if they receive the proper understanding and, most importantly, support. Patients are also the best judges of what is possible. All too often they do not comply with orders because the expectations of health professionals are not realistic for the patient’s circumstances. The other part of goal-setting is giving patients an opportunity to give and receive feedback on their accomplishments. Many studies have shown that patients who are confident in their ability to manage are the ones who have the best health outcomes.10 Health professionals are instrumental in helping patients gain this confidence. Professionals must make it clear that they want patients to become expert patients. Without proactive endorsement by the physician, patients cannot embrace their new role. One way for health professionals to boost patients’ confidence is to collaborate with them on short-term goal-setting to master new skills. This collaboration enables patients to make changes that are realistic and feasible. A second way is to give patients opportunities to meet others like themselves, through patient groups, peer-leaders, and disease-specific e-mail lists and organisations. The third way is to assist patients to understand their symptoms. If patients believe that medicines do not make them better, they may stop taking those that do not appear to be working. Symptoms should usually be explained as having many causes, which offers the possibility of different actions. For example, a person with fatigue might try healthier eating and exercise. Fourth, professions should practise social persuasion. People are more likely to change their behaviours and have confidence in doing so if they perceive those around them, including their health-care providers, to be supportive. All it takes is a kind word and a notice of even small accomplishments.

The expert-patient initiative should provide the opportunity to improve the health-care environment for both patients and providers, and in turn the effectiveness of health care and hence satisfaction for everyone. Years ago an advertising slogan for *Medical Self-Care Magazine* was that physicians would get off their pedestals when patients got off their knees (Tom Ferguson, editor of the magazine, personal communication). The expert-patient initiative should speed the formation of such equal partnerships.

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**Management of oral mucositis associated with cancer chemotherapy**

The mucositis that is commonly associated with cancer chemotherapy is often accompanied by pain, loss of taste, and reduction in oral intake, with consequent weight loss. Thus it can cause treatment delays and necessitate dose reductions, thereby affecting delivery of effective care with possible adverse effects on outcome. Some chemotherapeutic agents—in particular fluorouracil, methotrexate, doxorubicin, and bleomycin—are especially likely to be associated with this complication. The mucositis with each of these drugs is often strikingly dependent on dose or schedule and, for many of them, can be a dose-limiting toxic effect. Groups prone to this effect are children (although their healing capacity is better than that of older patients), patients with haematological cancers, those with head-and-neck cancer treated with chemoradiation, and patients receiving high-dose chemotherapy. In this last group mucositis is also a surrogate measure of outcome because severe oral inflammation in such patients is strongly associated with an increased risk of sepsis, use of total parenteral nutrition, high hospital costs, and poor treatment outcomes.

This complication is widely recognized as needing individualized, multidisciplinary care. The expertise ranges from oncolgy, nursing, and dental publications. The earliest evidence of mucosal damage can be detected in animal models within 24–36 h of start of chemotherapy or radiotherapy,1 when damaged epithelial cells release cytokines, which increase local vascularity and cause an inflammatory response. Within a few days the rapidly dividing cells of the oral basal epithelium are also affected such that the rate of cell division and replacement declines. Local soiling and trauma of the epithelium then leads to ulceration, pain, and infection, often at a time of systemic neutropenia. Blood-borne infection can occur but generally, in the absence of further chemotherapy, symptoms and signs gradually diminish spontaneously.

Although many randomised trials have been reported, these are on the whole very small and have produced conflicting results. A particular problem in these studies has been the lack of an agreed scoring system for mucositis, but the oral mucositis assessment scale,2 the result of an international collaborative effort, should help standardise such studies. However, there is no consensus on the most effective way of preventing and treating this distressing complication. Nevertheless, the issue is being actively investigated and there have been several reports of studies, albeit small and inconclusive, into the management of mucositis in the past few months.3–6

As always, the best approach is prevention. The value of good oral care (frequent rinsing of the mouth and effective brushing of the teeth two or three times a day with a soft brush) is difficult to validate but these measures are easy and probably helpful.1 Self-help guides to mouth care are available and should be more extensively prescribed.

A well-validated, simple, cheap, and effective approach for mucositis associated with drugs with a short half-life (particularly intravenous fluorouracil) is the sucking of ice chips during the intravenous infusion.1 By decreasing

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blood flow to the oral mucosa during the time of peak serum concentrations, the ice chips reduce exposure to the drug and hence the risk of mucositis. Sucking ice is the only measure judged in a recent Cochrane review to be of proven efficacy as a prophylactic treatment; the review found good evidence in two randomised trials that it halved the risk of mucositis (relative risk 0·57, 95% CI 0·43–0·77).3

Another prophylactic approach is the use of pilocarpine. Pilocarpine tablets stimulate salivary flow, particularly from the minor salivary glands that are known to be rich in mucin. This drug is moderately effective in the treatment of xerostomia caused by irradiation damage to the salivary gland4 and it is fairly well tolerated, although sweating and urinary frequency can be a problem. In a recent double-blind placebo-controlled crossover study, oral pilocarpine was compared with a placebo in patients receiving standard-dose chemotherapy.1 The study was of modest size but it showed a clear reduction in the frequency of mucositis (which occurred in six of 41 cases treated with pilocarpine and 20 of 41 treated with placebo).4

When given prophylactically, sucralfate, a complex of sucrosulphate and aluminium hydroxide, was found (in a recent double-blind randomised trial in patients undergoing autologous or allogeneic bone marrow transplantation11) to be associated with a lower frequency of severe mucositis and also of diarrhoea (which perhaps represents a lessening of the severity of enteritis). 102 patients were randomised and the frequency of severe mucositis was reduced from 47% to 29% in the treatment group. This potentially useful and well-tolerated regimen certainly deserves further evaluation.

Once mucositis is established the first priority is to exclude obvious local infection, particularly with candida (and occasionally with herpes simplex) since there are specific and highly active treatments for these disorders. In most cases the soreness and ulceration are due to the chemotherapeutic agents or irradiation, and treatment is palliative while natural healing is allowed to occur.

Many oncology centres routinely prescribe antiseptic mouth washes (eg, chlorhexidine) or anti-inflammatory washes (eg, benzylamine) as treatment for established mucositis. Current clinical trial evidence suggests that these approaches are ineffective or, worse, tend to intensify the local pain.5 A more recent approach has been the use of systemic or topical growth factors. Granulocyte and granulocyte-macrophage colony-stimulating factors have been shown to reduce the frequency of mucositis when given parenterally in small randomised clinical trials.11,14 This effect probably relates not to haemopoietic cell stimulation but to effects on the migration and production of endothelial cells. These growth factors are, however, expensive and potentially toxic. As a result, more recent studies have looked into the possibility of using these agents locally as a mouth-wash.5,6 Two recent randomised trials using different schedules of molgramostim mouth-wash in patients developing mucositis after chemotherapy or chemo-irradiation have been reported. These rather small studies gave conflicting results, so the usefulness of topically applied growth factors remains to be defined.

Overall the prevention and management of oral mucositis remains unsatisfactory, local and the existing approaches amount to little more than common sense. Unfortunately, in the present economic climate large-scale well-controlled trials are unlikely to be mounted unless a commercial imperative arises from new drug developments aimed at specific aetiological factors or processes underlying this complication.

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