool, 30 submissions were excluded from analysis as either the type of surgical procedure undertaken or the date that the surgery was performed was not recorded. This left 305 submissions.

The 305 surgical submissions related to:

- 176 separate patients, giving a median of 1 procedure per patient (range 1-11 and IQR 1-2)
- 59 individual sites, giving a median of 3 procedures per site (range 1-39 and IQR 1-7)

The table below shows surgical procedures that were carried out pre and post initiation of biological therapy (Infliximab and Adalimumab combined). For the purpose of this analysis only those procedures that related to patients that had a date of initial treatment recorded within their initial treatment submission were included. The table contains data of 67 surgeries that were undertaken on 49 separate patients.

IBD related surgery	National results N (%)	
Number of procedures by type	Procedures Pre-biologic initiation	Procedures Post-biologic initiation
Right hemicolectomy	17 (27%)	1 (25%)
Total proctocolectomy ileoanal pouch	1 (2%)	0 (0%)
Total proctocolectomy permanent ileostomy	5 (8%)	0 (0%)
Colectomy ileostomy with retained rectal stump	5 (8%)	0 (0%)
Colectomy colostomy with retained rectal stump	0 (0%)	0 (0%)
Partial colectomy	0 (0%)	0 (0%)
Small bowel resection	11 (17%)	0 (0%)
Insertion of seton	5 (8%)	1 (25%)
Drainage of perianal sepsis	9 (14%)	1 (25%)
Gastric surgery	0 (0%)	0 (0%)
Stricturoplasty	2 (3%)	0 (0%)
Apendicectomy	1 (2%)	0 (0%)
Cholecystectomy	0 (0%)	0 (0%)
Radiological drainage of abscess	0 (0%)	0 (0%)
Other surgical procedure	7 (11%)	1 (25%)

Patient Reported Outcome Measures (PROMs)

PROMs measure quality from the patient perspective. They are measures of a patient's health status or health-related quality of life. They are typically short, self-completed questionnaires, which measure the patients' health status or health related quality of life at a single point in time. The health status information is collected from patients by way of PROMs questionnaires before, during and after an intervention (in this case the initiation of biological therapy) and provides an indication of the outcomes or quality of care delivered to patients.

Adult patients

The EQ5D™ is a standardised instrument for use as a measure of health outcome. It provides a simple descriptive profile and a single index value for health status. It was primarily designed for self-completion by respondents and is ideally suited for use in clinics. The EQ5D is a descriptive system of health-related quality of life states consisting of five dimensions (mobility, self-care, usual activities, pain/discomfort, anxiety/depression) each of which can take one of three responses. The responses record three levels of severity (no problems/some or moderate problems/extreme problems) within a particular EQ5D dimension.

There were 36 completed and locked IBD PROM submissions entered at initial infusion (baseline) for 36 individual patients. The EQ5D component of the IBD PROM form at this point gives a median score of 0.71 (IQR 0.60, 0.76)

16 of these patients completed a total of 19 IBD PROM forms at subsequent follow up appointments. The median score at follow up was 0.73 (IQR 0.66, 0.76). Change in scores between baseline and follow up infusion was calculated (Median 0, IQR -0.06, 0.08) which unsurprisingly on such small numbers did not reveal a particularly relevant finding.

Paediatric patients

The IMPACT III is a health-related quality of life questionnaire for paediatric patients with IBD. Originally developed in Canada, the IMPACT III (UK) has been shown to be a valid tool to measure quality of life in British children with IBD[3]. Outcome measures have traditionally relied on disease activity indexes but these measures fail to assess the patient subjective view of their experience.

[3] Validation of an Instrument to Measure Quality of Life in British Children With Inflammatory Bowel Disease. Ogden, C.A.; Akobeng, A.K.; Abbott, J.; Aggett, P.; Sood, M.R.; Thomas, A.G. Journal of Pediatric Gastroenterology & Nutrition. 53(3):280-286, September 2011

There were 10 paediatric patients that completed the IMPACT III PROM at the point of initial infusion. Median score was 112 (IQR 98, 146)

5 of these patients completed a total of 6 IMPACT III PROM forms at subsequent follow up appointments. Median score was 145 (IQR 137, 158). Change in scores between baseline and follow up infusion was calculated (Median 20, IQR 6, 25)

A detailed analysis of this data requires data on a larger number of patients.

Appendix 2: Methodology and sample

Methods

The audit methodology was designed to be undertaken in a prospective manner, with data collection taking place in 'real time' during the clinical appointment with the patient.

Datasets and standards used in the biologics audit (2010) data collection process

- NICE guidelines:
  - Crohn's disease – Infliximab (review) and Adalimumab (review of TA40) (TA187) MTA
  - Ulcerative colitis (acute exacerbations) - Infliximab (TA 163)
  - Ulcerative colitis (sub-acute manifestations) – Infliximab (TA 140)
- Mowat C et al. Guidelines for the management of inflammatory bowel disease in adults. GUT. 2011; 60 (5): 571-607
- www.ibdstandards.org.uk

Data collection tool

The web tool included context specific online help including definitions and clarifications, internal logical data checks and feedback to enable more complete and accurate data. Sites accessed the datasets by using unique identifiers and passwords and data could be saved during, as well as at the end of, an input session

Recruitment

Three individuals from each hospital were approached at the onset of round 3 of the audit: a lead clinician, lead surgeon and a lead from within their clinical audit department. An overall 'audit lead' (usually a consultant gastroenterologist) from each site was then identified following local discussion. This 'audit lead' was responsible for ensuring the quality of data collection and entry for their particular site. Trust/health board chief executives were alerted to the audit.

Hospitals are eligible to participate in the biologics element of the audit if they prescribe and administer either Infliximab or Adalimumab to their IBD patients.

At each participating site the lead clinician is provided with a unique username and password and help booklets. The lead clinician is asked to identify and approve any further users at their site. A telephone and email helpdesk is provided by the Clinical Effectiveness & Evaluation Unit at the Royal College of Physicians in order to answer any individual queries about the audit.

Data required

Only data that are locked at a participating site can be included in any central analysis. To be locked, a submission must have all mandatory fields completed. Sites are able to enter data in addition to those identified as mandatory to enable them to make full use of all of the additional functionality that is available via the web tool.

Inclusion and exclusion criteria

Only those patients with diagnosed IBD; ulcerative colitis, Crohn's disease and IBD-type unspecified that are started on biological therapy (Adalimumab or Infliximab) for the purpose of the treatment of their IBD are to be included. Patients of all ages are included in the audit. Hospitals that do not provide any biological treatment to their IBD patients are excluded from participation.

Presentation of results

National results are presented as percentages for categorical data and as median and inter-quartile range (IQR) for numerical data.

Audit governance

The biologics audit is integral to the UK IBD audit that is directed by a collaborative partnership between gastroenterologists (the British Society of Gastroenterology), colorectal surgeons (the Association of Coloproctology of Great Britain and Ireland), Patients (Crohn's and Colitis UK), Physicians (the Royal College of Physicians of London) together with paediatric gastroenterologists (The British Society of Paediatric Gastroenterology, Hepatology and Nutrition).

This report follows the publication by the UK IBD Audit Steering Group of: the national organisational audit reports of paediatric and adult IBD services in the UK (May 2011); the national clinical audit reports of adult and paediatric inpatient care (February 2012); the national report of the UK IBD audit 3rd round inpatient experience questionnaire responses and the inaugural national report of the primary care questionnaire responses, both in April 2012. These reports enable sites to not only benchmark their provision of both service and care against national standards, but also to identify areas of improvement and monitor change from the previous rounds of audit in 2008 and 2006.

The audit is commissioned by the Health Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP) with additional funding from Health Improvement Scotland. The audit is co-ordinated by the Clinical Effectiveness and Evaluation unit (CEEu) of the Royal College of Physicians of London. Each hospital identified an overall clinical lead that was responsible for data collection and entry for their IBD Service. Data were collected by hospitals using a standardised method. The audit was guided by the multidisciplinary UK IBD Audit Steering Group which oversaw the preparation, conduct, analysis and reporting of the audit. Any enquiries in relation to the work of the UK IBD audit can be directed to: ibd.audit@rcplondon.ac.uk

Appendix 3: Abbreviations

Abbreviation	Full title
5ASA	5-Aminosalicyclic acid
ADA	Adalimumab
Anti TNF□	Anti-Tumour Necrosis Factor Alpha
BSG	British Society for Gastroenterology
BSPGHAN	British Society for Paediatric Gastroenterology Hepatology and Nutrition
CD	Crohn's disease
CEEu	Clinical Effectiveness and Evaluation Unit
CRP	C-Reactive Protein
HQIP	Health Quality Improvement Partnership
IBD	Inflammatory Bowel Disease
IFX	Infliximab
IQR	Inter-Quartile Range
MG/DAY	Milligrams per Day
NCAPOP	National Clinical Audit and Patient Outcomes Programme
NICE	National Institute for Health and Clinical Excellence
RCN	Royal College of Nursing
RCP	Royal College of Physicians
UC	Ulcerative colitis
UK	United Kingdom

Appendix 4: Members of the UK IBD Audit Steering Group

Dr Ian Arnott, Chair and clinical lead of the UK IBD audit and consultant gastroenterologist, Western General Hospital, Edinburgh

Association of Coloproctology of Great Britain and Ireland

- Mr Bruce George, consultant colorectal surgeon, John Radcliffe Hospital
- Mr Graeme Wilson, consultant colorectal surgeon, Western General Hospital, Edinburgh

British Dietetic Association

- Ms Miranda Lomer, consultant dietician, Guy's and St Thomas' NHS Foundation Trust

British Society of Gastroenterology

- Dr Stuart Bloom, consultant gastroenterologist, University College Hospital
- Dr Keith Bodger, consultant physician & gastroenterologist, University Hospital Aintree
- Dr Barney Hawthorne, consultant gastroenterologist, University Hospital of Wales
- Professor Chris Probert, consultant gastroenterologist, Bristol Royal Infirmary
- Professor Jonathan Rhodes, professor of medicine, University of Liverpool
- Mrs Chris Romaya, executive secretary
- Dr Ian Shaw, consultant gastroenterologist, Gloucestershire Royal Hospital
- Dr Abraham Varghese, consultant gastroenterologist, Causeway Hospital

British Society of Paediatric Gastroenterology, Hepatology and Nutrition

- Dr Sally Mitton, consultant paediatric gastroenterologist, St George's Hospital
- Dr Richard Russell, consultant paediatric gastroenterologist, Yorkhill Hospital, Glasgow

Health Services Modernisation

- Mr John Frankish, Aneurin Bevan Health Board

Crohn's and Colitis UK (NACC)

- Mr Richard Driscoll, chief executive
- Ms Elaine Steven, vice-president

Primary Care Society for Gastroenterology

- Dr John O'Malley, clinical director, All Day Health Centre, Arrowe Park Hospital

Royal College of Nursing Crohn's and Colitis Special Interest Group

- Ms Karen Kemp, IBD clinical nurse specialist, Manchester Royal Infirmary
- Ms Allison Nightingale, IBD clinical nurse specialist, Addenbrooke's Hospital

Royal College of Physicians

- Ms Rhona Buckingham, manager, Clinical Effectiveness and Evaluation Unit
- Mr Calvin Down, project manager, UK IBD audit
- Ms Jane Ingham, director, Clinical Standards Department
- Miss Aimee Protheroe, project coordinator, UK IBD audit
- Dr Jonathan Potter, clinical director, Clinical Effectiveness and Evaluation Unit *(Retired May 2011)*
- Dr Kevin Stewart, clinical director, Clinical Effectiveness and Evaluation Unit *(August 2011)*
- Professor John Williams, consultant gastroenterologist, Abertawe Bro Morgannwg University NHS Trust & Director of Health Informatics Unit

Royal Pharmaceutical Society of Great Britain

- Ms Anja St. Clair-Jones, lead pharmacist-surgery and digestive diseases, Royal Sussex County Hospital

Appendix 5: Participating sites

Each of the sites listed below contributed to this inaugural interim biologics audit report, submitting one or more (locked or unlocked) cases for inclusion:

Adult sites

- Addenbrooke's Hospital
- Airedale General Hospital
- Arrowe Park Hospital
- Basildon Hospital
- Bedford Hospital
- Belfast City Hospital
- Blackpool Victoria Hospital
- Borders General Hospital
- Bradford Royal Infirmary
- Bronglais General Hospital
- Calderdale & Huddersfield NHS Foundation Trust (Huddersfield Royal Infirmary and Calderdale Hospital combined)
- Chesterfield Royal Hospital
- Colchester General Hospital
- Countess of Chester Hospital
- Crosshouse Hospital
- Darent Valley Hospital
- Derriford Hospital
- East and North Hertfordshire NHS Trust (Lister Hospital & Queen Elizabeth II Hospital combined)
- Epsom General Hospital
- Freeman Hospital
- Glasgow Royal Infirmary
- Gloucestershire Hospitals NHS Foundation Trust (Gloucestershire Royal and Cheltenham General Combined)
- Good Hope Hospital
- Homerton University Hospital
- Hull and East Yorkshire NHS Trust (Hull Royal Infirmary and Castle Hill Hospitals Combined)
- Imperial College Healthcare NHS Trust (Charing Cross, Hammersmith and St Mary's Hospitals Combined)
- James Cook University Hospital
- James Paget Hospital
- John Radcliffe Hospital
- Kent & Sussex Hospital
- Kettering General Hospital
- King George Hospital
- King's College Hospital
- Kingston Hospital
- Leeds Teaching Hospitals NHS Trust (Leeds General Infirmary & St James's Hospital combined)
- Mayday Hospital
- Monklands Hospital
- Musgrove Park Hospital
- Nevill Hall Hospital
- Ninewells Hospital
- Norfolk & Norwich University Hospital
- North Bristol NHS Trust (Frenchay and Southmead Hospitals combined)
- North Manchester General Hospital
- North Middlesex University Hospital
- North Tyneside General Hospital
- North West London Hospitals NHS Trust (St Mark's & Northwick Park Hospitals combined)
- Pinderfields General Hospital
- Queen Elizabeth Hospital
- Queens Hospital
- Raigmore Hospital
- Rotherham Hospital
- Royal Bolton Hospital
- Royal Bournemouth Hospital
- Royal Cornwall Hospital
- Royal Derby Hospital
- Royal Devon & Exeter Hospital
- Royal Free Hospital
- Royal Gwent Hospital
- Royal Liverpool University Hospital
- Salford Royal Hospital
- Salisbury District General Hospital
- Sandwell and West Birmingham Hospitals NHS Trust (City Hospital and Sandwell Hospital Combined)
- Scarborough General Hospital
- Sheffield Teaching Hospitals NHS Foundation Trust (Royal Hallamshire Hospital & Northern General Hospital Combined)
- Sherwood Forest Hospitals NHS Foundation Trust (King's Mill Hospital & Newark Hospital Combined)
- Shrewsbury & Telford Hospital NHS Trust (Royal Shrewsbury Hospital & Princess Royal Hospital, Telford combined)

- South Tyneside District Hospital
- Southport & Formby District General Hospital
- St Mary's Hospital
- Stepping Hill Hospital
- Stirling Royal Infirmary
- Stoke Mandeville Hospital
- Sunderland Royal Hospital
- The Lewisham Hospital
- Ulster Hospital
- University College Hospital
- University Hospital Birmingham NHS Foundation Trust (Queen Elizabeth Hospital, Birmingham & Selly Oak Hospital combined)
- University Hospital Llandough
- University Hospital of North Durham
- University Hospital of North Tees
- University Hospital of Wales
- University Hospital, Aintree
- University Hospitals Coventry & Warwickshire NHS Trust
- Walsall Manor Hospital
- West Middlesex Hospital
- Western General Hospital
- Western Sussex Hospital Trust (Worthing and Southlands combined)
- Whiston Hospital
- Withybush General Hospital
- Worcestershire Acute Hospitals NHS Trust Worcestershire Royal Hospital & Alexandra Hospital combined)
- Wrexham Maelor Hospital
- Yeovil District Hospital
- York Hospital

Paediatric sites

- Addenbrooke's Hospital (Paediatric Gastro unit)
- Alder Hey Children's Hospital
- Barts and The London Children's Hospital
- Birmingham Children's Hospital
- Dept of Child Health, University Hospital of Wales
- Leicester Royal Infirmary Children's Hospital
- Norfolk and Norwich University Hospital (Paediatric Gastroenterology)
- North-East Scotland Paediatric Gastroenterology Network (Royal Aberdeen Children's Hospital, Ninewells Hospital and Raigmore Hospital combined)
- Nottingham Children's Hospital
- Oxford Children's Hospital
- Royal Hospital for Sick Children, Edinburgh
- Sheffield Children's Hospital
- Southampton Children's Hospital
- St George's Hospital (Paediatric Gastro unit)
- Yorkhill Children's Hospital

Appendix 6: Example of the 'patient summary report' produced from the biologics audit web tool

UK Inflammatory Bowel Disease Audit
Biologics Audit – Patient Summary

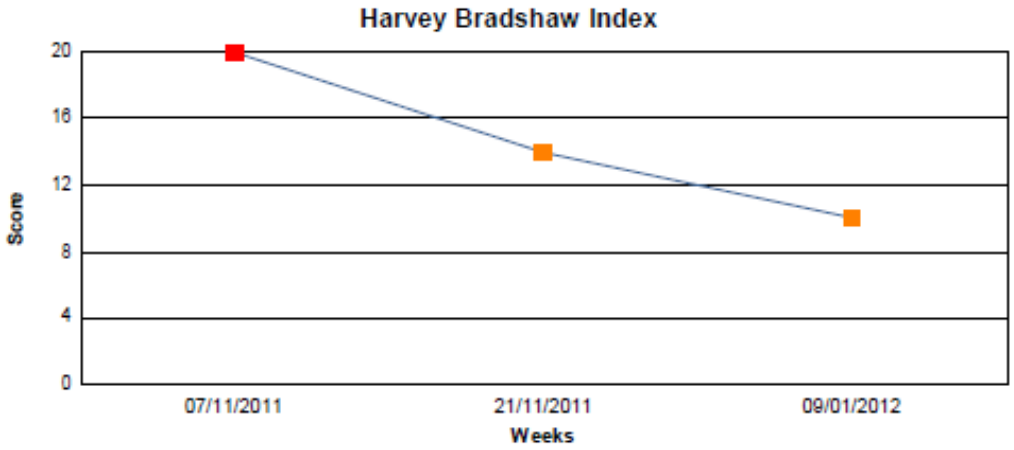
Summary of Biological Therapy for:
An Example, 123-123-1234 as at 03 May 2012

Current age	31	
Disease diagnosis	Crohn's Disease	
Year of diagnosis	2011	
Distribution of disease prior to initiation with Anti TNF treatment	Perianal	
Disease type	Stricturing	
Clinical indication for treatment	Active luminal Crohn's disease	
Treatment type	Infliximab	
Date of initial Anti-TNF treatment	07 November 2011	
12 month review due by	06 November 2012	
Infliximab treatment history (in mg)	09 January 2012 21 November 2011 07 November 2011	10 mg/kg 10 mg/kg 10 mg/kg
Surgery since being diagnosed with IBD and throughout Anti-TNF treatment	02 November 2011	Drainage of perianal sepsis
Acute treatment reactions recorded at Infliximab infusions	09 January 2012 21 November 2011	Dizziness Dizziness
Adverse events during Anti-TNF treatment recorded at most recent Infliximab infusion or Adalimumab review	21 November 2011	Infection

UK Inflammatory Bowel Disease Audit
Biologics Audit – Patient Summary

Summary of Biological Therapy for:
An Example, 123-123-1234 as at 03 May 2012

Disease Severity over the course of Anti TNF Treatment



Appendix 7: The UK IBD audit biologics audit system and hosted server security details

UK Inflammatory Bowel Disease Audit
Biologics Audit system and hosted server Security Details

www.ibdbiologicsaudit.org

For further information contact: biologics.audit@rcplondon.ac.uk

Table of contents

Overview

This document aims to provide information on the security and encryption measures used on the server hosting the Biologics Audit managed by the UK IBD Audit project team.

Note that this document attempts to summarise and give an overview of security measures in place, whilst there may be specific details that have not been mentioned, security procedures designed by Microsoft and industry standard bodies have been followed.

The contracted system developer has also implemented the recommended procedures contained within the NHS "*Securing Web Infrastructure and supporting services Good Practice Guideline*"

Details will be provided on the following:

Physical data centre
- Location
- Security
- Admission control
- Climatisation
- Electricity
- Fire Protection

Operating system
- Version
- User access
- Security
- Encryption
- Updates and patches
- Backups

Database software
- Version
- User access
- Encryption

Application software
- Source control
- User access
- Encryption

Physical data centre

Location
The system developer utilises servers provided by Serverloft, live servers are located in Germany whilst the development server is located in the USA.

Security
The serverloft data centres are protected 24/7 by a security service. Powerful video surveillance of the external facilities and of the entrance areas as well as the internal facilities ensures that no unauthorized persons can enter the technical service area.

Admission Control
Photo recognition systems, biometric palm scanners, and card systems on all inner doors allow only authorized persons to enter the data centres. The security doors with safety glass and steel walls in the entrance and exit areas complete the data centres' comprehensive security concept.

Climatisation
The climatisation of the serverloft data centres follows the principle of N+1 redundancy on full load. All climate modules have a standby compressor and are fed in turns over a redundant climate circuit (a and b). Each circuit consists of a running and a standby pump. Only about 75 % of the available cooling capacity is needed to run the data centres at full load.

Electricity
The permanent power supplies are secured by a sophisticated redundancy concept of multiple power suppliers with several uncrossed conductors. If there is a power outage in spite of this, a UPS (uninterruptible power supply) guarantees that all important components are supplied with power until the emergency power generators take over. For stability reasons, multiple emergency power generators have been installed.

- Capacity: 36 hours at full load
- Refuelable during operation
- Contract enabling refuelling within 180 minutes 24/7

Fire Protection
Two-stage detection systems as well as three-stage fire protection ensure operation even in case of a fire. Early detection systems for smoke and the automatic peripheral sprinkler systems (Marioff Hi-Fog-System) provide timely protection for the critical systems in the data centres and serverloft hardware against fire damage.

Operating System

Version
Windows server 2008

User access
Access to the backend of the server and its associated systems is available to employees of the contracted system developers. Each user has a separate account with a very strong password controlled by password policies. All built in administrator and guest accounts are disabled and service accounts are separate and restricted.

Security
Antivirus, intrusion detection and firewall software is installed on all servers. Firewalls have been restricted to only allow incoming connections from required ports and where possible there ports have been restricted to specific IP addresses as well. File and directory level permissions have been specified for all service accounts. Any unnecessary privileges, services and applications removed.

Encryption
Access to web applications is only available using SSL (443), each application has a valid secure certificate. Further to this the data drives of the server are encrypted using bit locker with the keys only being available to the contracted system developers.

Updates and patches
Anti-virus and intrusion prevention signatures are applied immediately, whilst operating system and server updates and patches are evaluated on our test servers before being applied to the live sites. This is done as soon as practically possible after a new update has been made available.

Backups
Backups are run nightly and are securely stored on the server and 2 off site locations. Each backup is encrypted and transferred either via secure FTP or over our internal VPN, this secures them in transport as well.

Database software

Version
Microsoft SQL server 2008

User access
Access is available only to windows users and service accounts; the SQL user function has not been enabled.

Encryption
The database is encrypted using Transparent Data Encryption this is a technology employed by both Microsoft and Oracle to encrypt database content. TDE offers encryption at a column, table, and tablespace level. TDE solves the problem of protecting data at rest, encrypting databases both on the hard drive and consequently on backup media.

Application software

Source Control
All copies of the source code are kept in 2 locations and are accessible only by users of WestCliff Solutions.

User access
User access is controlled by username and password, the password is controlled by a policy that requires at least 8 characters, at least 1 numeral and at least 1 capital. When a new user is registered they are sent 2 separate emails, 1 containing their username and 1 containing their password.

Every time a new page or section of the application is accessed the user credentials are checked to ensure that a user cannot access data that they do not have permissions for.

Encryption
Password and fields containing sensitive information (e.g. Patient identifiable data) are encrypted within the database using an internal key. This key is contained with the application source code and is only accessible to employees of the contracted system developers.

Overall this means that the data is encrypted 3 times, first at disk level, then at file level and finally the patient identifiable fields are encrypted within the database itself. This provides an extremely secure level of protection that is robust and well within recommended guidelines.

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