



The impact of subspecialty services on health care delivery – a community health centre based study

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Objectives. The objective was to evaluate the role of a paediatric surgical consultant at a primary health care facility.

Design. Descriptive and prospective.

Setting. In the process of planning and implementation of the 2010 health plan of the Provincial Government of the Western Cape, a shift occurred in the delivery of health care to children from a provincially based hospital system to a municipally based primary health care system. To contribute towards enabling this process, the Department of Paediatric Surgery at Red Cross War Memorial Children's Hospital established a paediatric surgical day clinic at a local community health centre during 2001.

Subjects. Information was obtained from patient data sheets containing details of consultations at the sub-specialist surgical clinic at Michael Mapongwana Community Health Centre.

Results. Over a 58-month period 1 171 children were seen, of whom 655 were male and 427 female. Their ages ranged from 0 to 19 years, the largest group being under 1 year. Eighty

per cent of patients were accompanied by their mothers. The correct diagnosis was established by the nurse practitioners in 71%. General paediatric surgical conditions predominated, followed by medical, dermatological, orthopaedic, trauma, otolaryngo-pharyngology, infectious diseases, ophthalmology, urology, neurosurgery, malignancy and maxillofacial conditions. The details are set out in the report. In total 597 patients were referred directly to an appropriate care facility and 574 patients could be managed entirely at the clinic level.

Conclusions. This study demonstrated the significant public health problem of paediatric surgical disease. It emphasised the preventative and cost-effective role of a surgical clinic at primary health care level. The clinic allowed for timely surgical intervention in 65% of surgical cases, thereby decreasing inappropriate tertiary referrals. We believe that bringing specialists into the community can only strengthen the 2010 health care plan.

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'Small steps and big leaps'¹

The process of planning and implementation of the 2010 health plan of the Provincial Government of the Western Cape brought about changes in the delivery of health care to children. These changes emanated from a need for a more equitable, efficient, affordable and integrated health care system. To achieve these goals, a pragmatic evolution of care for a service delivery platform was adopted by the provincial and municipal health authorities. This approach resulted in the introduction of municipality-based health care centres.

A network of municipality primary health care clinics (PHCs) functions as the first level where patients gain entry into the health system. These centres are situated in the community. Within this new dispensation, nurse practitioners would primarily be responsible for managing childhood

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ailments. Should more advanced diagnosis or treatment be required, patients would be referred to community health centres (CHCs), or secondary level or tertiary health facilities. The referral system is depicted in Fig. 1.

While the Provincial Health Department had previously been directly responsible for providing health services, it now assumes the role of providing guidelines, co-ordination, funding, monitoring and supporting the PHCs, which have become the primary providers.

A quantum shift therefore occurred in the delivery of health care to children from a provincially based hospital system to a municipally based PHC system. To contribute towards enabling this process, the Department of Paediatric Surgery at Red Cross War Memorial Children's Hospital (a tertiary referral centre) decided to establish a paediatric surgical day clinic at a local community health centre during 2001. The health centre is 1 of 9 CHC facilities that provide health services to the local community with a drainage population of approximately 300 000 inhabitants.

This site was chosen because 11% of children with surgical conditions seen at the tertiary hospital originated from this community. The clinic was established after extensive negotiations with the health authorities and the local communities. A specialist paediatric surgeon conducted a weekly 3-hour clinic. Children were referred from five PHCs or seen *de novo*. A dedicated nurse was allocated to the clinic.

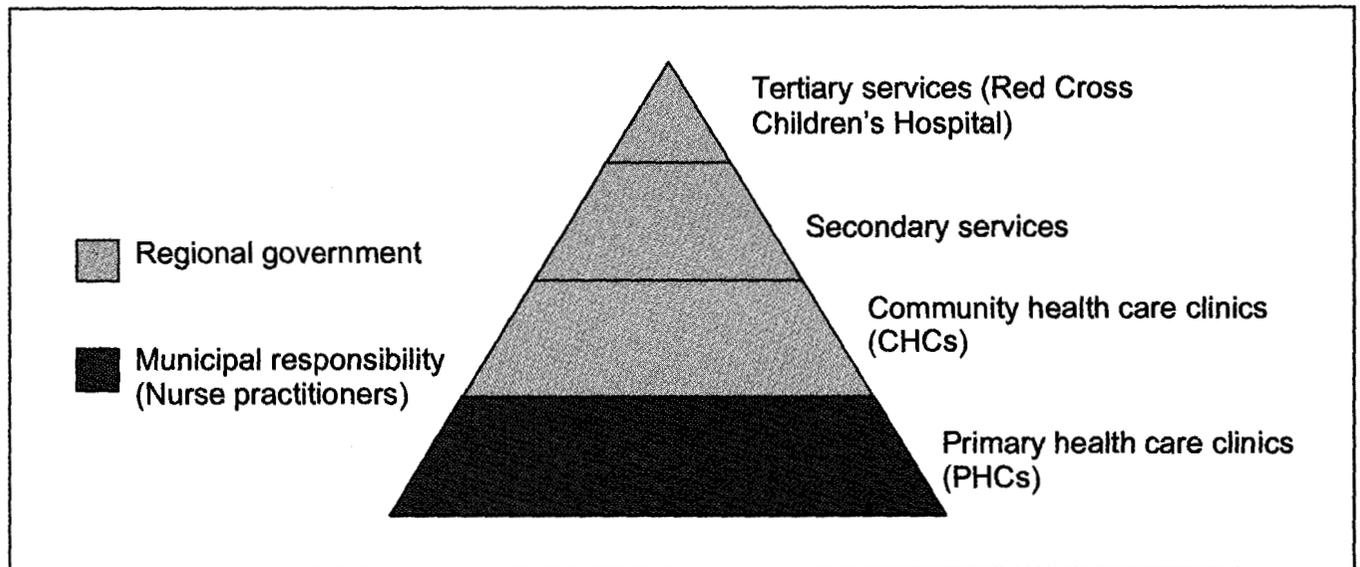


Fig. 1. Referral pattern for patients under the 2010 health care plan.

Methodology

The objective of this descriptive and prospective study was to evaluate the role of a paediatric surgical consultant at a CHC. The goals were to review the demographics, disease profiles, referral patterns and the prevalence and magnitude of surgical conditions in order to better understand the surgical needs of the community. In addition, the quality of care provided by the municipal health services, the diagnostic and therapeutic roles that nurse practitioners play in this setting, the benefits and drawbacks of having a sub-specialty service at community level in a low-resourced and low-income environment and the outcome following consultation were also assessed.

Information was obtained from the patient data sheets for the surgical clinic at Michael Mapongwana Community Health Centre. The information reported reflects those patients attending the sub-specialist paediatric surgery clinic from March 2001 to December 2005. When the opportunity arose, the time at the clinic was used to educate medical students and community service doctors about childhood surgical conditions.

Results

Patient demographics

One thousand one hundred and seventy-one paediatric patients were assessed and managed over the 58-month period. Patient numbers generally increased as the clinic became well known, from 160 in 2001 to 345 in 2005. Ages ranged from 0 to 19 years, the largest group being under 1 year of age. There were 655 males and 427 females (Fig. 2). The gender of 89 patients was not documented.

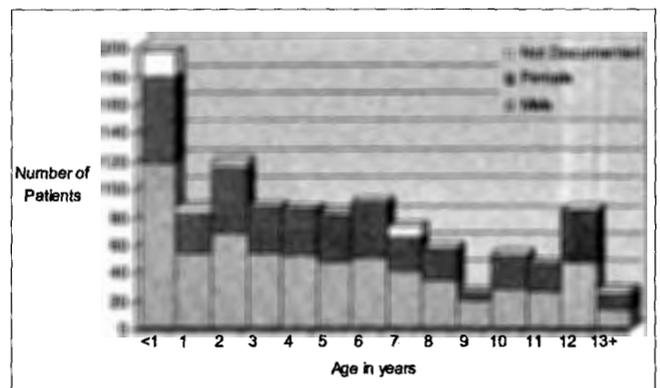


Fig. 2. Age and gender distribution of patients.

Accompanying person

The accompanying guardian was noted on 469 patient data sheets. Mothers accompanied the patients in 375 cases (80%), and fathers in 35 cases (7%). Six children presented with no escort.

Diagnostic accuracy of nurse practitioners' referral letters

A referral diagnosis made by the nurse practitioner from the referring municipal clinic was recorded in 357 cases. The correct diagnosis was established in 255 children (71%) and the diagnosis was incorrect in 102 (29%).

Medical sub-specialties

Fig. 3 represents an analysis by medical specialty of the total number of children seen at the clinic. As could be expected, general paediatric surgical conditions predominated, followed



by medical, dermatological, orthopaedic, trauma otolaryngo-pharyngology, infectious diseases, ophthalmology, urology, neurosurgery, malignancy and maxillofacial conditions.

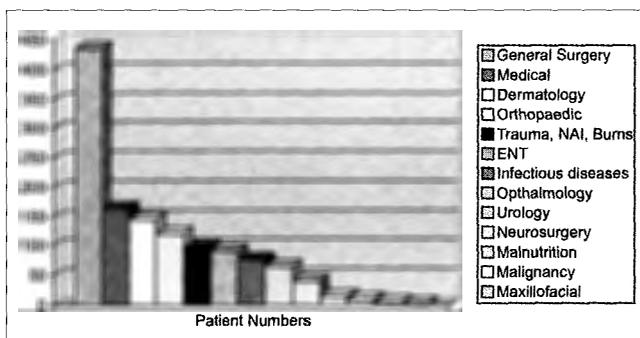


Fig. 3. Patient numbers in each specialty.

General surgery

Four hundred and thirty-one surgical patients were seen and a total of 451 diagnoses made. The prevalence and analysis of surgical disease profiles are depicted in Table I. Minor surgical conditions were more prevalent and most required elective surgical intervention. Acute appendicitis was diagnosed in 2 children, and 2 cases of malignancy, both advanced, were incorrectly diagnosed initially at PHC level. Four other children had lumps that were subsequently diagnosed as malignant. Management of surgical conditions involved 285 patients being referred to selected tertiary level facilities. In 104 children, management consisted of observation, advice and review. Antibiotics, analgesia and other medications were given to 36 children. The balance received dressings for burn wounds or septic wounds or had abscesses aspirated.

Medical conditions

A total of 140 medical patients were observed with a total of 164 diagnoses. Although there was a clinical suspicion of HIV

Table I. General surgical diagnoses

Diagnosis	Number
Inguino-scrotal pathology	157
Abscess/cellulitis/infection	92
Mass/cyst	53
Umbilical hernia/granuloma	34
Minor surgical conditions	28
Peri-anal conditions	21
Lymphadenopathy	17
Phimosis/paraphimosis/balanitis	14
Oesophageal atresia/stricture/dysphagia	9
Abdominal pain/constipation	9
Appendicitis	2
Malignancy – sarcoma/leukaemia/lipoma	6
Normal	9
Total	451

infection in many patients, only 22 patients were tested and documented as HIV-positive. Developmental delay, respiratory diseases and HIV accounted for 71% of the diseases. Sixty-six patients were treated on site with medication and antibiotics. Fifty-one required referral. Further investigations and social grant applications were required in 25.

Dermatology

Dermatological conditions (in 144 children) were among the most common conditions encountered. These consisted of primary skin disorders and infections, and molluscum contagiosum in 93%. One hundred and six patients were managed at the clinic either by prescription of medication or local procedures and management, while 38 were referred to a dermatology department for diagnostic and therapeutic reasons.

Orthopaedics

During the 58 months 120 orthopaedic patients were seen and managed. Their diagnoses ranged from congenital skeletal abnormalities to fractures and bone and joint infections. These diagnoses accounted for 83.3% of orthopaedic conditions. Seventy-two patients required referral to a tertiary care institution, while 48 patients could be dealt with locally with splinting, prescription of medication and minor procedures.

Other conditions

Nine children were seen after a non-accidental injury (NAI); 2 of these had been assaulted and sustained fractures, while 7 had been sexually assaulted. These children were managed according to the NAI protocol of the Western Cape.

Other sub-specialty patients were also seen. Ninety-one patients had problems of an ENT nature, mostly otitis media, foreign bodies in the ear or nose, and parotitis (related to HIV). Ophthalmological cases numbered 65 – meibomian cysts, strabismus, visual impairment, conjunctivitis and molluscum contagiosum being the most common diagnoses. Infectious diseases were documented in 76 patients. These included the usual childhood viral infections of mumps, measles, chickenpox, and most commonly tuberculosis. Central nervous system conditions (hydrocephalus and post-traumatic headaches) were encountered in 13 patients.

Acute trauma was diagnosed in 45 patients. This included a spectrum of injuries such as lacerations, contusions and fractures. Nineteen were referred, the others being treated at the local level with dressings, splinting or sutures. Forty-two patients presented with a history of burns, either acute or with chronic contractures. Fourteen of these were referred to a burn unit, one as an emergency. The others were managed locally with satisfactory outcome.

Excluding undescended testes and phimosis, 41 patients with a problem of a urological nature were encountered. The



most common diagnoses were congenital mega-prepuce, hypospadias and incontinence. Because of the nature of these problems, 29 patients were referred.

Overall management

Table II reflects the management of the group as a whole. In total 597 (51%) were referred directly to an appropriate care facility and department and 574 (49%) could be managed at the clinic level. Management included prescription of medication, dressings, advice and reassurance, and application for social care grants.

The surgeon was involved in the resuscitation of 2 children during this period. One had inhaled paraffin and the other was in shock as a result of gastroenteritis. Emergency ambulance transfer was not immediately available and they were transported directly to the tertiary unit in the surgeon's car. One neonate at the adjoining midwife obstetric unit was certified dead at birth.

There were occasional adult consultations for trauma, abdominal pain, surgical infections, diabetes, TB, haemoptysis and vascular abnormalities. The statistics for these conditions were not included in the audit.

Table II. Management summary of total cases

Management	Number
Referred/admitted	597
Observed/followed up	142
Antibiotics/medications/analgesia	234
Advised/X-rays	145
Dressings	32
Social grant	12
Plaster of Paris	9
Total	1 171

Discussion

Primary health care is defined as provision of first contact care; it is aimed at providing continuity, co-ordination and comprehensiveness. For this service to function optimally, it has to be multidimensional and requires a pathway for referral for diagnostic and management options when required. This survey has highlighted many of these aspects.

As part of the 2010 health plan of the Western Cape, an impressive network of municipally based primary health care facilities was developed where nurse practitioners were primarily responsible for preventive and primary curative care. However, within this new dispensation the provision of basic paediatric surgical care at primary and secondary levels was deficient, hence the decision to establish a surgical platform at this level. This novel service was introduced as a complementary service to the existing municipality health clinics.

Paediatric surgical disease is a significant public health problem. In an attempt to determine the surgical needs of children in Africa, it was estimated that 543/10 000 children, aged 0 - 14 years will require surgical care on an annual basis. Furthermore, a total of 46% of children presenting with surgical problems required surgical procedures, 68% of which were classified as minor. The estimated accumulated risk of developing surgical conditions was 85% by the age of 15 years.²

Traditionally surgery has been seen as an expensive, high-tech service and not considered part of a primary public health model. Primary health care policies, although excellent for child health in general terms, did not adequately address or reflect the surgical needs of children in the PHC system. (Powell D, Van der Merwe B, De War R. Survey of Child Health Services in the Western Cape Province, May 2003 – unpublished data available at the Institute of Child Health Library, Red Cross Hospital (printed copy as well as CD)). There is considerable uncertainty about a national and provincial plan for paediatric surgery, the lack of surgical facilities for children at primary health care level, the lack of anaesthetic facilities for children at a secondary level and the future role of specialists and sub-specialist paediatric surgical services at primary, secondary and tertiary level. The issue is not whether selected children can receive surgical care, but whether children have access to appropriate services.³

As primary care facilities developed, a progressively greater number of children were identified with surgical conditions and a concomitant need for an increase in primary surgical care or referral for diagnosis and treatment developed. The wide spectrum of diseases and conditions documented in this series is a reflection of the surgical needs of the community, and can also serve as a barometer of surgical needs in any stable regional community. Although this clinic was primarily established as a surgical service, 30% of the patients seen had diagnoses of a 'medical' nature. This possibly emphasises the need for such clinics to be established in other disciplines.

In our tertiary institution the outpatient load is disproportionately high for specialist attention. A large percentage of patients could be dealt with at non-specialist level, but are at present referred because of a lack of specialised services or knowledge of surgical conditions within community facilities. In this series 49% of patients were treated at the community level with no need for further referral. Had this clinic not been in operation, these patients would have been referred to already congested secondary and tertiary services. The proximity of a surgical specialist clinic to the primary health care clinics thus allows for easy referral of patients to the tertiary institution and lessens the financial burden on patients.

On the other hand, 51% of patients were referred directly to the appropriate surgical clinic or booked directly for surgical intervention, negating a preoperative outpatient visit. Patients thus receive streamlined service, with less waiting, fewer



points of contact within the system because of direct referral from a primary to a tertiary institution, less time off work and school, and reduced transport costs while the tertiary system is less flooded with outpatient visits.

A substantial number of children were seen with conditions necessitating early referral, including sick, dehydrated children and those with appendicitis, fractures, burns, diarrhoea and paraffin inhalation. Ambulance services were not always available as they were overburdened, hence the immediate transfer of 27 patients by means of private transport.

We were pleasantly surprised by the diagnostic and therapeutic skills of the PHC nurse practitioners. However, in 29% of cases their initial diagnosis or treatment programmes were incorrect. Inadequate history taking, inability to elicit and interpret clinical signs and symptoms and unfamiliarity with surgical conditions were contributing factors. The extended role of nurse practitioners in this area of primary care must be encouraged.⁴ Surgeons must be involved with their training and supervision through the establishment of a continuing medical education programme, incorporating eight surgical sub-specialties.

The medical and pharmaceutical infrastructure within the CHC were adequate to meet the local demands. A knowledgeable clinic nurse is essential, not only for organising the clinic, but also for translation purposes, history taking, and explanation of the condition and outcome. The clinic also offers an ideal opportunity to engage in a holistic health care approach, i.e. immunisation, physical growth assessment, developmental needs and psychosocial issues in the family.

Mothers carry a heavy burden in caring for their children. Of the cases where details of the accompanying individual were recorded, 80% of the children were brought to the clinic by their mothers. They often have to take a whole day off work and pay large transport fares to get to a tertiary centre. Having a community-based clinic allows the mothers to go to work for the second half of the day, thus decreasing the time off work – vital in this impoverished community where no work often means no pay.

The PHC system for children will not function well without an efficient referral and communication system. Problems encountered were difficulties in contacting the appropriate referral centres, long waiting lists for tertiary clinics, seeking

the father's consent for surgical procedures and significant financial constraints. Another restricting factor has been the lack of communication from the tertiary centre once a patient was referred. Over the duration of the study, the CHC only received 13 (2.3%) letters of acknowledgement and outcome from the tertiary services. We regard these replies as vital feedback to the primary nurse practitioners, to further their understanding and diagnostic ability.

The success of this clinic suggests that there is a role for sub-speciality services at PHC level. Clinics of this nature could be run on a weekly or monthly basis. The argument that sub-specialists are unable to conduct a general surgical or medical clinic at PHC level is not valid. This is substantiated by our findings. We believe that the presence of sub-specialists will make a definitive difference to both primary health care and tertiary care clinics.

Conclusions

This study demonstrated the significant public health problem of paediatric surgical diseases. It also emphasised the preventive and cost-effective role of a surgical clinic at primary health care level, which strengthens the 2010 health care plan.

A specialist consulting at a primary health centre allows more children to be seen at an appropriate level. This allowed for timely and cost-effective medical intervention in the majority of children, thereby decreasing inappropriate hospital admissions, outpatient visits and reducing the overall financial burden. Other benefits include opportunities for continuing medical education for medical students, community service doctors and nurses, and facilitation of social grant applications.

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