1. Introduction and Who Guideline applies to

1.1 The purpose of the guideline is to

a) provide patient safety by ensuring pre-treatment investigations, screening and pre-infusion examinations are performed prior to administration of Infliximab.

b) To ensure that Infliximab is prescribed appropriately within the context of published National Institute of Care and Clinical Excellence (NICE) guidance and local UHL guidance.

c) To outline the process of prescribing and administering of Infliximab for adult patients within a Hospital setting. (see formulary for currently used products)

1.2 The guideline applies to all staff who are involved in prescribing and administering Infliximab in a Hospital setting. The patient cohort comprises of adult patients with Gastroenterological, Dermatological and Rheumatological conditions requiring treatment with Infliximab

Key Changes made during review –
- Removal of EBV and CMV as required pre-screening tests
- Typographical changes
- Updated gastroenterology pre-screen checklist to current version (appendix 1)
- Clarified that prescriber has overall responsibility for checking baseline investigations

2. Guideline Standards and Procedures To support the process of prescribing and administering Infliximab for Adult patients within an Adult Day Case setting

2.1 Definitions

Word/Term	Descriptor
Infliximab, available as; **Remicade® (originator product)** **Remsima® (biosimilar product)** **Inflectra® (biosimilar product)**	Tumour necrosis factor alpha (TNF-α) inhibitor for the treatment of Rheumatoid Arthritis, Ankylosing Spondylitis, Psoriatic Arthritis, Crohns Disease, Ulcerative Colitis and Psoriasis
Infusion reaction	Adverse symptoms occurring within 1-2 hours of infusion.

2.2 Specific Roles and Responsibilities for staff groups

Post/Group staff	Details
Prescribers, working within Gastroenterology / Rheumatology and Dermatology	• to assess patients and carry out pre-treatment investigations • prescribe Infliximab by brand (see formulary for currently used products) for adult day case patients • dose calculations and selection of the correct dose using the dose band/ dose specific tables • audit and review of process
Prescribers working within Gastroenterology / Rheumatology and Dermatology It is prescriber's responsibility to check results satisfactory prior to prescribing cycle 1.	Baseline investigations and interpretation of results prior to first infusion (see appendix 1 for Gastroenterology patients) as follows; • Check medical History to assess risk of for Tubercle Bacillus (TB) • Quantiferon testing and subsequent T-SPOT testing if quantiferon result is equivocal • Chest X-ray (CXR) to see if evidence of active or latent TB • Virology; Varicella Zoster (VZV IgG), Hepatitis B (surface antigen and core antibody), Hepatitis C & HIV • Amoebic serology (Gastroenterology patients) • Stool sample for clostridium difficile toxin, entamoeba histolytica PCR (polymerase chain reaction) and bacterial culture MC&S (microscopy,culture and sensitivity) (Gastroenterology patients) • Stool sample for ova, cysts and parasites (OCP),foreign travel dependent, (Gastroenterology) NB pre-screening stool samples for parasitic infections should not delay Infliximab initiation for inpatients. Treatment with metronidazole will provide antimicrobial cover pending results. • Fasting lipids/glucose (Dermatology) • ANA/dsDNA (anti-nuclear antibodies/double stranded DNA) (Rheumatology & Dermatology patients) • Urinary pregnancy test as appropriate • FBC, LFTs, U&Es,CRP, serum albumin and calcium levels. • For subsequent infusions, order FBC, U&Es, LFTs and CRP 1 week prior to date of infusion.

Post/Group staff	Details
Designated Nurse responsible for the Infusion of Infliximab	• Carry out baseline observations; blood pressure, pulse, temperature and weight. • Check blood results to ensure these are normal and do not show evidence of infection or suppressed white cell counts. • Urine dip on arrival to clinic • Ensure no evidence of sepsis or clinically manifested infection. – using Sepsis screening tool • Cannulate patient • Prepare infliximab infusion as per UHL Intravenous administration guidelines • maintain a record of patients receiving infliximab and document product used by brand name, batch number and expiry date • selection of the correct brand of Infliximab as prescribed • dose calculations based on weight of patient • provide an independent check of prepared infusions • administration of infliximab • monitoring patients during and for a defined period post infusion

2.3 Prescribing of Infliximab in a Daycase or Inpatient setting

a) Complete all details on the prescription chart (paper or electronic). This includes patient name, date of birth, address and hospital number. An addressograph is sufficient.

b) Complete the allergy section of the chart and document the patient's weight.

c) **Dose** - Initially **5mg/kg** for all licensed indications with the **exception** of **3mg/kg** in Rheumatoid Arthritis.

d) Dose escalation up to 10mg/kg, under specialist supervision may occur in patients with a loss of response to or with an inadequate response to lower doses of Infliximab. Refer to The Electronic Medicines Compendium https://www.medicines.org.uk/emc/ for specialist literature for further dosing information.

e) Patients not previously treated with infliximab require initial loading with an infusion usually given at weeks 0, 2, 6 and then 8 weekly thereafter (maintenance). Annotate infusion number on the drug chart.

f) Prescribe Infliximab by brand; see formulary for currently used product. Calculate dose in mg/kg, select the most appropriate dose from the dose banding /dose specific tables (below), prescribe dose on the drug chart, sign and date the prescription**.**

g) **Dose review** – in some cases the frequency of administration may be altered following consultant review.

h) **Adjunctive drugs** - sign the reverse of the prescription chart or prescribe as required medications; paracetamol (PO), chlorphenamine IV/PO, hydrocortisone IV and salbutamol nebules as needed in the event of an infusion reaction.

2.4 DOSE CALCULATION (for Adult Day Case patients)

Approach to dose banding for Infliximab

The principles of this are:-

- Doses are banded to within +/-10% variance of the actual dose.
- The banded doses are incremented in 25mg (low doses) or 50mg increments (higher doses)
- The banded doses are where possible whole or half vials
- The banded dose is the mid point of the dose range.

Calculation of the banded dose:-

A table is provided to help prescribers calculate the banded dose.

- Use the pre calculated **Dose Specific** tables for 3mg/kg or 5mg/kg
- Look up the patients weight and find the weight range
- Read off the corresponding banded dose for 3mg/kg or 5mg/kg.

  OR

  Using the **Dose Banding** tables
- Calculate the actual patient dose based on 3mg/kg or 5mg/kg, or other dose.
- Look up where the actual dose falls in the table and read off the banded dose.

Dose modifications

If the dose needs to be increased/ decreased the prescriber can either ;

- Re calculate the required dose and find the new banded dose from the dose range chart

OR

- Use the banding chart and increase/decrease the dose by a number of dose bands.

Dose-specific Tables for Dose Banding Infliximab

Weight (kg)	33-37	37-46	46-54	54-62	62-75	75-92	92-108	108-125	125-142
3mg/kg	100	125	150	175	200	250	300	350	400

Weight (kg)	32-37	37-45	45-55	55-65	65-75	75-85	85-95	95-105	105-115	115-125	125-135	135-145
5mg/kg	175	200	250	300	350	400	450	500	550	600	650	700

Please note that a patient will move into the next band once their weight reaches the upper weight limit of that band e.g. a patient weighing 44.99kg will fall into the 37-45kg band and a patient weighing 45.0kg will fall into the 45-55kg band

2.5 Dose Banding Table – Infliximab

Vial Sizes of Drug	100mg/100mL	Drug	Infliximab

Master Bands and Ranges

Band Range (mg)		Band Dose (mg)	Variance (%)	
From	To		Below	Above
100	112	**100**	0	10.71
112	137	**125**	11.61	8.76
137	162	**150**	9.49	7.41
162	187	**175**	8.02	6.42
187	225	**200**	6.95	11.11
225	275	**250**	11.11	9.09
275	325	**300**	9.09	7.69
325	375	**350**	7.69	6.67
375	425	**400**	6.67	5.88
425	475	**450**	5.88	5.26
475	525	**500**	5.26	4.76
525	575	**550**	4.76	4.35
575	625	**600**	4.35	4.0
625	675	**650**	4	3.7
675	725	**700**	3.7	3.45

Nurse Proforma for Administration of Infliximab

NHS
University Hospitals of Leicester
NHS Trust

Patient ID Label

Product:

☐ REMICADE ☐ REMSIMA ☐ INFLECTRA

Date/Time of infusion: .....

Weight (taken immediately before each infusion): .....

To enable calculation of next dose

☐ Record baseline observations and NEWS score – if any deterioration or sign of infection report to doctor and request review.

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Name ..... Date .....

☐ Test urine and record. If urine infection suspected, send MSU and rebook patient for following week.

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Name ..... Date .....

☐ Check bloods have been taken within 2 weeks although usual practice is within 1 week for FBC, U&E, LFT, CRP. Record any abnormality and request medical review if required.

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Name ..... Date .....

(Hal)12181217551

☐ When indicated by the Physician or Specialist nurse, Infliximab trough levels are to be taken on the day of infusion and **prior** to infusing Infliximab.

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Name ..... Date .....

☐ Treatment protocol: Induction at Week 0, Week 2, Week 6 – These doses to be administered over 2 hours with a 2 hour wait post treatment. Observations recorded and deteriorating NEWS to be reported and acted upon.

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Name ..... Date .....

☐ Maintenance treatment to be commenced at 8 Week intervals – unless requested different frequency

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Name ..... Date .....

☐ Subsequent infusions may be given over 1 hour with a 30 minute wait on ward.
Patient preference may be different.

Whilst the shortened monitoring period is outside of the licensing agreement for Infliximab it is evidenced[1] and anecdotally based. Patients must be informed and consent to leave if this period is within ONE hour of the end of the infusion.

☐ Prepare infusion for those patients not suitable for ready made bags in line with UHL policy, ensuring there is a 0.2micron filter within the administration set.

☐ Check whether patient requires any premedication. Ensure this is given (if required) prior to administration – this is not required on most patients.

☐ Monitor patient throughout infusion, undertake NEWS observations and record and report any deterioration or deviation from baseline.

☐ Mild to Moderate allergic reactions:

- ◯ Occur most frequently during first and second infusion
- ◯ Symptoms include shortness of breath, mild chest discomfort, flushing, rash, urticaria, itching, nausea, fatigue, headache, fever, chills, and dizziness.
- ◯ Action: Report immediately to doctor and record in medical notes. Stop infusion and restart after 30 minutes at a lower rate, administer paracetamol 1g PO (if patient has not had any within 4 hours), administer chlorpheniramine 10mg IV over 1 minute.

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Name ..... Date .....

☐ Severe allergic reactions:

- ◯ Symptoms include bronchospasm (cough/wheeze/dysponoea, angio oedema of upper airway, hypotension (BP <40mmHg from baseline, anaphylaxis.

Action: STOP infusion, urgent medical assistance dial 2222, place patient in recumbent position, commence oxygen (hi flow), follow guidelines for treatment of anaphylaxis – check INSITE for most up-to-date guidelines.

(There is a no Gastroenterology SpR on call out of hours and patient should be advised to present to the Emergency Department if they experience any problems)

Record below:

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Name ..... Date .....

☐ Discharge: Ensure cannula is removed, complete cannula pathway, ensure NEWS is stable. Ensure next appointment is booked, written on Day Case Appointment card. Ensure the patient is aware of potential side effects and advise them to contact the Inflammatory Bowel Disease (IBD) nurse specialist during normal working hours (0116 2584352). Out of hours the patient should be advised to contact NHS 111 service or present to the Emergency Department.

☐ Please advise the patient to seek immediate medical assistance if they experience any delayed allergic reaction – symptoms may include acute shortness of breath, severe chest pain, throat or tongue swelling.

NB: Some patients may form antibodies towards infliximab which may increase the likelihood of infusion related reactions and will reduce the effect of the medication. Some patients may develop "double stranded DNA antibodies" which may cause lupus like symptoms – rash, arthralgia, serosis, nephritis – these should resolve with discontinuation of infliximab.

☐ Next appointment:

Date: ..... Time: .....

EVALUATION – continuation if required. PLEASE DATE AND TIME ALL ENTRIES

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Please ensure that the proforma is filed within the medical notes on discharge, an ICE letter is completed.

Signed ..... Date .....

3. Education and Training

Staff involved in the administration of infliximab must have completed the Trust IV drug administration training and read this Guideline prior to administering the medication.

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Prescribing adherence to dose banding	Annual audit	Commissioning Pharmacist	Annual	Present to Q&S relevant to Clinical speciality
Adherence to pre-screening tests prior to commencement of Infliximab	Annual audit	Commissioning Pharmacist	Annual	Present to Q&S relevant to Clinical speciality

5. Supporting References

Donnellan CF, Fairclogh A, Warren L, Hamlin PJ. (2010) Accelerated Infliximab Infusions are Safe and Well Tolerated in patients with Inflammatory Bowel Disease. Poster Presentation. British Society of Gastroenterology

Electronic Medicines Compendium (accessed 2.11.2023). Summary of Product Characteristics for *Remicade®, Remsima®and Inflectra®* http://emc.medicines.org.uk (the Trust is not responsible for the content of external websites)

National Institute of Clinical Excellence (NICE). Clinical guidelines NICE TA187 – Crohn's Disease; NICE TA134 – Psoriasis; NICE TA163/NICE TA 329 – Ulcerative Colitis; NICE TA375 – Rheumatoid Arthritis. Available via www.NICE.org.uk . Reviewed as current on 13/11/2023

The Injectable Medicines Guide -Medusa. Available via UHL intranet

6. Key Words

Infliximab, Remicade® , Remsima® ,Inflectra®,

CONTACT AND REVIEW DETAILS	
Guideline Lead: Adrian Nicholson, Pharmacist **Louise Garbett, Nurse Ward Manager** **Dr A Moorthy (Head of Service Rheumatology)** **Dr K Harman (Consultant Dermatology)** **Dr P Hooper (Consultant Gastroenterologist, Biologics Lead for Gastroenterology)**	**Executive Lead: Medical Director**

Appendix 1 - For Gastroenterology inpatients

INPATIENT BIOLOGIC PRE-SCREENING CHECKLIST

INSERT PATIENT STICKER HERE

Diagnosis:	Consultant:
Weight:	Biologic:
Allergies:	Date of decision:

	TEST	DATE requested	Date sent	Result and date
VIRAL SCREEN VZV once, other viral screens valid for 6 months (check prior to admit)	VZV IgG (only once)			
	HIV 1 & 2			
	Hep B core antibodies			
	Hep B surface antigen			
	Hep C antibody			
TB SCREEN	QuantiFERON Valid for 6 months Use 4 special bottles **Not for phleb round** T-spot (if QuantiFERON unequivocal) must be booked with immunology			
	CXR valid for 12 months *When requesting note "to exclude pulmonary TB and review heart size as per pre-biologics screen".*			
PARASITE SEROLOGY SCREEN	Amoebic serology (blood test) Valid for 6 months **Not for phleb round**			
STOOL SAMPLE SCREEN Valid for 6 months	C.diff toxin			
	Bacterial culture (MC&S)			
	Ova, cysts and parasites *-applicable if travelled outside Europe/N America*			
	Entamoeba histolytica PCR			

Has the patient had any live vaccinations in the past 4 weeks? YES/NO
Is there a chance the patient might be pregnant? YES/NO
Have the investigations already been requested? YES/NO
Patient's **Underlying Diagnosis, Weight, Allergies, Name of biologic started, Date started, Dose given** Emailed to:

- *IBD Nurses*
- *Biologics Support Service mailboxes*