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Day Case Surgery: The Way Forward for Elective Surgery in Developing Countries

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Authors' contributions

The sole author designed, analysed, interpreted and prepared the manuscript.

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Review Article

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ABSTRACT

The established principle of ambulating surgical patients as early as possible lies behind the concept of day case surgery currently being practised worldwide. There is a lag in day surgery practise between the developed and the developing world. In the last decades, freestanding and autonomous day surgery units have been established in the developed world however the developing world still tends to practise hospital based day case surgery. This article reviews the evolution, organization and infrastructure for day case surgery and evaluates this practise in developing countries. There is increasing need to develop the potential and relevance of day case surgery in developing countries which may result in substantial economic benefits. The health sectors in developing countries are coping with scarce resources and therefore day case surgery is an economically better option providing more advantages to patients as well as stakeholders. Surgical societies in developing countries should work closely with the Associations of Surgery in developed countries to establish infrastructure and guidelines to promote day case surgery in developing countries in East Africa.

Keywords: Day case surgery; developing countries; developed countries; economic benefits.

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1. INTRODUCTION

During the last three decades, the concept of day case surgery has become increasingly important in the management of elective surgery worldwide. Many developed countries have experienced a switch to day-surgery from inpatient surgery [1,2,3]. In East African developing countries, day surgery is still a new concept however in the Western world it accounts for the majority of cases undergoing elective surgery. In Canada and the USA it accounts for over 60% and in the UK over 50% of all elective surgeries, however, in East African countries like Uganda it is impossible to quote exact figures.

Recently there has been a steady increase in the number of day case procedures being performed in private clinics in Sub-Saharan Africa due to economic factors such as convenience and cost effectiveness and the advantage of using local anaesthesia for pain control in many surgical procedures [1, 4-8]. The Royal College of Surgeons defines day case surgery as 'when the surgical day case patient is admitted for investigation or operation on a planned non-resident basis who nonetheless requires facilities for recovery'. This definition does not include minor superficial surgery under local anaesthesia, flexible cystoscopy and lower/upper GI endoscopies. It is important to distinguish day case surgery from 'out-patient cases' postoperative monitoring needs to be carried out by a specialised nursing team for a couple of hours.

After the day case surgery, these patients are monitored in a specialised unit and when all post-operative observation parameters are uneventful they are discharged home on the same day from the day care surgery unit. The day care surgery unit has a specific operating theatre for the surgical management of patients who are admitted and eventually discharged on the same day. In the UK, 70% of eligible surgical cases such as cholecystectomy are carried out as day cases however the rates remain as low as 20% in other surgical procedures [9]. Poor organization and management of day surgery units and unfounded worries by surgeons about poor surgical outcomes was found to be the reason for the low rate of day case operations in the UK [9]. In the year 2000, the NHS UK set a target for 75% of all elective surgeries to be carried out as day cases. The reduction in the availability of hospital beds, high costs of inpatient management and the long operating waiting lists in NHS hospitals that provide most of the healthcare services in the country were the main reasons behind the concept of day case surgery.

The purpose of this review is to popularize the concept of day case surgery in developing countries, decreasing morbidity and mortality from elective surgery patients and providing valuable bed services to emergency surgical patients. This review examines the practise of day surgery in developing countries and reviews the scope, organization and the necessary standard for practising day surgery.

2. METHODOLOGY

A combined review of relevant texts together with local and international journals by an electronic literature search was carried out.

Table 1 shows some typical surgical procedures treated as day case procedures. The British Association of Day Surgery (BADS) has published guidelines for day case surgery in 2019 listing all the surgical procedures carried out as day case procedures [10].

Table 1. Typical day case surgery procedures

Specialty	Day Case Procedures
General Surgery	Excision of lumps, hernia repair, varicose vein stripping/ligation, haemorrhoidectomy, partial thyroidectomy, lateral anal sphincterotomy for anal fissure, laparoscopic cholecystectomy/herniorrhaphy/appendicectomy
Urology	Hydrocelectomy, orchidopexy, urethrotomy, laser prostatectomy, laparoscopic varicocelectomy, endoscopic shock wave lithotripsy
Paediatric Surgery	Circumcision
Orthopaedic Surgery	Carpal tunnel decompression, Dupuytren's contracture excision
Thoracic Surgery	Thoracoscopic sympathectomy

Source: This list was partly taken from Day Surgery – Development and Practice – April 2006 ; By International Association for Ambulatory Surgery (IAAS) Editors: Paulo Lemos, Paul Jarrett, Beverley Philip

3. DISCUSSION

Nicoll et al had observed that day case surgery is useful and cost effective especially for minor procedures in children [11,12]. Ambulatory surgery has been found to be associated with less wound sepsis compared to inpatient management and is encouraged by private and government agencies worldwide [2]. Day surgery has less costs and many patients may be treated in a day. The costs with day surgery are low due to:

1. Less staff being required compared to in-patient staff on the surgical wards.
2. Hospital beds have a high expense compared to day surgery beds as more administrative time is consumed. A reduction in in-patient hospital beds results in less cost incurred by the hospital.
3. On weekends, public holidays or at night, staff and facilities are not required hence reducing the hospital costs with day case surgery units.

3.1 Advantages to the Day Case Surgical Patient

1. Elimination of long waiting times and hence shorter waiting lists.
2. Earlier mobilisation
3. Reduced risk of surgical sepsis
4. Earlier return to normal life and less time off work
5. Paediatric patients have less psychological disturbances

3.2 Disadvantages of Day Case Surgery

1. Experienced senior clinical staff are required and therefore thee is less opportunity for junior staff to gain adequate training.
2. The day case surgery patient requires a responsible person at home for the first 24-48 hours post-operatively for monitoring.
3. In the post-operative period the day case surgery patient often calls the general practitioner for treatment or advice.
4. When less complex surgery is performed as a day case the cost-effectiveness of the day care unit is reduced.

3.3 Organization of the Facilities for Day Case Surgery

Day case surgery may be freestanding units or hospital based [13]. The surgical unit may provide service for one specialty (egs: hernia operations; orthopaedics surgery or ophthalmic surgery) or may be multidisciplinary providing services for many different operations in different surgical specialties. Many centres are multidisciplinary and the available facilities include:

1. **Hospital autonomous unit**

   The unit is autonomous from other parts of the hospital and is located on the same premises as the hospital. This surgical unit has its independent operating theatres, recovery area, anaesthetic areas and administration [13]. If advanced day surgery is carried out in this unit then there could be increased expenses for the hospital due to duplication of equipment and surgical skills.

2. **Hospital Integrated unit**

   This unit shares the recovery rooms and the hospital surgical operating theatres for day cases and inpatients. Within the hospital is a separate ward, known as a 'surgical day case ward' mixes both day case surgery patients and in-patients. This model may be used to set aside am operating theatre for only day case surgical patients on a particular day. Therefore mixing of in-patients with day case surgery patients is avoided on a single operating theatre list. The operating theatres tend to be well equipped and have experienced staff. The laparoscopic equipment may be used for both day case surgery cases and in-patients. In developing countries this approach although less desirable is acceptable. However, it is unsatisfactory and not recommended to have a general ward (inpatient) that mixes out-patients and in-patients.

3. **Hospital satellite unit**

   This surgical unit is not situated on the hospital campus and is sponsored and operated by the hospital.

4. **Freestanding unit**

   This day case surgery unit is not administratively or geographically part of another health care facility and is a completely autonomous facility. This

surgical unit is managed by an independent contractor and health delivery systems.

5. **Office surgical facilities (OSFs)**

   These day case surgery units practice day surgery in individual offices of surgeons'. In order to ensure superior care, guidelines are being developed to ensure standardisation of practise. A converted maternity ward has been used as a 12-bed unit by Berill et al [14].

3.4 Selection of Patients for Day Case Surgery

A high re-admission rate post-operatively due to complications developing at home may result from poor patient selection. Therefore ideal patient selection is imperative for successful outcomes [15-17]. The selection process should involve consultants, junior medical officers and staff, GPs and nurses. Pre-assessment clinics are important for proper patient selection [18].

Age limit is no longer considered an exclusion criterion. Awojobi et al has reported patients aged up to 85 years and patients as young as two months [19]. The upper age limit is based on the biological age rather than the chronological age however, elderly patients with cardiac renal or liver failure should be excluded from day case operating theatre lists [20]. The lower age limit depends on the staff experience, facilities available and the type of operative procedure. Obesity is also not an exclusion criterion. Operations involving excess blood loss or post-operative pain should be avoided for day case surgery [13].

In general the selection of patients for day case surgery depends on:

1. Patients undergoing general anaesthesia are assessed as ASA (American Society of Anaesthesiologists) classes I or II. Patients with ASA class III and IV may also be considered in well-equipped day case surgery units.
2. Frail elderly patients are managed as an inpatient rather than a day case patient.
3. Operations which involve severe post-operative pain or excessive blood loss should be disqualified.
4. Anxious and morbidly obese patients wishing to be treated as outpatients should be excluded as day case surgery patients.

3.5 The Operation for the Day Case Surgery Patient

The equipment, specifications and design of the operating theatre and recovery area should be similar to the in-patient equivalent as the standard expected of day case surgery is high. An over-emphasis must be placed on the value of preoperative evaluation [17,20]. An effort must be made to operate on day case surgery patients before midday in order to ensure an early and safe discharge of these patients [15]. There is no agreement generally regarding the most ideal anaesthetic technique [18]. Different techniques are being used which are safe with minimal post-operative morbidity and are associated with a rapid recovery. Reliable intra-operative monitoring of patients is necessary, irrespective of the choice of anaesthetic technique (regional/general anaesthesia/local anaesthesia). Although problematic in children, local anaesthesia is suitable for minor surgical procedures like herniorrhaphy and lumpectomy [21,22]. In the extremities, either regional blocks such as Bier's block/Brachial plexus block or central (epidural/spinal) anaesthesia may be employed. Central/regional anaesthesia and local anaesthesia are associated with less nausea and vomiting and reduce on the hazards of general anaesthesia which include airway trauma and sore throat.

There has been a reduction in the use of premedication's with the introduction of short acting, rapid onset anaesthetic agents. These rapid onset anaesthetic agents have been associated with less headache, drowsiness and nausea and vomiting [18,20]. Qualified anaesthetists should supervise the choice of anaesthetic agents and preoperative analgesia [18]. This will facilitate the postoperative recovery of the patient.

3.6 Discharge and Follow up of the Day Surgery Patient

There are three phases associated with patient recovery. These include early recovery which starts when anaesthetic agents are discontinued until motor function and protective reflexes return. The intermediate phase is when the patient achieves discharge criteria and late recovery occurs when he returns to his normal physiological state.

With the proper selection of patients and the use of ultra-short acting drugs the day surgery patient

may be transferred from the operating room to the day surgery unit. This reduces nursing workload and costs associated with a post anaesthesia care unit. Fast tracking criteria need to be satisfied using scores such as the White et al and Aldrete et al scores [23,24]. Prior to discharge the anaesthetist and surgeon should review the patient. Good communication, effective collaboration with community nurses and the accessibility of the patient to the hospital is of paramount importance. Quality of care audits are invaluable in order to monitor and improve the management of patients in the day surgery unit.

Discharge criteria used in the Day case surgery unis include:

1. Alert, oriented with stable vital signs
2. No post-operative nausea and oral analgesia used to control pain
3. No dizziness when walking
4. No post-operative bleeding
5. Any regional anaesthetic blocks must have been appropriately resolved.
6. Patient accepts and is prepared for discharge.
7. The patient should be accompanied home by a responsible adult.

Morbidity following Day case surgery

If a postoperative complication develops which interferes with the planned discharge postoperatively, or requires readmission, or involves the district nurse or GP then this is considered a major morbidity [18]. The surgical procedure is the most important indicator of complications however the type of anaesthesia used is also important [25]. Following discharge the overall complication rate at home has ranged from 0.9% to 13% [25,26]. When patients are well selected the major morbidity and mortality rates are rare [27,28,29]. However, minor complications tend to occur more frequently [27].

Many studies have shown that immediately in the postoperative period, pain is the commonest complication [29]. After day case plastic surgery, wound infection, wound breakdown and bleeding were found to be the leading complications [30]. Whilst in children following hernia repair, the leading complication was postoperative vomiting followed by stitch abscess [31]. A lower complication rate has been found with day case surgery procedures compared to inpatients undergoing similar procedures [25,32]. This lower morbidity rate may be due to a decrease in sedentary complications such as hypostatic pneumonia and deep vein thrombosis.

3.7 Satisfaction of Day Case Surgery Care

Over the last decade, a patient satisfaction rate of over 90% has been achieved for day surgery cases in well-established day surgery units [26,32]. The workload for community and primary health services is considerably less with modern day case surgery compared to inpatient surgical care. The satisfaction rates for the day surgery patient is high with the majority of patients showing preference to have some surgical procedures treated as day cases. These day surgery patients prefer to be treated in the comfort of their own homes compared to recovering in hospital [21,32,33]. Patients treated in rural settings have shown an equally good patient satisfaction [29]. Patients' dissatisfaction has been reported to be due to frequent cancellations, long waiting times and the development of post-operative complications.

3.8 Day Case Surgery in Developing Countries

Day case surgery is more relevant in developing countries due to universal poverty. As the patient does not need to pay for a hospital stay, this preserves the patients' scarce fund which may result in a rapid turnover of patients. This will increase Health insurance schemes and other health reform programmes.

In the developed world, there has been a significant increase in the use of day case surgery. The initial target of 50% for elective cases has been reviewed and increased to 75% for elective cases [34]. In developing countries differences exist in the coordination and level of organization of day case surgery. General wards or day case wards are utilised in developing countries, however unlike in Europe and the USA, there are no organizations available which develop guidelines for advancement of this practise.

Existing facilities should be upgraded to day surgery units and an agenda for the use of day case practise should be established. Guidelines need to be established for day case surgery practise in order for day care units to be established and for the eventual emergence of day case surgical offices. The respective Ministries of Health in developing countries and

public hospitals should be encouraged to establish hospital facilities which are autonomous by financially investing in day case practise. Efforts have been made in curtailing communicable diseases such as HIV/AIDS, malaria and Tuberculosis, however, other areas of the health care sectors such as day case surgery practise should not be neglected [13].

Enforcement of hospitals that are not currently practising day case surgery should be the way forward. Developing countries have peculiar circumstances such as the non-availability of community nursing services and GPs. Therefor an improved organization within our hospitals, with strict patient selection and the supervision of procedures up to discharge of the patient is of paramount importance in our setting. The excellent results from centres in the developing world that practise day case surgery despite the peculiar circumstances should inspire other centres to follow the same path [25,28,35].

There is an existing disparity between the developed and developing world, particularly in technology in the areas of interventional radiology and minimally invasive surgery. The scope of day case surgery is therefore broadened in the developed world to include specialised day case procedures such as laparoscopic fundoplication, laparoscopic cholecystectomy, laparoscopic herniorrhaphy and endocrine surgery. These procedures are also being carried out in free-standing settings in the developed world [36]. Possible reasons for this broadened scope of practise is the availability of refined post-operative pain management and advances in modern anaesthesia. In order to explore the full range of day case surgery procedures there is need for technological investments to be carried out in our setting.

Infrastructural issues that need to be addressed include power outages and water supply, poor communication and poor transportation. Development of manpower and training of surgical residents and consultants with the relevant skills is also necessary by providing them with the necessary facilities and working tools. There are poor facilities for the training of doctors in the specialty of day surgery with surgical specialties being side-lined by Health Ministries in developing countries in favour of communicable diseases.

The economic gains made from day case surgery may be used judiciously for further infrastructural development. The results from the day case surgery procedures from individual surgeons' day surgery unit should be audited in order to improve our own surgical practise. Nicoll pioneered day case surgery in Glasgow at the turn of the century where social conditions were not optimal as they are today [20]. Our challenges should not preclude us from taking day case surgical practise forward in our setting. With a proper focus, in developing countries, specialised day surgery is feasible [37]. A limitation of this review study is that it could not quantitatively determine the reduction in morbidity such as sepsis, pulmonary complications and thromboembolism with Day case surgery in developing countries. This review will form the basis for further studies to be carried out in this area. These studies will also help in examining the economic impacts of day case surgery in developing countries.

4. CONCLUSIONS

The accepted modality for the management of the majority of surgical patients in the developed world is day case surgery. The concept of day case surgery may be used to minimise the long waiting times of elective surgical procedures. This will help surgeons' to plan and prioritize inpatients' treatments and also allocate resources to more urgent and emergency surgical procedures. The healthcare policy design in Uganda and other East African developing countries should incorporate this concept as it will reduce cost and duration of hospital stay hence reducing the duration of time off work for the patients.

It is not desirable to mix emergency surgical cases with day case surgery patients, due to a disruption in workload with day case surgery patients being inadequately prepared for surgery. This may result in premature and inadequate discharge of patients home. Day case surgery patients should be managed in dedicated specialised facilities and not within a general surgery ward. Staff require an extensive amount of commitment and training and the design and implementation of day case surgery facilities is capital intensive.

In many developing countries in East Africa, day case surgery patients have to compete with emergency and major surgeries for time and space, leading to cancellations. There is also a lack of postoperative monitoring due to the lack of adequately trained nursing staff in developing countries. Poor transportation systems, long

distances away from the day case surgery unit, lack of funding from policy makers as well as lack of enthusiasm among anaesthetists and surgeons in performing major procedures as day cases because of fear of post-operative complications are other problems encountered.

In developing countries there is no adequate GP system, therefore day case surgery patients tend to come back to the main hospital for minor complications such as pain, nausea and vomiting. This results in diversion of vital resources and the attention of the healthcare staff away from emergency and urgent cases. Therefore, developing a GP system in developing countries whereby they can manage complications following minor complications without having to return to hospital is important and helpful. A good distribution of healthcare facilities, improved transport systems and ambulance services are important in promoting the concept of day case surgery.

Developing countries experience unique problems such as inadequate communication systems, illiteracy and poverty especially in rural areas and this may pose a challenge to the concept of day case surgery. However, with the global use of mobile systems, many rural people can be contacted for appointments using the text messaging services. This will be cheaper and faster for the hospitals than sending letters to patients to come for day case elective surgical procedures.

The health sectors in developing countries are coping with scarce resources and therefore day case surgery would be an economically better option providing more advantages to patients as well as stakeholders. In the best interests of patients, health ministries as well as surgical societies in developing countries should develop more day case surgery units as the majority of elective surgery procedures can be carried out on a day case basis. The local surgical societies and the Associations of Surgery in developed countries should work closely to develop guidelines and infrastructure to promote ambulatory surgery in developing countries in East Africa.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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