

# Technicity as a Quality Indicator of Excellence in Gynaecology

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## مُعَدَّل التَّقْنِيَّة كَمُؤَشِّر جُودَة لِلتَّمْيِيز فِي أَمْرَاض النِّسَاء

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**المخلص:** الأهداف: دراسة حساب مُعَدَّل التَّقْنِيَّة لعمليَّات استئصال الرَّحْم في مستشفى رعايَة ثالثي جامعي في عُمان. الطريقة: هذه دراسة استعدادية شملت المريَّضات اللواتي خضعن لعمليَّات استئصال الرَّحْم في مستشفى جامعة السلطان قابوس المرجعي للفترة من 2003 إلى 2009. تم إحصاء الترددات التراكمية لجميع أنواع عمليَّات استئصال الرحم، كما تمَّ حساب مؤشِّر التَّقْنِيَّة لكل عام. النتائج: بَلَغَ مجموع عمليَّات استئصال الرحم 258 عمليَّة، منها 6 (2.3%) عن طريق استخدام المنظار، 42 (16.3%) عن طريق المهبل، و 208 (80.6%) عن طريق فتح البطن. كان متوسط مُعَدَّل التَّقْنِيَّة 19% (258/84) وتراوحَت بين 11% إلى 24%. وتراوحَت نزعة التَّغْيِير حسب السنين، فكانت 16% في سنة 2003 لترتفع تدريجياً خلال الفترة من 2004-2006، ثم لتعود إلى الانخفاض مرة أخرى خلال سنتي 2007 - 2008 بشكل معتدَّ إحصائياً (P=0.02). تُعزَى هذه النزعة المنخفضة والمتذبذبة بشكل رئيسي إلى عدم توفر أعداد كافية من الجراحين المُدْرَبين وأجهزة المنظار. الخلاصة: يمكن تحسين معدل التَّقْنِيَّة بمستشفى جامعة السلطان قابوس بزيادة عدد عمليَّات استئصال الرحم عن طريق المنظار وذلك عن طريق توفير أدوات المنظار وتوفير الجراحين المُدْرَبين.

مفتاح الكلمات: مَنَسَب (دليل) التَّقْنِيَّة، استئصال الرحم، مؤشِّر الجودة، علم أمراض النساء، عُمان.

**ABSTRACT: Objectives:** The objective of this study was to calculate the technicity index (TI) for hysterectomies at a tertiary care university hospital in Oman. **Methods:** This is a retrospective chart review of patients who had hysterectomies at Sultan Qaboos University Hospital (SQUH), a tertiary care university hospital. Profiles were reviewed for all patients who had hysterectomies at SQUH in the period 2003-2009. The cumulative frequencies for all types of hysterectomies were tallied and the year-specific TI was calculated. **Results:** Overall, we enumerated a total of 258 hysterectomies, of which 6 (2.3%) were laparoscopic assisted hysterectomies, 42 (16.3%) vaginal hysterectomies, and 208 (80.6%) total abdominal hysterectomies. The average TI was 19% (48/258), and it ranged from 11% to 24%. The trend of change fluctuated over the years starting with 16% (2003) and increasing gradually during 2004-2006, but then declining again during 2007-2008 (trend P value 0.02). This low and fluctuating trend was mainly attributed to the inconsistency in the availability of trained surgeons and laparoscopic equipment. **Conclusion:** TI at our institution can be improved by increasing the number of minimally invasive hysterectomies through providing more trained surgeons and laparoscopic equipment.

**Keywords:** Technicity Index; Hysterectomy; Quality indicator; Gynaecology; Oman.

IN RECENT YEARS, INTERNATIONAL AND national health regulatory bodies have been advocating the use of indicators as a means of improving the quality of patient care.<sup>1</sup> Quality indicators are defined as specific and measurable elements of practice that can be used to assess the quality of patient care. They are usually derived from retrospective reviews of medical records or routine information sources.<sup>2</sup>

With the advancement of minimally invasive surgery (MIS) in gynaecology, new quality and performance indicators are required to evaluate the use of procedures which benefit patients and

may be more cost effective as a result of a reduced hospital stay.<sup>3,4</sup> One such indicator is the Technicity Index (TI) which is a relatively new quality metric in gynaecology. It was initially proposed for hysterectomies and is defined as the percentage of minimally invasive hysterectomies which includes vaginal hysterectomies (VH), laparoscopic assisted hysterectomies (LAH), laparoscopic assisted vaginal hysterectomies (LAVH), total laparoscopic hysterectomies (TLH), and supracervical hysterectomies (LSH) over the total number of hysterectomies (total abdominal hysterectomies (TAH), VH and LAH), performed in a single hospital in one

year. The TI provides a comparative benchmark which may help in implementing strategies to improve performance which can be defined as an increase in MIS and decrease in the proportion of TAH. It was first used in France to rank gynaecology departments' performance of hysterectomy. The highest TI in 2008 in France was reported as 90%, meaning that only 10% of hysterectomies were done by laparotomy.<sup>4</sup> In Canada, the average TI has been reported to be approximately 30% and the highest estimate was 60% in one hospital during the period 2008–2009.<sup>5</sup> To our knowledge, no prior report about technicity has been published from developing countries.

This TI research project aims at assessing the practice of hysterectomy in Oman, an upper-middle income country in the Arabian Peninsula, with an approximate population of 3.5 million.<sup>6,7</sup> There is a planned future extension of the project to assess the practice of hysterectomy in other hospitals in the country and the region. The objective of this study was to calculate TI as a quality indicator of excellence at our hospital.

## Methods

We conducted a retrospective chart review of all hysterectomies performed at Sultan Qaboos University Hospital (SQUH), a 524 bed tertiary care hospital, in the period 2003 to 2009. The cumulative frequencies for all types of hysterectomies were tallied and the TI was calculated for each year.

The Statistical Package for Social Sciences (SPSS) software (Version 16.0, IBM, Chicago, Illinois, USA) was used for data analysis. Chi-square analyses were used to evaluate the statistical significance of differences among proportions of categorical data, and a *P* value of <0.05 was used for all tests of statistical significance. The Fisher's exact test (two-tailed) replaced the chi-square test if the assumptions underlying chi-square were violated, namely in the case of small sample size and where the expected frequency was less than five in any of the cells. The study protocol was evaluated and approved by the Medical Research Ethics Committee at Sultan Qaboos University, Muscat, Oman.

**Table 1:** Year-specific technicity index (TI) for hysterectomies at Sultan Qaboos University Hospital, Muscat, Oman during the period 2003–2009.

Year	LAH	VH	TAH	Total	Technicity Index %
2003	0	7	36	43	16
2004	5	4	43	62	15
2005	0	10	32	42	24
2006	0	2	8	10	20
2007	0	2	17	19	11
2008	1	7	37	45	18
2009	0	4	33	38	11
<b>Total</b>	<b>6</b>	<b>42</b>	<b>208</b>	<b>258</b>	<b>19</b>

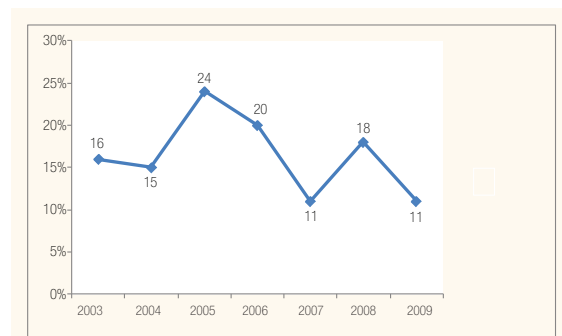
Legend: LAH = laparoscopic abdominal hysterectomy; VH = vaginal hysterectomy; TAH = total abdominal hysterectomy.

## Results

Table 1 shows the frequency distribution and year-specific TI for hysterectomies at SQUH throughout the period 2003–2009. Overall, we enumerated a total of 258 hysterectomies, of which 6 (2.3%) were LAH, 42 (16.3%) VH, and 208 (80.6%) TAH. The average TI was 19% (48/258), and it ranged from 11% to 24%. The trend of change fluctuated over the years. It started with 16% (year 2003) and increased gradually during 2004–2006, but then declined gradually during 2007–2008 (trend *P* value 0.02). The fluctuating trend of TI is depicted schematically in Figure 1.

## Discussion

The development of minimally invasive hysterectomy procedures in gynaecology has created a need for the development of quality



**Figure 1:** Trend of technicity index (TI) for hysterectomies at Sultan Qaboos University Hospital, Oman, in the period 2003–2009.

indicators in order to assess the performance of gynaecology departments. The TI provides a comparative benchmark which may help implement strategies to improve performance based on available evidence. The higher the TI in a department the better the quality of care for the procedure performed. The quality of care is determined by five criteria. These are complication rate, length of stay in the hospital, duration of surgery, hospital cost and quality of life. However, there is a need to decide on an acceptable TI level for hysterectomies for the region based on the available resources.

The overall TI was found to be low at our institution which is due to the low number of LAH and VH performed. The low and fluctuating trend in TI was mainly attributed to the inconsistency in the availability of trained gynaecologists and laparoscopic equipment in the different years. The increase in TI in 2005 is explained by a greater number of LAVH procedures compared to other years which is likely due to the availability of a gynaecologist trained in LAVH. The lowest TI in 2007 was due to a decrease in the number of VH performed. It can also be argued that the type of cases at different times would influence the type of procedure performed and may partially explain the changing trend. There are several reasons for caution in extrapolating conclusions from this study. We were unable to compare our TI results with TI in other institutions in the region as there is as yet no published data. To our knowledge, we are the first to report TI for hysterectomy in the region. The TI at our institution is lower than the reported TI from Canada and France; however, these TI values are not comparable due to the difference in resources and training of gynaecologists in North America, Europe and the Middle East. Additionally, we could identify the following limitations to our study. First, the numbers of hysterectomy procedures performed per year at our institution are small with an annual incidence of 0.87%. Although we attempted to compensate for that by looking at the overall number of hysterectomies performed over seven years, the sample size remained small. Second, when looking at the different indications for hysterectomies, we found that 2.7% of cases were malignant conditions and the rest were benign. The details of the cases would not change the TI, but could shed light on possible reasons for not choosing the minimally

invasive approach. For example, in the case of advanced uterine and ovarian cancer, the minimally invasive hysterectomy procedure may not be the standard of care. A more detailed analysis of the indications for hysterectomies during the period of study should be carried out in order to explain the results. We plan to include this in future expansions of our research project.

## Conclusion

With the emphasis on moving towards minimally invasive procedures in gynaecology, it will be imperative to develop quality and performance indicators in order to measure the quality of patient care. The TI indicator is one of the first to be developed for minimally invasive procedures and can be perceived as a quality indicator of excellence in gynaecology. Knowing where we stand in terms of providing the best care for our patients is important. In addition, acknowledging that transparency in quality is the first step towards achieving excellence will improve acceptance of accountability. In this study, we were able to establish that the TI for hysterectomy at our institution can be improved by increasing the number of minimally invasive hysterectomies through providing more trained gynaecologists, operating theatre nurses trained in endoscopy procedures and availability of appropriate laparoscopic equipment. As a result we expect that the TI at our institution will increase in the near future.

## CONFLICT OF INTEREST

The authors reported no conflict of interest.

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