

Appointment system at AIIMS

Background:

Under the initiation of Computer facility, AIIMS appointment system was started at AIIMS in 2014 to empower the citizens of India and to provide easy and accessible healthcare to all.

Configuration and implementation of appointment system

The data regarding OPD, clinics etc were configured in the system. Slots were allotted for each doctors/rooms as per the department's allocation. Patients are able to take appointments over web, phone (through call centre), IVRS and on site (Registration counters)

Modes of Appointment

1. Web Portal/online registration system (ORS)

Web portal was started on 29-September2014 and ORS appointment system was started on 9th May 2015. Patients with or without UHID can take appointment using web portal/ORS. For patients with UHID, they have to enter the registered mobile number and the OTP received in the mobile to proceed further. Patients can take both follow up and new appointments from the web portal and ORS.

Online Registration System is a cloud and mobile based portal for patients to book appointments, view lab reports, check blood availability and make online payments in Hindi and English. It facilitates patients to take online appointments with various departments of any hospital by authenticating using Aadhaar Number and in case they don't have Aadhaar number, using Mobile Number. A Patient giving Aadhaar number is authenticated using One Time Password (OTP) if patient's mobile number is registered with UIDAI and using patient's name if mobile number is not registered with UIDAI. New Patient will get appointment as well as Unique Hospital Identification (UHID) number, if authenticated using Aadhaar Number. If Aadhaar number is already linked with UHID number, then appointment number will be given and UHID will remain same.

2. Interactive voice responsive system (IVRS)

IVRS Appointment system for OPD patients were started on September 1st 2014. Only patients with UHID can take appointment through IVRS. The patients cannot choose doctor and Appointment to the previously shown doctor is automatically given. Contact Number: .18602583010

3. AIIMS counters

An innovative feature that was introduced by the Computer Facility, AIIMS was the single window EXIT OPD Counters, where patients could seek their next appointments, and dates for the various tests that were necessary. It was started in May 2015 and

patient reception counters were started in August 2015. A total of 19 counters are operational in Single Window Exit Counters.

A total of 52 counters are operational in PRC among which 18 counters are fast track, 22 current booking counters, 10 UHID counters and 2 screening counters manned by NIS. The idea was to reduce registration time for new patients to under a minute. Patients who were already registered would be fast tracked to the patient waiting areas, under the supervision of Nursing Informatics specialist.

a. Self service kiosk

Patients can take appointments from self service kiosk. Around Two Hundred self service Kiosk have been installed across the Hospital including wards and various OPDs . The Patient can avail the following Services from Kiosk:

- New appointment with Aadhar and non- Aadhar
- Duplicate Appointment slip.
- Follow up appointment.
- Confirmation or cancellation appointments.
- Patients can also view their Lab report on kiosk.

4. Call centre

Most of the patients who visit AIIMS are illiterate and are not able to utilize the web portal/IVRS. In order to avoid the human middleware the concept of call centre was started on 14th April 2015 to provide appointments for both new and old patients. To book appointment patient's has to dial the number 011-65900669. The call is transferred to call centre where date and time under a particular specialty is fixed and appointment is scheduled.

5. Mobile app

Mobile app was started on 1st February 2015. Patient can book appointment using Mobile app (android) - 'AIIMS@Delhi. Patient can download the app from play store. Patient has to enter phone number and UHID of the patient.

Once a patient takes appointment through any of the modalities, patient receive a confirmation SMS in their registered mobile number. All the information pertaining to the visit (reporting time, room no. etc) are provided to the patient through SMS. Patients who have taken the appointment can report in fast track counters and get their appointment confirmed and proceed to the concerned OPD for consulting the doctor. Special counters are also allotted for patients with e-OPD card.

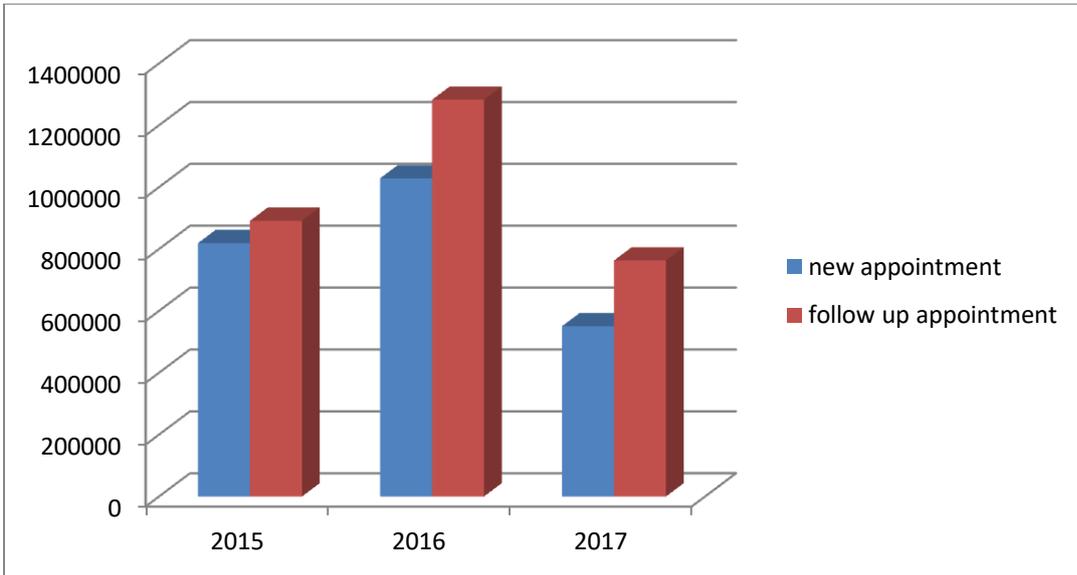


Fig.1 Number of appointments taken (2015-June 2017)

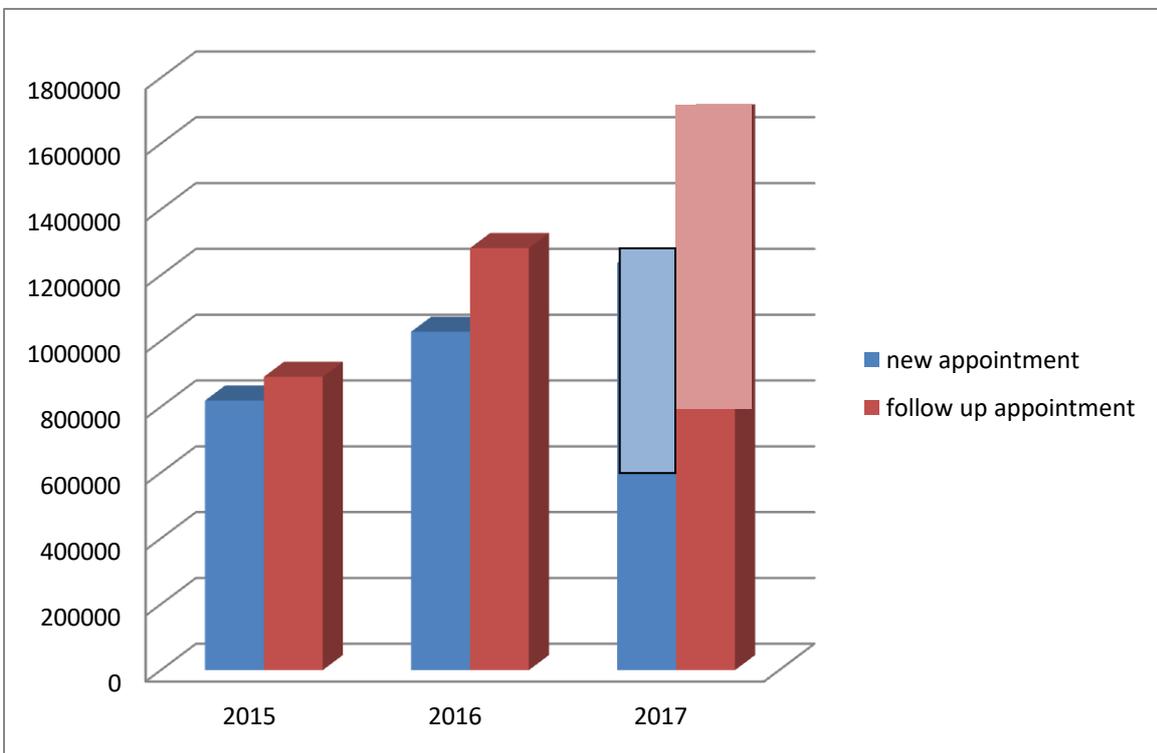


Fig.2 Figure showing predicted number of Appointments(by the end of 2017)

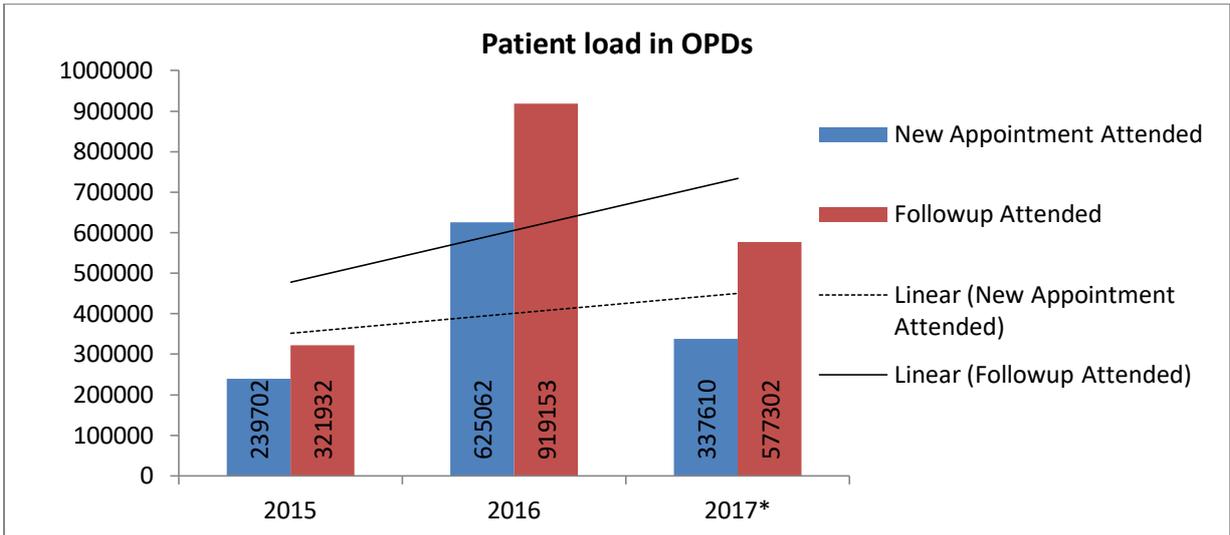


Fig.3 Figure showing actual patient load over the years (2015-2017)

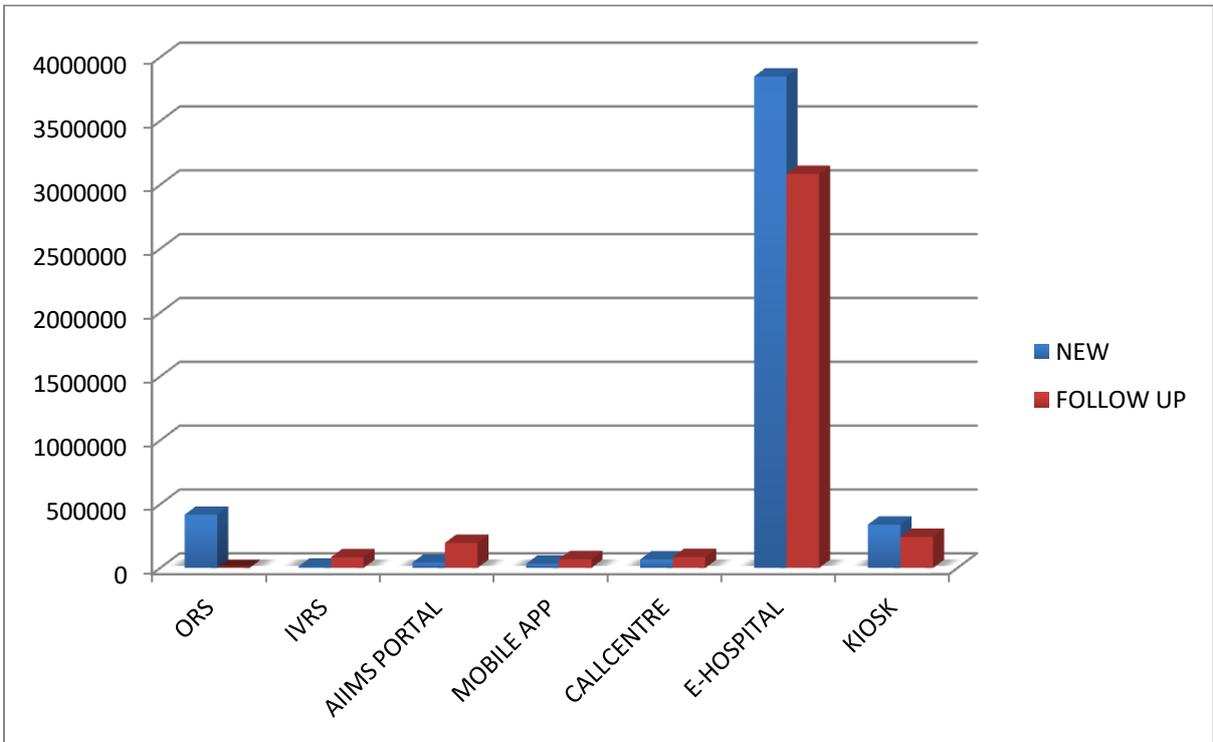


Fig.4 Graph showing the total number of appointments (New/follow up) taken through various modes (2014-June 2017)

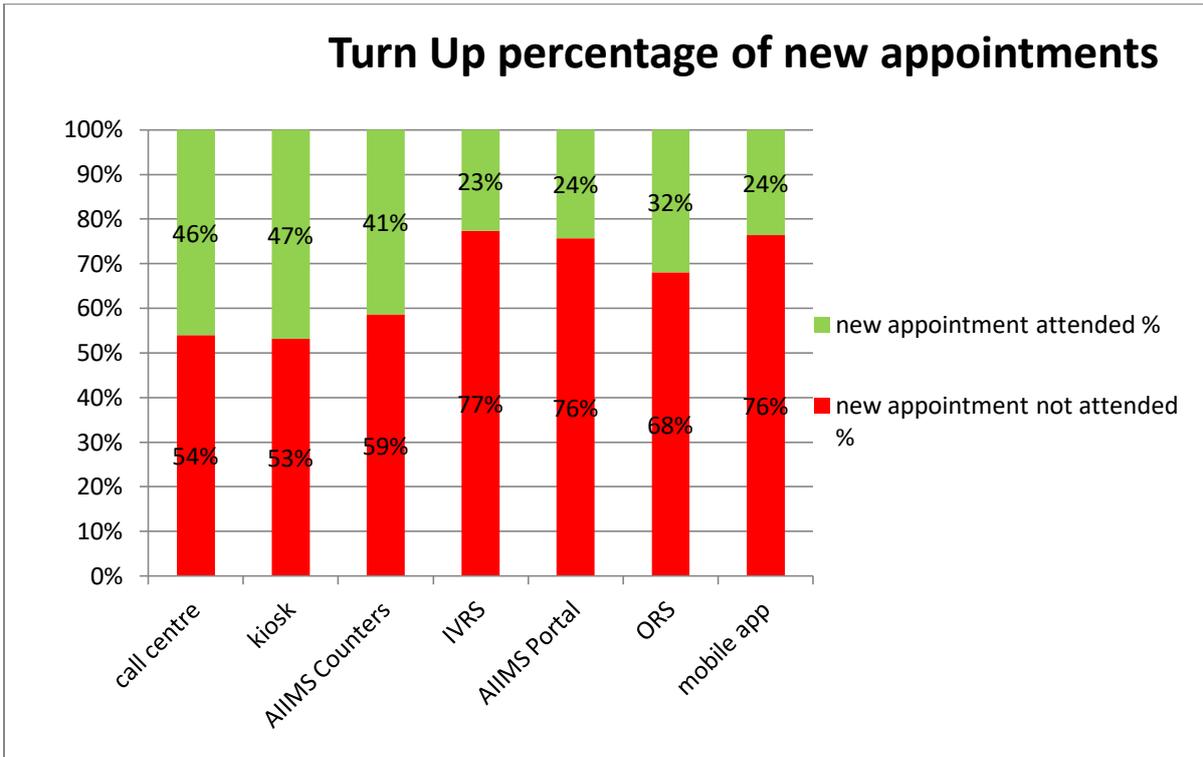


Fig.5 Graph showing average turn up percentage of new patients (2015-June 2017)

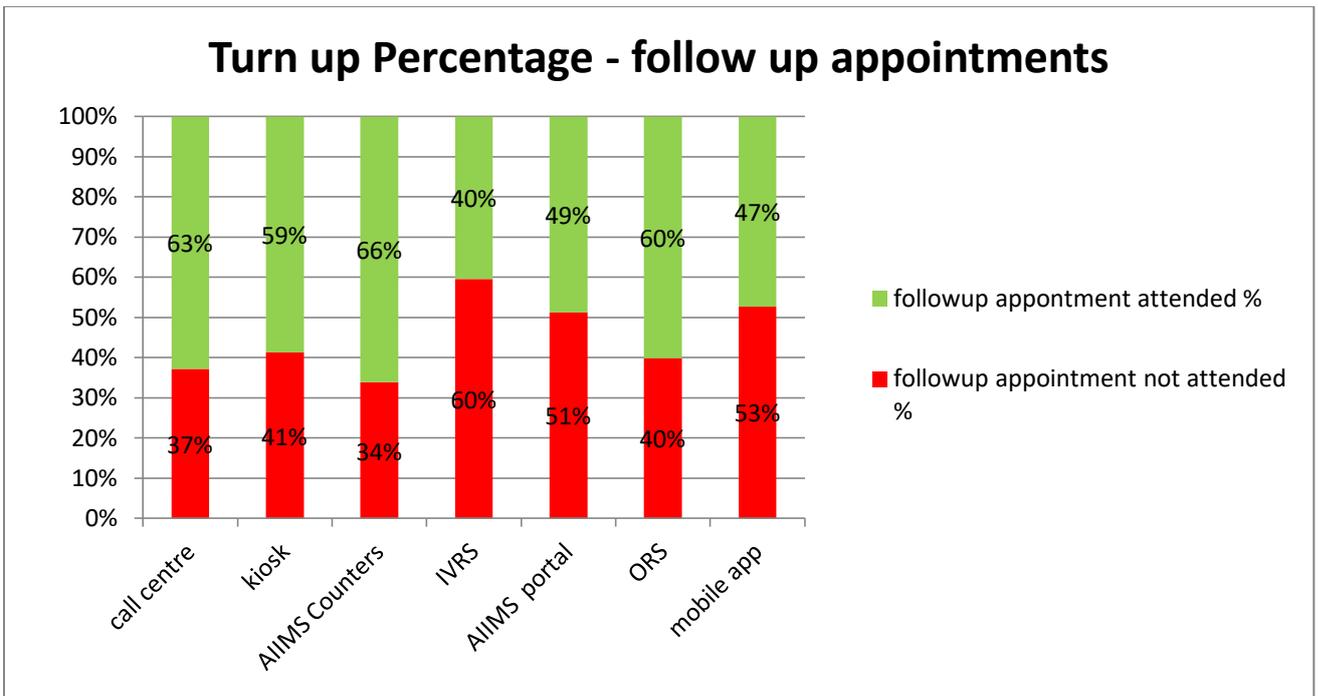


Fig.6 Graph showing average turn up percentage of follow up patients (2015-June 2017)

Table no.1: Table showing Department wise patient load (2015-2017)

| Dept Name | New Appointment Attended | | | Followup Attended | | |
|---------------------------------------|--------------------------|-------|-------|-------------------|-------|-------|
| | 2015 | 2016 | 2017* | 2015 | 2016 | 2017* |
| Medicine | 30771 | 70463 | 38637 | 38327 | 89326 | 54615 |
| PMR | 6799 | 15619 | 7535 | 10295 | 24149 | 11983 |
| Paediatrics | 25888 | 62920 | 27048 | 34969 | 92294 | 49568 |
| Skin | 12657 | 34269 | 20886 | 16854 | 50144 | 31975 |
| Psychiatry | 7033 | 19883 | 10466 | 20410 | 56872 | 35131 |
| Surgery | 20519 | 54831 | 30023 | 16256 | 44682 | 26481 |
| Orthopedics | 24382 | 54740 | 30171 | 37563 | 87826 | 51622 |
| ENT | 16460 | 60705 | 35785 | 19741 | 68081 | 41288 |
| Obs and Gynae | 14627 | 42674 | 23736 | 33030 | 98087 | 57159 |
| Pulmonary Medicine and Sleep Disorder | 4283 | 12544 | 6466 | 6399 | 17992 | 9872 |
| Gastroenterology | 10413 | 26065 | 14484 | 13297 | 35780 | 22111 |
| Cardiology | 17293 | 45220 | 22683 | 1598 | 31565 | 41892 |
| Nephrology | 3379 | 9553 | 6407 | 10890 | 34501 | 19323 |
| Neurology | 10881 | 28945 | 15982 | 1591 | 8245 | 13554 |
| Neuro Surgery | 6106 | 14864 | 8102 | 11484 | 15384 | 11214 |
| G.I. Surgery | 1187 | 2973 | 1749 | 3149 | 6670 | 3649 |
| Nuclear Medicine | 1127 | 1937 | 1082 | 8 | 111 | 46 |
| Urology | 8478 | 17939 | 10065 | 11261 | 38796 | 22626 |
| Paed surgery | 3016 | 8402 | 4534 | 6759 | 17911 | 10488 |
| Hematology | 2451 | 6872 | 3793 | 6104 | 27681 | 18219 |
| Endocrinology | 5591 | 13013 | 6626 | 8338 | 30861 | 19411 |
| Radiotherapy | 182 | 569 | 198 | 1 | 15 | 0 |
| Geriatric Medicine | 5079 | 15522 | 8602 | 10826 | 27568 | 16473 |
| Rheumatology | 1100 | 4540 | 2550 | 2782 | 14612 | 8602 |

The patient turn up rate through appointment varied across departments and patient absenteeism is an inevitable element in any appointment system. By taking this fact into account, Computer facility has made paramount effort to ensure the optimal utilization of the hospital resources. We have teamed up with Indian Statistical Institute (ISI) in collaborative project which in turn resulted in adopting a 'Statistical approach', which would automatically and intelligently predict the patient turn up rate by scientifically analyzing the historical turn up data from e-hospital. This approach helped us in setting new patient limits for different OPDs in an automatic manner so as to accurately predict (within 10%) the number of patient actually coming to every department.

Staggered Appointment system

Overcrowding was another major issue faced by AIIMS OPD. As many as 10,000 patients reach the hospital's OPD daily. Such an overwhelming foot fall often clogs the system. The feature of staggering appointment was enabled to tackle this issue. Systematic staggering of patients is achieved by allotting different time slots to every patient so as to ensure optimum capacity utilization.

Need for Staggering:

It was observed that 79% of patients reported before 10am and out of which only 19% had their consultations by 10.00am. This data throws light to the fact that the patient arrival is not in line with the actual consultation timings which further clogs the system eventually increasing the average patient waiting time in the OPD.

Appointments have been staggered for New as well as Follow-Up Patients. Current Booking Appointments have been staggered on the average volume of patients handled by each department

The three slots for morning OPDs are as under:

- Slot 1: 8 AM – 9 AM
- Slot 2: 9 AM – 10 AM
- Slot 3: 10 AM – 10:30 AM

The three slots for afternoon OPDs are as under:

- Slot 1: 1:30 PM – 2 PM
- Slot 2: 2 PM – 2:30 PM
- Slot 3: 2:30 PM – 3 PM

http://192.168.15.14:8081/ehospital/HR/Appointme
Phones } 2658850
2658870

CASH RECEIPT
ALL INDIA INSTITUTE OF MEDICAL SCIENCES
Ansari Nagar, New Delhi-110029

ALL INDIA INSTITUTE OF MEDICAL SCIENCES (AIIMS)
New Delhi,
APPOINTMENT SLIP

Receipt No.:
Received From:
PD/ MRD No:
Done By-5884
Queue No-25 (Follow-up)
General ₹ 0.0
Dated :
Patient Type :
Room No. :

Department Name: Paediatrics/Paediatric
Reporting Time: 10:00 AM-10:30 AM
Appointment Date: 01/08/2017

| | | | |
|-----------------|---------------------|--------------------------|-------------------------|
| Doctor Name | Dr. SHEFFALI GULATI | Appointment Request date | 18/07/2017 |
| Name of Patient | MR. DAKSH SHARMA | Appointment No | 2017071806657 |
| Sex | Male | Age | 3 years 3 months 6 days |
| Contact Details | Mobile: XXXXXX046 | Request Mode | counter |

Remarks:
Your UHID Is : 102741691
Your Clinic Number Is : 2017/P/NEURO OPD/2575
Book appointment for OPD's, video consults and download lab reports from android mobile via AIIMS app.
Download AIIMS app from play store <https://play.google.com/store/apps/details?id=com.aiims.hospital> or <https://goo.gl/YPn8We>

Fig.7 Reporting time mentioned in the appointment slip

Special slot category ('EHS known to')

There are dedicated counters operational in AIIMS to facilitate the registration of EHS patients, 'EHS Known to' patients, and patients referred by Director, Medical

Superintendent, OSD, Chairperson or Faculty I/C Media & Protocol Division etc.. Current system allows the registration of such patients under special category (special slot/over booking slot) which is over and above the limit agreed up on by the department and there by those patients can circumvent the long appointment waiting time.

The proportion of the said category is steadily increasing over time.

The new appointments taken through special slot in 2016-2017 was 42% higher than the year 2015-2016.

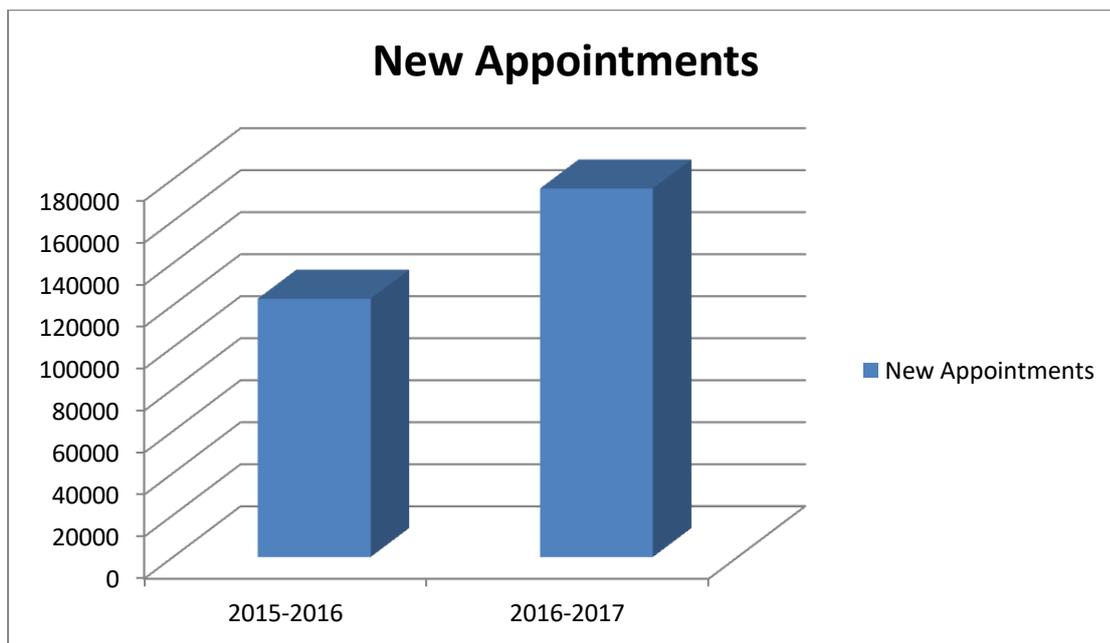


Fig.7 Showing the number of new and follow up appointments taken through Special slot (June 2015-May 2017)

Role of Nursing Informatics

With the implementation of patient registration counters and appointment system it was felt necessary to have nursing informatics specialist (NIS) staff posted in the registration area to screen every patient so as to avoid wrong referrals and act as interface between the patient and the registration staff. This has been a big success with around 10 NIS posted in OPD, Patient Reception counter and Single Window Exit Counters, which has made the entry of patients in to this premiere hospital much easier and making this a patient friendly hospital.