

A Trial to achieve Management idealism;

Total Quality Management program Application on operation rooms of Al-Batnan Medical Center

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Introduction:

Al-Batnan Medical Center is a main referral hospital for the eastern area of Libya. It introduces all medical services to more than 200.000 citizens in addition to offer both of ambulatory and intensive medical care for passengers utilizing the high way of Ben-Ghazy to the Libyan-Egyptian border, as it acts as a trauma center. The center occupies more than 450beds; 160 beds are for the different surgical departments, 12 SICU beds, and eight modern operation rooms fulfil all criteria according to ASA.

Elevated concerns regarding health care are dramatically intensifying the pressure to establish a *Total Quality Management programs*¹. Few hospital administrators would deny that operating rooms ORs are expensive to run, and all would concur that economic analysis of running OR are not readily available¹.

During the planning for multi-center studies, the Association of Anaesthesia Clinical Directors (AACD) were introduced OR utilization and efficiency Indices for data comparison and economic analysis¹. Al-Batnan Medical Center, as a leader teaching hospital decided to follow the plan introduced by AACD.

Aim of the work:

The aim of this study is to evaluate how the implemented model of AACD applied. The purpose is to improve OR efficiency of Al-Batnan Medical Center on 2005. A Service blueprint is constructed to control Operating room hold times². The aim is to evaluate the results of 2005 in comparison to 2004. The suggested scheme of work is based on:

1. Optimum utilization of the available facilities (Personnel, machines, rooms and time).
2. Perfect utilization of *Allocated OR time* to improve *OR efficiency*¹.
3. Quality and quantity Improvement with maximum economic and safety circumstances.

Methodology and Scheme of work:

Allocated OR time 7560 hour/year, 630 hour/month, 6 hour/day/room, 21 day/month, and 5 OT/day (The regular scheduled hours; from 08:00AM-02:00PM).

Anesthesiologists working during the year 2005 were eight specialists under supervision of one consultant (in comparison to 14/2004, and 24/2003). They were working according to maximum hours of duty; 240 hour/month.

They role to serve 9 OT (5 scheduled, 3 emergent, and 1 for hepatitis), 12 beds surgical intensive care unit (6 equipped with ventilators, 4 as intermediate, 1 for burn, and 1 for hepatitis) in addition to the supplementary services of the hospital departments.

The implemented model applied purposing to improve OR efficiency according to *Total Quality Management programs* depends on:

1. Reduction of turnover time between cases³.
2. Anaesthesia evaluation before the day of surgery decreases delay and cancellation, reduce costs, earlier starting time, and increase efficiency⁴.
3. Starting the IV line on the surgical ward to avoid delay-in-start times⁵.

Results:

The application of the service blueprint constructed according to *Total Quality Management programs* by Al-Batnan Medical Center administrators had achieved a significant success. Although dropping of anesthesiologists' number by 35.7% from 14 to 9, the optimum utilization according to the preformed plan resulted in:

1. OR efficiency was significantly increased from 73.87% on 2004 to 82.51% on 2005 (8.64%).
2. Increase quantity of completed cases/day/room from 3.45 to 3.85 cases (increased by 0.40 cases).
3. Increase operative mass from 5100 cases/2004 to 5732 cases/2005 by 12.39%.

4. Increase major operations (improve quality) from 3627 cases/2004 to 4066 cases/2005 by 12.10%.
5. Minor operations were increased from 830 cases /2004 to 1301 cases /2005 by 56.75 %.
6. Improved doctor's performance by 59.49%.

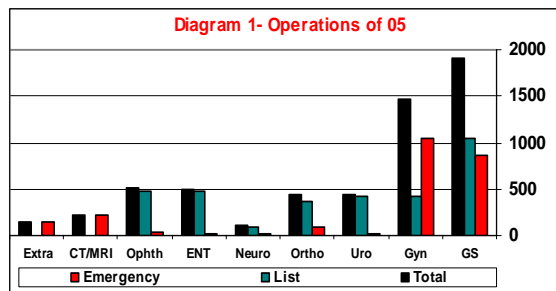
Discussion and Analysis:

- The operations during 2005 were 5732; classified as 3295 scheduled and 2437 emergent. **Table 1.**

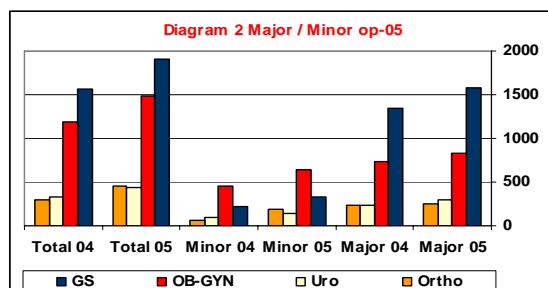
Department	Urgent	List	Total
General Surgery	856	1047	1903
OB-GYN	1055	422	1477
Uro-Surgery	15	424	439
Ortho-Surgery	84	365	449
Neuro-Surgery	21	84	105
ENT	12	477	489
Ophth-Surgery	29	476	505
C.T & M.R.I	224	0	224
Extra	141	0	141
All/2005	2437	3295	5732

Table.1 All cases of the year 2005

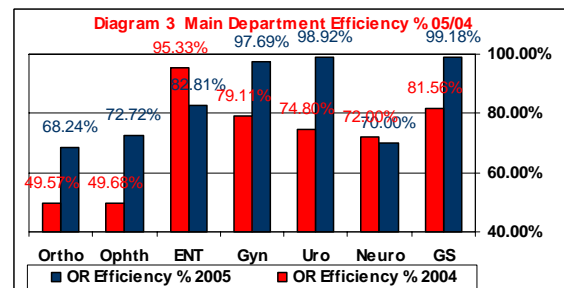
- There was a significant increase during 2005 in comparison with 2004 that had 5100 cases. The increase was by 632 cases and a ratio of 12.39%.



- Scheduled cases constituted 3295 cases (57.48% of total), while emergent cases constituted 2437 cases (42.52% of total). Major cases constituted 4066 cases (70.90% of total), with a significant increase of 439 cases (12.10%) in comparison to the year 2004 which had 3627 major cases. Minor cases constituted 1301 cases (22.69% of total) with a significant increase of 471 cases (56.75%) in comparison to the year 2004, which had 830 minor cases. Anesthesia out-side OT constituted 365 cases (07.37% of total).



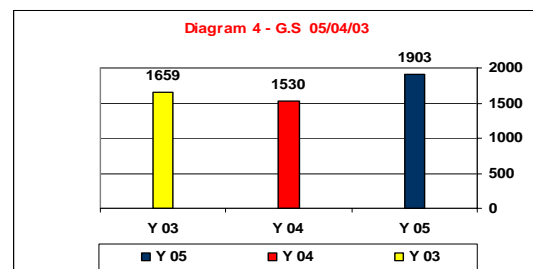
- Every anesthesiologist shared by 717 cases /Year 2005 (411.86 Scheduled and 304.63 Emergency) with efficiency 82.51%, while on 2004 sharing was by 517 with efficiency 59.49%. The increase of anesthesiologist efficiency was 23.02%.
- Allocated time for the scheduled cases was 5886 hour/year, while utilized time was 4855.85 hour, with OR efficiency of 82.51% for all the surgical procedures done during 2005. OR efficiency had increased significantly in comparison with 2004. Allocated time was the same, while utilized time was 4347.05 hours with OR efficiency of 73.87% on 2004. OR efficiency increased 08.64%.



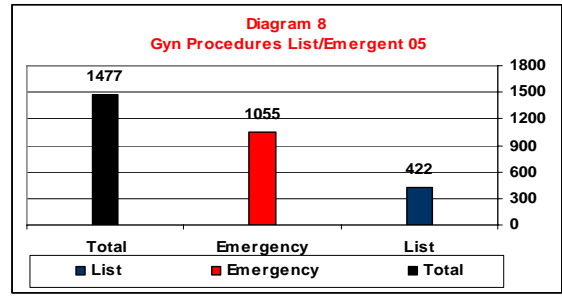
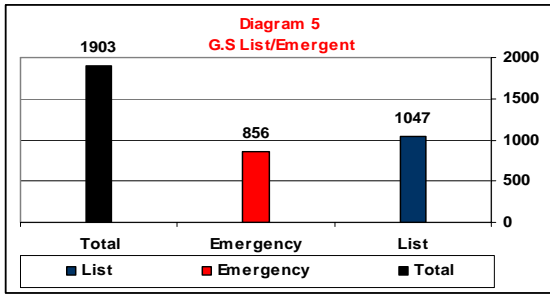
- Reduction of OR turnover time and increase efficiency increased the average number of cases completed per day from 3.45 to 3.85.
- Anesthesiologists reduced from 14 to 9, but with improved performance by 23.02% accompanied by an increase in OR efficiency 08.64%.
- Mortalities were 2 cases/2005, in comparison to case/2004, and 3cases/2003 (including emergency mortalities).
- The following detailed discussion analyzes the results from the different views.

I-General Surgery

- The general surgery operations during 2005 were 1903 in comparison to 1566 during 2004 with a significant increase of 337 cases. The ratio of increase was 21.52%.
- The ratio to the whole operations was 33%, in comparison to 30% On 2004.

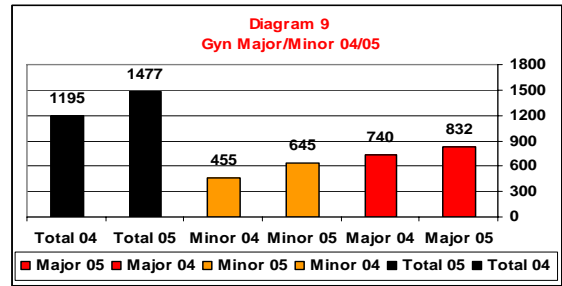
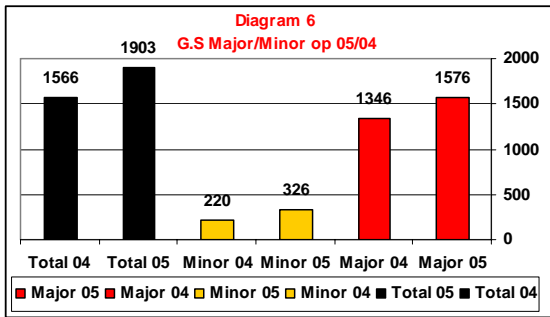


- The scheduled cases were 1047 constituted 55%, while emergencies were 856 that constituted 45%.



- The major procedures were 1576 cases (82.8% of total) on 2005, in comparison to 1346 cases on 2004 with a significant increase by 230 cases 17%.
- The minor procedures were 326 cases (17.2% of total) on 2005, in comparison to 220 on 2004 with a significant increase by 106 cases 48.10%.

- Major procedures were 832 cases (56.3% of total) on 2005, in comparison to 740 cases on 2004 with a significant increase by 92 cases 12.4%.
- Minor procedures were 645 cases (17.2% of total) on 2005, in comparison to 455 cases on 2004 with a significant increase by 190 cases 41.70%.



- Allocated time for scheduled cases was 1584 hours/year. The utilized time was 1570.50 hours with OR efficiency of 99.18% on 2005. OR efficiency had been increased significantly in comparison with 2004 that had utilized time 1291 hours with OR efficiency of 81.56%.

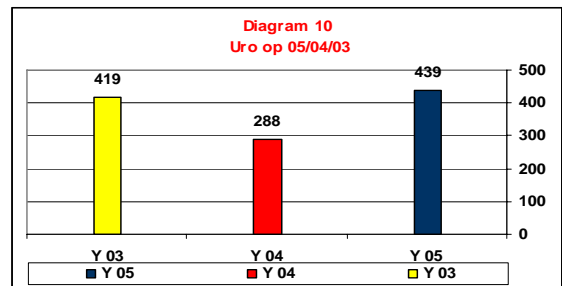
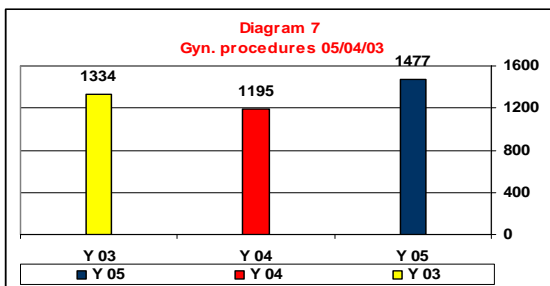
- Allocated time for the scheduled cases was 648 hours/year. Utilized time was 633 hours with OR efficiency of 97.69% on 2005. OR efficiency had significantly increased in comparison to 2004 that had utilized time 512 hours with OR efficiency of 79.11%.

II-Gynecologic procedures

III-Uro-surgical operations

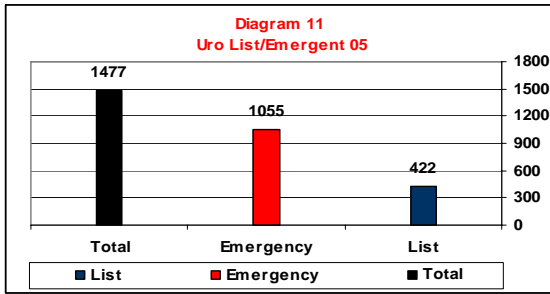
- Gynecologic operations on 2005 were 1477 in comparison to 1195 on 2004 with a significant increase of 141 cases. Increase ratio was 23.60%.
- The ratio to the whole operations was 25.67%, in comparison to 23.43% on 2004.

- The Uro-surgical operations during 2005 were 439 in comparison to 288 during 2004 with a significant increase of 151 cases. The ratio of increase was 52.4%.
- The ratio to the whole operations was 07.66%, in comparison to 06.45% on 2004.

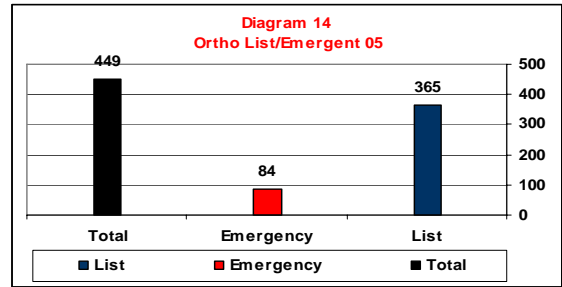


- The scheduled cases were 422, which constituted 28.60%, while the emergency cases were 1055, that constituted 71.40%.

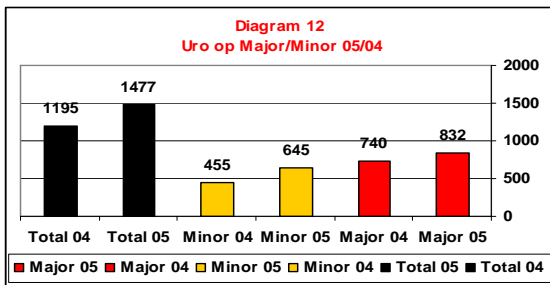
- The scheduled cases were 424, which constituted 97%, while the emergency cases were 15, which constituted 3%.



- Major procedures were 304 cases (96.2% of total) on 2005, in comparison to 230 cases on 2004 with a significant increase by 74 cases 32.1%.
- Minor procedures were 135 cases (30.8% of total) on 2005, in comparison to 99 cases on 2004 with a significant increase by 36 cases 36.3%.



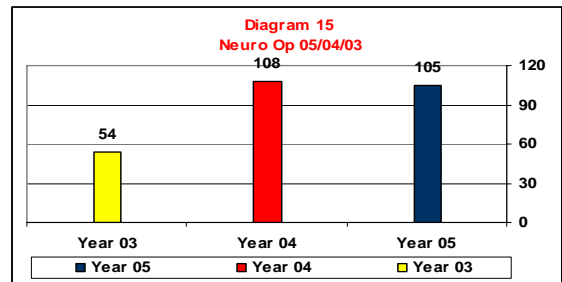
- Allocated time for the scheduled cases was 936 hours/year. The utilized time was 638.75 hours with OR efficiency of 68.24% on 2005. OR efficiency had been increased significantly in comparison with 2004 that had utilized time 464 hours with OR efficiency of 49.57%.



- Allocated time for the scheduled cases was 648 hours/year. The utilized time was 641.75 hours with OR efficiency of 98.92% on 2005. OR efficiency had been increased significantly in comparison with 2004 that had utilized time 484.75 hours with OR efficiency of 74.80%.

V-Neuro-surgical operations

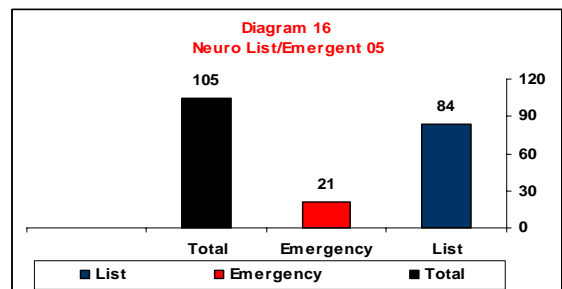
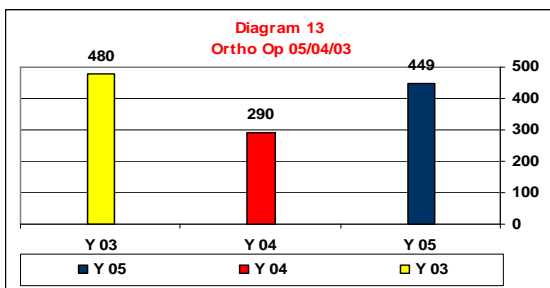
- The Neuro-surgical operations on 2005 were 105, in comparison to 108 on 2004 with a decrease of 3 cases. The ratio of decrease was 2.9%.
- The ratio to the whole operations was 18.32%, in comparison to 18.84% on 2004.



IV- Orthopedic Surgery

- Orthopedic operations during 2005 were 449, in comparison to 290 on 2004 with a significant increase of 159 cases. The ratio of increase was 54.82%.
- The ratio to the whole operations was 07.83%, in comparison to 05.69% on 2004.

- The scheduled cases were 84 (80%), while the emergency cases were 21 (20%).

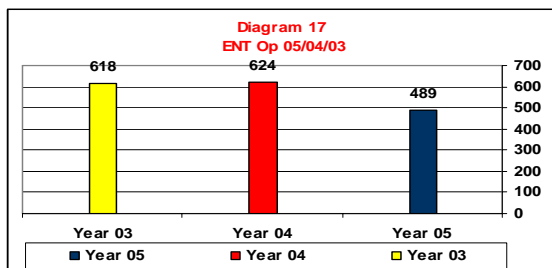


- The OT facilities force surgeons to schedule their cases as add-on or urgent.
- Scheduled cases were 365 that constituted 81%, while emergencies were 84 constituted 19%.

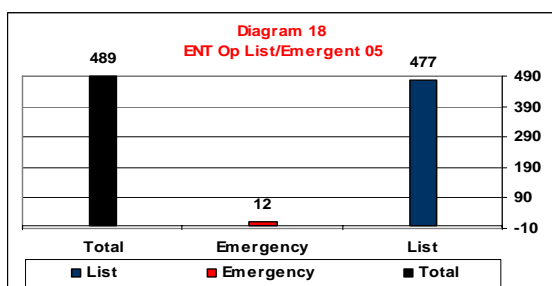
- The OT facilities force surgeons to schedule their cases as add-on or urgent
- Allocated time for the scheduled cases was 360 hours/year. The utilized time was 252 hours with OR efficiency of 70.00% on 2005. OR efficiency had been increased significantly in comparison with 2004 that had utilized time 259.20 hours with OR efficiency of 72.00% on 2004.

VI-ENT operations

- ENT operations on 2005 were 489, in comparison to 624 on 2004 with a significant decrease of 135 cases. The ratio of decrease was 22%.
- Ratio of ENT operations to the whole was 8.5%.



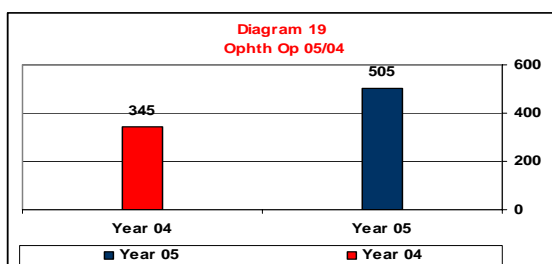
- Scheduled cases were 477 that constituted 97.5%, while the emergencies were 12 constituted 2.5%.



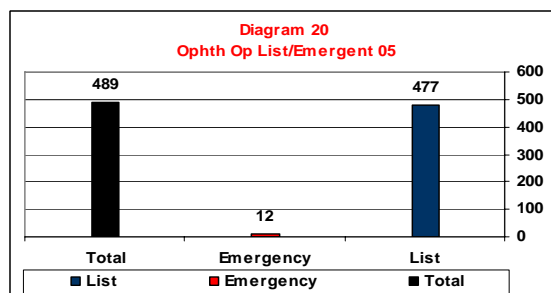
- Allocated time for the scheduled cases was 720 hours/year. The utilized time was 596.25 hours with OR efficiency of 82.81% on 2005. OR efficiency had been increased significantly in comparison with 2004 that had utilized time 686.40 hours with OR efficiency of 95.33%.

VII-Ophthalmology operations

- Ophthalmology operations on 2005 were 505, in comparison to 345 on 2004 with a significant increase of 160 cases. Ratio of decrease was 46%.
- The ratio of Ophthalmology operations to the whole operations was 9%.



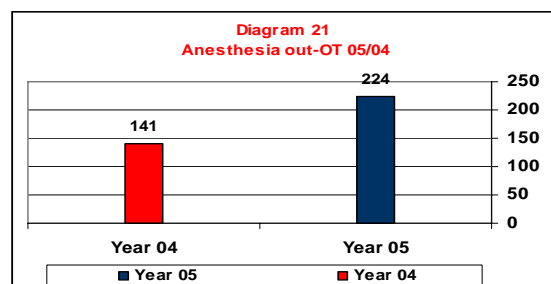
- The scheduled cases were 476, which constituted 94%, while the emergency cases were 29, which constituted 6%.



- Allocated time for the scheduled cases was 720 hours/year. The utilized time was 523.60 hours with OR efficiency of 72.72% on 2005. OR efficiency had been increased significantly in comparison with 2004 that had utilized time 357.70 hours with OR efficiency of 49.68%.

VIII-Anesthetic procedures out-side theaters

- Total anesthetic procedures out-side theaters were 224 cases during the year 2005 in comparison to 141 operations on 2004 with a significant increase of 83 cases. The ratio of decrease was 58.8%.



- Allocated time for the scheduled cases was 288 hours/year, while the utilized time was 136 hours, with OR efficiency of 47.22% during the year 2005. OR efficiency had increased significantly in comparison with 2004 that had utilized time 76.50 hours with OR efficiency of 26.56%.

Conclusion:

- There was an increase in the surgical procedures by 12.10%, Increased from 5100 cases on 2004 to 5732 cases on 2005
- Major cases increased from 3627 cases on 2004 to 4066 cases on 2005 by a difference of 439 cases, Increase by 12.40%.
- There was an improvement of the quality of the operations done in comparison to 2004.
- The reduction of OR turnover time increased the average number of cases completed/day/room from 3.45 to 3.85 which is coincided with the references results³.
- Patients evaluation prior to the day of surgery shorten starting time of the first case and turnover

times, reduce day of surgery cancellations, decrease costs, and increase OR efficiency which is coincided with the references results⁴.

- Difficulty in starting the IV line was the major cause of delay-in-start times⁵.
 - Improved anesthesiologist performance by 23.2% resulted in increase OR efficiency by 08.64%⁶.
 - Changes to operating room schedules during the day of surgery impact OR efficiency and staff satisfaction⁷.
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