*South African Family Practice* 2015; 57(4): 261–266
http://dx.doi.org/10.1080/20786190.2014.976954



S Afr Fam Pract
ISSN 2078-6190 EISSN 2078-6204

RESEARCH

# Intern to independent doctor: basic surgical skills required for South African practice and interns' reports on their competence

**Frank Peters[a]*, Jacky van Wyk[b] and Marietjie van Rooyen[a]**

[a] *Department of Family Medicine, University of Pretoria, Pretoria, South Africa*
[b] *Nelson R Mandela School of Medicine, University of KwaZulu-Natal, Durban, South Africa*
**Corresponding author, email: frank.peters@up.ac.za*

**Background:** The role and scope of general practitioners in semi-urban and rural areas is poorly understood and documented. An absence of specialist support results in generalists being called to perform surgical procedures. It is imperative that they competently and confidently perform specific surgical procedures.
**Method:** This cross-sectional study identified a list of agreed surgical procedures in which generalists should be competent. Enquires were made about generalists' competence in performing such skills and training junior doctors how to use these them. Interns were asked about the quality of their exposure to and their perceived competence in the skills. A questionnaire was given to interns who completed their internship in 2008 in Mpumalanga and Gauteng, and another to generalists affiliated to the University of Pretoria. Data were analysed descriptively using Microsoft® Excel®.
**Results:** The response rate was 31% and 21% for the interns and generalists, respectively. There was agreement on specific core skills in training. Most generalists (81%) lacked the competence to provide training on some of the specific core skills needed for independent practice. Most of the internships were completed in semi-urban areas (62%). The majority of the interns perceived themselves to be competent in Caesarean sections, the excision of lumps and bumps, and abscess drainage. Interns from urban areas rated themselves as being incompetent in the core surgical skills. Interns who worked in semi-urban regions felt competent in core surgical skills.
**Conclusion:** The training of interns should be supervised by senior doctors in in-service training settings. Basic surgical skills and in-service training can be taught during family medicine rotation internships by surgically skilled family physicians and generalists in semi-urban areas and district hospitals.

**Keywords:** competence, internship, rural areas, surgical skills, training



## Introduction

In his presentation at the international South African Association of Health Educationalists Conference in June 2008, Prof Max Price said: "From the 1950s until the 1990s doctors were trained as master craftsmen with a lot of surgical skills, while modern medical training is more focused on teaching consultation and counselling skills, and less on surgical skills".

The role and scope of practice of general medical practitioners (GPs) in non-urban district hospitals and rural community hospitals in South Africa is extremely wide and poorly documented. In the absence of specialist support, GPs in non-urban, small and large towns, as well as those in rural areas, are called upon to perform clinical duties. These duties range from primary care to emergency surgical procedures. A GP is a medical doctor who is registered with the Health Professions Council of South Africa (HPCSA) and qualified to diagnose and manage a patient with any problem at any time. Having surgical skills serves as an indicator of scope of practice.[1–3]

In the South Africa setting, the HPCSA governs all clinical work performed in the public and private sectors, and accredits the medical training programmes. As part of the HPCSA guidelines which specify the minimum requirements for the surgical skill training of interns, an intern is required to keep a record in a logbook of the essential skills and minor surgical procedures to which he or she was exposed during his or her internship period. A supervisor's signature is required in the logbook, validating that the intern observed or performed the specific skills listed there. There is no requirement in terms of the mastery of any surgical skill for registration as an independent practitioner. Upon completion of the internship, a doctor registers as a community service doctor in an accredited hospital. The doctor is able to register with the HPCSA as a GP who is qualified to practise independently on completion of the community service year. This includes family physicians who undertook a postgraduate degree in Family Medicine.

District hospitals play an essential role in rendering comprehensive primary healthcare services to communities in South Africa. These services include curative, as well as preventative, care. In addition to comprehensive clinical services and outreach, doctors working at district hospitals also provide in-service training and intersectoral linking.[4] Interns, community service doctors and GPs, as well as family physicians, form the staff in the district hospitals.[2]

In the absence of specialist support, doctors located at district hosptials are often called upon to perform clinical duties, ranging from basic primary care to advanced emergency surgical procedures.[5] Therefore, it is essential that doctors working at these hospitals are competent in performing a range of obstetric, surgical and orthopaedic procedures. They may find themselves in settings with limited options for referral.[3,6–10] The more senior doctors at the district hospitals act as supervisors to and trainers of the interns who must be exposed to these skills during their intern training. The surgical skills that doctors perform at the district hospitals serve as an indicator of their scope of practice.[3]

GPs who practise in district hospital settings are not always confident in their surgical skills and abilities, or are unprepared for the surgical challenges which they encounter in their daily practice. Therefore, for the purposes of this study, identification of the core surgical skills which interns and community service doctors need to master to equip them to manage surgical challenges in the future was imperative.

To achieve this, the study aimed to determine:

- A list of core surgical skills which would assist interns to become confident, competent independent practitioners. This was accomplished by asking doctors working as GPs and interns to draw up a list of surgical skills which they regarded as essential.
- The exposure to the identified list of essential skills by the interns.
- How confident the interns felt about their competence in carrying out these identified skills.

## Method

A literature search was conducted in July of 2008 to identify the suggested essential surgical skills which the GPs needed to learn. Four appropriate articles, i.e. those by De Villiers and De Villiers,[1] Reid,[11] Mazwai[12] and Couper et al,[13] were selected for this purpose, together with the logbook for interns published by the HPCSA. Eighteen core skills were generated by collating the five lists.

The generated list was included in the questionnaire in November 2008, and sent by post, electronic mail and facsimile to 240 GPs and 180 interns. The GPs were a convenience sample of practitioners known to the Department of Family Medicine at the University of Pretoria, and who had previously participated in the preceptorship programme. The interns included everybody on the HPCSA list who had just completed his or her two-year internship in either Mpumalanga or Gauteng.

In the questionnaire, GPs were asked:

- To indicate the demographic data pertaining to their practice location, length of time in practice, their gender and whether or not they only consulted or performed surgery.
- Whether or not they performed the skills on the list.
- Whether or not they felt that they could teach the skills on the list.
- Whether or not they felt that the skills on the list were important for a GP to know.
- To rank the skills on the list in terms of perceived importance.
- Through the use of an open-ended question why they felt that GPs should have surgical skills.

In the questionnaire that was sent to the interns, they were asked:

- Indicate their demographic data with respect to their place of work and study.
- Whether or not they had had the opportunity to perform the skills on the list ("yes" or "no").
- Whether or not they had had the opportunity to observe the skills on the list being performed ("yes" or "no").
- Whether or not they felt that they had received enough training to perform the skills on the list themselves ("yes" or "no").
- How competent they felt with regard to performing the skills, as determined by a Likert scale rating of "never done", "very incompetent", "somewhat incompetent", "somewhat competent" and "very competent".
- To rank the skills on the list in terms of perceived importance.
- Through the use of an open-ended question, to express their opinion on their surgical training.

Participants received a support letter with the questionnaire, and were asked to complete and return both to the researcher as soon as possible. The questionnaires were numbered. Data entry started after 15 January 2009.

The data were analysed using the Statistical Analysis Systems® package. Password protection and other physical storage procedures ensured that unauthorised access to the data was impossible. Data collection forms were identified by a study number. Ethical clearance for this study was obtained from the University of Pretoria.

## Results

### *Demographic profile of the general medical practitioners*

Fifty completed questionnaires were returned (a 20.83% response rate). The majority of the respondents 82% (42/50) practised in semi-urban areas (large and small towns), while 16% (8/50) practised in urban areas with a population of > 1 million, and 2% (1/50) in rural areas (very low-density population/square kilometre). Thirty-two per cent (16/50) of the respondents were qualified GPs or family physicians with a postgraduate degree in Family Medicine.

### *Demographic profile of the intern respondents*

Fifty-five of the 180 interns responded (a 30.55% response rate). The intern group consisted of 28 males and 27 females. More than half (53%, 29/55) attended secondary education in an urban area and 14% (8/55) completed their secondary education in a rural area. 62% (34/55) of the internships were completed in semi-urban areas and 38% (21/55) in urban areas.

Table 1 (column 4) presents a corroborated list according to the GPs' responses of the 18 core surgical procedural skills required for competent and independent practice in South Africa.

Table 2 summarises the responses from the interns in this study. Table 2 indicates the disparity between the number of times (percentage) that the interns had observed the skill being executed with the number of times (percentage) the skill had been performed by them during their training. They also indicated what they felt their competence to be in performing the listed skills. Table 2 lists only the 14 most important skills as perceived by the GP's and interns.

Table 3 presents a summary of the responses received from the GPs regarding their ability to train interns and community service doctors in the listed core skills.

### *Responses to the questionnaire*

#### *Responses to Question 1: To what extent do you use surgical skills in your daily practice?*

The first question explored the extent to which GPs performed surgical skills in their daily practice. They were also asked whether they thought it was important to be competent in performing the skills and about their ability to teach them. A visual representation of their responses is presented in Figure 1, while their belief in their ability to teach the skills is highlighted in Table 3.

The majority of the GPs (80%, 40/50) rated themselves as being competent in training interns on the agreed core skill list. Only one respondent from the urban area indicated a belief in his or her ability to teach surgical skills to the interns.

#### *Question 2: How confident are GP's in their ability to teach surgical skills?*

All of the family physicians were confident in their ability to teach surgical skills to interns and all of them practised in semi-urban settings.

**Table 1:** Ranking of the core skills

| List of identified surgical skills | Ranking according to the literature and the HPCSA intern logbook | Ranked order according to the general practitioners | Ranked based on a compilation of three generated lists |
|---|---|---|---|
| Caesarean section | 1 | 3 | 1 |
| Abscess drainage | 2 | 2 | 2 |
| Excision of lumps and bumps | 3 | 1 | 3 |
| Appendectomy | 7 | 4 | 4 |
| Sterilisation | 4 | 10 | 5 |
| Circumcision | 6 | 9 | 6 |
| Debridement of wounds | 5 | 11 | 7 |
| Wedge resection of big toenails | 15 | 5 | 8 |
| Breast tumour biopsy | 8 | 13 | 9 |
| Ectopic pregnancy surgery | 13 | 6 | 10 |
| Reduction of fractures | 10 | 12 | 11 |
| Cryotherapy of dermatological conditions | 18 | 8 | 12 |
| Adenotonsillectomy | 14 | 7 | 13 |
| Haemorrhoidectomy | 12 | 14 | 14 |
| Small open reduction and internal fixation of fractures | 11 | 16 | 15 |
| Hernia repair | 9 | 17 | 16 |
| Vasectomy | 17 | 15 | 17 |
| Hydrocelectomy or scrotal surgery | 16 | 18 | 18 |

HPCSA: Health Professions Council of South Africa

**Table 2:** Interns' estimation of their competence in executing the core surgical skills

| Surgical skill | Interns | | |
|---|---|---|---|
| **List of identified surgical skills** | **% of interns who observed the execution of the skill** | **% of interns who performed the skill** | **% of interns who perceived themselves as competent in executing the skill independently** |
| Caesarean section | 100 | 91 | 73 |
| Abscess drainage | 82 | 95 | 91 |
| Excision of lumps and bumps | 78 | 76 | 51 |
| Appendectomy | 85 | 47 | 11 |
| Sterilisation | 100 | 85 | 55 |
| Circumcision | 62 | 51 | 44 |
| Debridement of wounds | 75 | 65 | 65 |
| Wedge resection of big toenails | 51 | 40 | 25 |
| Breast tumour biopsy | 75 | 55 | 51 |
| Ectopic pregnancy surgery | 89 | 29 | 25 |
| Reduction of fractures | 100 | 76 | 69 |
| Cryotherapy of dermatological conditions | 49 | 73 | 40 |
| Adenotonsillectomy | 49 | 25 | 29 |
| Haemorrhoidectomy | 64 | 11 | 0 |

The following themes emerged from the qualitative data collected from the GPs on their ability to perform surgical skills. They also offered their perceptions on the necessity of being competent in performing specific surgical skills, and the reasons why they deemed having competency in surgical skills to be an essential component to training.

*Question 3: How confident are you in your ability to perform these surgical skills?*

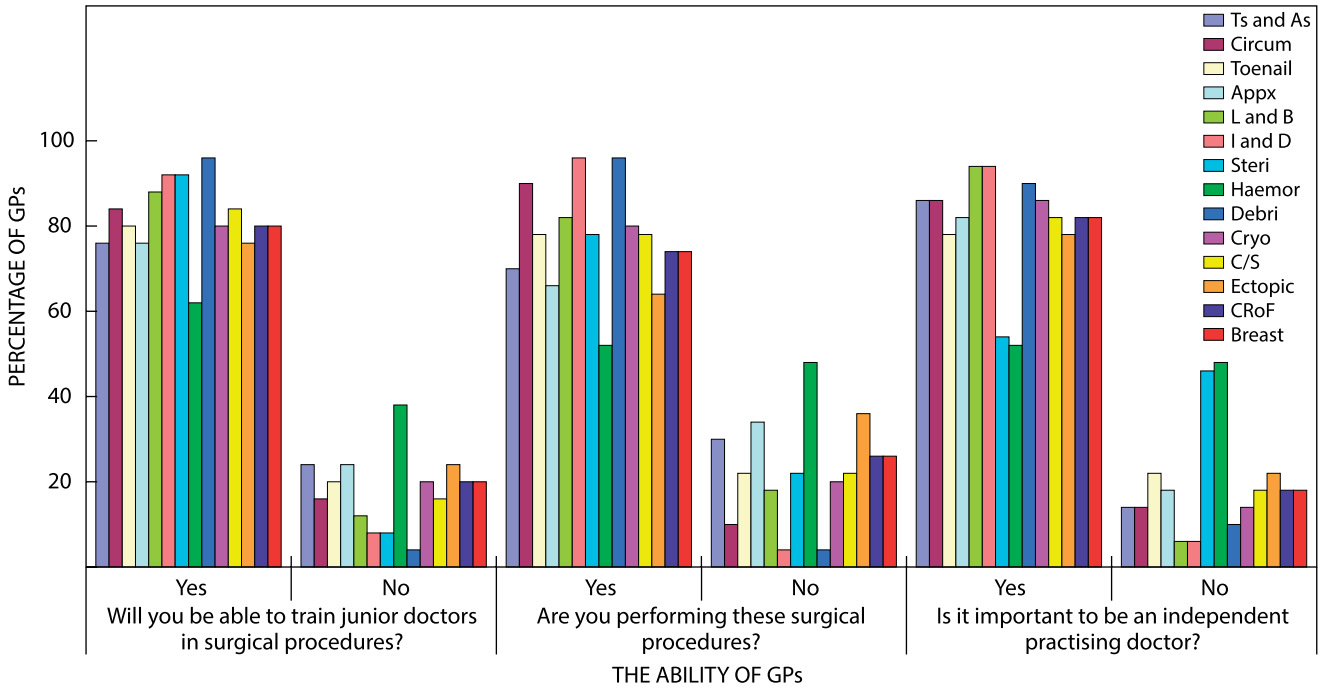
GPs' perceptions on their ability to perform surgical skills were as follows:

- "Specialists are unavailable and transport is becoming a considerable challenge in rural areas."
- "Surgery is essential to GP practice."
- "Community service is only of value if the doctor works under supervision and is taught properly."
- "General practice is a dying profession unless drastic action is taken to change the competency levels of graduandi."
- "If you are a doctor, then by definition you must be able to operate."
- "Doctors can only be trained by other GPs in state hospitals."
- "A GP needs to provide a 'one-stop service' and to be cost-effective".

**Table 3:** General practitioners' estimation of their ability to train interns on the core surgical skills

| List of identified surgical skills | % of general medical practitioners who are able to train the skill |
|---|---|
| Caesarean section | 82 |
| Abscess drainage | 86 |
| Excision of lumps and bumps | 84 |
| Appendectomy | 78 |
| Sterilisation | 86 |
| Circumcision | 82 |
| Debridement of wounds | 88 |
| Wedge resection of big toenails | 80 |
| Breast tumour biopsy | 80 |
| Ectopic pregnancy surgery | 78 |
| Reduction of fractures | 80 |
| Cryotherapy of dermatological conditions | 80 |
| Adenotonsillectomy | 78 |
| Haemorrhoidectomy | 61 |






Appx: Appendix, Breast: breast tumour bioposy, Circum: circumcision, C/S: Caesarean section, CRoF: Closed reduction of fractures, Cyro: cyrotherapy of dermatological conditions, Debri: debridement of wounds, Ectopic: ectopic pregnancy surgery, GPs: general practitioners, Haemor: haemorrhoidectomy, I and D: incision and drainage, L and B: Excision of lumps and bumps, Steri: sterilisation, Toenail: wedge resection of big toenails, Ts and As: Tonsils and adenoids

**Figure 1:** The ability of GPs to train and evaluate juniors to practise independently. Are general medical practitioners performing surgical skills, do they think they can teach these skills, and are these skills important for independent practice?

GPs' perceptions on the need for competency in surgical procedures were as follows:

- "A GP needs to do small procedures as soon as possible when referral is not possible."
- "I only consult because I am working in a specialist area."
- "The medico-legal implications are too high to perform surgery in a city".

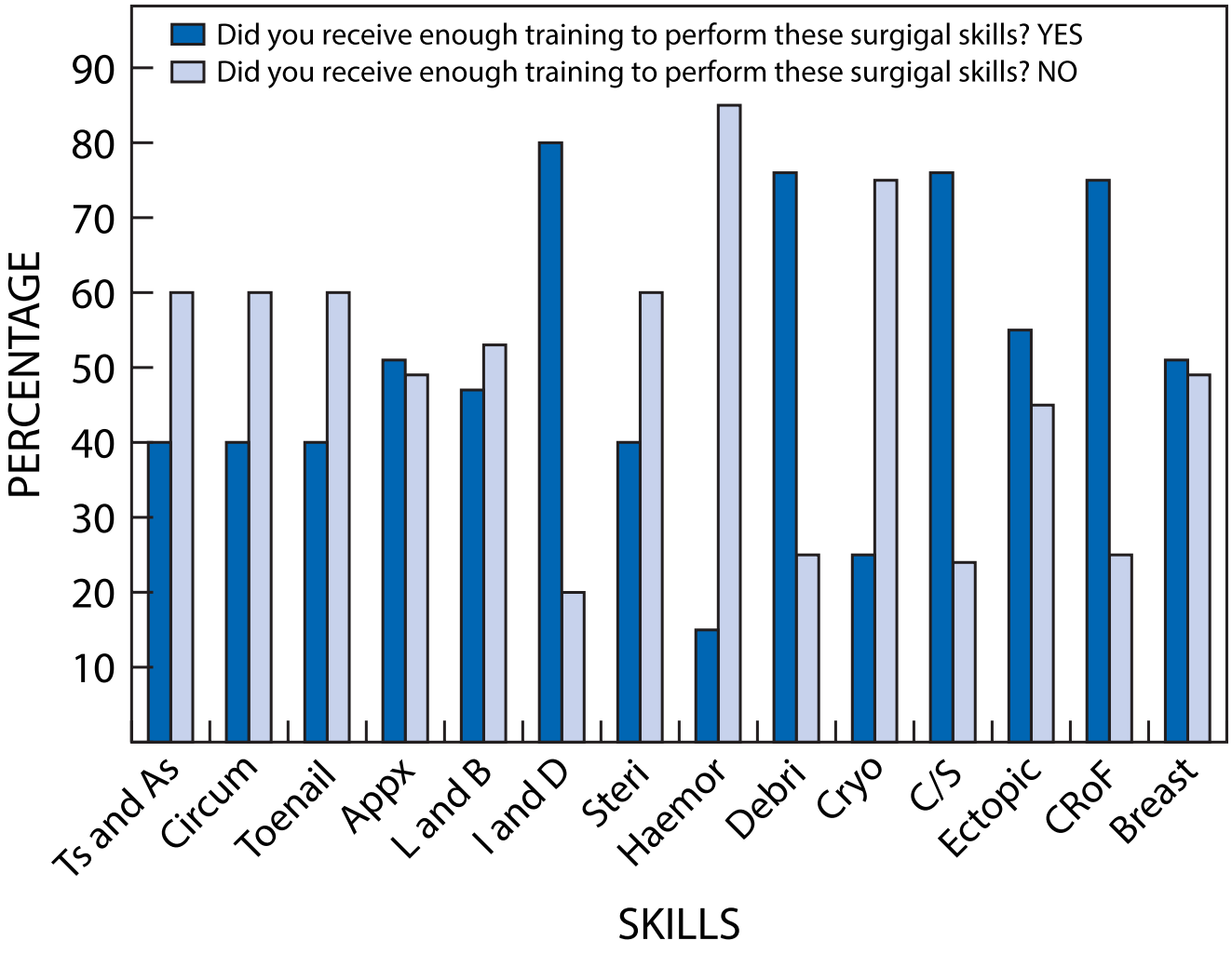
*Question 4 & 5: Where did you complete your internship and plan to do your community service?*

None of the interns completed their internship in a rural area, but 21/55 of them (38%) indicated that they intended to complete their community service in a rural location. Of concern, was that two of the 16 interns reported that they were incompetent at performing some of the surgical skills, while 14 interns rated themselves as being competent at the core surgical skills, and were willing to undertake community service in a rural area where they were most likely to be called upon to practice these skills.

Table 4 represents the interns' perceptions on their competence in the identified surgical skills listed. A rewarding finding was that the interns perceived themselves to be competent in the four most important surgical skills that had been identified. However, a significant number of interns did not feel confident in performing a number of the listed skills, which was worrying.

**Table 4:** Interns' perceptions on their competence in the identified surgical skills listed

| List of identified surgical skills | Never performed | Very incompetent | Somewhat incompetent | Somewhat competent | Very competent |
|---|---|---|---|---|---|
| Adenotonsillectomy | 29 | 4 | 6 | 16 | 0 |
| Circumcisions | 27 | 0 | 4 | 16 | 8 |
| Wedge resection of big toenails | 29 | 4 | 8 | 0 | 14 |
| Appendectomy | 15 | 18 | 0 | 6 | 0 |
| Excision of lumps and bumps | 14 | 10 | 4 | 0 | 28 |
| Abscess drainage | 3 | 2 | 0 | 10 | 40 |
| Sterilisation | 15 | 10 | 0 | 8 | 22 |
| Haemorrhoidectomy | 51 | 4 | 0 | 0 | 0 |
| Debridement of wounds | 13 | 6 | 0 | 8 | 28 |
| Cryotherapy of dermatological conditions | 29 | 6 | 0 | 0 | 22 |
| Caesarean section | 5 | 8 | 2 | 10 | 30 |
| Ectopic pregnancy surgery | 29 | 4 | 8 | 6 | 8 |
| Reduction of fractures | 5 | 6 | 6 | 8 | 30 |
| Breast tumour biopsy | 21 | 6 | 0 | 0 | 28 |




Appx: appendectomy, Breast: breast tumour bioposy, Circum: circumcision, C/S: Caesarean section, Cryo: cryotherapy of dermatological conditions, Debri: debridement of wounds, Ectopic: ectopic pregnancy surgery, GPs: general practitioners, Haemor: haemorrhoidectomy, I and D: incision and drainage, L and B: lumps and bumps, Steri: sterilisation, Toenail: wedge resection of big toenails, Ts and As: Tonsils and adenoids

**Figure 2:** Interns' reports on whether or not they received training in surgical skills

Figure 2 represents the interns' reports on whether or not they received training in surgical skills. None of the interns who trained in the urban group rated themselves as being competent in the first four skills. This raises a question about the appropriateness of training interns at tertiary hospital level. A further cause of concern relates to the trend of interns wanting to remain in tertiary settings to

conduct their community service even though it seems that they don't get the opportunity for training in the core surgical skills there.

### *Perceptions on adequacy of the training*

Interns were asked about their perceptions on the adequacy of their exposure during surgical training. They reported that they seldom performed surgical procedures, and only occasionally assisted registrars and medical officers during operations.

This intern's comment attests to the trend of interns being signed off by a supervisor when they didn't believe that they had had sufficient exposure or practice: "I only did two Caesarean sections. I know I had to do more, but never got a change since I was signed off as competent" (intern 5).

### *Placement of internship*

#### *Semi-urban locations*

Interns who conducted their training in semi-urban locations had more direct experiences. However, they became despondent if they did not receive the placement for which they had hoped. One intern described his experience in the following manner: "I did 112 Caesarean sections, five ectopic pregnancies, tonsillectomies, and many small surgical procedures in a semi-urban hospital. I wanted to specialise in Obstetrics and wanted to go to an urban area to start my career, but instead was sent to a small rural clinic, where I could not do any surgery. Instead I am leaving the country, without community service, and will see when I come back" (intern 3).

#### *Tertiary institutions*

Those placed at tertiary institutions did not report having experienced superior learning either. One intern commented: "There was no training in basic skills in the tertiary hospital because of the heavy workload during internship. There was pressure on me to neglect acquiring surgical skills in favour of doing hard work" (intern 10).

#### *Necessity of GP training in the South African Health service*

Junior doctors were asked if it was important that they all learn how to perform certain surgical procedures, to which one intern responded: "It advances your knowledge in the treatment of patients" (intern 1). Another expressed himself by saying: "Yes, it's needed since the training of good general practitioners will do more for South African health care than the training of hard-to-access specialists" (intern 5) and "Yes, especially skills like lumps and bumps, incision and drainage, and circumcisions, which a GP should do ", (intern 6).

## Discussion

According the literature, the three most important skills that an intern must be competent at performing were Caesarean sections, the drainage of abscesses and the excision of lumps and bumps, which correlates with what the GP and interns said. The competence of the interns was high with regard to the first three skills, but only 51 perceived themselves to be competent at excising lumps and bumps.

A worrying factor was that the next three generalist skills, namely an appendectomy, toenail surgery and ectopic laparotomy surgery, did not correspond with the next three most important skills listed in the literature, nor the collated list, and the interns reported having minimal confidence in performing "general practice surgery". According to the six most important skills ranked on the collated list, the interns required more training in appendectomy and circumcisions.

## Conclusion

This study reported on surgical procedural skills identified by general medical practitioners, interns and the literature as being essential within the repertoire of independent practitioners, especially in an environment in which referral to a specialist was not always possible.

This study also ascertained whether interns, after two years of internship, perceived themselves to have received sufficient training and exposure to practice independently in a clinical or district setting with surgical procedural skills.

Based on the qualitative intern reports, it is obvious that the interns did not feel adequately prepared to perform independent surgical skills, as required when practising in rural and non-urban communities.

This study showed the importance of district medical officers needing to be competent generalists. They are required to deal with primary care, trauma and emergency care skills, and to perform obstetric, orthopaedic and surgical procedures for their support and encouragement.

## Recommendations

- Family Medicine training programmes should give particular attention to the provision of relevant education with regard to district hospital medical practice.
- The training of interns needs to be under the supervision of senior doctors, and to comprise in-service training, like an apprenticeship.
- Distance learning and in-service training are absolutely vital in order for interns to become competent in independent practice.

*Acknowledgements* – The authors wish to thank the Sub-Saharan Africa-FAIMER Regional Institute fellowship programme for their support and encouragement.

*Funding* – This work was supported by University of Pretoria.

## References

1. De Villiers M, De Villiers P. Theatre and emergency services rendered by generalist medical practitioners in district hospitals in the Western Cape. SA Fam Pract. 2003;45(7):15–9.
2. De Villiers MR, De Villiers PJT, et al. The maintenance of competence of rural district hospital medical practitioners. SA Fam Pract. 2006;48(3):18–18d.
3. Jaschinski J, De Villiers M. Factors influencing the development of practical skills of interns working in regional hospitals of the Western Cape province of South Africa. SA Fam Pract. 2008;50(1):70–70d.
4. National Department of Health. Health facility definitions. 2006. Available from: http://www.hst.org.za/publications/health-facility-definitions
5. Reid S, Chabikuli N, et al. The procedural skills of rural hospital doctors. SAMJ. 1999;89(7):769–73.
6. Jacques P. Surgery in rural areas. Contin Med Edu. 2002;20(1):650–2.
7. Watts R. The GP procedurals. Aust Fam Phys. 1993;22(8):1475–8.
8. Kelly L. Surgical skills for family physicians. Do family physicians make the cut? Can Fam Phys. 1998;44:469–70.
9. Wise A, Hays R, Adkins P, et al. Training for rural practice. Med J Aust. 1994;42(4):314–8.
10. Mash B, Couper I, Hugo JF. Building consensus on clinical procedural skills for South African family medicine training using the Delphi technique. S Afr Fam Pract. 2006;48(10):14a–d. http://dx.doi.org/10.1080/20786204.2006.10873475
11. Reid S. Compulsory community service for doctors in South Africa: an evaluation of the first year. SAMJ. 2001;91(4):329–36.
12. Mazwai E. Training surgical competent doctors for South African rural settings. SAJS. 1997;35(3):147–8.
13. Couper I, Reid S, et al. Procedural skills of rural doctors in South Africa. 1998;1–28. Available from: http://www.hst.org.za/sites/default/files/appskils.pdf

Received: 06-11-2012 Accepted: 24-04-2014