

AI for Operational Efficiency



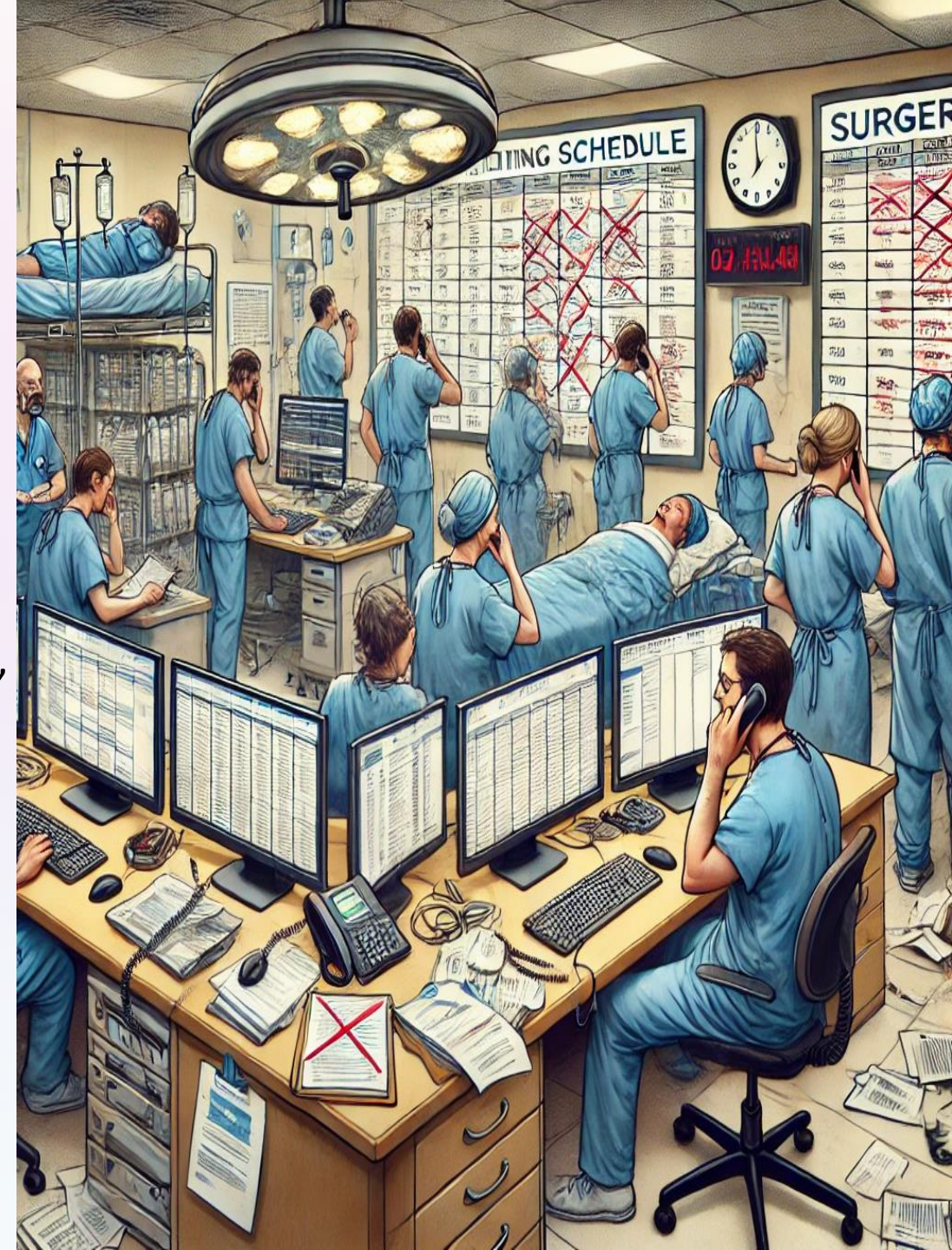
Melanie Rana

Sr Program Manager, Medical Administration
Amrita Hospitals, Faridabad

Challenges in Operations

Few Pain points in day to day functioning:

- ❑ Manual scheduling systems for managing multiple surgeries; Underutilization of resources-OT, Doctors, Nurses; Prolonged Surgeries; Handling unforeseen emergencies; Increased patient waiting times
- ❑ Discharge Delays:
- ❑ OP Waiting time:
- ❑ Antimicrobial Stewardship



Amrita OT Scheduler: Modules

1

Scheduler

- Automated Scheduling
- Real-Time Updates
- Resource Optimization

2

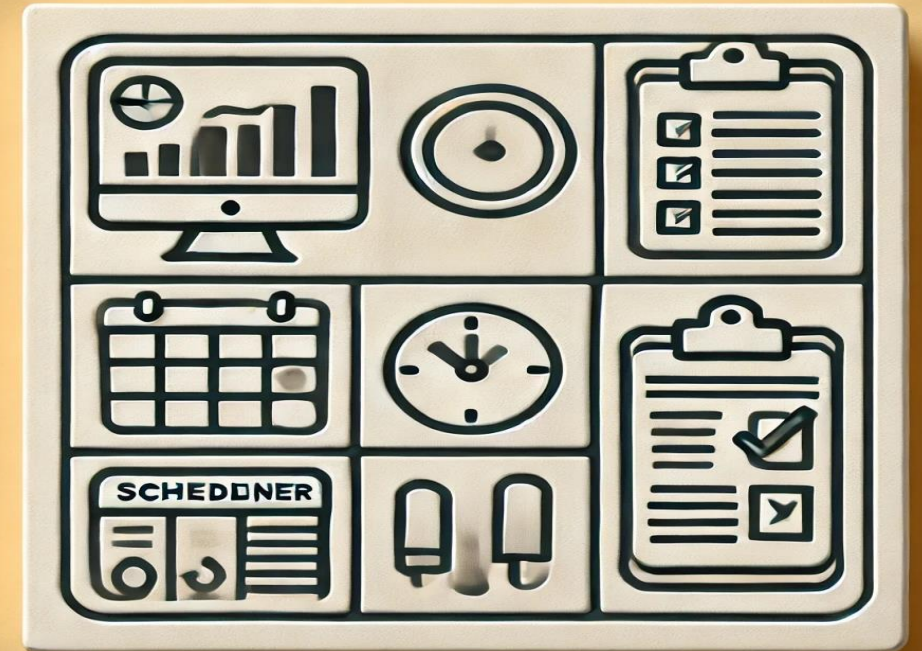
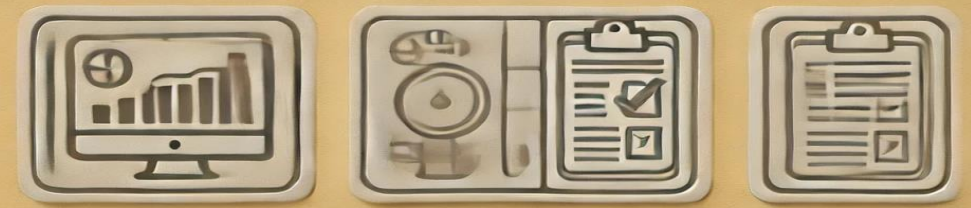
Event Monitoring

- Recording start/end time of each OT event
- Handling emergency surgeries
- Surgery Turnaround Times

3

Reports of Surgeries

- Performance Analytics
- Utilization Metrics
- Surgical Case Types



Scheduler Workflow

Input

DATE OF SURGERY	AGE/SEX	SURGERY	SURGEON	SPECIALITY	Name of the Patient	Special Request	Mrd Number
18-07-2024	28Yrs/F	DJ Stenting	Dr. Priya Gupta	Urology	Mr Vikram Singh	CARM (Simans)	1201
18-07-2024	47Yrs/F	Hemorrhoidectomy	Dr. Amit Patel	Gen Surgery	Ms Anjali Patel		1202
18-07-2024	2Yrs/M	EMERGENCY LSCS	Dr. Anjali Gupta	OBG	Ms Poonam Sharma	Cusa (Soring)	1203
18-07-2024	6Yrs/M	Bioplar Hemiarthroplasty	Dr. Rahul Singh	ORTHO	Mr Rakesh Kumar		1204
18-07-2024	66Yrs/F	RIGHT Eye Pterygium Surgery	Dr. Priya Sharma	Ophthalmology	Mr Saleem Khan		1205
18-07-2024	69Yrs/F	LSCS	Dr. Rahul Singh	OBG	Ms Anita Sharma		1206
18-07-2024	78Yrs/F	Lap Cholecystectomy	Dr. Ritu kumari	Gen Surgery	Ms Madhuri Devi		1207
18-07-2024	23Yrs/M	Examination Under GA	Dr. Sanjay Kumar	Gen Surgery	Mr Gopal Das		1208
18-07-2024	30Yrs/F	TURP	Dr. Vikram rathod	Urology	Ms Kavita Devi	Cusa (Soring)	1209
18-07-2024	39Yrs/F	Leep	Dr. Anjali kumari	Oncogyne	Mr Ravi Shankar		1210
18-07-2024	55Yrs/M	EUA	Dr. Amit kapoor	Oncogyne	Mr Vikas		1211
18-07-2024	3Yrs/M	Vaginal Tag Excision	Dr. Amit Gupta	Oncogyne	Mr Mahesh Chandra Singh		1212
18-07-2024	7Yrs/M	Hysteroscopic Endometrial Biopsy	Dr. Amit kumar	Oncogyne	Mr Deepak Kumar	Robot (Divanchi)	1213
18-07-2024	64Yrs/M	Excision OF Breast Lump	Dr. Meenakshi Sahai	Breast Surgery	Mr Ajay Kumar Singh		1214
18-07-2024	36Yrs/F	Breast Abscess Right	Dr. Priya gupta	Breast Surgery	Ms Neelam Devi		1215
18-07-2024	51Yrs/F	RIGHT Eye Cataract Implantation	Dr. Anjali Patel	Ophthalmology	Mr Amit Kumar Singh	CARM (Simans)	1216
18-07-2024	60Yrs/F	RIGHT Eye Pterygium Surgery	Dr. Mohan yadav	Ophthalmology	Ms Jyoti Devi		1217
18-07-2024	8Yrs/M	Cataract	Dr. Vikram Singh	Ophthalmology	Ms Kiran Devi		1218

List of Surgeries

Scheduler

Output

Scheduled Surgeries
View all scheduled surgeries across all operation theaters

OT NUMBER

Filter by OT number Download

OT Number	Surgeon	Department	Surgery	Start Tir
1	Dr.Namrata Seth	Obstetrics & Gynaecology	LAVH	8:00
1	Dr.Aparna Mahajan	ENT	Tympanoplasty+Mastoidectomy	12:27
3	Dr.Manav Suryavanshi/Dr.Ritesh Goel	Urology	DJ Stenting B/L	8:00
3	Dr.Puneet Dhar	Gastrointestinal Surgery	Laparoscopic Cholecystectomy	10:40
3	Dr.Sachin Mittal	General Surgery	Laparoscopic Cholecystectomy	13:04
3	Dr.Anil Sharma/Dr.Ahmed Kamaal	Urology	URS	15:28
4	Dr.Mrinal Sharma	Orthopaedic	Left TKR	8:00
9	Dr.Nitin Jain	Cardiac Surgery - Paediatric	1st Stage Hypospadias Repair	8:00
10	Dr.Sameer Bhate	Cardiac Surgery - Adult	CABG On Pump	8:00

Update/Confirm

Scheduled surgeries

**Improvement from 18% to 64% (manual to automated scheduling).
OT utilization increased from 43% to 66%.**

Event Monitoring: Workflow

Step1: Confirm patient details

Surgery List

View all scheduled surgeries across all operation theatres

OT NUMBER

Filter by OT number

Neeraj Procedure: LAVH Surgeon: Dr.Namrata Seth	View/Update Details
Uma Kant Jha Procedure: CABG On Pump Surgeon: Dr.Sameer Bhate	View/Update Details
Master Punit Procedure: 1st Stage Hypospadias Repair Surgeon: Dr.Nitin Jain	View/Update Details
Renu Procedure: Tympanoplasty+Mastoidectomy Surgeon: Dr.Aparna Mahajan	View/Update Details
Jitender Grover Procedure: DJ Stenting B/L Surgeon: Dr.Manav Suryavanshi/ Dr.Pitsh Ghal	View/Update Details

Emergency/Add-on Surgery

Step2: Record In-time/Out-time

Operation Theatre #1

Patient: Neeraj

Pre-OP 17:51:11	In Time
Prophylaxis 17:51:11	In Time
Wheel-In 17:51:13	In Time
Induction 17:51:15-	In Time
Painting & Draping 00:00-00:00	In Time
Incision 00:00-00:00	In Time
Extubation 00:00	In Time

OT utilization increased from 43% to 66%.

Reports for Surgeries: Features



Utilization Rates

Track OT usage efficiency and identify improvement opportunities.



Turnaround Times

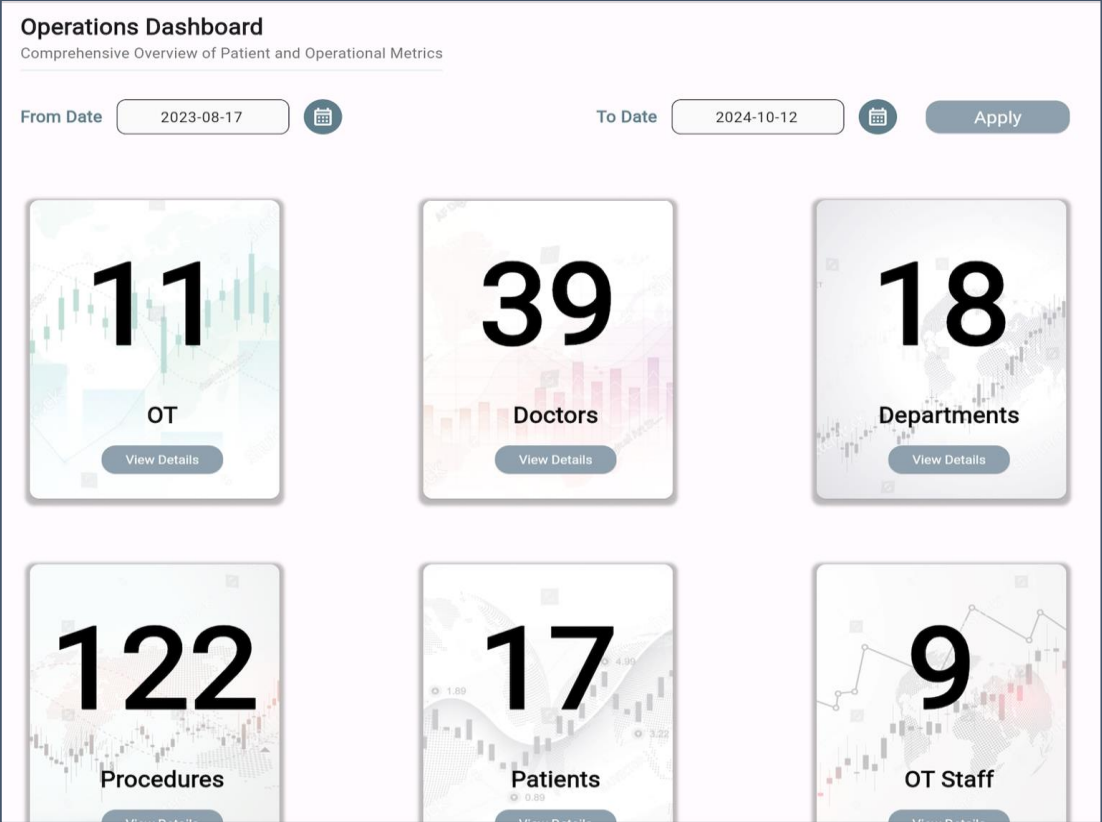
Monitor and optimize time between procedures for maximum efficiency.



Performance Metric Analysis

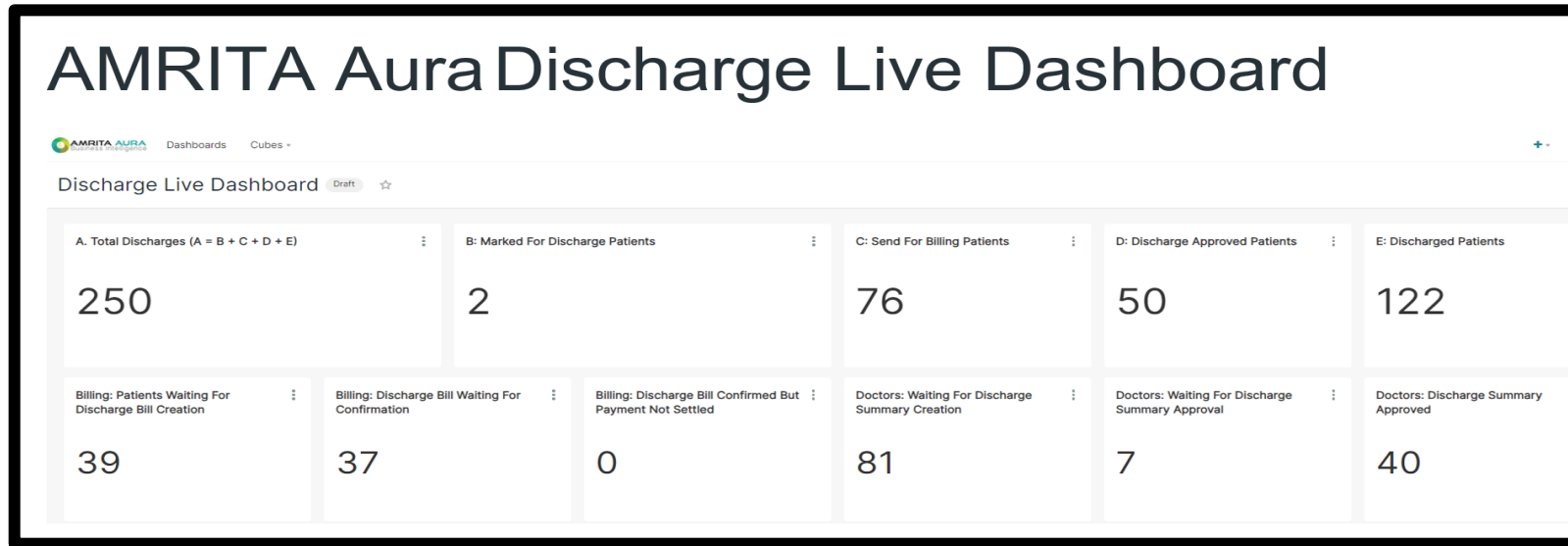
Analyze individual and team performance metrics for continuous improvement.

Safe Surgery Checklist compliance improved from 78% to 100%.



Dashboard Web Application Screenshot

Discharge: Pain Point - Dashboard



Discharge time improved by 2+ hours.
Introduction of a comprehensive OT dashboard.

Discharge Summary Details with time stamps with Delayed Time

Patients Delayed for Discharge (1 hour Beyond Send For Billing)

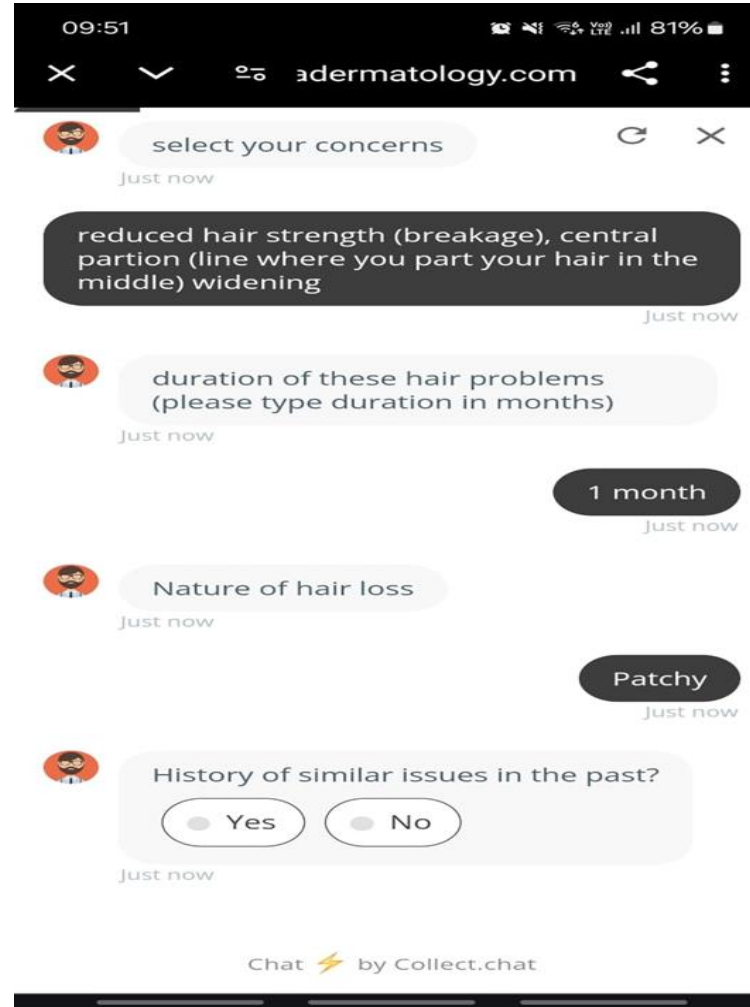
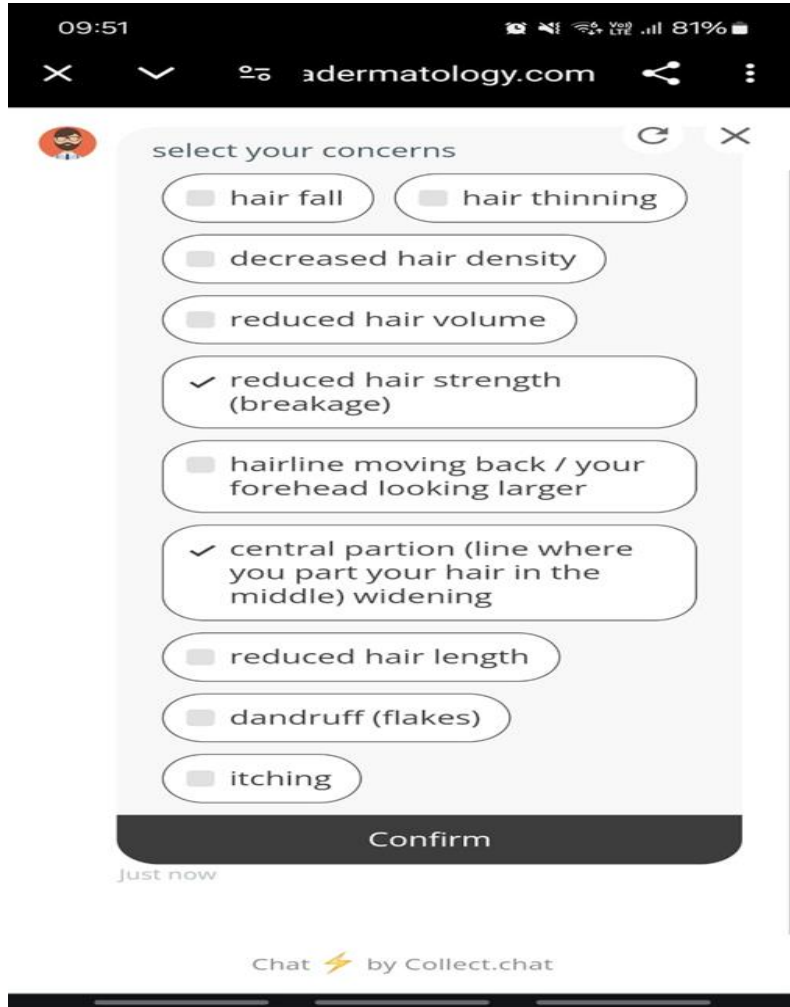
MRO Number	Patient Name	Admitting Doctor	Specialty	Current Status	Discharge Summary Approved Time	Mark For Discharge Date	Send For Billing Date	Bill Confirmed Date	Sales Return Request Processed Time	Discharge Approved Date	Actual Discharge Date	Total Discharge Prescription	Total Partially Processed Prescription	Total Fully Processed Prescription	Total Pending Prescription	DelayedTime
175202	MR ADITYA RAJ	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:41	19-10-2024 05:02	19-10-2024 04:41									37:15:25
175203	MR ANIL SAJ	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:41	19-10-2024 05:05	19-10-2024 04:41									37:12:08
175105	MR Gyan madhav sharma	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:42	19-10-2024 05:05	19-10-2024 04:42									37:11:51
175104	MR Ezekiel D Abubun	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:42	19-10-2024 05:06	19-10-2024 04:42									37:10:46
175103	MR DON THOMAS	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:42	19-10-2024 05:07	19-10-2024 04:42									37:09:46
175101	MR DIVANANJAY K J	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:42	19-10-2024 05:08	19-10-2024 04:42									37:08:51
175100	MR DEWANGU	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:42	19-10-2024 05:09	19-10-2024 04:42									37:07:48
175089	MR Anjali Ansh	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:41	19-10-2024 05:10	19-10-2024 04:41									37:06:51
175088	MR ANIL KRISHNA P S	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:41	19-10-2024 05:11	19-10-2024 04:41									37:05:53
175086	MR Amit Pawan	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:41	19-10-2024 05:12	19-10-2024 04:41									37:05:07
175084	MR Ajay Pooja	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:41	19-10-2024 05:13	19-10-2024 04:41									37:04:08
175085	MR ALWIN SHEEN JOHN	Unit1 Ortho	General Orthopaedics	SEND FOR BILLING	19-10-2024 04:41	19-10-2024 05:14	19-10-2024 04:41									37:03:20

Discharge Summary Details with time stamps.

Discharge Summary Detail (B+C+D+E)

MRO Number	Patient Name	Admitting Doctor	Specialty	Current Status	Overstayed Days than expected discharge	Discharge Summary Approved Time	Bill Preparation Time after Send For Billing	Payment Delay After Bill Confirmation	Actual Discharge after Discharge Approval	Sales Return Processing Time	Total Time Taken	Mark For Discharge Date	Actual Discharge Date
171117	SURINDER KAUR	Dr. Saphala Bagthar	Medical Oncology	DISCHARGE APPROVED	0	16-10-2024 16:50	01:41:17	00:00:00	00:00:00	00:00:00	0 days 00:00:00	NO	
154744	GUDDI GUDDI	Dr. Prashant Mehta	Medical Oncology	PATIENT DISCHARGED	0	16-10-2024 17:00	00:59:10	00:00:00	00:12:16	00:00:00	0 days 01:11:31	YES	16-10-2024 17:06
174900	MRS SUNITA	Unit1 Obs and Gynae	OBGY Surgery	PATIENT DISCHARGED	2		01:14:25	00:00:03	00:02:37	00:00:00	0 days 01:17:02	YES	16-10-2024 17:47
81550	RABINDRA MANJHI	Dr. Urmla Anandh	Nephrology (Adult)	PATIENT DISCHARGED	0		00:00:00	00:00:00	00:27:36	00:00:00	0 days 03:46:37	YES	16-10-2024 16:06
175288	FOOL SINGH	Unit1-Gen Medicine	Internal Medicine	PATIENT DISCHARGED	1	04:15:42	00:00:03		20:34:26	00:00:00	1 days 00:50:08	YES	14-10-2024 17:41 16-10-2024 13:04
175179	MR BALKAR	Unit1-Gen Surgery	General Surgery	PATIENT DISCHARGED	1	04:13:08	00:00:02		20:55:30	00:00:00	1 days 00:48:38	YES	14-10-2024 17:47 16-10-2024 13:01
175169	SHANKAR GUPTA	Unit1-Gen Surgery	General Surgery	PATIENT DISCHARGED	1	04:12:50	00:00:03		20:36:41	00:00:00	1 days 00:49:31	YES	14-10-2024 17:57 16-10-2024 13:01
175242	MRS SHARBATI	Unit1-Gen Medicine	Internal Medicine	PATIENT DISCHARGED	1	04:15:01	00:00:03		20:38:38	00:00:00	1 days 00:53:39	YES	14-10-2024 18:14 16-10-2024 13:07
175215	CHANCHAL DEVI	Unit1-Gen Surgery	General Surgery	PATIENT DISCHARGED	1	04:13:45	00:00:03		20:34:35	00:00:00	1 days 00:48:20	YES	14-10-2024 19:23 16-10-2024 13:00
175285	LOKESH SHARMA	Unit1-Gen Medicine	Internal Medicine	PATIENT DISCHARGED	1	04:15:47	00:00:02		20:34:52	00:00:00	1 days 00:50:39	YES	14-10-2024 19:45 16-10-2024 13:05
175285	RAJBALA DEVI	Unit1-Gen Medicine	Internal Medicine	PATIENT DISCHARGED	1	22:07:26	00:00:03		17:29:07	00:00:00	1 days 00:48:55	YES	14-10-2024 19:46 16-10-2024 13:03

Chat Bot – UI (Dept of Dermatology)

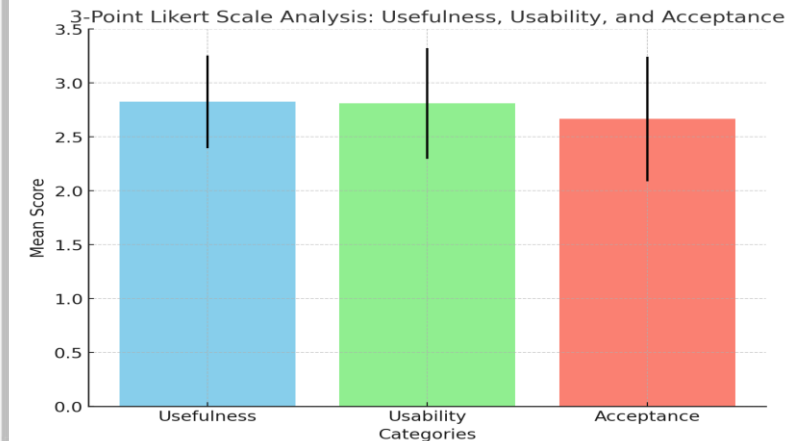


Comparision Chatbot Group:

Mean Consultation Time:

minutes.17.46 minutes

Gp2: 9.82 mts

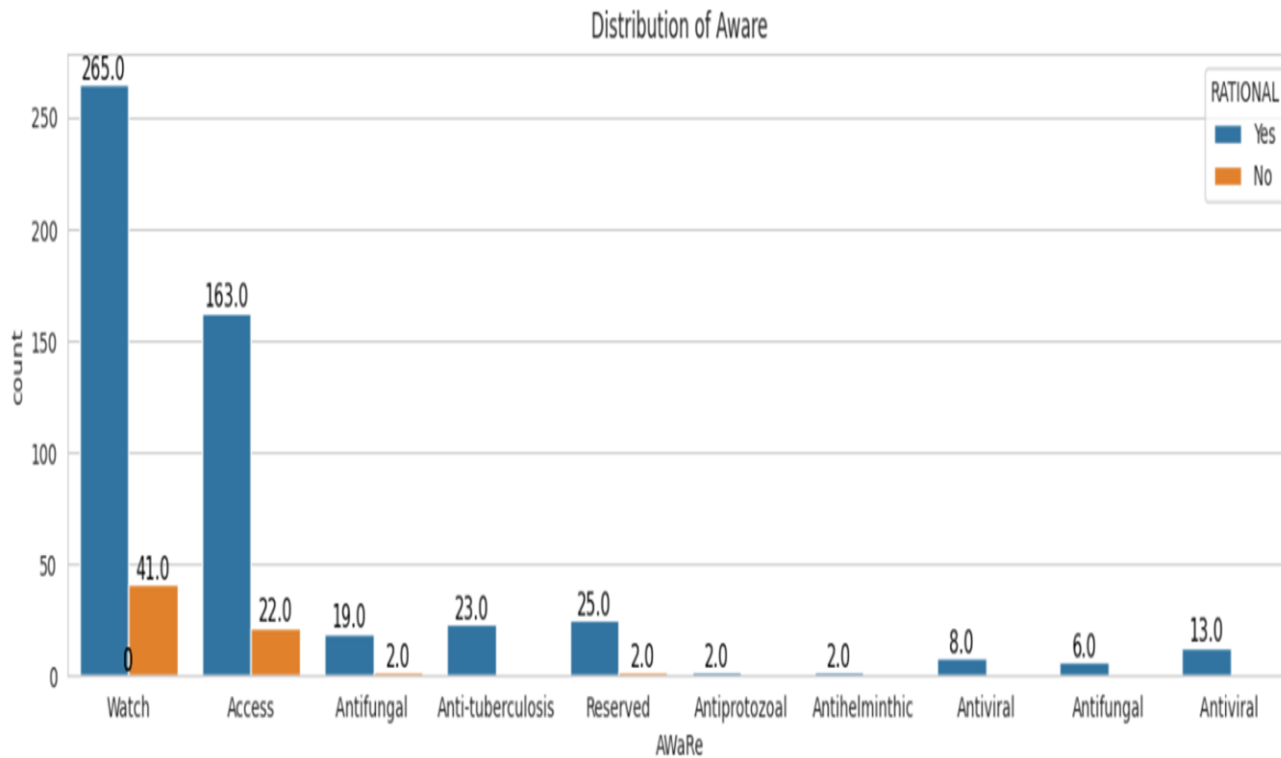


Consultation time reduced from 22 to 10.5 minutes.

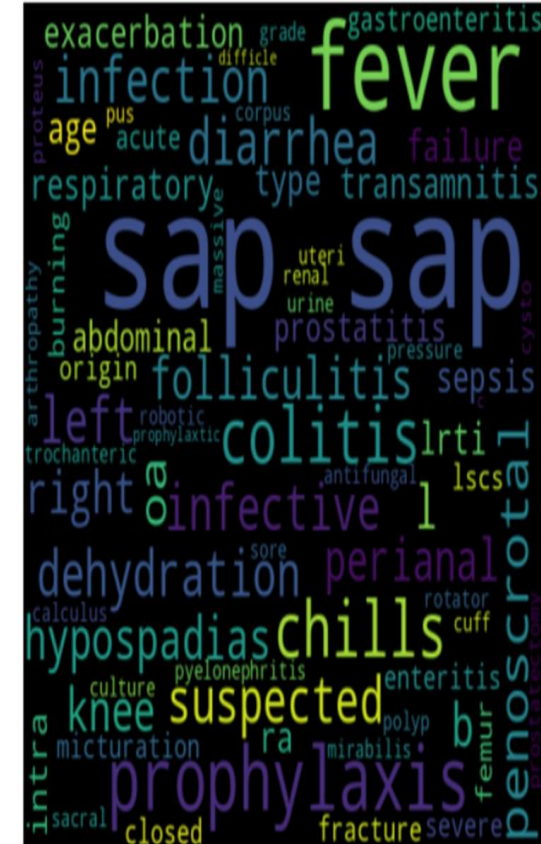
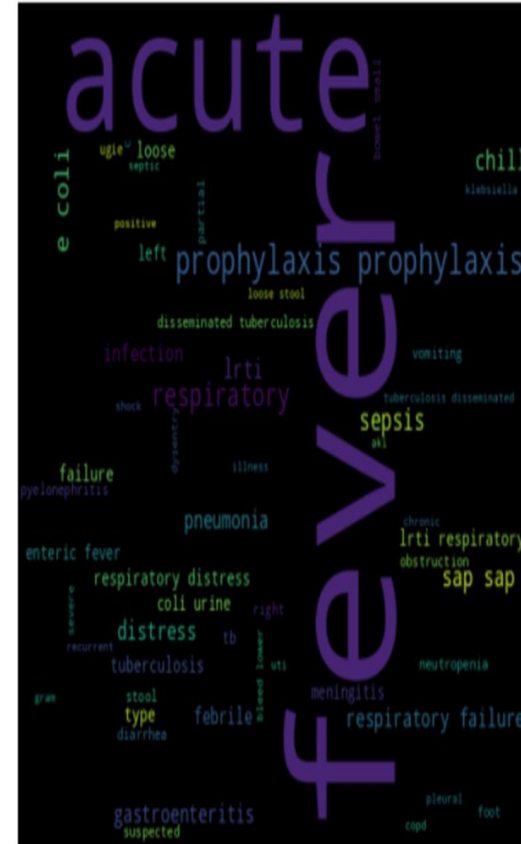
Satisfaction rate increased from 77% to 89%.



Antimicrobial Stewardship



Word Cloud of Indication for Correct Rationality Word Cloud of Indication for Incorrect Rationality



Thank you
melanie@fbd.amrita.edu

