

# Effectiveness Matters

## Prophylactic Removal of Impacted Third Molars: Is It Justified?

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### Introduction from Editor

The following article is reproduced with the permission of the centre for Reviews and Dissemination. It is the subject of *Effectiveness Matters* (Vol. 3, Issue 2, October 1998) and since the conclusions of this systematic review are so important, I have felt further dissemination to a wider audience was justified. The 'housestyle' is in accord with the original publication source on this occasion.

### Background

Removal of third molars (wisdom teeth) is one of the most common surgical procedures within the UK. In 1994–95 there were over 36,000 in-patient and 60,000 day-care admissions in England for 'surgical removal of tooth'.<sup>1</sup> Third molar surgery has been estimated to cost the NHS in England up to £30 million per year,<sup>2</sup> and approximately £20 million is spent annually in the private section.<sup>3</sup> Around 90 per cent of patients on waiting lists for oral and maxillo-facial surgery are scheduled for third molar removal.<sup>3</sup>

There are wide variations in rates of third molar surgery across the UK.<sup>4,2</sup> There is also some evidence that deprived populations with poor dental health are less likely to have third molars removed than more affluent populations with good dental health.<sup>5,2</sup> However, the reasons for this are complex.

Little controversy surrounds the removal of impacted third molars when they cause pathological changes and/or severe symptoms, such as 'infection, non-restorable carious lesions, cysts, tumours, and destruction of adjacent teeth and bone'.<sup>6</sup> However, the justification for prophylactic removal of impacted third molars is less certain and has been debated for many years.

The October 1998 issue of *Effectiveness Matters* summarizes research evidence evaluating the appropriateness of prophylactic removal of impacted third molars.

Several reasons are given for the early removal of asymptomatic or pathology-free impacted third molars, almost all of which are not based on reliable evidence: they have no useful role in the mouth, they may increase the risk of pathological changes and symptoms, and if they are removed only when pathological changes occur, patients may be older and the risk of serious complications after surgery may be greater.

On the other hand, the probability of impacted third molars causing pathological changes in the future may have been exaggerated.<sup>3,7</sup> Many impacted or unerupted third molars may eventually erupt normally and many impacted third molars never cause clinically important problems.<sup>8</sup> In addition, third molar surgery is not risk free; the complications and suffering following third molar surgery may be

considerable.<sup>9</sup> Therefore, prophylactic removal should only be carried out if there is good evidence of patient benefit.

The proportion of third molar surgery, which is carried out prophylactically in asymptomatic patients, is difficult to estimate precisely and depends on the definitions used. A UK survey of 181 consultants, found that 35.1 per cent of 25,001 third molars removed were disease free.<sup>10</sup> Other, reliable estimates of prophylactic removal suggest rates of between 20 to 40 per cent,<sup>11–13</sup> though rates as low as 4 per cent have been reported.<sup>14</sup>

### Pathological Changes Associated with Impacted Third Molars

There has been no long-term experimental evaluation of prophylactic removal. Therefore, the decision to extract prophylactically depends on an estimate of the balance between the likelihood of the unoperated molars causing pathology in the future, the advantage of earlier versus later surgery, and the risk of surgery in those who would never need extraction.

Pericoronitis (inflammation of the gingiva surrounding the crown of a tooth) is the most common indication for third molar surgery,<sup>10</sup> and mainly occurs in adolescents and young adults, but less commonly in older people.<sup>15</sup> A study reported that over 4 years of follow-up, 10 per cent of lower third molars develop pericoronitis.<sup>16</sup>

Very few impacted third molars cause dental caries (decay) of second molars,<sup>15</sup> though estimates vary (1–4.5 per cent).<sup>9</sup> Fear of second molar caries is not a justification for prophylactic removal.

There is a low incidence (less than 1 per cent) of root resorption of second molars with impacted third molars.<sup>16,17</sup> One review concludes that the risk of second molar root resorption by impacted third molars is low and is likely to occur in younger patients for whom surgery is claimed to be associated with less morbidity.<sup>15</sup>

The association between anterior (front) incisor crowding and impacted third molars is not significant and does not warrant the removal of third molars.<sup>18–20</sup>

Cyst development is very rare and is not an indication for prophylactic removal.<sup>15</sup> The risk of malignant neoplasms arising in a dental follicle is negligible and is not an indication for prophylactic removal.<sup>15</sup>

### Complications and Risks Following Surgery

The potential benefit of avoiding the relatively uncommon risk of pathology associated with leaving impacted third molars in place needs to be considered alongside the risks

associated with their removal. Patients should be fully informed of the potential risks and benefits.

Common complications following third molar surgery include sensory nerve damage (paraesthesia), dry socket (dry appearance of the exposed bond in the socket accompanied by severe pain and foul odour), infection, haemorrhage, and pain. Rarer complications include severe trismus, oro-antral fistula, buccal fat herniations, iatrogenic damage to the adjacent second molar, and iatrogenic mandibular fracture.

The rate of sensory nerve damage after third molar surgery has been shown to range from 0 to 20 per cent.<sup>9,15,21,22</sup> The overall rate of dry socket varies from 0 to 35 per cent among studies.<sup>9,23</sup> The risk of dry socket increases with lack of surgical experience and tobacco use,<sup>24</sup> though this does not justify prophylactic removal.

### Prophylactic Removal: Is It Justified?

A recent evaluation of published reviews<sup>19</sup> has concluded that there is little reliable evidence to support prophylactic removal of impacted third molars. Two decision analyses also concluded that, on average, patients' longer term well-being is more likely to be maximized if only those impacted third molars with pathology are removed.<sup>22,25</sup>

Two reviews from North America also confirm this conclusion. One acknowledged a lack of reliable evidence to support the prophylactic removal of impacted third molars.<sup>26</sup> The other concluded that 'routine prophylactic third molar extraction is unjustifiable'.<sup>15</sup> It showed that impacted third molars in adolescents are most likely to develop pathological indications, while impacted third molars in adults are unlikely to undergo significant pathological changes. This review also indicated that 'older patients, for whom third molar extraction is necessary, generally tolerate the procedure well'.

Given the lack of reliable evidence, a general anaesthetic for the removal of a symptomatic third molar should not normally be sufficient justification for removing pathology-free third molars at the same time.

### Risks: pathology versus Surgery

In a comparison of the risk of pathological changes in retained third molars and complications after third molar surgery,<sup>15</sup> the rate of complications after removing third molars was 11.8 per cent in youths (age range 12–29) and 21.5 per cent in older age (age range 25–81). In addition, results from several studies showed that the risk of pathological changes in older adults ranges from zero to 12 per cent.

Using these figures, it can be calculated that there will be more complications after prophylactic removal of pathology free third molars than after removing only those third molars with pathological changes (see Table 1). For every 100 young people who would undergo prophylactic removal 12 may be expected to suffer from clinically significant complications. Without prophylactic removal, 12 of these 100 people will require surgical removal of third molars at older ages, of whom only three will experience surgical complications.

TABLE 1 Number of complications after surgical removal of third molars: a comparison of two strategies†

Strategies	Number of people who undergo procedures	Number of complications
Prophylactic removal of pathology free impacted third molars	100	12 (i.e. 100*11.8%)
Removal of impacted third molars when pathology developed	12 (i.e. 100*12%)	3 (i.e. 12*21.5%)

†Based on a hypothetical cohort of 100 young people with pathology free third molars. The rates of complications and pathological changes are based on the results of Daley.<sup>15</sup>

These estimates of the risk of leaving impacted third molars and the risks of prophylactically extracting them are necessarily approximate because of the relatively poor quality or research in this area and difference methods used by studies.

Dental surgeons will tend to see (and remember) those patients who experience long-term problems with impacted third molars, rather than patients with no complications. The perceived risk of impacted third molars and the benefits of prophylactic removal will therefore tend to be exaggerated.

Overall, there appears to be little justification for the removal of pathology-free impacted third molars.

### Conclusions

- Third molar surgery rates vary widely across the UK.
- Around 35 per cent of third molars removed for prophylactic purposes in the UK are disease free.
- Surgical removal of third molars can only be justified when clear long-term benefit to the patient is expected.
- It is not possible to predict reliably whether impacted third molars will develop pathological changes if they are not removed.
- There are no randomized controlled studies to compare the long-term outcome of early removal with retention of pathology-free third molars.
- In the absence of good evidence to support prophylactic removal, there appears to be little justification for the routine removal of pathology-free impacted third molars.
- To ensure appropriate treatment, referrals and waiting lists for the surgical removal of third molars should be monitored through a process of audit.

### Recommendations

- Research evidence suggests that impacted third molars should not be removed unless pathological changes are evident.
- Ideally, a long-term rigorous experimental evaluation of prophylactic removal is required. More practically, high quality observational studies in some countries where this practice has not been routine, may shed light on the natural history of impacted third molars.

- Referrals and waiting lists for the surgical removal of third molars should be monitored through a process of audit (to ensure appropriate treatment).

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