

## Safety of community-based minor surgery performed by GPs:

an audit in different settings

### Abstract

#### Background

Minor surgery is a well-established part of family practice, but its safety and cost-effectiveness have been called into question.

#### Aim

To audit the performance of GP minor surgeons in three different settings.

#### Design and setting

A community-based surgery audit of GP minor surgery cases and outcomes from three settings: GPs who carried out minor surgery in their practice funded as enhanced (primary care) services (ESGPs); GPs with a special interest (GPwSIs) who worked independently within a healthcare organisation; and GPs working under acute trust governance (Model 2 GPs).

#### Method

An audit form was completed by volunteer GP minor surgeons. Data were collected about areas of interest and aggregated data tables produced. Percentages were calculated with 95% confidence intervals (CIs) and significant differences across the three groups of GPs tested using the  $\chi^2$  test.

#### Results

A total of 6138 procedures were conducted, with 41% [2498; 95% CI = 39.5 to 41.9] of GP minor surgery procedures being on the head/face. Nearly all of the samples from a procedure that were expected to be sent to histology were sent [5344; 88.8%; 95% CI = 88.0 to 89.6]. Malignant diagnosis was correct in 69% [33; 95% CI = 54.2 to 79.2] of cases for ESGPs, 93% [293; 95% CI = 90.1 to 95.5] for GPwSIs, and 91% [282; 95% CI = 87.2 to 93.6] for Model 2 GPs. Incomplete excision was significantly more frequent for ESGPs (17%; 9; 95% CI = 7.5 to 28.3,  $P < 0.001$ ). Complication rates were very low across all practitioners.

#### Conclusion

GP minor surgery is safe and prompt. GPs working within a managed framework performed better. Consideration needs to be given on how better to support less well-supervised GPs.

#### Keywords

clinical audit; dermatology; general practice; minor surgical procedures; quality improvement; skin neoplasm.

### INTRODUCTION

Minor surgery is a well-established part of family practice but its safety has been called into question. A major trial suggested that the quality of minor surgery carried out in general practice is not as high as that carried out in hospital, although the difference was not great.<sup>1</sup> The investigators of that trial felt there were deficiencies in GPs' recognition of malignant lesions, and possibly in completeness of excision compared with hospital doctors. They stated:

*'Minor surgery carried out in primary care is not as safe as it is currently practised. It must be concluded that it is unsafe to leave minor surgery in the hands of doctors who have never been trained to do it.'*

One of the few positive notes was that patients were more satisfied if their procedure was performed in primary care, largely because of convenience. These concerns have been echoed in research that found that GPs compare unfavourably with skin specialists in diagnosing and excising basal cell carcinomas (BCCs), the commonest malignancy excised in primary care; whereas non-specialised GPs perform no worse than GPs with a special interest (GPwSI).<sup>2</sup>

However, the same authors found that GPs performed as well, if not better, than

specialists in excising squamous cell carcinomas (SCC); whereas, again, practice-based GPs performed as well as GPwSIs.<sup>3</sup> Further research by the same authors showed that melanoma excisions by GPs appeared to be of similar quality to those undertaken by specialists; there was no difference demonstrated between frequent and infrequent GP surgeons.<sup>4</sup> This article describes how GP minor surgery is taking place and they are removing pigmented lesions, despite national guidance that they should be referred to secondary care as GPs perform less well.<sup>5</sup>

Registries, clinical audits, and surgery checklists are all tools used to improve quality and are relevant to GP minor surgery. Registries can be used to profile individual surgeons and to monitor quality.<sup>6</sup> Reporting of quality standards to registries has been used as a quality improvement tool in primary care.<sup>7</sup> Clinical audits combined with feedback are a well-established quality improvement intervention, which is acceptable to practitioners and widely used in primary care.<sup>8</sup> Checklists are also known to improve surgical safety,<sup>9</sup> and have been supported by the World Health Organization.<sup>10</sup> Although checklists are mainly aimed at the problems associated with more major surgery and anaesthesia, they may have a role in reducing errors or omissions commonly made in GP minor surgery.

**J Botting**, BSc, MRCP, DRCOG, MSOM, GP and RCGP minor surgery clinical champion, Royal College of General Practitioners, London.  
**A Correa**, BA, MSc, research assistant; **S Jones**, MSc, PhD, research professor, University of Surrey, Guildford. **J Duffy**, MA(Econ), audit manager, Health and Social Care Information Centre, Leeds.  
**S de Lusignan**, MD(Res), MSc, FRCGP, FBCS CITP, FHEA, DRCOG, professor of primary care and clinical informatics, University of Surrey, Guildford, and director of the RCGP Research and Surveillance Centre, Royal College of General Practitioners, London.

#### Address for correspondence

Simon de Lusignan, Department of Clinical and Experimental Medicine, University of Surrey, Guildford, GU2 7XH, UK.

**E-mail:** s.lusignan@surrey.ac.uk

**Submitted:** 14 October 2015; **Editor's response:** 2 November 2015; **final acceptance:** 6 December 2015.

#### ©British Journal of General Practice

This is the full-length article (published online 11 Mar 2016) of an abridged version published in print. Cite this article as: **Br J Gen Pract 2016; DOI: 10.3399/bjgp16X684397**

## How this study fits in

The Minor Surgery Trial In the Community carried out in 2008 reported that, although patients were more satisfied with the greater convenience of GP practice-based minor surgery, there were questions about GPs' ability to recognise malignant lesions or excise them correctly. This audit reports how contemporary GP surgeons send 89% of specimens to histology and that 95% of the GP predictions that a lesion was malignant were correct; with 96% completely excised. There was a gradation in quality between GPs working under enhanced services provision within their own practice, who did less well across a range of indicators, than GPs with a special interest and GPs working under acute trust governance (Model 2 GPs). A GP minor surgery register, with the data collection acting as a surgical checklist, might improve quality and allow audit of clinical standards.

This study aimed to audit the performance of GP minor surgeons. The audit was called the community-based surgery audit. The predefined dataset collected was also a pilot of a register of GP surgery, and the structured nature of the data required may act as a checklist around key areas of quality. An audit tool was developed to explore the feasibility of collecting data about areas of reported poor quality, and to explore whether there were any differences in quality between GPs working in different settings.

## METHOD

This audit was based on self-reported data of minor surgery cases and outcomes from volunteer GPs. The audit was set up as a collaboration between the Royal College of General Practitioners (RCGP) and the Health and Social Care Information Centre (HSCIC), the body that holds English national health and social care datasets. The audit was set up as an initiative by one author in their role as RCGP minor surgery lead. GPs were classified as working in one of three settings:

- *Enhanced services GPs (ESGPs)*. GPs carrying out minor surgery in their own practices do so under a system called 'enhanced services'. These GPs will operate on benign lesions and low-risk BCCs situated below the neck. There is a national contract for directly enhanced services and, sometimes additionally, locally enhanced services. These practitioners will be expected through these contracts to have had their surgery

directly observed, to have been trained in resuscitation, to obtain written consent for procedures, and to audit their diagnostic accuracy, wound infection rate, and rate of low-risk BCC excision. They would be expected to report these data as part of their annual GP appraisal.

- *GPs with a special interest (GPwSIs)*. These are GPs who work independently within a secondary or community care health organisation. In addition to extended surgical and dermatological training, these practitioners are expected to attend additional relevant education each year, and audit the clinical accuracy of their diagnoses. They will be linked to and regularly work with their local dermatology or plastic surgery service, and attend the skin cancer multidisciplinary team meetings at least four times per year, one of which should be an audit meeting. They are accredited to undertake the treatment of low-risk BCC anywhere on the body.
- *GPs working under acute NHS trust governance (Model 2 GPs [that is, those working under acute trust governance])*. GPs in Model 2 have a further extension of their role. These GPs do all the surgery carried out by the GPs above, but can also operate on all cases of skin cancer within their surgical expertise having been pre-discussed with a core member of their local multidisciplinary team. This surgery is carried out under governance arrangements of the acute trust to whom that patient has been referred.

These classifications and the requirements for their accreditation are laid out in published guidance.<sup>11,12</sup>

A structured audit form was developed by one author in collaboration with members of relevant organisations (British Association of Dermatologists, British Society for Dermatological Surgery, Association of Surgeons in Primary Care, and Primary Care Dermatology Society). The audit was completed by volunteer GP minor surgeons recruited through the RCGP and the national GP press. Data were collected about: location of lesions excised; closure method; proportion sent to histology; histological diagnoses; proportion correctly and incorrectly diagnosed; completeness of excision; complications; waiting time to surgery and histology; administrative procedures; and onward referral.

The audit was constructed so that GP surgeons entered their pre-histology opinion as to whether the lesion was benign or malignant, so that that judgement could be tested by the histology report. Additionally,

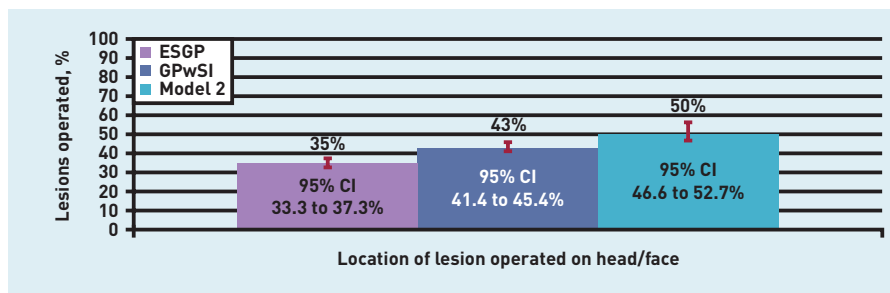


Figure 1. Location of lesions operated on by practitioner type. ESGP = enhanced services GP. GPwSI = GP with a special interest.

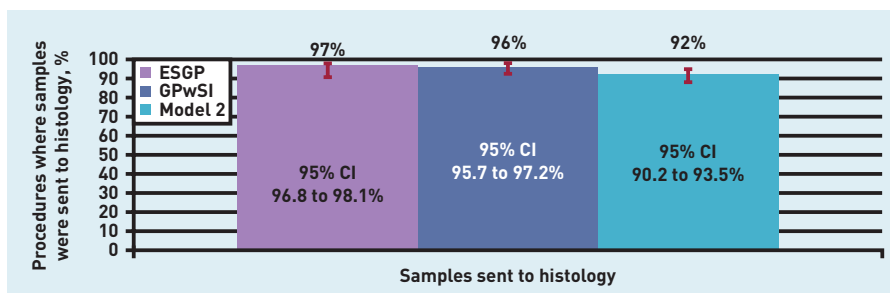


Figure 2. Proportion of samples sent to histology, by practitioner type. ESGP = enhanced services GP. GPwSI = GP with a special interest.

the audit provided a comparator for GP surgeons with their peers, so that for each data item they could compare their practice with the wider group of surgeons.

The individual practitioner data were processed by the HSCIC, and aggregated tables were provided to the University of Surrey, where this analysis took place. Data from the HSCIC were reported for each of the three types of practitioners listed above, or unclassified where the type of practitioner was not listed.

Where relevant, percentages were calculated and graphed; 95% confidence intervals (CIs) were calculated for each estimated percentage using the CRITBINOM function on Microsoft Excel; and are represented graphically using error bars. A  $\chi^2$  test, using the R statistical software, was used to determine the statistical significance of any differences across the counts; the *P*-values of this test are reported.

## RESULTS

A total of 6138 procedures were conducted, of which 2289 (37%; 95% CI = 36.1 to 38.5) were by ESGPs, 2331 (38%; 95% CI = 36.8 to 39.2) were by GPwSIs, and 1045 (17%; 95% CI = 16.1 to 18.0) were by Model 2 GPs. A total of 473 (8%; 95% CI = 7.0 to 8.4) were unclassified. Almost one-half of the procedures were excision biopsies ( $n = 3009$ , 49%; 95% CI = 47.8 to 50.3). Out of the procedures conducted by ESGPs, 46% (1058;

95% CI = 44.2 to 48.3) were excision biopsies, compared with 57% (1324; 95% CI = 54.8 to 58.8) for GPwSIs, and 59% (617; 95% CI = 56.1 to 62.0) for Model 2 GPs. The next most common procedures were shave excisions (19%; 1188; 95% CI = 18.4 to 20.3), and curettage or scoop biopsies (13%; 827; 95% CI = 12.6 to 14.3). Procedures such as partial nail avulsions were not undertaken by Model 2 GPs at all, whereas skin grafts following excision were only performed by this group. There were 471 procedures (8%; 95% CI = 7.0 to 8.3) with missing data regarding type.

The location of lesions operated on has been divided into head/face and rest of body. A total of 41% (2498; 95% CI = 39.5 to 41.9) of all procedures were on the head/face. Model 2 GPs were more likely than GPwSIs and ESGPs to operate on the head/face ( $P < 0.001$ ) (Figure 1). A total of 57% (4333; 95% CI = 56.2 to 58.4) of all closures were sutures. Model 2 GPs and GPwSIs were more likely than ESGPs to use sutures ( $P < 0.001$ ). Nearly all of the samples from a procedure that were expected to be sent to histology were sent (5344; 88.8%; 95% CI = 88.0 to 89.6), although the percentage is slightly lower for Model 2 GPs (92%; 954; 95% CI = 90.2 to 93.5) than for ESGPs (97%; 2177; 95% CI = 96.8 to 98.1) and GPwSIs (96%; 2195; 95% CI = 95.7 to 97.2) ( $P < 0.001$ ) (Figure 2).

Of all procedures with a histological diagnosis, 17% (926; 95% CI = 15.9 to 17.8) were malignant, 6% (310; 95% CI = 5.0 to 6.3) were premalignant, and 78% (4264; 95% CI = 76.4 to 78.6) were benign. Of the malignant lesions, 10% (93; 95% CI = 8.1 to 12.0) were operated on by ESGPs, 43% (400; 95% CI = 40.1 to 46.4) by GPwSIs, and 39% (361; 95% CI = 35.9 to 42.1) by Model 2 GPs. By far the most common of the malignant lesions were BCCs, with GPwSIs having the highest proportion (86%; 345; 95% CI = 82.8 to 89.5), and ESGPs having the lowest proportion (81%; 75; 95% CI = 72.0 to 88.2) of malignant lesions being BCCs. BCCs were a small proportion (4%; 75; 95% CI = 2.8 to 4.3) of the total number of lesions ESGPs operated on; the percentage for GPwSIs was 17% (345; 95% CI = 15.6 to 18.8), and 32% (302; 95% CI = 29.3 to 35.3) for Model 2 GPs.

The diagnostic accuracy of each group of practitioners for malignant and benign lesions was high. However, GPwSIs (93%; 293; 95% CI = 90.1 to 95.5) and Model 2 GPs (91%; 282; 95% CI = 87.2 to 93.6) are more accurate in diagnosing malignant and benign lesions than ESGPs (69%; 33; 95% CI = 54.2 to 79.2) ( $P < 0.001$ ) (Figure 3). Additionally, the specific diagnostic accuracy rates with respect to BCCs show that GPwSIs (96%; 267; 95% CI = 93.5 to 98.2) and Model 2

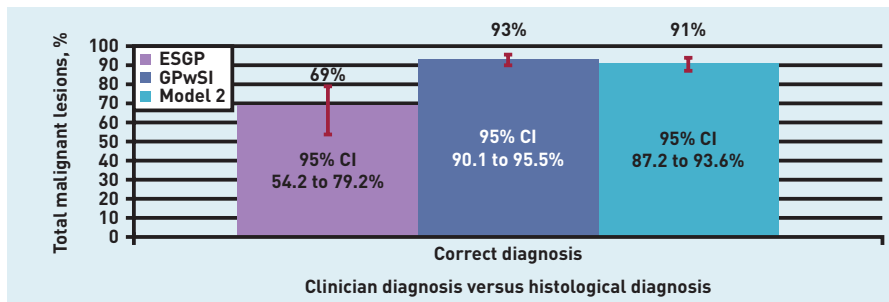


Figure 3. Diagnostic accuracy for malignant lesions, by practitioner type. ESGP= enhanced services GP. GPwSI= GP with a special interest.

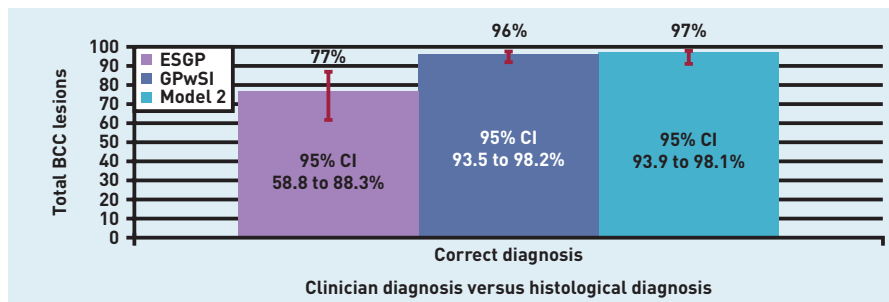


Figure 4. Diagnostic accuracy for basal cell carcinoma, by practitioner type. BCC= basal cell carcinoma. ESGP= enhanced services GP. GPwSI= GP with a special interest.

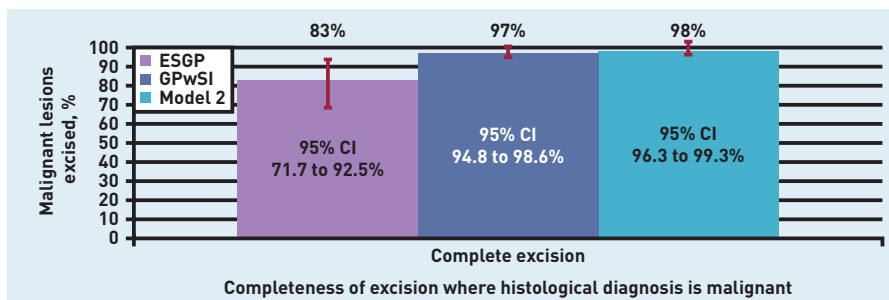


Figure 5. Completeness of excision for malignant lesions, by practitioner type. ESGP= enhanced services GP. GPwSI= GP with a special interest.

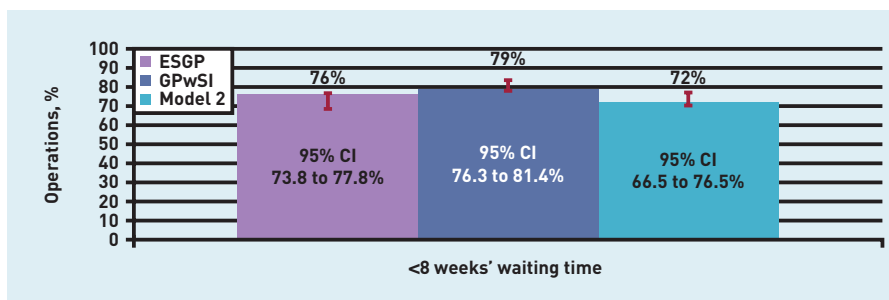


Figure 6. Waiting times for surgery by practitioner type. ESGP= enhanced services GP. GPwSI= GP with a special interest.

GPs (97%; 253; 95% CI = 93.9 to 98.1) have statistically significantly higher diagnostic accuracy rates relating to BCCs than ESGPs (77%; 26; 95% CI = 58.8 to 88.3;  $P < 0.001$ ) (Figure 4).

Model 2 GPs and GPwSIs have statistically significant higher rates of completeness of excision, compared with ESGPs ( $P < 0.001$ ) (Figure 5). There were very low rates of both

major (0.7%; 41; 95% CI = 0.5 to 0.9) and minor (1.3%; 81; 95% CI = 1.0 to 1.6) complications developed within 2 months of the operation. Neither of the groups conducted procedures resulting in a high number of major or minor complications, and there were no statistically significant differences ( $P = 0.27$  for major complications;  $P = 0.10$  for minor complications). The two most common major complications were wound infections ( $n = 20$ ) and wound dehiscence ( $n = 12$ ). Half of these complications were from procedures conducted by ESGPs (10 wound infections and 6 wound dehiscence). There was one instance of nerve damage by a GPwSI and two instances of significant bleed by ESGPs. Wound infections were the most common complications for ESGPs and GPwSIs, whereas wound dehiscence was the most common for Model 2s. Out of the 6138 operations, there were only 45 major complications.

Most operations were conducted within <8 weeks' wait (Figure 6); however, a slightly higher proportion of Model 2 GPs offered surgery with a wait of  $\geq 8$  weeks. This difference is statistically significant at the 5% level, but not at the 1% level. The average wait for histology results was around 2 weeks; the minimum wait was 0 days (this only happens if a user enters 0 in error), and the maximum was >3 months; these figures did not vary much across the three practitioner groups.

ESGPs and GPwSIs nearly always took written consent for surgery, whereas this proportion was 37% (387; 95% CI = 34.3 to 40.1) for Model 2 GPs, because they took oral consent instead. GPwSIs nearly always provided a postoperative sheet to patients (94.8%; 2210; 95% CI = 93.9 to 95.7), whereas this proportion was 75.5% (1728; 95% CI = 73.7 to 77.2) for ESGPs and 66.6% (696; 95% CI = 63.7 to 69.5) for Model 2 GPs. Of all patients receiving a malignant histology diagnosis, 21.5% were referred to secondary care afterwards. This proportion was 48.4% for ESGPs, 25.1% for GPwSIs, and 11.6% for Model 2 GPs. Within this, most referrals were routine.

## DISCUSSION

### Summary

It is feasible to capture detailed audit data from GP minor surgeons, as part of a community-based surgery audit. Extensive data were recorded from a large number of minor surgery procedures. This could form the basis of a register of GP surgery with the capability to provide feedback to practitioners, commissioners, and regulators. GPs in this audit appear to offer

safe surgery. Diagnostic accuracy appears good, excisions adequate, and histology frequently requested. Complication rates are low, as are waiting times for surgery.

Across a range of indicators, GPwSIs and Model 2 GPs appear to have higher-quality standards than practitioners working under enhanced services arrangements in their own practices. The differences between types of GP surgeons might be because of the selection processes to become a GPwSI or Model 2 practitioner, the supervision available, the quality system, or other reasons.

GP surgeons frequently knowingly excised BCCs and appeared to do so with adequate margins. Where other skin cancers were excised, margins also appeared adequate. The GPs who participated in this audit appear to be excising malignancies safely. The service was prompt with complete treatment delivered within 8 weeks. GP surgeons may be an underused resource.

### Strengths and limitations

The strengths of the study are its size and the careful way the questionnaire was designed to test whether previous issues with GP minor surgery are still apparent. Also, the completeness of the data across its sections was impressive. The audit shows differences in case selection between different GP minor surgeons. This may represent them working within their expertise. Once preoperative clinical diagnoses were entered into the community-based surgery audit, they became date stamped and un-editable, thereby ensuring an accurate measurement of diagnostic skill when compared with histological results.

The principal limitation is that the data analysed are self-selected data from a self-selected group of GP minor surgeons, compared with previous trials. The audit may reflect what the best can achieve. Given that the GPs volunteered to participate in the study, there could be a bias towards GPs with a better performance, across all types of practitioners. Nonetheless, GP minor surgery is usually conducted by volunteers, therefore this research design could be deemed appropriate in representing routine clinical practice. Additionally, as seen in the procedure type, more challenging lesions to operate on are not distributed uniformly across all GPs, which might affect the levels of performance of the GP.

This audit was based on an analysis of aggregated data. As such, it is not possible to ascertain the factors behind differences in surgical performance. Having data regarding the individual practitioner characteristics,

such as years of experience, qualifications, and so on, would greatly expand the scope of recommendations to be made from this audit. Patient preference has not been included, which is a crucial factor in the delivery of minor surgery by GPs.

### Comparison with existing literature

The study refutes many of the notions of poor quality reflected in the Minor Surgery Trial In the Community (MiSTIC) trial.<sup>1</sup> The GP surgeons in the current study appear to achieve higher standards of diagnosis, excision completeness, and use of histology than for those reported in that study. However, the range of conditions being operated on seems to be more extensive, and the numbers of pigmented lesions excised, which is at odds with national guidance.<sup>13</sup> The similarity in results between ESGPs and GPwSIs reported in the other studies was not seen in the current study's data.<sup>2-4</sup>

### Implications for research and practice

Further research is needed. A new trial with non-aggregated data, and ideally a randomisation of patients, would be preferable. Moreover, alongside the data collection on the performance of GPs, it would be useful to collect patient preference data. All GPs who offer a minor surgery provision to their NHS patients should be encouraged to enter their surgical data into the audit. By this means, individual GPs can observe their difference from their peers; however, no statistical or process tools are provided for them to know if this represents a significant difference in competence.

The audit should be retained but also developed to become a more explicit surgical checklist and register. Further research is needed to understand what level of difference represents a patient safety issue, what characteristics of GP surgeons correlate with outcomes, and whether further training or other interventions are required. However, this tool has the potential to provide such data, particularly if numbers of contributors expand further.

Clinical systems should be developed to enable consistent and compatible coding to allow data extraction to the community-based surgery audit. For UK GPs, it would seem reasonable that, within their competence, cancer and facial surgery should be relaxed but carefully audited.

Although this audit found minor surgery by GPs to be safe, a register of all GP minor surgical procedures through the use of the community-based surgery audit could ensure that it was practised consistently to a high standard.

### Funding

This audit was funded by the Royal College of General Practitioners and the Health and Social Care Information Centre.

### Ethical approval

This study was an audit of an existing provision of service. The Health Research Authority advises that service audits and evaluations do not require review by a research ethics committee.

### Provenance

Freely submitted; externally peer reviewed.

### Competing interests

Jonathan Botting is a GP who practises minor surgery and provided data for this audit. James Duffy was the audit manager at the Health and Social Care Information Centre responsible for the audit data collection. The other authors have declared no competing interests.

### Acknowledgements

Volunteer GP minor surgeons who contributed to the audit; Samina Ladhani at the Clinical Innovation and Research Centre (CIRC) for assistance and project management; Peter Murchie at the University of Aberdeen; and Matthew Hoghton and Imran Rafi at CIRC for helpful comments and review.

### Discuss this article

Contribute and read comments about this article: [bjgp.org/letters](http://bjgp.org/letters)



## REFERENCES

1. George S, Pockney P, Primrose J, *et al*. A prospective randomised comparison of minor surgery in primary and secondary care. The MISTIC trial. *Health Technol Assess* 2008; **12(23)**: iii–iv, ix–38.
2. Murchie P, Delaney EK, Thompson WD, Lee AJ. Excising basal cell carcinomas: comparing the performance of general practitioners, hospital skin specialists and other hospital specialists. *Clin Exp Dermatol* 2008; **33(5)**: 565–571.
3. Delaney EK, Duckworth L, Thompson WD, *et al*. Excising squamous cell carcinomas: comparing the performance of GPs, hospital skin specialists and other hospital specialists. *Fam Pract* 2012; **29(5)**: 541–546.
4. Murchie P, Sinclair E, Lee AJ. Primary excision of cutaneous melanoma: does the location of excision matter? *Br J Gen Pract* 2011; DOI: 10.3399/bjgp11X556272.
5. Purdy S, de Berker D. To excise or not to excise? Should GPs remove possible melanomas? *Br J Gen Pract* 2011; DOI: 10.3399/bjgp11X556164.
6. Hall BL, Huffman KM, Hamilton BH, *et al*. Profiling individual surgeon performance using information from a high-quality clinical registry: opportunities and limitations. *J Am Coll Surg* 2015; **221(5)**: 901–913.
7. Hagen M. American Board of Family Medicine's Physicians Quality Reporting System registry. *J Am Board Fam Med* 2011; **24(4)**: 479–480.
8. Ivers N, Jamtvedt G, Flottorp S, *et al*. Audit and feedback: effects on professional practice and healthcare outcomes. *Cochrane Database Syst Rev* 2012; **16(1)**: CD000259. DOI: 10.1002/14651858.CD000259.pub3.
9. Gillespie BM, Chaboyer W, Thalib L *et al*. Effect of using a safety checklist on patient complications after surgery: a systematic review and meta-analysis. *Anesthesiology* 2014; **120(6)**: 1380–1389.
10. van Klei WA, Hoff RG, van Aarnhem EE, *et al*. Effects of the introduction of the WHO 'Surgical Safety Checklist' on in-hospital mortality: a cohort study. *Ann Surg* 2012; **255(1)**: 44–49.
11. National Institute for Health and Care Excellence. *Guidance on cancer services: improving outcomes for people with skin tumours including melanoma (update). The management of low-risk basal cell carcinomas in the community*. London: NICE, 2010. <https://www.nice.org.uk/guidance/csg8/resources/improving-outcomes-for-people-with-skin-tumours-including-melanoma-2010-partial-update-773380189> [accessed 2 Mar 2016].
12. NHS. *Revised guidance and competences for the provision of services using GPs with Special Interests (GPwSIs): dermatology and skin surgery*. [https://www.pcc-cic.org.uk/sites/default/files/articles/attachments/revised\\_guidance\\_and\\_competences\\_for\\_the\\_provision\\_of\\_services\\_using\\_gps\\_with\\_special\\_interests\\_0.pdf](https://www.pcc-cic.org.uk/sites/default/files/articles/attachments/revised_guidance_and_competences_for_the_provision_of_services_using_gps_with_special_interests_0.pdf) [accessed 2 Mar 2016].
13. National Institute for Health and Care Excellence. *Guidance on cancer services: improving outcomes for people with skin tumours including melanoma: the manual*. London: NICE, 2006. [www.nice.org.uk/guidance/csg8/evidence/full-guideline-2006-2191950685](http://www.nice.org.uk/guidance/csg8/evidence/full-guideline-2006-2191950685) [accessed 2 Mar 2016].