

# Day surgery in a developing country – the Malaysian experience

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## Abstract

**Aim:** To study the scope, practice and status of day surgery in Malaysian public Ambulatory Care Centres.

**Methods:** Data from 2011 and 2012 was collected using a pre-tested questionnaire from 8 ACCs.

**Results:** All centres provided day procedures in 6 basic specialties: general surgery, ophthalmology, orthopaedic, otorhinolaryngology, gynaecology and dental surgery. Overall the day surgery rate was about

30%. The operating workforce and facilities available were suboptimal. 20% of procedures performed using day operating resources were of inpatient/emergency nature. Selected Key Performance Indices were achieved.

**Conclusion:** Day surgery is still sub-optimal in terms of its utility and resources available for services provision.

**Keywords:** Day surgery; Ambulatory Care Centre; Day surgery rate; Malaysia.

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## Introduction

The concept of day surgery (DS) in Malaysia had its beginnings in 1980. [1] What prompted this move was the inability of the hospitals within the Ministry of Health to cope with the over-utilisation of hospital beds. In the interest of cost and efficiency, the Ministry of Health, spearheaded by the Medical Development Division (MDD), embarked on a policy of investing in the infrastructure for day surgical services. It defined DS as any scheduled procedure provided to patients without the need for overnight admission and which is completed within the same calendar day. [2] The policy provided protocols on the scope, objectives, and organisation for purpose built Ambulatory Care Centres (ACC). In addition to this, the Day Care Anaesthesia protocols established by MDD and the Task Force for Day Care Anaesthesia Services provided, amongst others, guidance on the work-flow, listing of procedures suitable for day surgery, the guidelines for patient selection, their pre-operative assessment and the instructions on discharge tailored to the local setting [1].

The first dedicated ACC in the Ministry of Health was established in 1987 at Ipoh Hospital [1]. To date, 15 ACCs have been built within the Ministry of Health. Most of these ACCs are stand alone units within the hospital sites. Six more have been planned under the 10th Malaysia Plan 2010-2015 according to the recently published Malaysia Health System Review. [3]

However, little is known about the services that have been provided, the facilities that are actually available, the workforce involved and the quality of services of these ACCs. We undertook this study to gather information on these issues, hitherto not officially known.

## Study setting and methods

From 2011 to 2012, there were 13 ACCs providing day surgery services within the Ministry of Health. From these 13 centres, we captured information from only five stand-alone and three integrated ACCs. The reasons for excluding the other five centres were either because they admitted all patients overnight, were operating beyond office hours or were performing procedures only under local anaesthesia. The centres were also sampled such that they represented

different regions of the country.

A pretested questionnaire was used to capture the information under the following sections:

1. Facility: number of functioning operating rooms, recovery spaces and day care beds
2. Activity: day surgical services by specialty, total number of elective inpatient, emergency and day procedures (overall and for 4 index procedures i.e. inguinal hernia repair, laparoscopic cholecystectomy, tonsillectomy and cataract surgery). In addition, the number of inpatient and emergency surgery (I&ES) performed using day operating facility was analysed. The choice of index procedures was determined by an expert panel of anaesthetists and surgeons in order to benchmark the DS activity in these 8 ACCs
3. Operative Workforce (support staff): number of anaesthetic assistants, recovery room nurses and scrub nurses.
4. Four quality measures or key performance indices (KPI) selected were:
  - a. No-show rate (NSR) = (Total number of patient not attended on day of procedure without prior notice) / (Total number of day procedure)
  - b. Unplanned admission rate (UAR) = (Total number of patient admitted to inpatient ward after day procedure) / (Total number of day procedure)
  - c. Cancellation rate (CR) = (Total number of cases cancelled due to patient or facility factor(s)) / (Total number of day procedure)
  - d. Percentage of cases performed using day operating facility for inpatient & emergency purposes (PIEP) = (Total number of inpatient & emergency cases performed in the day OR) / (Total number of cases performed in the day OR)

This pretested questionnaire was initially drafted and distributed to 5 of these 8 centres prior to the actual study. Feedback was gathered from these centres with regards to the practicality of such

data collection questionnaire. Necessary adjustment was made after multiple reviews. The final questionnaire generated through this process was used for the actual study.

The data collection process was initiated by briefing the respective ACCs staff and assisted by the site investigators. The sources for the data collected included administrative documents, operating room census and operating lists during the study period.

From the information gathered, the following outcomes of interest were presented as:

1. The number and scope of the day surgical services provided in the various Centres
2. The day surgery rates (DSR) for the overall and index procedures and expressed as:  
(Total number of day surgical procedure) / (Total number of elective surgical procedure). Elective Caesarean sections were excluded.
3. The number of operating facilities and the workforce involved
4. The four selected quality measures or KPI of day surgery practice alluded to above.

Because of confidentiality, the hospitals names are removed and are replaced by alphabets (site A-H).

## Results

### Scope of Day Surgical Services

Table 1 shows the characteristic of the eight sites. Site H appears to be an outlier when compared to the rest. This is because the hospital is located in the Federal Government Administrative Capital where the hospital setup and characteristics of the catchment population were different.

Seven out of the 8 sites provided DS for all these surgical disciplines i.e. general surgery, ophthalmology, orthopaedic, otorhinolaryngology, gynaecology and dental surgery. Half of these sites also provided plastic surgery. One (site B) reported performing vascular surgery. Others (site C, E, H) had either neurosurgery, urology or breast-endocrine day services in addition to the basic ones (Table 1).

### Day surgery rate (DSR)

Table 2 summarises the overall day surgery rate (DSR) and the DSR of the 4 index procedures for 2011 and 2012. The overall DSR for both years was below 30%. However, this improved for most sites and for the three out of the four index procedures over the two years. The exception was for cataract surgery which showed a slight decrease. Overall, site C appeared to have outperformed all other peer sites. In 2012, only two sites performed day surgical laparoscopic cholecystectomy. Half of these sites have yet to perform any tonsillectomy.

### Operating Facilities and Workforce (support staff):

For 2012, the average number of functioning day operating rooms (ORs) was 4.5 per site (range: 1–7) (Table 3). The mean ratio of functioning recovery space to OR was 0.9 while the mean functioning day bed was 32.8 (range: 16–50). Furthermore, the mean ratio of Anaesthetic Assistance (AA) to OR, Recovery Nurse (RN) to Recovery Bay (RB) and the Scrub Nurse (SN) to OR was 0.6, 0.5 and 2.0 respectively. Though not displayed (Table 3), this ratio was constant for 2011 and 2012.

### Quality measure or Key Performance indices (KPI)

Table 4 summarises the quality measures or Key Performance Indices

selected namely, the unplanned admission rates (UAR), the no-show rates (NSR), the cancellation rates (CR) and percentage of cases performed in day operating theatre for inpatient and emergency purposes (PIEP). Except for PIEP which showed a 23 to 31% rate, the rest were below the 5% target.

## Discussion

We set out to investigate the latest scope & practice status of day surgery (DS) in the country. Notwithstanding the difficulty in data collection, we used a pretested survey questionnaire that was designed to capture and report the best possible statistics in our local context. Furthermore, the process was assisted by field investigators in order to ensure the quality of the data.

Overall, the DSR was below 30%. However, there was a slight improvement from 2011 to 2012. Seven out of the eight Centres provided DS rate in general surgery, ophthalmology, orthopaedics, ENT, gynaecology and Ear nose and throat surgery. Furthermore, the rate for the index procedures was encouraging and there was a general improvement over the two years. Besides the alarming 30% of inpatient & emergency procedures performed using day OR, other key performance indicators such as unplanned admission rates, no show rates and cancellation rates were within expectation.

Despite some shortcomings, our results show an improvement from that reported by Inbasegaran K who showed that in 1996, the DSR was less than 5% in Malaysia (as cited in Norsidah, 2001). [4] In 1998–2000, the DSR in a tertiary teaching hospital in Malaysia was found to be around 14%. [4]. Our finding of 29% appears to follow a positive trend. Similar DSR has also been reported recently in other developing country such as Nigeria. [5] Yet, literature on day surgery in the developing world is sparse, making comparison and tracing of its development difficult.

Though the movement is encouraging, it is evident that day surgery is still not sufficiently established in the country despite the resources and effort invested. A few factors may explain the relatively poor state. However, the lack of solid evidence may make our interpretations a mere speculation. Firstly, many surgeons may still believe that day surgery is unsafe; some may not be willing to take up the extra effort and responsibility of managing DS patients [6]. From personal communication with the Chairperson of Day Surgery Service in Malaysia, that may be the case in this country. (Yan YW, MOH Malaysia Day Surgery Service Chairperson, MD, FRCS (Aug 2013))

Funding may be an additional problem. There is no incentive for surgeons in the MOH to encourage DS and additionally, there is no separate budget for day surgical services in the MOH. Lastly, lack of clinical leadership and inadequate support staff may have further contributed to the lack of progress. These factors have been shown to be important in ensuring higher output and quality of day surgery services. [6]

What was of concern was that, a significant proportion of cases performed in the day operating rooms were for inpatient and emergency purposes. The most likely reason may be the high un-met demands for inpatient and emergency operation in MOH hospitals as reported in the National Healthcare Establishment and Workforce Survey 2011. [7] This inappropriate use of day operating resources may defeat the purpose of DS. Some may argue that this problem could be improved, if more surgery were to be performed as day cases, sparing the inpatient operating resources for real emergencies and cases that truly required full inpatient care. This issue needs to be examined closer in order to understand the inter-relation of factors

**Table 1** Hospital Characteristics and Scope of Day Surgical Services available in the eight Ambulatory Care Centres.

Site	A	B	C	D	E	F	G	H
Region	Southern	West Coast	Northern	Northern	Central	Central	West Coast	Central
Estimated Population Catchment ('000) <sup>1</sup>	833	476.5	781.5	527.3	690.6	879.2	350.7	76
Hospital Bed Strength <sup>2</sup>	901	759	990	1107	880	893	821	278
Bed per 1000 population <sup>2</sup>	1.08	1.59	1.27	2.10	1.27	1.12	2.34	3.66
Bed Occupancy Rate(%) <sup>2</sup>	85.1	80.7	69.8	81.2	64.9	94.3	74.2	101.2
Scope of Day Surgical Services	b, c	a, d	a, c, e	a	a, f	a, c	a, c	a, g

<sup>1</sup> Estimation was based on statistics provided by the Malaysia Department of Statistics, Population Census 2011

<sup>2</sup> Statistics obtained from the National Health Establishment and Workforce Statistics 2011

<sup>a</sup> all 7 basic disciplines (Ophthalmology, Obstetrics & Gynaecology, Orthopaedics, ENT, General Surgery, Endoscopy and Dental Surgery),

<sup>b</sup> only ophthalmology and general surgery, c-plastic surgery, d-vascular surgery, e-neurosurgery, f-urology, g-breast & endocrine surgery

**Table 2** Overall day surgery rate (DSR) and the DSR for 2011 and 2012.

Site	A	B	C	D	E	F	G	H	Overall
Inguinal Hernia Repair (2011)	0%	10%	88%	0%	0%	98%	4%	7%	26%
Inguinal Hernia Repair (2012)	0%	37%	92%	0%	19%	NR	33%	5%	27%
Tonsillectomy (2011)	0%	0%	58%	0%	0%	0%	11%	52%	15%
Tonsillectomy (2012)	0%	24%	43%	0%	0%	0%	64%	32%	20%
Lap Cholecystectomy (2011)	0%	0%	78%	0%	0%	0%	0%	0%	10%
Lap Cholecystectomy (2012)	0%	11%	90%	0%	0%	0%	0%	0%	13%

NR - Not recorded for day surgery

**Table 3** Operating Facilities and Supporting Workforce for 2012.

Site	A	B	C	D	E	F	G	H
Number of Day OR	2	4	6	7	5	5	6	1
Number of RS	2	5	6	8	2	3	3	1
RS : OR Ratio	1.0	1.3	1.0	1.1	0.4	0.6	0.5	1.0
Day Bed	16	48	50	35	34	17	30	33
AA : OR Ratio	0.5	0.5	0.7	0.4	0.2	0.2	1.0	1.0
RN : RS Ratio	0.5	0.4	0.5	0.3	0.5	0.3	0.7	NA
SN : OR Ratio	1	2.8	3.8	2.1	2.4	0.6	1.5	2

OR - Operating Room RS - Recovery Space AA - Anaesthetic Assistance RN - Recovery Room Nurse SN - Scrub Nurse

NA - Information Not Available

**Table 4** Day Surgery Quality Measures (Key Performance Indices) for 2011 & 2012.

Site	A	B	C	D	E	F	G	H	Overall
UAR, 2011	4.2%	0.3%	2.9%	0.0%	NR	1.6%	0.8%	2.7%	1.8%
UAR, 2012	2.1%	0.5%	1.8%	0.4%	0.6%	1.3%	1.6%	2.9%	1.4%
NSR, 2011	0.0%	0.8%	1.6%	NR	NR	NR	0.0%	0.0%	0.5%
NSR, 2012	0.0%	2.1%	1.6%	NR	0.2%	2.7%	0.0%	NR	1.1%
CR, 2011	3.3%	1.4%	0.9%	2.0%	NR	NR	0.0%	3.2%	1.8%
CR, 2012	3.1%	3.5%	1.7%	0.1%	0.2%	1.9%	0.0%	2.4%	1.6%
% I&EC ,2011	0.0%	42.7%	27.3%	NR	23.9%	10.9%	31.1%	NR	22.7%
% I&EC ,2012	0.0%	54.8%	15.0%	58.1%	21.7%	16.5%	48.9%	NR	30.7%

UAR - Unplanned admission rate    NSR - No show rate    CR - Cancellation rate  
 % I&EC - Percentage of cases performed in day operating room for inpatient and emergency purposes

involved. Then carefully planned and implemented policies such as ring-fencing [8, 9] and well defined management pathway may benefit the service.

The limitations of our study are recognised. Firstly, a purposive sampling was chosen to provide a manageable study framework as difficulty in data collection was anticipated due to different hospital administrative practices. Also, hospitals without dedicated day surgical units but providing DS were excluded. Secondly, there was no uniform coding for these day procedures. As a result it may be difficult to standardise across these centres. Similar problems were reported in other countries. [6] Only recently has the MOH trained the records officers to code procedures using ICD-9CM.

Despite these limitations, we believe our study does provide and insight into the state of day surgery services in our public hospitals. These findings may help our policy makers in planning our future directions for DS services and the ACCs. It also allows other similar countries to benchmark their own performances. No doubt, more studies will be needed to explore and understand the reasons for the delay in implementing DS in the country despite all the good evidence of its safety and effectiveness.

## Conflict of interest

We have no conflict of interest to declare.

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