

# STUDY ON OPERATION THEATRE SCHEDULING USING DMAIC APPROACH



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# Introduction

- Scheduling of Operation theatre is an important factor contributing to the operation theatre efficiency.
- It involves determining the average length of common operations and fitting them into the calculated available operating time
- The scheduling of operation theatre plays an important role towards the patients satisfaction by minimizing his/her total waiting time before undergoing major or minor operations.
- Poor scheduling of operation theatre cause pre operative delays.

## **Research Questions:**

What are the factors responsible for delay in OT of scheduled cases?

## **Objectives:**

- To analyze the complete process of OT scheduling in the operation theatre complex.
- To identify the gap between scheduled time and actual time of, if any.
- To identify the reasons for ‘first –case’ delays and ‘overall case’ delays.
- To provide recommendations to improve the operation theatre scheduling by reducing the ‘first case’ delays and ‘overall case’ delays.

# Methodology

- **Study design and approach:** Descriptive study.
- **Location of study:** Medica Synergie Hospital, kolkata.
- **Time frame:** February 2017-April 2017
- **Study Approach:** DMAIC approach.
- **Sampling Technique:** The sampling technique is purposive sampling.
- **Sample size :** Total Sample size:400
  - ☐ Cardiac cases =165
  - ☐ Ortho cases = 95
  - ☐ General cases =140
- **Sample population:**
  - **Exclusion Criteria**  
PHACO and emergency cases

# Study procedure

DMAIC approach is used.

**Define** the system through current process map.

**Measure** key aspect of the current process and collection of relevant data.

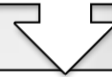
**Analyze** the data to investigate and verify cause and effect relationships. Determine what the relationships are, and attempt to ensure that all factors have been considered. Seek out root cause of the defect under investigation.

**Improve** or optimize the current process based upon data analysis  
**Control** the future state process to ensure that any deviations from the target are corrected before they result in defects and continuously monitor the process.



# PHASE 1- DEFINE

Surgeons/Surgeon assistant calls the OT coordinator for OT booking of their cases one day prior to surgery



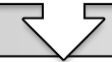
OT coordinator checks for OT slot availability and availability of instruments with sister in-charge and technician



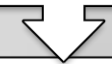
OT Coordinator informs the surgeon about the same and book the case.



On the day of Surgery ,OT coordinator calls to shift the patient to OT recovery



Patient is shifted to pre operative area of recovery from ward



Patient is shifted to OT by OT nurses and GDA staffs



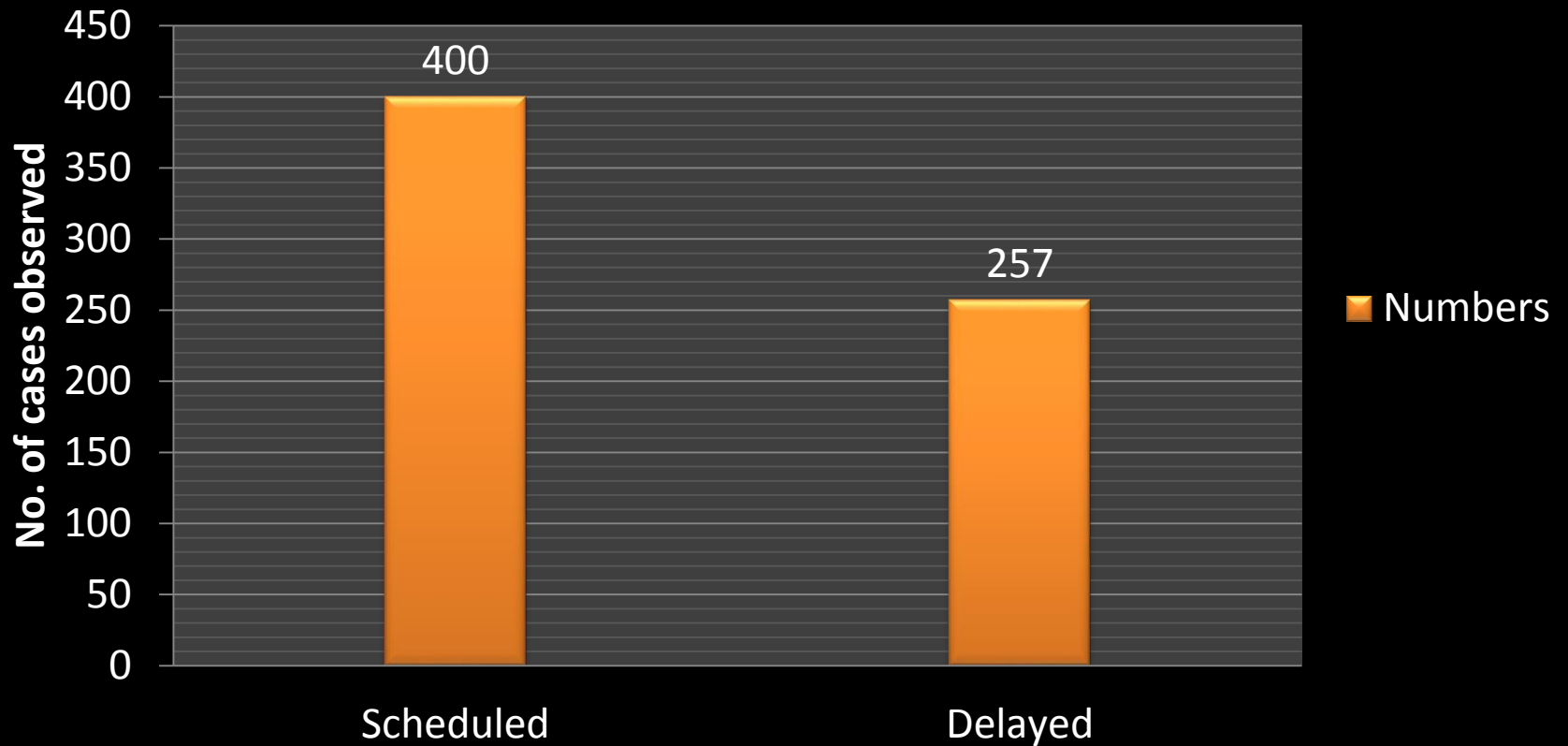
After the Surgery performed patient is shifted to post operative area of recovery



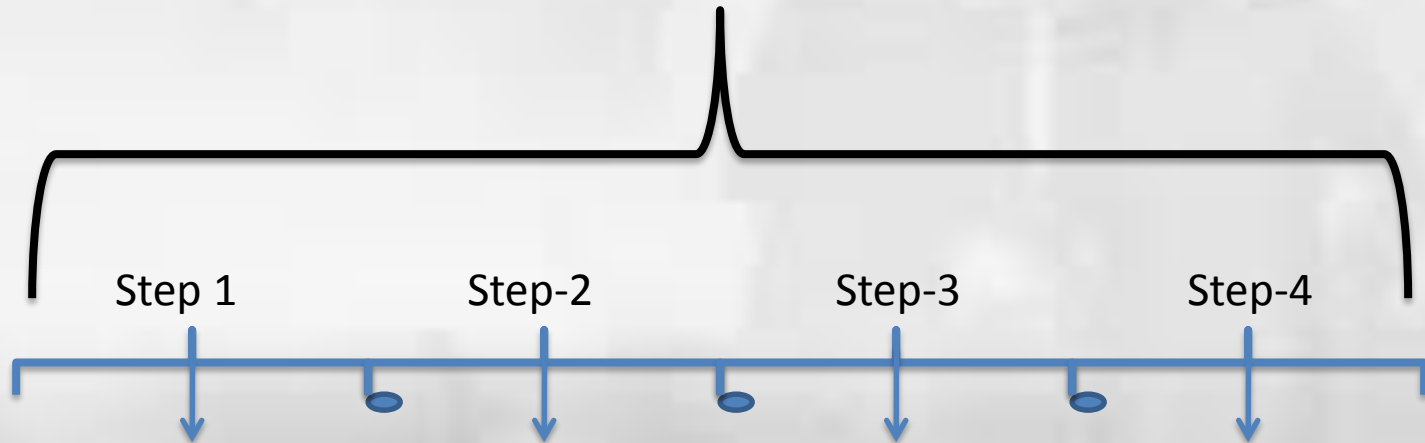
Patient finally shifted to their respective ward.

# PHASE-II MEASURE

Scheduling of operation theatre



# Steps to Measure the Completion of cases



Time taken  
between patient  
Enter in Pre  
Operative area  
from ward.

Time taken between  
patient wheel in OT  
table from pre  
operative area

Time taken in  
completion of  
surgery

Time taken  
between  
completion of  
surgery to patient  
wheeled out of OT



(Specialty wise)

Cardiac Cases (n=165)

| Measurement Parameters                                                       | Average Time taken |
|------------------------------------------------------------------------------|--------------------|
| Case delay                                                                   | 52mins             |
| Step-1 Time taken between patient Enter in Pre Operative area from ward.     | 23mins             |
| Step-2 Time taken between patient wheel in OT table from pre operative area. | 26mins             |
| Step-3 Time taken in completion of surgery                                   | 4 hours 22mins     |
| Step-4 Time taken between completion of surgery to patient wheeled out of OT | 33mins             |

# Ortho cases (n=95)

| Measurement Parameters                                                | Average Time |
|-----------------------------------------------------------------------|--------------|
| Case delay                                                            | 48mins       |
| Time taken between patient Enter in Pre Operative area from ward.     | 10mins       |
| Time taken between patient wheel in OT table from pre operative area. | 20mins       |
| Time taken in completion of surgery                                   | 1hour 15mins |
| Time taken between completion of surgery to patient wheeled out of OT | 13mins       |

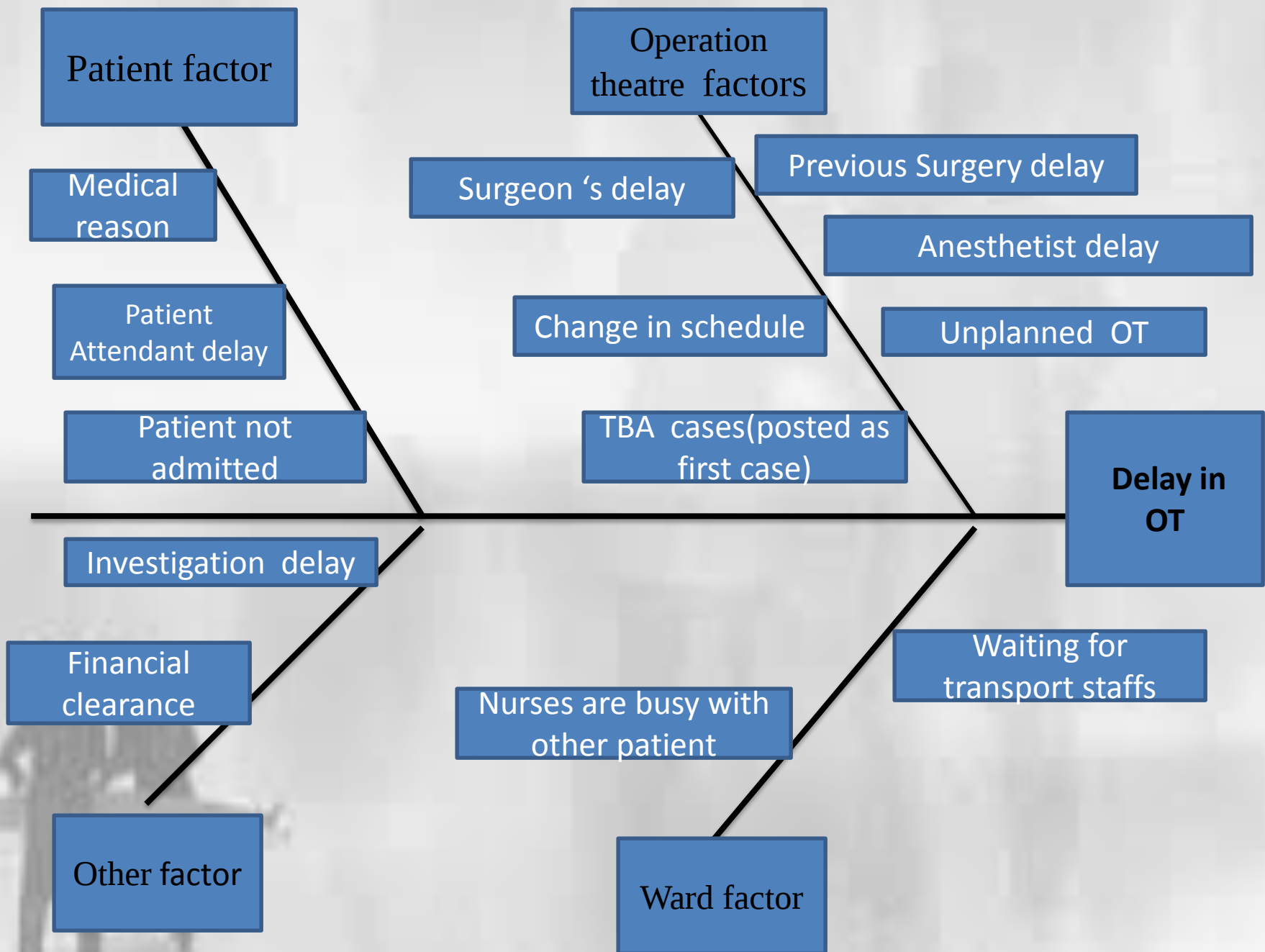
# General Cases (n=140)

| Measurement Parameters                                                | Average Time |
|-----------------------------------------------------------------------|--------------|
| Case delay                                                            | 40mins       |
| Time taken between patient Enter in Pre Operative area from ward.     | 10mins       |
| Time taken between patient wheel in OT table from pre operative area. | 14mins       |
| Time taken in completion of surgery                                   | 1hour 02mins |
| Time taken between completion of surgery to patient wheeled out of OT | 10mins       |

# PHASE III-Analysis(Specialty wise)

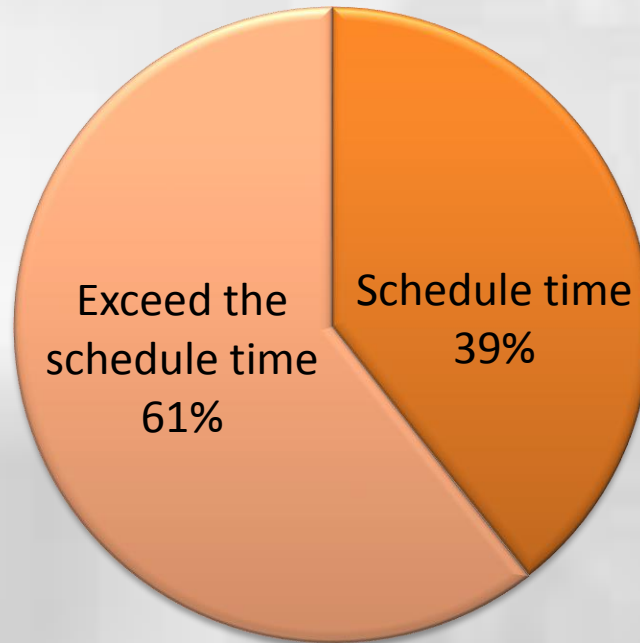
## Cause and Effect Diagram (Fish Bone Diagram)





# Cardiac Cases

**No. of Cardiac cases**



Total no. of cases: 165

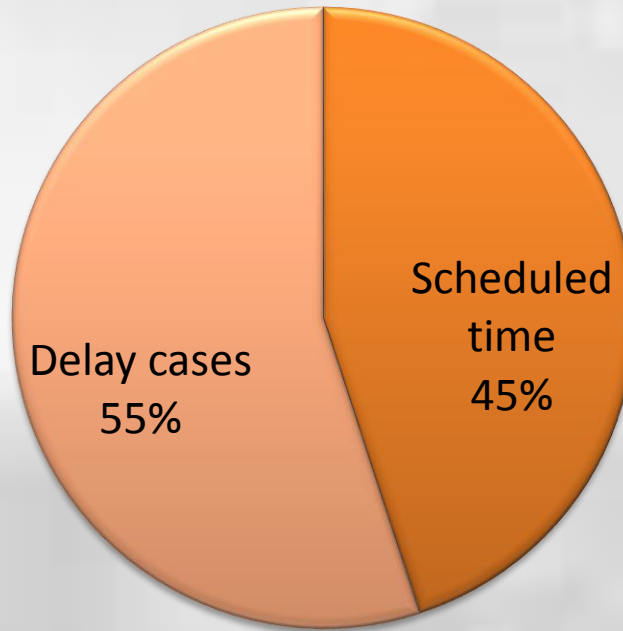
No. of cases started on scheduled time: 65

No. of cases delayed: 100

Average time of delayed cases: 52minutes

# Cardiac First cases

**No. of first cases**



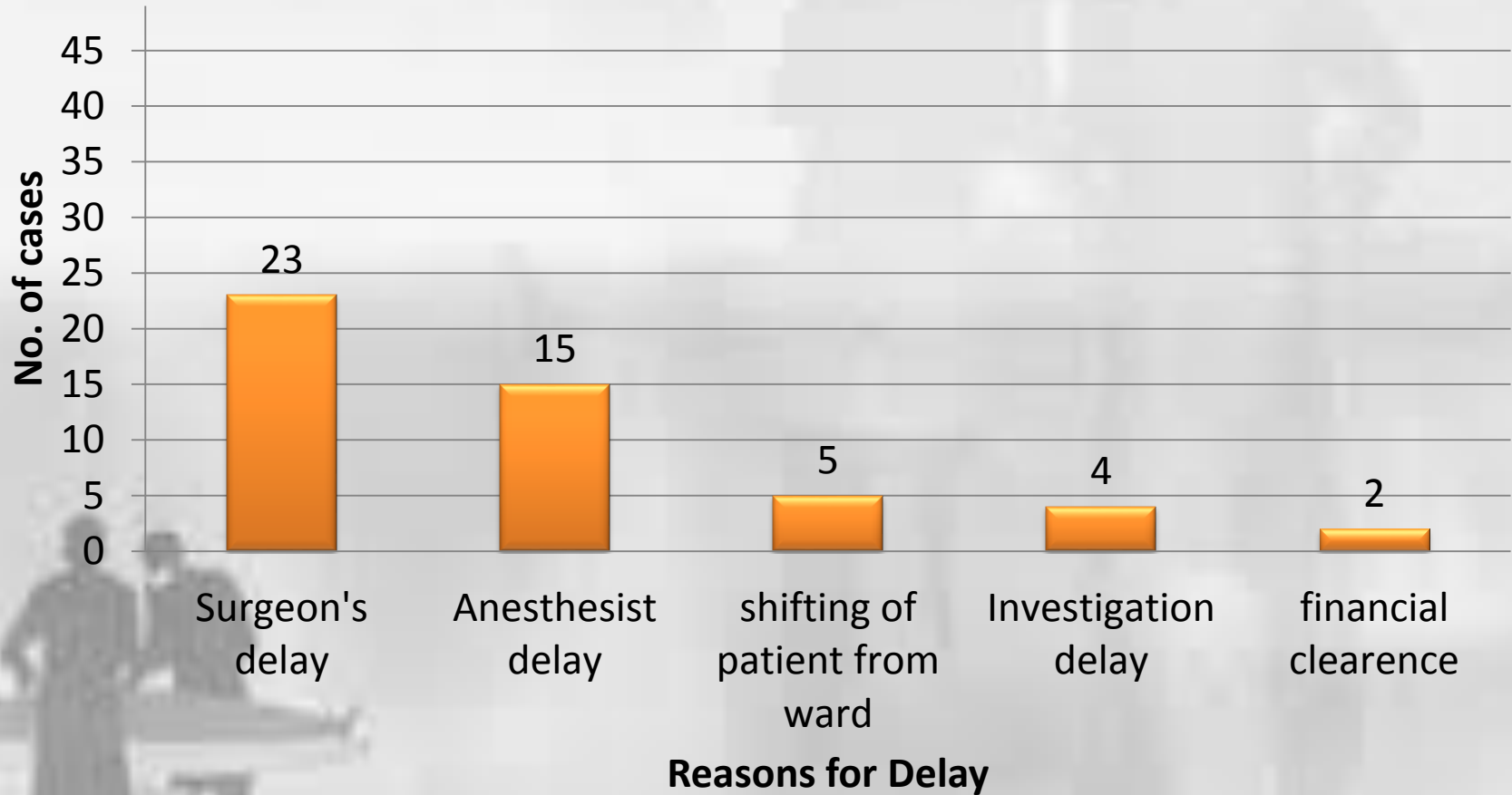
Total No. of cases:89

No. of cases started on scheduled time:40

No. of cases delayed:49

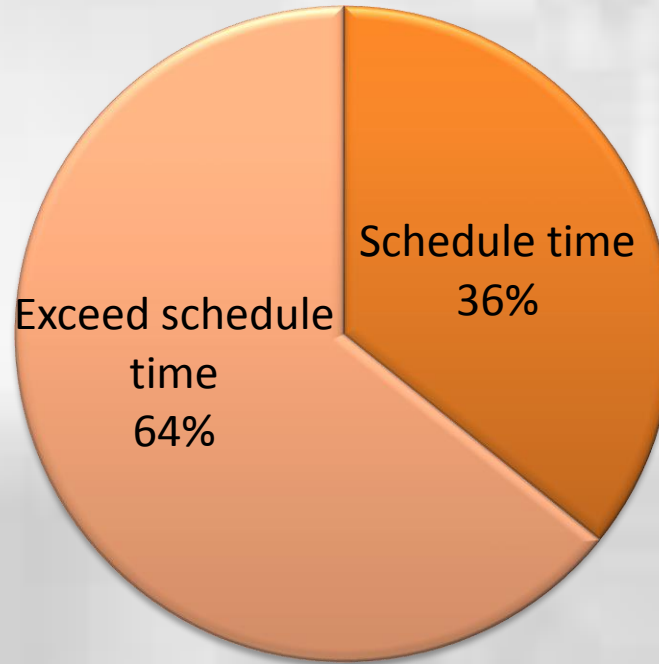
Average delay in first cases:19minutes

# Cardiac first case delay



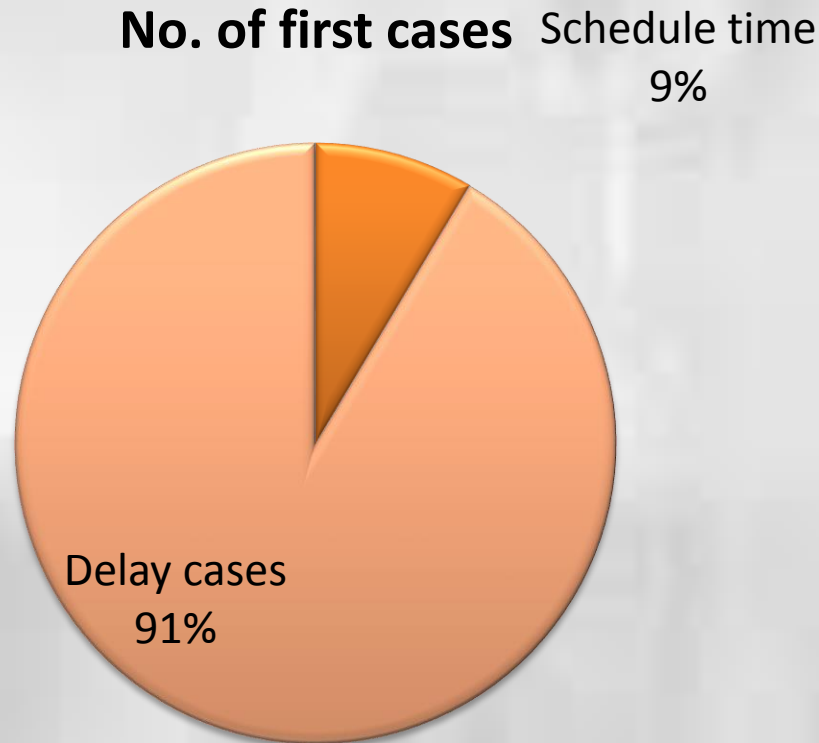
# Ortho Cases

**No. of Ortho cases**



- Total no. of cases:95
- No. of cases started on scheduled time:34
- No. of cases delayed:61
- Average time of delayed cases: 48 minutes

# Ortho first case



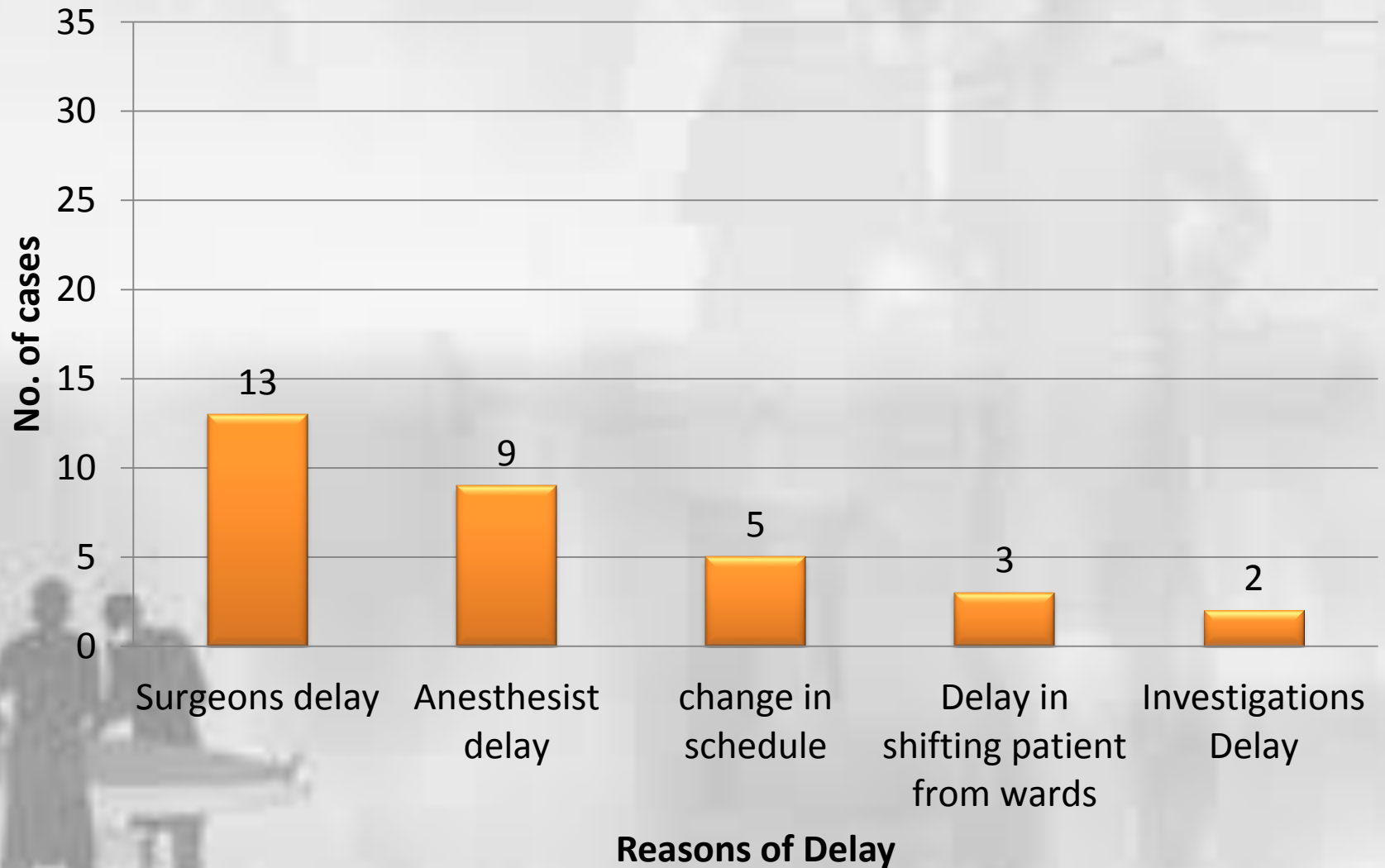
Total No. of cases:35

No. of cases started on scheduled time: 3

No. of cases delayed:32

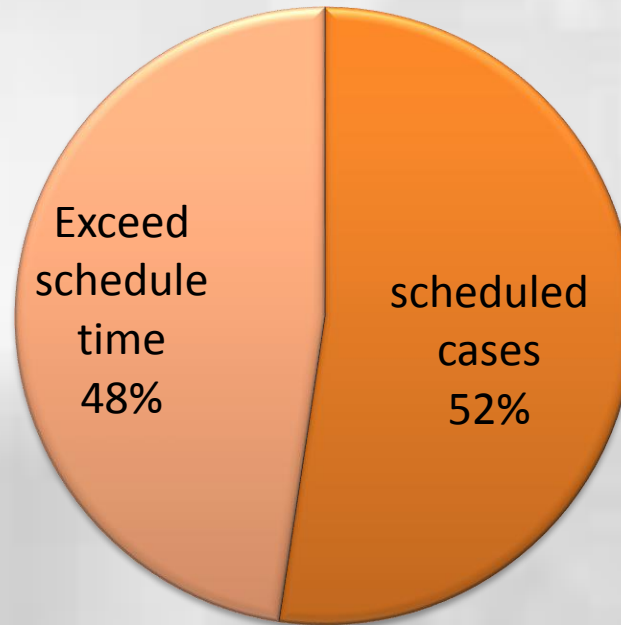
Average delay in first cases:39minutes

# Ortho first cases



# General Cases

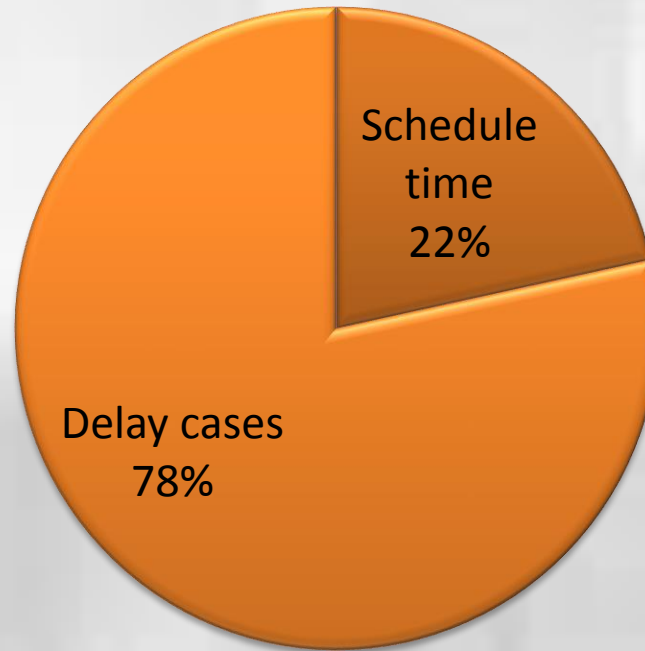
**No. of General cases**



- Total no. of cases: 140
- No. of cases started on scheduled time: 44
- No. of cases delayed: 96
- Average time of delayed cases: 40minutes

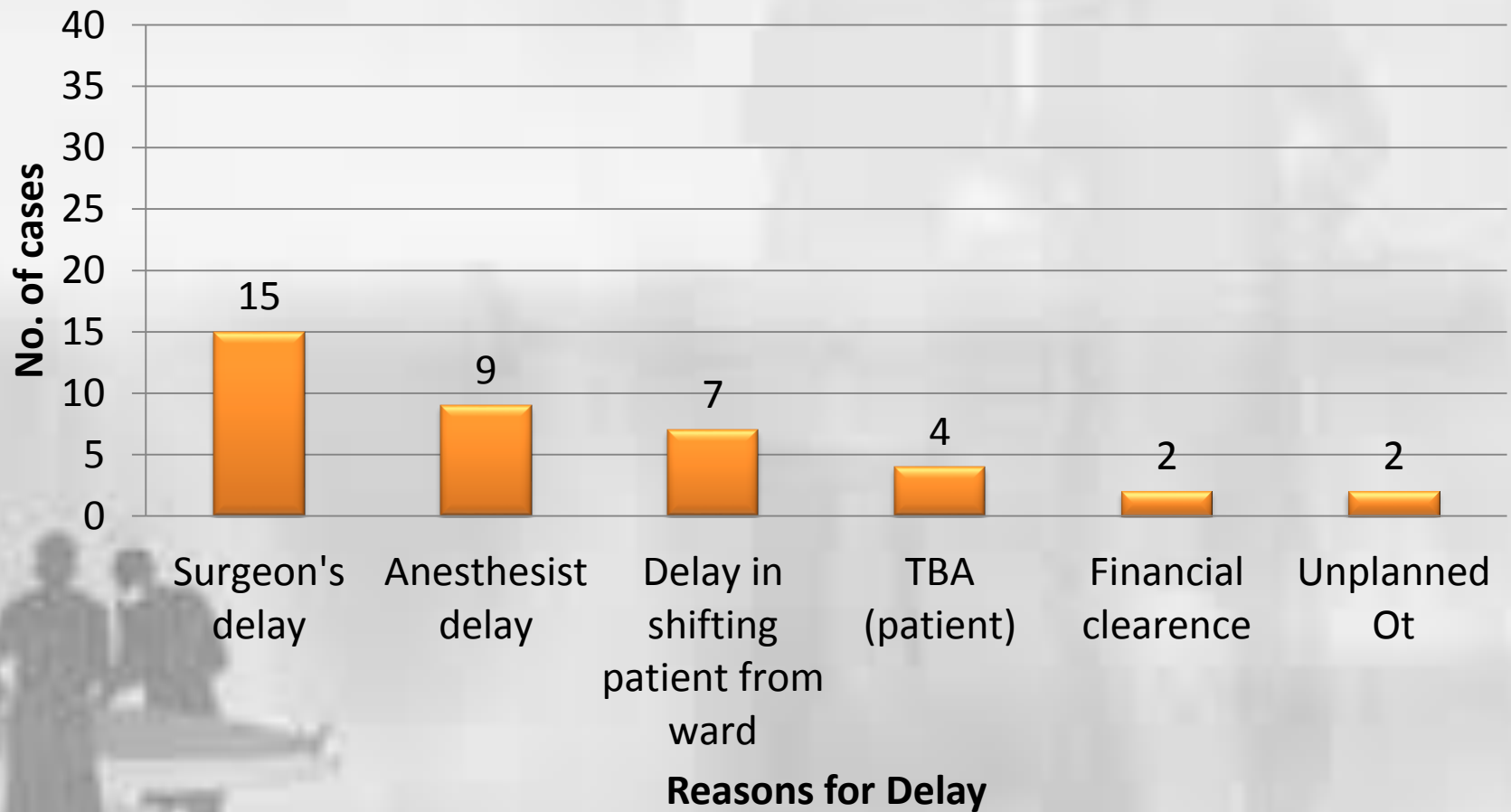
# General surgery first case

## No. of first cases



- Total No. of cases:51
- No. of cases started on scheduled time: 11
- No. of cases delayed:40
- Average delay in first cases:36minutes

# General first cases



## Other issues related to Operation theatre

- Pre anesthesia check up not done in 57% of cases(i,e.225 cases out of 400 cases).
- OT consent form which is being filled in operation theatre occurs in 55% of cases (i,e. 53 cases out of 95 cases)
- Allocated nurses do not accompany patients during his/her transfer to OT recovery.
- Operation theatre case list is not prepared till 6pm in the evening.

# PHASE IV: Recommendation to Improve

- All the cases or surgery should be started on the scheduled time so as to reduce the frequency of previous surgery delay which occurs due to ripple effect of first cases. A combined effort of medical team is required which includes both surgeons and anesthetists.
- Patient from the ward should be called an hour before the scheduled time of surgery.
- To be admitted cases should not be posted as first case and they should be posted as second case.
- All surgeons who have their OPD timings on the same day of surgery should scheduled their case with the gap of 30 minutes between the finishing time of OPD and scheduled time of the surgery so as to prevent change in schedule.



## PHASE V: CONTROL



# Process for preparing OT list

Surgeon decides the case for next day and informs RMO/Nursing/Ward coordinator



Ward coordinator informs Billing for clearance



Billing department calls up OT coordinator and conveys the clearance or refusal.



If clearance  
is Received

YES

OT Coordinator will book the OT and inform the surgeon and all concerned staff so that all the patient is ready for OT the next day.



Implementation done on 5<sup>th</sup> May 2017 onwards:

- All the surgeries or cases have started scheduling at 8:00am as before it was scheduled at 9:00am.
- OT coordinator have started calling the patient from respective wards one hour before the scheduled time of the surgery so that they can reach the OT recovery at least half an hour before the scheduled time of surgery.
- TBA cases are not posted as the first case of surgery in Operation theatre.

- Chairman has issued a circular on 5<sup>th</sup> May that bedside PAC should be done one day prior to surgery and OPD basis should be done before evening.
- Nursing Superintendent has addressed the nursing in-charges of all the floors regarding nursing aspects related to OT handover and has ensured that only the allocated nurse will accompany the patient to OT recovery.



# Conclusion :

Improvement of OT scheduling will have direct impact on increasing the efficiency of Operation theatre . It will not only help to reduce the waiting time of patient but also increase the satisfaction level among them and hence, Optimum utilization of OT can be done also.



*Thank You*

