

**Table 4****Medications used in inflammatory bowel disease, side effects and monitoring requirements**

| Medication                     | Side effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Monitoring                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5-ASA                          | <ul style="list-style-type: none"> <li>● Diarrhoea</li> <li>● Headache</li> <li>● Rarely, renal impairment<sup>1</sup></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Baseline U&E and eGFR then 2-3 months after commencing 5-ASA and then annually long term <sup>1</sup>                                                                                                                                                                                                                                                                                                          |
| Thiopurines                    | <ul style="list-style-type: none"> <li>● Leukopenia, thrombocytopaenia<sup>1</sup></li> <li>● Hepatotoxicity</li> <li>● Pancreatitis</li> <li>● Hypersensitivity (nausea and flu-like symptoms)</li> <li>● Long-term azathioprine use is associated with:               <ol style="list-style-type: none"> <li>1) Epstein Barr related and non-related lymphomas. Absolute risk remains low at 1/1,000 patient-years<sup>27</sup></li> <li>2) A 6-fold increased risk for non melanoma skin cancer. The risk is lower but persists with cessation of thiopurines<sup>28</sup></li> <li>3) Kidney and bladder cancer especially in men aged &gt; 65. The increased risk is reversed on cessation of the drug<sup>29</sup></li> </ol> </li> </ul> | <p>Baseline FBC, U&amp;E and LFT, then at weeks 2, 4 and 8 and then at least three monthly<sup>1</sup></p> <p>Thiopurine methyltransferase (TPMT) activity should be measured in secondary care prior to commencing thiopurines,<sup>2</sup> as absence can cause lethal bone marrow suppression. Patients should be advised to report abnormal bleeding, bruising or symptoms of infection<sup>2,26</sup></p> |
| Methotrexate                   | <ul style="list-style-type: none"> <li>● Leukopenia, thrombocytopaenia</li> <li>● Hepatotoxicity</li> <li>● Pneumonitis</li> <li>● Mucositis</li> <li>● Renal failure<sup>30</sup></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Baseline FBC, U&amp;E and LFT, then at weeks 2, 4 and 8 and then at least three monthly<sup>1</sup></p> <p>It is also important to consider the potential for any drug interactions,<sup>30</sup> particularly NSAIDs, aspirin and some antibiotics. Refer to the BNF<sup>26</sup> for a full list of potential drug interactions</p>                                                                       |
| Biologics and small molecules* | <p><b>General side effects</b></p> <ul style="list-style-type: none"> <li>● Infections including exacerbation of existing or latent infections i.e. TB. Risk of infections may not be present with vedolizumab as it is gut selective</li> <li>● Injection site reactions</li> <li>● Delayed infusion reactions: flu-like symptoms and arthralgia<sup>31</sup></li> </ul> <p><b>Class specific side effects</b></p> <ul style="list-style-type: none"> <li>● Anti-TNF agents: worsening of heart failure and demyelination<sup>31</sup></li> <li>● Tofacitinib: increased risk of pulmonary embolism with high doses (10 mg bd)<sup>24</sup> and elevated risk of herpes zoster infection<sup>35</sup></li> </ul>                               | <p>Monitoring is usually carried out in secondary care. If an infection is present, biologic therapy should be delayed until the infection has resolved or definitive treatment has been commenced, i.e. antibiotics</p>                                                                                                                                                                                       |
| Corticosteroids                | <ul style="list-style-type: none"> <li>● Avascular necrosis of the hip is a serious complication of prolonged steroid use, so should be considered in high-risk patients presenting with hip pain<sup>1</sup></li> <li>● Long-term corticosteroids can be associated with osteoporosis, Cushing's syndrome, hyperglycaemia, cataracts or glaucoma<sup>9</sup></li> </ul>                                                                                                                                                                                                                                                                                                                                                                        | <p>Patients receiving corticosteroids should be taking calcium and vitamin D supplements and advised to make lifestyle changes to protect bone health.</p> <p>Patients who are high risk for osteoporosis should be commenced on bisphosphonate therapy<sup>1</sup></p>                                                                                                                                        |

\*Monoclonal antibodies to tumour necrosis factor- $\alpha$  (anti-TNF agents): infliximab, golimumab, adalimumab<sup>31</sup>

Monoclonal antibody to  $\alpha 4\beta 7$  integrin: vedolizumab<sup>32</sup>

Monoclonal antibody to IL-12 and IL-23: ustekinumab<sup>33</sup>

Janus-associated tyrosine kinase (JAK) 1 and 3 inhibitor: tofacitinib<sup>34</sup>