

## **CHAPTER 2**

### **PHASE 1: THE DEVELOPMENT AND VALIDATION OF A MODEL OF THE COMPETENT SOUTH AFRICAN INTERN**

#### **2.1 INTRODUCTION AND BACKGROUND**

Chapter 1 presented a detailed background to the reasons for changing the undergraduate medical curriculum at the University of the Witwatersrand, the differences between the old and the new curricula and a review of the literature pertinent to the study. This chapter describes the first phase of the research which was to develop a model of the desired attributes to be found in a competent, uniquely South African intern. The model had to clearly identify the benchmark (“gold standard”) features or elements necessary for the practice of medicine by newly graduated interns in the public sector hospitals in South Africa. Once validated, this model was used to develop the instruments which would be employed in the second phase of the study.

#### **2.2 AIMS**

The question of what constitutes competence (integrating knowledge, skills and attitudes thoughtfully in different clinical situations) and capability (knowledge and understanding + personal skills and qualities + ‘professional thinking’ (Eraut and Cole, 1993 in Prozesky, 2000) in the context of the medical internship was clarified in Chapter 1. This chapter addresses the first two objectives which relate to Phase 1 of the study.

- 1 to identify the elements which contribute to the development of a Model of the Competent South African Intern and to validate this model
- 2 to use the model to develop instruments to be used in a subsequent study to measure these characteristics in Wits interns from two diverse curricula

## 2.3 METHODS

Two main methods were used to develop the intern model. The first was a document review of internal University documents and a literature review of national and international publications which dealt with the subjects of undergraduate medical curriculum change and the assessment of internship competence. The dearth of South African literature on medical education and internship at that time necessitated a further step in the research design, that of semi-structured interviews. It was important to hear opinions about the qualities expected of newly qualified interns in South African hospitals from both experienced intern supervisors as well as ex-interns who had recently undergone their internship training and were currently undertaking their community service year.

### 2.3.1. *Document and literature reviews*

A content analysis of the following documents was performed to identify elements for potential inclusion in the model. In 1995 the Faculty of Health Sciences conducted a survey of the attitudes of staff, students and graduates towards the curriculum. This resulted in an internal document which outlined the desired attributes of the Faculty's medical graduates (Manning, 2008). It later served as a foundation for the outcomes document for the renewed curriculum which was registered on the South African National Qualifications Framework (University of the Witwatersrand, 2000). More detailed outcomes for the four vertical themes and the clinical components of the proposed new curriculum were included in an internal document (University of the Witwatersrand, 2003). National documents consulted included the Health Professions Council of South Africa (HPCSA) Handbook on Internship Training (HPCSA, 2004) and the Logbook for Internship Training (HPCSA, 2005). These provided valuable insights into the expectations of interns from the point of view of the HPCSA.

An online literature search (keywords: intern performance, internship, junior doctors, competence, clinical assessment, problem-based, medical curriculum, outcomes, change) produced 23 useful articles. The search ended when saturation of aspects relevant to intern performance or competence was reached. Numerous studies on intern competence and comparisons between curricula had been reported worldwide and these were important in teasing out elements of internship competence (Al-Haddad and Jayawickramarajah, 1991;

Hill, Rolfe, Pearson and Heathocote, 1998; Pearson, Rolfe and Henry, 1998; Hannon, 2000; Rolfe, Pearson, Sanson-Fisher, *et al*, 2002; Dean, Barratt, Hendry and Lyon, 2003; Akabayashi, Slingsby, Kai *et al*, 2004; Barnsley *et al*, 1994; Evans, Elwyn and Edwards, 2004; Hayes, Feather, Hall, *et al*, 2004; Schmidt and van der Molen, 2001) as well as patients' perceptions of interns (Coulter, 2002) and intern stressors (Firth-Cozens, 1987) for inclusion in the model. No comparable South African studies were found at the time of planning this stage of the research. A few articles describing some aspects of internship and undergraduate medical education were found and included (Dubb, 1986, Jaques, Reid, Chabikuli, *et al*, 1998; van Staden, Joubert, Pickworth, *et al*, 2004).

### **2.3.2      *Semi-structured interviews***

The inclusion of locally conducted interviews in addition to the international literature ensured that the model and the final instruments were “grounded in the views, experiences and language” (Schifferdecker and Reed, 2009, pp. 639) of those working in the South African hospital situation rather than relying on overseas terminology or the perspective of the researcher. The interviews also enabled the researcher to learn more about internship conditions and the roles and responsibilities of the different levels of medical staff in the hospitals visited. This was important to the success of the Phase 2 phase of the study.

#### **2.3.2.1      Study Population**

The opinions of both experienced intern supervisors and ex-interns who had recently undergone internship training and were currently undertaking their community service year were important sources of opinion about the qualities of the excellent South African Intern.

Semi-structured interviews were conducted with twelve intern supervisors and five community service doctors drawn from all three levels of the hospital system and included both males and females as well as different ethnic backgrounds.

#### **2.3.2.2      Sampling Method**

Interviewees were selected by purposeful quota sampling which is the non-probability equivalent of stratified sampling for use in smaller populations (Cohen and Manion, 1989).

With this type of sampling it was necessary to be aware of, and consciously eliminate, possible biases in the researcher such as not wanting to go to certain kinds of places as well as other unintentional or unobserved biases such a feeling more comfortable interviewing subject of particular ethnic or gender groups (Treece & Treece, 1982, p. 164). The standardised interview schedules enabled each interview to follow the same pattern and only one interviewer was used.

Interviews were conducted with twelve experienced intern supervisors and five community service doctors who had recently undergone their own internship training. At this point saturation level for new information was reached. Table 1 shows the distribution of the sample between the different hospital levels (district, regional and provincial or national) and racial and gender groupings.

Table 2.1 Sample of intern supervisors and community service doctors interviewed

	RACE	INDIAN		WHITE		BLACK/COLOURED	
	GENDER	F	M	F	M	F	M
HOSPITAL LEVEL	LEVEL 1 District	CS 03		IS 06 CS 02			IS 12
	LEVEL 2 Regional	IS 09		IS 02 CS 01 IS 07 CS 05	IS 03	IS 08	CS 04
	LEVEL 3 Provincial / National			IS 04	IS 01 IS 05 IS 11		IS 10

Key: IS= Intern supervisors currently supervising interns (12 persons sampled).  
CS= Community service doctors in the year following a one-year internship  
(5 persons sampled)

### 2.3.2.3 Geographic details

Figure 2.1 shows a map of the provinces in SA. It was not considered necessary to sample all South African provinces. Initial interviews were conducted within reasonable travelling distance from Johannesburg, adding to this sample and moving further afield, until all the desired groupings had been included and saturation of information was reached.



Figure 2.1 Map to show interview regions (circled) (adapted from CABS Car Rental, South Africa, 1990)

#### 2.3.2.4 Hospital levels

Intern accredited hospitals are mainly in urban areas within a radius of 20 kilometres from a teaching hospital. In many cases a complex of hospitals combines to give interns exposure to a number of different hospital levels during internship. The hospital levels where interns are allocated are graded according to their human resources, services offered, levels of care provided and availability of equipment and drugs (HPCSA, 2004). Undergraduate medical education should prepare interns to work at any hospital level.

Level I: District hospitals are community hospitals which have more medical officers than a community health centre, one of whom is available on call at night. Senior nursing staff and other health care professionals are available and there are some visits by specialists. These hospitals have general wards and operating theatre services with diagnostic, radiological and laboratory services and oral health services also available. They receive referrals from, support and refer back to Community Health Centres. Drugs in the Essential Drug List (EDL) for primary care are available.

Level II: Regional hospitals have the services offered at District hospitals, but in addition have specialists in the more common disciplines, dentists and other health care professionals. They offer a wider range of more complex diagnostic and therapeutic services and fewer ambulatory and polyclinic services. Patients receive comprehensive hospital care with 24-hour specialist cover on call and receive referrals from District hospitals. Drugs are available as per the EDL for Regional hospitals.

Level III: National, Central or Provincial tertiary hospitals are mainly academic hospitals with a range of teams led by specialists and some highly specialised units. There are no polyclinics or general casualty services offered as these are covered by the District or Regional level hospitals. They may provide care for people from several or all provinces and receive referrals from Regional hospitals all over South Africa. A range of highly specialised equipment is available, often different in the different hospitals and drugs in the EDL for Central hospitals are available.

Specialised hospitals were not included in this study as interns are not allocated at these hospitals (HPCSA, 2004, p. 119-121).

#### **2.3.2.5 Instruments**

Semi-structured interview schedules (appendix A) were designed with standardised questions arranged sequentially from broad to narrower and more detailed. Open ended comments allowed interviewees to expand the discussion within the designated areas of the interview guide as appropriate. The mean time taken for interviews was 61 minutes (range = 35 -110 min) for intern supervisors and 48 minutes (range = 35 – 60 min) for community service doctors.

## **2.4 RESULTS**

### **2.4.1 Data analysis**

Forty four individual documents, articles and interview transcripts were used in developing the model. Thematic Content Analysis of all sources produced a list of ninety elements of

intern behaviour which fell naturally into nine general themes. The themes, or categories, and the elements under them were entered as rows in a Microsoft Office Excel spreadsheet with the sources given in the columns (see Appendix A1). The elements identified from each source were marked on the spreadsheet and the number of occurrences recorded.

The important elements of undergraduate medical training for internship in South Africa are similar in most respects to those described in the international literature. However, some interesting differences emerged in the South African literature and interviews. Internship worldwide is commonly reported to be a time of considerable pressure requiring stamina to cope with long hours and working under pressure (Hannon, 2000; Schmidt and van der Molen, 2001; Al-Haddad and Jayawickramarajah, 1991; Firth-Cozens, 1987). This was exacerbated in South Africa by the sometimes severe staff shortages and lack of resources, especially the uneven rural-urban distribution of health professionals and the movement to the private sector (Wemmer, 2008). Although the global HIV and AIDS pandemic affects all sectors of society, in South Africa poor families carry the greatest burden of disease and have the least reserves to cope (*ibid*). The burden of caring for these people falls mainly to public sector hospitals and this has impacted every sphere of the internship experience and has added to the stress and workload of the interns. Ethical considerations have taken on new meaning and personal safety and protection present a constant concern.

South Africa is a multilingual country with eleven official languages of which English is the language of business, politics and the media but it only ranks fifth out of eleven as a home language. Many other languages are also spoken by indigenous and immigrant populations (SouthAfrica.info, 2009). It was interesting that the intern supervisors and past interns interviewed did not mention the importance of understanding community health concepts or taking cultural differences and language issues into account when treating the very varied patient populations in South African hospitals. This may be due to the nature of internship, which is mainly in secondary and tertiary level hospitals, but even those doctors interviewed in district level hospitals made no mention of this. These aspects were, however, identified as important by the validators and were retained in the final model because this very lack of understanding of the patients' social and cultural backgrounds was one of the reasons for the change in the curriculum and is essential in the South African situation.

### 2.4.2 Refining the model

The list was carefully scrutinised by the researcher and two independent medical education experts for overlap of elements within categories and for those which had been incorrectly categorised. This reduced the number of elements to fifty nine. Thereafter, the following process was applied to eliminate extraneous or non-relevant items.

A “coarse sieve” process removed sixteen elements identified by only 10% (4) or fewer of the sources. A further “fine sieve” process was then employed to review the relevance of those elements included in fewer than 20% (9) of the sources. The decision as to whether an item would be eliminated or retained was made on the basis of the importance given to those items by the undergraduate outcomes documents, the HPCSA guidelines or the interview transcripts. These sources were particularly relevant to South African interns. No further elements were removed but three, which fell within the Community Health category and were eliminated at the coarse sieve stage, were given special status and reinstated. They were considered important to internship in South Africa although seldom mentioned in international literature. Table 2.2 shows the stages of the refinement process.

Table 2.2 The process of refining the model of the competent South African intern

	Categories	No of elements remaining at various stages of the refinement process			
		After literature search and interviews	After rationalisation by experts	After “coarse sieve” process	After “fine sieve” review
1	Fundamental theoretical knowledge	5	4	4	4
2	Medical problem solving	9	7	7	7
3	Holistic patient management	21	14	8	8
4	Community health	9	7	1	*4
5	Professional attitudes	12	5	4	4
6	Effective communication skills	7	5	5	5
7	Working with others in a team	6	4	4	4
8	Self directed learning	7	5	5	5
9	Confidence and personal attributes	14	7	6	6
	TOTAL	90	59	43	47
				16 removed ≤10% sources	* 3 re-instated



The resulting model comprised nine main categories with forty seven sub-categories or elements falling under them. The elements were then worded as outcomes in preparation for validation.

## **2.5 VALIDATION OF THE MODEL**

The “Model of the Competent South African Intern” was validated by a panel of experts, selected by purposive sampling, who were insightful, independent and representative. The criteria for selection are discussed below.

### ***2.5.1 Definitions of criteria***

‘Insightful’ meant that panellists had to be South African medical doctors or doctors who had worked in South Africa for at least five years and ‘independent’ meant that they should not have been directly involved in the development of the new curriculum. In order to be considered representative, the panellists had to be doctors who practiced in institutions accredited for intern training from different geographical regions and from the three different hospital levels (district, regional, tertiary) or who were Health Professional Council of South Africa (HPCSA) inspectors in the various provinces or medical educationalists from the various medical schools in South Africa.

The thirty panellists who were invited to participate comprised one medical educationist from each of the seven medical schools in South Africa, five HPCSA inspectors of accredited institutions for internship and eighteen doctors practising in intern training institutions. Each was sent a letter explaining the study and clarifying the requested task, a copy of the model and a structured comment form on which to record the suitability of each of the elements for inclusion in such a model and additional elements that they felt had been omitted. The criteria for deciding whether to include new items in the model or exclude items from the model based on the panel’s suggestions were as follows:

Probability of entry: If 30% of the panel were in favour of including a similar new item it would be added to the model. If the item had appeared in the original source data for the model, but was excluded in the coarse sieve process, it would need the agreement of 20% of the panellists for it to be reinstated.

Probability of exclusion: it should be more difficult to remove items (since all panellists would have considered all items that might potentially be removed) so it would need 50% agreement to exclude an item already in the model.

### ***2.5.2 Results of the validation process***

Twenty seven replies were received which represented a 90% response rate. Many of the panellists went to considerable trouble and provided excellent insights into the nature of internship and the difficulties of assessing intern performance. Some made valuable suggestions for refining the wording of individual items. The panel approved all the elements that had been included and, although a few felt that research skills were not appropriate during internship, no elements were considered unimportant enough to omit. Some comments were:

*“All are important – many hard to measure”*

*“The model is very comprehensive”*

Several of the validation panellists raised Community Health issues as important for inclusion in the model. They suggested that interns should have knowledge of the national burden of disease in South Africa, know how to report notifiable diseases to the relevant authorities and be alert to changing patterns of disease within their working environments. They should also be able to identify the socio-economic and political forces which constrain the delivery of health care in particular regions and propose realistic working solutions to optimise health care within these health delivery constraints.

Although interesting and worthy of note, none of the new elements suggested by the validation panel met the required 20% or 30% level of support for reinstatement or inclusion respectively. Many of the elements identified were in fact included in the model in a more general way and these new ideas were valuable in clearly wording some of the items when developing the questionnaires. The number of comments relating to the community health theme supported our decision to reinstate elements in this category during the model refinement stage. Other suggestions such as the inclusion of interns’

preparedness to work in different level hospitals would be included in the research design and analysis of the second, comparative phase of the study for which the model was being developed. Table 2.3 shows the final model of the competent South African intern after validation by the panel of experts.

## **2.6 THE DEVELOPMENT OF INSTRUMENTS BASED UPON THE MODEL**

Once the model was established and validated, instruments were developed to survey the competence of interns who had graduated from the traditional and the GEMP curricula at Wits medical school. To increase the validity of the study triangulation was employed by obtaining information from the interns, supervisors, colleagues and patients, requiring four sets of instruments.

In the questionnaires, the subcategories identified in the model were expanded to ensure clarity and avoid ambiguity or the inclusion of more than one concept per item. In the category on holistic management and skills, the individual procedural skills expected of interns at the commencement of their internship were identified from the literature and the interviews. These were listed separately as part 'B' of the category. This resulted in a fifty seven-item questionnaire which was used in the subsequent comparative study for both the interns and, with slight adaptations to the wording, for the intern supervisors. Equal weighting was given to each item in the questionnaire but those categories considered to be particularly important during the internship (holistic patient management and clinical skills and medical problem solving and judgement) had more items, resulting in a form of weighting. Semi structured interview schedules were prepared for the interviews, to probe responses at the extremes of the scale and link these to the curriculum.

A shortened version of the questionnaire, using only appropriate items, was prepared for colleagues. The format allowed for self-completion or administration as a structured interview. The schedule for patients was administered as a semi structured interview. The instruments are described in more detail in Chapter 3 and the final versions are presented in Appendix B.

Table 2.3 The Model of the Competent South African Intern

Categories and performance elements	
<b>1</b>	<b>Fundamental (theoretical) knowledge</b>
1.1	Applies basic (chem, physics, biol) and medical (anat, physiology, mol med, haem) science to patient problems
1.2	Demonstrates understanding of disease processes (pathology, pathophysiology, microbiology) related to patient problems
1.3	Applies principles of therapeutics, pharmacokinetics and pharmacodynamics to the prescribing of medicines
1.4	Applies the theory of self knowledge, interpersonal and communication skills to the doctor patient relationship
<b>2</b>	<b>Medical problem solving and clinical judgement</b>
2.1	Collects data by taking a good history, reason for encounter, increasingly focuses questions
2.2	Performs a thorough yet focused physical examination and elicits and interprets signs
2.3	Able to solve problems (defines problem, develops/tests hypotheses, thinks deliberately, diff diagnoses) diagnoses
2.4	Requests or performs appropriate diagnostic tests in a cost conscious manner, minimising needless investigations
2.5	Documents findings, at an acceptable standard, in patient notes or referral letters
2.6	Analyses, interprets and reflects critically on the information from history, examination, diagnostic tests, patient notes
2.7	Makes appropriate decisions regarding immediate management and initiates treatment of common conditions
<b>3</b>	<b>Holistic management and skills</b>
3.1	Achieves a safe level of basic technical skills (drip/suturing/venepuncture/BP/catheterisation/CPR/LP/ECG)
3.2	Assists competently with major surgical procedures and anaesthesia
3.3	Performs lesser surgical procedures competently under supervision, including pre- and post-operative care
3.4	Demonstrates awareness of clinical priorities (triage) and can manage medical and surgical emergencies
3.5	Formulates orderly patient care plans (investigation, observation, therapy, medication, counselling, referral, follow-up)
3.6	Plans for continuation of care of chronic problems and follows up his/her own patients in outpatients
3.7	Involves the patient and the family in planning care and takes into account the patient's priorities and preferences
3.8	Identifies individual patient risk factors and facilitates behaviour change for health promotion and to prevent disease
<b>4</b>	<b>Community health</b>
4.1	Demonstrates ability to deliver care to ambulatory patients in clinics and outpatient departments
4.2	Provides the best possible care for patients within the delivery constraints of the South African health care system
4.3	Takes into account the patients' home circumstances when planning discharge and aftercare
4.4	Shows understanding of the South African communities and cultures and the relevance of this to health care
<b>5</b>	<b>Professional attitudes, values and Ethics</b>
5.1	Incorporates ethical principles (beneficence, non-maleficence, autonomy, justice) in practice and respects confidentiality
5.2	Respects the dignity of patients and colleagues, encompassing diversity of language, culture and opportunity
5.3	Prioritises the patients' interests and rights and practices patient advocacy
5.4	Demonstrates awareness of medico-legal risks and practises within the law
<b>6</b>	<b>Effective communication skills</b>
6.1	Demonstrates good interpersonal skills, takes time to listen, allows patients to elaborate, responds to body language
6.2	Uses an appropriate style and language structure with colleagues, patients and family members
6.3	Deals empathetically with difficult patient questions and sensitive issues such as breaking bad news
6.4	Shows ability to support and counsel a dying patient and his or her relatives
6.5	Presents patient cases clearly and succinctly at seminars & ward rounds using appropriate technology (OHP/PowerPoint)
<b>7</b>	<b>Working with others in a team</b>
7.1	Works effectively in a team, establishes good relationships, shows team spirit, shares ideas, learns from others
7.2	Takes an appropriate share of the work load/team assignments and is up to date on administrative tasks and paperwork
7.3	Shows the ability to give and accept constructive feedback and learn from mistakes
7.4	Appreciates the roles and skills of other health professionals so as to cooperate professionally and refer appropriately
<b>8</b>	<b>Self directed learning</b>
8.1	Shows self motivation in seeking information, uses learning opportunities to improve knowledge/make sense of
8.2	Self evaluates and recognises limitations in knowledge or skills, seeks help when necessary
8.3	Attends ward rounds and formal teaching sessions regularly
8.4	Demonstrates ability to use a modern library, read medical literature, access online resources (including e-
8.5	Applies scientific (research) knowledge and critical reflection to the reading of research articles and EBM
<b>9</b>	<b>Confidence and personal attributes (intangible personal resources)</b>
9.1	Demonstrates a sense of personal responsibility and accountability for his/her patients
9.2	Demonstrates stamina and coping skills to deal with long hours, exhaustion, uncertainty and changing environments
9.3	Shows personal time management skills by maintaining a balanced personal and work life
9.4	Shows a caring and compassionate nature with empathy and humaneness towards others
9.5	Shows that he/se is dependable, thorough, punctual, there when expected, hardworking, fulfils obligations, shows
9.6	Demonstrates an anticipation and enjoyment of clinical work, is enthusiastic and willing to "go the extra mile"

## **2.7 CONCLUSION**

The validated model was considered sufficiently robust to serve as the foundation for the development of a set of instruments (questionnaires and interview schedules) to be used in a subsequent study. This would compare the preparedness for internship, in South African intern training hospitals, of a cohort of graduates from the traditional medical curriculum and the new Graduate Entry Medical Programme. The model could be useful to other Southern African or international medical schools intending to develop similar instruments.

## **2.8 SUMMARY**

This chapter has described in considerable detail the first phase of the intern research. The Model of the Competent South African Intern was developed and validated and this was essential in setting the scene for the design of Phase two, the comparative survey of interns from two different curricula at the University of the Witwatersrand, Johannesburg which formed the major thrust of the research and is reported in the remaining chapters of this thesis.