

# Extracorporeal photopheresis for Crohn's disease

Interventional procedures guidance

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[www.nice.org.uk/guidance/ipg288](http://www.nice.org.uk/guidance/ipg288)

## Your responsibility

This guidance represents the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take this guidance fully into account, and specifically any special arrangements relating to the introduction of new interventional procedures. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the [Yellow Card Scheme](#).

Commissioners and/or providers have a responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with

those duties. Providers should ensure that governance structures are in place to review, authorise and monitor the introduction of new devices and procedures.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

# 1 Guidance

- 1.1 Current evidence on extracorporeal photopheresis (ECP) for Crohn's disease is based on reports that include a very small number of patients. These reports describe no major safety issues but they provide little evidence of efficacy. Therefore, this procedure should not be used outside the context of research.

## 2 The procedure

### 2.1 Indications and current treatments

- 2.1.1 Crohn's disease is a chronic inflammatory disorder that can affect any part of the gastrointestinal tract from the mouth to the anus, but most commonly causes inflammation and ulceration of the ileum and the colon. It may cause the intestine to develop fistulae to the bowel or skin, or strictures causing narrowing of the bowel. Symptoms of Crohn's disease include diarrhoea, weight loss, rectal bleeding and fever. Complications may include rectal abscesses and joint disease. Some people with Crohn's disease have long periods of symptom-free remission.
- 2.1.2 Disease severity is assessed using the Crohn's Disease Activity Index (CDAI), which ranges from 0 to 600 (a score lower than 150 indicates inactive disease; above 450 represents severe, active disease).
- 2.1.3 Conservative treatment includes dietary measures and drug therapy. Corticosteroids and immunosuppressive agents are used with the aim of controlling inflammation and other symptoms, and reducing relapse. Surgical

removal of the affected bowel is sometimes necessary but this is not curative as the disease can recur in other sites.

## 2.2 Outline of the procedure

- 2.2.1 Extracorporeal photopheresis involves drawing blood from the patient via a peripheral line. The leukocyte-containing buffy coat cells, which include mononuclear cells (one subgroup of which is the T-cells that are thought to be involved in Crohn's disease) and platelets are separated from the red blood cells. The red blood cells and the remaining plasma are then returned to the patient via the same indwelling catheter.
- 2.2.2 A photosensitive drug (8-methoxypsoralen) and an anticoagulant are added to the buffy coat cells, which are then passed through a sterile chamber and irradiated with ultraviolet light to activate the drug. The activated drug binds to the DNA in the buffy coat cells, arresting cell proliferation and initiating changes that lead to cell death.
- 2.2.3 The buffy coat cells are then returned to the patient. These re-infused dying cells produce a generalised immune response against the pathogenic T-cell clones that are involved in the pathogenesis of inflammation in Crohn's disease.
- 2.2.4 Extracorporeal photopheresis is usually carried out over 2 consecutive days at intervals of 2 to 4 weeks for about 20 treatment sessions. One extracorporeal photopheresis (ECP) session takes about 3 to 4 hours.

## 2.3 Efficacy

Sections 2.3 and 2.4 describe efficacy and safety outcomes which were available in the published literature and which the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the [overview](#).

- 2.3.1 In a case series of 28 patients (some refractory or intolerant to immunosuppressants or anti-tumour necrosis factor alfa agents) treated by ECP,

50% (14 out of 28) of patients reported a clinical response and 25% (7 out of 28) were in remission at 12-week follow-up. In a case series of 10 patients, a response (defined as a 50% reduction in steroid use) was seen in 8 patients (median follow-up of 10 weeks), with remission in 4 patients (defined by a CDAI score lower than 150 at median follow-up of 20 weeks). Three of the 4 patients remained in remission at the end of the follow-up period (mean 16.5 weeks; range 4 to 20 weeks).

2.3.2 In the case series of 28 patients the mean Inflammatory Bowel Disease Questionnaire score improved from 122 points at baseline to 154 points at 12-week follow-up (scoring system not defined;  $p < 0.001$ ).

2.3.3 The Specialist Advisers stated that key efficacy outcomes for this procedure included improved quality of life, reduction of bowel motion frequency and abdominal cramps, reduced steroid use and reduction in inflammatory markers such as faecal calprotectin.

## 2.4 Safety

2.4.1 In the case series of 28 patients, 7% (2 out of 28) of patients discontinued treatment because of adverse events. One patient had nausea and malaise, and one patient had increased C-reactive protein concentration and fever. Headaches and nasopharyngitis occurred in 29% (8 out of 28) of patients, and nausea occurred in 18% (5 out of 28) of patients.

2.4.2 Adverse events that followed the procedure in the case series of 10 patients and two case series each of 2 patients included two instances of asymptomatic hypotension, one of mild headache and one of a small haematoma at the infusion site. One patient developed monoclonal gammopathy. Worsening of anaemia following the procedure was reported in 3 patients.

2.4.3 The Specialist Advisers stated that published and anecdotal adverse events following this procedure include vasovagal episodes such as hypotension and fits, light sensitivity or allergy to the photoactivating agent, anaemia and central venous line infection. They added that theoretical adverse events include haemorrhage caused by heparin use and malignancy from light exposure.

## 3 Further information

- 3.1 NICE has produced [interventional procedures guidance on leukapheresis for inflammatory bowel disease](#) and [technology appraisal guidance on infliximab and adalimumab for the treatment of Crohn's disease](#).

## Sources of evidence

The evidence considered by the Interventional Procedures Advisory Committee is described in the [overview](#).

## Information for patients

NICE has produced [information for the public on this procedure](#). It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind.

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## Endorsing organisation

This guidance has been endorsed by [Healthcare Improvement Scotland](#).